September 2, 2020

Via Electronic Filing

Public Utility Commission of Oregon
Attn: Filing Center
201 High St. SE, Suite 100
Salem, OR 97301

Re: Docket No. UE 374 - In the Matter of PACIFICORP, dba PACIFIC POWER, Request for a General Rate Revision.

Enclosed for filing in the above-caption docket please find the Sierra Club Cross-Examination Exhibits. The Confidential versions of the Cross-Examination Exhibits will be served in accordance with OAR 860-001-0070(3) and the Commission's Covid-19 Response outlined in Order 20-088 on all eligible party representatives electronically via encrypted password protected ZIP folders

If you have any questions or require any additional information, please do not hesitate to contact me.

Respectfully submitted,

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BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

In the Matter of PACIFICORP d/b/a PACIFIC POWER, Request for a General Rate Revision	UE 374

CERTIFICATE OF SERVICE

I hereby certify that on this 2nd day of September, 2020, I have served the foregoing Sierra Club Cross-Examination Exhibits upon all party representatives on the official service list for this proceeding. The public version of these documents was served upon parties via email, and the confidential version of these documents was served pursuant to General Protective Order No. 20-040 upon all eligible party representatives electronically via encrypted password protected ZIP folders.

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Dated this 2nd day of September, 2020 at Redwood City, CA.

/s/ Ana Boyd

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BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UE 374

In the Matter of PACIFICORP d/b/a PACIFIC POWER, Request for a General Rate Revision	SIERRA CLUB'S PRE-FILED AND CROSS-EXAMINATION EXHIBITS

Sierra Club Pre-Filed Exhibits in UE 374

Witness	**Exhibit No.**	**Description**
Jeremy Fisher	Sierra Club/100	Highly Confidential Opening Testimony of Jeremy Fisher, PhD
	Sierra Club/101	Curriculum Vitae of Jeremy Fisher, PhD
	Sierra Club/102	Public Discovery Responses
	Sierra Club/103	Confidential Direct Testimony of Rick Link in 20000-418-EA-12 (Wyo.P.S.C.) (provided as an attachment to PacifiCorp Response to Sierra Club Data Request 1.1)
	Sierra Club/104	Redacted Rebuttal Testimony of Rick Link in 20000-418-EA-12 (Wyo.P.S.C.)
	Sierra Club/105	WY DEQ Bart Appeal Settlement Agreement (November 2010)
	Sierra Club/106	PacifiCorp Emission Reduction Plan (Nov. 2, 2010)
	Sierra Club/107	PacifiCorp Comments on WY Regional Haze Plan (Aug. 26, 2013) (excerpt)
	Sierra Club/108	Confidential Rebuttal Testimony of Dana Ralston in UE-152253 (Wash. U.T.C) (provided as an attachment to PacifiCorp Response to Sierra Club Data Request 1.8(c))
	Sierra Club/109	Redacted Supplemental Rebuttal Testimony of Cindy A. Crane in UE-152253 (Wash. U.T.C)
	Sierra Club/110	PacifiCorp Response to Sierra Club Data Request 4.9 in Docket No. 13-035-184 (Utah P.S.C.)
	Sierra Club/111	Hearing Transcript of Ms. Cindy Crane in Docket No. 20000-418-EA-12 (Wyo.P.S.C)
	Sierra Club/112	"Attach Sierra Club 3.27" in Docket No. LC 70

Witness	Exhibit No.	Description
	Sierra Club/113	Andrew Graham, *Life beneath the earth in Wyo's only underground coal mine*
	Sierra Club/114	Supplemental Testimony of Jeremy Twitchell in Docket No. UE-152253 (Wash.U.T.C.)
	Sierra Club/115	Confidential Attachment 1.5-2 to PacifiCorp Response to Sierra Club Data Request
	Sierra Club/116	PacifiCorp, *2012 Natural Gas Request for Proposals Workshop* (Oct. 29, 2013)
	Sierra Club/117	PacifiCorp Response to Sierra Club Data Request 4.10 in Docket No. 13-035-184 (Utah P.S.C.)
	Sierra Club/118	PacifiCorp Dec. 5, 2013 Memorandum (provided as a confidential attachment to PacifiCorp Response to Sierra Club Data Request 1.4)
	Sierra Club/119	Highly Confidential Exhibit B Re: Bridger EPC Contract
	Sierra Club/120	Direct Testimony of Susan Arigoni in Docket No. 11A-917E (Colo. P.U.C.)
	Sierra Club/121	Confidential Technical Workshop: Review of Existing Analysis on Craig and Hayden Environmental Investments (provided as a confidential attachment to PacifiCorp Response to Sierra Club 2.6)
	Sierra Club/122	Confidential Attachment to PacifiCorp Response to Sierra Club Data Request 2.6-2 (Hayden PVRR)
	Sierra Club/123	Confidential Hayden SCR Recommendation Memo (provided as a confidential attachment to PacifiCorp Response to Sierra Club Data Request 2.4)
	Sierra Club/124	Confidential Attachment to PacifiCorp Response to Sierra Club Data Request 2.4 (Xcel Energy Projects)
	Sierra Club/125	Direct Testimony of James Hill in Docket No. 10M-245E (Colo. P.U.C.)
David Posner	Sierra Club/200	Opening Testimony of David Posner
	Sierra Club/201	Curriculum Vitae of David Posner
	Sierra Club/202	Morgan Stanley, The second wave of clean energy, (December 10, 2019)
	Sierra Club/203	American Electric Power, 2019 AEP Fact Book (2019)
	Sierra Club/204	U.S. Securities and Exchange Commission, Alliant Energy Form 10-K for the fiscal year ended December 31, 2019
Ezra Hausman	Sierra Club/300	Opening Testimony of Ezra Hausman, PhD
	Sierra Club/301	Resume of Ezra D. Hausman, Ph.D.

Witness	Exhibit No.	Description
	Sierra Club/302	Oregon Governor Kate Brown's Executive Order No. 20-04
	Sierra Club/303	Oregon Governor Kate Brown's Executive Order No. 17-20
	Sierra Club/304	Oregon Global Warming Commission's 2018 Biennial Report to the Legislature for the 2019 Legislative Session
	Sierra Club/305	Selected Public Data Responses
Jeremy Fisher	Sierra Club/400	Confidential Rebuttal Testimony of Jeremy Fisher, PhD
	Sierra Club/401	Exhibit DR-2C to the Direct Testimony of Dana Ralston in UE-152253 (Wash. U.T.C.) (provided as a confidential attachment to Sierra Club Data Request 1.8)
	Sierra Club/402	Exhibit DR-3C to the Direct Testimony of Dana Ralston in UE-152253 (Wash. U.T.C.) (provided as a confidential attachment to Sierra Club Data Request 1.8)
	Sierra Club/403	Selected Sierra Club Public Data Responses
	Sierra Club/404	Confidential Attachment "Bridger Summary Analysis.xlsx." Summary tab to PacifiCorp Response to Sierra Club Data Request 9.1
	Sierra Club/405	Confidential Rebuttal Testimony of Rick Link in 20000-418-EA-12 (Wyo. P.S.C.)
	Sierra Club/406	2013 PacifiCorp IRP Confidential Vol. III
	Sierra Club/407	Redacted Direct Testimony of Jeremy Fisher in 20000-418-EA-12 (Wyo. P.S.C.)
	Sierra Club/408	Redacted Rebuttal Testimony of Chad Teply in 20000-418-EA-12 (Wyo. P.S.C.) (excerpt)
	Sierra Club/409	PacifiCorp Response to Wyoming Industrial Energy Consumers Data Request 1.83 in 20000-418-EA-12 (Wyo. P.S.C.)
	Sierra Club/410	Confidential Letter from PacifiCorp Energy's William K. Lawson to Wyoming DEQ's David Finley (Jan. 29, 2009) (provided as a confidential attachment to PacifiCorp Response to Sierra Club Data Request 9.6)
	Sierra Club/411	Exhibit Sierra Club/114, 2003 PacifiCorp Control Report in UE 246
	Sierra Club/412	Exhibit Sierra Club/115, Air Quality Reference Case Investments 2005 in UE 246
	Sierra Club/413	Cal. P.U.C Advice Letter 507-E (July 21, 2014)
	Sierra Club/414	Docket No. UE-191024 et al. Proposed Settlement Stipulation (Wash. U.T.C)

Witness	Exhibit No.	Description
Ezra Hasuman	Sierra Club/500	Rebuttal Testimony of Ezra Hausman, PhD
Jeremy Fisher	Sierra Club/600	Confidential Supplemental Rebuttal Testimony of Jeremy Fisher, PhD
	Sierra Club/601	PacifiCorp Response to Sierra Club Data Request 8.2 – 1st Revised
	Sierra Club/602	Confidential attachment to PacifiCorp Response to Sierra Club 8.2, 1st Revised (excerpt)

Cross-Examination Exhibits

Exhibit No.	Description
Sierra Club/700	WA UTC Exhibit CAT-21C, April 24, 2013 SCR Memorandum (provided as a confidential attachment to PacifiCorp Response to Sierra Club Data Request 4.1)
Sierra Club/701	PacifiCorp Response to Sierra Club Data Request 11.1
Sierra Club/702	PacifiCorp Response to Sierra Club Data Request 11.2
Sierra Club/703	Confidential PacifiCorp Response to Sierra Club Data Request 11.3
Sierra Club/704	PacifiCorp Response to Sierra Club Data Request 11.4
Sierra Club/705	PacifiCorp Response to Sierra Club Data Request 11.5
Sierra Club/706	Confidential PacifiCorp Response to Sierra Club Data Request 11.6
Sierra Club/707	Confidential PacifiCorp Response to Sierra Club Data Request 11.7
Sierra Club/708	Confidential Attachment to Sierra Club 9.1, "BCC Production-Operating Cost Schedules (4-unit Coal Operation).xlsx", tab “OPEX”
Sierra Club/709	Confidential Attachment to Sierra Club 9.1, "BRIDGER (2015 IRP).xlsx"
Sierra Club/710	Confidential Attachment to Sierra Club 9.1, "Bridger Summary Analysis.xlsx"
Sierra Club/711	Confidential Attachment to Sierra Club 1.8, "BRIDGER.xlsx"
Sierra Club/712	Confidential Attachment to Sierra Club 12.1-1, "BRIDGER.xlsx"
Sierra Club/713	Confidential Ralston Workpaper "CONF Exhibit_PAC_2603_CONF and WPs.xlsx "
Sierra Club/714	Confidential Link Workpaper "Link Figures 11, 12, 14.xlsx"
Sierra Club/715	Attachment to PacifiCorp Response to Sierra Club Data Request 1.6
Sierra Club/716	PacifiCorp Response to Sierra Club Data Request 12.5
Sierra Club/717	Confidential PacifiCorp Response to Sierra Club Data Request 7.1
Sierra Club/718	Confidential Attachment to Sierra Club 7.1-1
Sierra Club/719	PacifiCorp Response to Sierra Club Data Request 7.2
Sierra Club/720	Confidential Attachment to Sierra Club 7.2-2: "PIRA_REDACTED_Nominal$_10.10.13 PROPRIETARY CONF.xlsx"

Exhibit No.	Description
Sierra Club/721	Confidential Attachments to PacifiCorp Response to Sierra Club 8.3 - 1st supp.
Sierra Club/722	PacifiCorp Response to Sierra Club Data Request 12.2
Sierra Club/723	Attachment to Sierra Club 12.2 (Gateway West)
Sierra Club/724	Attachment to Sierra Club 12.2 (Aeolus West)

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 700

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided under separate cover.

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 701

Cross-Examination Exhibit

UE 374/PacifiCorp
August 27, 2020
Sierra Club Data Request 11.1

Sierra Club Data Request 11.1

Refer to Exhibit PAC/2603 and the Reply Testimony of Dana Ralston (PAC/2600) at Ralston/10:11-11:7, with respect to the October 2013 mine plan, specifically that "SCR benefits would have decreased by approximately $16.7 million over the 10- year budget period".

(a) Confirm or deny: the $16.7 million value is a present value calculated through the period 2014-2023 only. If denied, provide evidence and work papers showing that the present value was calculated through a different period.

(b) Please confirm whether Mr. Ralston calculated a differential in the SCR benefits through 2030 using the October 2013 mine plan? If he did not, please explain why not. If so, provide that calculation.

(c) Please confirm whether Mr. Ralston calculated a differential in the SCR benefits through 2037 using the October 2013 mine plan. If he did not, please explain why not. If so, provide that calculation.

Response to Sierra Club Data Request 11.1

(a) Confirmed.

(b) Not confirmed. The October 2013 mine plan was developed to support PacifiCorp's 2014 10-year business plan process. As such, updated Jim Bridger plant million British thermal unit (MMBtu) requirements where only available through 2023.

(c) Please refer to the Company's response to subpart (b) above.

Despite PacifiCorp's diligent efforts, certain information protected from disclosure by the attorney-client privilege or other applicable privileges or law may have been included in its responses to these data requests. PacifiCorp did not intend to waive any applicable privileges or rights by the inadvertent disclosure of protected information, and PacifiCorp reserves its right to request the return or destruction of any privileged or protected materials that may have been inadvertently disclosed. Please inform PacifiCorp immediately if you become aware of any inadvertently disclosed information.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 702

Cross-Examination Exhibit

UE 374/PacifiCorp
August 27, 2020
Sierra Club Data Request 11.2

Sierra Club Data Request 11.2

Refer to the work papers supporting Exhibit PAC/2603, "CONF Exhibit_PAC_2603_CONF and WPs.xlsx, tabs "January 2013 Mine Plan" and "October 2013 Mine Plan".

(a) Provide a $/MMBtu estimate of the cost of coal procured from Bridger coal company for years 2014-2030 in January 2013 and October 2013.

Response to Sierra Club Data Request 11.2

(a) Please refer to Confidential Attachment Sierra Club 11.2 for Bridger Coal Company delivered coal cost. Bridger Coal Company coal costs after 2023 are high level estimates without Jim Bridger plant generation forecast and are only used to derive final reclamation contributions.

Confidential information is designated as Protected Information under the protective order in this proceeding and may only be disclosed to qualified persons as defined in that order.

Despite PacifiCorp's diligent efforts, certain information protected from disclosure by the attorney-client privilege or other applicable privileges or law may have been included in its responses to these data requests. PacifiCorp did not intend to waive any applicable privileges or rights by the inadvertent disclosure of protected information, and PacifiCorp reserves its right to request the return or destruction of any privileged or protected materials that may have been inadvertently disclosed. Please inform PacifiCorp immediately if you become aware of any inadvertently disclosed information.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 703

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided under separate cover.

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 704

Cross-Examination Exhibit

UE 374/PacifiCorp
August 27, 2020
Sierra Club Data Request 11.4

Sierra Club Data Request 11.4

Refer to PAC/4100 Ralston/9:11-19, specifically "my reply testimony made clear that the two-unit/no SCR analysis under the October 2013 mine plan would remove the $28.3 million reclamation cost increase."

(a) Confirm that a two-unit / no SCR analysis following the October 2013 mine plan would not have accelerated surface reclamation costs relative to a four-unit analysis. If denied, provide a precise reason why a two-unit / no SCR analysis after October 2013 would continue to have accelerated surface reclamation costs.

(b) Confirm that Mr. Ralston's estimate of a $16.7 million SCR benefit differential (see line 17) resulting from the October 2013 mine plan does not include a specific year-by-year two-unit scenario, calibrated to fuel supply as known in October 2013. If denied, provide a citation and reference to a two-unit scenario updated to October 2013, and provide underlying work papers.

(c) Confirm that Mr. Ralston's estimate of a $16.7 million SCR benefit differential does not adjust for the lack of accelerated surface reclamation costs relative to a four-unit analysis. If denied, explain, in detail, how Mr. Ralston's estimate accounts for a change in surface reclamation costs.

Response to Sierra Club Data Request 11.4

(a) Confirmed.

(b) Confirmed.

(c) Not confirmed for the four-unit scenario. In both the January 2013 and October 2013 four-unit scenarios, the surface mine was assumed to operate until 2037.

Despite PacifiCorp's diligent efforts, certain information protected from disclosure by the attorney-client privilege or other applicable privileges or law may have been included in its responses to these data requests. PacifiCorp did not intend to waive any applicable privileges or rights by the inadvertent disclosure of protected information, and PacifiCorp reserves its right to request the return or destruction of any privileged or protected materials that may have been inadvertently disclosed. Please inform PacifiCorp immediately if you become aware of any inadvertently disclosed information.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 705

Cross-Examination Exhibit

UE 374/PacifiCorp
August 27, 2020
Sierra Club Data Request 11.5

Sierra Club Data Request 11.5

Refer to the work papers supporting PAC/2603, "CON Exhibit_PAC_2603_CONF and WPs.xlsx", tab "October 2013 Mine Plan," lines 140-143, labeled "two unit scenario" and NPV calculation, respectively.

(a) Confirm that the values in line 141 represent the total cost of fuel delivered to Jim Bridger in a two-unit scenario, from the years 2014-2023. If denied, provide a clarification on what is represented by the values in line 141.

(b) Confirm that the values in line 141 are derived from a January 2013 two-unit scenario fuel plan for Jim Bridger, as used in the Utah and Wyoming CPCNs. If denied, provide a clarification on source of the values in line 141.

(c) Refer, in addition, to work papers provided in Attach Sierra Club 9.1 CONF. Provide a citation to the source of line 141 of CONF Exhibit_PAC_2603_CONF and WPs.xlsx, tab "October 2013 Mine Plan" as contained in Mr. Ralston's work papers. If the source of these values are not contained in work papers as previously provided, provide a work paper showing the derivation of line 141.

(d) Confirm that the two unit scenario for Jim Bridger as derived in the January 2013 contemplated accelerated surface reclamation and associated recovery of surface reclamation dollars, as shown in Exhibit PAC/706. If denied, explain.

Response to Sierra Club Data Request 11.5

(a) Denied. The values represent a cash cost of fuel delivered. Cash coal costs exclude depreciation, depletion, amortization and coal inventory adjustments.

(b) Confirmed.

(c) The derivation is calculated by multiplying Bridger 2-unit annual coal cash price[1] by the System Optimizer (SO) model PAC Share Two-Unit annual Fuel Requirement[2]. In addition, this calculation was performed by Mr. Fisher in WA UE-152253[3].

(d) Confirmed.

[1] Link Confidential Workpapers\SO Inputs and Outputs, CONF\Base Gas, Base CO2 (Gas, Outputs) CONF\StaMoFuel-C_M1209_16_B315_B416_NC.out
[2] Confidential Exhibit 705
[3] UE-152253_CONFIDENTIAL Fisher Workpapers_Revised cash and capital costs from Exhibit No. RTL-7C, Confidential Figure 3.xlsx, "SOModel – Base" tab, line 169

Despite PacifiCorp's diligent efforts, certain information protected from disclosure by the attorney-client privilege or other applicable privileges or law may have been included in its responses to these data requests. PacifiCorp did not intend to waive any applicable privileges or rights by the inadvertent disclosure of protected information, and PacifiCorp reserves its right to request the return or destruction of any privileged or protected materials that may have been inadvertently disclosed. Please inform PacifiCorp immediately if you become aware of any inadvertently disclosed information.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 706

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided under separate cover.

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 707

CONFIDENTIAL

Cross-Examination Exhibit

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 708

CONFIDENTIAL

Cross-Examination Exhibit

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 709

CONFIDENTIAL

Cross-Examination Exhibit

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 710

CONFIDENTIAL

Cross-Examination Exhibit

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 711

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided in Excel format.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 712

CONFIDENTIAL

Cross-Examination Exhibit

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 713

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided in Excel format.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 714

CONFIDENTIAL

Cross-Examination Exhibit

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 715

Cross-Examination Exhibit

This exhibit is provided in Excel format.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 716

Cross-Examination Exhibit

UE 374/PacifiCorp
August 31, 2020
Sierra Club Data Request 12.5

Sierra Club Data Request 12.5

Refer to PAC/3800 at Link/7:17-Link/8:1 and PAC/2300 at Link/23:13-18.

(a) Provide any records in the Company's possession on market forwards, for as far forward as in the Company's possession, obtained by or produced for the Company between September 1, 2013 through December 1, 2013. For clarity, this requests market forward records as produced or provided to the Company at any time from September 1, 2013 through December 1, 2013 for the forward period extending December 2013 through the next 84 months.

Response to Sierra Club Data Request 12.5

(a) The Company objects to this request as overly burdensome and onerous that would not lead to a meaningful outcome. Notwithstanding the foregoing objections, the Company responds as follows:

The Company has provided all the available information in its possession for September 2013 and December 2013 related to natural gas and electricity prices quarterly forecasts with its responses to Sierra Club Data Request 7.1, Sierra Club Data Request 12.3, and Sierra Club Data Request 12.4.

Despite PacifiCorp's diligent efforts, certain information protected from disclosure by the attorney-client privilege or other applicable privileges or law may have been included in its responses to these data requests. PacifiCorp did not intend to waive any applicable privileges or rights by the inadvertent disclosure of protected information, and PacifiCorp reserves its right to request the return or destruction of any privileged or protected materials that may have been inadvertently disclosed. Please inform PacifiCorp immediately if you become aware of any inadvertently disclosed information.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 717

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided under separate cover.

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PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 718

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided in Excel format.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 719

Cross-Examination Exhibit

UE 374/PacifiCorp
July 6, 2020
Sierra Club Data Request 7.2

Sierra Club Data Request 7.2

Refer to the Reply Testimony of Mr. Rick Link, PAC/2300 at Link/25:3-12.

(a) For each of the three different third-party experts consulted for long-term price forecasts, provide Mr. Link's calculated nominal levelized price of Opal gas prices (in $/MMBtu) for the most recent forecast preceding the September 2013 OFPC.

(b) For each of the three different third-party experts consulted for long-term price forecasts, provide Mr. Link's calculated nominal levelized price of Opal gas prices (in $/MMBtu) for the first forecast post-dating the September 2013 OFPC.

Response to Sierra Club Data Request 7.2

(a) Please refer to Confidential Attachment Sierra Club 7.2-1 which provides the nominal levelized price of Opal gas (dollars per million British thermal units ($/MMBtu)) as calculated from the published forecasts of three expert third-party subscription services. The provided long-term price forecasts were the most then-current available prior to PacifiCorp's publication of the September 2013 official forward price curve (OFPC). Note: the confidential attachment referenced above provides the third-party information that is in the Company's possession. The provided third-party information is proprietary and is provided subject to the terms and conditions of the protective order/confidentiality agreement in this proceeding.

(b) Please refer to Confidential Attachment Sierra Club 7.2-2 which provides the nominal levelized price of Opal gas ($/MMBtu) as calculated from the published forecasts of three expert third-party subscription services. The provided long-term price forecasts were the most then-current available following PacifiCorp's publication of the September 2013 OFPC. Note: the confidential attachment referenced above provides the third-party information that is in the Company's possession. The provided third-party information is proprietary and is subject to the terms and conditions of the protective order/confidentiality agreement in this proceeding.

Confidential information is designated as Protected Information under the protective order in this proceeding and may only be disclosed to qualified persons as defined in that order.

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UE 374

SIERRA CLUB EXHIBIT 720

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided in Excel format.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 721

CONFIDENTIAL

Cross-Examination Exhibit

This exhibit is confidential pursuant to Protective Order 20-040 and is provided under separate cover.

.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 722

Cross-Examination Exhibit

UE 374/PacifiCorp
September 1, 2020
Sierra Club Data Request 12.2

Sierra Club Data Request 12.2

Refer to PAC/4200 at Vail/46:16-Vail/47:7, referring to the transmission constraints mitigated by Gateway Segment D.2:

(a) Identify the transmission studies produced by or available to the Company prior to December 1, 2013 which specifically identify the constraints and mitigations noted here.

(b) Provide the transmission studies identified in (a) above.

(c) Refer to Vail/46:17-18. How much "additional renewable generation" is added in eastern Wyoming before the "first transmission constraint" is identified? Identify the nameplate capacity and specific type of generation tested in the reliability or transmission model.

(d) Refer to Vail/46:17-18. As of December 1, 2013, in what year did PacifiCorp anticipate adding the "additional" amount of renewable generation identified in (c), above? Identify the source of information (IRP or other) specifying that amount of renewable generation in that year, if possible.

(e) Refer to Vail/46:20-22. How much additional renewable generation is added in the model when Mr. Vail refers to "increasing renewable generation" causing "the next transmission constraint"? Identify the nameplate capacity and specific type of generation tested in the reliability or transmission model.

(f) Refer to Vail/46:20-22. As of December 1, 2013, in what year did PacifiCorp anticipate adding the "increasing renewable generation" that caused "the next transmission constraint" as identified in (e), above? Identify the source of information (IRP or other) specifying that amount of renewable generation in that year, if possible.

(g) Refer to Vail/47:1-6. Under the "high transfer conditions" identified here, does the transmission model assume that Jim Bridger 3 & 4 are operational, or not?

(h) Refer to Vail/47:1-6. Specify the "high transfer conditions" studied here.

(i) Refer to Vail/47:6-7. Explain, in detail, why the existing 345 lines west of Jim Bridger would be overloaded "even if Units 3 and 4 at Jim Bridger were retired."?

(j) Refer to Vail/47:1-7. Did PacifiCorp examine the need for each individual segment of the Gateway West or Gateway South projects in the absence of

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generation from Jim Bridger 3 & 4? If so, identify and provide such studies. If not, why not?

(k) Refer to Vail/47:1-7. Did PacifiCorp examine alternative mitigations (i.e. line upgrades, substation upgrades, voltage support at key locations) to relieve transmission constraints from new expected renewable energy in the absence of generation from Jim Bridger 3 & 4? If so, identify and provide such studies. If not, why not?

Response to Sierra Club Data Request 12.2

(a) Prior to December 1, 2013, Western Electricity Coordinating Council (WECC) Path Rating studies were performed for nine transmission paths that were impacted by the addition of the Energy Gateway Project. The Western Interconnection transmission model used for the studies reflected the entire Energy Gateway Transmission project. Specific to the Energy Gateway West, the following report was prepared:

> "Energy Gateway Project – Stage 1, Bridger / Anticline West (New Path 19), Path C (New Path 20) Southbound, Aeolus West (New Path) Phase 2 Path Rating Report," Revision 5.0, dated March 24, 2010.

Subsequent to completing this technical study, PacifiCorp completed the "Aeolus West Transmission Path Transfer Capability Assessment" study, Revision 2.1, dated March 30, 2018, that focused specifically on adding the Energy Gateway West – Subsegment D.2 (Aeolus – Bridger/Anticline) Project prior to other Energy Gateway project facilities in Wyoming.

(b) Please refer to Attachment SC 12.2 which provides copies of the reports referenced in the Company's response to subpart (a) above.

(c) The current Wyoming transmission system has an existing transmission constraint on the TOT 4A transmission path. The addition of the D.2 Project mitigated this constraint and allowed for the addition of the LGI Q0706 (250 megawatts (MW)) wind generation, and with the addition of 230 kV network improvements an additional 1,020 MW of queued wind generation requests could be integrated. Higher Wyoming east to west transfers were realized on the Aeolus West transmission path, which was formed by combining the D.2 Project 500 kilovolt (kV) line flows with the TOT 4A path lines flows.

Path rating studies referenced in (a) above assumed Wyoming renewable resources that were included in the Revised 2008 Integrated Resource Plan (IRP) Preferred Portfolio (May 28, 2009) totaling 2,156 MW, which would be added between 2008 and 2018. Additionally, please refer to the preferred portfolio selections of the 2013 IRP indicating 432 MW of Wyoming Wind in 2024 and an additional 218 MW of Wyoming Wind in 2025 (Table 8.7). As

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described in Table 7.5, Energy Gateway Scenario Definitions, the preferred portfolio EG-02 Case-07a included Gateway segment D.

(d) The Energy Gateway West - Subsegment D.2 and ancillary projects identified in the related interconnection studies for the renewable projects, enabled interconnection of another 1,270 MW of new wind facilities. Any further interconnections in the eastern Wyoming area would require addition of the Energy Gateway South (Aeolus-Clover) Project as referenced in the Surrebuttal Testimony of Company witness Rick A. Vail, Exhibit PAC/4200, Vail 46/22 through Vail 47/1.

(e) Per PacifiCorp's 2017R Request for Proposals, this renewable generation would need to be in-service in 2020. Please refer to the Company's response to subpart (d) above.

(f) The WECC 2021-22 heavy winter base case that was used for the simulation reflected generation resource requirements in a time period before Jim Bridger unit retirements were considered.

(g) The higher transfer conditions referenced are specific to flows on both Aeolus West and Aeolus South being increased to as high a 1,700 MW.

(h) With both Energy Gateway West – Subsegment D.2 (Aeolus – Bridger/Anticline) and Energy Gateway South (Aeolus – Clover) projects in-service, loaded simultaneously to 1,700 MW, if it is assumed that Jim Bridger Unit 3 and Jim Bridger Unit 4 are retired, there are enough remaining resources at Jim Bridger coupled with eastern Wyoming wind generation to load the Bridger West transmission path to the 2,400 MW path rating. Under this high transfer condition, if the Gateway South line trips the remaining power will flow on the Aeolus West and Bridger West transmission paths overloading the existing 345 kV lines west of Jim Bridger above their thermal ratings.

(i) Not specifically. The scope and nature of the Energy Gateway Project has been modified over time to meet the resource needs of PacifiCorp customers.

The determination of the status of the PacifiCorp coal fleet is driven by economics and regulatory requirements that are reflected in the IRP analysis. Once a coal retirement decision is made, a formal large generator interconnection (LGI) request will be submitted to PacifiCorp Transmission to trigger a detailed evaluation to determine the impact that this coal retirement would have on the PacifiCorp transmission system. Short of such a request, any determination on the impacts of such a coal retirement are considered preliminary.

(j) The rating of the Bridger West transmission path was increased from 2,200 MW to 2,400 MW in 2011, prior to the completion of the Bridger/Anticline West path rating, which increased transfers west of Bridger/Anticline by 1,700 MW, up to 4,100 MW. As part of the 2011 path rating analysis, every facility

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was reviewed and upgraded as necessary. Therefore, any increase in the Bridger West transmission system will require transmission additions between Anticline and Populus. Technical studies evaluating the Bridger/Anticline path rating of 4,100 MW are included in the attached report:

"Energy Gateway Project – Stage 1, Bridger / Anticline West (New Path 19), Path C (New Path 20) Southbound, Aeolus West (New Path) Phase 2 Path Rating Report," Revision 5.0, dated March 24, 2010.

Despite PacifiCorp's diligent efforts, certain information protected from disclosure by the attorney-client privilege or other applicable privileges or law may have been included in its responses to these data requests. PacifiCorp did not intend to waive any applicable privileges or rights by the inadvertent disclosure of protected information, and PacifiCorp reserves its right to request the return or destruction of any privileged or protected materials that may have been inadvertently disclosed. Please inform PacifiCorp immediately if you become aware of any inadvertently disclosed information.

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Energy Gateway Project – Stage 1

Bridger / Anticline West (New Path 19)

Path C (New Path 20) Southbound

Aeolus West (New Path)

Phase 2 Path Rating Report

Submitted by

WECC Phase 2 - Bridger Area Study Group

Date;

November 24, 2010

Revision 5.0

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APPENDIX FILES; Located on Idaho Power's FTP Site at; https:\\fileexch.idahopower.com

Appendix 6-1; See file; Appendix_6-1.pdf Aeolus West vs. Aeolus South – Base Case & PT Plots
Appendix 6-2; See file; Appendix_6-2.pdf Aeolus West vs. Aeolus South – Dynamics plots
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Appendix 10-1; See file; Appendix_10-1.pdf Bridger West vs. Path C South – Base Case & PT Plots
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Appendix 12-1; See file; Appendix_12-1.pdf Bridger West vs. Idaho – Montana (18) Base Case+PT Plots
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Appendix 14-2; See file; Appendix_14-2.pdf Bridger West vs. Rock Spgs / Firehole– Dynamics plots
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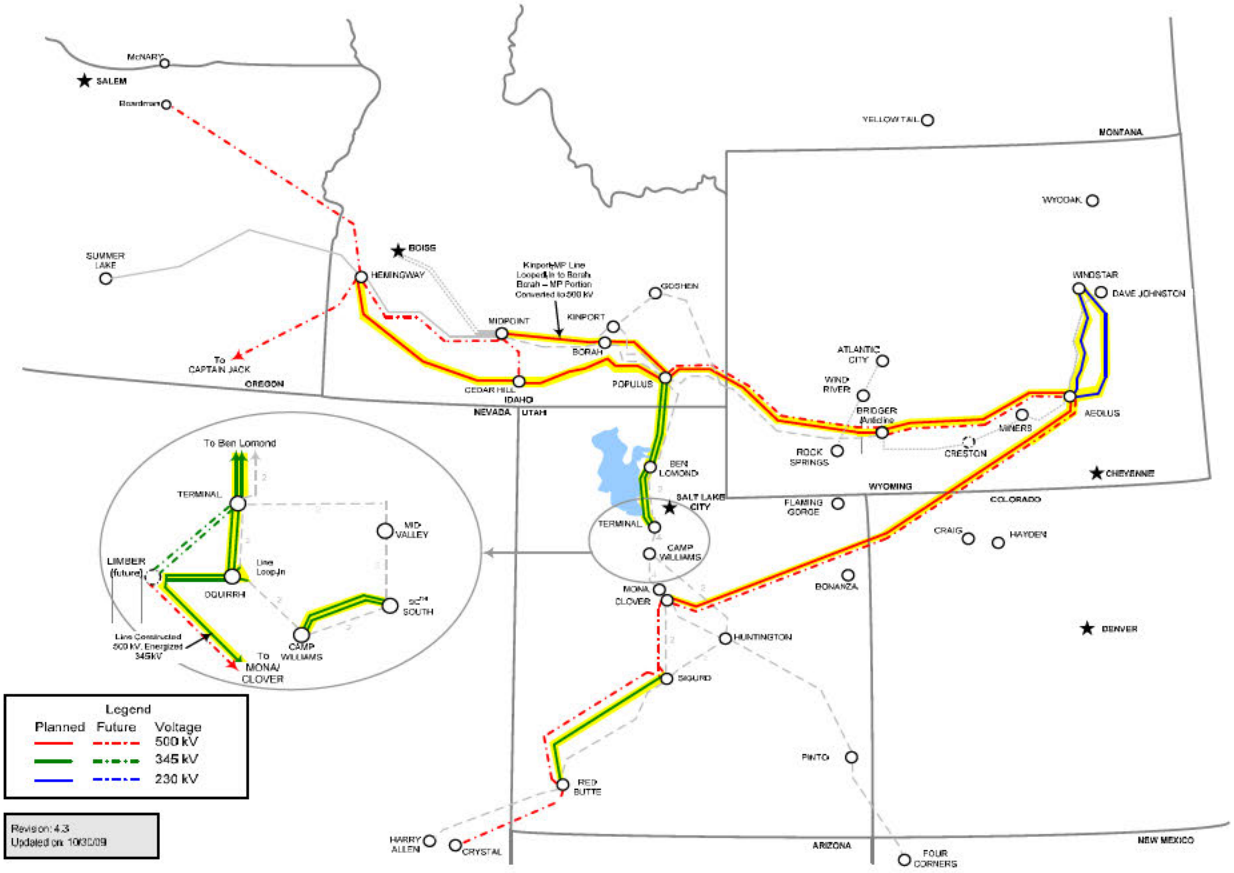
Appendix 20-2; See file; Appendix_20-2.pdf Path C South vs. Rock Spgs / Firehole– Dynamics plots

Executive Summary

PacifiCorp plans to build a 500 kV transmission Project to deliver wind power from central Wyoming to central Utah and eastern Idaho. The Project consists of 500 kV transmission from central Wyoming to central Utah and a second set of 500 kV lines from Wyoming to the eastern Idaho area and eventually to the lower Columbia River system in north central Oregon. The project also consists of a 230 kV collector system in Wyoming, which delivers the output of various wind farms to a 500 / 230 kV central hub called Aeolus. Just to the northwest of the existing Dave Johnston plant, a second 230 kV hub station called Windstar will be developed with 230kV tie lines to Aeolus. See Figure 1 for a geographic depiction of the proposed facilities that comprise 'Stage 1' of the ultimate build-out plan for the system. As noted in the Legend, Stage 1 consists of the solid lines only.

Figure 1
Gateway Energy Project
Stage 1 - Transmission Plan



This study covers the "Bridger Area" and includes the following primary paths;

- Aeolus West
- Bridger / Anticline West
- Path C Southbound

This study shows that the proposed project meets all applicable NERC Planning Standards and WECC System Performance Criteria with minor modifications to the originally proposed plan of service.

At the start of this study, Idaho Power and PacifiCorp agreed that the Bridger West 345 kV path be studied only at 2400 MW, a 200 MW upgrade from the existing rating of 2200 MW.

1. Introduction

This report establishes that, at the proposed transfer levels, the Bridger Area of the Gateway West system has little to no impact on paths external to PacifiCorp and Idaho.

1.1. Project Description

As shown in Figure 1, the Gateway West system consists of a 230kV collector system for various wind farms in central and western Wyoming. These systems either connect to the "Tot 4a" 230kV lines or connect directly to the Windstar and Aeolus hubs. From Aeolus extends a 500 kV line to Anticline, in the Bridger vicinity, and then on to Populus. Other portions of the Gateway West project will consist of 500 kV lines from Populus to Midpoint and Hemmingway, and on to Slatt substation in Oregon. A second 500 kV line from Aeolus will extend through northwestern Colorado and into a new substation called Mona Annex (or Clover) located with a few miles of the existing Mona 345kV station.

1.2. Plan of Service

.See Appendix 5 for the Gateway West Study Plan (2010 01 19 V9 - Phase I II GW Study Plan.doc) for a detailed listing of the project components.

1.3. Planned Operating Date

The plan of service provides for the Aeolus West stage one facilities to be operational by 2016 or 2017. The Aeolus South stage two facilities will be operational by 2017 to 2019

2. Transfer Capability

This report intends to prove that the Gateway West Project has little or no significant impact to paths external to PacifiCorp. In the few instances where impacts are identified, simultaneous flow impacts will be respected. In some cases, impact remediation facilities will be installed.

Early on in this study, a request was received to analyze possible increases in the study plan table of desired capacities to allow some flexibility of delivery to Aeolus South or Aeolus West. Table 1 shows the originally proposed path ratings and actual ratings achieved.

Table 1

WECC Path Name / Number	Proposed Stage 1 Rating	Path Rating Achieved in this study
Aeolus West[1] (New)	1500 MW	2672 MW
Bridger / Anticline West (19)	3900 MW	4100 MW
Path C (20) Southbound	2250 MW	2250 MW

The above ratings are all based on a heavy summer representation for the 2019 time frame. An analysis of a lighter load condition to study Path C northbound was requested, but a PRG approved base case was not delivered in time to be included in this study. The Path C northbound path rating will be addressed in a separate report.

The path transfer capability is limited due to NERC/WECC reliability performance requirements. The NERC/WECC "Reliability Criteria" is available at the following link: http://www.wecc.biz/documents/library/procedures/CriteriaMaster.pdf

3. Study Methods and Standards

3.1. Steady-State Case Stressing

Details of how each study base case was developed can be found in the Base Case Development sections of the studied system flow conditions.

3.2. Post Transient

The power flow conditions generated above are modeled with single line (N-1) outages, credible double line (N-2) outages, breaker failure outages, as well as risk assessment outages to evaluate the NERC/WECC category B, and C performance. All modeled system bus voltages and line, transformer, and series capacitor current flows are monitored. Voltage deviations greater than 5% and significant overloaded elements, with greater than a 2% change in flow, are reported in the tables located in the appendices. Engineering judgment was used to determine whether the overloading was relevant to the area. For example, some contingencies in the PACE area caused parallel transformer tap changers in B.C.Hydro and Alberta to head in opposite directions, leading to circulating Vars overloading the transformers. These loading issues are clearly a defect in modeling built into the original base cases and these loadings have not been included in the reports.

For PacifiCorp's Wyoming system, voltages less than .90 pu are reported. For Montana buses on Path 18 for Level B and C contingencies, .90 pu voltage is required. For Idaho and PacifiCorp Path 18 buses, voltages less than .87 pu are limiting for Level B and C contingencies. For Level C contingencies, under-voltage load tripping at Amps, Peterson Flats, and Big Grassy is allowed to restore system voltages.

[1] The study plan definition of Aeolus West as only the Aeolus – Anticline 500 kV line. During the course of this study, the definition was modified to include three 230 kV lines.

Violations of the NERC/WECC allowed performance are identified in the summary paragraphs for each path relationship / nomogram section.

3.3. Reactive Margin

Idaho Power's reactive margin requirements are;

- For N-1 outages; 500 MVAR for 500 kV and 250 MVAR for 345 and 230 kV.
- For N-2 outages; 400 MVAR for 500 KV and 200 MVAR for 345 and 230 kV

For this study, Idaho is assumed to be the owner of the following margin tested buses;

- Borah 500
- Borah 345
- Kinport 345
- Midpoint 500
- Hemmingway 500
- Cedar Hill 500

The WECC also requires that new rated paths or facilities be scheduled at 2.5% for all level C contingencies and 5% over their rated capacities for Level B contingencies to test for voltage collapse. Each starting nomogram corner case was modified to increase the flow by 5% and checked that a solution was attained for each outage.

3.4. Transient Stability

Utilizing GE PSLF software, select single line (N-1) and double line (N-2) and other outages were studied to evaluate transient stability performance. Relevant bus voltage and frequency violations of the NERC/WECC allowed performance are documented in Appendix 4.

3.5. Generation Drop via Remedial Action Schemes (RAS)

In order to maintain PacifiCorp's current level of reserve requirements (for Bridger contingencies), Wyoming wind generation dropping via RAS was limited to 600 MW for single line outage contingencies (N-1) and 1200 MW for double line outage contingencies.

4. Path Definitions

Both new and existing path definitions are as follows, with a '*' denoting the metering points.

4.1. Aeolus West (New)

The Aeolus West transmission path is a constrained path and is defined as the sum of the flows on the following lines: (this defn differs from the study plan)

- Aeolus* – Anticline 500 kV
- Platte* – Latham 230 kV
- Mustang* - Bridger 230 kV

- Riverton* - Wyopo 230 kV

4.2. Aeolus South (New)

The Aeolus South path is a constrained path and is defined as the sum of the flows on only one line:

- Aeolus* – Mona Annex 500 kV

4.3. Bridger West 345 kV (Existing)

The Bridger / Anticline West constrained path and is defined as the sum of the flows on the following lines:

- Bridger* – 3 Mile Knoll 345 kV
- Bridger* – Populus 345 kV #1
- Bridger* – Populus 345 kV #2

Bridger West, comprising only the existing 345 kV lines from Bridger, is currently rated at 2200 MW. With the Gateway West Project, this path rating is planned to increase to 2400 MW.

4.4. Bridger / Anticline West (Modified)

The Bridger / Anticline West constrained path and is defined as the sum of the flows on the following lines:

- Anticline* – Populus 500 kV
- Bridger* – 3 Mile Knoll 345 kV
- Bridger* – Populus 345 kV #1
- Bridger* – Populus 345 kV #2

With the Gateway West Project this Path is anticipated to be rated at 4100 MW.

4.5. Path C (Existing – After completion of the Populus –Terminal Project)

Path C is a constrained path and is defined as the sum of the flows on the following lines:

- Terminal – Populus* 345 kV
- Ben Lomond – Populus* 345 kV #2
- Ben Lomond – Populus* 345 kV #3
- Treasureton – Brady* 230 kV
- Fish Creek – Goshen* 161 kV
- Malad - American Falls *138 kV
- 3 Mile Knoll 138 / 345* kV Transformer
- 3 Mile Knoll* - Hooper Spur 138 kV

After completion of the Populus – Terminal Project, Path C will have a southbound rating of 1600 MW and a northbound rating of 1250 MW. With the Gateway West Project, the Path C rating goals are 2250 MW bi-directional.

4.6. Monument – Naughton (Internal Path)

Monument – Naughton is a path internal to PacifiCorp, is not registered with the WECC, and is defined as the sum of the flows on the following lines:

- Monument PST* – Craven Creek 230 kV
- Monument PST* – Naughton 230 kV

4.7. West of Rock Springs / Firehole (Internal Path)

Monument – Naughton is a path internal to PacifiCorp, is not registered with the WECC, and is defined as the sum of the flows on the following lines:

- Rock Springs* – Palisade 230 kV
- Firehole* - Mansface 230 kV

5. Project Base Case Modifications

The following describes various changes to the base cases to resolve PSLF solution convergence issues.

5.1. SVC Tie Line Modeling

At St. George, Red Butte, Platte, and Aeolus, tie lines between the SVC and the main substation bus had too low an impedance to obtain reliable solutions in PSLF. These impedances were adjusted to be above the Z threshold to get the cases to reliably converge. In some instances, the Red Butte SVC had to be disconnected to obtain a valid solution.

5.2. Line and Transformer Rating Conflicts

From the original WECC base cases there are some instances where the emergency ratings (MVA2) are lower than the normal ratings (MVA1). The consequences of this are that the Post-transient flow program output would get clogged with reports of overloads that are not real. To reduce the erroneous reports, a program was run to set the emergency ratings at least equal to the normal ratings.

5.3. Phase Shifter Tap Steps

Most of the controlled flow phase shifter tap steps were changed to zero degrees to allow for fine tuning of the path flows.

5.4. SVDs to Shunt Conversions

In the PacifiCorp system, many of the Static Var Devices (SVDs) were disconnected and replaced with shunt capacitors and reactors to allow forcing of the devices to correct voltage profiles while keeping generator reactive within reasonable limits.

5.5. Other System Modeling Changes / Corrections

Several cases involving heavy Path C southbound flows resulted in Aeolus flows greater than 1700 MW. To keep the Aeolus south flows within the 1700 MW limit, a small portion of the

series capacitors closest to Aeolus were bypassed (by modifying the bank impedance) on the Aeolus – Mona Annex 500 kV line.

On the starting base case, errors were noted on the PDCI B-Face table such that the PDCI flows were being incorrectly reported. This was corrected via an epcl routine.

5.6. PacifiCorp System Updates / Corrections

Through the course of the study, modeling errors were noted in both the existing system in the Gateway West proposed facilities. To track case versions, these changes also describe case version code changes;

1. Early on in the studies, a reactive deficiency at Bonanza was noted. At the recommendation of Deseret Energy, the 345 kV line reactor was removed from the Bonanza – Mona 345 kV line and a 60 MVar shunt capacitor was added to the Bonanza 138 kV bus. A previously suggested load addition at Chapita 138 was not added due to the lack of a plan of service study. At about the same time it was noted that the SVDs modeled at the Tot 4a 230kV buses were causing the PT cases to diverge. To fix this problem, the SVDs were converted to shunts and switched via RAS in the switching files. These changes, along with a rating change of the Malad – American Falls 138 kV line were incorporated into cases identified by the version code '8h5'.
2. An error was found in the conversion of the cases from PSSE to PSLF in the shunt tables. In PSSE, shunts are part of the bus records, and if they are off line, they are simply deleted from the record. When converting to PSLF, this information is lost. An EPCL was developed to incorporate the original shunt tables from the parent WECC case. The case version code for this change was '8h6'.
3. In the approved project case, only transformer and phase shifters connected to Anticline 500 kV to Bridger 345. A change was requested to add the 5 mile section of 345 kV line between Anticline and Bridger with the transformers and phase shifters located at Anticline. Also, the addition of Riverton – Wyopo 230 kV line to the Aeolus West interface. The case version code for this change was '8h7'.
4. Errors were noted in the representation of the Aeolus area shunts and SVC. The SVC was increased to +450 MVar. At this same time, the fixed SVD at Spence was removed and replaced with a switchable shunt and the Pinto phase shifter impedance was corrected. The case version code for this change was '8h8'.
5. After it was found that the Platte – Miners and Platte – Latham 230 kV lines were constraining Aeolus West flows, it was decided to change the emergency rating (MVA2) to the 30 minute rating of 521 MVA for both of these lines. As the network topology did not change, the version code remained at '8h8'.

6. Path Studies

6.1. Aeolus West vs. Aeolus South

6.1.1. Base Case Development

The Gateway West Project base case was modified to stress Aeolus West to 2672 MW with several cases spanning a range of Aeolus South flows. The primary resource for stressing Aeolus West was the Wyoming Wind developments. Aeolus South flows were stressed by varying; 1) Current Creek generation, 2) IPP DC flows and the wind generation connected to IPP 345, and lastly, Nevada generation and Tot 2C flows.

For cases with Aeolus South flows at 1700 MW, Aeolus West flows were fine tuned by varying schedules from WAPA (73) to the Northwest (40). Shunt capacitors were added to Mona Annex 500 kV to support the high flows into central Utah. Path flows for each of the above cases are shown on Appendix 3-1. The resulting nomogram is shown on Appendix 2-1.

Finally, two margin test cases were developed with 5% additional flows across 1) Aeolus West path and 2) Aeolus South path. These cases are shown near the bottom of Appendix 3-1.

6.1.2. Post-Transient Analysis

Appendix 3-1 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **<u>Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)</u>**

  This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) becomes the limiting contingency for both nomogram corners. This outage results in overloads on the Miners – Platte 230 kV line even when the 521 MVA 30 minute emergency rating is used, and thereby sets the PT limit for this contingency.

- **<u>Aeolus – Mona Annex (Clover) 500 kV Line (Contingency B36 and RAS variations)</u>**

  This contingency also diverges without any RAS actions. However, with 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications, the contingency problems are fully resolved.

- **<u>Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. Some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted in overloads of the Bridger – Rock Springs 230kV line. Follow-up cases with Bridger generation dropping and additional RAS action on Path 18 resolve both the loading problem and the voltage deviation issues on Path 18.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in overloads of Springer – Gladstone 115 kV line for one corner point of the nomogram and an overload of Merwin – View Tap 115kV line for the other corner point. Springer – Gladstone is a known problem for which remediation is already planned. The Merwin – View tap problem is also a known problem related to north to south flows on transmission into the Vancouver, WA and Portland, OR loads.

6.1.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-1. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.1.4. Transient Stability Analysis

As shown on Appendix 4-1, dynamic simulations were run on both nomogram corner points. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. However, these deviations are within the exceptions for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

Contingency B16 (Aeolus – Mona Annex 500 kV line) also produced voltage deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies. Blundel #2 also lost synchronism and went out-of-step. Blundel #2 is known as having modeling problems where the unit losses synchronism for very remote faults. This result is not relevant to this study.

6.2. Aeolus West vs. Bonanza West

6.2.1. Base Case Development

The Gateway West Project base case was modified to stress Aeolus West to 2666 MW with several cases with Bonanza West flows at 785 MW and 685 MW. The primary resource for stressing Aeolus West was the Wyoming Wind developments. Bonanza West flows were stressed by varying; 1) Current Creek generation, and 2) IPP DC flows and the wind generation connected to IPP 345. From the starting point (2666, 785) Aeolus West flows were cut by 100 MW to 2566 MW by varying schedules from WAPA (73) to the Northwest (40). Path flows for each of the above cases are shown on Appendix 3-2. The resulting nomogram is shown on Appendix 2-2.

Two margin test cases were developed with 5% additional flows across 1) Aeolus West path and 2) Bonanza West path. These cases are shown near the bottom of Appendix 3-2.

6.2.2. Post-Transient Analysis

Appendix 3-2 contains the tables associated with the post-transient study results for the Aeolus West vs. Bonanza West cases. A discussion of several of the prominent outages follows.

- **Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **Bridger – 3 Mile Knoll 345 kV Lines (B04 and RAS variations)**

  For this outage, loadings are within emergency ratings. However, voltage deviations and deviations from the .90 pu standard for Path 18 are noted. Subsequent simulations with RAS actions fully resolve these issues.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

  This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) becomes the limiting contingency for both nomogram corners. This outage results in overloads on the Miners – Platte 230 kV line even with the 521 MVA 30 minute emergency rating, and thereby sets the PT limit for this contingency.

- **Aeolus – Mona Annex (Clover)500 kV Line (Contingency B36 and RAS variations)**

This contingency also diverges without any RAS actions. However, with 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications, the contingency problems are fully resolved.

- **Bonanza – Mona 345 kV Line (B40 and B40a with RAS)**

For this outage, a total of 10 elements overload, with the worst being the Bonanza – Vernal 138 kV line that loads to 133.42% of its emergency rating. Contingency 40a, with the existing Bonanza generation dropping RAS, fully resolves the loading and voltage deviations issues.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. Some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted on overloads of the Bridger – Rock Springs 230kV line. Follow-up cases with Bridger generation dropping and additional RAS action on Path 18 resolve both the loading problem and the voltage deviation issues on Path 18.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in overloads of Springer – Gladstone 115 kV line. Springer – Gladstone is a known problem for which remediation is already planned.

6.2.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-2. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.2.4. Transient Stability Analysis

As shown on Appendix 4-2, , dynamic simulations were run on both nomogram corner points. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. For contingency B09c, the backswing exceeded the "exceptions" for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger. If this deviation is determined to be acceptable and not a risk to tripping the Bridger units, an amendment to the WECC exceptions list could easily resolve this issue.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

Contingency B16 (Aeolus – Mona Annex (Clover) 500 kV line) for the second base case (785, 2666) also produced voltage deviations and a over-excitation limiter (OEL1) relay trip of the Bonanza unit. Follow-up RAS cases with generation drop RAS and capacitor switching did not resolve the OEL trips. A further investigation into the OEL1 relay resulted in new relay data from Deseret Energy. However, the new data also resulted in a trip of Blundel #2 in addition to the OEL trip of Bonanza. After checking the dynamics plots it was found that the excitation current was well below the OEL1 trip setting. A further test with the trip functions of the OEL relay disabled produced stable operation and generator filed currents well within the maximums. From this, it is concluded to be a relay / modeling problem and is not a problem associated with Gateway West transfers. If a more detailed analysis determines Bonanza OEL1 relay settings to be correct and the field current to be a real problem, a 60 MVar switchable cap (#2) could be added to get the generator off its excitation / Var limits. This sensitivity analysis is provided on line 86 of Appendix 4-2.

6.3. Aeolus West vs. Tot 1a

6.3.1. Base Case Development

The Gateway West Project base case was modified to stress Aeolus West to 2672 MW with several cases with Tot 1a flows at 650 MW and 550 MW. The primary resource for stressing Aeolus West was the Wyoming Wind developments. Tot 1a flows were stressed by varying; 1) Bonanza generation, 2) Craig / Hayden generation, 3) Current Creek generation, and 4) IPP DC flows and the wind generation connected to IPP 345. Craig #3 generation was modeled at 430[2] MW which is above the governor limit shown in the dynamics data file. From the starting point (2672, 650) Aeolus West flows were cut by 100 MW to 2572 MW by varying schedules from WAPA (73) to the Northwest (40). Path flows for each of the above cases are shown on Appendix 3-3. The resulting nomogram is shown on Appendix 2-3.

One margin test cases was developed with 5% additional flows across the Aeolus West path and Tot 1a. These cases are shown near the bottom of Appendix 3-3.

6.3.2. Post-Transient Analysis

Appendix 3-3 contains the tables associated with the post-transient study results for the Aeolus West vs. Bonanza West cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

[2] An email request for this modeling change was made to Tri-State on June 17, 2010. As of this writing, no response has been received.

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **Bridger – 3 Mile Knoll 345 kV Lines (B04 and RAS variations)**

For this outage, loadings are within emergency ratings. However, voltage deviations and deviations from the .90 pu standard for Path 18 are noted. Subsequent simulations with RAS actions fully resolve these issues.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) becomes the limiting contingency for both nomogram corners. This outage results in overloads on the Miners – Platte 230 kV line even with the 521 MVA 30 minute emergency rating, and thereby sets the PT limit for this contingency.

- **Aeolus – MonanX (Clover) 500 kV Line (Contingency B36 and RAS variations)**

This contingency also diverges without any RAS actions. However, with 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications, the only issues remaining are voltage deviations greater than 5% in the Bonanza area. A shunt capacitor, discussed later in this report, may be available to bring the Bonanza generator off of its upper Var limit and thereby reduce the voltage deviations to acceptable limits.

- **Bonanza – Mona 345 kV Line (B40 and B40a with RAS)**

For this outage, a total of 10 elements overload, with the worst being the Boanza – Vernal 138 kV line that loads to 133.42% of its emergency rating. Contingency 40a, with the existing gen drop RAS, fully resolves the loading and voltage deviations issues.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. Some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted on overloads of the Bridger – Rock Springs 230kV line. Follow-up cases with Bridger generation dropping and additional RAS action on Path 18 resolve both the loading problem and the voltage deviation issues on Path 18.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in overloads of Springer – Gladstone 115 kV line. Springer – Gladstone is a known problem for which remediation is already planned.

6.3.3. Reactive Margin Analysis

As shown near the bottom of Appendix 3-3, One simultaneous case was developed with +5% on Aeolus West and Tot 1a. This case solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.3.4. Transient Stability Analysis

As shown on Appendix 4-3, dynamic simulations were run on both nomogram corner points. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. For contingency B09c, the backswing exceeded the exceptions for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger. If this deviation is determined to be acceptable and not a risk to tripping the Bridger units, an amendment to the WECC exceptions list could easily resolve this issue.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

Contingency B16 (Aeolus – Mona Annex (Clover) 500 kV line) for the second base case (650, 2522) resulted in an over-excitation limiter (OEL1) relay trip of the Bonanza unit. Follow-up RAS cases with generation drop RAS and capacitor switching did not resolve the OEL trips. A further investigation into the OEL1 relay resulted in new relay data from Deseret Energy. However, was not successful in elimination of the Bonanza OEL trip. After checking the dynamics plots it was found that the excitation current was well below the OEL1 trip setting. A further test with the trip functions of the OEL relay disabled. The resulting run produced stable operation and generator filed currents well within the maximums. From this, it is concluded to be a relay / modeling problem and is not a problem associated with Gateway West transfers. If a more detailed analysis determines Bonanza OEL1 relay settings to be correct and the field current to be a real problem, a 60 MVar switchable cap (#2) could be added to get the generator off its excitation / Var limits.

6.4. Bridger / Anticline West vs. Aeolus South

6.4.1. Base Case Development

The Gateway West Project base case was modified to stress Bridger / Anticline West to 4100 MW with several cases spanning a range of Aeolus South flows from 1500 MW to 1700 MW. The primary resource for stressing Bridger / Anticline West was the Wyoming Wind developments. Aeolus South flows were controlled by varying; 1) Current Creek generation, 2) IPP DC flows and the wind generation connected to IPP 345, and lastly, Nevada generation and Tot 2C flows.

For cases with Aeolus South flows at 1700 MW, Bridger / Anticline West flows were fine tuned by varying schedules from WAPA (73) to the Northwest (40). Shunt capacitors were added to Mona Annex (Clover) 500 kV to support the high flows into central Utah. Path flows for each of the above cases are shown on Appendix 3-4. The resulting nomogram is shown on Appendix 2-4.

Finally, two margin test cases were developed with 5% additional flows across 1) Aeolus West path and 2) Aeolus South path. These cases are shown near the bottom of Appendix 3-4.

6.4.2. Post-Transient Analysis

Appendix 3-4 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **<u>Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)</u>**

  This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) becomes the limiting contingency for both nomogram corners. For the upper left nomogram corner point, this outage results in overloads of the Bridger 345 / 230 kV transformer #2, and thereby sets the PT limit. For the lower right nomogram point, this outage results in overloads of three critical elements, the worst of which is the Miners – Platte 230 kV line.

- **Aeolus – Mona Annex (Clover) 500 kV Line (Contingency B36 and RAS variations)**

This contingency also diverges without any RAS actions. However, with 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications, the contingency problems are fully resolved.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. Some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted on overloads of the Bridger – Rock Springs 230kV line. Follow-up cases with Bridger generation dropping and additional RAS action on Path 18 resolve both the loading problem and the voltage deviation issues on Path 18.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in overloads of Springer – Gladstone 115 kV line. Springer – Gladstone is a known problem for which remediation is already planned.

6.4.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-4. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.4.4. Transient Stability Analysis

As shown on Appendix 4-4, dynamic simulations were run on cases near the nomogram corner points. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. However, these deviations are within the "exceptions" for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

Contingency B16 (Aeolus – Mona Annex (Clover) 500 kV line) also produced voltage deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

6.5. Bridger / Anticline West vs. Path C Southbound

6.5.1. Base Case Development

The Gateway West Project base case was modified to stress Bridger / Anticline West to 4100 MW with several cases spanning a range of Path C Southbound flows from 1450 to 1550 MW. The primary resource for stressing Bridger / Anticline West was the Wyoming Wind developments. Path C Southbound flows were controlled by varying; 1) Northwest (40) generation, and 2) PACE area generation including Current Creek, Lakeside, and Huntington.

A second case with Path C southbound flows at 2250 MW, and Bridger / Anticline West reduced to 3900 MW was very difficult to schedule without overloading the Aeolus South path. Additional cases with higher Bridger / Anticline West were not attainable. The resulting nomogram is shown on Appendix 2-5.

Two margin test cases were developed with 5% additional flows across 1) Bridger / Anticline West and 2) Path C Southbound. These cases are shown near the bottom of Appendix 3-5.

6.5.2. Post-Transient Analysis

Appendix 3-5 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **<u>Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)</u>**

  This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) resolves the voltage deviation problems. The Jefferson phase shifter overload shown is based on an emergency rating of 100 MVA. When corrected to the true rating of 112 MVA, the overload is resolved.

- **<u>Aeolus – MonanX (Clover) 500 kV Line (Contingency B36 and RAS variations)</u>**

This contingency also diverges without any RAS actions. With 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications, the Grace – Soda 138 kV line remains overloaded, indicating the need for bypassing ½ of the 3 Mile Knoll series capacitor or reconductoring of the Grace – Soda 138 kV line.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. Some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted in an overload of the Bridger – Rock Springs 230kV line. Follow-up cases with Bridger generation dropping and additional RAS action on Path 18 resolve both the loading problem and the voltage deviation issues on Path 18.

- **Path C Double Line Outages (Contingencies C09, C10, C11, & C12)**

This outage resulted in an overload of the Grace – Soda 138 kV line, indicating the need for bypassing ½ of the 3 Mile Knoll series capacitor or reconductoring of the Grace – Soda 138 kV line.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in overloads of Springer – Gladstone 115 kV line. Springer – Gladstone is a known problem for which remediation is already planned.

6.5.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-5. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions). While it would appear that the Level C (N-2) contingencies do not meet Idaho's reactive margin requirements, a review of the margin tables shows the lowest margins for contingencies C03 & C04. Follow-up RAS scenarios fully resolve margin deficiencies noted by red shaded cells.

6.5.4. Transient Stability Analysis

As shown on Appendix 4-5, dynamic simulations were run on both nomogram corner points. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. However, these deviations are within the "exceptions" for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

Contingency B16 (Aeolus – Mona Annex 500 kV line) also produced voltage deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

6.6. Bridger / Anticline West vs. Bonanza West

6.6.1. Base Case Development

The Gateway West Project base case was modified to stress Bridger / Anticline West to 4100 MW with several cases spanning a range of Bonanza West flows. The primary resource for stressing Bridger / Anticline West was the Wyoming Wind developments. Bonanza West flows were controlled by varying; 1) Bonanza generation, 2) Craig / Hayden generation, 3) Currant Creek generation, and 4) IPP DC flows and the wind generation connected to IPP 345.

For cases with Aeolus South flows at 1700 MW, Bridger / Anticline West flows were fine tuned by varying schedules from WAPA (73) to the Northwest (40). Shunt capacitors were added to Mona Annex 500 kV to support the high flows into central Utah. Path flows for each of the above cases are shown on Appendix 3-6. The resulting nomogram is shown on Appendix 2-6.

Finally, two margin test cases were developed with 5% additional flows across 1) Aeolus West path and 2) Bonanza West path. These cases are shown near the bottom of Appendix 3-6.

6.6.2. Post-Transient Analysis

Appendix 3-6 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **<u>Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)</u>**

This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) becomes the limiting contingency for both nomogram corners. For both nomogram corner points, this outage results in overloads of the Miners – Platte 230 kV line, and this loading sets the PT limit.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. Some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted on overloads of the Bridger – Rock Springs 230kV line. Follow-up cases with Bridger generation dropping and additional RAS action on Path 18 resolve both the loading problem and the voltage deviation issues on Path 18.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in overloads of Springer – Gladstone 115 kV line. Springer – Gladstone is a known problem for which remediation is already planned.

6.6.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-6. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.6.4. Transient Stability Analysis

As shown on Appendix 4-6, dynamic simulations were run on both nomogram corner points. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. However, these deviations are within the "exceptions" for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

Contingency B16 (Aeolus – Mona Annex (Clover) 500 kV line) resulted in no voltage or frequency deviations for the upper left nomogram point (695, 4100). The lower right nomogram corner point (785, 4062) had extensive difficulties with an over-excitation limiter (OEL1) model that tripped the unit supposedly to protect the rotor from overheating damage. Flows on Bonanza
West were decremented down to 3532 MW before the OEL1 generation trip problem was resolved. After a discussion of these results, Deseret provided corrected OEL1 model data that slightly changed the timing of the trips, but not the end result. Additional sensitivity cases with the OEL1 trip timers set to 999 seconds but with the OEL1 runback function still active, the PT corner point (785, 4062) had no voltage or frequency deviations and of course the unit does not trip.

6.7. Bridger / Anticline West vs. Idaho – Montana (Path 18)

6.7.1. Base Case Development

The Gateway West Project base case was modified to stress Bridger / Anticline West to 4100 MW and Path 18 was controlled to 337 MW. The primary resource for stressing Bridger / Anticline West was the Wyoming Wind developments with fine tuning using schedules from WAPA (73) to Northwest (40). Path 18 flows were controlled by schedules from Montana (62) to Idaho (60) and adjustments of the Jefferson and Mill Creek phase shifters.

Two margin test cases were developed with 5% additional flows across 1) Bridger / Anticline West and 2) Path 18. These cases are shown near the bottom of Appendix 3-7.

6.7.2. Post-Transient Analysis

Appendix 3-7 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **<u>Bridger – 3 Mile Knoll 345 kV Line (Contingency B04 and RAS variations)</u>**

  This outage results in voltage deviations and violations of the .87 pu voltage standard for the Path 18 buses. Follow-up cases were run with switching of the Kinport 345 kV shunt capacitor, Dillon 69 kV shunt capacitors c3 & c4, and a new 42 MVar shunt capacitor at Big Grassy 161 kV. These cases show the voltage problem resolved with the lowest voltage

shown to be .881 pu at Peterson Flat 230. The overload shown for E.Helena 69/100 kV #2 is the result of circulating reactive power (vars) between the two transformers at E.Helena. If the transformers were correctly modeled, the overload would be resolved.

- **3 Mile Knoll –Goshen 345 kV Line (Contingency B06 and RAS variations)**

Contingency B06 results in overloads on the Grace – Soda 138 kV line. The follow-up case B06a, with the 3 Mile Knoll series capacitor bank bypassed, results in a violation of Montana's .90 pu voltage standard. A second follow-up case (B06b), with switching of the Big Grassy 161 kV shunt capacitor fully resolves the voltage problem.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) fully resolves all voltage and loading problems.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. In follow-up cases, some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted in voltage deviations on Path 18 buses. Follow-up cases with RAS switching of Path 18 shunt capacitors and load tripping via under-voltage relays results in acceptable performance.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in overloads of several overloads including the Sigurd PS – Glen Canyon 230kV line. This line is loaded southbound in the base case, and this loading result may indicate a simultaneous flow relationship between Bridger / Anticline West and Tot 2B.

6.7.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-7. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies.

Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions). While it would appear that the Level C (N-2) contingencies do not meet Idaho's reactive margin requirements, a review of the margin tables shows the lowest margins for contingencies C03 & C04. Follow-up RAS scenarios fully resolve any margin deficiencies.

6.7.4. Transient Stability Analysis

As shown on Appendix 4-7, dynamic simulations were run on the simultaneous flow corner point. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. However, these deviations are within the exceptions for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the post-transient contingencies.

6.8. Bridger / Anticline West vs. Monument – Naughton

6.8.1. Base Case Development

The Gateway West Project base case was modified to stress Bridger / Anticline West to 4100 MW with several cases spanning a range of Monument – Naughton flows from 332 MW to 475 MW. The primary resource for stressing Bridger / Anticline West was the Wyoming Wind developments. Monument – Naughton flows were controlled by the Monument phase shifting transformers. Loads in the Trona area of SW Wyoming (Zone 668) were reduced by roughly 141 MW to prevent the Rock Springs / Firehole cut-plane from exceeding its 640 MW capacity. The resulting nomogram is shown on Appendix 2-8.

Two margin test cases were developed with 5% additional flows across 1) Bridger / Anticline West and 2) Monument - Naughton. These cases are shown near the bottom of Appendix 3-8.

6.8.2. Post-Transient Analysis

Appendix 3-8 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **<u>3 Mile Knoll – Goshen 345 kV Line (Contingencies B06 and B06a)</u>**

Contingency B06 results in overloads on the Grace – Soda 138 kV line. The follow-up case B06a, with the 3 Mile Knoll series capacitor bank bypassed, fully resolves the overload.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) resolves the voltage deviation problems. This outage results in a slight overload (100.04%) on the Miners – Platte 230 kV line even with the 521 MVA 30 minute emergency rating, and thereby sets the PT limit for this contingency.

- **Aeolus – Mona Annex (Clover) 500 kV Line (Contingency B36 and RAS variations)**

This contingency also diverges without any RAS actions. With 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications, the contingency converges to a solution with no overloads.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. Some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted in a voltage deviation at Populus 500 for the case with Bridger / Anticline West at 4100 MW. Follow-up RAS cases with Bridger gen tripping resolve the Populus deviation problem, but then created problems for Path 18 buses. The case with 475 MW on Monument - Naughton, this outage overloaded both Monument phase shifters. While RAS actions did help the loading situation, a better solution would be to adjust the phase shifter taps to reduce flows.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in an overload of the Glen Canyon 345 / 230 kV transformer. This overload arises when the generation at Glen Canyon is not correctly divided between the 230 kV and 345 kV

step-up buses. This is a known modeling problem and is unrelated to the Gateway West Project.

6.8.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-8. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.8.4. Transient Stability Analysis

As shown on Appendix 4-5, dynamic simulations were run on both nomogram corner points. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. However, these deviations are within the exceptions for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

6.9. Bridger / Anticline West vs. Rock Springs / Firehole

The Gateway West Project base case was modified to stress Bridger / Anticline West to 4100 MW with several cases spanning a range of Rock Springs / Firehole (RS/FH) West flows from 489 MW to 640 MW. The primary resource for stressing Bridger / Anticline West was the Wyoming Wind developments. RS/FH flows were controlled by adjustments to the Monument phase shifting transformers. The resulting nomogram is shown on Appendix 2-9.

Two margin test cases were developed with 5% additional flows across 1) Bridger / Anticline West and 2) RS/FH West. These cases are shown near the bottom of Appendix 3-9.

6.9.1. Post-Transient Analysis

Appendix 3-9 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies

imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **3 Mile Knoll – Goshen 345 kV Line (Contingencies B06 and B06a)**

Contingency B06 results in overloads on the Grace – Soda 138 kV line. The follow-up case B06a, with the 3 Mile Knoll series capacitor bank bypassed, fully resolves the overload.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) resolves the voltage deviation problems. This outage results in a slight overload (100.05%) on the Miners – Platte 230 kV line even with the 521 MVA 30 minute emergency rating, and thereby sets the PT limit for this contingency.

- **Aeolus – Mona Annex (Clover) 500 kV Line (Contingency B36 and RAS variations)**

This contingency also diverges without any RAS actions. With 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications, the contingency converges to a solution with no overloads.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. Some voltage deviation problems are noted, but these issues are fully mitigated with RAS switching.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in an overload of the Glen Canyon 345 / 230 kV transformer. This overload arises when the generation at Glen Canyon is not correctly divided between the 230 kV and 345 kV step-up buses. This is a known modeling problem and is unrelated to the Gateway West Project.

6.9.2. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-9. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.9.3. Transient Stability Analysis

As shown on Appendix 4-5, dynamic simulations were run on both nomogram corner points. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. However, these deviations are within the exceptions for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

6.10. Bridger / Anticline West with the MSTI Project

6.10.1. Base Case Development

The Gateway West Project base case was modified to stress Bridger / Anticline West to 4100 MW simultaneous with the MSTI project at 1496 MW. Resources for the majority of the schedules were from three 450 MW equivalent wind models represented near Townsend, Montana. To fully load the MSTI project, other Montana generation was increased and scheduled to Idaho and the Northwest.

Two margin test cases were developed with 5% additional flows across 1) Bridger / Anticline West and 2) The MSTI project. These cases are shown near the bottom of Appendix 3-10. The resulting nomogram is shown on Appendix 2-10.

6.10.2. Post-Transient Analysis

Appendix 3-10 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

This contingency diverges without any RAS actions. However with RAS actions as noted for the B35g, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied, additional 230kV capacitors at Mustang, Riverton, and additional capacitors on Path 18) does not quite resolve the voltage deviation problems until Path 18 is reduced to 287 MW.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. However, as noted above, the loading numbers are to be used as a design input for rebuilding the limiting conductor sections. The Bridger – Rock Spring 230 kV line is also overloaded. But this loading and the voltage deviation problems are mitigated with RAS switching.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted in an overload of the Bridger – Rock Springs 230kV line. Follow-up cases with Bridger generation dropping and additional RAS action on Path 18 resolved both the loading problem and the voltage deviation issues on Path 18.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event resulted in overloads of Springer – Gladstone 115 kV line. Springer – Gladstone is a known problem for which remediation is already planned. This contingency also had 7 voltage deviations in the New Mexico system.

6.10.3. Reactive Margin Analysis

Margin cases from the point with simultaneous flows on Bridger / Anticline West and the MSTI Project were tested with +5% flow cases as noted near the bottom of Appendix 3-10. Both +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient

reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.10.4. Transient Stability Analysis

As shown on Appendix 4-9, dynamic simulations were run on the one simultaneous case. Contingency B08 and B09 with RAS variations, resulted in back swing under-frequency deviations. However, these deviations are within the exceptions for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage and frequency deviations. However, these were mitigated with some of the RAS actions simulated in the PT contingencies.

6.11. Path C Southbound vs. Idaho – Montana (Path 18)

6.11.1. Base Case Development

The Gateway West Project base case was modified to stress Path C North to South flows to 2250 MW simultaneous with stressed Path 18 North to South flows. Two base cases were developed. The first case included Path 18 Shunt Additions while the second case did not. Without the Path 18 Shunt Additions, Path 18 North to South flows were limited to 285 MW. With the Path 18 Shunt Additions, Path 18 North to South flows were limited to the current Path 18 transfer limit of 337 MW. The Path 18 Shunt Additions include switchable capacitor banks at the Amps, Peterson Flat, Big Grassy, and Dillon stations.

Multiple margin test cases were developed with 5% additional flows across Path C and Path 18. These cases are shown near the bottom of Appendix 3-11.

The resulting nomogram is shown on Appendix 2-10.

6.11.2. Post-Transient Analysis

Appendix 3-10 contains the tables associated with the post-transient study results for the import cases with and without Path 18 Shunt Additions. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  When applied to the case without the Path 18 Shunt Additions, this outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West

Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

When Contingency B01 was applied to the case with the Path 18 Shunt Additions, this outage didn't result in any overloads or voltage issues.

- **3 Mile Knoll - Goshen 345kV Line (Contingency B06 and RAS variations)**

In both cases (with and without the Path 18 Shunt Additions), this outage without RAS resulted in overloads of the Grace – Soda and 3 Mile Knoll – Soda 138 kV lines. Bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigates both of these overloads.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

In the case without the Path 18 Shunt Additions, this outage resulted in overloads on the Dave Johnston - Dave Johnston South Tap 115 kV line and the Bridger 345/230kV Bank #2. In the case with the Path 18 Shunt Additions, this outage resulted in overloads on the Dave Johnston - Dave Johnston South Tap 115 kV line only. In both cases, the RAS actions as noted for disturbance B35a (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied at Aeolus, and additional 230kV capacitors applied at Aeolus, Atlantic, Miners and Platt) resolved these overloads.

- **Aeolus – Mona Annex (Clover) 500 kV Line (Contingency B36 and RAS variations)**

In both cases (with and without the Path 18 Shunt Additions), this disturbance without any RAS actions caused the cases to diverge. With 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications, the contingency problems are fully resolved.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

In both cases (with and without the Path 18 Shunt Additions), this disturbance without any RAS actions caused overloads on the Bridger – 3 Mile Knoll 345 kV and Grace - Soda 138kV lines. RAS action, as noted for disturbance C02a (Tripping of a Bridger Unit), resolved these overloads.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

In the case without the Path 18 Shunt Additions, this disturbance was limiting for Path 18 flows. Outage C03 caused the voltage at the PTRSNFUR 69kV bus to drop to 0.90 pu. Increasing Path 18 flows to levels greater than 285MW North to South caused post-contingency voltages at the PTRSNFUR 69kV bus to drop below 0.90 pu. In addition, the RAS variations of disturbance C03, including C03a and C03b (dropping one or two Bridger units), caused the post-contingency voltages at the PTRSNFUR 69kV bus to be worse. Since

disturbances C03d and C03e both include Path 18 shunts addition switching, they were not applied to the case.

Without the Path 18 Shunt Additions, this outage limited Path 18 flows to 285 MW North to South. With the Path 18 Shunt Additions and their employment in outage C03d and C03e, Path 18's transfer limit is maintained at 337 MW North to South.

- **Populus - Ben Lomond 345 kV #2 and #3 Double Line Outage (C06 and RAS variations)**

In both cases (with and without the Path 18 Shunt Additions), this outage resulted in an overload of the Grace – Soda 138 kV line. In the case with Path 18 shunts, this outage also resulted in an overload of the 3 Mile Knoll – Soda 138 kV line. Bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigates these overloads.

- **Populus – Terminal 345 kV + Treasureton – Brady 230 kV Lines Outage (C12)**

In the case without the Path 18 Shunt Additions, this outage resulted in an overload of the Grace – Soda 138 kV line. Bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigates both of these overloads. In the case with the Path 18 Shunt Additions, no emergency overloads were encountered.

6.11.3. Reactive Margin Analysis

From the base cases, margin cases (with and without Path 18 Shunt Additions) were created. The margin cases stressed Path 18 North to South and Path C North to South flows by an additional +5% as noted near the bottom of Appendix 3-11. All +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.11.4. Transient Stability Analysis

As shown on Appendix 4-11, dynamic simulations were run on the simultaneous cases (with and without Path 18 Shunt Additions). Contingency B09 resulted in back swing under-frequency deviations that exceed the standard WECC frequency deviation criteria for load buses, but did not exceed PacifiCorp's frequency deviation exception for Bridger unit buses on file with WECC. All the other disturbances modeled did not result in transient stability problems or criteria violations.

6.12. Path C Southbound vs. Bonanza West

6.12.1. Base Case Development

The Gateway West Project base case was modified to stress Path C North to South flows simultaneous with stressed Bonanza West (Path 33) flows. Two base cases were developed. The first case included Path C set at 2250 MW North to South with Bonanza West simultaneously set at 749 MW. The second case included Path C set at 1849 MW North to South with Bonanza West simultaneously set at 785 MW, Path 33's current transfer limit.

Multiple margin test cases were developed with 5% additional flows across Path C and Bonanza West. These cases are shown near the bottom of Appendix 3-12.

The resulting nomogram is shown on Appendix 2-11.

6.12.2. Post-Transient Analysis

Appendix 3-12 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)**

  This outage results in overloads on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **3 Mile Knoll - Goshen 345kV Line (Contingency B06 and RAS variations)**

  In both cases, this outage without RAS resulted in overloads of the Grace – Soda and 3 Mile Knoll – Soda 138 kV lines. Bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigates the loading on the 3 Mile Knoll – Soda 138 kV line entirely. However, bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigates the loading on the Grace – Soda 138 kV line to approximately 101% of its emergency rating.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

  In the case with Path C stressed at 2250 MW North to South and Bonanza West at 749 MW, this outage resulted in overloads on the Platt - Latham and Miners - Platt 230kV lines as well as voltage deviations greater than 5% on many buses. The RAS actions as noted for disturbance B35a, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied at Aeolus, and additional 230kV capacitors applied at Aeolus, Atlantic, Miners and Platt) resolved these overloads and voltage deviations.

  In the case with Bonanza West stressed at 785 MW and Path C at 1849 MW North to South, this outage resulted in the following: overloads on all three Bridger 345/230 kV banks, the Platt - Latham 230kV line, Miners - Platt 230kV line and Bar X-Echo Springs 230kV line; voltage deviations greater than 5% on many buses; and post-contingency voltages in Wyoming lower than 0.9 pu. The RAS actions, as noted for disturbance B35a, were enough

to mitigate the emergency overloads; however, they were not enough to mitigate the bus voltage deviations. The RAS actions as noted for disturbance B35d (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied at Aeolus, and additional 230kV capacitors applied at Aeolus, Atlantic, Miners, Platt, Mustang and Riverton) resolved the remaining voltage deviations.

- **Aeolus – Mona Annex (Clover) 500 kV Line (Contingency B36 and RAS variations)**

This disturbance without any RAS measures caused both cases to diverge. With 600 MW of generation dropping and 500 kV and 230 kV switchable capacitor applications (outage B36a), the cases exhibited enough reactive margin to solve.

In the case with Path C stressed at 2250 MW North to South and Bonanza West at 749 MW, an overload on the Grace – Soda 138 kV line still remained even with the RAS actions employed for disturbance B36a. The additional RAS measure of bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigated the Grace – Soda 138 kV line overload.

In the case with Bonanza West stressed at 785 MW and Path C at 1849 MW North to South, the RAS actions as noted for B36a were sufficient to mitigate all emergency overloads and voltage deviations.

- **Bonanza –Mona 345kV Line (Contingency B40 and RAS variations)**

In the case with Path C stressed at 2250 MW North to South and Bonanza West at 749 MW, this outage resulted in overloads on the Emma Park - Upalco, Emma Park - Panther and Panther - Carbon 138kV lines as well as voltage deviations greater than 5% on a few buses near Upalco. In the case with Bonanza West stressed at 785 MW and Path C at 1849 MW North to South, this outage resulted in overloads on the Emma Park - Upalco, Emma Park - Panther and Panther - Carbon, Bonanza-Vernal 138kV lines as well as the Flaming Gorge 230/138 kV bank #2. This outage also resulted in voltage deviations greater than 5% on a few buses near Upalco. The RAS actions as noted for disturbance B40a, (Tripping a Bonanza Unit) resolved these overloads and voltage deviations. In both cases, Path C and Bonanza West flows were limited by disturbance C04a with RAS tripping of a Bonanza unit and the subsequent overload of the Emma Park - Upalco 138kV line.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

In both cases, this disturbance without any RAS actions caused overloads on the Bridger – 3 Mile Knoll 345 kV and Grace - Soda 138kV lines. RAS action, as noted for disturbance C02a (Tripping of a Bridger Unit), resolved the Grace - Soda 138kV line overloads. The Bridger - 3 Mile Knoll 345kV line remained overloaded in both cases. Tripping two Bridger units will mitigate the loading on the Bridger - 3 Mile Knoll 345kV line; however, the voltage drop around Path 18 starts to become an issue in the case with Path C stressed at 2250 MW North to South and Bonanza West at 749 MW. After the tripping two units, the

post-contingency bus voltage at the PTRSNFUR 69.0 bus was 0.899 pu, which is right at the limit of 0.9 pu.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

Disturbance C03 without any RAS actions caused the case with Path C at 2250 MW North to South and Bonanza West at 749 MW to diverge. Conversely, the case with Bonanza West at 785 MW and Path C at 1849 MW North to South solved following disturbance C03. Both cases solved following C03a (C03 plus RAS Tripping of one Bridger Unit) and C03b (C03 plus RAS Tripping of two Bridger Unit); however, the RAS tripping of the Bridger units following disturbance C03 caused the voltage at the PTRSNFUR 69kV bus to get worse (less than 0.9 pu). Both cases solved following disturbance C03d (C03 plus RAS Tripping of one Bridger unit plus RAS switching of capacitors at Amps and Big Grassy stations) exhibited acceptable voltages in Wyoming and near Path 18. The Amps and Big Grassy capacitors switched as part of the remedial action for disturbance C03 are part of the Path 18 Shunt Additions.

- **Populus - Ben Lomond 345 kV #2 and #3 Double Line Outage (C06 and RAS variations)**

In the case with Path C at 2250 MW North to South and Bonanza West at 749 MW, this outage resulted in an overload of the Grace – Soda 138 kV line. Bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigates this overload.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event, resulted in overloads of Springer – Gladstone 115 kV line. Springer – Gladstone is a known problem for which remediation is already planned.

6.12.3. Reactive Margin Analysis

From the base cases, margin cases were created. The margin cases stressed Bonanza West and Path C North to South flows by an additional +5% as noted near the bottom of Appendix 3-12. All +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.12.4. Transient Stability Analysis

As shown on Appendix 4-12, dynamic simulations were run on the simultaneous cases. Contingency B08 and B09 resulted in back swing under-frequency deviations that exceed the standard WECC frequency deviation criteria for load buses, but did not exceed PacifiCorp's frequency deviation exception for Bridger unit buses on file with WECC.

In the case with Path C at 2250 MW North to South and Bonanza West at 749 MW, all the other disturbances modeled did not result in transient stability problems or criteria violations.

In the case with Bonanza West at 785 MW and Path C at 1849 MW North to South, disturbances B15 (Aeolus – Anticline 500 kV Line) and B16 (Aeolus – Mona Annex (Clover) 500 kV Line) caused voltage dips exceeding 20% for 20 cycles or more at multiple load buses. Disturbances B15a and B16a with RAS (tripping 600 MW of Aeolus units and insertion of capacitors at the Aeolus 500kV bus and at the Aeolus, Miners, Platt and Atlantic 230kV buses) mitigated the voltage dips noted.

6.13. Path C Southbound with the MSTI Project

6.13.1. Base Case Development

The Gateway West Project base case was modified by the addition of the MSTI project. The case was further modified by stressing Path C North to South flows simultaneous with MSTI Project flows. One base case was developed with Path C set at 2250 MW North to South and MSTI Phase Shifter flow simultaneously set at 1500 MW. To achieve a Phase Shifter flow of 1500 MW, it was necessary to dispatch 800 MW of total MSTI generation

Multiple margin test cases were developed with 5% additional flows across Path C and the MSTI Phase Shifter. These cases are shown near the bottom of Appendix 3-13.

The resulting nomogram is shown on Appendix 2-12.

6.13.2. Post-Transient Analysis

Appendix 3-13 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>Anticline – Populus 500 kV Line (Contingency B01 and RAS variations)</u>**

  This outage results in an overload on the Bridger – 3 Mile Knoll 345 kV line. In the cases, the line is rated at 1840 Amps and this loading information has been requested for design input to PacifiCorp to determine the magnitude of rating increase needed to rebuild the single conductor portions of the line capable of withstanding the most severe contingencies imposed by the Gateway West Project. Several RAS options are shown to allow selection of line upgrade costs vs. the risks inherent with RAS.

- **<u>3 Mile Knoll - Goshen 345kV Line (Contingency B06 and RAS variations)</u>**

  This outage without RAS resulted in overloads of the Grace – Soda and 3 Mile Knoll – Soda 138 kV lines. Bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigates both of these overloads.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

This outage resulted in voltage deviations greater than 5% on many buses. The RAS actions, as noted for disturbance B35a (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied at Aeolus, and additional 230kV capacitors applied at Aeolus, Atlantic, Miners and Platt), resolved the voltage deviations.

- **Bonanza –Mona 345kV Line (Contingency B40 and RAS variations)**

This outage resulted in overloads on the Emma Park - Upalco, Emma Park - Panther and Panther - Carbon 138kV lines. The RAS actions, as noted for disturbance B40a (Tripping a Bonanza Unit), resolved these overloads.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

This disturbance without any RAS actions caused overloads on the Bridger – 3 Mile Knoll 345 kV and Grace - Soda 138kV lines. RAS action, as noted for disturbance C02a (Tripping of one Bridger Unit), resolved the Grace - Soda 138kV line overload. The Bridger - 3 Mile Knoll 345kV line remained slightly overloaded. Tripping of two Bridger units, as modeled in disturbance C02b, resolved both overloads.

- **Populus - Ben Lomond 345 kV #2 and #3 Double Line Outage (C06 and RAS variations)**

This outage resulted in an overload of the Grace – Soda 138 kV line. Bypassing the 1/2 the series capacitor in the Bridger - 3 Mile Knoll 345kV line mitigates this overload.

- **Palo Verde 2-unit loss with FACRI (N-2)**

This contingency, with FACRI action and Desert SW load dropping planned for this event, resulted in overloads of Springer – Gladstone 115 kV line. Springer – Gladstone is a known problem for which remediation is already planned.

6.13.3. Reactive Margin Analysis

From the base cases, margin cases were created. The margin cases stressed MSTI and Path C North to South flows by an additional +5% as noted near the bottom of Appendix 3-13. All +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.13.4. Transient Stability Analysis

As shown on Appendix 4-12, dynamic simulations were run on the simultaneous cases. Contingency B09 resulted in back swing under-frequency deviations that exceed the standard

WECC frequency deviation criteria for load buses, but did not exceed PacifiCorp's frequency deviation exception for Bridger unit buses on file with WECC.

6.14. Path C Southbound vs. Monument – Naughton

6.14.1. Base Case Development

The Gateway West Project base case was modified to stress Path C Southbound to 2250 MW with Monument – Naughton flows at 475 MW. Path C was stressed by reducing generation in Utah and increasing generation in the Pacific Northwest. Monument – Naughton flows were controlled by the Monument phase shifting transformers. Loads in the Trona area of SW Wyoming (Zone 668) were reduced by roughly 356 MW to prevent normal overloads of the Rock Springs - Palisades 230kV Line. The resulting nomogram is shown on Appendix 2-13.

Two margin test cases were developed with 5% additional flows across 1) Path C Southbound and 2) Monument - Naughton. These cases are shown near the bottom of Appendix 3-14.

6.14.2. Post-Transient Analysis

Appendix 3-14 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **<u>3 Mile Knoll – Goshen 345 kV Line (Contingencies B06 and B06a)</u>**

  Contingency B06 results in an overload on the Grace – Soda 138 kV line. The RAS modeled in outage B06a, which included bypassing 1/2 of the 3 Mile Knoll series capacitor bank, resolved the overload.

- **<u>Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)</u>**

  Contingency B35 diverged without any RAS actions. The RAS actions, as noted for the B35d (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied at Aeolus and additional 230kV capacitors at Aeolus, Atlantic, Miners, Platt, Mustang, and Riverton), resolved the voltage deviation problems.

- **<u>Aeolus – Mona Annex (Clover) 500 kV Line (Contingency B36 and RAS variations)</u>**

  Contingency B36 diverged without any RAS actions. The RAS actions, as noted for the B36v (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied at Aeolus, Anticlin, Populus, additional 230kV capacitors at Aeolus, Atlantic, Miners, Platt, Mustang, Riverton and Chappel, as well as one 345kV capacitor at Kinport), resolved the divergence and didn't produce any WECC criteria violations.

- **<u>Bonanza –Mona 345kV Line (Contingency B40 and RAS variations)</u>**

Outage B40 resulted in overloads on the Bonanza - Vernal, Emma Park - Upalco, Emma Park - Panther and Panther - Carbon 138kV lines, Flaming Gorge 230/138kV Transformer #2 as well as voltage deviations greater than 5% on a few buses near Upalco. The RAS actions, as noted for contingency B40a (Tripping a Bonanza Unit), resolved these overloads and voltage deviations.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

Outage C02 resulted in an overload on the Bridger – 3 Mile Knoll 345 kV line. As noted above, the loading numbers will be used as a design input for rebuilding the limiting conductor sections. The overload was fully mitigated with RAS switching of one Bridger unit as modeled in outage C02a.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

Outage C03 resulted in an overload on the Bridger-Rock Springs 230kV line and a low voltage on a single bus (PTRSNFUR 69.0) near Path 18. RAS actions, as noted for the C03d (Tripping of Bridger unit and additional switchable capacitors applied at Big Grassy 161 kV and Amps 230kV buses), resolved the overload and low voltage problems.

6.14.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-14. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.14.4. Transient Stability Analysis

As shown on Appendix 4-14, dynamic simulations were run for various contingencies. Contingency B08 and B09 with RAS variations resulted in back swing under-frequency deviations; however, these deviations are within the exceptions for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage deviations, which were mitigated with some of the RAS actions simulated in the PT contingencies.

6.15. Path C Southbound vs. Rock Springs - Firehole

6.15.1. Base Case Development

The Gateway West Project base case was modified to stress Path C Southbound to 2250 MW with Rock Springs / Firehole West flows at 640 MW. Path C was stressed by reducing generation in Utah and increasing generation in the Pacific Northwest. Rock Springs / Firehole

West flows were controlled by the Monument phase shifting transformers. The resulting nomogram is shown on Appendix 2-14.

Two margin test cases were developed with 5% additional flows across 1) Path C Southbound and 2) Rock Springs / Firehole West. These cases are shown near the bottom of Appendix 3-15.

6.15.2. Post-Transient Analysis

Appendix 3-15 contains the tables associated with the post-transient study results for the import cases. A discussion of several of the prominent outages follows.

- **3 Mile Knoll – Goshen 345 kV Line (Contingencies B06 and B06a)**

  Contingency B06 results in an overload on the Grace – Soda 138 kV line. The RAS modeled in outage B06a, which included bypassing 1/2 of the 3 Mile Knoll series capacitor bank, resolved the overload.

- **Aeolus – Anticline 500 kV Line (Contingency B35 and RAS variations)**

  Contingency B35 without any RAS actions produced several voltage deviations greater than 5%, low voltages in Wyoming and various emergency overloads. The worst emergency overload occurred on the Platt - Latham 230kV line at 111%., and the worst voltage deviation (17.4%) occurred at the Latham 34.5kV bus. Correspondingly, the lowest voltage (0.838 pu) was experienced occurred at the Bairoil 115kV bus. The RAS actions, as noted for the B35d, (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied at Aeolus and additional 230kV capacitors at Aeolus, Atlantic, Miners, Platt, Mustang, and Riverton) resolved all the voltage deviations, low voltages and emergency overloads.

- **Aeolus – Mona Annex (Clover) 500 kV Line (Contingency B36 and RAS variations)**

  Contingency B36 diverged without any RAS actions. The RAS actions, as noted for the B36v (600 MW of Aeolus area generation dropping, 500 kV switchable capacitors applied at Aeolus, Anticlin, Populus, additional 230kV capacitors at Aeolus, Atlantic, Miners, Platt, Mustang, Riverton and Chappel, as well as one 345kV capacitor at Kinport), resolved the divergence and didn't produce any WECC criteria violations.

- **Bonanza –Mona 345kV Line (Contingency B40 and RAS variations)**

  Outage B40 resulted in overloads on the Bonanza - Vernal, Emma Park - Upalco, Emma Park - Panther and Panther - Carbon 138kV lines, Flaming Gorge 230/138kV Transformer #2 as well as voltage deviations greater than 5% on a few buses near Upalco. The RAS actions as noted for disturbance B40a, (Tripping a Bonanza Unit) resolved these overloads and voltage deviations.

- **Bridger – Populus 345 kV Lines 1 & 2 (C02 and RAS variations)**

Outage C02 resulted in an overload on the Bridger – 3 Mile Knoll 345 kV line. As noted above, the loading numbers will be used as a design input for rebuilding the limiting conductor sections. The overload was fully mitigated with RAS switching of one Bridger unit as modeled in outage C02a.

- **Bridger – Populus & Bridger – 3 Mile Knoll 345 kV Lines (C03 and RAS variations)**

This outage resulted a low voltage on a bus (PTRSNFUR 69.0) near Path 18. RAS actions, as noted for the C03d (Tripping of Bridger unit and additional switchable capacitors applied at Big Grassy 161 kV and Amps 230kV buses), resolved the low voltage problems.

- **Populus – Ben Lomond 345 kV Double Line Outage (Contingencies C06 and C06k)**

Contingency C06 resulted in an overload on the Grace – Soda 138 kV line. Bypassing 1/2 of the 3 Mile Knoll series capacitor as modeled in outage C06k fully resolved the overload.

6.15.3. Reactive Margin Analysis

Both corner points of the nomogram were tested with +5% flow cases as noted near the bottom of Appendix 3-15. Both corner +5% cases solved for all contingencies (with appropriate RAS actions), indicating sufficient reactive margins for both Level B and Level C contingencies. Idaho's reactive margin requirements were also met for all contingencies (with appropriate RAS actions).

6.15.4. Transient Stability Analysis

As shown on Appendix 4-15, dynamic simulations were run for various contingencies. Contingency B08 and B09 with RAS variations resulted in back swing under-frequency deviations; however, these deviations are within the exceptions for Bridger that are filed with the WECC. See Appendix 21 for details of the TSS Approved exceptions for Bridger.

Contingency B15 (Aeolus – Anticline 500 kV line) also produced voltage deviations, which were mitigated with some of the RAS actions simulated in the PT contingencies.

7. Contingencies Studied

A list of the studied contingencies are located in Appendix A

8. Study Conclusions / Recommendations

Results of the simultaneous path interaction studies are summarized in Table 2.

Table 2

Primary Path	Secondary Path	Simultaneous Limitations	Max Path Flows		Comments
			Primary	Secondary	
Aeolus West;	Aeolus South Flow	Nomogram	2672	1700	
	Bonanza West	Nomogram	2672	785	
	Tot 1a		2672	650	
Bridger / Anticline West	Aeolus South Flow	Nomogram	4095	1700	Primary Path to be increased to 4100 MW
	Path C Southbound	Nomogram	4100	2250	
	Bonanza West	Nomogram	4100	785	
	Path 18	No Restrictions	4100	337	Path 18 @ 337 Achieved w/ Caps Added
	MSTI Project	No Restrictions	4100	1500	
	Monument-Naughton	Nomogram	4100	475	
	Rock Spgs / Firehole West	Nomogram	4100	640	
Path C Southbound;	Path 18	Nomogram	2250	337	Path 18 @ 337 Achieved w/ Caps Added
	Bonanza West	Nomogram	2250	785	
	MSTI Project	No Restrictions	2250	1500	
	Monument-Naughton	Nomogram			Internal Path - To be added after PRG Review
	Rock Spgs / Firehole West	Nomogram			Internal Path - To be added after PRG Review

Throughout the studies, the Bridger West 345 Path was modeled at 2400 MW with reductions in Bridger / Anticline West flows taken entirely on the Anticline – Populus 500 kV line. Although this path uprate was not specifically requested in the study plan goals, in conjunction with the Gateway West system, a Bridger West 2400 MW rating is proven by this study.

As can be seen from the post-transient results tables, for contingencies involving the Aeolus – Anticline 500 kV and Aeolus – Mona Annex (Clover) 500 kV lines have varying needs for RAS switching to achieve post-transient solutions and acceptable voltage deviations. Details of transfer levels commensurate with RAS generation tripping and capacitor switching will need to be determined in additional studies prior to operation. It is expected that additional studies will need to be developed to determine operating limits as the various components of the Gateway West facilities are energized.

During the course of this study, post-transient voltage deviations and violations of the .90 pu local voltage criteria were noted to be limiting for the most critical contingencies. As a relatively economical expansion of transfer capabilities, some additional shunt capacitors were added as follows;

1. Mona Annex 500; A total of three 200 MVar switchable shunt capacitor banks
2. Anticline 500 kV; A total of three 200 MVar switchable shunt capacitor banks
3. Populus 500 kV; Three 200 MVar switchable shunt capacitor banks
4. Mustang 230 kV; Two 30 MVar Switchable capacitor banks
5. Riverton 230 kV; One 41 MVar Switchable capacitor bank
6. Chapel Creek 230 kV; One 30 MVar Switchable capacitor banks
7. Bonanza 138 kV; One 60 MVar Switchable capacitor bank

Earlier studies of the Bridger / Anticline West vs. Path 18 studies showed a nomogram relationship limited by voltage problems at the Path 18 buses. After changes to the base case modeling from Northwestern, Idaho Power, and PacifiCorp, revised studies show the modeling changes along with lowering the allowable Path 18 minimum voltage to .87 pu for Level B and Level C contingencies, will allow simultaneous operation at full capacity on each path. While not demonstrated in these studies, it is expected that these same modeling and voltage standard changes will also impact the Path C southbound vs. Path 18 nomogram such that both paths can be operated at their respective ratings.

Base case overloads noted to be most significant in Appendices 3-5, 3-7, and 3-10. These overloads appear in SE Wyoming and along the Colorado front range and are more prevalent in cases with high loadings on Tot 1a and Bonanza West. In these cases, Tot 3, between SE Wyoming and the "front range" area is some 400 – 600 MW under its current operating limit of 1604 MW. The Cottonwood – Monument – Kettle Creek 115 kV and Kelker W – Rock Island 115 kV overloads appear to be in the Colorado Springs area and are probably more indicative of a local area problem than anything associated with Gateway West. The Sidney DC tie and the Sidney 230 / 115 transformer overloads appear to be due to scheduling of the Sidney back-to-back DC terminals.

In many of the path flow scenarios studied, overloads of the Grace – Soda 138 kV line, and to a lesser extent, the 3 Mile Knoll – Soda 138 kV line were encountered. These overloads were as a result of Bridger 345 kV system N-1 & N-2 outages and Path C N-2 outages. Tests of several RAS options indicated that bypassing both segments of the 3 Mile Knoll capacitor bank resulted in impacts to system voltages for several 345 kV outages. Bypassing ½ of the 3 Mile Knoll 345 kV series capacitor bank was the most effective method of mitigating the 138 kV overloads for most conditions while not causing other voltage problems. This assumes that Path 18 recommended voltage mitigations are installed. With these assumptions, the 3 Mile Knoll – Soda 138 kV line was still slightly overloaded at 101% of its emergency rating and will need to be either uprated, equipped for dynamic ratings, or be rebuilt with higher temperature conductors.

Several scenarios show that for high levels of wind generation and an outage of one of the Aeolus 500 / 230 kV transformers, the remaining two transformers load to about 105% of their emergency ratings. As these transformers have not yet been specified, it is recommended that the top FOA ratings shown in the base case data be increased to 1764 MVA.

The Bridger – 3 Mile Knoll 345 kV line maximum flows were encountered on the Bridger / Anticline West vs. Path C southbound cases with Contingency C02 and C02a (Bridger - Populus

345kV line DLO). With no gen drop RAS, the maximum line flow was found to be 2354 Amps. If one Bridger Unit is tripped via RAS, then the maximum line flow is 2064 Amps. These flow numbers can be found on Appendix 3-5. With this information, the cost of upgrading the Bridger - 3 Mile Knoll 345 kV line can be compared to continued exposure of the Bridger Units to RAS tripping.

Dynamic stability analysis of Aeolus West vs. Bonanza West and Aeolus West vs. Tot 1a both showed under frequency deviations down to 59.418 Hz. which is outside the TSS Approved exceptions to the NERC/WECC reliability performance standards. Appendix 21 includes the approved exceptions on pages C24 through C26. On page C26, the Bridger 22 kV generator buses are allowed a under frequency deviation down to 59.42 Hz. This exception to the standards may need to be amended to allow for the lower frequency excursion down to 59.40 Hz.

Appendix 1 – Post-Transient and Dynamic Contingency Lists

Table 1-1 – List of N-1 Post Transient Contingencies

1	Anticline – Populus 500 kV Line
2	Anticline 500 / 345 kV Transformer
3	Bridger – Populus 345 kV Line
4	Bridger – 3Mileknoll 345 kV Line
5	Bridger 345 / 230 kV Transformer
6	3Mileknoll – Goshen 345 kV Line
7	Kinport – Goshen 345 kV Line
8	Kinport – Borah 345 kV Line
9	Populus – Borah 500 kV Line
10	Borah 500 / 345 kV Transformer
11	Borah 345 / 230 kV Transformer
12	Populus – Cedar Hill 500 kV Line
13	Cedar Hill – Midpoint 500 kV Line (Out of Service)
14	Cedar Hill – Hemingway 500 kV Line
15	Midpoint – Hemingway 500 kV Line
15a	Hemingway – Summer Lake 500kV line
16	Borah – Midpoint 500 kV Line
17	Midpoint 500 / 345 kV Transformer
18	Midpoint 345 / 230 kV Transformer
19	Borah – Adelaide #2 345 kV Line
20	Adelaide – Midpoint #2 345 kV Line
21	Borah – Adelaide – Midpoint #1 345 kV Line
22	Borah – Hunt 230 kV Line
23	Midpoint – Boise Bench #3 230 kV Line
24	Midpoint – Rattle Snake 230 kV Line
25	Midpoint – Dram 230 kV Line
26	Rattle Snake – Boise Bench 230 kV Line
27	Dram – Boise Bench 230 kV Line
28	Hemingway 500/230 kV Transformer
29	Kinport – Goshen 345 kV Line (Dupicate of #7)
30	Populus – Borah #1 345 kV Line
31	Populus – Borah #2 345 kV Line
32	Populus – Kinport 345 kV Line
33	Populus – Ben Lomond #3 345 kV Line
34	Populus – Terminal 345 kV Line
35	Aeolus – Anticline 500 kV Line
36	Aeolus – Mona 500 kV Line
37	Aeolus 500 / 230 kV Transformer
38	Aeolus – Windstar 230 kV Line
39	Aeolus – Miners 230 kV Line (Changed to Aeolus – Freezeout)
40	Bonanza –Mona 345kV Line

Table 1-2 – List of N-2 Post Transient Contingencies

1	Anticline – Populus 500 kV Lines (two circuits) – with & w/o generator tripping (NA)
2	Bridger – Populus #1 & # 2 345 kV Lines – with & w/o generator tripping (NA)
3	Bridger – 3MileKnoll + Bridger – Populus #1 345 kV lines – with & w/o generator tripping
4	Bridger – 3MileKnoll + Bridger – Populus #2 345 kV lines – with & w/o generator tripping
5	Borah – Populus 345 kV DLO with / w/o generator tripping
6	Populus – Ben Lomond 345 kV DLO
7	Ben Lomond – Terminal 345 kV DLO
8	Populus – Kinport + Populus – Borah #2 345 kV Lines with/ w/o generator tripping
9	Populus – Borah #2 345 kV + Treasureton – Brady 230 kV Lines
10	Populus – Borah #1 345 kV + Treasureton – Brady 230 kV Lines
11	Populus – Ben Lomond #2 + Populus Terminal 345 kV Lines.
12	Populus – Terminal 345 kV + Treasureton – Brady 230 kV Lines
13	Borah – Adelaide #2 & Borah – Adelaide – Midpoint #1 345 kV lines (RA)
14	Borah – Adelaide #2 & Midpoint - Adelaide #2 345 kV lines (RA)
15	Borah – Adelaide #2 & Borah – Hunt 230 kV lines
16	Borah – Kinport & Borah – Adelaide – Midpoint #1 345 kV lines (RA?)
18	Borah – Kinport & Midpoint – Adelaide #2 345 kV lines (RA?)
19	Borah – Kinport 345 kV & Borah – Hunt 230 kV lines (RA?)
20	Borah – Adelaide – Midpoint #1 & Midpoint – Adelaide #2 345 kV lines
21	Borah – Adelaide – Midpoint #1 345 kV & Borah -Hunt 230 kV lines (RA)
23	Borah – Adel #2 345 kV + Borah – Midpoint 500 kV Lines
24	Bridger – Populus #1 & Goshen – Kinport 345 kV Lines -- with & w/o generator tripping.
25	Bridger – Populus #2 & Goshen – Kinport 345 kV lines with & w/o generator tripping.
26	Aeolus – Anticline 500 kV Lines (two circuits) – with & w/o generator tripping (NA)
27	Aeolus – Mona 500 kV Lines (two circuits) – with & w/o generator tripping (NA)
28	Palo Verde Generation – Trip Two Units

Table 1-3 – List of N-1 Dynamics Contingencies

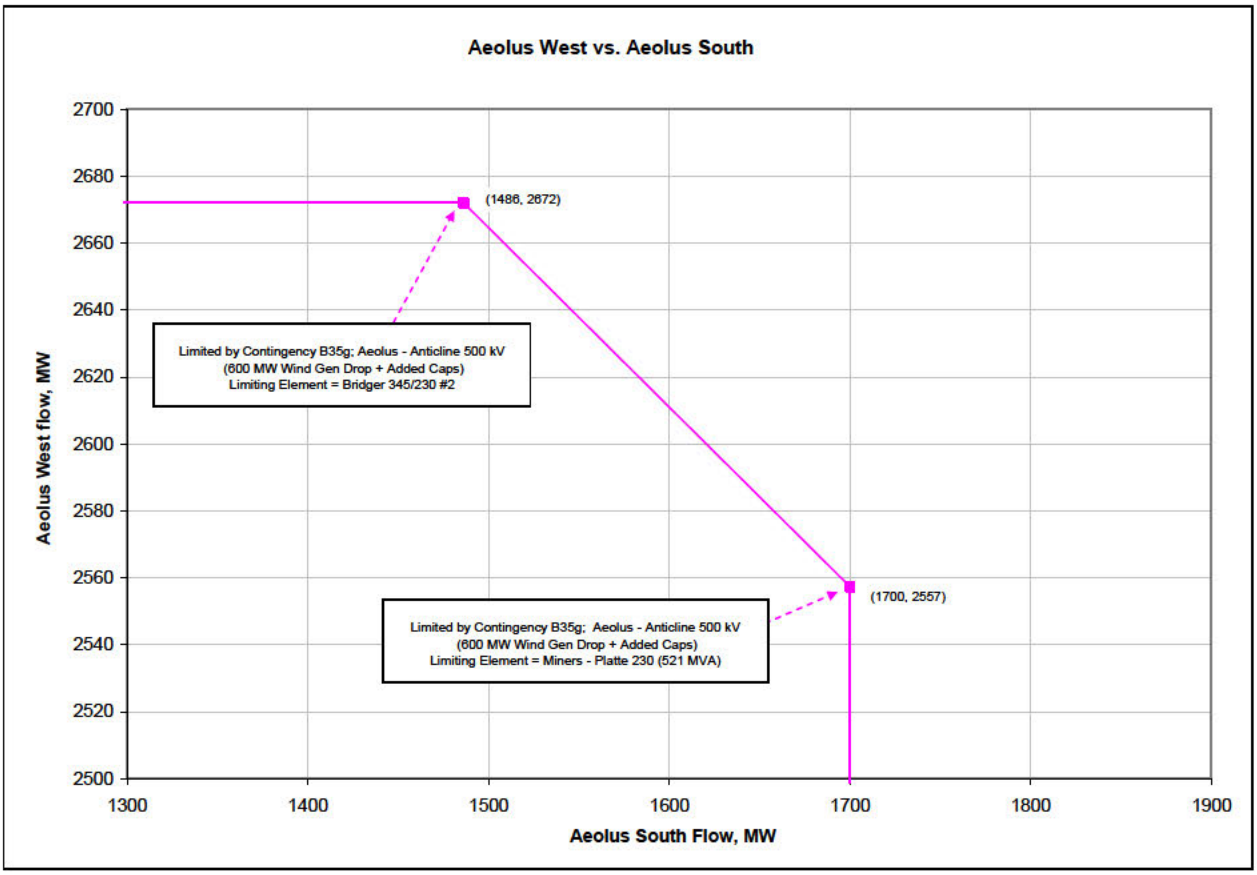
1	Anticline – Populus 500 kV Line
2	Populus – Borah 500 kV Line
3	Populus – Cedar Hill 500 kV Line
4	Borah – Midpoint 500 kV Line
5	Cedar Hill – Midpoint 500 kV Line
6	Cedar Hill – Hemingway 500 kV Line
7	Midpoint – Hemingway 500 kV Line
8	Bridger – Populus 345 kV Line
9	Bridger – 3MileKnoll 345 kV Line
10	Populus – Borah #1 345 kV Line
11	Populus – Borah #2 345 kV Line
12	Populus – Kinport 345 kV Line
13	Borah – Kinport 345 kV Line
14	Borah – Adelaide – Midpoint #1 345 kV Line
15	Aeolus – Anticline 500 kV Line
16	Aeolus – Mona 500 kV Line
17	Hemingway – Summer Lake 500 kV Line (NA)

Table 1-4 – List of N-2 Dynamics Contingencies

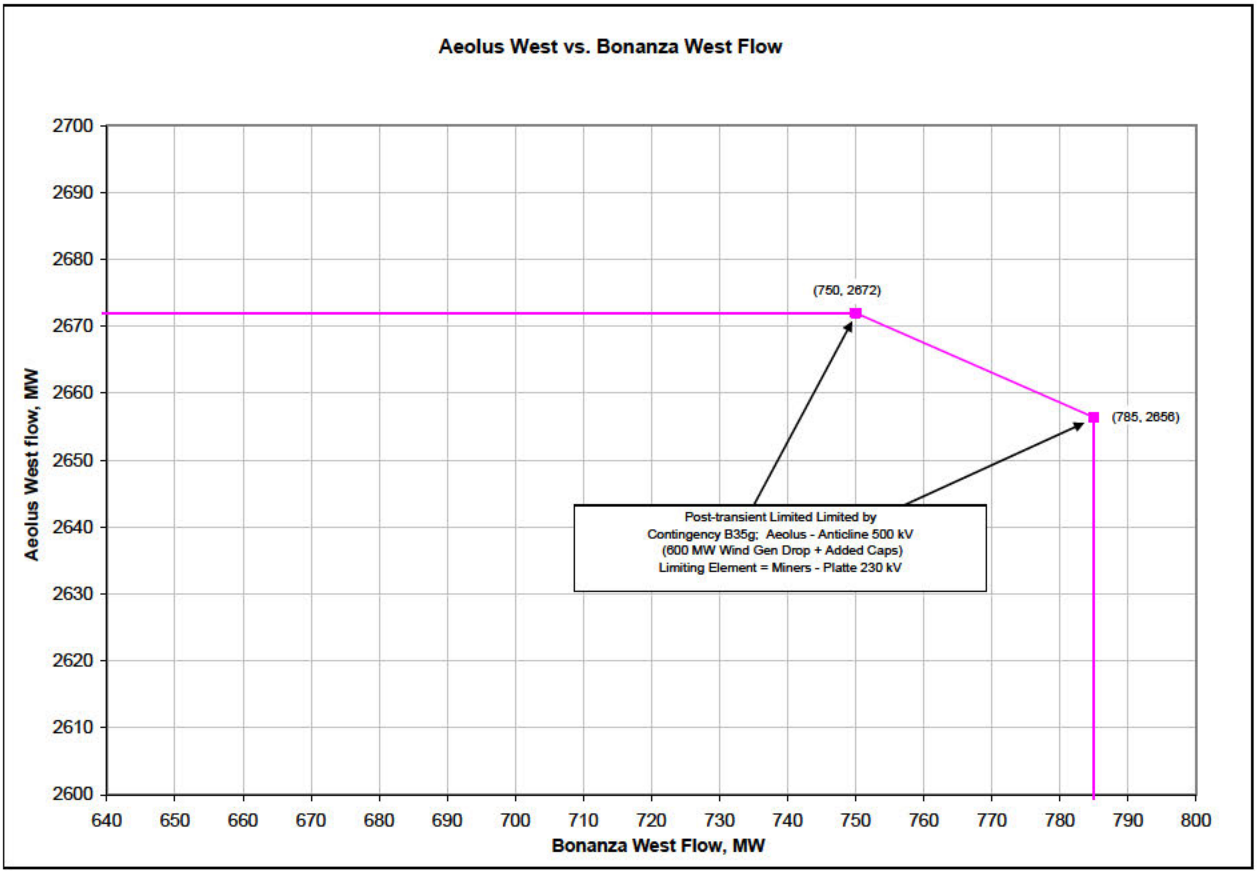
1	Anticline – Populus 500 kV Lines (two circuits) – with & w/o generator tripping
2	Bridger – Populus #1 & # 2 345 kV Lines – with & w/o generator tripping
3	Bridger – 3MileKnoll + Bridger – Populus #1 345 kV lines – with & w/o generator tripping
4	Bridger – 3MileKnoll + Bridger – Populus #2 345 kV lines – with & w/o generator tripping
5	Borah – Populus 345 kV DLO with / w/o generator tripping)
6	Populus – Ben Lomond 345 kV DLO
7	Populus – Kinport + Populus – Borah #2 345 kV Lines with/ w/o generator tripping
8	Populus – Borah #2 345 kV + Treasureton – Brady 230 kV Lines
9	Borah – Adelaide #2 & Borah – Hunt 230 kV lines
10	Midpoint – Kinport & Borah – Adelaide – Midpoint #1 345 kV lines
11	Midpoint – Kinport 345 kV & Borah – Hunt 230 kV lines
12	Borah – Adelaide – Midpoint #1 & Midpoint – Adelaide #2 345 kV lines
13	Midpoint – Adelaide #2 345 kV & Borah – Hunt 230 kV lines
14	Palo Verde Generation – Trip Two Units

Appendix 2 - Nomograms

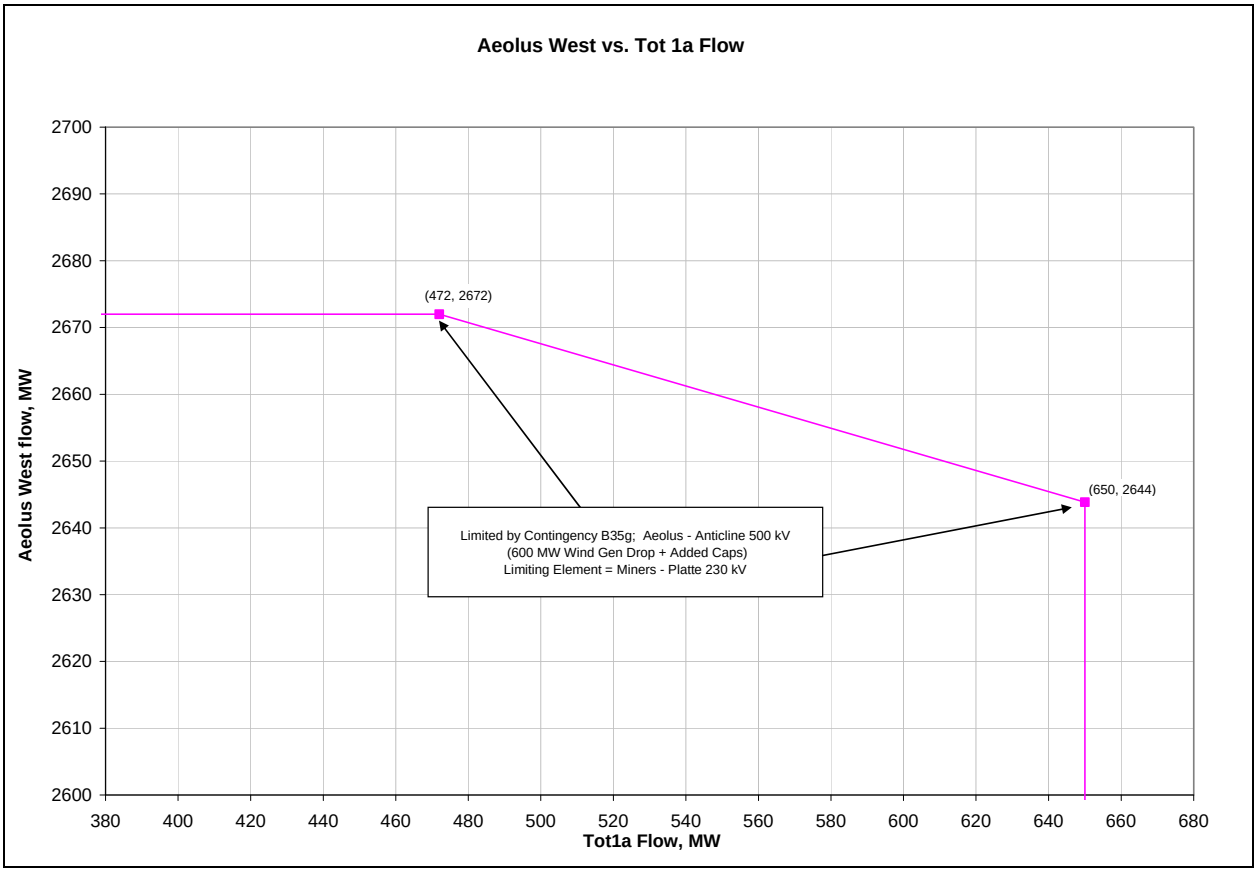
Appendix 2-1; Aeolus West vs. Aeolus South



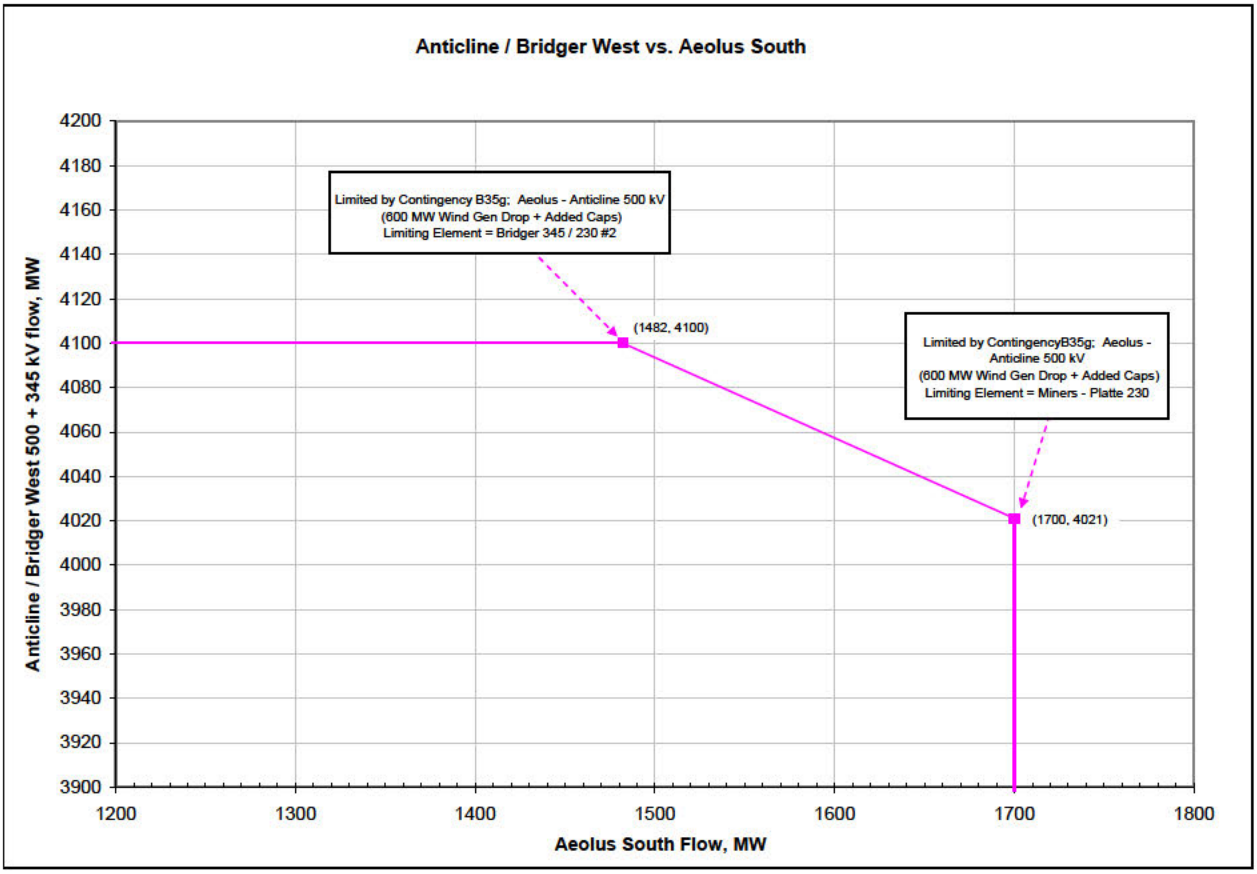
Appendix 2-2; Aeolus West vs. Bonanza West



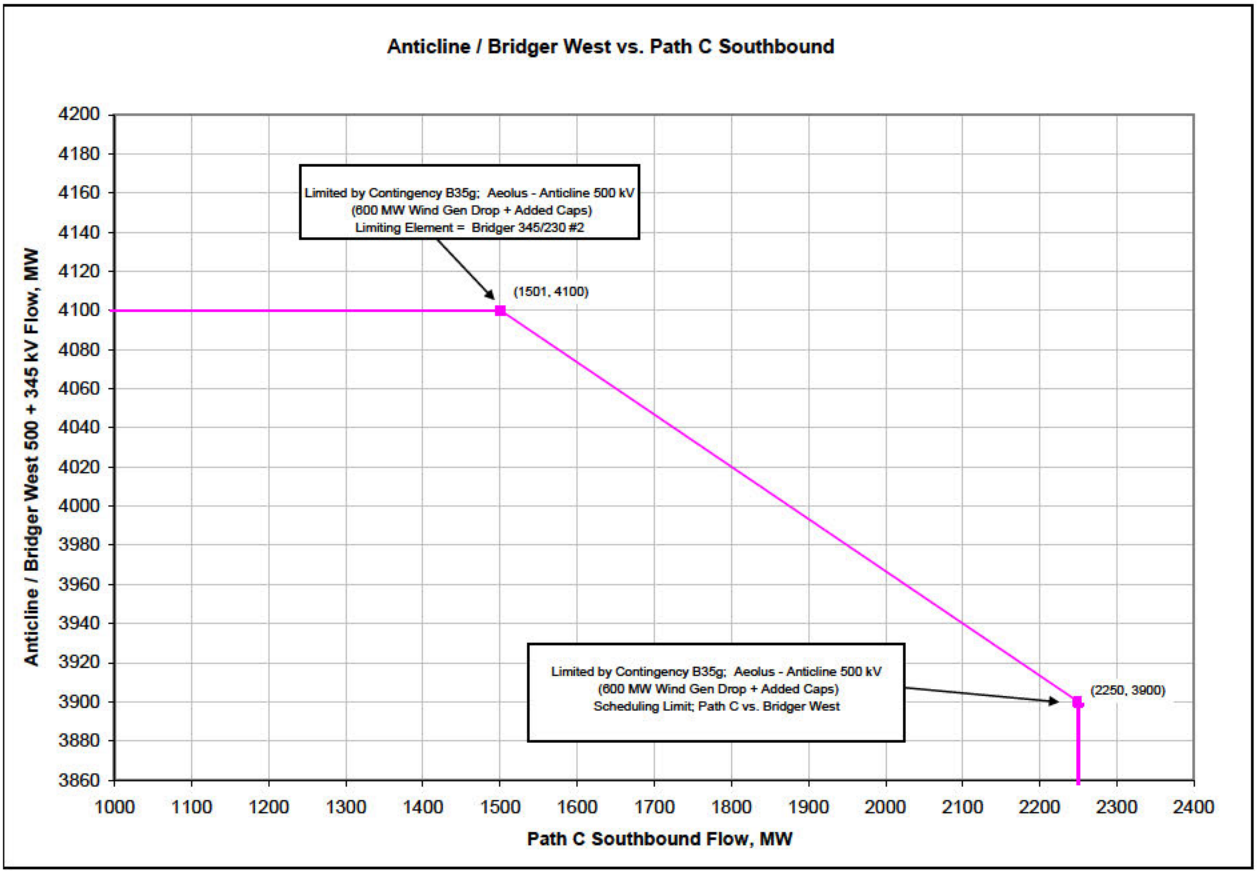
Appendix 2-3; Aeolus West vs. Tot 1a



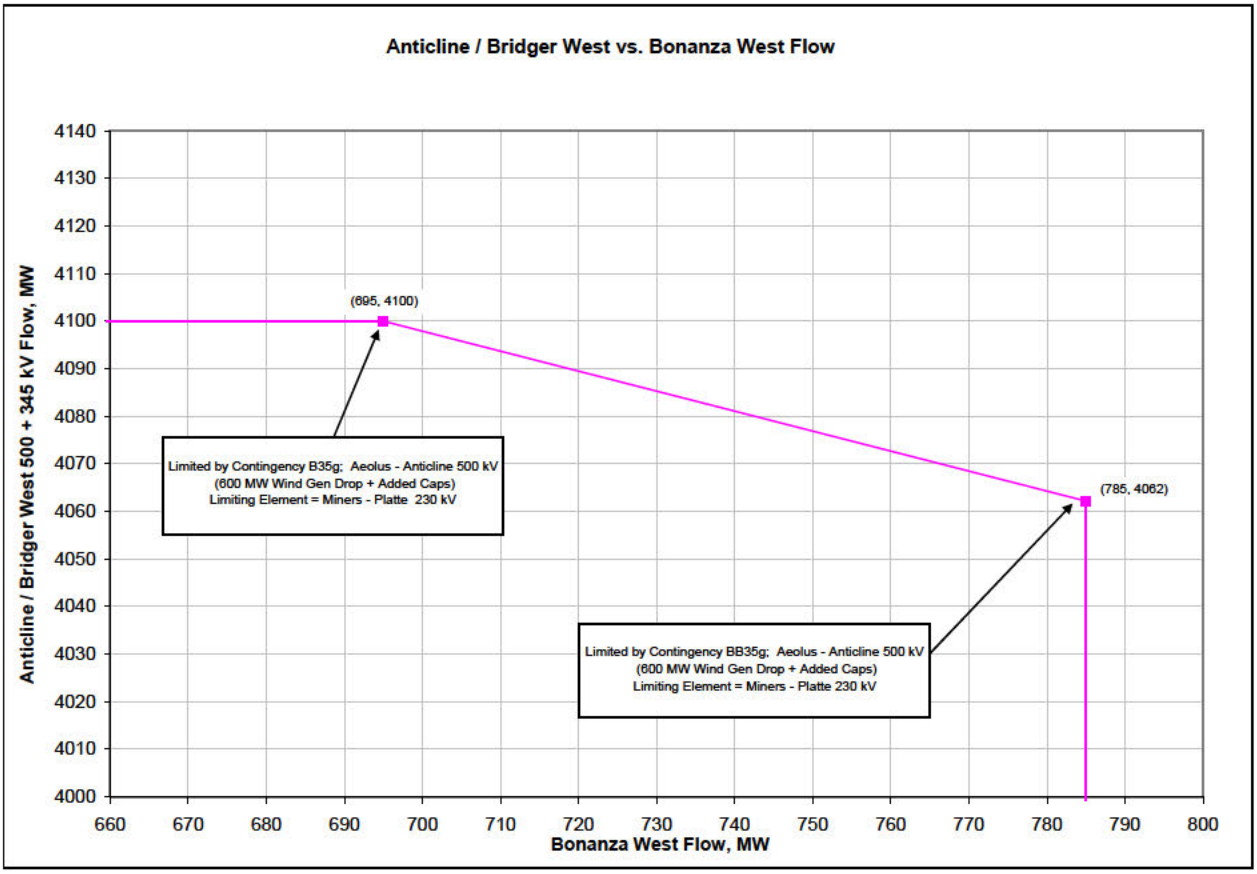
Appendix 2-4; Bridger / Anticline West vs. Aeolus South



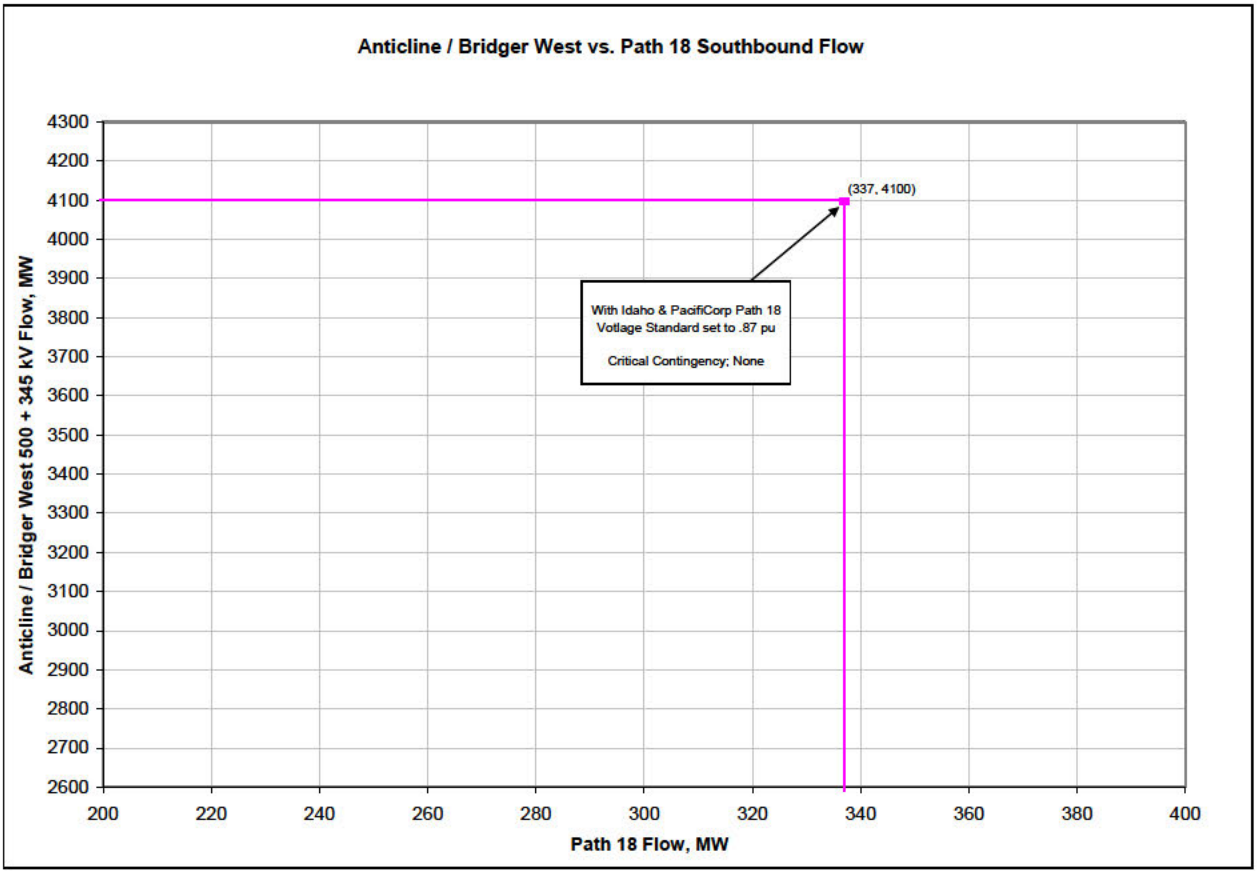
Appendix 2-5; Bridger / Anticline West vs. Path C Southbound



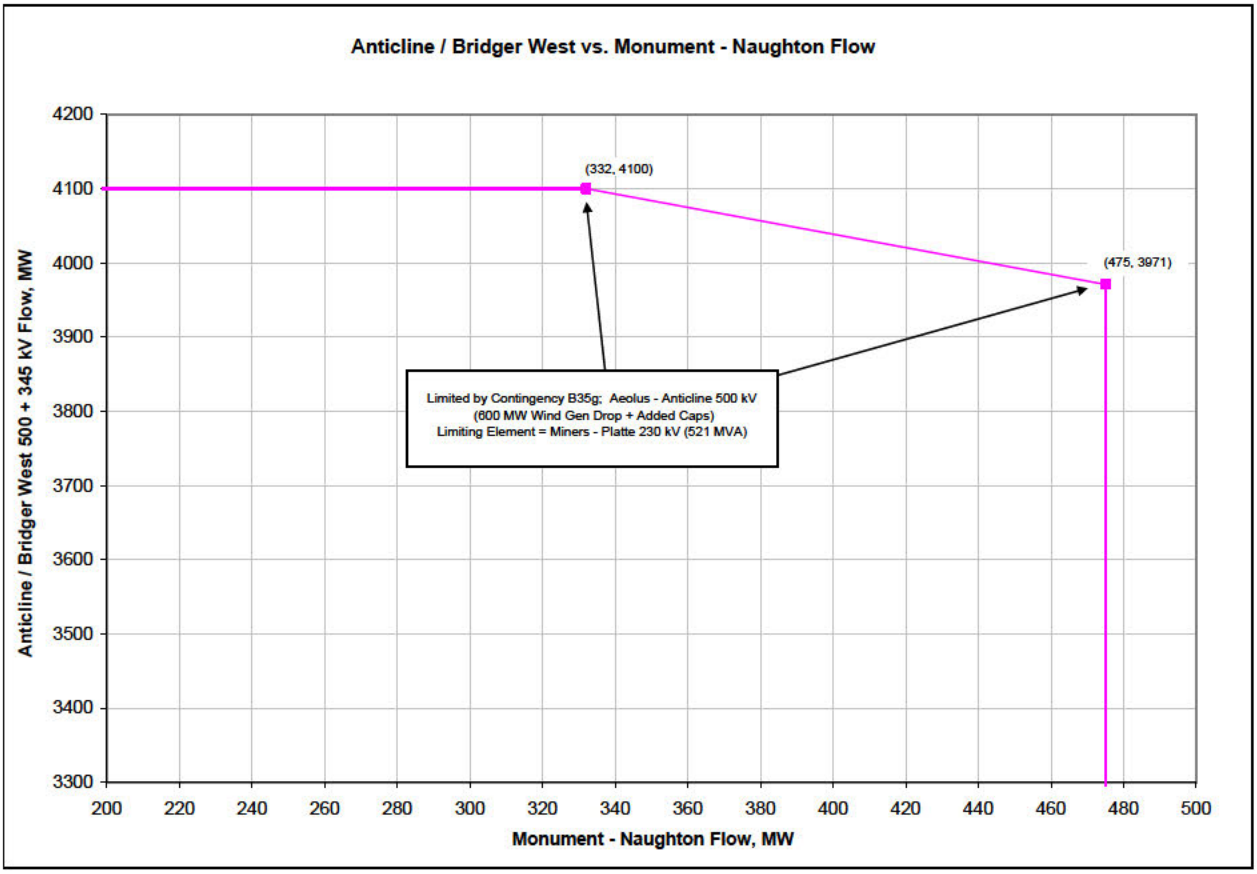
Appendix 2-6; Bridger / Anticline West vs. Bonanza West



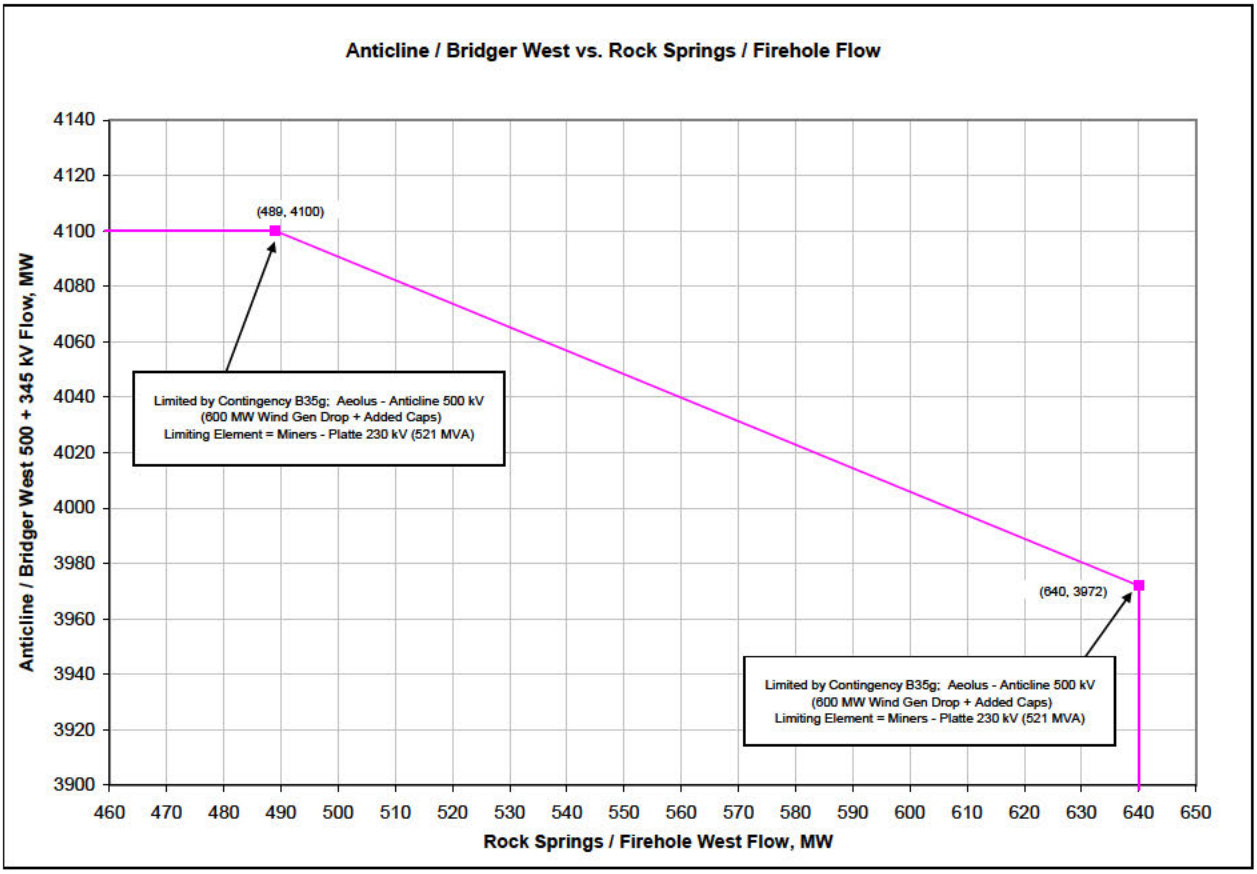
Appendix 2-7; Bridger / Anticline West vs. Idaho – Montana (Path 18)



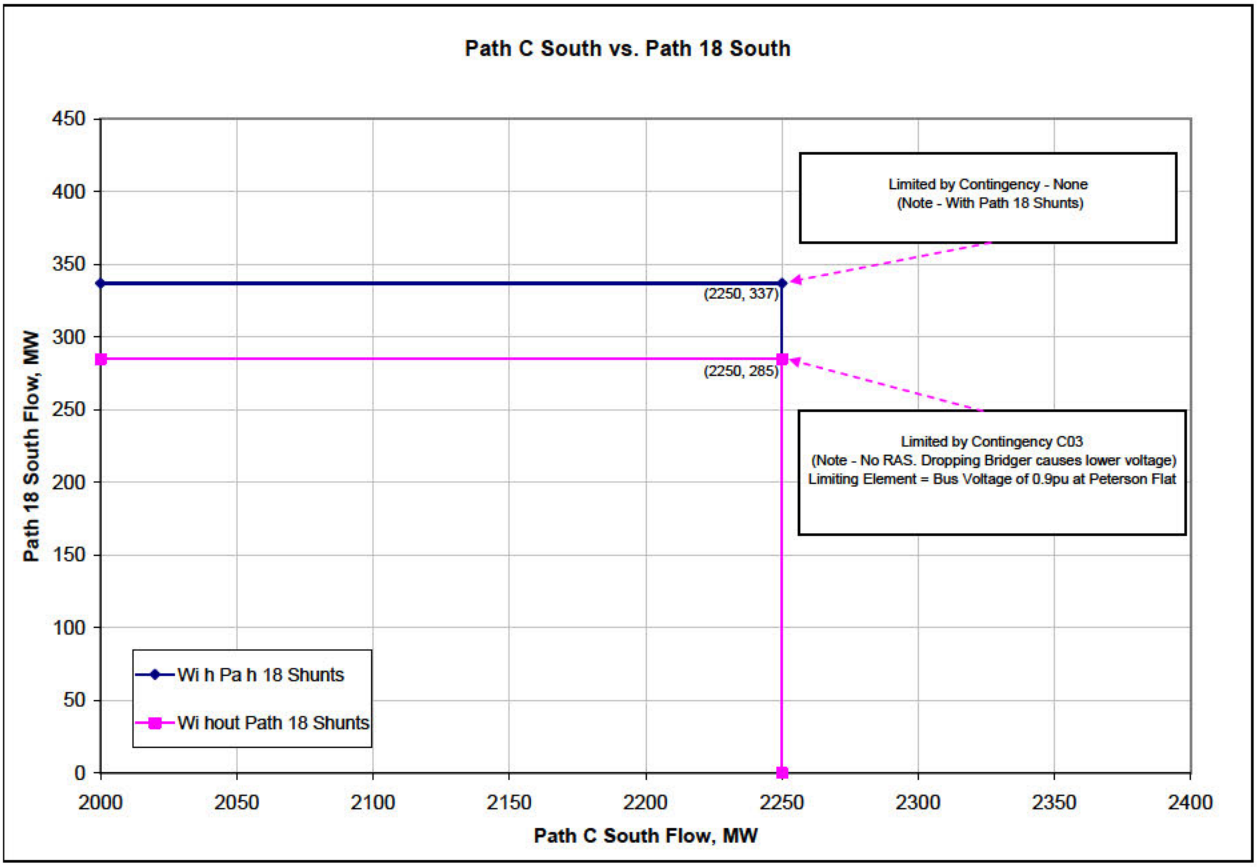
Appendix 2-8; Bridger / Anticline West vs. Monument – Naughton



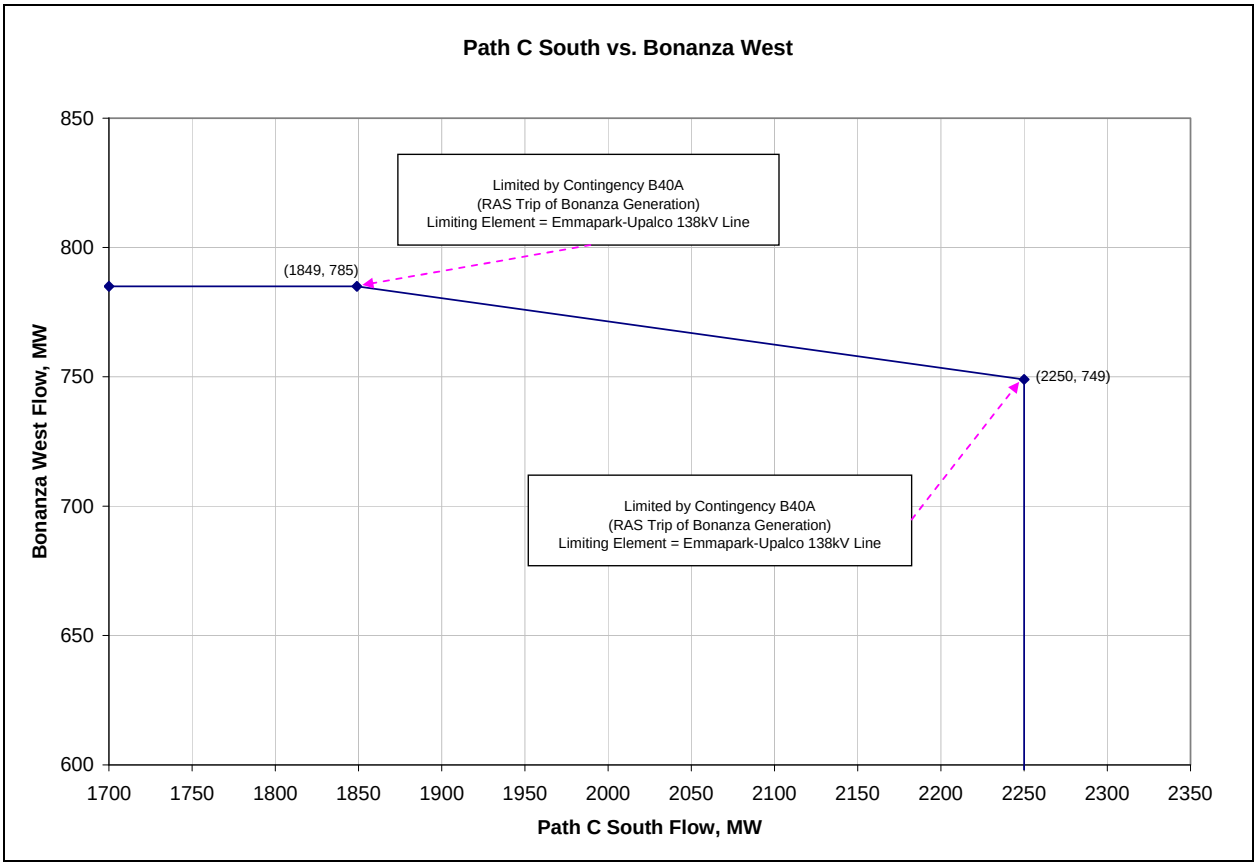
Appendix 2-9; Bridger / Anticline West vs. Rock Springs / Firehole



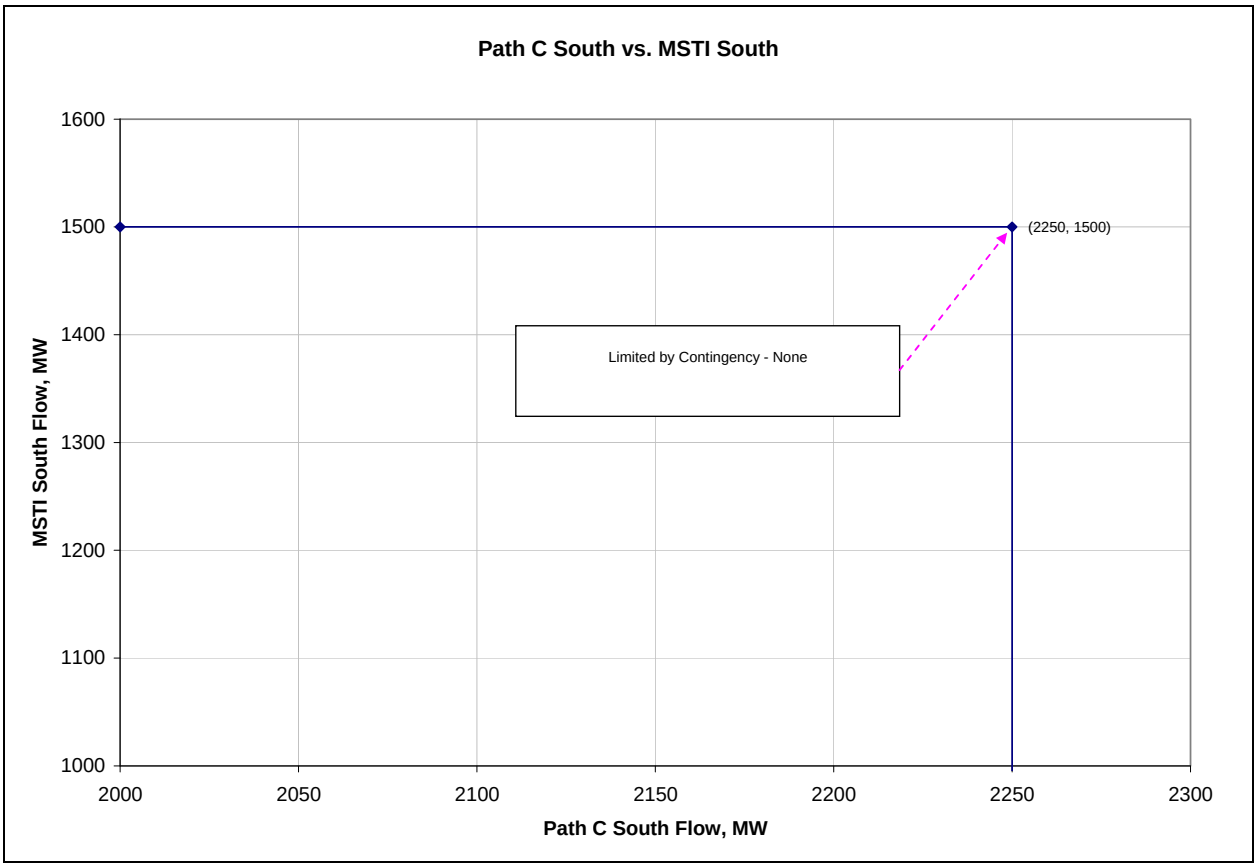
Appendix 2-10; Path C Southbound vs. Idaho – Montana (Path 18)



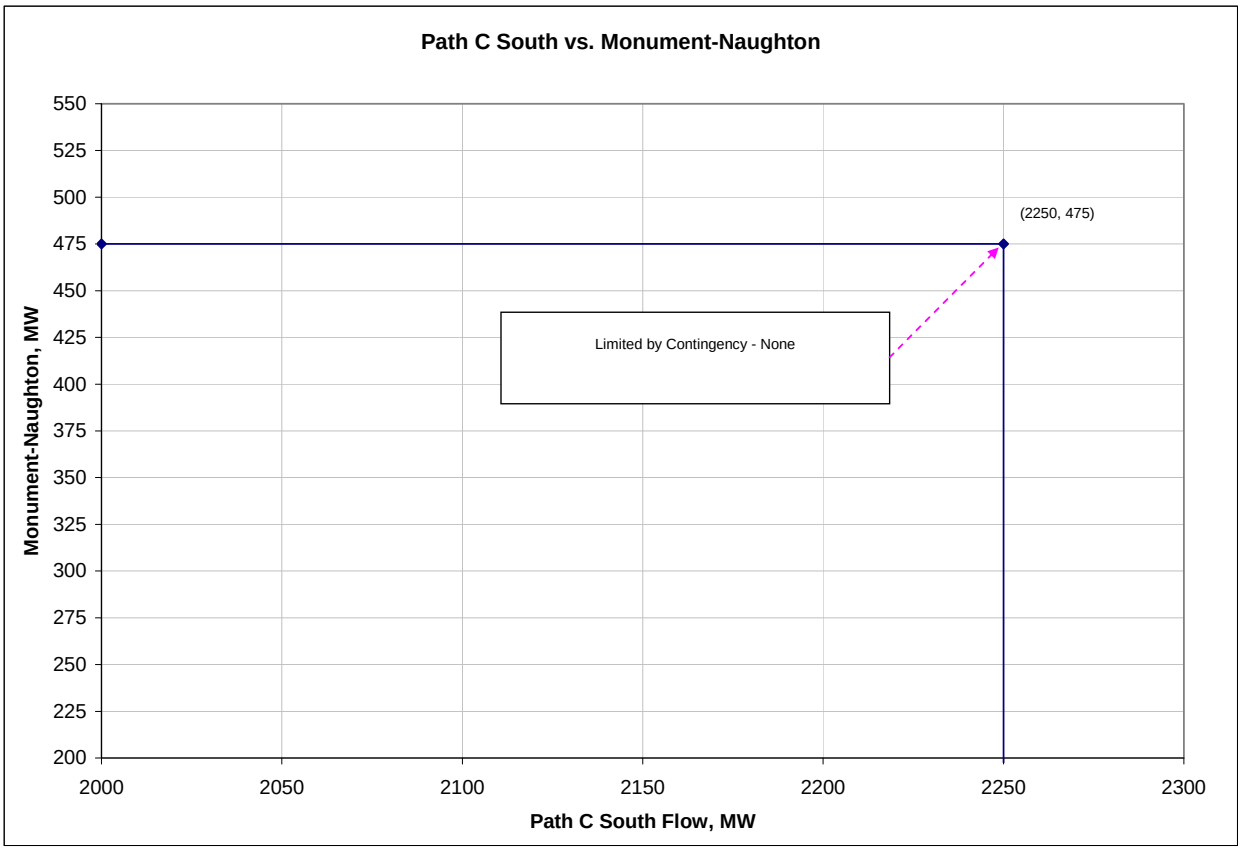
Appendix 2-11; Path C Southbound vs. Bonanza West



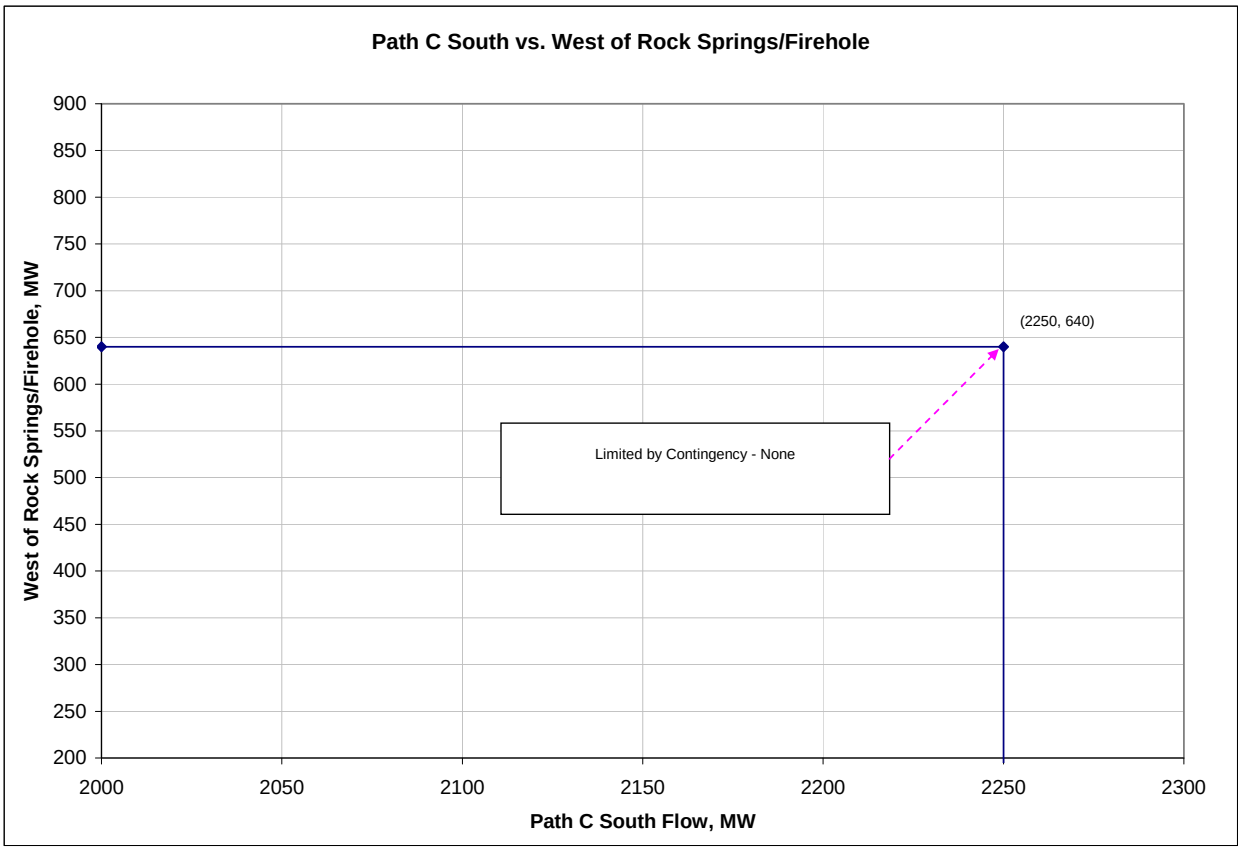
Appendix 2-12; Path C Southbound vs. the MSTI Project



Appendix 2-13; Path C Southbound vs. Monument – Naughton



Appendix 2-14; Path C Southbound vs. Rock Springs / Firehole



Appendix 3 – Post-transient Results Tables

Appendix 3-1 Pg.1 - - - Post-transient Results For Aeolus West vs. Aeolus South

BASE CASE / P PA H FLOWS; Gen Drop

INE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeo us South	Aeo us West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	M dpo nt West	Montana SE	Montana Idaho P18)	ot 4a	Bonanza West	ot 1a (30)	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP onder	RedB H Allen (ot 2C)	Pinto 4Corners 2B1)	Sigurd GlenC (2B 2)	daho Area System osses	Pace Area System osses	Bridger Gen Tr ps	Aeolus Gen Trip
3																													
		egwstg1 8h8 4100 2400 1500 2672 sav	1500	2672	1700	2 00	-1203	1680	263	567	682	126	-188	2051	688	5 2	12	2996	2280	6	2150	110	357	12	230	217	661		
5																													
6																													
7		Level "B" Cont ngenc es																											
8	B01	Ant cline – Populus 500 kV Line	1895	2080	0	338	-760	1322	3 6	65	362	2	-195	18 2	732	57	88	2996	2120	327	2150	137	370	1	230	3 1	691	0	0
9	B01a	Ant cline – Populus 500 kV Line	1826	2253	0	30 6	-737	1082	311	617	139	63	-215	19 7	739	606	7	2996	2032	29	2150	126	323	386	220	291	676	575	0
10	B01g	Ant cline – Populus 500 kV Line JBG1 KinpCap	1822	2260	0	305	-7 2	1087	310	616	1	6	-215	19 9	738	606	7	2996	203	296	2150	125	323	387	220	289	675	575	0
11	B02	Ant cline 500 / 3 5 kV Transformer	1516	2653	177	2319	-1199	1683	256	559	685	125	-189	20 8	686	5	12	2996	2282	65	2150	111	358	13	230	209	66	0	0
12	B03	B idger – Populus 3 5 kV Line	1566	2573	1907	2023	-1076	1622	308	613	631	106	-189	2016	705	5	117	2996	2255	5	2150	11	356	10	229	220	685	0	0
13	B0	B idger – 3M leknoll 3 5 kV Line	160	2515	19 0	1878	-982	161	3 5	652	626	91	-220	199	713	5 9	113	2996	22 2	32	2150	115	35	09	228	237	698	0	0
1	B0 a	B idger – 3M leknoll 3 5 kV Line	1537	2682	1823	1655	-961	135	308	61	386	129	-236	209	720	583	98	2996	21 7	395	2150	10	306	380	218	202	683	575	0
15	B05	B idger 3 5 / 230 kV Transformer	1501	2670	1699	2396	-1201	1679	26	568	680	125	-188	2051	689	5 1	12	2996	2279	65	2150	111	358	13	230	216	661	0	0
16	B06	3M leknoll – Goshen 3 5 kV Line	1525	2632	1790	22 6	-1181	1651	277	581	658	113	-203	203	69	5 1	119	2996	2259	9	2150	11	360	13	230	213	686	0	0
17	B06a	3M leknoll – Goshen 3 5 kV Line Bypas 3MK Caps	15	2602	1828	2637	-1126	1652	296	600	659	108	-206	2023	698	5 2	118	2996	2258	5	2150	11	359	13	230	213	678	0	0
18	B07	Kinport – Goshen 3 5 kV Line	1 99	267	1695	2 09	-1205	168	262	566	685	126	-192	2053	687	5 2	12	2996	2278	67	2150	110	357	12	230	218	661	0	0
19	B08	Kinport – Borah 3 5 kV Line	1502	2670	1701	2397	-1203	1678	263	567	680	126	-188	2051	688	5 2	12	2996	2278	65	2150	110	358	12	230	217	661	0	0
20	B09	Populus – Borah 500 kV Line	1521	26 0	1617	2 5	-1189	1650	268	571	661	119	-189	20 0	689	5 2	11	2996	2265	50	2150	116	360	1	230	229	660	0	0
21	B10	Borah 500 / 3 5 kV Transformer	1505	2668	1682	2 13	-1191	1689	26	568	691	127	-191	2053	689	5 3	12	2996	228	71	2150	109	355	11	229	218	661	0	0
22	B11	Borah 3 5 / 230 kV Transformer	1502	2671	1693	2 0	-1197	1687	265	569	687	126	-19	2052	688	5 2	125	2996	2281	66	2150	110	357	12	230	219	662	0	0
23	B12	Populus – Cedar Hill 500 kV Line	1517	2628	16 3	2 08	-12 6	1573	265	569	568	105	-17	2022	68	532	126	2996	2215	09	2150	121	380	25	23	225	660	0	0
25	B1	Cedar Hi l – Hemingway 500 kV Line	1520	2623	1637	2 09	-12 3	1569	266	570	565	10	-17	2020	68	533	126	2996	2213	07	2150	121	380	25	23	226	661	0	0
26	B15	Midpoint – Hemingway 500 kV Line	1506	2662	1692	2396	-1202	1668	26	567	669	123	-186	20 7	688	5 1	12	2996	227	59	2150	111	360	13	230	217	662	0	0
27	B16	Borah – M dpoint 500 kV Line	1510	26 9	1679	2396	-1227	1625	26	568	631	115	-181	2037	686	537	113	2996	22 9	35	2150	120	368	18	232	22	661	0	0
28	B17	Midpoint 500 / 3 5 kV Transformer	150	2672	1690	2 09	-1195	1690	26	567	712	129	-192	2055	690	5	99	2996	2296	7	2150	118	352	10	229	223	661	0	0
29	B18	Midpoint 3 5 / 230 kV Transformer	1501	2670	1699	2399	-120	1677	263	566	676	125	-188	2051	688	5 1	126	2996	2276	6	2150	110	359	13	230	217	661	0	0
30	B19	Borah – Adela de #2 3 5 kV Line	1503	2665	1700	2393	-1213	1661	263	567	667	123	-185	20 7	687	5 0	117	2996	2270	55	2150	115	361	1	231	218	661	0	0
31	B20	Ade a de – Midpoint #2 3 5 kV Line	1501	2670	1701	2397	-1208	1673	263	566	677	125	-187	2050	688	5 1	122	2996	2276	63	2150	112	359	13	230	216	661	0	0
32	B21	Borah – Adela de – M dpoint #1 3 5 kV Line	1503	2665	1700	2392	-121	1660	263	567	667	122	-185	20 7	687	5 0	117	2996	2270	5	2150	115	361	1	231	217	661	0	0
33	B22	Borah – Hunt 230 kV Line	1502	2669	1701	2396	-1209	1669	263	566	672	12	-186	20 9	688	5 1	121	2996	2273	61	2150	112	360	1	230	218	661	0	0
3	B23	Midpoint – Boise Bench #3 230 kV Line	1502	2669	1699	2398	-1207	1672	263	566	672	12	-187	20 9	688	5 1	126	2996	227	60	2150	110	360	13	230	218	661	0	0
35	B2	Midpoint – Ratt e Snake 230 kV Line	1501	2670	1700	2399	-1205	1677	263	566	678	125	-188	2051	688	5 1	125	2996	2277	6	2150	110	358	13	230	217	661	0	0
36	B25	Midpoint – Dram 230 kV Line	1502	2670	1699	2398	-1205	1676	263	566	676	125	-187	2050	688	5 1	125	2996	2275	6	2150	110	359	13	230	217	661	0	0
37	B26	Ratt e Snake – Boise Bench 230 kV Line	1502	2669	1699	2398	-1206	1673	263	566	673	12	-187	2050	688	5 1	126	2996	2273	60	2150	110	359	13	230	221	661	0	0
38	B27	Dram – Boise Bench 230 kV Line	1501	2671	1700	2399	-1203	1680	263	566	681	126	-188	2052	688	5 2	12	2996	2279	66	2150	110	358	12	230	217	661	0	0
39	B28	Hemingway 500/230 kV Transformer	1502	2671	1699	2 00	-1202	1680	263	567	683	126	-188	2051	688	5 2	122	2996	2278	67	2150	111	357	12	230	218	661	0	0
1	B30	Populus – Borah #1 3 5 kV Line	1 99	2672	1706	239	-121	1668	263	566	673	12	-188	2050	687	5 0	121	2996	2272	61	2150	113	360	1	230	218	661	0	0
2	B31	Populus – Borah #2 3 5 kV Line	1500	2670	1705	239	-1213	1668	263	567	673	12	-188	20 9	687	5 0	121	2996	2272	60	2150	113	360	1	230	217	661	0	0
3	B32	Populus – Kinport 3 5 kV Line	1 96	2676	1696	2 09	-1216	1675	263	566	679	12	-19	2051	686	5 1	121	2996	227	59	2150	113	360	1	230	220	661	0	0
	B33	Populus – Ben Lomond #3 3 5 kV Line	1539	2631	1668	2366	-1106	171	279	583	707	129	-187	20 9	699	550	131	2996	230	88	2150	101	3	0	227	215	668	0	0
5	B3	Populus – Terminal 3 5 kV Line	1533	2636	1676	2375	-1128	1707	270	57	702	128	-187	20 8	697	5 8	130	2996	2298	85	2150	103	3 7	06	228	216	66	0	0
6	B35	Aeolus – Ant c ine 500 kV Line	P CASE DIVERGED																										
7	B35a	Aeolus – Ant c ine 500 RAS Caps 600 MW Aeolus Drop	2113	1210	773	1968	-611	1035	212	515	101	27	-235	1799	730	662	67	2996	2011	275	2150	128	318	382	218	178	75	0	600
8																													
9	B35g	Aeolus–Anticline500 RASCaps 600MW Drop MonanxCaps Mus a	2152	1223	778	1973	-592	1080	215	517	1	3	-252	1850	722	6 8	68	2996	201	277	2150	131	331	388	222	177	735	0	600
50																													
51	B36	Aeolus – Mona 500 kV Line																											
52	B36a	Aeolus–Mona 500 RAS Caps 600 MW Aeolus Drop	0	3 72	2067	2660	-1985	1502	335	6 2	82	108	-209	19 1	836	680	1 9	2996	2305	550	2150	33	188	307	190	2	675	0	600
53	B37	Aeolus 500 / 230 kV Transformer	1 87	2662	1690	2398	-1203	1671	26	568	673	118	-189	2029	69	5 9	123	2996	2278	63	2150	110	356	11	229	216	660	0	0
5	B38	Aeolus – Windstar 230 kV Line	1 0	2590	1650	2376	-1200	1622	260	56	627	82	-195	1920	716	583	121	2996	226	53	2150	108	3 6	03	227	21	670	0	0
55	B39	Aeolus – Freezeout 230 kV Line	1 81	2697	1688	2 18	-1209	1679	271	575	680	128	-188	2062	690	538	12	2996	2280	66	2150	110	357	12	230	218	668	0	0
56	B 0	Bonanza –Mona 3 5kV Line	16 3	270	1729	2 72	-1 00	158	310	615	583	96	-197	2238	131	130	127	2996	2218	02	2150	87	288	357	211	22	700	0	0
57	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1620	2665	1681	2 13	-1	1 53	285	589	61	137	-206	2166	86	5	121	2996	2206	39	2150	78	267	353	208	217	658	0	0
58	B 1	Hemingway – Summer Lake 500kV ine	1511	2639	1676	2389	-1256	1582	263	567	561	112	-175	2028	682	531	1 7	2996	2206	03	2150	115	38	26	235	207	662	0	0
59	B51	DaveJon - Diff culty 230 kV Line	1 1	2592	1651	2377	-1200	162	260	56	628	83	-195	1921	716	583	121	2996	226	53	2150	108	3 6	0	227	21	668	0	0
60	B52	Spence - Mustang 230 kV Line	1517	2551	169	2312	-1178	1629	2 5	5 8	63	77	-196	19 7	700	570	120	2996	2270	56	2150	110	352	08	228	208	668	0	0
61	B53	Riverton - A lant c 230 kV Line	1532	2506	1708	236	-12 7	1623	2 6	5 9	627	2	-199	1933	695	580	121	2996	228	66	2150	108	350	06	228	213	661	0	0
62	B53a	Riverton - A lant c 230 kV Line D sc. Caps	1533	250	1708	2363	-12 7	1622	2 6	5 8	626	0	-199	1932	695	580	121	2996	2285	66	2150	108	350	06	228	213	660	0	0
63																											Minimum Margins > >		
6																											N-1 Cr ter a; > >		
65																													
66		Level "C" Cont ngenc es																											
69	C02	B idger – Populus #1 # 2 3 5 kV Lines	1682	239	2256	1365	-856	1522	385	69	5	68	-192	19 7	736	550	105	2996	2218	09	2150	120	353	07	228	20	7	0	0
70	C02a	B idger – Populus #1 # 2 3 5 kV Lines w/ RAS	160	2580	2087	1229	-85	1280	3 1	6 8	319	110	-211	2056	7 0	583	91	2996	2129	377	2150	108	306	379	217	180	711	575	0
71	C02b	B idger – Populus #1 # 2 3 5 kV Lines w/ RAS	1530	2757	1910	1089	-8 7	1022	297	602	80	150	-231	2160	7 5	619	76	2996	2035	339	2150	97	257	3 8	206	162	690	1150	0
72	C03	B idger – 3M leKno l Bridger – Populus #1 3 5 kV ines	1717	2336	2269	12 0	-762	152	22	73	5 8	52	-230	1922	7 3	55	102	2996	2203	398	2150	121	352	05	227	227	7 6	0	0
73	C03a	B idger – 3M leKno l Bridger – Populus #1 3 5 kV ines w/ RAS	1636	2529	2116	1098	-767	1282	377	686	32	97	-2	2036	7 6	587	89	2996	2116	367	2150	109	30	377	217	195	719	575	0
7	C03b	B idger – 3M leKno l Bridger – Populus #1 3 5 kV ines w/ RAS	P CASE DIVERGED																									1150	0
75	C03c	B idger–3MK Br dge-Pop#1 3 5 RAS; 2JBG Path18 Caps UV Loa	1558	2703	1950	9 6	-797	1083	331	637	138	138	-2 6	213	7 5	61	79	2996	2051	3 6	2150	99	265	353	208	168	693	1150	0
76	C0	B idger – 3M leKno l Bridger – Populus #2 3 5 kV ines	1717	2336	2269	12 0	-762	152	22	73	5 8	52	-230	1922	7 3	55	102	2996	2203	398	2150	121	352	05	227	227	7 6	0	0
77	C0 a	B idger – 3M leKno l Bridger – Populus #2 3 5 kV ines w/ RAS	1636	2529	2116	1098	-767	1282	377	686	32	97	-2	2036	7 6	587	89	2996	2116	367	2150	109	30	377	217	195	719	575	0
78	C0 b	B idger – 3M leKno l Bridger – Populus #2 3 5 kV ines w/ RAS	P CASE DIVERGED																									1150	0
79	C0 c	B idger–3MK Br dge-Pop#2 3 5 RAS; 2JBG Path18 Caps UV Loa	1558	2703	1950	9 6	-797	1083	331	637	138	138	-2 6	213	7 5	61	79	2996	2051	3 6	2150	99	265	353	208	168	693	1150	0
80	C05	Borah – Populus 3 5 kV DLO	1 96	2670	1718	2379	-1237	16 2	263	567	65	119	-189	20	685	537	11	2996	2257		2150	119	366	17	232	218	662	0	0
81	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1 6	2808	1612	2100	-1180	1370	235	538	02	151	-210	2133	697	575	98	2996	2158	02	2150	108	316	388	221	190	65	575	0
82	C06	Populus – Ben Lomond 3 5 kV DLO	1615	2550	1606	2298	-906	1787	312	618	763	137	-18	20 3	720	568	1 8	2996	2355	539	2150	81	31	386	220	213	68	0	0
83	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Series Ca	1637	2515	1662	2180	-859	1783	330	637	760	129	-190	2029	725	568	1 6	2996	2350	53	2150	82	31	386	221	207	685	0	0
8	C07	Ben Lomond – Terminal 3 5 kV DLO	1505	2666	1698	2397	-1196	1683	262	565	683	126	-188	2051	689	5 2	125	2996	2281	68	2150	109	356	12	230	217	661	0	0
85	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1 93	2675	1701	2 03	-1235	1656	263	567	666	120	-197	20 7	68	538	116	2996	2261	6	2150	117	365	17	231	221	662	0	0
87	C09	Populus – Borah #2 3 5 kV Treasureton – Brady 230 kV Lines	1501	2669	1701	2393	-1207	1670	265	569	67	12	-188	20 9	687	5 1	121	2996	2273	62	2150	112	360	1	230	217	662	0	0
88	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1500	2671	1703	2393	-1209	1670	265	569	67	125	-188	2050	687	5 1	121	2996	2273	62	2150	112	360	1	230	218	662	0	0
89	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1588	2577	1632	2328	-988	1759	292	596	7 2	133	-18	20	713	560	1 1	2996	2335	519	2150	89	326	393	223	21	673	0	0
90	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1536	263	1671	237	-1119	1710	27	578	70	129	-186	20 8	698	5 9	130	2996	2300	87	2150	102	3 5	05	227	216	665	0	0
91	C13	Borah – Adela de #2 Borah–ADT–Midpoint #1 3 5 kV ines (RA)	1506	2650	1702	237	-12 6	1606	263	567	629	11	-177	2035	685	536	98	2996	22 7	29	2150	127	371	20	232	220	662	0	0
92	C1	Borah – Adela de #2 M dpoint - Ade a de #2 3 5 kV ines (RA)	1503	2665	1701	2392	-1215	1659	263	567	666	122	-185	20 7	687	5 0	116	2996	2269	5	2150	115	361	15	231	218	661	0	0
93	C15	Borah – Adela de #2 Borah – Hunt 230 kV lines	1503	2662	1701	2388	-1222	16 7	263	566	656	120	-182	20	687	539	113	2996	2262	9	2150	118	363	16	231	220	661	0	0
9	C16	Borah – Kinpo t Borah–Adel–Midpoint #1 3 5 kV ines (RA?)	1503	2665	1701	2391	-1213	1660	263	567	667	122	-185	20 7	687	5 0	117	2996	2270	5	2150	115	361	1	231	218	662	0	0
95	C18	Borah – Kinpo t M dpoint – Adelaide #2 3 5 kV lines (RA)	1502	2669	1702	2395	-1207	1672	263	566	676	125	-187	2050	688	5 1	122	2996	2276	63	2150	112	359	13	230	216	661	0	0
96	C19	Borah – Kinpo t 3 5 kV Borah – Hunt 230 kV lines RA?)	1502	2668	1702	239	-1209	1669	263	566	671	12	-186	20 9	688	5 1	121	2996	2275	60	2150	113	360	1	230	218	661	0	0
97	C20	Borah–Adel–Midpoint #1 Midpoint – Ade a de #2 3 5 kV ines	150	2662	1702	2387	-1222	16 6	263	566	658	120	-183	20	687	539	113	2996	2265	9	2150	118	36	16	231	216	662	0	0
98	C21	Borah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV ines (RA)	1503	2662	1702	2387	-1223	16 6	263	566	655	120	-182	20	687	539	113	2996	2262	8	2150	118	36	16	231	219	661	0	0
99	C23	Borah – Adel #2 3 5 kV Borah – M dpoint 500 kV Lines	1513	2637	1676	2386	-12 8	1586	26	568	601	109	-175	2028	685	53	102	2996	2230	17	2150	128	375	22	233	228	662	0	0
100	C2	B idger – Populus #1 Goshen – Kinport 3 5 kV Lines	1567	2572	1919	2009	-107	1620	309	61	629	106	-188	2015	706	5	117	2996	2255	7	2150	11	356	10	229	219	686	0	0
101	C2 a	B idger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1501	2736	1787	1796	-10 8	1363	273	577	391	1 2	-212	211	713	580	102	2996	2160	06	2150	103	308	382	219	190	670	575	0
102	C25	B idger – Populus #2 Goshen – Kinport 3 5 kV lines	1567	2572	1919	2009	-107	1620	309	61	629	106	-188	2015	706	5	117	2996	2255	7	2150	11	356	10	229	219	686	0	0
103	C25a	B idger – Populus #2 Goshen – Kinport 3 5 kV lines w/ RAS	1501	2736	1787	1796	-10 8	1363	273	577	391	1 2	-212	211	713	580	102	2996	2160	06	2150	103	308	382	219	190	670	575	0
108	C28x	Palo Ve de - Trip 1&2, w/ FACRI	1582	2685	1690	2 06	-1383	1525	271	575	530	152	-211	2118	709	555	128	2996	3205	170	2150	82	512	513	263	218	723	0	0
109																											Minimum Margins; > >		
110																											N-2 Cr ter a > >		
111																													
112		egwstg1 8h8 4100 2400 1400 2672 sav	1 00	2672	1700	2 00	-1027	18 7	259	562	872	126	-179	19 5	60	2	98	2996	2673	858	18 9	137	3 9	96	25	220	6 7	0	0
113																													
11																													
115																													
116	B35g	Aeolus–Anticline500 RASCaps 600MW Drop MonanxCaps Mus a	2081	120	760	1973	-39	1250	211	513	3 0	8	-2 3	1755	639	5 6	1	2996	2 08	67	18 9	159	32	76	2 8	177	716	0	600
117																													
118																													
119																													

REAC IVE MARGIN MVAR (Gray shaded cells are the minimum margins)

INE #	CON INGENCY#	Aeo us 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	M dpo nt 500	Heminway 500	CedarHil 500	Bridger 345	oshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeo us 230	M ners 230	Mustang 230	Riverton 230	onahGas 230	ladstone 230
8	B01	-709	-8 8	-565	-759	-775	-1025	-1 6	-903	- 8	-389	-338	-610	-670	-709	-918	-997	-917	-666	-778	-587	-282	-276	-211	-56
9	B01a	-730	-1027	-637	-1083	-1096	-1 08	-1925	-1222	-609	-538	- 88	-873	-98	-1019	-119	-1232	-1088	-658	-781	-588	-271	-263	-215	-61
10	B01g	-770	-108	-68	-1231	-12 5	-1578	-2122	-1358	-679	-61	-553	-1003	-1131	-1168	-1320	-1311	-1132	-660	-821	-612	-276	-26	-217	-61
11	B02	-966	-1752	-997	-1791	-1829	-2099	-2575	-17 3	-1095	-883	-85	-1535	-181	-1812	-1829	-1837	-1859	-729	-985	-726	-309	-303	-2	-68
12	B03	-1070	-1009	-1152	-1 69	-1532	-18 7	-2388	-15 9	-1053	-750	-7 6	-1298	-701	-1519	-1621	-1679	-1733	-718	-1066	-680	-320	-313	-2 0	-66
13	B0	-998	-1 51	-965	-1093	-1121	-1 27	-19 1	-1228	-909	- 19	-377	-839	-1068	-1051	-1302	-1 6	-156	-708	-993	-709	-321	-308	-232	-65
1	B0 a	-10 2	-1671	-1151	-1 08	-1 8	-1768	-231	-1516	-1115	-517	- 70	-1106	-1 22	-138	-1605	-1707	-1795	-698	-1025	-718	-309	-29	-23	-69
15	B05	-1165	-1781	-1397	-1762	-1795	-1561	-2599	-17 7	-13 2	-877	-897	-1521	-1793	-1780	-1830	-18 6	-1873	-729	-11 0	-76	-308	-306	-2 2	-68
16	B06	-11 1	-105	-13 2	-16 0	-1661	-1938	-2 55	-1659	-129	-583	-775	-1322	-800	-1613	-1720	-1759	-1805	-726	-1119	-759	-320	-313	-2 5	-67
17	B06a	-1118	-1669	-126	-1536	-1562	-185	-2393	-1590	-1208	-585	-507	-1236	-1537	-832	-1656	-1708	-176	-723	-1098	-750	-319	-312	-2 2	-66
18	B07	-1173	-1792	-1358	-17 7	-1758	-2055	-2600	-1737	-1201	-328	-507	-1539	-1752	-1728	-1826	-1855	-1885	-730	-11 8	-769	-31	-307	-2	-68
19	B08	-1168	-1778	- 32	-17 2	-1783	-2052	-2585	-1736	-1326	-828	-868	-1377	-1758	-1773	-1817	-1837	-1868	-730	-11 3	-767	-31	-308	-2	-68
20	B09	-1170	-1751	-1351	-1595	-1612	-1969	-2530	-12 5	-1299	-8 3	-863	-1 51	-1705	-1697	-1785	-1803	-183	-728	-972	-769	-317	-2 9	-2	-67
21	B10	-1170	-1778	-1392	-1758	-16 9	-20 7	-2577	-1738	-133	-852	-880	-1 56	-17 1	-165	-1812	-1835	-1869	-729	-11 5	-768	-31	-307	-2	-68
22	B11	-1172	-1783	-500	-173	-176	-203	-2577	-1728	-1328	-782	-865	-1 8	-1753	-17 5	-181	-18 1	-1875	-729	-11 7	-769	-31	-307	-2	-68
23	B12	-1189	-17 9	-1365	-1539	-1656	-2051	-2 02	-938	-1317	-855	-877	-1 28	-16 9	-1655	-1782	-1810	-1830	-733	-1165	-778	-317	-31	-2 6	-66
25	B1	-1176	-1731	-1327	-1 89	-1609	-1999	-2359	-1058	-1279	-751	-855	-138	-1596	-1603	-175	-1787	-1811	-733	-1153	-772	-317	-31	-2 5	-65
26	B15	-1150	-17 3	-1312	-1587	-1518	-1 2	-2323	-1696	-1252	-723	-835	-13 2	-1578	-1528	-17 8	-1787	-1832	-729	-1126	-759	-318	-308	-2	-67
27	B16	-1167	-17 9	-13 8	-1612	-1 99	-1858	-2 8	-1675	-129	-8 2	-838	-1 13	-1652	-1628	-1781	-1802	-183	-731	-11 3	-767	-315	-311	-2	-67
28	B17	-1168	-1781	-1392	-17 9	-1775	-1778	-2559	-1731	-1339	-869	-890	-1 99	-1770	-17 7	-1826	-18 3	-187	-728	-11 3	-767	-317	-307	-2	-68
29	B18	-1159	-1513	-1380	-1739	-17 6	-202	-2582	-1717	-1330	-866	-878	-1 88	-17 2	-1730	-175	-1718	-1532	-728	-1135	-76	-317	-307	-2 5	-68
30	B19	-739	-362	-1376	-1717	-17 8	-2018	-25 3	-1719	-1323	-789	-568	-1 73	-1736	-1707	-735	-1136	-1857	-730	-11 2	-766	-317	-188	-173	-67
31	B20	-1159	-1512	-1381	-1737	-17 7	-2053	-2600	-172	-1329	-863	-877	-1 7	-1728	-1703	-1751	-1716	-1531	-729	-1135	-765	-317	-308	-2 5	-68
32	B21	-1161	-1767	-1376	-1712	-17 2	-2031	-2558	-1720	-1321	-857	- 98	-1 50	-1722	-1685	-1802	-982	-1856	-730	-11 1	-767	-318	-309	-2 5	-67
33	B22	-1157	-1509	-1375	-1730	-17 0	-2020	-2563	-1713	-132	-859	-873	-1 69	-1726	-1713	-17 7	-1713	-1527	-729	-1133	-76	-318	-308	-2 5	-67
3	B23	-1158	-1510	-1375	-1722	-172	-1989	-2555	-1706	-132	-861	-87	-1 71	-1722	-1706	-17 8	-1713	-1528	-729	-113	-76	-317	-308	-2 5	-67
35	B2	-1158	-1512	-1373	-1703	-1695	-196	-2579	-1693	-1322	-859	-873	-1 55	-1702	-1677	-17 7	-1715	-1530	-728	-1133	-76	-317	-307	-2 5	-68
36	B25	-1158	-1511	-1377	-173	-17 0	-2013	-2569	-171	-1327	-86	-876	-1 81	-1735	-1722	-1751	-1715	-1529	-728	-1133	-76	-317	-307	-2 5	-68
37	B26	-1159	-1511	-1380	-17 3	-1753	-2021	-2553	-1717	-1330	-866	-878	-1 90	-17 6	-1736	-1753	-1716	-1530	-729	-113	-76	-317	-308	-2 5	-67
38	B27	-1169	-1781	-1395	-1760	-1791	-2059	-2596	-17 5	-13 6	-876	-896	-1518	-1792	-1777	-1831	-18 5	-1873	-730	-11	-767	-315	-308	-2 5	-68
39	B28	-1168	-1780	-1391	-17 8	-1780	-20 5	-2580	-1731	-13 1	-87	-893	-1510	-1780	-1766	-1827	-18 3	-1872	-730	-11	-767	-31	-308	-2	-68
1	B30	-1175	-1789	-1 09	-1773	-1800	-2061	-2209	-1755	-13 3	-881	-902	-1535	-1798	-1772	-1837	-1851	-1880	-731	-1136	-770	-319	-309	-85	-67
2	B31	-1159	-1512	-1378	-1739	-17	-2022	-2578	-1718	-1328	-862	-876	-1 86	-1729	-1712	-17 7	-1713	-1530	-729	-1135	-765	-318	-308	-2 5	-67
3	B32	-1168	-1529	-1385	-1738	-1717	-2007	-2576	-1716	-132	-7 2	-823	-1202	-1751	-1665	-1763	-1733	-15 9	-730	-11 3	-768	-317	-307	-2 5	-67
	B33	-1151	-1688	-135	-1652	-168	-1969	-2 82	-1675	-1297	-8 7	-871	-1 07	-1629	-1636	-1597	-1671	-1770	-721	-1128	-7 9	-31	-305	-2 1	-68
5	B3	-1151	-1681	-13 6	-16 1	-1672	-1959	-2510	-1667	-1288	-8 1	-838	-1 09	-163	-1033	-1712	-1668	-1759	-722	-1128	-761	-315	-308	-2 3	-68
6	B35	P CASE DIVERGED																							
7	B35a	-610	-852	-1362	-199	-2030	-231	-17 8	-1902	-137	-1002	-10 9	-1771	-2025	-2037	-1317	-1160	-1006	-598	-675	- 83	-169	-151	-195	-56
9	B35g	-8 7	-1376	-1515	-1771	-2281	-2 63	-28 9	-1975	-1599	-111	-1163	-2007	-236	-2320	-187	-17 6	-1613	-6 5	-916	-635	-221	-207	-218	-59
51	B36	P CASE DIVERGED																							
52	B36a	-1280	-1773	-1011	-1083	-1152	-1 87	-200	-1229	-736	-675	-62	-1019	-1103	-11 2	-15 2	-1801	-19 8	-590	-1319	-853	-290	-269	-220	-6
53	B37	-1039	-1516	-1301	-171	-17 9	-20 1	-2595	-1720	-1286	-869	-878	-1 91	-17 1	-1733	-1762	-1728	-15 1	-722	-100	-706	-312	-301	-2 2	-67
5	B38	-1182	-18 0	-1 66	-1827	-1826	-2081	-2592	-178	-1372	-61	-550	-15 2	-18 7	-1822	-93	-1881	-1923	-697	-1139	-780	-279	-16	-231	-63
55	B39	-1152	-1801	-1373	-17 2	-1761	-20 3	-2590	-1730	-1165	-870	-873	-1 86	-17 7	-1737	-1828	-1855	-1890	-729	-1123	-50	-31	-309	-2 1	-68
56	B 0	-8 0	-16 7	-1033	-1 03	-1 76	-1835	-2332	-1512	-1031	-808	-787	-1285	-1	-1 63	-166	-17 8	-1817	- 81	-825	-621	-295	-282	-225	- 9
57	B 0a	-960	-1501	-1199	-1608	-1662	-1979	-2530	-1660	-1189	-839	-838	-1 19	-16 1	-16 7	-1723	-1729	-15 3	- 89	-9 3	-681	-303	-286	-23	-6
58	B 1	-1183	-1759	-1388	-16 9	-165	-1769	-1858	-15 3	-1337	-863	-887	-1 6	-1692	-1661	-1802	-182	-18 1	-73	-1160	-775	-317	-313	-2 6	-65
59	B51	-1196	-1836	-1 59	-1822	-18 2	-2102	-2620	-1782	-138	-889	-909	-15 0	-1827	-1806	-885	-188	-1917	-696	-1155	-782	-277	-163	-231	-63
60	B52	-9	-1711	-13 0	-1255	-18 0	-2125	-2611	-1773	-1385	-899	-956	-1607	-1862	-1852	-18 3	-18 1	-1857	-712	-921	-668	-235	-252	-156	-65
61	B53	-97	-1 57	-1216	-1633	-1687	-1998	-2553	-167	-1210	-855	-853	-1 2	-167	-167	-172	-1677	-1 8	-706	-955	-677	-310	-276	-222	-65
62	B53a	-955	-1 51	-1198	-1617	-1676	-1993	-25 8	-166	-1197	-852	-8 9	-1 36	-1661	-166	-1722	-1675	-1 81	-705	-935	-668	-300	-2	-222	-65
63		610	362	432	759	775	1025	1464	903	448	328	338	610	670	709	735	982	917	481	675	50	169	151	85	49
6						500	500	500	500	100			250		250										
69	C02	-821	-12 7	-698	-933	-1018	-1337	-1813	-1090	-620	-515	- 67	-870	-1015	-1009	-1213	-1326	-1 1	-690	-8 2	-6 6	-331	-280	-227	-62
70	C02a	-928	-1501	-906	-1252	-1360	-1696	-2198	-1396	-802	-671	-63	-1168	-137	-13 0	-150	-15 1	-15 7	-686	-92	-675	-317	-30	-231	-66
71	C02b	-935	-1663	-988	-1 55	-1539	-1856	-2308	-1537	-889	-76	-731	-1330	-1567	-15 6	-1686	-1739	-1823	-67	-926	-67	-301	-28	-232	-70
72	C03	-732	-1005	-613	-728	-775	-1030	-1 20	-871	-575	-353	-325	-618	-737	-738	-956	-109	-1206	-676	-759	-601	-330	-309	-216	-61
73	C03a	-861	-1380	-8 1	-1063	-1107	-1 08	-1895	-120	-789	- 53	- 0	-850	-1069	-10 5	-1285	-1 25	-1533	-677	-87	-65	-318	-300	-22	-66
7	C03b	P CASE DIVERGED																							
75	C03c	-9 0	-1611	-1010	-1 32	-1 92	-1611	-2302	-1519	-955	-637	-526	-856	-1 86	-1 73	-1610	-1691	-1772	-67	-930	-677	-306	-288	-229	-70
76	C0	-732	-1073	-613	-728	-775	-1030	-1 56	-871	-575	-353	-325	-618	-737	-738	-956	-109	-1206	-676	-759	-601	-330	-309	-216	-61
77	C0 a	-87	-1380	-8 1	-1057	-1107	-1 07	-1861	-120	-789	- 53	- 0	-850	-1053	-1030	-1285	-1 25	-1533	-677	-87	-65	-318	-300	-22	-66
78	C0 b	P CASE DIVERGED																							
79	C0 c	-9 0	-1611	-1010	-1 32	-1 92	-1796	-2303	-1519	-955	-601	-526	-122	-823	-1 73	-1610	-1691	-1772	-67	-930	-677	-306	-288	-229	-70
80	C05	-1175	-1776	-1391	-17 1	-1751	-2001	-25 3	-1728	-1336	-858	-881	-1 96	-1726	-167	-1806	-1826	-1863	-732	-1151	-770	-315	-311	-2 5	-67
81	C05a	-1137	-1873	-1387	-1839	-1857	-2092	-2615	-180	-1381	-918	-931	-1601	-1099	-1782	-1919	-1925	-1990	-716	-1111	-75	-301	-292	-2 3	-70
82	C06	-1116	-1 98	-1310	-152	-1550	-1852	-2 12	-1378	-12	-757	-8 5	-1305	-1 70	-1505	-12 6	-1388	-1562	-699	-1097	-7 9	-315	-299	-23	-68
83	C06a	-1081	-1 9	-1208	-139	-1090	-1726	-2251	-1 71	-11 8	-63	-713	-1178	-133	-1369	-1213	-1352	-1513	-695	-1069	-739	-317	-300	-232	-67
8	C07	-1165	-1708	-1371	-1696	-1723	-2008	-2557	-1706	-131	-856	-875	-1 53	-1692	-1691	-1567	-1721	-1781	-728	-11 0	-766	-315	-309	-2	-68
85	C08	-1180	-1793	-1387	-1721	-1688	-1962	-2530	-1710	-1309	-711	-810	-1150	-17 5	-1177	-1806	-18 1	-1882	-732	-1155	-772	-315	-309	-2 5	-67
87	C09	-1158	-1506	-1371	-1725	-1729	-200	-2557	-1708	-1318	-856	-865	-1 71	-1715	-1693	-1726	-1702	-152	-728	-1133	-76	-317	-307	-2	-67
88	C10	-1162	-1515	-1387	-1750	-1752	-2026	-2578	-172	-1336	-866	-876	-1 9	-17 2	-1718	-17 1	-171	-153	-729	-1138	-766	-317	-307	-2	-68
89	C11	-112	-1550	-1301	-1522	-1553	-185	-2387	-1585	-1236	-808	-836	-1306	-1 65	-1 99	-1 51	-1 63	-1618	-708	-1105	-752	-315	-30	-239	-68
90	C12	-11 9	-87	-1338	-162	-111	-19 0	-2 88	-1655	-1278	-83	-852	-9 8	-1600	-1605	-1689	-1656	-1750	-721	-1126	-760	-31	-306	-2 2	-68
91	C13	-115	-1 78	-1331	-1612	-1618	-1892	-2 13	-16 1	-1267	-817	-83	-13 8	-1575	-1516	-1679	-166	-1 9	-730	-1131	-763	-319	-311	-2 6	-66
92	C1	-1168	-1769	-1377	-1712	-17 2	-2028	-2555	-1720	-1322	-857	-572	-1 53	-1722	-168	-9 6	-1820	-1857	-730	-11 3	-767	-318	-219	-2 5	-67
93	C15	-1167	-1762	-1370	-1697	-1728	-1986	-2500	-1705	-1315	-850	-87	-1 3	-1707	-1672	-178	-1813	-18 8	-731	-11 2	-766	-317	-310	-2 5	-67
9	C16	-115	-1 97	-13 9	-1678	-1696	-1999	-25	-1688	-1286	-803	-836	-1311	-16 9	-16 1	-1716	-1693	-151	-729	-1130	-763	-318	-308	-2 5	-67
95	C18	-1158	-1508	-1368	-1718	-1737	-20 0	-2587	-171	-1309	-816	-850	-13 3	-1695	-1696	-1739	-1710	-1526	-728	-1133	-76	-317	-307	-2 5	-67
96	C19	-1156	-1505	-1362	-1710	-1730	-2007	-25 9	-1702	-1303	-811	-8 6	-133	-1691	-1707	-173	-1706	-1523	-728	-1132	-763	-317	-308	-2 5	-67
97	C20	-1167	-1760	-1363	-1102	-1692	-2037	-25 6	-1706	-1303	-835	-863	-138	-1638	-1566	-1777	-1805	-18 5	-731	-11 3	-767	-315	-310	-2 5	-67
98	C21	-1167	-1761	-1369	-1690	-1720	-1999	-2509	-1277	-1313	-8 6	-871	-1 28	-1691	-16 8	-1790	-1811	-18 8	-731	-11 3	-767	-316	-310	-2 5	-67
99	C23	-1167	-1729	-132	-1552	-1 32	-1755	-235	-1635	-1266	-819	-8 2	-13 9	-157	-1532	-1733	-1771	-1808	-732	-11	-767	-317	-313	-2 5	-66
100	C2	-1079	-1632	-1095	-1 2	-913	-1820	-2372	-1531	-906	-269	-37	-1307	-1 7	-1 55	-1617	-1687	-1738	-718	-106	-737	-320	-313	-239	-66
101	C2 a	-1092	-180	-1220	-1731	-1795	-2093	-2611	-1753	-1030	-327	- 92	-158	-1819	-1780	-1853	-1880	-193	-706	-1071	-739	-308	-296	-2 0	-70
102	C25	-1079	-1633	-1095	-1 2	-913	-1820	-2372	-1531	-906	-269	- 15	-1307	-1 7	-1 55	-1617	-1687	-17 0	-718	-106	-737	-320	-313	-2 0	-66
103	C25a	-1092	-180	-1220	-1723	-1795	-2070	-2611	-1753	-1030	-327	- 92	-158	-1819	-1780	-1853	-1880	-193	-706	-1071	-739	-308	-296	-2 0	-70
108	C28x	-1012	-1 68	-12 2	-1120	-1671	-2008	-2520	-1670	-1219	-8 7	-859	-1 3	-1657	-1663	-1666	-1618	-1532	-689	-993	-702	-306	-290	-237	-29
109		732	874	613	728	775	1030	1420	871	575	269	325	618	737	738	946	1094	1206	674	759	601	301	219	216	29
110						00	00	00	00	100			200		200										

INE #	CON INGENCY#	Voltage Deviation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Vo tage	COMMEN
					Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs					
5						SIDNEY 115 / 230 #1	109.99%			
6						CTTNWD N - KETTLECK 115 #1	103.93%			
8	B01	1	3M KNOLL 3 5	5.1	1	BRIDGER - BR DGE&A 3 5 #1	113.80%	-	None	
9	B01a	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	102.51%	-	None	
10	B01g	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	102.23%	-	None	
11	B02	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	82 81%	-	None	
12	B03	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	99 55%	-	None	
13	B0	0	- - -	- - -	0	BRIDGER - ROCKSPGS 230 #1	87.11%	-	None	
1	B0 a	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	79. 9%	-	None	
15	B05	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
16	B06	0	- - -	- - -	2	GRACE - SODA 138 #1	115.22%	-	None	
17	B06a	0	- - -	- - -	0	GRACE - SODA 138 #1	78 33%	-	None	Bypass Resolves OL
18	B07	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	87 55%	-	None	
19	B08	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
20	B09	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	87 25%	-	None	
21	B10	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
22	B11	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
23	B12	0	- - -	- - -	0	SIGURDPS - GLENCANY 230 #1	8 83%	-	None	
25	B1	0	- - -	- - -	0	SIGURDPS - GLENCANY 230 #1	8 85%	-	None	
26	B15	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.13%	-	None	
27	B16	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.13%	-	None	
28	B17	0	- - -	- - -	0	LOCUST - MORA 138 #1	88 52%	-	None	
29	B18	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	82. %	-	None	
30	B19	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
31	B20	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
32	B21	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
33	B22	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79 83%	-	None	
3	B23	0	- - -	- - -	0	LOCUST - MORA 138 #1	88 03%	-	None	
35	B2	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
36	B25	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
37	B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	90 89%	-	None	
38	B27	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
39	B28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82 99%	-	None	
1	B30	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
2	B31	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
3	B32	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	88 81%	-	None	
	B33	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.1 %	-	None	
5	B3	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.1 %	-	None	
6	B35				P CASE DIVERGED					
7	B35a	73	GREATDIV 3 .5	10 9	5	M NERS - PLATTE 230 #1	10 .2 %	-	None	
8						BRIDGER 3 5 / 230 #2	103.53%			
9	B35g	0	- - -	- - -	1	MINERS - PLATTE 230 #1	100.29%	-	None	
50						BRIDGER 3 5 / 230 #2	99 00%			
51	B36				P CASE DIVERGED					
52	B36a	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	93.72%	-	None	
53	B37	0	- - -	- - -	2	AEOLUS 500 / 230 #2	100.39%	-	None	
5	B38	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	87 36%	-	None	
55	B39	0	- - -	- - -	0	MINERS - PLATTE 230 #1	77.1 %	-	None	
56	B 0	0	- - -	- - -	3	BONANZA - VERNAL 138 #1	123.53%	-	None	
57	B 0a	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	8 52%	-	None	Gen Trip resolves overload
58	B 1	0	- - -	- - -	0	LOCUST - MORA 138 #1	87 69%	-	None	
59	B51	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	88. %	-	None	
60	B52	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	83 36%	-	None	
61	B53	0	- - -	- - -	0	BRIDGER - ROCKSPGS 230 #1	91.79%	-	None	Negative Vdevs > 10%
62	B53a	0	- - -	- - -	0	BRIDGER - ROCKSPGS 230 #1	91.72%	-	None	
69	C02	1	3M KNOLL 3 5	6.6	3	BRIDGER - BR DGE&A 3 5 #1	125.63%	-	None	2311 63 Amps
70	C02a	0	- - -	- - -	1	BRIDGER - BRIDGE&A 3 5 #1	110.66%	-	None	2036 20 Amps
71	C02b	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	96 37%	-	None	
72	C03	0	POPULUS 500	5.1	1	BRIDGER - ROCKSPGS 230 #1	11 . 1%	-	None	
73	C03a	0	PTRSNFRG 69	5.2	0	BRIDGER - ROCKSPGS 230 #1	9 . 7%	-	None	
7	C03b				P CASE DIVERGED					
75	C03c	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	83. %	-	None	
76	C0	0	POPULUS 500	5.1	1	BRIDGER - ROCKSPGS 230 #1	11 . 1%	-	None	
77	C0 a	0	PTRSNFRG 69	5 2	0	BRIDGER - ROCKSPGS 230 #1	9 . 7%	-	None	
78	C0 b				P CASE DIVERGED					
79	C0 c	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	83. %	-	None	w/ P18 Caps & Load Drop
80	C05	0	- - -	- - -	9	BRIDGER - BR DGE&A 3 5 #1	87.15%	-	None	
81	C05a	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	78 80%	-	None	Gen Trip Not Req d
82	C06	0	- - -	- - -	0	GRACE - SODA 138 #1	80.70%	-	None	
83	C06a	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	83.16%	-	None	
8	C07	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.13%	-	None	
85	C08	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	91.11%	-	None	
87	C09	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
88	C10	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
89	C11	0	- - -	- - -	0	SIGURDPS - GLENCANY 230 #1	79 50%	-	None	
90	C12	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.1 %	-	None	
91	C13	0	- - -	- - -	0	HUNT 138 / 230 #2	77 92%	-	None	
92	C1	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
93	C15	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79 92%	-	None	
9	C16	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
95	C18	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
96	C19	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79 85%	-	None	
97	C20	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	76.12%	-	None	
98	C21	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79 50%	-	None	
99	C23	0	- - -	- - -	0	M DPO NT 138 / 230 #1	76.1 %	-	None	
100	C2	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	98 25%	-	None	
101	C2 a	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	89 03%	-	None	
102	C25	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	98 25%	-	None	
103	C25a	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	89 03%	-	None	
108	C28x	0	- - -	- - -		SPR NGER - GLADSTON 115 #1	111.29%	-	None	
112					Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs					
113						SIDNEY 115 / 230 #1	109. 0%			
11						CTTNWD N - KETTLECK 115 #1	10 .19%			
116	B35g	0	- - -	- - -	0	M NERS - PLATTE 230 #1	98 20%	-	None	
117						BRIDGER 3 5 / 230 #2	93 86%			

1) Voltage Violations > 5% for Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line Side) and Transfo mer tertiary buses.

Appendix 3-1 Pg.2 - - - Post-transient Results For Aeolus West vs. Aeolus South

			BASE CASE / P PA H FLOWS																								Gen Drop	
L NE #	CON INGENCY#	CON NGENCY / BASE CASE NAME	Aeolus Sou h	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana Idaho (P18)	ot 4a	Bonanza West	ot 1a (30)	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant IPP Gonder	RedB H Allen (ot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Br dger Gen Tr ps	Aeolus Gen Trip
3																													
5																													
6		egwstg1 8h8 4000 2400 1700 5 sav	1700	2577	1600	2 00	-1607	1231	215	517	190	127	23	2009	6 6	32	170	2996	2398	582	2035	65	50	336	192	219	69		
7																													
8																													
9		**Level "B" Contingencies**																											
10	B01	Anticline – Populus 500 kV Line	2056	203	0	3333	-1192	89	297	603	-111	31	238	1809	690	63	136	2996	22 7	5	2035	89	512	337	192	3 0	725	0	0
11	B01a	Anticline – Populus 500 kV Line	1989	2207	0	2996	-1165	655	263	567	-333	71	255	1915	696	95	121	2996	2155	18	2035	79	70	306	180	295	708	575	0
12	B01g	Anticline – Populus 500 kV Line JBG1 KinpCap	198	2213	0	300	-1171	659	262	566	-330	72	256	1917	695	95	122	2996	2156	18	2035	78	71	307	180	29	706	575	0
13	B02	Anticline 500 / 3 5 kV Transformer	1718	2560	1709	2291	-1606	1239	205	507	197	128	235	2009	6 3	3	171	2996	2 00	583	2035	65	505	337	193	209	696	0	0
1	B03	Br dger – Populus 3 5 kV Line	1763	2 82	1815	2018	-1 79	1176	261	56	1 2	108	23	1973	66	35	163	2996	237	565	2035	68	502	333	191	223	717	0	0
15	B0	Br dger – 3Mi eknoll 3 5 kV Line	1798	2 28	18 8	1877	-1382	1170	298	603	1 0	95	259	1953	672	0	159	2996	236	55	2035	69	99	330	190	239	729	0	0
16	B0 a	Br dger – 3Mi eknoll 3 5 kV Line	173	2592	172	1659	-1358	907	262	565	-105	133	273	2053	679	7	1	2996	226	512	2035	58	58	300	178	209	711	575	0
17	B05	Br dger 3 5 / 230 kV Transformer	702	2575	599	2397	605	230	2 6	5 8	89	26	23	2008	6 7	32	70	2996	2397	580	2035	65	505	336	92	2 9	69	0	0
18	B06	3M leknoll – Goshen 3 5 kV Line	1723	2539	1690	22 8	-158	1203	229	531	167	115	2 6	1992	653	32	165	2996	2377	567	2035	68	505	337	193	215	719	0	0
19	B06a	3M leknoll – Goshen 3 5 kV Line Bypas 3MK Caps	17 2	2510	1730	2638	-1529	1205	2 8	551	169	110	2 9	1981	657	33	16	2996	2378	566	2035	68	505	336	192	215	710	0	0
20	B07	Kinport – Goshen 3 5 kV Line	1700	2579	1596	2 07	-1608	123	215	516	192	127	236	2010	6 6	33	171	2996	2397	582	2035	65	50	336	192	220	69	0	0
21	B08	Kinport – Borah 3 5 kV Line	1702	2575	1599	2398	-1605	1230	215	517	189	127	23	2009	6 7	33	170	2996	2397	581	2035	65	50	336	192	219	69	0	0
22	B09	Populus – Borah 500 kV Line	1720	25 8	1523	2 1	-1593	1205	220	522	172	121	23	1998	6 8	33	161	2996	2385	570	2035	70	507	338	193	230	69	0	0
23	B10	Borah 500 / 3 5 kV Transformer	1707	2572	157	2 18	-1588	12 3	217	519	202	128	237	2010	6 8	35	170	2996	2 0	588	2035	63	501	33	192	222	693	0	0
2	B11	Borah 3 5 / 230 kV Transformer	1702	2576	1592	2 0	-1600	1236	217	519	19	127	238	2009	6 6	33	171	2996	2397	583	2035	6	50	336	192	221	69	0	0
25	B12	Populus – Cedar H ll 500 kV Line	1711	2550	1565	2 05	-1636	116	216	518	119	11	226	1990	6 3	26	172	2996	2355	5 9	2035	71	517	3 5	196	222	693	0	0
27	B1	Cedar Hill – Hemingway 500 kV Line	1713	25 6	1560	2 05	-1632	1162	217	519	118	113	226	1989	6	27	171	2996	2356	5 6	2035	72	517	3 5	196	223	69	0	0
28	B15	Midpoint – Hemingway 500 kV Line	1706	2576	1593	2 05	-158	1252	217	518	223	131	237	2013	6 9	36	158	2996	2 15	597	2035	66	97	331	191	221	695	0	0
29	B16	Borah – M dpoint 500 kV Line	708	2560	58	2397	622	93	2 6	5 8	57	20	229	999	6 5	30	62	2996	2376	562	2035	72	5	3	9	22	69	0	0
30	B17	Midpoint 500 / 3 5 kV Transformer	1705	2576	1586	2 12	-1595	12 2	216	518	227	130	237	2013	6 9	36	1 0	2996	2 16	592	2035	7	99	332	191	228	69	0	0
31	B18	Midpoint 3 5 / 230 kV Transformer	702	2575	599	2399	607	229	2 5	5 7	85	26	233	2008	6 6	32	72	2996	2395	579	2035	6	505	337	93	2 9	69	0	0
32	B19	Borah – Ade a de #2 3 5 kV Line	1703	2571	1599	239	-161	1216	215	517	179	12	232	2005	6 6	31	16	2996	2389	575	2035	68	507	338	193	220	69	0	0
33	B20	Ade aide – Midpoint #2 3 5 kV Line	1702	2575	1600	2398	-1608	1227	215	517	187	126	233	2008	6 6	32	169	2996	2396	579	2035	66	505	337	193	219	69	0	0
3	B21	Borah – Adela de – Midpoint #1 3 5 kV Line	1703	2571	1600	239	-1613	1217	215	517	180	12	232	2005	6 6	31	165	2996	2390	575	2035	68	507	338	193	220	69	0	0
35	B22	Borah – Hunt 230 kV Line	1702	257	1600	2396	-1611	1223	215	517	183	126	232	2007	6 6	32	168	2996	2393	578	2035	66	506	337	193	220	69	0	0
36	B23	Midpoint – Boise Bench #3 230 kV Line	1702	257	1599	2398	-1608	1226	215	517	183	126	233	2007	6 6	32	172	2996	2392	578	2035	65	505	337	193	220	69	0	0
37	B2	Midpoint – Ratt e Snake 230 kV Line	1702	2576	1599	2399	-1606	1231	215	517	190	127	23	2009	6 6	32	170	2996	2397	581	2035	65	50	336	192	219	69	0	0
38	B25	Midpoint – Dram 230 kV Line	1702	2575	1599	2398	-1607	1228	215	517	186	126	233	2008	6 6	32	171	2996	2395	579	2035	65	505	337	193	219	69	0	0
39	B26	Rattle Snake – Bo se Bench 230 kV Line	1702	257	1599	2398	-1608	1225	215	517	183	125	233	2007	6 6	32	172	2996	2390	578	2035	65	505	337	193	223	69	0	0
0	B27	Dram – Boise Bench 230 kV Line	1702	2576	1599	2399	-1606	1231	215	517	190	127	23	2009	6 6	33	170	2996	2398	581	2035	65	50	336	192	219	69	0	0
1	B28	Hemingway 500/230 kV Trans ormer	1702	2575	1598	2 00	-1605	1231	215	517	191	127	23	2009	6 7	33	169	2996	2397	582	2035	65	50	336	192	220	69	0	0
3	B30	Populus – Borah #1 3 5 kV Line	700	2577	605	2395	6 5	223	2 5	5 7	8	26	23	2008	6 5	3	68	2996	2392	577	2035	67	506	338	93	220	693	0	0
	B31	Populus – Borah #2 3 5 kV Line	1701	2575	1603	2395	-1613	1223	215	517	18	125	23	2007	6 6	31	168	2996	2392	577	2035	67	506	337	193	219	69	0	0
5	B32	Populus – Kinport 3 5 kV Line	1697	2580	1596	2 08	-1618	1226	215	516	187	125	238	2008	6	31	168	2996	2391	577	2035	67	507	338	193	221	693	0	0
6	B33	Populus – Ben Lomond #3 3 5 kV Line	1753	2521	1555	2353	-1 71	1279	238	5 1	226	132	232	200	662	5	181	2996	2 31	616	2035	51	86	323	187	216	706	0	0
7	B3	Populus – Terminal 3 5 kV Line	1751	2521	1562	2361	-1 87	1276	227	529	22	130	232	2003	662	3	180	2996	2 28	61	2035	52	87	32	188	217	701	0	0
8	B35	Aeolus – Ant c ine 500 kV Line																											
9	B35a	Aeolus – Ant c ine 500 RAS Caps 600 MW Aeolus Drop	22 1	1192	706	2002	-1053	598	173	7	-383	31	273	1761	689	550	115	2996	2130	395	2035	81	6	301	178	19	781	0	600
50	B35d	Aeolus – Ant c ine 500 RAS Caps 600 MW Aeolus Drop																											
51	B35g	Aeolus–Anticline500 RASCaps 600MW Drop MonanxCaps Mustang River on Caps																										0	600
52	B36	Aeolus – Mona 500 kV Line																											
53	B36a	Aeolus–Mona 500 RAS Caps 600 MW Aeolus Drop	0	3515	2007	2716	-2 78	10 0	303	609	-28	9	252	1833	832	603	199	2996	2 35	68	2035	-26	326	201	138	26	7 1	0	600
5	B37	Aeolus 500 / 230 kV Transformer	1689	256	1588	2398	-1605	1221	216	518	180	119	235	1985	652	0	170	2996	2393	579	2035	65	503	335	192	219	693	0	0
55	B38	Aeolus – Windstar 230 kV Line	16	2 9	15 7	2376	-1600	1173	213	515	135	8	2 0	1880	67	72	167	2996	2379	569	2035	63	9	327	189	217	702	0	0
56	B39	Aeolus – Freezeout 230 kV Line	67	26 0	580	2 2	6 2	228	226	528	87	30	233	202	6 9	28	70	2996	2396	583	2035	6	503	335	92	22	707	0	0
57	B 0	Bonanza –Mona 3 5kV Line	1831	2610	1629	2 70	-1791	11	265	569	100	100	2 0	2183	123	9	173	2996	2336	519	2035	2	3	277	171	228	736	0	0
58	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1811	2568	1577	2 11	-183	1007	237	539	-29	1 1	2 8	2111	78	365	167	2996	232	557	2035	33	25	272	168	22	698	0	0
59	B 1	Hemingway – Summer Lake 500kV ine	1706	256	1590	2396	-1623	1198	215	517	1 9	123	231	2001	6 5	29	178	2996	2370	561	2035	67	512	3 1	19	216	69	0	0
60	B51	DaveJon - Diff culty 230 kV Line	16 7	2 97	15 9	2377	-1600	1175	213	515	137	86	239	1883	673	71	167	2996	2380	569	2035	63	95	327	189	217	699	0	0
61	B52	Spence - Mustang 230 kV Line	1715	2 58	159	231	-1582	1180	198	99	1 2	79	2 0	1905	658	59	167	2996	2386	573	2035	65	99	331	191	211	701	0	0
62	B53	Riverton - A lantic 230 kV Line	1730	2 16	1609	2365	-16 8	1176	199	500	138	5	2 3	1892	653	69	168	2996	2 02	582	2035	63	97	330	190	217	692	0	0
63	B53a	Riverton - A lantic 230 kV Line Disc. Caps	1730	2 15	1608	236	-16 7	1175	199	500	137		2 3	1891	653	69	168	2996	2 02	582	2035	63	97	330	190	217	692	0	0
6																													Minimum Margins; > >
65																													N-1 Criteria; > >
66																													
67		**Level "C" Contingencies**																											
70	C02	Br dger – Populus #1 # 2 3 5 kV Lines	1870	2311	2179	135	-1263	1081	338	6 5	60	71	236	1905	695	2	152	2996	23 1	532	2035	73	98	328	189	208	775	0	0
71	C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	797	2 93	2002	222	255	836	295	600	69		253	20	699	75	37	2996	22 6	9	2035	62	56	298	77	89	7	575	0
72	C02b	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1727	2666	1817	1085	-12 2	576	252	555	- 10	15	269	2119	70	510	121	2996	21 9	5	2035	51	1	265	165	177	717	1150	0
73	C03	Br dger – 3Mi eKno l Bridger – Populus #1 3 5 kV lines	1902	2259	2191	1236	-1167	1087	375	68	68	57	268	1882	701	6	1 9	2996	2330	523	2035	73	95	326	188	229	775	0	0
7	C03a	Br dger – 3Mi eKno l Bridger – Populus #1 3 5 kV lines w/ RAS	1827	2 6	2028	1098	-1166	8 0	331	637	-162	102	280	1995	705	78	13	2996	2237	87	2035	63	5	296	177	203	7 6	575	0
75	C03b	Br dger – 3Mi eKno l Bridger – Populus #1 3 5 kV lines w/ RAS	1755	262	1857	953	-1158	578	287	592	- 06	1	291	210	710	513	119	2996	21 0	8	2035	52	11	263	16	186	727	1150	0
76	C03c	Br dger–3MK Br dge-Pop#1 3 5 RAS; 2JBG Path18 Caps UV Loa	1752	2616	185	9 9	-1193	6 1	285	589	-3 9	1 2	286	2093	70	505	12	2996	2167	62	2035	53	21	271	167	181	719	1150	0
77	C0	Br dger – 3Mi eKno l Bridger – Populus #2 3 5 kV lines	1902	2259	2191	1236	-1167	1087	375	68	68	57	268	1882	701	6	1 9	2996	2330	523	2035	73	95	326	188	229	775	0	0
78	C0 a	Br dger – 3Mi eKno l Bridger – Populus #2 3 5 kV lines w/ RAS	1827	2 6	2028	1098	-1166	8 0	331	637	-162	102	280	1995	705	78	13	2996	2237	87	2035	63	5	296	177	203	7 6	575	0
79	C0 b	Br dger – 3Mi eKno l Bridger – Populus #2 3 5 kV lines w/ RAS	1755	262	1857	953	-1158	578	287	592	- 06	1	291	210	710	513	119	2996	21 0	8	2035	52	11	263	16	186	727	1150	0
80	C0 c	Br dger–3MK Br dge-Pop#2 3 5 RAS; 2JBG Path18 Caps UV Loa	1752	2616	185	9 9	-1193	6 1	285	589	-3 9	1 2	286	2093	70	505	12	2996	2167	62	2035	53	21	271	167	181	719	1150	0
81	C05	Borah – Populus 3 5 kV DLO	1697	2575	161	238	-1632	1203	215	517	170	122	235	200	6	29	163	2996	2381	567	2035	71	510	3 0	19	220	69	0	0
82	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	6 9	27 3	503	2 0	572	930	88	88	8	5	253	2093	656	66	6	2996	2277	52	2035	60	67	308	8	98	68	575	0
83	C06	Populus – Ben Lomond 3 5 kV DLO	1857	2 09	1 66	2260	-1193	1380	286	590	302	1 3	229	1996	69	71	205	2996	250	690	2035	22	6	292	176	211	737	0	0
8	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Series Ca	1876	2377	1525	21 2	-11 7	1377	303	609	300	135	23	1982	699	72	203	2996	2501	686	2035	23	6	292	176	205	738	0	0
85	C07	Ben Lomond – Terminal 3 5 kV DLO	1725	25 9	1589	2389	-1565	1251	208	509	205	128	233	2005	655	37	175	2996	2 12	595	2035	59	97	331	190	218	695	0	0
86	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1695	2580	1600	2 03	-1633	1211	215	517	177	122	2 0	2005	6 3	29	16	2996	2381	569	2035	70	510	3 0	19	222	69	0	0
88	C09	Populus – Borah #2 3 5 kV Treasureton – Brady 230 kV Lines	1702	257	1599	239	-1605	1226	218	520	186	126	23	2007	6 6	32	169	2996	239	579	2035	66	505	337	193	219	69	0	0
89	C10	Populus – Borah #1 3 5 kV Treasure on – Brady 230 kV Lines	1701	2576	1600	2395	-1607	1226	218	520	186	126	23	2008	6 6	32	169	2996	239	579	2035	66	505	337	193	219	69	0	0
90	C11	Populus – Ben Lomond #2 Populus Te minal 3 5 kV Lines.	1827	2 39	1 98	2295	-1287	13 9	258	562	280	138	229	1996	686	62	197	2996	2 82	666	2035	31	59	302	180	213	719	0	0
91	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	175	2518	1555	2359	-1 7	1281	232	53	228	131	231	2003	663		181	2996	2 31	617	2035	51	86	323	187	217	701	0	0
92	C13	Borah – Ade a de #2 Borah–ADT–Midpoint #1 3 5 kV ines (RA)	1706	2560	1602	2379	-1639	117	215	517	150	117	226	1996	6	28	1 9	2996	2372	555	2035	78	51	3 3	195	223	695	0	0
93	C1	Borah – Ade a de #2 Midpoint - Ade aide #2 3 5 kV lines (RA)	1703	2571	1600	239	-161	1216	215	517	178	12	232	2005	6 6	31	165	2996	2389	575	2035	68	507	338	193	220	69	0	0
9	C15	Borah – Ade a de #2 Borah – Hunt 230 kV ines	170	2568	1601	2390	-1621	1205	215	517	170	123	230	2003	6 6	30	161	2996	2383	571	2035	71	508	339	193	222	69	0	0
95	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV ines (RA?)	170	2571	1599	2393	-1612	1217	215	517	180	125	232	2005	6 6	31	165	2996	2390	576	2035	68	506	338	193	220	69	0	0
96	C18	Borah – Kinport Midpoint – Adela de #2 3 5 kV ines (RA?)	702	2575	600	2397	607	227	2 5	5 7	87	26	233	2008	6 6	32	69	2996	2396	580	2035	65	505	336	93	2 9	69	0	0
97	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA)	1703	2573	1600	2395	-1609	1223	215	517	183	126	232	2007	6 6	32	168	2996	2392	578	2035	66	505	337	193	221	69	0	0
98	C20	Borah–Adel–Midpoint #1 Midpoint – Ade aide #2 3 5 kV lines	170	2570	1600	2391	-1615	1212	215	517	176	12	231	200	6 6	31	16	2996	2388	57	2035	69	507	338	193	220	69	0	0
99	C21	Borah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA)	170	2568	1601	2390	-1620	1206	215	517	171	123	230	2003	6 6	30	162	2996	238	571	2035	70	508	339	193	221	69	0	0
100	C23	Borah – Adel #2 3 5 kV Borah – M dpoint 500 kV Lines	1711	2551	1582	2389	-1638	116	216	518	135	115	225	1992	6	27	153	2996	2362	5 9	2035	78	516	3	195	227	695	0	0
101	C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines	176	2 81	1829	2000	-1 77	1172	262	565	139	107	232	1973	66	35	163	2996	2373	56	2035	68	502	333	191	222	718	0	0
102	C2 a	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1701	26 1	1691	1792	-1 8	911	226	528	-10	1 3	253	2071	672	70	1 8	2996	2273	520	2035	57	61	302	179	199	700	575	0
103	C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV ines	176	2 81	1829	2000	-1 77	1172	262	565	139	107	232	1973	66	35	163	2996	2373	56	2035	68	502	333	191	222	718	0	0
10	C25a	Br dger – Populus #2 Goshen – Kinport 3 5 kV ines w/ RAS	1701	26 1	1691	1792	-1 8	911	226	528	-10	1 3	253	2071	672	70	1 8	2996	2273	520	2035	57	61	302	179	199	700	575	0
109	C28x	Palo Verde - Trip 1&2, w/ FACRI	177	2585	1585	2 0	-1782	1068	225	527	30	155	252	2071	662	39	17	2996	3320	181	2035	37	635	2	235	223	759	0	0
110																													Minimum Margins; > >
111																													N-2 Criteria; > >
112																													
113		egwstg1 8h8 3993 2400 1700 2550 5 sav	700	2550	593	2 00	579	2 7	96	97	99	26	228	979	6 8	3	77	2996	2 6	329	2205	57	86	308	80	2 7	685		
11	B35d	Aeolus–Anticline500 RASCaps 600MW Drop MonanxCaps Mustar	2226	1206	712	2018	-1030	637	159	59	-353	1	267	1756	688	5 0	123	2996	1886	1 7	2205	73	50	275	166	192	763	0	600
115																													
116		**Marg n est w/ Aeo us South at 5% of 1700 MW**																											
117		egwstg1 8h8 4052 2423 1785 sav	1785	2632	1629	2 23	-1705	1180	536	128	125	-235	2118	770	632	233	181	2996	2293	7	2129	53	79	288	17	22	731		
118																													

		REAC IVE MARGIN MVAR (Gray shaded ce ls are the min mum marg ns)																							
L NE #	CON INGENCY#	Aeolus 500	Monanx 500	Ant clin 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Bridger 345	Goshen 345	3 Mi Kno l 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
10	B01	-779	-1211	-667	-965	-979	-1262	-1728	-110	-602	- 91	-	-779	-869	-907	-108	-1319	-1366	-707	-82	-615	-290	-280	-221	75
11	B01a	-793	-1 02	-718	-1238	-12 8	-15 8	-2010	-13	-721	-616	-576	-1005	-11 8	-1176	-1333	-1555	-1590	-701	-825	-613	-277	-268	-225	79
12	B01g	-818	-672	-763	-1378	-1388	-1696	-2170	-1 61	-788	-690	-6 0	-1131	-1291	-1319	-1	-1627	-1635	-708	-8 1	-619	-277	-269	-226	79
13	B02	-990	-18 5	-10 2	-1872	-1909	-2136	-25 7	-1768	-11 6	-887	-891	-1592	-1881	-1878	- 86	-1928	-2000	-76	-1011	-737	-301	-303	-2 8	83
1	B03	-1000	-1681	-125	-1571	-1613	-1893	-23 6	-1615	-1166	-751	-802	-1372	-1602	-1599	-1525	-175	-1855	-751	-983	-699	-31	-31	-2	81
15	B0	-911	-1 83	-106	-11	-620	-139	-1878	-1260	-1025	- 06	-318	-807	-1071	-1020	-1168	-1500	-168	-7 0	-906	-667	-315	-308	-236	81
16	B0 a	-973	-1737	-1225	-1 66	-1 27	-1713	-2206	-1525	-1206	-525	- 57	-1059	-1 27	-1332	-1 83	-392	-19 0	-738	-956	-686	-30	-295	53	8
17	B05	-1093	-1836	-1 8	-1875	-1887	-2126	-25 8	-1809	-1 8	-871	-9 5	-1595	-1885	-1871	-1728	-1913	-1995	-763	-1069	-733	-302	-307	-2 7	83
18	B06	-1065	-1770	-1 3	-173	-1723	-19 8	-2032	-1703	-1 05	-609	-817	-933	-172	-1666	-1628	-182	-1930	-760	-10	-725	-312	-313	-2 9	82
19	B06a	-1039	-172	-1359	-1625	-1618	-1867	-2330	-16 0	-1320	-579	-505	-1221	-1607	-1552	-15	-178	-1887	-757	-1020	-715	-313	-313	-2 7	82
20	B07	-1101	-18 6	-1 56	-1866	-186	-2116	-2553	-1811	-1313	-320	- 95	-1622	-1855	-1832	-1717	-1923	-2007	-76	-1076	-738	-308	-308	-2 9	83
21	B08	-1095	-1832	-1 70	-1853	-1875	-2112	-2536	-1802	-1 32	-820	-91	-1 2	-1082	-12 6	-171	-1905	-1991	-76	-1071	-735	-309	-2 7	-2 9	83
22	B09	-1097	-1808	-1 2	-1707	-1678	-2013	-2 78	-1733	-1 13	-819	-913	-1531	-1807	-1790	-1680	-1882	-1962	-762	-107	-738	-308	-309	-2 8	82
23	B10	-1097	-1832	-1 76	-1862	-1720	-2098	-2525	-1790	-1 35	-839	-922	-1515	-1818	-1721	-1703	-1823	-1989	-763	-1073	-736	-308	-308	-2 9	83
2	B11	-1100	-18 0	-1 76	-18 5	-1858	-2099	-2531	-1799	-1 37	-818	-911	-1518	-18	-1837	-1708	-1910	-1998	-76	-1076	-738	-308	-308	-2 9	83
25	B12	-1110	-1819	-1 61	-1665	-1787	-2137	-2350	-9 2	-1 39	-863	-938	-1535	-1776	-1785	-1697	-1892	-1971	-766	-1087	-7	-311	-313	-251	82
27	B1	-1095	-1800	-1 23	-161	-1737	-2090	-2306	-1081	-1 00	-8	-917	-1 91	-1723	-1732	-1668	-1867	-1950	-766	-1073	-738	-310	-312	-250	82
28	B15	-1066	-1797	-1389	-1682	-1596	-1 71	-227	-1760	-13 8	-80	-879	-1 05	-1656	-160	-1637	-185	-1960	-761	-10 3	-723	-307	-306	-2 7	83
29	B16	-1091	-1806	-1 0	-1732	-1595	-1855	-2397	-1763	-1 08	-815	-918	-1500	-1757	-173	-1677	-1873	-1963	-76	-1068	-73	-309	-311	-2 9	82
30	B17	-1093	-1833	-1 7	-18 9	-1855	-1751	-250	-1793	-1 0	-860	-935	-156	-1851	-1827	-1720	-1909	-1995	-762	-1069	-735	-308	-308	-2 9	83
31	B18	-1098	-1836	-1 83	-1361	-187	-2112	-2537	-180	-1 53	-870	-9	-1588	-1877	-1859	-1728	-1913	-1995	-76	-1073	-737	-309	-310	-250	83
32	B19	-109	-1823	-1 67	-1833	-18 6	-2076	-2 97	-1792	-1 33	-856	-932	-1550	-1831	-1802	-1705	-1895	-1980	-76	-1070	-735	-309	-310	-2 9	83
33	B20	-1097	-1835	-1 82	-1863	-1876	-2126	-25 7	-1810	-1 51	-866	-9 2	-1572	-1860	-1829	-1723	-1910	-199	-76	-1073	-736	-309	-310	-2 9	83
3	B21	-109	-1823	-1 65	-1827	-18 0	-2085	-2506	-179	-1 31	-852	-929	-1536	-1816	-1777	-1701	-1889	-1980	-76	-1070	-735	-309	-310	-2 9	83
35	B22	-1096	-1831	-1 78	-1855	-1869	-1702	-2512	-1800	-1 6	-863	-939	-1567	-1090	-18 1	-1719	-1899	-1989	-76	-1071	-736	-309	-310	-250	83
36	B23	-1096	-1832	-1 76	-18 7	-1852	-2079	-250	-1795	-1 5	-865	-937	-1569	-1855	-1832	-1720	-1907	-1990	-76	-1071	-736	-309	-310	-2 9	83
37	B2	-1096	-183	-1 76	-1831	-1822	-2061	-25 1	-1788	-1	-863	-939	-155	-1835	-1802	-1718	-1909	-199	-76	-1071	-736	-309	-309	-250	83
38	B25	-1096	-1833	-1 78	-1857	-1867	-2099	-2518	-1800	-1 8	-867	-9 2	-1580	-1868	-1850	-172	-1909	-1992	-76	-1071	-736	-309	-27	-2 9	83
39	B26	-1097	-183	-1 81	-1867	-1881	-2105	-2500	-1802	-1 51	-869	-9 1	-1589	-1879	-1865	-1727	-1910	-1992	-76	-1073	-736	-309	-275	-250	83
0	B27	-1096	-1836	-1 82	-1871	-188	-2121	-25 6	-1808	-1 53	-855	-9 5	-1592	-1883	-1869	-1730	-1913	-1995	-76	-1072	-736	-309	-309	-250	83
1	B28	-1096	-1835	-1 79	-1356	-1872	-2107	-25 2	-1795	-1 8	-868	-9 0	-1585	-1873	-1858	-1726	-1911	-199	-76	-1071	-736	-308	-309	-250	83
3	B30	-1103	-18 3	-1 98	-1895	-1901	-2121	-25 8	-1817	-1 69	-878	-952	-1612	-1892	-1865	-1738	-1919	-2002	-765	-1078	-739	-309	-310	-250	83
	B31	-1098	-183	-1 82	-1869	-1877	-2103	-2532	-1 87	-1 51	-868	-9 1	-1590	-1866	-18 1	-1722	-1907	-1992	-76	-107	-737	-309	-310	-250	83
5	B32	-1107	-1853	-1 93	-1877	-1855	-2093	-2537	-151	-1 53	-7 6	-885	-1239	-1895	-179	-1737	-1926	-201	-765	-1083	-7 1	-309	-309	-250	83
6	B33	-1065	-1705	-1 37	-1761	-1779	-20 2	-2 87	-17 8	-1 02	-819	-920	-1 99	-17 2	-1751	-1 77	-1703	-1851	-751	-10 3	-72	-308	-305	-2	83
7	B3	-106	-1697	-1 28	-12 9	-1765	-2031	-2 79	-1739	-1393	-835	-913	-1 85	-1725	-1733	-1586	-1703	-18 1	-752	-10 2	-723	-309	-308	-2 7	83
8	B35	P CASE DIVERGED																							
9	B35a	-398	-755	-1 97	-2152	-21 1	-1 17	-2627	-1902	-1521	-985	-1105	-18 1	-2173	-2150	-1 32	-13 1	-1112	-65	- 7	-3 1	-15	-1 6	-20	75
51	B35g	P CASE DIVERGED																							
52	B36	P CASE DIVERGED																							
53	B36a	-1091	-1726	-728	-735	-788	-10 2	-1 26	-860	-569	- 69	- 37	-679	-72	-762	-9 2	-1355	-1888	-602	-9 2	-773	-257	-2 7	-129	79
5	B37	-973	-1816	-1395	-1822	-1852	-2113	-2551	-1792	-1 01	-87	-9 7	-1598	-1860	-185	-1732	-1927	-2013	-760	-938	-673	-30	-30	-2 7	82
55	B38	-1122	-1913	-1556	-1955	-1938	-215	-256	-1831	-1506	-881	-957	-1627	-1933	-1915	-1752	-1952	-2056	-739	-1081	-755	-268	-257	-237	80
56	B39	-1069	-1869	-1116	-1 32	-1 82	-18 7	-2395	-15 9	-616	-802	-73	-1268	-1370	-1 35	-1583	-1923	-2018	-760	-1056	10	-206	-218	-1 6	-83
57	B 0	-782	-1603	-1120	-1 87	-15 5	-187	-2375	-157	-1137	-712	-8 5	-1322	-1 95	-1513	-1 62	-172	-1832	-515	-772	-589	-292	-288	-235	-70
58	B 0a	-889	-1711	-128	-1661	-1701	-1989	-2 28	-1692	-128	-831	-896	-1 65	-1676	-1675	-1575	-182	-17 9	- 98	-88	-651	-299	-292	-2 1	-81
59	B 1	-1091	-960	-1 5	-1721	-1717	-1783	-1815	-1588	-1 17	-8 8	-92	-1 98	-1753	-1722	-1690	-1889	-197	-765	-1068	-735	-309	-310	-250	-82
60	B51	-1137	-1902	-15 9	-1939	-1933	-2152	-2563	-18 0	-1 91	-880	-956	-162	-1929	-1912	-1750	-1955	-2052	-739	-1097	-75	-265	-25	-237	80
61	B52	-875	-1769	-1391	-1888	-1909	-2128	-25 5	-1798	-1 85	-890	-999	-1650	-1935	-1919	-1736	-1916	-1986	-751	-853	-63	-231	-237	-238	81
62	B53	-913	-1757	-1312	-17 1	-1365	-2068	-2509	-17 7	-1323	-853	-927	-15 7	-1782	-1782	-1726	-1896	-1969	-7 9	-89	-6 8	-305	-268	-226	81
63	B53a	-89	-1750	-1293	-1725	-1770	-2057	-250	-1737	-1309	-863	-92	-1535	-1765	-1768	-1720	-1895	-196	-7 9	-87	-638	-29	-239	-225	81
6	Minimum Margins; > >	**398**	**672**	**667**	**735**	**620**	**1042**	**1426**	**860**	**569**	**320**	**318**	**679**	**724**	**762**	**486**	**392**	**1112**	**498**	**447**	**10**	**154**	**146**	**53**	**70**
65	N-1 Criteria; > >					500	500	500	500	100			250		250										
70	C02	-687	-1291	-809	-51	-1065	-1362	-1802	-11 6	-751	-518	- 15	-895	-1035	-1038	-1067	-13 7	-1 99	-721	-75	-592	-323	-317	-228	79
71	C02a	-855	-1566	-1008	-1336	-1397	-16	-2101	-1 11	-907	-610	-691	-1180	-751	-1380	-1367	-1671	-1798	-72	-8 8	-635	-312	-305	-236	82
72	C02b	-88	-17 1	-1072	-1518	-1573	-1812	-215	-1569	-972	-759	-779	-13 8	-1589	-1568	-1581	-18 8	-1983	-718	-871	-6 6	-296	-286	-239	85
73	C03	-656	-109	-710	-716	-731	-96	-135	-8 8	-706	-335	-310	-572	-683	-680	-818	-1058	-1288	-705	-669	-5 1	-323	-308	-215	78
7	C03a	-790	-1 22	-929	-1053	-1021	-1316	-173	-79	-891	- 31	-388	-797	-995	-956	-1150	-1 69	-1651	-71	-795	-610	-313	-300	-229	82
75	C03b	-851	-1632	-1029	-1269	-1238	-1507	-1908	-1355	-982	- 88	- 32	-9 1	-1201	-1156	-1373	-1718	-188	-712	-8 1	-631	-298	-28	-23	85
76	C03c	-88	-1692	-1096	-1 73	-1 82	-172	-2155	-1526	-10 5	-616	-513	-1170	-1 63	-1 19	-1506	-1805	-1931	-718	-873	-6 8	-302	-290	-236	8
77	C0	-656	-109	-710	-716	-731	-96	-135	-8 8	-706	-335	-310	-572	-683	-680	-818	-1058	-1288	-705	-669	-5 1	-323	-308	-215	78
78	C0 a	-782	-1 22	-93	-1053	-1020	-1316	-1758	-79	-891	-391	-388	-797	-995	-971	-1150	-1 69	-1651	-71	-795	-610	-313	-300	-229	82
79	C0 b	-851	-1632	-1029	-1269	-1238	-1507	-1907	-1355	-982	- 88	- 32	-9 1	-1201	-1156	-1373	-1717	-188	-712	-8 1	-631	-298	-28	-23	85
80	C0 c	-88	-1693	-1096	-1 73	-1 82	-172	-2155	-1526	-10 5	-611	-513	-1170	-1 62	-1 19	-1506	-1805	-1931	-718	-873	-6 8	-302	-290	-236	8
81	C05	-110	-99	-1 89	-187	-1863	-2056	-2503	-1806	-1 55	-866	-9 2	-1591	-1833	-1775	-1700	-1892	-1988	-766	-1080	-7 0	-310	-311	-250	83
82	C05a	-1081	-19 3	-1 65	-1950	-1925	-211	-2530	-1867	-1 80	-91	-982	-167	-1937	-1857	-1830	-2009	-2130	-333	-1056	-729	-296	-29	-2 9	85
83	C06	-987	-1 18	-1377	-1625	-16 1	-1900	-2 11	-1658	-1339	-808	-896	-1392	-1573	-1608	-1081	-1338	-15 8	-719	-97	-696	-308	-295	-23	83
8	C06a	-952	-1369	-1292	-877	-1501	-1773	-2296	-1555	-12 5	-691	-730	-732	-1 31	-1 35	-10 9	-1300	-150	-713	-9 0	-681	-310	-296	-230	83
85	C07	-1082	-793	-1 60	-1808	-1817	-2073	-2515	-1777	-1 26	-851	-927	-1529	-1787	-1785	-1 05	-1780	-1887	-758	-1059	-731	-310	-311	-250	83
86	C08	-1110	-18 9	-1 87	-1858	-180	-2030	-2331	-1799	-1 2	-717	-866	-1167	-1859	-1697	-1721	-1913	-2007	-766	-1085	-7 2	-309	-310	-250	-83
88	C09	-1096	-1828	-1 75	-1352	-1863	-2086	-2515	-1798	-1 1	-861	-927	-1576	-1852	-182	-1681	-189	-1985	-76	-1072	-736	-309	-309	-2 8	-83
89	C10	-1101	-1837	-1 91	-1881	-1886	-210	-2531	-1809	-1 59	-871	-939	-1598	-1878	-18 8	-1695	-1907	-1995	-76	-1076	-738	-309	-309	-2 9	-83
90	C11	-1006	-1 98	-137	-1625	-1625	-1932	-2397	-1659	-1335	-803	-887	-1388	-1562	-1609	-1283	-1 6	-1633	-729	-991	-703	-309	-302	-2 0	-83
91	C12	-1061	-1689	-1 20	-1731	-17 9	-2015	-2 63	-1729	-1381	-828	-899	-1 70	-1709	-1716	-15 2	-1686	-1831	-751	-1039	-722	-309	-306	-2 5	-83
92	C13	-1092	-1800	-1 1	-1759	-1767	-1933	-2378	-1756	-1 00	-828	-907	-1 58	-1721	-1651	-1653	-1860	-1952	-765	-1068	-735	-310	-312	-250	-82
93	C1	-109	-1823	-1 67	-1828	-18 0	-2082	-2503	-179	-1 32	-853	-930	-1536	-1816	-1777	-1701	-189	-1980	-76	-1070	-735	-309	-310	-2 9	-83
9	C15	-1093	-1819	-1 61	-181	-1826	-20 2	-2 51	-1782	-1 26	-8 7	-925	-1521	-1803	-1767	-1686	-1887	-197	-76	-1069	-735	-309	-311	-250	-82
95	C16	-1092	-1819	-1 52	-1808	-1281	-2073	-2 9	-1786	-1 10	-805	-900	-1399	-1783	-1768	-1686	-1879	-1976	-76	-1068	-73	-309	-310	-2 9	-83
96	C18	096	83	70	8 3	86	2	2536	80	30	8 7	9 2	28	826	820	708	902	989	76	072	736	309	309	2 9	83
97	C19	-109	-1826	-1 65	-1835	-1858	-2088	-2500	-179	-1 2	-812	-908	-1 18	-1823	-1833	-1703	-1898	-1985	-76	-1070	-735	-309	-310	-2 9	-83
98	C20	-1093	-1817	-1 53	-1782	-1790	-2067	-2 96	-1787	-1 12	-831	-913	-1 62	-1731	-1105	-1672	-1880	-1973	-76	-1069	-735	-309	-310	-2 9	-83
99	C21	-1093	-1817	-1 60	-1807	-1820	-20 8	-2 60	-178	-1 23	-818	-922	-1505	-1786	-17 1	-1687	-1886	-197	-76	-1069	-735	-309	-311	-250	-83
100	C23	-1090	-905	-1 21	-1680	-153	-1755	-2217	-1735	-1385	-82	-901	-1 2	-1687	-16	-16 2	-1850	-19 1	-765	-1067	-73	-310	-312	-250	-82
101	C2	-998	-1682	-1211	-15 0	-157	-1866	-2360	-1598	-1026	-266	- 08	-1365	-1570	-15 1	-1500	-1760	-1852	-751	-982	-699	-31	-313	-2	-81
102	C2 a	-1029	-1870	-1311	-1809	-1859	-2091	-2511	-1790	-1132	-316	- 82	-1635	-189	-1851	-1751	-1968	-2076	-7 6	-1008	-710	-302	-298	-2 5	-8
103	C25	-998	-1682	-1211	-15 0	-157	-1866	-2360	-1598	-1026	-266	- 08	-1365	-1570	-15 1	-1500	-1760	-1865	-751	-982	-699	-31	-313	-2	-81
10	C25a	-1029	-1871	-1311	-1809	-1859	-1852	-2511	-1791	-1132	-316	- 82	-1635	-189	-1851	-1751	-1968	-2076	- 82	-1008	-710	-302	-298	-2 5	-8
109	C28x	-938	-1 91	-1301	-1672	-1709	-200	-1982	-1703	-1293	-823	-891	-1 71	-1687	-1698	-15 2	-932	-1607	-735	-921	-667	-300	-290	-2 2	-5
110	Minimum Margins; > >	**656**	**793**	**710**	**514**	**731**	**964**	**1354**	**794**	**706**	**266**	**310**	**572**	**683**	**680**	**818**	**932**	**1288**	**333**	**669**	**541**	**296**	**284**	**215**	**54**
111	N-2 Criteria; > >					00	00	00	00	100			200		200										

L NE #	CON INGENCY#	Vo tage Deviation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Voltage	COMMEN
7						S DNEY 115 / 230 #1	109 99%			
8						CTTNWD N - KETTLECK 115 #1	103 93%			
10	B01	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	111 67%	-	None	
11	B01a	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	100. 7%	1	PTRSNFUR 69 @ 899	
12	B01g	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	100.19%	-	None	
13	B02	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	81 33%	-	None	
1	B03	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	98 70%	-	None	
15	B0	0	- - -	- - -	0	BR DGER - ROCKSPGS 230 #1	90 23%	-	None	
16	B0 a	0	- - -	- - -	0	E HELENA 69 / 100 #2	85 03%	-	None	
17	B05	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
18	B06	0	- - -	- - -	2	GRACE - SODA 138 #1	116 02%	-	None	
19	B06a	0	- - -	- - -	0	GRACE - SODA 138 #1	79 08%	-	None	Bypass Resolves OL
20	B07	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	86. 5%	-	None	
21	B08	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
22	B09	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	86 33%	-	None	
23	B10	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
2	B11	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
25	B12	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 5 %	-	None	
27	B1	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 5 %	-	None	
28	B15	0	- - -	- - -	0	LOCUST - MORA 138 #1	86 72%	-	None	
29	B16	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 5 %	-	None	
30	B17	0	- - -	- - -	0	LOCUST - MORA 138 #1	88 58%	-	None	
31	B18	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	71 32%	-	None	
32	B19	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
33	B20	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
3	B21	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
35	B22	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79 52%	-	None	
36	B23	0	- - -	- - -	0	LOCUST - MORA 138 #1	86. 6%	-	None	
37	B2	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
38	B25	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
39	B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	89 30%	-	None	
0	B27	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
1	B28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82 22%	-	None	
3	B30	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
	B31	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
5	B32	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	87. 7%	-	None	
6	B33	0	- - -	- - -	0	GRACE - SODA 138 #1	76.16%	-	None	
7	B3	0	- - -	- - -	0	GRACE - SODA 138 #1	73 76%	-	None	
8	B35	P CASE DIVERGED								
9	B35a	65	GREATDIV 3 5	10.2	3	MINERS - PLATTE 230 #1	101 87%	-	None	
50	B35d	9	WYOPO 3 5	5 5	3	MINERS - PLATTE 230 #1	101.13%	-	None	
51	B35g	P CASE DIVERGED								
52	B36	P CASE DIVERGED								
53	B36a	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	96 30%	-	None	
5	B37	0	- - -	- - -	2	AEOLUS 500 / 230 #2	10 66%	-	None	
55	B38	0	- - -	- - -	0	DAVEJOHN - W NDSTAR 230 #1	9 39%	-	None	
56	B39	0	- - -	- - -	0	MINERS - PLATTE 230 #1	86 25%	-	None	
57	B 0	0	- - -	- - -	1	S DNEY 115 / 230 #1	108.17%	-	None	
58	B 0a	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	82 88%	-	None	Gen Trip resolves over oad
59	B 1	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
60	B51	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	9 69%	-	None	
61	B52	0	- - -	- - -	0	CASPERPP 230 / 115 #1	88 61%	-	None	
62	B53	0	- - -	- - -	0	BR DGER - ROCKSPGS 230 #1	9 57%	-	None	Negative Vdevs > 10%
63	B53a	0	- - -	- - -	0	BR DGER - ROCKSPGS 230 #1	9 52%	-	None	
70	C02	11	3M KNOLL 3 5	6.	2	BR DGER - BRIDGE&A 3 5 #1	12 . 1%	-	None	2289 20 Amps
71	C02a	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	109 82%	-	None	2020.73 Amps
72	C02b	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	95 89%	-	None	
73	C03	0	PTRSNFRG 69	5 9	1	BR DGER - ROCKSPGS 230 #1	116 90%	-	None	
7	C03a	0	PTRSNFRG 69	6 6	0	BR DGER - ROCKSPGS 230 #1	97 21%	-	None	
75	C03b	0	- - -	- - -	0	HARD N 230 / 115 #	91 90%	-	None	
76	C03c	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	83 55%	-	None	
77	C0	0	PTRSNFRG 69	5 9	1	BR DGER - ROCKSPGS 230 #1	116 90%	-	None	
78	C0 a	0	PTRSNFRG 69	6 6	0	BR DGER - ROCKSPGS 230 #1	97 21%	-	None	
79	C0 b	0	- - -	- - -	0	HARD N 230 / 115 #	91 90%	-	None	
80	C0 c	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	83 55%	-	None	w/ P18 Caps & Load Drop
81	C05	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
82	C05a	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	78.11%	-	None	Gen Trip Not Req'd
83	C06	0	- - -	- - -	0	GRACE - SODA 138 #1	87 27%	-	None	
8	C06a	0	- - -	- - -	0	BR DGER - ROCKSPGS 230 #1	89.18%	-	None	
85	C07	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 56%	-	None	
86	C08	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	89 23%	-	None	
88	C09	0	- - -	- - -	0	GRACE - SODA 138 #1	7 29%	-	None	
89	C10	0	- - -	- - -	0	GRACE - SODA 138 #1	7 20%	-	None	
90	C11	0	- - -	- - -	0	GRACE - SODA 138 #1	81 08%	-	None	
91	C12	0	- - -	- - -	0	GRACE - SODA 138 #1	78 63%	-	None	
92	C13	0	- - -	- - -	0	HUNT 138 / 230 #2	76 58%	-	None	
93	C1	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
9	C15	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79 57%	-	None	
95	C16	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
96	C18	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 53%	-	None	
97	C19	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79 56%	-	None	
98	C20	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	70 5 %	-	None	
99	C21	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79. 6%	-	None	
100	C23	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	7 59%	-	None	
101	C2	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	97 03%	-	None	
102	C2 a	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	88 07%	-	None	
103	C25	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	97 03%	-	None	
10	C25a	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	88 07%	-	None	
109	C28x	0	- - -	- - -	0	MERW N - V EW TAP 115 #1	111 29%	-	None	This is not due to GWW
11	B35d	1	MONANX 500	5.1	0	MINERS - PLATTE 230 #1	99 58%	-	None	
117		**All Contingencies Converged Indicating Positive Reac ive Margin**								

1) Voltage Viola ions > 5% or Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line Side) and Transformer ter iary buses.

Appendix 3-2 Pg.1 - - - Post-transient Results For Aeolus West vs. Bonanza West

BASE CASE / P PA H FLOWS; Gen Drop

LINE #	CON NGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Mon ana Idaho P18)	ot 4a	Bonanza West	ot 1a (30)	daho S erra	PDCI	COI	Path 26	PP DC	Pavant PP Gonder	RedB H Al en (ot 2C)	P nto 4Comers 2B1)	S gurd GlenC (2B 2)	daho Area System Losses	Pace Area System Losses	Br dger Gen Trips	Aeolus Gen Trp
3																													
		egwstg1 8h6 4092 2397 1526 750 2672 sav	1551	2672	169	2397	-1337	15 9	283	588	5 3	133	-198	21 0	750	620	132	2996	2173	355	21 0	96	50	368	207	216	693	0	0
5																													
6																													
7		**Level "B" Contingencies**																											
8	B01	Anticline – Populus 500 kV Line	1939	2087	0	3383	-901	1190	366	67	222	31	-205	1930	790	6 7	96	2996	201	219	21 0	122	51	370	207	3 3	723	0	0
9	B01a	Anticline – Populus 500 kV Line Drop B idger G1	1870	2258	0	30 3	-878	9 8	330	637	-2	71	-22	2033	793	676	82	2996	1922	183	21 0	111	72	3 0	196	293	706	575	0
10	B01g	Anticline – Populus 500 kV Line JBG1 KinpCap	1866	226	0	3051	-883	953	329	636	2	72	-22	2035	792	676	83	2996	192	18	21 0	111	72	3 0	196	291	705	575	0
11	B02	Anticline 500 / 3 5 kV Transfo mer	1565	2655	1768	2319	-133	1553	276	580	5 7	133	-199	2138	7 9	622	132	2996	2176	353	21 0	96	505	368	207	209	695	0	0
12	B03	Br dger – Populus 3 5 kV Line	1616	257	1901	2021	-1210	1 91	328	63	93	11	-199	2105	767	622	125	2996	21 8	336	21 0	99	503	366	206	220	717	0	0
13	B0	Br dger – 3Mi eknoll 3 5 kV Line	655	25 5	935	87	3	83	365	673	88	99	229	2083	77	626	2	2996	2 35	323	2 0	00	500	36	206	237	730	0	0
1	B0 a	Br dger – 3Mi eknoll 3 5 kV Line	1587	2679	1816	1652	-1093	1219	328	63	2	138	-2	2180	779	657	106	2996	2038	28	21 0	89	58	333	19	203	71	575	0
15	B0 b	Br dger – 3Mi eknoll 3 5 kV Line	1528	2829	1686	1 20	-1062	938	292	597	-17	173	-259	2271	786	690	89	2996	1936	2 1	21 0	79	13	300	181	179	706	1150	0
16	B0 c	Br dger – 3Mi eknoll 3 5 kV Line	16 9	2523	19 1	1879	-1122	1 90	36	672	95	100	-231	2085	773	625	122	2996	2137	325	21 0	100	501	36	206	23	727		
17	B05	Br dger 3 5 / 230 kV Transformer	1552	2670	1693	239	-1335	15 8	28	589	5 2	133	-198	21 0	751	620	132	2996	2172	353	21 0	96	505	368	207	215	693	0	0
18	B06	3M leknoll – Goshen 3 5 kV Line	1575	2632	1783	22 5	-1315	1520	298	602	520	121	-212	2123	756	619	127	2996	2151	339	21 0	100	506	369	208	212	718	0	0
19	B06a	3M leknoll – Goshen 3 5 kV Line Bypas 3MK Caps	1595	2602	1822	2638	-1259	1521	316	621	521	116	-216	2112	760	620	126	2996	2151	337	21 0	100	506	369	207	212	710	0	0
20	B07	Kinport – Goshen 3 5 kV Line	1550	267	1689	2 07	-1339	1553	282	587	5 7	13	-202	21 2	750	620	133	2996	2172	355	21 0	95	505	368	207	217	693	0	0
21	B08	Kinport – Borah 3 5 kV Line	1553	2670	169	2395	-1336	15 8	283	588	5 2	133	-198	21 0	750	620	132	2996	2172	35	21 0	96	505	368	207	216	693	0	0
22	B09	Populus – Borah 500 kV Line	1572	26 0	1612	2 2	-1322	1520	288	592	523	127	-199	2129	752	621	122	2996	2158	3 2	21 0	101	507	370	208	228	692	0	0
23	B10	Borah 500 / 3 5 kV Transformer	1556	2668	1673	2 13	-1322	1559	28	589	55	135	-201	21 2	751	622	132	2996	2178	360	21 0	9	502	366	207	218	692	0	0
2	B11	Borah 3 5 / 230 kV Transformer	553	267	686	2 02	33	555	286	590	5 8	3	203	2	750	62	33	2996	2 72	356	2 0	95	50	368	207	2 8	693	0	0
25	B12	Populus – Cedar H ll 500 kV Line	1567	2632	16 2	2 05	-1375	1 53	285	590	2	115	-186	211	7 7	612	13	2996	2116	306	21 0	105	523	380	212	222	692	0	0
27	B1	Cedar Hill – Hemingway 500 kV Line	569	2627	636	2 06	372	50	286	590	39		85	2 2	7 7	6 2	3	2996	2	305	2 0	06	523	380	2 2	223	693	0	0
28	B15	Midpoint – Hemingway 500 kV Line	1557	2665	1686	2397	-1330	15 6	28	588	5	133	-198	2139	751	621	128	2996	2173	355	21 0	97	50	368	207	217	69	0	0
29	B16	Borah – Midpoint 500 kV Line	1560	2651	167	239	-1358	1 98	28	589	98	12	-191	2127	7 9	616	123	2996	21 5	329	21 0	105	51	37	209	222	693	0	0
30	B17	Midpoint 500 / 3 5 kV Transfo mer	1555	2672	1683	2 08	-1328	1559	28	588	576	136	-201	21	752	623	106	2996	2189	363	21 0	10	500	365	206	223	693	0	0
31	B18	Midpoint 3 5 / 230 kV Transfo mer	1552	2670	1693	2397	-1338	15 6	283	587	538	133	-197	21 0	750	620	13	2996	2170	352	21 0	95	505	369	208	216	693	0	0
32	B19	Borah – Ade a de #2 3 5 kV Line	155	2665	169	2391	-13 6	1531	283	588	530	130	-195	2136	750	619	126	2996	2163	3 6	21 0	100	508	370	208	217	693	0	0
33	B20	Adelaide – Midpoint #2 3 5 kV Line	1552	2670	1695	2395	-13 1	15 3	283	587	539	133	-197	2139	750	620	130	2996	2170	351	21 0	97	506	369	208	215	693	0	0
3	B21	Borah – Ade a de – Midpoint #1 3 5 kV Line	155	2665	169	2391	-13 6	1531	283	588	530	130	-195	2136	750	619	126	2996	216	3 6	21 0	100	508	370	208	217	693	0	0
35	B22	Borah – Hunt 230 kV Line	1553	2668	1695	239	-13 2	1539	283	587	535	132	-196	2138	750	619	129	2996	2167	350	21 0	98	506	369	208	217	693	0	0
36	B23	Midpoint – Boise Bench #3 230 kV Line	1553	2668	1693	2395	-13 0	15 2	283	587	53	132	-197	2138	750	620	13	2996	2166	350	21 0	96	506	369	208	217	693	0	0
37	B2	Midpoint – Ratt e Snake 230 kV Line	1552	2670	169	2397	-1338	15 7	283	587	5 1	133	-198	21 0	750	620	133	2996	2171	353	21 0	96	505	369	207	216	693	0	0
38	B25	Midpoint – Dram 230 kV Line	553	2669	693	2396	338	5 5	283	587	538	33	97	2 39	750	620	33	2996	2 69	352	2 0	96	506	369	208	2 6	693	0	0
39	B26	Ra tle Snake – Bo se Bench 230 kV Line	1553	2669	1693	2396	-13 0	15 2	283	587	535	132	-197	2138	750	620	13	2996	216	351	21 0	96	506	369	208	220	693	0	0
0	B27	Dram – Boise Bench 230 kV Line	1552	2671	169	2397	-1337	15 9	283	587	5 3	13	-198	21 1	750	620	132	2996	2173	35	21 0	96	505	368	207	216	693	0	0
1	B28	Hemingway 500/230 kV Trans ormer	1552	2671	1692	2398	-1336	15 9	283	588	5 5	133	-198	21 0	750	620	131	2996	2172	355	21 0	96	50	368	207	217	693	0	0
3	B30	Populus – Borah #1 3 5 kV Line	1550	2672	1700	2392	-13 7	1538	283	587	536	132	-198	2139	7 9	619	129	2996	2166	3 9	21 0	98	507	370	208	217	693	0	0
	B31	Populus – Borah #2 3 5 kV Line	1551	2670	1698	2392	-13 6	1538	283	588	536	132	-198	2138	7 9	619	129	2996	2166	3 9	21 0	98	507	370	208	216	693	0	0
5	B32	Populus – Kinport 3 5 kV Line	15 7	2675	1690	2 06	-1350	15 3	283	587	5 1	132	-20	21 0	7 8	619	130	2996	2165	3 9	21 0	98	507	370	208	219	693	0	0
6	B33	Populus – Ben Lomond #3 3 5 kV Line	1595	2626	1659	2360	-1228	1587	301	606	572	137	-196	2137	762	629	1 1	2996	2198	381	21 0	85	90	358	20	21	701	0	0
7	B3	Populus – Te minal 3 5 kV Line	1589	2630	1667	2369	-1250	1581	291	596	568	136	-196	2137	761	628	139	2996	2195	376	21 0	87	93	360	20	215	697	0	0
8	B35	Aeolus – Anticline 500 kV Line																											
9	B35a	Aeolus – Anticline 500 kV Line	21 6	1218	770	1970	-763	891	231	53	-51	30	-2	1878	777	726	75	2996	1898	161	21 0	112	63	333	193	181	790	0	600
50	B35g	Aeolus – Anticline 500 kV Line	2193	1230	775	197	-737	9	23	537	1	51	-262	1936	777	718	76	2996	1903	163	21 0	117	80	3 2	198	179	765	0	600
51	B36	Aeolus – Mona 500 kV Line																											
52	B36a	Aeolus – Mona 500 kV Line	0	35 3	2075	2673	2 53	362	358	666	333	2	2 9	20 9	885	7 6	59	2996	2 96	0	2 0	3	3 2	2 8	6	2 8	7	0	600
53	B37	Aeolus 500 / 230 kV Transformer	1538	2661	1683	2396	-1337	1539	28	589	53	126	-199	2117	756	627	132	2996	2169	352	21 0	95	503	367	207	215	692	0	0
5	B38	Aeolus – Winds ar 230 kV Line	1 88	2583	16 0	2371	-133	1 85	280	58	83	87	-205	2001	779	66	129	2996	215	3 1	21 0	93	93	358	20	213	703	0	0
55	B39	Aeolus – Freezeout 230 kV Line	1533	269	1682	2 1	-13 2	15 8	290	595	5 2	136	-198	2150	752	617	132	2996	2170	357	21 0	95	50	368	207	217	699	0	0
56	B 0	Bonanza –Mona 3 5kV Line	1696	2700	171	2 78	-1557	1 29	332	639	21	96	-208	2328	1 3	172	135	2996	2100	28	21 0	69	33	300	183	225	7 3	0	0
57	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza P ant	1681	2663	1672	2 16	-1595	1306	308	613	306	1 3	-216	2266	98	87	130	2996	2090	322	21 0	61	17	297	181	218	693	0	0
58	B 1	Hemingway – Summer Lake 500kV line	1560	26 6	167	2389	-1377	1 7	28	588	51	123	-189	2122	7 6	612	150	2996	2116	308	21 0	99	523	380	212	209	693	0	0
59																													Minimum Margins; > >
60																													N-1 Criteria; > >
61																													
62		**Level "C" Contingencies**																											
65	C02	Br dger – Populus #1 # 2 3 5 kV Lines	1722	239	22 3	1367	-992	138	06	716	399	71	-202	2025	799	629	113	2996	2110	300	21 0	10	98	360	20	206	779	0	0
66	C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1650	2578	2077	1229	-990	11 3	361	668	176	118	-221	2139	798	658	99	2996	2019	266	21 0	93	57	331	193	181	7 3	575	0
67	C03	Br dger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines	752	2335	2253	2	897	382		757	00	53	2 0	995	805	633	0	2996	2095	287	2 0	105	95	358	203	229	78	0	0
68	C03a	Br dger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	1680	2526	210	1097	-901	11 3	397	707	178	103	-253	2115	803	661	96	2996	2007	256	21 0	9	5	329	192	197	752	575	0
69	C03b	Br dger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	1609	2705	19 1	9 7	-899	883	352	659	-6	1 7	-266	2225	80	690	81	2996	1912	219	21 0	83	11	297	180	175	731	1150	0
70	C03c	Br dger–3MK Br dge-Pop#1 3 5 RAS; 2JBG Path18 Caps UV Loa	1608	2699	19 1	9	-932	9 6	350	657	-6	1 7	-255	2218	800	683	86	2996	19 0	233	21 0	8	21	305	183	170	723	1150	0
71	C0	Br dger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines	1752	2335	2253	12 1	-897	1382		757	00	53	-2 0	1995	805	633	110	2996	2095	287	21 0	105	95	358	203	229	78	0	0
72	C0 a	Br dger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	1680	2526	210	1097	-901	11 3	397	707	178	103	-253	2115	803	661	96	2996	2007	256	21 0	9	5	329	192	197	752	575	0
73	C0 b	Br dger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	1609	2705	19 1	9 7	-899	883	352	659	-6	1 7	-266	2225	80	690	81	2996	1912	219	21 0	83	11	297	180	175	731	1150	0
7	C0 c	Br dger–3MK Br dge-Pop#2 3 5 RAS; 2JBG Path18 Caps UV Loa	1608	2699	19 1	9	-932	9 6	350	657	-6	1 7	-255	2218	800	683	86	2996	19 0	233	21 0	8	21	305	183	170	723	1150	0
75	C05	Borah – Populus 3 5 kV DLO	15 7	2670	1711	2378	-1368	151	28	588	518	127	-199	213	7 7	616	123	2996	2152	337	21 0	103	512	373	209	217	69	0	0
76	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1 97	2805	1603	2099	-1312	1238	255	558	263	160	-220	2220	757	650	107	2996	2050	292	21 0	92	68	3 1	197	191	68	575	0
77	C06	Populus – Ben Lomond 3 5 kV DLO	1680	2535	1588	2283	-100	1668	338	6 5	63	1 6	-193	2132	785	6 9	159	2996	2250	3	21 0	62	59	335	195	211	721	0	0
78	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Series Cap	70	250	6 5	2 65	958	665	356	66	632	38	200	2 8	790	6 9	58	2996	2252	33	2 0	63	59	335	95	205	723	0	0
79	C07	Ben Lomond – Terminal 3 5 kV DLO	1560	2662	1690	239	-1323	1555	281	585	5 8	13	-197	2139	753	621	13	2996	2178	358	21 0	9	502	367	207	216	693	0	0
80	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	5	267	695	2 0	367	526	283	588	528	28	206	2 36	7 7	6 7	2	2996	2 55	338	2 0	02	5	373	209	220	69	0	0
82	C09	Populus – Borah #2 3 5 kV Treasure on – Brady 230 kV Lines	1552	2669	169	2391	-1338	15 1	286	591	538	132	-198	2139	750	620	130	2996	2168	351	21 0	97	506	369	208	216	69	0	0
83	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1551	2671	1696	2391	-13 0	15 1	286	590	538	132	-198	2139	7 9	620	130	2996	2168	351	21 0	97	506	369	208	217	693	0	0
8	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1651	256	1617	2316	-1093	1639	316	621	612	1 2	-19	2132	778	6 1	152	2996	2235	16	21 0	71	71	3	198	213	708	0	0
85	C12	Populus – Te minal 3 5 kV Treasureton – Brady 230 kV Lines	1592	2628	1660	2367	-1239	1585	296	601	571	137	-196	2137	761	629	1 0	2996	2197	379	21 0	86	91	359	20	21	698	0	0
86	C13	Borah – Ade a de #2 Borah–ADT–Midpoint #1 3 5 kV lines (RA)	1557	2651	1696	237	-1376	1 80	28	588	95	122	-188	2125	7 8	615	108	2996	21 3	323	21 0	112	516	376	210	220	69	0	0
87	C1	Borah – Ade a de #2 Midpoint - Ade aide #2 3 5 kV lines (RA)	155	2665	169	2390	-13 7	1530	283	588	529	130	-195	2136	750	619	125	2996	2163	3 6	21 0	100	508	370	208	217	693	0	0
88	C15	Borah – Ade a de #2 Borah – Hunt 230 kV ines	155	2662	1695	2386	-135	1518	283	587	519	129	-193	2133	7 9	618	122	2996	2156	3 1	21 0	103	510	372	209	219	693	0	0
89	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV lines RA?)	155	2665	169	2390	-13 5	1531	283	588	530	130	-195	2136	750	619	126	2996	216	3 6	21 0	100	508	370	208	217	693	0	0
90	C18	Borah – Kinport Midpoint – Ade a de #2 3 5 kV ines (RA?)	1553	2669	1695	239	-13 0	15 3	283	587	539	133	-197	2139	750	620	130	2996	2170	351	21 0	97	506	369	208	216	693	0	0
91	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA)	1553	2668	1695	2392	-13 2	1538	283	587	53	132	-196	2138	750	619	129	2996	2167	350	21 0	98	506	369	208	217	693	0	0
92	C20	Borah–Adel–M dpoint #1 Midpoint – Ade aide #2 3 5 kV lines	555	2662	695	2386	353	520	283	588	523	29	9	2 3	7 9	6 8	23	2996	2 60	3 2	2 0	02	5 0	37	208	2 6	693	0	0
93	C21	Borah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA)	155	2662	1696	2386	-135	1517	283	587	519	128	-193	2133	7 9	618	122	2996	2157	3 1	21 0	103	510	372	209	218	693	0	0
9	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1563	2639	1671	2385	-1377	1 63	285	589	70	118	-186	2119	7 8	613	112	2996	2128	313	21 0	112	520	378	211	226	69	0	0
95	C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines	1617	2573	1913	2007	-1208	1 89	329	635	91	11	-198	2105	767	622	125	2996	21 8	336	21 0	99	503	366	206	219	718	0	0
96	C2 a	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1551	273	1779	179	-1183	1228	292	597	2 9	150	-221	2200	772	65	110	2996	2050	29	21 0	88	61	335	195	191	700	575	0
97	C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV ines	1617	2573	1913	2007	-1208	1 89	329	635	91	11	-198	2105	767	622	125	2996	21 8	336	21 0	99	503	366	206	219	718	0	0
98	C25a	Br dger – Populus #2 Goshen – Kinport 3 5 kV ines w/ RAS	1551	273	1779	179	-1183	1228	292	597	2 9	150	-221	2200	772	65	110	2996	2050	29	21 0	88	61	335	195	191	700	575	0
103	C28x	Palo Verde - Trip 1&2, w/ FACRI	1626	267	1678	2398	-1510	1389	289	593	388	165	-220	2187	755	610	136	2996	310	1609	21 0	68	638	73	2 7	217	75	0	0
10																													Minimum Margins; > >
105																													
106																													
107		**Marg n est w/ Bonanza West at 5% of 785 MW**																											
108		**egwstg1 8h6 3952 2400 1547 824 sav**	15 7	2127	1 82	2 70	-1 33	13 5	219	520	320	130	-22	1788	82	665	153	2996	25 0	720	2005	73	50	355	203	22	656		
109																													
110		**Marg n est w/ Bridger West at 5% of 4100 MW**																											
111		**egwstg1 8h8 4305 2520 1579 754 sav**	1579	2835	1785	2520	-1123	1916	208	510	911	128	-158	2192	75	611	127	2996	2090	275	2005	107	50	385	219	231	733		
112																													

REAC IVE MARGIN MVAR (Gray shaded cells are the minimum margins)

LINE #	Aeolus 500	Monanx 500	Antic l n 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarH l 500	Bridger 345	Goshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erm nal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
8	3	3 5	289	- 97	520	783	-1173	662	269	283	2 3	- 16	- 25	- 76	- 1	- 32	- 01	-	-397	-350	-239	-255	-206	-55
9	- 25	- 97	37	797	821	-1093	-1 81	9 2	37	- 2	369	67	69	772	667	-636	-573	-521	- 6	-380	-238	-2 5	-213	-60
10	- 75	57	- 27	961	-1006	-1308	-1772	-1115	-	533	- 38	82	851	9 2	772	73	-6 5	-551	-513	- 17	-250	-251	-221	-60
11	702	-1017	76	-1501	-1609	-1937	-2 62	-1590	-1035	855	825	-1 17	-1598	-1617	-1268	-1191	-1077	-660	-71	-582	-305	-297	-2 9	-67
12	789	88	927	-1230	-1300	-1690	-2189	-1365	878	713	682	-1131	-1251	-1286	-10 6	-1005	913	-6 3	-772	-601	-315	-30	-2 5	-65
13	685	682	729	822	8 3	-1112	-1573	958	716	378	3 5	66	783	789	730	7 2	712	613	687	556	313	-295	-23	-6
1	7 7	909	905	-1178	-1223	-1551	-2079	-1316	917	511	- 6	973	-1169	-1168	-10 5	-1030	9 1	623	730	576	301	-282	-238	-68
15	718	-1003	883	-1260	-1308	-16 5	-2166	-1387	928	5 7	- 73	-1069	-1261	-1266	-1171	-11 3	-10 1	608	701	556	280	259	237	-72
16	736	76	829	981	-1005	-1306	-1901	-1122	811	- 52	- 02	799	9 1	9 6	853	8 8	796	625	725	576	315	298	237	-6
17	880	-1050	-1161	-1551	-1613	-1957	-2517	-162	-1172	852	856	-1 06	-1579	-1601	-1276	-119	-1081	660	855	6 3	303	299	2 7	-67
18	853	979	-1116	-1 21	-1 75	-1796	-23 5	-1517	-1122	593	7 2	-1215	-1 28	-1 0	-1161	-1111	-1010	657	831	633	315	306	250	-66
19	827	929	-1039	-1311	-136	-1696	-22 0	-1 29	-1033	562	503	-1116	-1308	-1320	-1092	-10 9	958	652	807	620	316	305	2 7	-65
20	889	-1063	-1133	-1537	-1600	-1953	-251	-1618	-10 7	319	- 92	-1 35	-1575	-1590	-128	-1209	-1095	662	86	6 9	310	301	250	-67
21	883	-10 7	-11 8	-1526	-1595	-19 1	-2 97	-1607	-1153	803	828	-1287	-15 3	-1586	-1265	-1189	-1078	661	859	6 6	310	301	250	-67
22	885	-1020	-1121	-1392	-1509	-1885	-2 39	-1517	-1126	818	825	-13 5	-1 99	-15 0	-1235	-1161	-1052	659	862	6 8	310	301	2 9	-66
23	885	-10 6	-1155	-15 1	-1509	-1938	-2500	-1612	-1160	825	839	-1351	-153	-1503	-1265	-1187	-1077	660	860	6 7	310	300	250	-67
2	888	-1053	-1153	-1520	-1578	-192	-2 85	-1600	-115	801	828	-13 6	-15 0	-1563	-1270	-1195	-1085	661	863	6 9	310	300	250	-67
25	902	-1031	-11 0	-135	-1501	-1967	-2391	990	-11	831	8 1	-133	-1 7	-1509	-1239	-1168	-1062	665	879	658	31	307	252	-65
27	888	-1008	-110	-1301	-1 5	-1908	-23 6	-1002	-1105	810	816	-1283	-1 1	-1 50	-1206	-11 3	-1039	66	865	650	313	307	251	-65
28	860	-1006	-1078	-1368	-13 6	-13 0	-2322	-155	-1070	781	786	-1221	-1370	-1357	-1195	-1137	-1035	659	837	63	309	300	2 9	-67
29	881	-1020	-1119	-1 07	-13 5	-182	-2 11	-15 8	-1119	815	820	-1301	-1 50	-1 60	-1223	-1155	-1050	662	857	6 6	312	30	251	-66
30	882	-10 8	-1155	-1532	-1587	-1716	-2 66	-1603	-116	8 2	8 8	-1383	-155	-1570	-1271	-1191	-1079	659	858	6 6	310	300	250	-67
31	886	-1052	-1160	-1539	-1596	-1936	-2502	-1613	-1172	8 9	85	-1396	-1566	-1586	-1276	-1195	-1083	661	861	6 7	311	302	250	-67
32	882	-1038	-11 3	-150	-1563	-1916	-2 72	-1591	-1151	83	839	-1356	-1521	-1529	-1253	-1177	-1068	662	858	6 6	311	302	250	-67
33	886	-1051	-1160	-1538	-1599	-1968	-2526	-1621	-1171	8 6	852	-138	-1556	-156	-1273	-1193	-1082	662	861	6 8	311	302	250	-67
3	882	-1038	-11 2	-1 99	-1559	-1930	-2 82	-1592	-11 8	830	836	-13 5	-1511	-1511	-1251	-1176	-1068	-662	-858	-6 6	-311	-302	-250	-67
35	88	-10 7	-1155	-1529	-1589	-1936	-2 87	-1608	-1166	8 2	8 8	-1378	-1551	-1569	-1268	-1189	-1078	-662	-859	-6 7	-311	-302	-251	-67
36	88	-10 7	-115	-1523	-1575	-1901	-2 76	-1602	-1165	8	8 9	-1380	-15 9	-156	-1269	-1189	-1079	-662	-860	-6 7	-311	-302	-250	-67
37	88	-10 9	-1153	-1510	-1555	-1862	-2 92	-1590	-1163	8 2	8 8	-1368	-1536	-15 2	-1270	-1191	-1081	-661	-859	-6 7	-310	-302	-250	-67
38	88	-10 9	-1156	-1533	-1590	-1923	-2 90	-1609	-1168	8 7	851	-1389	-1559	-1578	-1272	-1191	-1080	-661	-860	-6 7	-311	-302	-250	-67
39	885	-1050	-1159	-15 1	-1601	-1937	-2 85	-161	-1172	8 9	853	-1397	-1568	-1590	-127	-1192	-1081	-662	-861	-6 7	-311	-302	-250	-67
0	885	-1051	-1159	-15 6	-1606	-1951	-2515	-1620	-117	851	855	-1 01	-1573	-1595	-1277	-1195	-1083	661	-860	-6 7	-310	-301	-250	-67
1	88	-1050	-1156	-1535	-1595	-193	-2 85	-1605	-1169	8 8	852	-1393	-1563	-158	-127	-1193	-1081	661	-859	-6 6	-310	-301	-250	-67
3	891	-1060	-117	-1568	-1630	-1966	-2526	-1637	-1188	856	86	-1 23	-158	-1611	-1285	-1203	-1092	663	866	650	-311	-302	-251	-67
	886	-1050	-1158	-15 0	-1601	-19 2	-2502	-1616	-1170	8 6	852	-1397	-155	-1583	-1269	-1190	-1081	662	862	6 8	-311	-302	-251	-67
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6	861	931	-112	-1 9	-1506	-1861	-2 16	-15 6	-1127	823	829	-1310	-1 50	-1 86	-10 7	-1022	956	6 8	838	636	310	298	2 6	-67
7	861	925	-1118	-1 38	-1 95	-1850	-2 05	-1537	-1119	817	822	-1299	-1 0	-1 7	-1116	-1016	9 8	650	838	636	311	300	2 8	-67
8	P CASE DIVERGED																							
9	16	161	988	903	931	-1219	-1577	-1029	969	703	7	852	7 8	895	333	267	205	220	188	171	-98	-91	1 6	-5
50	569	756	-1 72	-2165	-2183	-2399	-283	-2010	-1519	-1087	-1130	-1915	-2177	-2197	-1192	-1028	8 9	560	621	- 65	210	196	221	-58
51	P CASE DIVERGED																							
52	-1013	-1075	80	921	-100	-1319	-1786	-1073	672	596	552	886	963	996	-1102	-1133	-1111	501	-1058	753	282	260	220	-62
53	767	-1027	-1068	-1 92	-1561	-1918	-2 78	-1583	-111	8 2	83	-1365	-1523	-1550	-1252	-1173	-1061	651	733	57	302	292	2 7	-66
5	898	-1115	-1223	-1637	-1691	-2027	-2577	-1686	-122	865	879	-1 69	-1662	-1681	-1337	-1239	-1135	622	859	655	267	2 7	235	-62
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57	653	-1027	911	-1326	-1 02	-1762	-2298	-1 51	962	777	751	-1225	-1353	-1385	-121	-1170	-1077	- 60	636	518	286	267	23	-62
58	892	-1036	-11 6	-1 37	-1 82	-1669	-1787	-1 28	-1150	832	8 1	-1332	-1 90	-1 93	-12 8	-1176	-1067	665	868	652	313	305	252	-65
59	**164**	**161**	**289**	**497**	**520**	**783**	**1173**	**662**	**269**	**283**	**243**	**416**	**425**	**476**	**333**	**267**	**205**	**220**	**188**	**58**	**98**	**91**	**146**	**45**
60					500	500	500	500	100			250		250										
61																								
62																								
65	- 89	- 93	- 65	579	733	858	-1396	801	- 37	382	3 6	555	597	620	550	-550	-526	-5 5	-506	-	-318	-297	-22	-60
66	629	7 6	670	961	-1037	-13	-1826	-1118	619	583	522	903	987	-1016	865	8 7	-781	-593	-622	-513	-306	-286	-232	-66
67	326	291	313	312	336	- 98	675	578	36	203	195	281	303	317	306	316	317	- 03	351	- 85	-308	-282	-201	-59
68	5 8	600	591	710	7 1	982	-1 03	8 9	582	38	351	60	683	698	658	667	636	561	558	- 88	30	-279	-222	-65
69	608	788	688	969	-1007	-1308	-1765	-1115	682	- 67	- 16	81	9	953	888	890	825	580	599	- 95	286	-262	-227	-69
70	6	838	7 6	-1127	-119	-1516	-2082	-127	7 5	591	- 98	998	-1131	-1153	-1003	-967	-875	-591	-632	-517	-292	-270	-231	-69
71	326	291	313	312	336	721	675	578	36	203	195	281	303	317	306	316	317	- 03	351	-3 3	-308	-282	-201	-59
72	5 8	600	591	711	7 1	99	-1557	8 9	582	38	351	60	683	698	658	667	636	561	558	- 88	30	-279	-222	-65
73	608	788	688	969	-1007	-1308	-1765	-1115	682	- 67	- 16	81	9	953	888	890	825	580	599	- 95	286	-262	-227	-69
7	6	838	7 6	-1127	-119	-1516	-2017	-127	7 5	591	- 98	998	-1131	-1153	-1003	-967	-875	-591	-632	-517	-292	-270	-231	-69
75	892	-10 9	-1161	-1536	-1600	-1922	-2 82	-161	-1167	839	8 9	-1397	-1519	-1558	-1255	-1182	-1080	-66	-867	-651	-312	-30	-251	-66
76	856	-1135	-1132	-1620	-1683	-1997	-25 2	-1680	-1199	892	888	-1 76	-1609	-16 0	-1366	-128	-1171	-6 9	-831	-630	-296	-28	-2 9	-70
77	802	696	-1079	-1332	-1381	-1731	-229	-1 8	-1072	786	805	-1195	-1302	-13 8	699	722	71	-602	-790	-612	-308	-289	-236	-68
78	757	6 3	988	-1195	-123	-1582	-2125	-1327	970	668	677	-1059	-1160	-1201	652	670	660	588	75	59	-309	-288	-233	-67
79	878	966	-11 5	-1 9	-1553	-1905	-2 66	-1581	-11 9	83	838	-1350	-1509	-1535	-1202	-1072	989	658	85	6	311	-302	-250	-67
80	897	-1066	-1158	-1521	-1551	-1881	-2 5	-1598	-1153	698	785	-1115	-1538	-1 91	-1271	-1202	-1099	665	872	653	311	-303	-251	-67
82	88	-10 3	-1151	-152	-158	-1922	-2 83	-1602	-1160	839	8 0	-1382	-1538	-1565	-1253	-1179	-1073	661	860	6 6	310	301	2 9	-67
83	889	-1053	-1167	-1552	-1612	-19 6	-2506	-162	-1178	850	852	-1 08	-1567	-1593	-1269	-1192	-1085	662	86	6 9	310	301	250	-67
8	823	761	-1077	-1333	-1383	-173	-2293	-1 50	-1068	783	795	-1198	-1309	-135	8 2	805	779	621	80	618	310	295	2 2	-67
85	858	916	-1110	-1 20	-1 77	-1828	-2387	-1521	-1107	810	811	-1283	-1 21	-1 5	-1099	-1003	939	6 8	835	63	310	299	2 7	-67
86	880	-1012	-1117	-1 23	-1 76	-1837	-2371	-1536	-1110	800	809	-12 1	-1 16	-1390	-1205	-11	-10 2	663	857	6 5	312	305	251	-66
87	883	-1038	-11 3	-1 99	-1559	-1930	-2 79	-1592	-11 9	830	837	-13 5	-1511	-1511	-1251	-1177	-1069	662	858	6 6	311	302	250	-67
88	882	-1032	-1138	-1 8	-15 3	-1895	-2 35	-1577	-11 1	82	831	-1329	-1 96	-1 98	-12 2	-1170	-1063	662	857	6 5	311	303	251	-66
89	880	-1033	-1130	-1 79	-15 5	-1916	-2 67	-1578	-1127	786	811	-12 2	-1 82	-1500	-1239	-1170	-1063	661	856	6 5	311	302	250	-67
90	88	-10 6	-11 7	-1518	-1585	-1955	-2508	-1607	-1150	799	825	-1275	-1526	-1553	-1262	-1187	-1077	661	860	6 7	310	302	250	-67
91	882	-10 2	-11 2	-1509	-1576	-1921	-2 71	-159	-11	79	821	-126	-1520	-1560	-1256	-1182	-1073	661	858	6 6	311	302	250	-67
92	882	-1029	-1131	-1 57	-1513	-1955	-2 91	-1577	-1127	807	821	-1280	-1	-1 12	-1231	-116	-1060	662	857	6 6	311	303	250	-66
93	882	-1032	-1137	-1 79	-1538	-1908	-2 8	-1578	-1139	819	829	-1316	-1 8	-1 79	-12 0	-1169	-1062	662	858	6 6	311	303	251	-66
9	880	-1001	-1100	-1352	-1283	-1735	-2327	-1508	-1091	793	800	-12 1	-1383	-137	-1189	-1132	-1031	663	857	6 6	313	306	251	-65
95	787	887	877	-1202	-1283	-1631	-2170	-13	756	261	396	-11 8	-12 2	-1262	-10 1	-1008	919	6 3	770	601	315	30	2	-65
96	806	-1059	982	-1 98	-1583	-1938	-2 75	-159	875	316	- 7	-1 31	-1573	-1581	-1289	-1215	-1097	636	785	608	301	287	2 5	
97	787	887	877	-1202	-1283	-1631	-2170	-13	756	261	396	-11 8	-12 2	-1262	-10 1	-1008	919	6 3	770	601	315	30	2	-65
98	806	-1059	982	-1 98	-1583	-1938	-2 80	-159	875	316	- 7	-1 31	-1573	-1581	-1289	-1215	-1097	636	785	608	301	287	2 5	-69
103																								
10	**326**	**291**	**313**	**312**	**336**	**498**	**675**	**578**	**364**	**203**	**195**	**281**	**303**	**317**	**306**	**316**	**317**	**403**	**351**	**343**	**286**	**262**	**201**	**59**

LINE #	Voltage Deviation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Vol age	COMMEN
3				**Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs**					
					SIDNEY 115 / 230 #1	108 39%			
5					CTTNWD N - KETTLECK 115 #1	103. 9%			
6									
7				**CON INGENCY LOADINGS**					
8	1	3M KNOLL 3 5	5 2	1	BRIDGER - BR DGE&A 3 5 #1	11 08%	-	None	2098.99 Amps
9	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	102 69%	-	None	1889. 7 Amps
10	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	102. 0%	-	None	
11	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	83.00%	-	None	
12	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	99.66%	-	None	
13	1	BIGGRASS 69	5.1	0	PALISADE - ROCKSPGS 230 #1	88.27%	-	None	
1	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	82.05%	-	None	
15	3	PTRSNFRG 69	5.7	0	HARDIN 230 / 115 #1	92.58%	1	PTRSNFUR 69 @ .900	
16	0	- - -	- - -	0	DILLON S 161 / 69 #1	93. 3%	-	None	
17	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
18	0	- - -	- - -	2	GRACE - SODA 138 #1	116 75%	-	None	Mit gated in B06a
19	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	80.15%	-	None	
20	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	87.78%	-	None	
21	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
22	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	87 36%	-	None	
23	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
2	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
25	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.77%	-	None	
27	0	- - -	- - -	0	LOCUST - MORA 138 #1	82 89%	-	None	
28	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 37%	-	None	
29	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	75 37%	-	None	
30	0	- - -	- - -	0	LOCUST - MORA 138 #1	88 83%	-	None	
31	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	79 56%	-	None	
32	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
33	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
3	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75.36%	-	None	
35	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79.68%	-	None	
36	0	- - -	- - -	0	LOCUST - MORA 138 #1	87.87%	-	None	
37	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75.36%	-	None	
38	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75.36%	-	None	
39	0	- - -	- - -	0	LOCUST - MORA 138 #1	90.7 %	-	None	
0	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75.36%	-	None	
1	0	- - -	- - -	0	LOCUST - MORA 138 #1	83.02%	-	None	
3	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75.36%	-	None	
	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75.36%	-	None	
5	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	88.82%	-	None	
6	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	78 07%	-	None	
7	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 39%	-	None	
8	P CASE DIVERGED								
9	13	RIVERTON 3 .5	11 8	6	MINERS 230 0 PLATTE 230 0 #1	10 68%		GREATDIV 115 @ .892	
50	0	- - -	- - -	0	MINERS 230 0 PLATTE 230 0 #1	99 85%	-	None	Based on ERate=521 MVA
51	P CASE DIVERGED								
52	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	9 .71%	-	None	
53	0	- - -	- - -	2	AEOLUS 500 / 230 #2	101 21%	-	None	Spec MVA2 about 10% higher
5	0	- - -	- - -	0	SIDNEY - SIDNEYDC 230 #1	97.1 %	-	None	
55	0	- - -	- - -	0	MINERS 230.0 PLATTE 230 0 #1	75.18%	-	None	
56	5	MOONLAK1 69	5.7	6	BONANZA - VERNAL 138 #1	13 93%	-	None	
57	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	85 92%	-	None	
58	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 37%	-	None	
59									
60									
61									
62									
65	0	3M KNOLL 3 5	6 9		BRIDGER - BR DGE&A 3 5 #1	126 23%	-	None	2322.58 Amps
66	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	110 87%	-	None	2039.91 Amps
67	0	POPULUS 500	5.7	3	BRIDGER - ROCKSPGS 230 #1	115 37%	-	None	
68	0	PTRSNFRG 69	5.8	0	BRIDGER - ROCKSPGS 230 #1	9 .89%		PTRSNFUR 69 @ .898	Mit gated with RAS
69	0	PTRSNFRG 69	6.7	0	DILLON S 161 / 69 #1	92.18%	1	PTRSNFUR 69 @ .890	
70	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	85.29%	-	None	w/ P18 Caps & Load Drop
71	0	POPULUS 500	5.7	3	BRIDGER - ROCKSPGS 230 #1	115 37%	-	None	
72	0	PTRSNFRG 69	5.8	0	BRIDGER - ROCKSPGS 230 #1	9 .89%		PTRSNFUR 69 @ .898	Mit gated with RAS
73	0	PTRSNFRG 69	6.7	0	DILLON S 161 / 69 #1	92.18%	1	PTRSNFUR 69 @ .890	
7	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	85.29%	-	None	w/ P18 Caps & Load Drop
75	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75.36%	-	None	
76	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	80.82%	-	None	
77	0	- - -	- - -	0	GRACE - SODA 138 #1	8 .03%	-	None	
78	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	86.76%	-	None	
79	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 37%	-	None	
80	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	90 99%	-	None	
82	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
83	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
8	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	80 3 %	-	None	
85	0	- - -	- - -	0	GRACE - SODA 138 #1	77. 3%	-	None	
86	0	- - -	- - -	0	HUNT 138 / 230 #2	77 38%	-	None	
87	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
88	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	79.77%	-	None	
89	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
90	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 36%	-	None	
91	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	79.72%	-	None	
92	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 37%	-	None	
93	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	79. 6%	-	None	
9	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	75 38%	-	None	
95	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	98. 6%	-	None	
96	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	89 2 %	-	None	
97	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	98. 6%	-	None	
98	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	89 2 %	-	None	
103	0	- - -	- - -	1	SPRINGER - GLADSTON 115 #1	110 09%	-	None	
10									
105									
106									
107									
108	**A l Con ingenc es (w/ F nal RAS) Converged ndicat ng Positive Reactive Margin**								
109									
110									
111	**A l Con ingenc es (w/ F nal RAS) Converged ndicat ng Positive Reactive Margin**								
112									

1) Vol age V olat ons > 5% for Level B & > 10% for Level C
2) Excluding Ser es Cap Buses (Line S de) and Transformer tertiary buses.

Appendix 3-2 Pg.2 - - - Post-transient Results For Aeolus West vs. Bonanza West

			BASE CASE / P PA H FLOWS																								Gen Drop	
INE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeo us South	Aeo us West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	M dpo nt West	Montana SE	Montana Idaho P18)	ot 4a	Bonanza West	ot 1a (30)	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP onder	RedB H A len (ot 2C)	Pinto 4Corners 2B1)	Sigurd GlenC (2B 2)	daho Area System osses	Pace Area System osses	Bridger Gen Trips	Aeolus Gen Tr p
3																												
		egwstg1 8h6 4055 2384 1591 785 2666 sav	1591	2666	1672	2383	-1 92	138	352	659	367	127	-221	2091	785	639	1 5	2996	2 79	660	2103	8	50	370	209	217	701	0	0
5																													
6																													
7																													
8																													
9																													
10																													
11		**Level "B" Contingencies**																											
12	B01	Anticline – Populus 500 kV Line	1973	209	0	3360	-1065	1031	30	7 2	52	26	-226	1888	821	663	109	2996	2322	527	2103	110	513	370	208	3 2	730	0	0
13	B01a	Anticline – Populus 500 kV Line Drop B idger G1	190	2262	0	3018	-10 3	783	396	706	-178	66	-2	1989	82	690	9	2996	2228	90	2103	98	69	3 0	197	295	71	575	0
1	B01g	Anticline – Populus 500 kV Line JBG1 KinpCap	1900	2268	0	3026	-10 8	788	395	706	-17	67	-2 5	1991	823	690	95	2996	2230	91	2103	98	69	3 0	197	293	713	575	0
15	B02	Anticline 500 / 3 5 kV Transfo mer	1606	26 7	1751	2299	-1 89	1388	3	651	371	127	-222	2088	78	6 1	1 5	2996	2 81	657	2103	8	505	370	209	209	70	0	0
16	B03	Br dger – Populus 3 5 kV Line	655	257	878	20	366	328	396	706	3 9	09	22	2058	80	6 0	38	2996	2 5	6 2	2 03	87	502	367	208	22	72	0	0
17	B0	Br dger – 3Mi eknoll 3 5 kV Line	169	2513	1913	1863	-1268	1318	32	7	313	95	-2 8	2037	808	6	13	2996	2 2	629	2103	88	99	36	207	237	739	0	0
18	B0 a	Br dger – 3Mi eknoll 3 5 kV Line	1633	2666	1786	1635	-12 1	10	398	707	58	132	-262	2129	812	673	117	2996	23 1	588	2103	77	55	332	195	207	726	575	0
19	B0 b	Br dger – 3Mi eknoll 3 5 kV Line	1575	2812	1653	1 03	-1210	756	363	670	-209	167	-275	2217	816	70	100	2996	2238	5 5	2103	66	09	298	182	186	718	1150	0
20																													
21	B0 c	Br dger – 3Mi eknoll 3 5 kV Line	169	2513	1913	1863	-1269	1320	32	7	31	9	-250	2036	807	6 3	13	2996	2 2	629	2103	88	99	36	207	237	739		
22	B05	Br dger 3 5 / 230 kV Transformer	1592	266	1671	2381	-1 91	1383	353	660	366	127	-221	2091	786	639	1	2996	2 78	658	2103	8	50	370	209	216	701	0	0
23	B06	3M leknoll – Goshen 3 5 kV Line	161	2628	1759	2236	-1 70	1356	366	67	3 5	116	-233	2076	791	638	139	2996	2 58	6	2103	88	506	370	209	212	725	0	0
2	B06a	3M leknoll – Goshen 3 5 kV Line Bypass 3MK Caps	163	2599	1798	2632	-1 1	1357	38	693	3 7	111	-236	2065	795	639	139	2996	2 58	6 3	2103	88	506	370	209	213	717	0	0
25	B07	Kinport – Goshen 3 5 kV Line	1590	2668	1666	2393	-1 9	1388	351	658	370	128	-22	2092	785	639	1 5	2996	2 78	659	2103	8	50	370	209	218	701	0	0
26	B08	Kinport – Borah 3 5 kV Line	1593	266	1671	2382	-1 91	1383	352	659	366	127	-221	2091	786	639	1 5	2996	2 78	658	2103	8	50	370	209	217	701	0	0
27	B09	Populus – Borah 500 kV Line	1611	2635	1591	2 27	-1 78	1356	357	66	3 8	121	-221	2080	787	639	135	2996	2 6	6 7	2103	90	507	371	209	228	701	0	0
28	B10	Borah 500 / 3 5 kV Transformer	1597	2661	16 8	2 01	-1 76	1395	353	661	379	129	-22	2093	787	6 1	1 5	2996	2 8	665	2103	82	501	368	208	219	701	0	0
29	B11	Borah 3 5 / 230 kV Transformer	593	2665	663	2388	85	390	35	662	372	28	225	2092	785	639	5	2996	2 78	660	2 03	83	503	369	209	2 9	702	0	0
30	B12	Populus – Cedar H ll 500 kV Line	160	2633	1628	2390	-1526	1303	35	661	282	112	-211	2070	782	632	1 6	2996	2 30	618	2103	92	521	380	213	221	700	0	0
32	B1	Cedar Hill – Hemingway 500 kV Line	1607	2629	1622	2391	-1522	1300	355	662	280	111	-211	2068	783	632	1 6	2996	2 28	617	2103	93	520	380	213	222	701	0	0
33	B15	Midpoint – Hemingway 500 kV Line	1596	2662	166	2386	-1 78	1393	353	660	383	129	-222	2093	787	6 1	137	2996	2 87	667	2103	85	500	367	208	218	702	0	0
3	B16	Borah – Midpoint 500 kV Line	1599	26 7	165	2380	-1511	13 0	353	660	329	120	-215	2080	78	636	136	2996	2 5	637	2103	92	512	375	211	222	701	0	0
35	B17	Midpoint 500 / 3 5 kV Transfo mer	1595	2666	1660	239	-1 83	139	353	660	02	131	-22	2095	787	6 2	116	2996	2 95	669	2103	92	99	366	207	225	701	0	0
36	B18	Midpoint 3 5 / 230 kV Transfo mer	1592	266	1671	2383	-1 93	1381	352	659	362	127	-220	2091	785	639	1 7	2996	2 75	657	2103	8	505	370	209	217	701	0	0
37	B19	Borah – Ade a de #2 3 5 kV Line	159	2660	1671	2377	-1501	1367	352	659	355	125	-218	2088	785	638	139	2996	2 70	652	2103	88	507	371	209	218	701	0	0
38	B20	Adelaide – Midpoint #2 3 5 kV Line	1592	266	1672	2381	-1 95	1379	352	659	36	127	-220	2091	785	638	1 3	2996	2 77	656	2103	85	505	370	209	216	701	0	0
39	B21	Borah – Ade a de – Midpoint #1 3 5 kV Line	159	2660	1671	2377	-1500	1368	352	659	356	125	-218	2088	785	638	139	2996	2 71	652	2103	88	507	371	209	218	701	0	0
0	B22	Borah – Hunt 230 kV Line	1593	2663	1672	2380	-1 97	1375	352	659	360	126	-219	2090	785	638	1 2	2996	2 73	655	2103	86	506	371	209	218	701	0	0
1	B23	Midpoint – Boise Bench #3 230 kV Line	593	2663	670	2382	9	378	352	659	360	26	2 9	2090	785	638	6	2996	2 73	655	2 03	8	506	370	209	2 8	70	0	0
2	B2	Midpoint – Ratt e Snake 230 kV Line	1592	2665	1671	2383	-1 92	1383	352	659	366	127	-220	2091	785	639	1 5	2996	2 78	657	2103	8	505	370	209	217	701	0	0
3	B25	Midpoint – Dram 230 kV Line	592	266	67	2382	93	380	352	659	363	27	220	2090	785	639	5	2996	2 75	656	2 03	8	505	370	209	2 7	70	0	0
	B26	Ra tle Snake – Bo se Bench 230 kV Line	1592	2663	1671	2382	-1 9	1378	352	659	360	126	-219	2090	785	638	1 6	2996	2 70	655	2103	8	506	370	209	221	701	0	0
5	B27	Dram – Boise Bench 230 kV Line	1592	2665	1671	2383	-1 92	138	352	659	368	128	-221	2092	785	639	1	2996	2 79	658	2103	8	50	370	209	217	701	0	0
6	B28	Hemingway 500/230 kV Trans ormer	1592	2665	1670	238	-1 91	138	352	659	369	127	-221	2091	786	639	1 3	2996	2 78	659	2103	8	50	369	209	218	701	0	0
8	B30	Populus – Borah #1 3 5 kV Line	1590	2666	1677	2379	-1502	137	352	659	361	126	-221	2090	78	638	1 2	2996	2 73	65	2103	86	506	371	209	218	701	0	0
9	B31	Populus – Borah #2 3 5 kV Line	1591	2665	1676	2378	-1500	137	352	659	360	126	-221	2090	785	638	1 2	2996	2 73	65	2103	86	506	371	209	217	701	0	0
50	B32	Populus – Kinport 3 5 kV Line	1587	2669	1668	2392	-1505	1378	352	659	36	126	-226	2091	78	638	1 2	2996	2 71	65	2103	86	507	371	209	219	701	0	0
51	B33	Populus – Ben Lomond #3 3 5 kV Line	1639	2615	1632	23 1	-1371	1 26	372	681	399	132	-219	2088	798	6 9	15	2996	2508	688	2103	72	88	358	20	215	712	0	0
52	B3	Populus – Te minal 3 5 kV Line	1633	2620	16 1	2352	-1396	1 19	361	669	39	130	-219	2087	797	6 7	152	2996	2503	683	2103	7	91	360	205	215	706	0	0
53	B35	Aeolus – Anticline 500 kV Line																											
5	B35a	Aeolus – Anticline 500 kV Line	2179	122	753	1961	-927	722	299	605	-231	22	-263	1835	811	7 1	87	2996	2203	68	2103	100	62	333	19	187	796	0	600
55																													
56	B35g	Aeolus – Anticline 500 kV Line	2217	12 0	758	1966	-906	775	30	609	-180	2	-285	1887	809	732	89	2996	2207	69	2103	10	76	3 2	199	185	773	0	600
57																													
58	B36	Aeolus – Mona 500 kV Line																											
59	B36a	Aeolus – Mona 500 kV Line	0	35 0	2061	2672	-2332	1186	31	7	1 5	103	-239	1963	913	760	171	2996	2502	7 7	2103	-2	333	2 3	160	255	732	0	600
60	B36g	Aeolus – Mona 500 kV Line	0	3553	2061	2675	-2328	1193	37	7 9	152	110	-239	1976	912	757	172	2996	2503	7 7	2103	-2	33	2	160	255	730	0	600
61	B37	Aeolus 500 / 230 kV Transformer	1578	2655	1660	2382	-1 92	137	353	660	358	119	-222	2068	791	6 6	1	2996	2 75	656	2103	8	503	368	208	216	701	0	0
62	B38	Aeolus – Windstar 230 kV Line	1532	2582	1620	2359	-1 90	1323	3 9	656	310	82	-227	1961	809	678	1 2	2996	2 60	6 6	2103	82	93	359	205	21	710	0	0
63	B39	Aeolus – Freezeout 230 kV Line	1571	2692	1658	2 02	-1 97	1382	360	667	366	130	-220	2102	787	635	1 5	2996	2 77	660	2103	83	503	369	209	219	710	0	0
6	B 0	Bonanza –Mona 3 5kV Line	17 0	2698	1693	2 70	-1729	1253	399	710	235	86	-231	2288	1 9	167	1 7	2996	2 03	588	2103	56	28	297	183	228	759	0	0
65	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza P ant	1726	2659	16 9	2 05	-176	1129	378	687	118	135	-238	2222	106	86	1 2	2996	2391	62	2103	7	12	295	181	222	705	0	0
66	B 1	Hemingway – Summer Lake 500kV line	1598	26 5	1656	2377	-152	132	353	660	293	119	-21	2077	782	632	159	2996	2 31	623	2103	87	519	379	212	211	702	0	0
67																													Minimum Margins; > >
68																													N-1 Criteria > >
69																													
70		**Level "C" Contingencies**																											
71	C01	Anticline – Populus 500 kV Lines (two circu ts)																											
72	C01a	Anticline – Populus 500 kV Lines (two circu ts) w/ RAS																											
73	C02	Br dger – Populus #1 # 2 3 5 kV Lines	1759	2395	2220	1363	-1152	1222	71	785	226	67	-223	1981	829	6 5	126	2996	2 17	606	2103	92	96	361	205	209	786	0	0
7	C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1689	2576	2050	122	-1150	975	27	739	-	113	-2 1	2092	828	672	111	2996	232	572	2103	81	55	331	19	186	751	575	0
75	C03	Br dger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines	1790	2335	2232	1236	-1056	1218	506	823	225	9	-258	1951	836	6 9	122	2996	2 03	595	2103	92	92	357	20	231	792	0	0
76	C03a	Br dger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	1719	2523	2079	1090	-1059	973	63	776	-3	98	-270	2069	833	675	108	2996	2312	563	2103	81	51	328	193	201	761	575	0
77	C03b	Br dger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	16 9	2699	191	939	-1057	707	19	730	-251	1 3	-282	2175	833	70	93	2996	2215	52	2103	70	07	296	181	181	7 1	1150	0
78	C03c	Br dger–3MK Br dge-Pop#1 3 5 RAS; 2JBG Path18 Caps UV Loa	16 7	2693	191	935	-1091	773	17	728	-190	1 2	-276	2168	829	697	98	2996	22 3	539	2103	71	18	30	18	176	732	1150	0
79	C0	Br dger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines	1790	2335	2232	1236	-1056	1218	506	823	225	9	-258	1951	836	6 9	122	2996	2 03	595	2103	92	92	357	20	231	792	0	0
80	C0 a	Br dger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	1719	2523	2079	1090	-1059	973	63	776	-3	98	-270	2069	833	675	108	2996	2312	563	2103	81	51	328	193	201	761	575	0
81	C0 b	Br dger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	6 9	2699	9	939	057	707	9	730	25	3	282	2 75	833	70	93	2996	22 5	52	2 03	70	07	296	8	8	7	50	0
82	C0 c	Br dger–3MK Br dge-Pop#2 3 5 RAS 2JBG Path18 Caps UV Loa	16 7	2693	191	935	-1091	773	17	728	-190	1 2	-276	2168	829	697	98	2996	22 3	539	2103	71	18	30	18	176	732	1150	0
83	C05	Borah – Populus 3 5 kV DLO	1587	266	1687	2366	-1521	1352	352	659	3 5	122	-221	2086	783	635	136	2996	2 59	6 3	2103	91	511	37	210	218	702	0	0
8	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1538	2797	1578	2086	-1 66	1070	32	630	83	15	-2 1	2169	791	668	119	2996	2356	598	2103	80	66	3 2	198	19	693	575	0
85	C06	Populus – Ben Lomond 3 5 kV DLO	1736	2513	1553	2256	-1123	1515	13	723	66	1 1	-216	2082	821	668	175	2996	2570	752	2103	5	51	331	195	211	738	0	0
86	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Series Cap	1757	2 79	1610	2138	-1076	1511	30	7 1	63	133	-222	2069	825	668	17	2996	2567	7 8	2103	7	52	331	195	205	739	0	0
87	C07	Ben Lomond – Terminal 3 5 kV DLO	1600	2656	1668	2379	-1 78	1390	350	657	372	128	-220	2090	788	6 0	1 6	2996	2 83	662	2103	82	502	368	208	216	701	0	0
88	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	158	2669	1672	2387	-1521	1362	352	659	353	123	-228	2087	782	636	137	2996	2 60	6 6	2103	90	510	37	210	220	702	0	0
90	C09	Populus – Borah #2 3 5 kV Treasure on – Brady 230 kV Lines	1593	2663	1669	2377	-1 89	1378	357	66	363	127	-221	2090	785	639	1 3	2996	2 75	656	2103	85	505	370	209	217	702	0	0
91	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1592	2665	1671	2378	-1 90	1379	356	66	36	127	-221	2091	785	639	1 3	2996	2 75	657	2103	85	505	370	209	217	702	0	0
92	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1702	25 7	1585	2293	-1221	1 82	388	697	2	136	-216	2082	813	660	167	2996	25 8	727	2103	56	66	3 2	199	213	721	0	0
93	C12	Populus – Te minal 3 5 kV Treasureton – Brady 230 kV Lines	637	26 7	632	2350	380	25	367	675	399	3	2 9	2088	797	6 8	5	2996	2506	687	2 03	73	89	359	205	2 5	708	0	0
9	C13	Borah – Ade a de #2 Borah–ADT–Midpoint #1 3 5 kV lines (RA)	1597	26 8	1673	2362	-1528	1322	352	660	32	117	-212	2078	783	63	122	2996	2 51	631	2103	99	515	377	211	221	702	0	0
95	C1	Borah – Ade a de #2 Midpoint - Ade aide #2 3 5 kV lines (RA)	59	2660	672	2377	50	367	352	659	355	25	2 8	2088	785	637	39	2996	2 70	65	2 03	88	507	372	209	2 8	70	0	0
96	C15	Borah – Ade a de #2 Borah – Hunt 230 kV ines	159	2657	1673	2373	-1508	1356	352	659	3 6	123	-216	2085	785	637	135	2996	2 63	6 7	2103	90	509	373	210	220	701	0	0
97	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV lines RA?)	159	2660	1671	2377	-1 99	1368	352	659	356	125	-219	2088	785	638	139	2996	2 70	652	2103	88	507	371	209	218	702	0	0
98	C18	Borah – Kinport Midpoint – Ade a de #2 3 5 kV ines (RA?)	1593	266	1672	2380	-1 9	1379	352	659	36	127	-220	2090	785	639	1 3	2996	2 76	656	2103	85	505	370	209	217	701	0	0
99	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA)	1593	2662	1673	2379	-1 96	1375	352	659	359	126	-219	2089	785	638	1 2	2996	2 73	655	2103	86	506	371	209	218	701	0	0
100	C20	Borah–Adel–M dpoint #1 Midpoint – Ade aide #2 3 5 kV lines	159	2658	1672	237	-150	1361	352	659	351	12	-217	2086	785	637	137	2996	2 68	6 9	2103	89	508	372	210	217	702	0	0
101	C21	Borah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA)	159	2657	1673	2373	-1507	1356	352	659	3 6	123	-216	2085	785	637	136	2996	2 6	6 7	2103	90	509	373	210	219	701	0	0
102	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1602	2638	1651	2372	-1528	1308	353	661	30	11	-211	2073	783	633	126	2996	2 39	622	2103	99	518	378	212	226	702	0	0
103	C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines	1656	2570	1889	1998	-136	1326	397	706	317	108	-220	2058	801	6 0	138	2996	2 5	6 2	2103	87	502	367	208	221	725	0	0
10	C2 a	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1591	2727	1752	178	-13 1	1057	361	668	67	1 5	-2 2	2150	805	670	122	2996	235	599	2103	76	59	336	196	195	708	575	0
105	C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV ines	1656	2570	1889	1998	-136	1326	397	706	317	108	-220	2058	801	6 0	138	2996	2 5	6 2	2103	87	502	367	208	221	725	0	0
106	C25a	Br dger – Populus #2 Goshen – Kinport 3 5 kV ines w/ RAS	59	2727	752	78	3	057	36	668	67	5	2 2	2 50	805	670	22	2996	235	599	2 03	76	59	336	96	95	708	575	0
111	C28x	Palo Verde - Trip 1&2 w/ FACRI	1665	2663	1651	2381	-1676	120	360	668	192	162	-2 1	2132	788	627	1 8	2996	3 20	1918	2103	55	636	73	2 7	219	76	0	0
112																													Minimum Margins > >
113																													N-2 Criteria > >
11		**Cut Bonanza West by 100 MW**																											
115		egwstg1 8h6 4100 2400 1499 685 sav	1 99	2666	1700	2 00	-1213	1672	261	56	679	13	-189	1995	685	5 0	118	2996	2 06	589	180	113	50	23	230	217	675		
116																													
117		**Level "B" Contingencies**																											
118	B01	Anticline – Populus 500 kV Line																											
119	B01a	Anticline – Populus 500 kV Line Drop B idger G1																											
120	B01g	Anticline – Populus 500 kV Line JBG1 KinpCap																											
121	B35	Aeolus – Anticline 500 kV Line																											
122	B35a	Aeolus – Anticline 500 kV Line																											
123																													
12	B35g	Aeolus – Anticline 500 kV Line																											
125																													
126																													
127		**Cut Aeo us West by 100 MW**																											
128		egwstg1 8h6 3967 2362 1617 785 2566 sav	1617	2566	160	2362	-1618	1193	335	6 1	160	128	-238	2012	785	626	162	2996	2 25	606	2203	66	50	330	191	217	687		
129																													
130																													
131																													
132																													
133																													
13		**Level "B" Contingencies**																											
135	B01	Anticline – Populus 500 kV Line	1980	2020	0	3300	-120	858	13	72	-139	31	-2 2	1818	820	651	128	2996	2273	77	2203	90	513	331	191	336	71	0	0
136	B01a	Anticline – Populus 500 kV Line Drop B idger G1	9 2	2 9	0	2960	78	6	379	688	366	7	259	920	823	678	3	2996	2 8		2203	80	70	300	79	292	699	575	0
137	B01g	Anticline – Populus 500 kV Line Kinport Cap	1908	2197	0	2968	-1185	618	378	687	-363	72	-260	1922	822	677	11	2996	2181	1	2203	79	71	301	180	291	697	575	0
138	B35	Aeolus – Anticline 500 kV Line																											
139	B35a	Aeolus – Anticline 500 kV Line	2165	1197	719	1969	-1070	565	290	595	- 07	35	-276	1788	811	723	107	2996	2158	20	2203	82	65	295	177	19	766	0	600
1 0																													
1 1	B35g	Aeolus – Anticline 500 kV Line																											
1 2																													

REAC IVE MARGIN MVAR (Gray shaded cells are the minimum margins)

INE #	CON INGENCY#	Aeo us 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	M dpo nt 500	Heminway 500	CedarHil 500	Bridger 345	oshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeo us 230	M ners 230	Mustang 230	Riverton 230	onahGas 230	adstone 230
12	B01	- 03	697	33	658	681	911	-1292	790	305	3 7	288	539	570	626	775	882	-878	-528	- 51	-373	-258	-256	-200	- 6
13	B01a	- 39	8 9	392	875	901	-1171	-1599	-101	399	- 63	386	723	775	838	-1009	-1091	-1073	-539	- 73	-38	-250	-239	-20	-51
1	B01g	- 82	9 0	- 1	8 9	-1073	-1377	-185	-1183	- 63	55	- 5	870	933	-1006	-11 9	-1200	-1175	5 9	-517	- 16	-262	-2 2	-210	-52
15	B02	697	-1 97	765	-1588	-1663	-1971	-2 50	-1633	-10 6	871	8 5	-1 5	-16 6	-1658	-1616	-167	-1687	63	707	- 98	-311	-285	-2 1	-59
16	B03	778	-1386	9 8	797	-13 9	-1691	-2200	-1 02	893	721	699	-1167	-1322	-1335	-1382	-1 82	-1521	616	760	591	-321	-293	-235	-56
17	B0	600	-11	7 6	881	917	-1196	-1655	-1026	721	380	3 8	717	866	866	-1016	-1169	-1275	597	675	5 5	319	28	222	-55
18	B0 a	735	-1 07	912	-1196	-1238	-1560	-2053	-1327	910	507	- 5	978	-118	-1187	-1332	-1 79	-1556	59	717	565	306	267	-227	-60
19	B0 b	702	-1006	879	-12 8	-1051	-1613	-209	-1371	906	537	- 68	-10 8	-1257	-12 9	-1 3	-1590	-1675	578	68	5 3	286	239	-225	-65
21	B0 c	722	-12 2	8 1	-103	-1073	-1382	-1871	-1177	81	- 53	- 0	8 9	-1025	-102	-1150	-1295	-137	603	710	565	319	287	-225	-55
22	B05	867	-155	-1178	-1587	-16 5	-1979	-2503	-16 6	-1167	860	871	-1 32	-1621	-1636	-1615	-1677	-1698	633	8 1	- 97	309	288	239	-59
23	B06	8 2	-1 8	-1139	-1 67	-1519	-183	-23 3	-1089	-1135	602	751	-12 6	-1 9	-1 90	-150	-1586	-1626	630	820	62	321	295	2 1	-58
2	B06a	816	-1 29	-1060	-135	-1 08	-1730	-22 7	-1 61	-10 2	569	500	-1151	-1373	-1372	-1 32	-1523	-1568	62	795	611	321	293	238	-57
25	B07	876	-1566	-11 6	-156	-1628	-1520	-2 99	-1636	-1056	317	- 90	-1 55	-1610	-1615	-1612	-1689	-171	635	850	639	265	170	2 1	-59
26	B08	870	-1552	-116	-1562	-1627	-1961	-2 86	-1629	-1165	752	8 2	-1308	-158	-1621	365	-1670	-169	63	8 5	636	316	291	2 1	-59
27	B09	872	-1523	-1139	-1 28	-1537	-1905	-2 3	-15	-11 0	829	8 2	-137	-15 5	-1579	-1572	-16 5	-1667	633	8 8	638	316	291	2 1	-58
28	B10	871	-1550	-1170	-1575	-1532	-195	-2 70	-129	-1170	763	853	-1372	-1572	-1532	-1599	-1668	-169	633	8 6	636	315	289	2 1	-59
29	B11	875	-1556	-1169	-1553	-1609	-19 5	-2 7	-1621	-1169	808	8 2	-1366	-1572	-1596	-1600	-88	-1702	63	8 9	638	316	290	2 1	-59
30	B12	888	-1533	-1152	-1397	-15 9	-1535	-2353	933	-1166	8 7	863	-1371	-1529	-1558	-1588	-1659	-1677	639	863	6 7	319	297	2 3	-57
32	B1	87	-1512	-1116	-13	-1 93	-19 5	-2307	-1022	-1126	827	838	-1322	-1 66	-1 99	-155	-1630	-1653	637	850	639	319	297	2 2	-57
33	B15	8	-1510	-1093	-1 01	-1372	-1363	-2269	-1573	-1081	789	801	-12 3	-1 06	-1385	-1525	-1610	-16 9	630	820	622	31	287	2 0	-59
3	B16	868	-1523	-1139	-1 7	-1380	-1830	-2381	-1577	-1137	7 3	8 0	-1332	-1 98	-1501	-1565	-1638	-1662	635	8 3	635	317	29	2 1	-58
35	B17	868	-1551	-1169	-1552	-1615	-1720	-2 3	-1621	-117	850	862	-1 05	-1592	-1600	-1609	-1673	-1699	632	8 3	635	315	289	2 1	-59
36	B18	-873	-1556	-1177	-1576	-1629	-1959	-2 90	-1635	-1185	859	870	-1 22	-1610	-1621	-1617	-1678	-1699	635	8 7	637	317	291	2 1	-59
37	B19	-869	-15 1	-1161	-15 3	-1598	-19 0	-2 56	-1616	-116	8	855	-1383	-1566	-1566	359	-1653	-1685	635	8	635	317	292	2 1	-58
38	B20	-873	-155	-1177	-157	-1632	-1990	-2508	-16 3	-1183	789	868	-1 10	-1599	-1599	-161	-1677	-1698	635	8 7	533	316	291	2 1	-59
39	B21	869	-15 1	-1161	-1537	-159	-195	-2 68	-1617	-1162	8 0	853	-1372	-1555	-15 8	-1590	-1661	-168	-635	-8	-635	-317	-292	-2 1	-58
0	B22	868	-1552	-1172	-1566	-1623	-1957	-2 73	-1632	-1179	783	86	-1 03	-1595	-160	-1609	-1673	-169	-635	-750	-636	-317	-292	-2 1	-58
1	B23	871	-1552	-1171	-1559	-1609	-1923	-2 6	-1625	-1178	853	865	-1 06	-1591	-1598	-1609	-1670	-169	-635	-8 6	-636	-316	-291	-2 1	-58
2	B2	861	-155	-1170	-15 5	-1586	-1885	-2 82	-1612	-1176	851	86	-1393	-1578	-1576	-1609	-1671	-1698	63	-8 5	-636	-317	-291	-2 1	-59
3	B25	861	-155	-1173	-1569	-1622	-19 7	-2 77	-1632	-1180	789	867	-1 1	-1602	-1612	-1613	-1668	-1696	635	-8 6	-636	-316	-291	-2 1	-59
	B26	872	-155	-1176	-1578	-163	-1 91	-2 69	-1637	-118	858	869	-1 23	-1612	-1625	-1615	-1669	-1697	635	-838	-533	-316	-292	-2 1	-58
5	B27	871	-1556	-1176	-1582	-1638	-1 99	-2 99	-16 2	-1185	859	865	-1 26	-1616	-1629	-1618	-1678	-1700	63	8 6	636	-316	-291	-2 1	-59
6	B28	871	-155	-1173	-1571	-1627	-1 85	-2 77	-1627	-1181	857	867	990	-1606	-1619	-161	-1676	-1698	63	8 5	636	-268	-291	-2 1	-59
8	B30	878	-156	-1191	-1606	-1663	-1987	-2510	-1660	-1202	866	880	-1 50	-1629	-16 5	-1628	-1679	-1709	636	852	6 0	317	292	-2 2	-58
9	B31	873	-1555	-1176	-1578	-1635	-1963	-2 88	-16 0	-1183	856	868	-1 25	-1600	-1617	-1611	-1672	-1697	635	8 8	637	317	292	-2 1	-58
50	B32	882	-1573	-1186	-1585	-1622	-1952	-2 88	-16 3	-1186	738	82	-1183	-1627	-1588	-1628	-169	-1717	637	856	6 2	316	291	-2 2	-59
51	B33	8	-1 31	-113	-1 71	-1526	-1871	-2 00	-1559	-1128	7 7	839	-1322	-1 75	-1022	269	-1 8	-1561	619	821	623	315	285	236	-59
52	B3	8 6	-1 32	-1129	-1010	-1517	-1861	-2391	-1552	-1123	820	833	-131	-1 66	-1 95	-1 80	-1 91	-1558	621	822	62	316	288	239	-59
53	B35	P CASE DIVERGED																							
5	B35a	270	- 3	-12 5	-1828	-180	-2089	-25 6	-1801	-11 5	956	-1003	-1539	-1637	-1687	866	760	602	390	29	239	1	119	175	- 5
56	B35g	537	-1075	-1 80	-219	-1777	-239	-27 6	-1930	-1523	-1086	-1137	-19 9	-2270	-225	60	-158	-1 2	535	58	- 39	228	19	212	- 8
58	B36	P CASE DIVERGED																							
59	B36a	975	-1597	75	8	933	-1225	-1661	-1000	61	222	513	820	87	917	-115	-1 72	-17 5	295	-1032	735	286	2 2	198	-52
60	B36g	999	-160	779	858	959	-1255	-1700	-1029	639	260	527	830	900	9 0	-1162	-1 88	-1752	- 55	-1052	7	292	258	186	-53
61	B37	750	-1528	-1077	-1523	-1588	-1935	-2 63	-1601	-1112	851	8 8	-1385	-1559	-1578	-1589	-1655	-1671	623	566	562	309	280	238	-58
62	B38	881	-1620	-1233	-1660	-1710	-203	-21 8	-1697	-121	87	896	-1 85	-1692	-1702	-1657	-1725	-1762	-59	-8 2	-6	-282	-2	-227	-53
63	B39	856	-1570	-11 8	-1556	-1618	-1962	-2 9	-1626	-1036	787	855	-1397	-1591	-1608	-1623	-1698	-1725	-63	-827	-39	-317	-291	-237	-59
6	B 0	- 53	-1296	6 5	-1007	-1105	-1 35	-192	-1168	685	660	607	978	-10	-1095	-1278	-1 3	-1538	399	- 1	-380	-270	-229	-198	-33
65	B 0a	615	-1522	88	-1295	-137	-1723	-220	-1 23	930	660	7 2	-1199	-1328	-1357	-1 77	-1622	-1727	- 50	599	- 92	-291	-250	-221	-52
66	B 1	875	-1537	-1158	-1 65	-1509	-1687	-1783	-1 7	-11 7	8 0	856	-135	-1527	-1013	363	-1658	-1679	637	850	-639	-318	-29	-2 2	-57
67	Minimum Margins; > >	**270**	**434**	**334**	**658**	**681**	**911**	**1292**	**790**	**305**	**222**	**288**	**539**	**570**	**626**	**269**	**88**	**602**	**295**	**294**	**39**	**144**	**119**	**175**	**33**
68	N-1 Criteria > >					500	500	500	500	100			250		250										
73	C02	511	919	- 85	680	755	-1012	-1 01	826	- 50	2	359	65	7	7 7	873	988	-1065	562	521	- 5	322	-288	-207	-51
7	C02a	622	-1219	681	-1011	-1102	-1 19	-1873	-116	62	590	530	957	-1098	-1097	-1191	-131	-1379	572	613	50	311	27	-220	-57
75	C03	- 00	668	371	- 55	- 96	675	9 5	568	371	266	252	- 16	- 65	- 76	659	701	776	523	- 15	365	1 1	27	- 7	- 9
76	C03a	553	-1030	597	795	8 3	-1078	-1512	939	576	386	35	676	80	805	9 0	-1081	-1180	553	550	- 63	309	266	207	-56
77	C03b	596	-1239	683	971	-1011	-1307	-17 9	-1119	665	- 5	- 07	812	996	980	-11 7	-1316	-1 18	553	586	- 83	293	2	21	-62
78	C03c	632	-1309	7 8	-1151	-1227	-15 3	-1602	-1288	730	583	- 9	-1025	-1200	-1193	-1301	-1 33	-1 91	-563	-61	-506	-298	-25	-219	-61
79	C0	- 00	668	371	- 55	- 96	675	9 5	568	371	266	252	- 16	- 65	- 76	58	701	776	-523	- 15	-365	-1 1	-27	- 7	- 9
80	C0 a	553	-1030	597	795	827	-1081	-1512	939	576	386	35	676	80	805	9 0	-1081	-1180	-553	-550	- 63	-309	-266	-207	-56
81	C0 b	596	-1239	671	95	-1030	-1301	-1751	-1120	665	- 5	- 07	823	996	989	-1162	-130	-1 20	-553	-585	- 83	-293	-2	-21	-62
82	C0 c	621	-1328	7 8	-1151	-1227	-15 3	-1996	-1288	730	583	- 9	-1027	-1191	-1189	-1297	-1 20	-1 92	-563	-620	-506	-298	-25	-219	-61
83	C05	879	-1552	-1182	-1581	-1636	-19 2	-2 67	-1552	-1185	798	869	-1 29	-1572	-1590	-1599	-166	-1696	-638	-85	-6 1	-318	-29	-2 2	-58
8	C05a	8 3	-1212	-11 2	-16 3	-1698	-1999	-2350	-1691	-1205	898	898	-1215	-1060	-1391	-1700	-175	-1813	-621	-817	-620	-302	-270	-2 0	-62
85	C06	778	-1158	-1070	-1321	-138	-1727	-2222	-1107	-1055	778	799	-1180	-1290	-1337	997	-11 2	-1269	-579	-762	-593	-312	-272	-22	-59
87	C07	865	-1 77	-1160	-1523	-1578	-1921	-2 51	-1600	-1155	839	850	-1369	-15 0	937	-1391	-1 62	-1607	-631	-8 0	-63	-317	-291	-117	-59
88	C08	88	-1570	-1178	-1562	-158	-1902	-2	-162	-1173	707	806	-1129	-1591	-1521	-1603	-1681	-1717	-638	-859	-6 3	-317	-292	-2 2	-58
90	C09	871	-15 5	-1168	-1561	-1617	-19 3	-2 68	-1626	-1170	8 8	855	-1 08	-1582	-1597	362	-1657	-1687	-63	-8 5	-518	-316	-290	-2 0	-59
91	C10	875	-1556	-118	-1589	-16	-1967	-2 91	-16 6	-1189	859	867	-1 30	-1612	-1625	-1592	-1670	-1699	635	-8 0	-638	-316	-290	-2 1	-59
92	C11	800	-12 3	-107	-13 3	-1393	-1738	-2269	-1 55	-1058	779	71	-1200	-1318	-1360	-1193	-1253	-1368	595	782	603	31	-280	-232	-59
93	C12	8 2	-1 19	-1120	-1 3	-1 97	-13	-2370	-1536	-1108	812	819	-1295	-1 6	-1 73	-1 1	-1 72	-15 5	619	819	622	315	286	237	-59
9	C13	869	-1516	-11 0	-1 68	-1521	-1859	-2350	-1569	-1129	813	830	-1295	-1 66	-1 32	-15 5	-1625	-1655	637	8	635	318	295	2 2	-57
95	C1	870	-15 1	-1162	-1538	-159	-1953	-20 2	-1617	-1163	8 1	85	-1373	-1556	-15 7	-1591	-1660	-1685	635	8 5	636	317	292	2 1	-58
96	C15	869	-1536	-1157	-1525	-1580	-1 68	-2 21	-160	-1157	83	8 9	-1357	-15 2	-1536	-1582	-1650	-1680	635	8	635	317	293	2 1	-58
97	C16	868	-1536	-11 8	-1055	-1580	-19 0	-2 5	-1602	-11 1	795	827	-126	-152	-1536	-1568	-16 7	-1679	63	8 3	635	316	291	2 1	-58
98	C18	871	-1551	-116	-1553	-1618	-1977	-2 9	-1263	-1163	807	8 1	-1295	-1567	-1588	365	-1668	-1692	63	8 6	636	316	291	2 1	-59
99	C19	869	-15 6	-1159	-15 5	-1610	-19 3	-2 59	-1618	-1157	802	836	-1285	-1562	-1595	-1593	-1663	-1688	63	8	635	316	291	2 1	-58
100	C20	869	-153	-1150	-1 9	-1551	-197	-2 72	-1603	-11 3	818	838	-1306	-1 86	-1 7	-1567	-16 5	-1677	635	8	635	317	292	2 1	-58
101	C21	869	-1536	-1156	-1518	-157	-1932	-2 33	-1605	-115	830	839	-13	-1529	-1516	-1579	-1651	-1679	635	8	635	317	293	2 1	-58
102	C23	868	969	-1113	-1396	-1322	-1737	-2299	-15	-1112	708	822	-1276	-1 35	-1 19	-1532	-1613	-16 3	637	8	635	318	296	2 2	-57
103	C2	775	-138	89	-12	-1317	-1659	-2173	-1376	76	261	398	-1177	-1296	-1296	-1366	-1 80	-1525	616	758	591	321	292	23	-56
10	C2 a	793	-1571	986	-1511	-1597	-1936	-2 33	-159	871	312	- 72	-1 0	-1597	-1593	-1612	-1686	-1737	607	771	597	306	272	236	-61
105	C25	775	-138	89	-12	-1317	-1659	-2173	-1376	76	261	398	-1177	-1296	-1296	-1366	-1 80	-1525	616	758	591	321	292	23	-56
106	C25a	793	-1571	986	-1511	-1597	-1936	-2 33	-1599	871	312	- 72	-1101	-1597	-1593	-1612	-1693	-1737	607	771	597	306	272	236	-61
111	C28x	729	-1220	-1016	-1 03	-1 70	-1319	-23 0	-1511	-1038	800	798	-1275	-1 26	-1 51	-1395	-1388	-1313	600	710	561	302	261	231	-19
112	Minimum Margins > >	**400**	**668**	**371**	**455**	**496**	**675**	**945**	**568**	**371**	**244**	**252**	**416**	**465**	**476**	**362**	**701**	**776**	**523**	**415**	**365**	**141**	**244**	**47**	**19**
113	N-2 Criteria > >					00	00	00	00	100			200		200										

INE #	CON INGENCY#	Voltage Deviation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Vol age	COMMEN
3						**Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs**				
						SIDNEY 115 / 230 #1	107 55%			
5						CTTNWD N - KETTLECK 115 #1	106 80%			
6						MONUMENT - FLYHORSE 115 #1	102 88%			
7						KETTLECK - FLYHORSE 115 #1	102 68%			
8						KELKER W - ROCKISLD 115 #1	100 98%			
9						BONANZA - MONA 3 5 #1	100 63%			
11						**CON INGENCY LOADINGS**				
12	B01	1	3M KNOLL 3 5	5.1	1	BRIDGER - BR DGE&A 3 5 #1	113. 5%	-	None	2087.53 Amps
13	B01a	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	102.10%	-	None	1878.66 Amps
1	B01g	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	101 81%	-	None	
15	B02	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	82.60%	-	None	
16	B03	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	99.28%	-	None	
17	B0	2	BIGGRASS 69	5.5	0	PALISADE - ROCKSPGS 230 #1	97.5 %	1	PTRSNFUR 69 @ .893	
18	B0 a	8	PTRSNFRG 69	5.9	0	PALISADE - ROCKSPGS 230 #1	91.72%	1	PTRSNFUR 69 @ .883	
19	B0 b	15	PTRSNFRG 69	7.6	0	HARDIN 230 / 115 #1	93.05%	1	PTRSNFUR 69 @ .868	
20		0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	97.52%	1	PTRSNFUR 69 @ .897	
21	B0 c	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	97.1 %	-	None	
22	B05	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
23	B06	0	- - -	- - -	1	GRACE - SODA 138 #1	119. 8%	-	None	Mit gated in B06a
2	B06a	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	89 35%	-	None	
25	B07	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	87.73%	-	None	
26	B08	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
27	B09	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	87 07%	-	None	
28	B10	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
29	B11	0	- - -	- - -	0	GRACE - SODA 138 #1	76.79%	-	None	
30	B12	0	- - -	- - -	0	LOCUST - MORA 138 #1	82. %	-	None	
32	B1	0	- - -	- - -	0	LOCUST - MORA 138 #1	82 57%	-	None	
33	B15	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
3	B16	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	75.10%	-	None	
35	B17	0	- - -	- - -	0	LOCUST - MORA 138 #1	88. 3%	-	None	
36	B18	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	75 20%	-	None	
37	B19	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
38	B20	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
39	B21	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
0	B22	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79.57%	-	None	
1	B23	0	- - -	- - -	0	LOCUST - MORA 138 #1	86.89%	-	None	
2	B2	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
3	B25	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
	B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	89.7 %	-	None	
5	B27	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
6	B28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.39%	-	None	
8	B30	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.15%	-	None	
9	B31	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
50	B32	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	88. %	-	None	
51	B33	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	87 66%	-	None	
52	B3	0	- - -	- - -	0	GRACE - SODA 138 #1	77.10%	-	None	
53	B35				P CASE DIVERGED					
5	B35a	82	RIVERTON 3 .5	11 2	6	M NERS 230 0 PLATTE 230 0 #1	10 6 %	1	H LLTP1 115 @ 89	
55						PLATTE - LATHAM 230 #1	88 81%			
56	B35g	1	WYOPO 3 .5	5.2	2	M NERS - PLATTE 230 #1	100. 7%	-	None	Based on ERate=521 MVA
57						PLATTE - LATHAM 230 #1	8 .15%			Based on ERate=521 MVA
58	B36				P CASE DIVERGED					
59	B36a	10	BONANZA 3 5	6.2	0	PALISADE - ROCKSPGS 230 #1	99 05%	-	None	
60	B36g	10	BONANZA 3 5	6	0	PALISADE - ROCKSPGS 230 #1	98 93%	-	None	
61	B37	0	- - -	- - -	2	AEOLUS 500 / 230 #2	101 87%	-	None	Spec Transformers about 10% hig
62	B38	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	93.98%	-	None	
63	B39	0	- - -	- - -	0	M NERS 230 0 PLATTE 230 0 #1	79.5 %	-	None	
6	B 0	12	MOONLAK1 69	6.7	10	BONANZA - VERNAL 138 #1	133. 2%	-	None	
65	B 0a	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	9 .80%	-	None	
66	B 1	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
73	C02	0	3M KNOLL 3 5	6.8	6	BRIDGER - BR DGE&A 3 5 #1	125 7 %	-	None	2313.59 Amps
7	C02a	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	110 35%	-	None	2030.52 Amps
75	C03	0	BIGGRASS 69	7.0	3	BRIDGER - ROCKSPGS 230 #1	118 85%	1	PTRSNFUR 69 @ .876	90 pu voltage v olat on
76	C03a	0	BIGGRASS 69	7.1	2	BRIDGER - ROCKSPGS 230 #1	102 92%	1	PTRSNFUR 69 @ .872	Mit gated with RAS
77	C03b	0	PTRSNFRG 69	8.2	0	PALISADE - ROCKSPGS 230 #1	95 20%	2	PTRSNFUR 69 @ .862	
78	C03c	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	9 .61%	-	None	w/ P18 Caps & Load Drop
79	C0	0	BIGGRASS 69	7.0	3	BRIDGER - ROCKSPGS 230 #1	118 85%	1	PTRSNFUR 69 @ .876	90 pu voltage v olat on
80	C0 a	0	BIGGRASS 69	7.1	2	BRIDGER - ROCKSPGS 230 #1	102 92%	1	PTRSNFUR 69 @ .872	Mit gated with RAS
81	C0 b	0	PTRSNFRG 69	8 2	0	PALISADE - ROCKSPGS 230 #1	95.20%	2	PTRSNFUR 69 @ .862	
82	C0 c	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	9 .61%	-	None	OK w/ P18 Caps & Load Drop
83	C05	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
8	C05a	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	90.31%	-	None	
85	C06	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	9 .35%	-	None	
86	C06a	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	97.19%	-	None	
87	C07	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.17%	-	None	
88	C08	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	90. %	-	None	
90	C09	0	- - -	- - -	0	GRACE - SODA 138 #1	79.91%	-	None	
91	C10	0	- - -	- - -	0	GRACE - SODA 138 #1	79.82%	-	None	
92	C11	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	90.28%	-	None	
93	C12	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	86 91%	-	None	
9	C13	0	- - -	- - -	0	HUNT 138 / 230 #2	76 88%	-	None	
95	C1	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
96	C15	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	79 6 %	-	None	
97	C16	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
98	C18	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
99	C19	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	79 61%	-	None	
100	C20	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.16%	-	None	
101	C21	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	79. %	-	None	
102	C23	0	- - -	- - -	0	MIDPO NT 138 / 230 #1	7 28%	-	None	
103	C2	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	98 29%	-	None	
10	C2 a	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	89.15%	-	None	
105	C25	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	98 29%	-	None	
106	C25a	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	89.15%	-	None	
111	C28x	0	YORKCANY 115	5.2	1	SPR NGER - GLADSTON 115 #1	117. 2%	-	None	
11						**Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs**				
115						SIDNEY 115 / 230 #1	108 55%			
116						CTTNWD N - KETTLECK 115 #1	103 39%			
117						**CON INGENCY LOADINGS**				
118	B01	1	3M KNOLL 3 5	5.2	1	BRIDGER - BR DGE&A 3 5 #1	113 91%	-	None	2095.97 Amps
119	B01a	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	102 63%	-	None	1888.29 Amps
120	B01g	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	102 3 %	-	None	
121	B35				P CASE DIVERGED					
122	B35a	68	GREATDIV 3 .5	10 2		MINERS 230 0 PLATTE 230 0 #1	103 59%	-	None	
123						PLATTE - LATHAM 230 #1	87.76%			
12	B35g	0	- - -	- - -	0	MINERS 230 0 PLATTE 230 0 #1	99.60%	-	None	Based on ERate=521 MVA
125						PLATTE - LATHAM 230 #1	83.55%			
127						**Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs**				
128						CTTNWD N - KETTLECK 115 #1	107. 2%			
129						SIDNEY 115 / 230 #1	107 35%			
130						MONUMENT - FLYHORSE 115 #1	103 96%			
131						KETTLECK - FLYHORSE 115 #1	103 61%			
132						KELKER W - ROCKISLD 115 #1	101 33%			
133						BONANZA - MONA 3 5 #1	100 70%			
13						**CON INGENCY LOADINGS**				
135	B01	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	111 26%	-	None	
136	B01a	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	100.10%	1	PTRSNFUR 69 @ .89	
137	B01g	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	99.69%	-	None	
138	B35				P CASE DIVERGED					
139	B35a	51	GREATDIV 3 .5	9.3	2	MINERS 230 0 PLATTE 230 0 #1	99.77%	1	PTRSNFUR 69 @ .895	
1 0						PLATTE - LATHAM 230 #1	83.51%			
1 1	B35g	0	- - -	- - -	1	MINERS 230 0 PLATTE 230 0 #1	95.57%	-	None	
1 2						DILLON S 161 / 69 #1	97.07%	-	None	

1) Vol age V o at ons > 5% for Level B & > 10% for Level C
2) Excluding Ser es Cap Buses (Line S de) and Transformer tertiary buses.

Appendix 3-3 - - - Post-transient Results For Aeolus West vs. Tot 1a

BASE CASE / P PA H FLOWS — Gen Drop

INE #	CON INGENCY#	CON NGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Br dger West 500	Br dger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana daho P18)	ot 4a	Bonanza West	ot 1a (30)	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP onder	RedB H A len (ot 2C)	Pinto 4Corners 2B1)	Sigurd G enC (2B 2)	daho Area System osses	Pace Area System osses	Bridger Gen Trips	Aeolus Gen Trp
3																													
		egwstg1 8h6 aw1a 2672 650 sav	1592	2672	1676	2388	-1 82	1 00	3 6	653	386	128	-219	2099	779	650	1 1	2996	2 73	65	2103	83	50	371	209	217	702		
5																													
6																													
7																													
8																													
9		Level "B" Contingencies																											
10	B01	An icline – Populus 500 kV Line	197	2099	0	3367	-1053	10 6	25	737	70	27	-22	1896	816	676	106	2996	2316	522	2103	108	513	372	209	3 3	731	0	0
11	B01a	An icline – Populus 500 kV Line Drop Br dger G1	1906	2267	0	302	-1031	799	391	701	-160	67	-2 3	1996	819	703	91	2996	2222	85	2103	97	69	3 1	198	295	715	575	0
12	B01g	An icline – Populus 500 kV Line JBG1 KinpCap	1902	2273	0	3032	-1037	803	390	700	-156	68	-2 3	1998	818	702	92	2996	222	86	2103	97	70	3 2	198	293	713	575	0
13																													
1	B02	An icline 500 / 3 5 kV Transformer	1608	2653	175	2303	-1 78	1 0	339	6 5	390	128	-220	2096	778	652	1 1	2996	2 76	652	2103	83	505	371	209	209	70	0	0
15	B03	Bridger – Populus 3 5 kV Line	1657	2577	1882	201	-1355	13	391	700	338	110	-220	2066	796	653	13	2996	2 8	637	2103	86	503	369	208	221	725	0	0
16	B0	Bridger – 3Milekno l 3 5 kV Line	696	25 9	9 7	867	257	335	27	738	332	96	2 6	20	802	656	3	2996	2 36	62	2 03	87	99	366	207	238	7 0	0	0
17	B0 a	Bridger – 3Milekno l 3 5 kV Line	1629	2679	1796	16 2	-1238	106	391	700	81	13	-261	2139	806	685	115	2996	2337	58	2103	76	56	33	196	206	72	575	0
18	B0 b	Bridger – 3Milekno l 3 5 kV Line	1571	282	166	1 09	-1207	777	356	663	-186	168	-275	2226	810	716	97	2996	2233	5 1	2103	65	10	300	183	18	717	1150	0
19	B0 c	Bridger – 3Milekno l 3 5 kV Line																											
20	B05	Bridger 3 5 / 230 kV Trans ormer	159	2670	1675	2385	-1 80	1399	3 7	65	385	128	-219	2099	780	650	1 1	2996	2 72	652	2103	83	505	371	209	217	702	0	0
21	B06	3Mi ekno l – Goshen 3 5 kV Line	1616	263	1763	2239	-1 60	1372	360	668	36	117	-232	208	785	650	136	2996	2 52	639	2103	86	506	372	210	213	726	0	0
22	B06a	3Mi ekno l – Goshen 3 5 kV Line Bypas 3MK Caps	1635	2605	1802	2636	-1 03	137	379	687	366	112	-23	2073	789	651	136	2996	2 52	638	2103	87	506	371	209	213	718	0	0
23	B07	Kinport – Goshen 3 5 kV Line	1591	2675	1670	2397	-1 83	1 0	3 5	652	390	129	-222	2101	779	651	1 2	2996	2 72	65	2103	82	50	371	209	218	702	0	0
2	B08	Kinport – Borah 3 5 kV Line	159	2671	1676	2386	-1 80	1399	3 6	653	386	128	-219	2099	780	651	1 1	2996	2 72	653	2103	83	50	371	209	217	702	0	0
25	B09	Populus – Borah 500 kV Line	1613	26 2	1595	2 31	-1 67	1372	351	658	367	122	-220	2088	781	651	132	2996	2 58	6 2	2103	88	507	372	210	229	701	0	0
26	B10	Borah 500 / 3 5 kV Transformer	1598	2667	1652	2 05	-1 65	1 11	3 8	655	398	130	-222	2101	781	652	1 2	2996	2 78	659	2103	81	501	369	209	219	701	0	0
27	B11	Borah 3 5 / 230 kV Transformer	59	267	668	2392	75	06	3 9	656	39	29	22	2 00	780	65	2	2996	2 72	655	2 03	82	50	370	209	2 9	702	0	0
28	B12	Populus – Cedar Hi l 500 kV Line	1605	2639	1632	239	-1516	1317	3 8	655	300	113	-208	2077	776	6 3	1 3	2996	2 23	612	2103	91	521	382	213	222	701	0	0
30	B1	Cedar H ll – Hemingway 500 kV Line	608	263	626	2395	5 2	3 5	3 9	656	297	2	208	2076	777	6 3	3	2996	2 2	6	2 03	92	52	382	2 3	223	70	0	0
31	B15	M dpoint – Hemingway 500 kV Line	1598	2668	1668	2389	-1 68	1 08	3 7	65	01	130	-220	2100	781	652	13	2996	2 80	660	2103	8	501	369	208	219	703	0	0
32	B16	Borah – Midpoint 500 kV Line	1601	2653	1658	238	-1500	1355	3 7	65	3 7	120	-213	2088	778	6 7	133	2996	2 8	631	2103	91	512	376	211	222	702	0	0
33	B17	M dpoint 500 / 3 5 kV Trans ormer	1597	2672	166	2398	-1 72	1 10	3 7	65	21	132	-222	2103	781	653	113	2996	2 89	663	2103	91	99	368	208	225	702	0	0
3	B18	M dpoint 3 5 / 230 kV Trans ormer	1593	2671	1675	2387	-1 83	1398	3 6	653	382	128	-218	2099	779	650	1 3	2996	2 70	651	2103	82	505	371	210	217	702	0	0
35	B19	Borah – Adelaide #2 3 5 kV Line	1595	2666	1675	2381	-1 90	1383	3 6	653	37	126	-216	2096	779	6 9	135	2996	2 6	6 6	2103	87	507	373	210	218	702	0	0
36	B20	Adelaide – M dpoint #2 3 5 kV Line	159	2670	1676	2385	-1 8	1395	3 6	653	383	128	-218	2099	779	650	1 0	2996	2 71	651	2103	8	505	372	210	217	702	0	0
37	B21	Borah – Adelaide – Midpoint #1 3 5 kV Line	1595	2666	1676	2381	-1 90	138	3 6	653	375	126	-217	2096	779	6 9	136	2996	2 65	6 6	2103	87	507	373	210	218	702	0	0
38	B22	Borah – Hunt 230 kV Line	159	2669	1676	238	-1 87	1391	3 6	653	379	127	-217	2098	779	650	139	2996	2 67	6 9	2103	85	506	372	210	218	702	0	0
39	B23	M dpoint – Boise Bench #3 230 kV Line	159	2669	1675	2386	-1 8	139	3 6	653	379	127	-218	2098	779	650	1 3	2996	2 67	650	2103	83	506	372	210	218	702	0	0
0	B2	M dpoint – Ra tle Snake 230 kV Line	159	2671	1675	2387	-1 82	1399	3 6	653	385	128	-219	2099	779	650	1 2	2996	2 72	652	2103	83	505	371	209	217	702	0	0
1	B25	M dpoint – Dram 230 kV Line	59	2670	675	2386	83	397	3 6	653	382	28	2 8	2099	779	650	2	2996	2 69	65	2 03	83	505	37	2 0	2 7	702	0	0
2	B26	Rat le Snake – Boise Bench 230 kV Line	159	2669	1675	2386	-1 8	139	3 6	653	379	127	-218	2098	779	650	1 3	2996	2 6	650	2103	83	506	372	210	221	702	0	0
3	B27	Dram – Bo se Bench 230 kV Line	159	2671	1675	2387	-1 81	1 00	3 6	653	387	129	-219	2100	780	650	1 1	2996	2 73	653	2103	83	50	371	209	217	702	0	0
	B28	Hemingway 500/230 kV Transformer	159	2671	167	2388	-1 80	1 00	3 6	653	388	128	-219	2099	780	651	1 0	2996	2 72	65	2103	83	50	371	209	218	702	0	0
6	B30	Populus – Borah #1 3 5 kV Line	1591	2673	1682	2383	-1 91	1391	3 6	653	380	127	-219	2098	779	6 9	139	2996	2 67	6 8	2103	85	507	372	210	218	701	0	0
7	B31	Populus – Borah #2 3 5 kV Line	1592	2671	1680	2382	-1 90	1390	3 6	653	380	127	-219	2098	779	6 9	139	2996	2 67	6 8	2103	85	507	372	210	217	702	0	0
8	B32	Populus – Kinport 3 5 kV Line	1589	2676	1672	2396	-1 9	1395	3 6	653	38	127	-22	2099	778	6 9	139	2996	2 65	6 8	2103	85	507	373	210	220	701	0	0
9	B33	Populus – Ben Lomond #3 3 5 kV Line	16 0	2621	1636	23 5	-1361	1 1	367	675	18	133	-217	2096	792	661	151	2996	2 99	68	2103	71	88	359	205	215	712	0	0
50	B3	Populus – Terminal 3 5 kV Line	163	2626	16 5	2356	-1386	1 35	356	663	13	131	-217	2095	791	658	1 9	2996	2 97	678	2103	73	91	361	206	216	707	0	0
51	B35	Aeolus – Anticline 500 kV Line																											
52	B35a	Aeolus – Anticline 500 kV Line	2181	1226	755	1963	-915	736	293	599	-21	22	-262	18 0	806	75	8	2996	2197	63	2103	99	62	33	195	187	797	0	600
53																													
5	B35g	Aeolus – Anticline 500 kV Line	2219	12 3	761	1968	-89	790	298	603	-162	2	-283	1893	80	7 5	86	2996	2201	6	2103	103	76	3 3	200	18	775	0	600
55																													
56	B36	Aeolus – Mona 500 kV Line																											
57	B36a	Aeolus – Mona 500 kV Line	0	35 7	2071	2677	-2330	1203	22	733	165	103	-239	1970	908	772	169	2996	2 96	7 1	2103	-3	33	2 5	161	253	730	0	600
58	B36g	Aeolus – Mona 500 kV Line	0	3553	2070	2677	-2327	1207	2	736	169	108	-238	1977	907	771	169	2996	2 96	7 1	2103	-3	335	2 6	161	253	729	0	600
59	B37	Aeolus 500 / 230 kV Transformer	1579	2661	1665	2386	-1 81	1390	3 7	65	377	120	-220	2076	785	658	1 1	2996	2 69	651	2103	82	503	369	209	217	701	0	0
60	B38	Aeolus – Windstar 230 kV Line	1533	2588	162	2363	-1 79	1339	3 3	650	329	83	-225	1968	80	690	138	2996	2 5	6 0	2103	80	93	361	206	21	711	0	0
61	B39	Aeolus – Freezeout 230 kV Line	1572	2698	1662	2 06	-1 87	1399	35	661	385	131	-218	2111	781	6 6	1 2	2996	2 71	65	2103	82	50	370	209	219	710	0	0
62	B 0	Bonanza –Mona 3 5kV Line	17 0	270	1697	2 73	-1716	1271	39	70	255	87	-229	229	1 9	183	1	2996	2398	58	2103	55	29	299	18	228	759	0	0
63	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza P an	1727	2667	1655	2 12	-1750	1151	373	682	1 3	13	-236	2232	106	87	139	2996	2386	618	2103	7	13	297	182	222	707	0	0
6	B 1	Hemingway – Summer Lake 500kV line	1600	2651	1659	2380	-1515	1338	3 7	65	309	120	-212	208	776	6	156	2996	2 23	616	2103	86	520	381	213	211	702	0	0
65																													
66																												N-1 Cr ter a; > >	
67																													
68		Level "C" Contingencies																											
71	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1761	2 00	2225	1365	-11 0	1238	66	780	2	68	-222	1989	82	657	122	2996	2 11	601	2103	91	96	362	206	209	787	0	0
72	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1690	2582	2055	1226	-1139	991	22	733	15	11	-2 0	2100	823	68	108	2996	2318	566	2103	79	55	333	195	186	751	575	0
73	C03	Bridger – 3MileKnoll B idger – Populus #1 3 5 kV line	1792	23 1	2236	1238	-10	123	501	818	2 3	9	-256	1958	831	661	119	2996	2396	589	2103	91	92	359	20	231	793	0	0
7	C03a	Bridger – 3MileKnoll B idger – Populus #1 3 5 kV line	1721	2529	208	1092	-10 8	989	58	771	16	99	-269	2076	828	687	105	2996	2306	557	2103	80	51	330	19	201	761	575	0
75	C03b	Bridger – 3MileKnoll B idger – Populus #1 3 5 kV line	1650	2705	1918	9 1	-10 6	723	1	725	-231	1	-281	2182	828	716	90	2996	2212	517	2103	69	07	297	181	180	7 2	1150	0
76	C03c	Bridger–3MK Bridge-Pop#1 3 5 RAS; 2JBG Path18 C	16 9	2699	1918	937	-1079	790	12	722	-171	1 3	-27	2175	82	709	95	2996	2237	533	2103	70	18	305	185	176	732	1150	0
77	C0	Bridger – 3MileKnoll B idger – Populus #2 3 5 kV line	1792	23 1	2236	1238	-10	123	501	818	2 3	9	-256	1958	831	661	119	2996	2396	589	2103	91	92	359	20	231	793	0	0
78	C0 a	Bridger – 3MileKnoll B idger – Populus #2 3 5 kV line	1721	2529	208	1092	-10 8	989	58	771	16	99	-269	2076	828	687	105	2996	2306	557	2103	80	51	330	19	201	761	575	0
79	C0 b	Bridger – 3MileKnoll B idger – Populus #2 3 5 kV line	1650	2705	1918	9 1	-10 6	723	1	725	-231	1	-281	2182	828	716	90	2996	2212	517	2103	69	07	297	181	180	7 2	1150	0
80	C0 c	Bridger–3MK Bridge-Pop#2 3 5 RAS; 2JBG Path18 C	16 9	2699	1918	937	-1079	790	12	722	-171	1 3	-27	2175	82	709	95	2996	2237	533	2103	70	18	305	185	176	732	1150	0
81	C05	Borah – Populus 3 5 kV DLO	589	267	692	2370	5	368	3 7	653	36	23	220	209	777	6 7	33	2996	2 53	637	2 03	90	5 2	376	2	2 8	702	0	0
82	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	15 0	2803	1582	2089	-1 55	1086	318	62	102	155	-239	2177	786	679	116	2996	2350	593	2103	79	66	3 3	199	19	69	575	0
83	C06	Populus – Ben Lomond 3 5 kV DLO	736	2520	558	226		530	07	7 7	8	2	2	2090	8 5	680	72	2996	256	7 6	2 03	5	52	333	96	2	738	0	0
8	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3M	1757	2 87	1615	21 3	-1068	1526	2	735	82	13	-220	2076	819	680	170	2996	2560	7 1	2103	6	52	332	196	205	739	0	0
85	C07	Ben Lomond – Terminal 3 5 kV DLO	1602	2662	1672	2383	-1 67	1 07	3	651	392	129	-218	2098	782	652	1 3	2996	2 78	657	2103	81	502	369	209	217	702	0	0
86	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1586	2675	1676	2391	-1510	1378	3 6	653	372	12	-226	2096	776	6 7	13	2996	2 5	6 0	2103	89	511	375	211	221	702	0	0
88	C09	Populus – Borah #2 3 5 kV Treasureton – Brady 230	159	2669	1673	2381	-1 79	139	351	658	383	128	-219	2098	779	650	1 0	2996	2 69	651	2103	8	505	371	210	217	703	0	0
89	C10	Populus – Borah #1 3 5 kV Treasu eton – Brady 230	1593	2671	1675	2382	-1 80	1395	351	658	383	128	-219	2099	779	650	1 0	2996	2 69	651	2103	8	505	372	210	218	703	0	0
90	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV	1703	255	1590	2297	-1212	1 98	383	691	61	137	-215	2090	808	672	16	2996	25 1	721	2103	55	66	3 3	199	213	721	0	0
91	C12	Populus – Terminal 3 5 kV Treasure on – Brady 230	1638	2623	1637	235	-1370	1 1	362	669	18	132	-217	2096	792	660	151	2996	2500	682	2103	72	89	360	205	215	708	0	0
92	C13	Borah – Adelaide #2 Borah–ADT–M dpoint #1 3 5 kV	1598	265	1678	2366	-1517	1338	3 7	65	3 3	118	-210	2086	778	6 5	119	2996	2 5	625	2103	98	515	378	212	221	703	0	0
93	C1	Borah – Adelaide #2 Midpoint - Adelaide #2 3 5 kV li	1595	2666	1676	2381	-1 91	1383	3 6	653	37	126	-216	2096	779	6 9	135	2996	2 6	6 6	2103	87	507	373	210	218	702	0	0
9	C15	Borah – Ade aide #2 Borah – Hunt 230 kV lines	1596	2663	1677	2377	-1 97	1372	3 6	653	365	12	-21	2093	779	6 8	132	2996	2 57	6 2	2103	89	509	37	210	220	702	0	0
95	C16	Borah – Kinport Borah–Adel–M dpoint #1 3 5 kV line	595	2666	675	238	88	38	3 7	653	375	26	2 7	2096	779	6 9	36	2996	2 6	6 7	2 03	86	507	373	2 0	2 8	702	0	0
96	C18	Borah – Kinport Midpoint – Ade aide #2 3 5 kV lines	159	2670	1676	238	-1 83	1395	3 6	653	383	128	-218	2099	779	650	1 0	2996	2 70	651	2103	8	505	371	209	217	702	0	0
97	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV ines (R	159	2668	1677	2383	-1 85	1391	3 6	653	379	127	-217	2098	779	650	139	2996	2 67	6 9	2103	85	506	372	210	218	702	0	0
98	C20	Borah–Adel–M dpoint #1 M dpoint – Adelaide #2 3 5	1596	266	1677	2378	-1 9	1377	3 6	653	370	125	-215	209	779	6 9	13	2996	2 62	6 3	2103	88	508	37	210	217	702	0	0
99	C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 kV li	1596	2663	1677	2377	-1 97	1372	3 6	653	365	12	-21	2093	779	6 8	132	2996	2 58	6 2	2103	89	509	37	210	219	702	0	0
100	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lin	160	26	1655	2376	-1518	1323	3 8	655	322	115	-209	2081	777	6	123	2996	2 32	616	2103	98	518	380	212	226	703	0	0
101	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	1657	2576	189	2001	-1353	13 2	392	701	336	110	-218	2065	796	652	13	2996	2 8	636	2103	86	503	369	208	221	726	0	0
102	C2 a	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	1592	2733	1757	1787	-1330	107	355	662	87	1 6	-2 1	2158	799	683	119	2996	23 8	593	2103	75	59	337	197	195	709	575	0
103	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines	1657	2576	189	2001	-1353	13 2	392	701	336	110	-218	2065	796	652	13	2996	2 8	636	2103	86	503	369	208	221	726	0	0
10	C25a	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines	1592	2733	1757	1787	-1330	107	355	662	87	1 6	-2 1	2158	799	683	119	2996	23 8	593	2103	75	59	337	197	195	709	575	0
109	C28x	Pa o Verde - Trip 1&2, w/ FACRI	1667	2669	1655	2385	-1665	1221	35	662	212	163	-2 0	21 0	783	639	1 5	2996	3 15	1913	2103	5	636	7	2 8	219	765	0	0
110																													0
111																												N-2 Cr ter a; > >	
112																													0
113		Cut Aeolus West by 100 MW																											0
11		egwstg1 8h6 aw1a 2572 650 sav	1519	2572	1605	788	-1 67	1338	351	658	323	122	-226	2197	788	650	1	2996	2 73	65	2103	86	50	367	208	215	675		0
115																													0
116																													0
117																													0
118																													0
119																													0
120		Level "B" Contingencies																											0
121	B01a	An icline – Populus 500 kV Line Drop Br dger G1	1827	2187	0	2960	-1029	753	393	703	-208	67	-2 9	2108	82	700	9	2996	2228	89	2103	100	69	338	197	287	686	575	0
122	B01g	An icline – Populus 500 kV Line JBG1 KinpCap	1823	2193	0	2967	-1035	757	392	702	-205	68	-250	2110	823	699	95	2996	2229	90	2103	100	70	338	197	285	68	575	0
123	B35	Aeolus – Anticline 500 kV Line																											
12	B35a	Aeolus – Anticline 500 kV Line	2096	1190	713	1970	-912	710	30	610	-2	3	-266	1986	809	7 2	88	2996	2207	70	2103	103	66	335	195	188	7 8	0	600
125																													
126	B35g	Aeolus – Anticline 500 kV Line	2135	119	716	1971	-892	755	306	612	-201	50	-288	2029	808	735	89	2996	2208	69	2103	106	80	3 2	200	186	732	0	600
127																													
128																													
129																													
130		Cut ot 1a by 100 MW																											
131		egwstg1 8h6 aw1a 2672 550 sav	1588	2672	167	2375	-1 82	1388	3 2	6 9	375	135	-220	2095	710	550	1 1	2260	2518	700	2103	83	503	381	213	216	695		
132																													
133																													
13																													
135																													
136		Level "B" Contingencies																											
137	B01a	An icline – Populus 500 kV Line Drop Br dger G1	1900	2266	0	3009	-1028	791	387	697	-167	7	-2	1989	759	611	91	2236	2270	533	2103	98	70	353	202	29	706	575	0
138	B01g	An icline – Populus 500 kV Line JBG1 KinpCap	1896	2273	0	3017	-103	795	387	696	-16	75	-2 5	1991	758	610	92	2236	2271	53	2103	97	70	353	202	292	70	575	0
139	B35	Aeolus – Anticline 500 kV Line																											
1 0	B35a	Aeolus – Anticline 500 kV Line	217	1227	75	1952	-909	732	290	596	-218	31	-263	1832	751	667	8	2233	22 6	513	2103	100	6	3 7	199	187	786	0	600
1 1	B35g	Aeolus – Anticline 500 kV Line	2215	12 2	760	1956	-890	783	29	599	-169	51	-28	1888	7 3	652	86	2239	22 8	513	2103	10	78	355	20	18	765	0	600
1 2																													
1 3																													
1		Cut ot 1a to 250 MW																											
1 5		egwstg1 8h6 aw1a 2672 250 3 sav	152	2672	1675	2378	-1316	1553	283	587	552	126	-215	2161	501	250	128	2227	2928	1112	160	105	50	6	2 6	218	679		
1 6																													
1 7																													
1 8																													
1 9																													
150		Level "B" Contingencies																											
151	B35g	Aeolus – Anticline 500 kV Line	2168	123	758	1959	-712	956	236	539	17	6	-279	1963	533	3 8	72	2206	2661	928	160	126	80	3	239	182	7 2	0	600
152																													
153																													
15		Margin est w/ Aeolus West and ot 1a at 5%																											
155		egwstg1 8h6 aw1a 2806 683 sav	1578	2806	1777	2 28	-1335	1655	3	651	6 8	122	-195	2228	796	683	132	2307	2 2	609	2009	102	50	00	222	220	726		

REAC IVE MARGIN MVAR Gray shaded cells are the minimum marg ns)

INE #	Aeolus 500	Monanx 500	Anticlin 500	Popu us 500	Borah 500	Midpoint 500	Hem nway 500	CedarHil 500	Br dger 345	oshen 345	3 Mi Knoll 345	Kinport 345	Popu us 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	adstone 230
10	-389	-683	-322	-638	-661	-886	-1236	-769	-29	-337	-279	-523	-551	-607	-753	-866	-861	-531	- 35	-363	-253	-253	-197	- 5
11	- 28	-837	-382	-859	-885	-1153	-1575	-999	-389	- 5	-378	-709	-760	-822	-973	-1079	-1060	-5 6	- 60	-375	-2 7	-237	-203	-51
12	- 71	-928	- 31	-1028	-1058	-1360	-1836	-1169	- 53	-5 6	- 6	-857	-918	-991	-1136	-1189	-1167	-561	-50	- 07	-259	-2 1	-210	-51
1	-687	-1 9	-755	-108	-1657	-1965	-2 8	-1627	-10 3	-870	-8 3	-1 0	-1639	-1651	-1613	-1665	-1685	-6 6	-697	-567	-310	-28	-2 1	-58
15	-769	-138	-938	-1265	-13 0	-1683	-219	-139	-886	-719	-695	-1161	-131	-1325	-1379	-1 81	-1520	-628	-751	-586	-320	-292	-235	-56
16	-675	-11 2	-737	-872	-911	-119	-1652	-1019	-71	-380	-3 8	-716	-861	-861	-1013	-1168	-1273	-609	-666	-539	-318	-283	-222	5
17	-726	-1 05	-90	-1177	-123	-1556	-2010	-1322	-903	-508	- 21	-979	-1177	-1170	-1331	-1 79	-1556	-606	-708	-560	-305	-265	-227	59
18	-693	-1505	-870	-12	-1290	-1612	-2089	-1368	-901	-538	- 69	-1050	-1255	-989	-1 35	-1592	-1677	-591	-675	-538	-285	-237	-225	6
19	-713	-1239	-832	-1025	-1068	-1378	-1868	-692	-807	- 53	- 0	-8 8	-1017	-1018	-11 8	-129	-1375	-61	-702	-560	-320	-286	-226	55
20	-858	-1553	-1168	-1578	-1637	-1973	-2501	-16 0	-1178	-860	-868	-1 25	-1613	-1628	-161	-1675	-1698	-6 5	-833	-628	-308	-287	-239	58
21	-833	-1 8	-1129	-1 58	-1512	-1829	-2298	-15 3	-1128	-602	-7 9	-12 2	-1 86	-1 83	-1501	-1586	-1626	-6 2	-811	-619	-320	-29	-2 1	57
22	-807	-1 28	-1050	-13 5	-1 01	-1726	-22 3	-1 5	-1035	-569	- 95	-11 7	-1365	-1365	-1 30	-1522	-1567	-636	-786	-606	-320	-292	-239	56
23	-857	-1567	-1137	-1556	-1622	-1962	-2 96	-1630	-1051	-318	- 91	-1 52	-1602	-1610	-1611	-1680	-1713	-6 7	-8 1	-63	-315	-288	-2 2	58
2	-861	-15 9	-1155	-155	-1620	-1957	-2 83	-1623	-1158	-810	-8 0	-1303	-1576	-1613	-1602	-166	-169	-6 6	-836	-631	-315	-289	-2 1	58
25	-863	-1523	-1129	-1 20	-1531	-1901	-2 32	-1537	-1133	-829	-839	-1368	-1537	-1571	-1575	-16 5	-1668	-6 5	-839	-633	-315	-290	-2 1	57
26	-862	-1550	-1161	-1567	-1526	-19 9	-2 79	-1300	-116	-832	-8 5	-1367	-1565	-1007	-1598	-1669	-169	-6 5	-837	-632	-31	-288	-2 1	58
27	-866	-1556	-1160	-15 5	-1602	-1939	-2 72	-1615	-1163	-808	-839	-1357	-1571	-1588	-1599	-1675	-1702	-6 6	-8 0	-63	-315	-288	-2 1	58
28	-879	-1532	-1153	-1388	-15 1	-1999	-2355	-933	-1159	-8 6	-855	-136	-1520	-1551	-1586	-1659	-1677	-651	-855	-6 2	-319	-296	-2 3	56
30	-865	-1511	-1117	-1336	-1 85	-19 0	-2310	-1018	-1119	-826	-835	-131	-831	-1 92	-1552	-1629	-1652	-6 9	-8 2	-635	-318	-295	-2 2	56
31	-836	-1510	-108	-1390	-1366	-1359	-2272	-1567	-1075	-700	-798	-1238	-1399	-1379	152	-1611	-1650	-6 2	-812	-618	-31	-286	-2 0	58
32	-859	-1523	-1130	-1 39	-1373	-1828	-2382	-1570	-1130	-827	-836	-1326	-1 90	-1 93	-1563	-1638	-166	-6 7	-835	-631	-317	-292	-2 2	57
33	-859	-1551	-1160	-1555	-1607	-1719	-2 39	-1616	-1168	-850	-859	-1399	-1585	-1593	-1608	-157	-1699	-6	-83	-630	-31	-287	-2 1	58
3	-86	-1555	-1167	-1567	-1622	-1953	-2 88	-1629	-1163	-858	-867	-1 16	-1602	-161	-1606	-1673	-1700	-6 7	-838	-632	-315	-290	-2 1	58
35	-860	-15 1	-1152	-153	-1591	-1935	-2 5	-12 7	-1157	-8 3	-852	-1377	-1558	-1558	-158	-1660	-1685	-6 7	-835	-631	-316	-291	-2 1	58
36	-86	-1555	-1167	-1566	-162	-1985	-2506	-1637	-1177	-85	-865	-1 0	-1591	-1591	-1612	-1677	-1699	-6 7	-838	-632	-316	-290	-2 1	-58
37	-860	-15 0	-1151	-1529	-1586	-1950	-2 57	-1611	-1155	-766	-8	-1366	-15 7	-15 0	-1589	-1659	-1685	-6 7	-835	-631	-316	-290	-2 1	-58
38	-862	-1551	-1162	-1558	-1615	-1953	-2 71	-1625	-1172	-851	-861	-1398	-1587	-1597	-1598	-1673	-1695	-6 7	-837	-632	-316	-290	-2 1	-58
39	-862	-1552	-1161	-1551	-1601	-1919	-20	-1618	-1171	-853	-862	-1399	-1583	-1591	-1598	-1673	-1695	-6 7	-837	-632	-316	-290	-2 1	-58
0	-862	-1553	-1160	-1536	-1579	-1880	-2 80	-1606	-1170	-851	-861	-1387	-1570	-1569	-1608	-167	-1697	-6 6	-837	-632	-315	-290	-2 1	-58
1	-862	-1552	-1163	-1561	-1615	-19 1	-2 75	-1625	-117	-855	-86	-1 08	-159	-1605	-1609	-1675	-1696	-6 6	-837	-632	-315	-290	-2 1	-58
2	-863	-1552	-1166	-1570	-1627	-1953	-2 68	-1631	-1177	-858	-866	-1 17	-160	-1617	-1613	-1672	-1699	-6 7	-838	-632	-316	-290	-2 1	-58
3	-862	-1555	-1166	-1573	-1631	-1966	-2080	-1636	-1179	-859	-867	-1 19	-1607	-1621	-1617	-1679	-1700	-6 6	-837	-632	-315	-290	-2 1	-58
	-862	-1553	-1163	-1562	-1619	-1951	-2 75	-1278	-117	-793	-86	-1 12	-1597	-1611	-1613	-1676	-1698	-6 6	-833	-631	-316	-290	-2 1	-58
6	-869	-156	-1181	-1597	-1655	-1983	-2508	-165	-1195	-866	-877	-1	-1621	-1638	-1616	-1686	-1710	-6 8	-8 3	-635	-316	-291	-2 2	-58
7	-86	-155	-1167	-1570	-1628	-1959	-2 86	-1633	-1176	-855	-865	-1 18	-1592	-1609	-1325	-1673	-1698	-6 7	-839	-633	-316	-290	-2 2	-58
8	-873	-1572	-1176	-1577	-1615	-19 7	-2 86	-1637	-1180	-738	-821	-1181	-1619	-1581	-1617	-1692	-1722	-6 8	-8 7	-637	-315	-290	-2 2	-58
9	-836	-1 32	-1125	-1 6	-1520	-1865	-2397	-1553	-1122	-750	-836	-1318	-1 68	-1 98	-1380	-1 86	-156	-631	-813	-619	-31	-28	-237	-58
50	-837	-1 32	-1120	-1 5	-1510	-1856	-2388	-15 5	-1116	-820	-81	-1308	-1 58	-1 88	-1 78	-1 91	-1558	-633	-813	-619	-315	-287	-239	-58
51	P CASE DIVERGED																							
52	-250	- 19	-10 7	-180	-1780	-2076	-2531	-1786	-1133	-956	-1001	-1505	-1622	-1708	-858	-7 2	-58	-385	-285	-227	-138	-11	-172	-
5	-526	-106	-1 78	-2191	-2211	-2397	-2753	-1809	-1519	-1087	-1137	-19 9	-2267	-2251	-1666	-1580	-1 3	-5 6	-572	- 30	-226	-191	-211	- 7
56	P CASE DIVERGED																							
57	-858	- 03	-7 5	-2 5	-925	-1216	-16 7	-990	-606	-556	-509	-81	-855	-910	-11	-1 78	-1751	- 6	-1022	-730	-285	-2 1	-179	-52
58	-989	-1608	-769	-8 8	-951	-1225	-558	-1019	-631	-569	-523	-835	-893	-93	-116	-1500	-1758	- 68	-10 2	-7 0	-291	-257	-206	-52
59	-7 1	-1527	-1066	-151	-1580	-1929	-2 59	-1595	-1117	-850	-8 5	-1379	-1551	-1570	-1576	-1655	-1675	-635	-707	-556	-308	-279	-238	-57
60	-873	-1620	-1223	-1652	-1703	-2029	-25 3	-1692	-1225	-87	-893	-1 80	-1685	-1695	-1656	-1727	-1765	-606	-83	-639	-280	-2 2	-226	-52
61	-8 7	-1568	-1138	-15 7	-1610	-1956	-2 90	-1620	-103	-857	-851	-1 03	-1583	-1600	-1609	-1698	-172	-6 6	-818	-39	-315	-290	-237	-58
62	- 8	-1301	-639	-1001	-1100	-1 29	-1918	-1163	-68	-659	-591	-975	-10	-1091	-1278	-1 30	-15 1	- 1	- 37	-377	-270	-229	-199	-32
63	-602	-1511	-867	-1269	-1360	-1703	-2221	-1 09	-917	-766	-723	-780	-715	-13 3	-1 68	-1615	-1718	- 9	-586	- 8	-289	-2 8	-221	-51
6	-867	-1536	-1150	-1 59	-1076	-168	-1785	-1 3	-1156	-770	-85	-13 9	-1521	-1518	-1587	-1659	-1678	-6 9	-8 2	-635	-317	-293	-2 2	-56
65	**250**	**403**	**322**	**245**	**661**	**886**	**558**	**692**	**294**	**318**	**279**	**523**	**551**	**607**	**753**	**742**	**584**	**385**	**285**	**39**	**138**	**114**	**172**	**32**
66					500	500	500	500	100			250		250										
71	-500	-910	- 7	-665	-7 3	-99	-1369	-810	- 1	- 03	-353	-6 3	-732	-733	-866	-982	-1055	-573	-39	- 50	-322	-287	-207	-50
72	-612	-1215	-672	-997	-1093	-1385	-1866	-1155	-617	-587	-525	-950	-1088	-1067	-1188	-1312	-1376	-58	-603	- 98	-311	-272	-221	-56
73	-389	-661	-360	- 8	- 86	-66	-930	-557	-362	-26	-250	- 09	- 56	- 68	-577	-695	-769	-533	- 0	-357	-316	-272	-179	- 9
7	-5	-1028	-378	- 16	-838	-1098	-1507	-933	-569	-386	-35	-671	-798	- 09	-92	-1080	-1178	-565	-5 1	- 57	-308	-265	-207	55
75	-587	-1237	-67	-971	-1026	-1313	-17 7	-8 0	-659	- 55	- 08	-82	-993	-986	-1161	-1317	-1 19	-565	-576	- 77	-291	-2 3	-21	61
76	-623	-1327	-738	-11	-1223	-15 0	-1996	-999	-723	-58	- 9	-10 0	-1198	-1205	-1293	-1 33	-1 91	-575	-55	-500	-297	-253	-219	-61
77	-389	-661	-360	- 8	- 86	-66	-930	-557	-362	-26	-250	- 09	- 56	- 68	-577	-695	-769	-533	- 0	-357	-316	-272	-179	- 9
78	-5	-1028	-588	-787	-8 0	-1098	-1507	-933	-569	-386	-35	-675	-798	-801	-937	-1080	-1178	-565	-5 1	- 57	-308	-265	-207	-55
79	-587	-1228	-67	-970	-102	-1312	-17 7	-8 0	-658	- 55	- 08	-82	-993	-986	-1162	-1301	-1 19	-565	-576	- 77	-291	-2 3	-21	-61
80	-623	-1327	-738	-11	-1222	-15 0	-1996	-1283	-723	-58	- 9	-10 0	-119	-1205	-1289	-1 33	-1 91	-575	-611	-500	-297	-253	-219	-61
81	-870	-1551	-1172	-1572	-1628	-1936	-2 65	-1636	-1178	-851	-865	-1 23	-156	-158	-1597	-166	-1698	-6 9	-8 5	-636	-317	-292	-2 2	-57
82	-83	-1209	-1131	-1618	-1675	-1997	-2 59	-1688	-1198	-890	-896	-1 85	-1637	-16 7	-1700	-1759	-181	-633	-808	-615	-301	-268	-2 0	-62
83	-772	-1161	-1061	-1329	-1378	-129	-2256	-1	-1050	-778	-796	-117	-1288	-1327	-1001	-11 8	-1276	-592	-755	-589	-312	-271	-22	-58
8	-737	-1105	-973	-119	-1239	-1115	-2098	-1325	-9 8	-661	-670	-1055	-1156	-1198	-956	-1099	-1217	-583	-722	-570	-313	-270	-220	-58
85	-856	-1 77	-11 9	-151	-1571	-1915	-2 7	-1593	-11 8	-731	-8 7	-1362	-1532	-1553	-1389	-1563	-1606	-6 3	-831	-629	-316	-290	-2 1	-58
86	-875	-1569	-1169	-1553	-1577	-1898	-2 2	-1616	-1167	-707	-803	-1127	-1583	-151	-1608	-1682	-1718	-650	-850	-639	-316	-291	-2 2	-58
88	-862	-15	-1159	-1553	-1610	-1937	-2 67	-1620	-116	-8 8	-852	-1 02	-157	-1590	-1566	-1655	-1688	-6 6	-837	-631	-315	-288	-2 0	-58
89	-866	-1555	-117	-1581	-1637	-1962	-2 89	-16 0	-1183	-859	-86	-1 27	-160	-1618	-1591	-1666	-1700	-6 6	-8 1	-63	-315	-289	-2 1	-58
90	-792	-1255	-1065	-1335	-1387	-1731	-1772	-1 9	-1052	-778	-79	-1196	-1311	-1353	-11 1	-1255	-1370	-607	-77	-599	-313	-279	-232	-58
91	-83	-1 20	-1110	-1 35	-1 89	-183	-1886	-1529	-1102	-811	-816	-1290	-1 38	-1 66	-1 1	-1 7	-15 6	-631	-810	-617	-31	-28	-237	-58
92	-860	-1516	-1130	-1 59	-1512	-1856	-2351	-1562	-1122	-812	-826	-1289	-1 58	-1 2	-15 3	-1625	-165	-6 8	-835	-631	-317	-29	-2 2	-57
93	-861	-15 1	-1152	-1529	-1586	-19 8	-2 65	-1611	-1156	-8 0	-851	-1366	-15 8	-15 0	-1102	-1660	-1683	-6 7	-836	-631	-316	-291	-2 1	-58
9	-860	-1536	-11 7	-1516	-1572	-1913	-2 20	-1598	-1150	-83	-8 6	-1350	-1533	-1529	-1581	-1653	-1680	-6 7	-835	-631	-316	-291	-2 2	-57
95	-859	-1535	-1139	-1508	-1572	-193	-2 52	-1596	-1135	-79	-820	-1258	-1516	-1528	-352	-16 9	-1680	-6 6	-83	-630	-316	-290	-2 1	-58
96	-862	-1551	-1155	-15 5	-1611	-1971	-207	-1623	-1156	-750	-838	-1290	-1559	-1580	-1597	-1668	-1693	-6 6	-837	-632	-315	-290	-2 1	-58
97	-860	-15 6	-1150	-1536	-1602	-1939	-2 56	-1611	-1151	-802	-828	-1280	-155	-1587	-1592	-1661	-1689	-6 6	-835	-631	-316	-289	-2 1	-58
98	-860	-1533	-11 0	-1 86	-15 3	-1970	-2 28	-1597	-1137	-817	-835	-1301	-1 79	-1 0	-350	-16 5	-1675	-6 7	-835	-630	-316	-291	-2 1	-57
99	-860	-1535	-11 6	-1063	-1566	-192	-2032	-1598	-11 7	-752	-8 3	-1338	-1521	-1509	-1577	-1651	-1679	-6 7	-835	-631	-316	-291	-2 2	-57
100	-859	-150	-111	-1387	-1315	-1736	-2299	-1536	-1105	-806	-819	-1270	-788	-1 09	-1530	-1613	-16 3	-6 9	-835	-631	-318	-295	-2 2	-56
101	-766	-1383	-885	-1233	-1310	-165	-2166	-1369	-758	-261	-397	-117	-1289	-1293	-1363	-1 79	-1526	-627	-7 9	-586	-320	-291	-23	-56
102	-783	-1570	-977	-1500	-1591	-1935	-1731	-159	-866	-313	- 72	-1 36	-1595	-1581	-1610	-1693	-173	-619	-762	-591	-305	-271	-236	-60
103	-766	-1383	-885	-1233	-1310	-165	-2166	-1369	-758	-261	-397	-117	-1289	-1293	-1363	-1 79	-1526	-627	-7 9	-586	-320	-291	-23	-56
10	-783	-1570	-967	-1503	-1576	-1935	-2188	-159	-866	-313	- 72	-1 37	-1593	-1588	-1610	-1693	-1737	-619	-762	-592	-305	-271	-236	-60
109	-720	-1218	-1006	-139	-1 62	-1808	-2338	-1505	-1032	-799	-79	-1270	-1 19	-1	-139	-1386	-1309	-610	-700	-555	-301	-260	-231	-18
110	**389**	**661**	**360**	**416**	**486**	**664**	**930**	**557**	**362**	**261**	**250**	**409**	**456**	**409**	**350**	**695**	**769**	**533**	**394**	**357**	**291**	**243**	**179**	**18**
111					00	00	00	00	100			200		200										

INE #	Voltage Dev ation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOAD NG	% of MVA2	# of Buses < 90 pu	Wyom ng Pa h 18 Buses < 90 pu P Voltage	COMMEN
3				Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs					
					SIDNEY 115 / 230 #1	107. 9%			
5					CTTNWD N - KETTLECK 115 #1	106.77%			
6					MONUMENT - FLYHORSE 115 #	102 83%			
7					KETTLECK - FLYHORSE 115 #1	102 63%			
8					KELKER W - ROCKISLD 115 #1	100 95%			
9				CON INGENCY LOAD NGS					
10	1	3MIKNOLL 3 5	5.1	1	BRIDGER - BRIDGE&A 3 5 #1	113 63%			2090 81 Amps
11	0	- - -	- - -	1	BRIDGER - BRIDGE&A 3 5 #1	102 26%	-	None	1881 61 Amps
12	0	- - -	- - -	1	BRIDGER - BRIDGE&A 3 5 #1	101 97%	-	None	1876 23 Amps
13					PALISADE - ROCKSPGS 230 #1	92.28%			
1	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	82.70%	-	None	
15	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	99. 1%	-	None	
16	2	BIGGRASS 69	5 5	0	PALISADE - ROCKSPGS 230 #1	96.78%	1	PTRSNFUR 69 @ 895	
17	2	PTRSNFRG 69	5 0	0	PALISADE - ROCKSPGS 230 #1	90.63%	1	PTRSNFUR 69 @ 892	
18	8	PTRSNFRG 69	6.7	0	HARD N 230 / 115 #1	93.01%	1	PTRSNFUR 69 @ 877	
19	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	96.39%	-	None	
20	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.15%	-	None	
21	0	- - -	- - -	2	GRACE - SODA 138 #1	119 35%	-	None	Mit ga ed in B06a
22	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	88.59%	-	None	
23	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	87.78%	-	None	
2	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
25	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	87.17%	-	None	
26	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
27	0	- - -	- - -	0	GRACE - SODA 138 #1	76. 9%	-	None	
28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82. 3%	-	None	
30	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.55%	-	None	
31	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
32	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	75.07%	-	None	
33	0	- - -	- - -	0	LOCUST - MORA 138 #1	88. 1%	-	None	
3	0	- - -	- - -	0	MIDPOINT 230 / 3 5 #2	75.6 %	-	None	
35	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
36	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.15%	-	None	
37	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
38	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.58%	-	None	
39	0	- - -	- - -	0	LOCUST - MORA 138 #1	86.9 %	-	None	
0	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.15%	-	None	
1	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.15%	-	None	
2	0	- - -	- - -	0	LOCUST - MORA 138 #1	89.79%	-	None	
3	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.15%	-	None	
	0	- - -	- - -	0	LOCUST - MORA 138 #1	82. 1%	-	None	
6	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.15%	-	None	
7	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.15%	-	None	
8	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	88.5 %	-	None	
9	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	86.87%	-	None	
50	0	- - -	- - -	0	GRACE - SODA 138 #1	76.80%	-	None	
51	P CASE DIVERGED								
52	88	RIVERTON 3 5	11.	8	MINERS - PLATTE 230 #1	10 99%		HILLTP1 115 @ 891	
53					PLATTE - LATHAM 230 #1	89.1 %			
5	2	WYOPO 3 5	5.3	2	MINERS - PLATTE 230 #1	100 85%	-	None	Based on ERate=521 MVA
55					PLATTE - LATHAM 230 #1	8 . 8%			Based on ERate=521 MVA
56	P CASE DIVERGED								
57	7	BONANZA 3 5	6	0	PALISADE - ROCKSPGS 230 #1	97.81%	-	None	
58	5	BONANZA 3 5	5 9	0	PALISADE - ROCKSPGS 230 #1	97.72%	-	None	
59	0	- - -	- - -	2	AEOLUS 500 / 230 #2	102 03%	-	None	Spec Trans ormers about 10
60	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	9 .66%	-	None	
61	0	- - -	- - -	0	MINERS - PLATTE 230 #1	79.5 %	-	None	
62	10	MOONLAK1 69	6.	10	FLAMGORG 138 / 230 #2	132.1 %	-	None	
63	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	95.93%	-	None	
6	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
71	0	3MIKNOLL 3 5	6 9	6	BR DGER - BRIDGE&A 3 5 #1	125 95%	-	None	2317 51 Amps
72	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	110 5 %	-	None	2033 88 Amps
73	0	PTRSNFRG 69	6 2	3	BR DGER - ROCKSPGS 230 #1	118 38%	1	PTRSNFUR 69 @ 882	.90 pu vo tage violation
7	0	PTRSNFRG 69	6 6	2	PALISADE - ROCKSPGS 230 #1	102.16%	1	PTRSNFUR 69 @ 878	Mit ga ed with RAS
75	0	PTRSNFRG 69	7 8	0	PALISADE - ROCKSPGS 230 #1	9 . 5%	1	PTRSNFUR 69 @ 867	
76	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	93.88%	-	None	w/ P18 Caps & Load Drop
77	0	PTRSNFRG 69	6 2	3	BRIDGER - ROCKSPGS 230 #1	118 38%	1	PTRSNFUR 69 @ 882	.90 pu vo tage violation
78	0	PTRSNFRG 69	6 6	2	PALISADE - ROCKSPGS 230 #1	102.16%	1	PTRSNFUR 69 @ 878	Mit ga ed with RAS
79	0	PTRSNFRG 69	7 8	0	PALISADE - ROCKSPGS 230 #1	9 . 5%	1	PTRSNFUR 69 @ 867	
80	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	93.88%	-	None	OK w/ P18 Caps & Load Drc
81	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.15%	-	None	
82	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	90. %	-	None	
83	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	93.51%	-	None	
8	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	96.35%	-	None	
85	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.17%	-	None	
86	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	90.55%	-	None	
88	0	- - -	- - -	0	GRACE - SODA 138 #1	79. 5%	-	None	
89	0	- - -	- - -	0	GRACE - SODA 138 #1	79.36%	-	None	
90	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	89. 8%	-	None	
91	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	86.11%	-	None	
92	0	- - -	- - -	0	HUNT 138 / 230 #2	76.92%	-	None	
93	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
9	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.65%	-	None	
95	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
96	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
97	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.62%	-	None	
98	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	73.16%	-	None	
99	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79. %	-	None	
100	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	7 .2 %	-	None	
101	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	98.36%	-	None	
102	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	89.21%	-	None	
103	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	98.36%	-	None	
10	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	89.21%	-	None	
109	0	SPR NGER 69	5 3	1	SPR NGER - GLADSTON 115 #1	117 67%	-	None	
113				Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs					
11					SIDNEY 115 / 230 #1	107 01%			
115					CTTNWD N - KETTLECK 115 #1	106.71%			
116					MONUMENT - FLYHORSE 115 #	102.71%			
117					KETTLECK - FLYHORSE 115 #1	102 53%			
118					BONANZA - MONA 3 5 #1	101 03%			
119					KELKER W - ROCKISLD 115 #1	100 90%			
120				CON INGENCY LOAD NGS					
121	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	100.10%	-	None	18 1.789 Amps
122	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	99.82%	-	None	
123	P CASE DIVERGED								
12	53	GREATDIV 3 .5	9.3	0	MINERS 230 0 PLATTE 230.0	96. 9%	-	None	
125					PLATTE - LATHAM 230 #1	80. %			
126	0	- - -	- - -	0	MINERS 230 0 PLATTE 230.0	97.83%	-	None	Based on ERate=521 MVA
127					D LLON S 161 / 69 #1	96.62%			
130				Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs					
131					SIDNEY 115 / 230 #1	108 57%			
132					CTTNWD N - KETTLECK 115 #1	107.16%			
133					MONUMENT - FLYHORSE 115 #	103. 7%			
13					KETTLECK - FLYHORSE 115 #1	103 20%			
135					KELKER W - ROCKISLD 115 #1	101 03%			
136				CON INGENCY LOAD NGS					
137	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	101.79%	-	None	
138	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	101 50%	-	None	
139	P CASE DIVERGED								
1 0	80	RIVERTON 3 5	11 0	3	MINERS 230 0 PLATTE 230.0	10 82%	3	H LLTP1 115 @ 893	
1 1	1	WYOPO 3 5	5.0	2	MINERS 230 0 PLATTE 230.0	100 6 %	-	None	
1 2					PLATTE - LATHAM 230 #1	8 .3 %			
1				Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs					
1 5					SIDNEY 115 / 230 #1	110 87%			
1 6					CTTNWD N - KETTLECK 115 #1	108.71%			
1 7					MONUMENT - FLYHORSE 115 #	106 06%			
1 8					KETTLECK - FLYHORSE 115 #1	105. 9%			
1 9					KELKER W - ROCKISLD 115 #1	101 56%			
150				CON INGENCY LOAD NGS					
151	0	- - -	- - -	0	MINERS 230 0 PLATTE 230.0	98.19%	1	PTRSNFUR 69 @ 892	
152					PLATTE - LATHAM 230 #1	8 .3 %			
155	All Cont ngencies (w/ Final RAS) Converged Indicating Positive Reactive Marg n								

1) Vo tage Viola ions > 5% or Level B & > 10% or Level C
2) Excluding Se ies Cap Buses (Line Side) and Trans ormer tert ary buses.

Appendix 3-4 Pg. 1 - - - Post-transient Results For Bridger / Anticline West vs. Aeolus South

BASE CASE / P PA H FLOWS | REAC IVE MARG N MVAR (Gray shaded cells are the m nimum margins)

| INE # | CON INGENCY/ | CON INGENCY / BASE CASE NAME | Aeolus South (88) | Aeolus West (87) | Br dger West 500 (96) | Br dger West 345 (19) | Nav P ath C (NB>) 94) | Borah West (17) | Mona Naughtn (84) | West of RS / FH (85) | Midpoint West (82) | Montana SE (80) | Montana Idaho (P18) | ot 4s (57) | Bonanza West (33) | ot 1s (38) | dalto Sierra (16) | POCI (65) | COI (66) | Path 26 | PP DC (87) | Pavant PP Gonder | Red H Allen (ot 2 C) | Pinto 4Corners (281) | Sigurd Glenc (28 2) | Gallo Area System cases | Pace Area System cases | Gen Drop: Bridger Gen Trips | Gen Drop: Aeolus Gen Trip | Aeolus 500 | Monaux 500 | Anticline 500 | Populus 500 | Borah 500 | Midpoint 500 | Hemingway 500 | Cedar Hill 500 | Br dger 345 | oshen 345 | 3 M Knoll 345 | Kinport 345 | Populus 345 | Ben Lomond 345 | erm nal 345 | Mona 345 | Bonanza 345 | Aeolus 230 | Mines 230 | Mustang 230 | Riverton 230 | snaHole 230 | adsione 230 |
|---|---|---

Appendix 3-4 Pg. 2 - - - Post-transient Results For Bridger / Anticline West vs. Aeolus South

BASE CASE / P PA H FLOWS; Gen Drop

INE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Br dger West 500	Br dger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana Idaho P18)	ot 4a	Bonanza West	ot 1a (30)	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP onder	RedB H Allen (ot 2C)	Pinto 4Corners 2B1)	Sigurd GlenC (2B 2)	daho Area System osses	Pace Area System osses	Bridger Gen Trips	Aeolus Gen Tr p
3																													
		egwstg1 8h8 4100 2400 1700 sav	1700	2650	1700	2 00	-1 9	1 56	217	519	22	12	-209	2176	739	611	160	2996	2171	358	2109	77	50	332	191	217	719		
5																													
6																													
7		Level "B" Contingencies																											
8	B01	Ant c ine – Populus 500 kV Line	2067	2082	0	3398	-1020	1093	306	611	98	21	-215	1961	78	6 2	12	2996	2011	222	2109	102	511	332	191	3 8	75	0	0
9	B01a	Ant c ine – Populus 500 kV Line	2003	22 9	0	3057	-992	855	269	573	-122	61	-233	2065	788	67	109	2996	1920	186	2109	91	69	302	179	298	736	575	0
10	B02	Ant c ine 500 / 3 5 kV Trans ormer	1707	26 3	17 8	2352	-1 9	1 59	212	51	26	12	-209	2176	738	612	160	2996	2173	357	2109	77	505	333	192	213	720	0	0
11	B03	Bridger – Populus 3 5 kV Line	1763	255	1906	202	-1320	1398	26	567	372	10	-210	21 0	757	61	153	2996	21 8	338	2109	80	502	330	190	222	7 5	0	0
12	B0	Bridger – 3Mileknoll 3 5 kV Line	1799	2 97	1938	1879	-1223	1390	302	607	368	90	-238	2118	765	618	1 9	2996	213	327	2109	81	99	327	189	239	758	0	0
13	B0 a	Bridger – 3Mileknoll 3 5 kV Line	735	2659	820	656	20	29	26	567	26	28	25	22 6	770	65	3	2996	2035	287	2 09	70	57	295	77	206	739	575	0
1	B0 b	Bridger – 3Mileknoll 3 5 kV Line	1678	2806	1690	1 2	-1165	851	227	529	-131	163	-268	2307	779	687	117	2996	1933	2 2	2109	60	13	261	16	183	731	1150	0
15	B0 c	Bridger – 3Mileknoll 3 5 kV Line	179	2505	19 5	1883	-1232	1397	301	606	37	91	-2 1	2120	763	617	150	2996	2136	329	2109	81	500	327	190	237	75	0	0
16	B05	Bridger 3 5 / 230 kV Transformer	1701	26 8	1699	2395	-1 6	1 5	219	521	21	123	-209	2176	7 0	611	160	2996	2170	356	2109	77	505	332	192	217	719	0	0
17	B06	3Mileknoll – Goshen 3 5 kV Line	172	2611	1788	22 8	-1 27	1 26	231	53	399	112	-223	2159	7 6	611	15	2996	21 9	3 2	2109	80	506	333	192	21	7 5	0	0
18	B06a	3Mileknoll – Goshen 3 5 kV Line Bypas 3MK Caps	17 2	2582	1827	26 1	-1371	1 27	250	553	00	106	-226	21 8	750	611	15	2996	21 9	3 1	2109	81	506	332	192	21	737	0	0
19	B07	Kinport – Goshen 3 5 kV Line	1699	2652	1695	2 08	-1 51	1 59	216	518	25	12	-212	2178	739	611	160	2996	2170	358	2109	77	505	332	192	218	719	0	0
20	B08	Kinport – Borah 3 5 kV Line	1702	26 8	1700	2398	-1 8	1 55	217	519	22	12	-209	2176	7 0	611	160	2996	2170	357	2109	77	505	332	192	218	720	0	0
21	B09	Populus – Borah 500 kV Line	1721	2618	161	2 6	-1 3	1 26	222	52	02	117	-210	216	7 1	612	150	2996	2156	3 5	2109	82	507	33	192	229	719	0	0
22	B10	Borah 500 / 3 5 kV Transformer	1706	26 5	1676	2 18	-1 33	1 66	218	520	3	125	-212	2178	7 1	613	160	2996	2176	36	2109	75	502	330	191	220	719	0	0
23	B11	Borah 3 5 / 230 kV Transformer	1702	26 9	1692	2 0	-1 3	1 62	219	521	27	12	-21	2177	7 0	612	161	2996	2170	359	2109	76	50	332	191	219	720	0	0
2	B12	Populus – Cedar Hill 500 kV Line	1715	2613	1651	2 08	-1 8	1367	219	521	329	107	-198	2152	736	60	162	2996	2118	313	2109	86	522	3	196	223	719	0	0
26	B1	Cedar Hill – Hemingway 500 kV Line	1717	2609	16 5	2 08	-1 80	136	220	521	327	106	-198	2150	737	60	161	2996	2116	312	2109	86	521	3	196	22	720	0	0
27	B15	M dpoint – Hemingway 500 kV Line	1706	26 5	1691	2 01	-1 36	1 61	218	520	35	125	-210	2177	7 1	613	153	2996	2177	36	2109	78	501	330	191	219	721	0	0
28	B16	Borah – Midpoint 500 kV Line	1709	2630	1680	2396	-1 68	1 08	218	520	380	115	-203	216	738	608	151	2996	21	33	2109	85	513	338	19	223	720	0	0
29	B17	M dpoint 500 / 3 5 kV Trans ormer	170	2650	1688	2 11	-1 39	1 67	218	520	58	127	-213	2181	7 2	61	131	2996	2188	368	2109	85	99	329	190	225	719	0	0
30	B18	M dpoint 3 5 / 230 kV Trans ormer	1701	26 8	1699	2399	-1 50	1 53	217	518	18	123	-208	2176	739	611	162	2996	2167	355	2109	76	505	333	192	218	719	0	0
31	B19	Borah – Ade aide #2 3 5 kV Line	1703	26	1699	2393	-1 58	1 38	217	519	10	121	-207	2173	739	610	15	2996	2161	350	2109	81	507	33	192	219	720	0	0
32	B20	Adela de – M dpoint #2 3 5 kV Line	1701	26 8	1700	2397	-1 52	1 50	217	518	19	123	-208	2176	739	611	158	2996	2168	355	2109	78	506	333	192	217	719	0	0
33	B21	Borah – Ade aide – Midpoint #1 3 5 kV Line	1703	26	1700	2393	-1 58	1 38	217	519	10	121	-206	2173	739	610	15	2996	2162	350	2109	81	507	33	192	218	720	0	0
3	B22	Borah – Hunt 230 kV Line	1702	26 7	1700	2396	-1 5	1 6	216	518	1	122	-207	2175	739	610	157	2996	2165	353	2109	79	506	333	192	219	719	0	0
35	B23	M dpoint – Boise Bench #3 230 kV Line	1702	26 7	1698	2398	-1 51	1 9	217	518	1	122	-208	2175	739	611	162	2996	216	35	2109	77	506	333	192	219	719	0	0
36	B2	M dpoint – Ra tle Snake 230 kV Line	1701	26 9	1699	2399	-1 9	1 5	217	518	21	12	-209	2176	7 0	611	160	2996	2169	356	2109	77	505	333	192	217	719	0	0
37	B25	M dpoint – Dram 230 kV Line	1702	26 8	1699	2399	-1 50	1 52	217	518	18	123	-208	2176	739	611	161	2996	2167	355	2109	77	505	333	192	218	719	0	0
38	B26	Ratt e Snake – Boise Bench 230 kV Line	1702	26 7	1699	2398	-1 51	1 9	217	518	15	122	-208	2175	739	611	162	2996	2162	35	2109	77	506	333	192	221	719	0	0
39	B27	Dram – Boise Bench 230 kV Line	70	26 9	699	2399	8	56	2 7	5 8	23	2	209	2 77	7 0	6	60	2996	2 7	357	2 09	77	505	332	92	2 7	7 9	0	0
0	B28	Hemingway 500 230 kV Transformer	1702	26 9	1698	2 00	-1 7	1 56	217	519	2	12	-209	2177	7 0	611	158	2996	2170	358	2109	77	50	332	191	219	719	0	0
2	B30	Populus – Borah #1 3 5 kV Line	1699	2650	1705	2395	-1 59	1 6	216	518	16	122	-209	2175	739	610	157	2996	2165	352	2109	79	507	33	192	218	719	0	0
3	B31	Populus – Borah #2 3 5 kV Line	1700	26 9	170	239	-1 57	1 6	217	519	15	122	-209	2175	739	610	157	2996	2165	352	2109	79	507	33	192	218	719	0	0
	B32	Populus – Kinport 3 5 kV Line	1697	2653	1696	2 08	-1 61	1 50	216	518	20	122	-21	2176	738	610	157	2996	2163	352	2109	79	507	33	192	220	719	0	0
5	B33	Populus – Ben Lomond #3 3 5 kV Line	17 6	2600	1661	2358	-1328	1 98	238	5 0	55	128	-207	2173	753	622	169	2996	2200	388	2109	65	88	320	187	215	730	0	0
6	B3	Populus – Terminal 3 5 kV Line	17 5	2601	1667	2365	-13 3	1 95	227	529	52	127	-207	2171	753	620	169	2996	2197	386	2109	66	89	321	187	216	725	0	0
7	B35	Aeolus – Anticline 500 kV Line																											
8	B35a	Aeolus – Anticline 500 RAS Caps 600 MW Aeolu	22	1216	808	1963	-90	792	165	66	-178	12	-255	1883	777	733	10	2996	1897	167	2109	90	56	291	17	183	830	0	600
9																													
50																													
51	B35g	Aeolus–An ic ine500 RASCaps 600MW Drop Mona	2250	1255	819	1978	-902	8 0	171	72	-133	27	-276	1926	775	723	107	2996	1902	170	2109	92	66	297	177	182	811	0	600
52																													
53																													
5	B36	Aeolus – Mona 500 kV Line																											
55	B36a	Aeolus–Mona 500 RAS Caps 600 MW Aeolus Dr	0	3599	211	2722	-2339	1263	303	609	203	90	-230	2010	896	759	189	2996	220	55	2109	-1	326	195	137	258	763	0	600
56	B36g	Aeolus–Mona 500 RAS Caps 600 MW Aeolus Drop																											
57	B37	Aeolus 500 / 230 kV Transformer	1687	2638	1688	2397	-1 8	1 5	218	520	13	116	-210	2152	7 5	618	159	2996	2166	355	2109	76	503	331	191	217	719	0	0
58	B38	Aeolus – Windstar 230 kV Line	1637	2555	16 3	2371	-1 3	1389	213	515	360	76	-216	2032	768	655	157	2996	2150	3	2109	7	93	321	188	21	731	0	0
59	B39	Aeolus – Freezeout 230 kV Line	1679	2678	1685	2 19	-1 53	1 5	226	528	21	127	-209	2189	7 2	607	160	2996	2170	359	2109	76	50	332	191	219	728	0	0
60	B 0	Bonanza –Mona 3 5kV Line	18 6	2685	1730	2 79	-166	13 8	271	575	312	91	-218	2371	1 0	170	163	2996	2101	289	2109	51	35	263	167	227	773	0	0
61	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Pl	1827	26 9	1685	2 25	-1702	1228	2 6	5 9	200	130	-226	2306	100	59	158	2996	2090	322	2109	2	18	259	16	222	731	0	0
62	B 1	Hemingway – Summer Lake 500kV line	1708	2629	1683	2393	-1 79	1397	217	519	351	116	-202	2162	737	605	173	2996	2126	322	2109	80	519	3 2	195	212	720	0	0
63	B51	DaveJon - D fficulty 230 kV Line	1638	2555	16	2371	-1 3	1390	213	515	361	77	-216	2031	768	656	157	2996	2150	3	2109	7	93	321	188	21	728	0	0
6	B52	Spence - Mus ang 230 kV Line	1715	2521	1693	2308	-1 2	1 00	197	99	371	71	-217	2063	751	6 1	156	2996	2159	3 8	2109	77	99	327	190	208	727	0	0
65	B53	Riverton - At ant c 230 kV Line	1730	2 78	1708	2363	-1 93	1396	201	503	366	35	-220	2052	7 6	651	157	2996	2176	358	2109	75	97	325	189	21	717	0	0
66	B53a	Riverton - At ant c 230 kV Line Disc. Caps	1731	2 75	1707	2361	-1 93	1395	201	502	365	33	-220	2050	7 6	651	157	2996	2176	358	2109	75	97	325	189	21	717	0	0
67																											Minimum Margins; > >		
68																											N-1 Criteria; > >		
69																													
70		Level "C" Contingencies																											
73	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1873	2378	2253	1367	-1100	1295	3	651	283	65	-212	2069	788	619	1 1	2996	2110	305	2109	85	97	32	188	208	807	0	0
7	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1799	2559	208	1230	-1096	105	298	603	59	109	-231	2177	789	651	127	2996	2017	268	2109	7	56	293	176	185	771	575	0
75	C02b	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1728	2730	1905	1088	-1085	797	252	555	-180	1 9	-2 9	2279	793	686	111	2996	1921	229	2109	63	13	260	16	169	7 6	1150	0
76	C03	Bridger – 3MileKno l Bridger – Populus #1 3 5 kV l	1906	2322	2266	12 1	-1002	1298	383	692	289	9	-2 8	20 3	795	623	137	2996	2097	29	2109	86	95	322	187	231	809	0	0
77	C03a	Bridger – 3MileKno l Bridger – Populus #1 3 5 kV l	1829	2509	2112	1099	-1005	1057	335	6 2	6	95	-261	2156	795	655	12	2996	2006	260	2109	75	5	291	175	200	777	575	0
78	C03b	Bridger – 3MileKno l Bridger – Populus #1 3 5 kV l	1757	2685	19 7	950	-1000	797	289	593	-177	138	-27	2261	799	689	109	2996	1911	221	2109	63	11	258	163	179	757	1150	0
79	C03c	Bridger–3MK Bridge-Pop#1 3 5 RAS; 2JBG Path1	175	2678	19 5	9 7	-103	859	287	591	-121	137	-265	2252	79	681	11	2996	1938	236	2109	65	21	266	166	17	7 9	1150	0
80	C0	Bridger – 3MileKno l Bridger – Populus #2 3 5 kV l	1906	2322	2266	12 1	-1002	1298	383	692	289	9	-2 8	20 3	795	623	137	2996	2097	29	2109	86	95	322	187	231	809	0	0
81	C0 a	Bridger – 3MileKno l Bridger – Populus #2 3 5 kV l	1829	2509	2112	1099	-1005	1057	335	6 2	6	95	-261	2156	795	655	12	2996	2006	260	2109	75	5	291	175	200	777	575	0
82	C0 b	Bridger – 3MileKno l Bridger – Populus #2 3 5 kV l	1757	2685	19 7	950	-1000	797	289	593	-177	138	-27	2261	799	689	109	2996	1911	221	2109	63	11	258	163	179	757	1150	0
83	C0 c	Bridger–3MK Bridge-Pop#2 3 5 RAS; 2JBG Path1	175	2678	19 5	9 7	-103	859	287	591	-121	137	-265	2252	79	681	11	2996	1938	236	2109	65	21	266	166	17	7 9	1150	0
8	C05	Borah – Populus 3 5 kV DLO	1697	26 8	1715	2382	-1 78	1 23	217	519	399	118	-210	2170	737	607	151	2996	2151	3 1	2109	8	512	337	193	219	720	0	0
85	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	16 9	2781	1608	2102	-1 18	11 9	188	89	1 6	150	-230	2256	7 8	6 3	135	2996	20 8	295	2109	73	67	30	181	193	710	575	0
86	C06	Populus – Ben Lomond 3 5 kV DLO	1837	2503	1583	2273	-1080	1589	281	586	523	138	-20	2165	780	6	191	2996	2265	5	2109	38	52	293	177	212	756	0	0
87	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of	1857	2 70	16 0	2156	-1033	1585	299	605	521	130	-210	2151	78	6 5	189	2996	2261	9	2109	39	52	292	177	206	757	0	0
88	C07	Ben Lomond – Terminal 3 5 kV DLO	1721	2626	1690	2391	-1 1	1 72	211	512	35	12	-208	217	7 6	615	16	2996	2183	369	2109	72	98	328	190	217	720	0	0
89	C08	Populus – Kinport Populus – Borah #2 3 5 kV Line	169	2652	1700	2 03	-1 77	1 33	217	518	08	119	-216	2172	736	608	153	2996	2152	3	2109	83	511	337	193	221	720	0	0
91	C09	Populus – Borah #2 3 5 kV Treasureton – Brady 2	1701	26 7	1700	239	-1 51	1 7	219	521	17	123	-209	2175	739	611	158	2996	2166	353	2109	78	506	333	192	218	720	0	0
92	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 2	1700	26 9	1702	239	-1 53	1 8	219	521	17	123	-209	2176	739	610	158	2996	2166	353	2109	78	506	33	192	218	720	0	0
93	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 k	8	2529	6	2306	65	56	256	559	502	33	20	2 65	773	636	8	2996	22 5	32	2 09	7	6	302	80	2	7 0	0	0
9	C12	Populus – Terminal 3 5 kV Treasureton – Brady 23	17 7	2599	1661	236	-1333	1 98	231	533	55	128	-207	2172	753	621	169	2996	2200	388	2109	65	88	320	187	216	726	0	0
95	C13	Borah – Ade aide #2 Borah–ADT–Midpoint #1 3 5	1706	2630	1701	2377	-1 87	1389	217	519	376	113	-200	2162	738	606	136	2996	21 1	328	2109	92	516	3 0	19	221	721	0	0
96	C1	Borah – Ade aide #2 Midpoint - Adelaide #2 3 5 kV	1703	26 3	1700	2393	-1 59	1 37	217	519	09	121	-206	2172	739	610	15	2996	2161	350	2109	81	508	33	192	219	720	0	0
97	C15	Borah – Ade aide #2 Borah – Hunt 230 kV lines	170	26 0	1701	2389	-1 65	1 25	216	518	399	119	-20	2170	739	609	150	2996	215	3 5	2109	83	509	336	193	221	720	0	0
98	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV li	1703	26 3	1699	2392	-1 57	1 38	217	519	10	121	-207	2172	739	610	15	2996	2162	350	2109	81	507	33	192	218	720	0	0
99	C18	Borah – Kinport M dpoint – Adela de #2 3 5 kV line	1702	26 7	1701	2396	-1 51	1 50	217	519	18	123	-208	2175	7 0	611	158	2996	2168	355	2109	78	506	333	192	217	720	0	0
100	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines	1702	26 6	1701	2395	-1 53	1 5	217	518	1	122	-207	217	739	611	157	2996	2165	353	2109	79	506	333	192	219	720	0	0
101	C20	Borah–Adel–Midpoint #1 M dpoint – Adela de #2 3	170	26 1	1701	2389	-1 63	1 29	217	519	0	119	-205	2170	739	609	151	2996	2158	3 6	2109	82	509	335	193	217	720	0	0
102	C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 kV	170	26 0	1701	2389	-1 66	1 25	216	518	399	119	-20	2170	739	609	150	2996	2155	3 5	2109	83	510	336	193	220	720	0	0
103	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV L	1712	2619	1677	2388	-1 87	1373	218	520	353	109	-198	2156	737	605	1 0	2996	2128	318	2109	92	519	3 2	195	227	721	0	0
10	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lin	176	2553	1918	2008	-1319	1395	265	568	369	10	-208	21 0	757	61	153	2996	21 5	3 0	2109	80	502	330	190	221	7 5	0	0
105	C2 a	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lin	1701	2710	1785	179	-1291	1135	227	529	129	1 0	-231	2235	763	6 8	138	2996	20 7	296	2109	69	60	298	178	19	726	575	0
106	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV line	176	2553	1918	2008	-1319	1395	265	568	369	10	-208	21 0	757	61	153	2996	21 5	3 0	2109	80	502	330	190	221	7 5	0	0
107	C25a	Bridger – Populus #2 Goshen – Kinport 3 5 kV line	1701	2710	1785	179	-1291	1135	227	529	129	1 0	-231	2235	763	6 8	138	2996	20 7	296	2109	69	60	298	178	19	726	575	0
112	C28x	Pa o Verde - Trip 1&2, w/ FACRI	1771	2657	1686	2 0	-162	1297	22	526	268	153	-230	2225	75	616	16	2996	3090	1596	2109	9	636	0	23	219	78	0	0
113																											Minimum Margins; > >		
11																											N-2 Criteria; > >		
115																													
116		egwstg1 8h8 4000 2400 1700 sav	1700	255	1600	2 00	-1566	126	221	523	22	126	-227	21	7 5	613	169	2996	22 3	29	2109	65	507	310	182	219	696	0	0
117	B35g	Aeolus–An ic ine500 RASCaps 600MW Drop Mona	2233	1212	73	2010	-1030	675	181	82	-308	1	-291	1929	777	716	117	2996	1979	2	2109	81	72	278	169	190	770	0	600
118																													
119																													
120																													
121		egwstg1 8h8 4000 2400 1700 5 sav	1700	2577	1600	2 00	-1607	1231	215	517	190	127	-23	2009	6 6	32	170	2996	2398	582	2035	65	50	336	192	219	69		
122	B35g	Aeolus–An ic ine500 RASCaps 600MW Drop Mona	22	92	706	2002	053	598	73	7	383	3	273	76	689	550	5	2996	2 30	395	2035	8	65	30	78	9	78	0	600
123																													
12																													
125																													
126		egwstg1 8h8 3900 2400 1700 5 sav	1700	2 79	1500	2 00	-1701	1058	208	510	9	128	-250	1903	620	389	179	2996	2515	701	1995	55	510	327	188	223	675		
127	B35g	Aeolus–An ic ine500 RASCaps 600MW Drop Mona	2218	11 7	621	2027	-1182		172	72	-5 5	5	-308	1686	6 3	70	122	2996	19 5	7 6	1995	68	75	299	177	200	1 16	0	600
128																													
129																													
130		Margin est w/ Aeolus South at 5% of 1700 MW																											
131		egwstg1 8h8 4052 2423 1785 sav	1785	2632	1629	2 23	-1705	1180	233	536	128	125	-235	2118	770	632	181	2263	2293	7	2129	53	79	288	17	22	731		
132																													

REAC IVE MARGIN MVAR (Gray shaded ce ls are the minimum margins)

INE #	Aeolus 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Br dger 345	oshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erm nal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	adstone 230
8	-563	-687	- 61	-559	-575	-770	-1098	-680	-32	-298	-256	- 5	- 86	-525	-665	-817	-850	-597	-628	- 99	-255	-25	-208	-58
9	-60	-963	-537	-896	-911	-1182	-1638	-1036	-52	- 68	- 16	-729	-803	-8 2	-1011	-1192	-1085	-625	-657	-513	-2 6	-2 2	-217	-63
10	-81	-1 90	-86	-1672	-1713	-199	-2 88	-1683	-1019	-8 0	-806	-1 25	-1661	-1670	-1658	-1787	-1570	-712	-835	-652	-293	-287	-251	-69
11	-858	-1360	-1029	-13	-1395	-1711	-22 0	-1 7	-977	-707	-691	-1176	-1358	-1367	-1 16	-159	-1 23	-696	-8 7	-635	-305	-295	-2 5	-67
12	-77	-1191	-8 2	-9 6	-965	-1258	-1738	-1085	-821	-379	-3 6	-739	-906	-905	-1058	-1305	-1259	-682	-769	-595	-305	-289	-236	-66
13	-825	-1 09	-1012	-1301	-1310	-1623	-21 6	-1 07	-1020	-50	- 2	-1011	-1266	-12 3	-1398	-1636	-1 75	-677	-813	-617	-289	-273	-2 0	-70
1	-805	-1509	-996	-1398	-1 15	-1715	-2221	-1 90	-1035	-5 1	- 70	-1105	-1381	-13 6	-15 0	-1778	-1587	-662	-792	-60	-268	-2 9	-238	-7
15	-807	-1262	-931	-1097	-1117	-1 26	-1938	-1228	-910	- 8	- 00	-867	-1060	-1058	-1190	-1 29	-1327	-687	-800	-611	-306	-291	-238	-66
16	-957	-1509	-126	-1657	-1675	-1970	-2507	-1668	-1268	-8	-852	-1 2	-165	-165	-1655	-1789	-157	-711	-939	-679	-290	-287	-2 8	-69
17	-927	-1 5	-1217	-1528	-1535	-1832	-2351	-1571	-1217	-583	-7 3	-1238	-1506	-1 91	-1539	-1690	-1508	-708	-912	-668	-302	-295	-251	-68
18	-899	-1 02	-1139	-1 16	-1 30	-1738	-2267	-1 92	-1128	-552	-506	-1150	-1390	-1381	-1 6	-1633	-1 6	-703	-886	-655	-303	-29	-2 8	-68
19	-966	-1518	-12 5	-1635	-165	-1968	-2511	-1660	-1126	-329	-506	-1 57	-1635	-1627	-1653	-1800	-158	-713	-9 7	-68	-297	-289	-251	-69
20	-960	-1506	-1250	-1633	-1661	-1953	-2 89	-165	-12 9	-796	-823	-1292	-1616	-16 3	-16 3	-1781	-1571	-712	-9 2	-681	-297	-290	-251	-69
21	-956	-1 7	-1215	-1 91	-152	-1880	-2 29	-1566	-1218	-809	-816	-135	-1562	-1576	-1609	-17 8	-1539	-710	-9 0	-681	-297	-289	-250	-69
22	-960	-150	-1257	-1652	-1560	-1950	-2 86	-1659	-1256	-818	-83	-1362	-1601	-15 0	-1638	-1781	-1569	-711	-9 2	-682	-296	-288	-250	-69
23	-96	-1510	-1255	-1626	-16	-1937	-2 79	-16 7	-1252	-795	-821	-1356	-1613	-1619	-1638	-1786	-1576	-712	-9 6	-68	-297	-289	-250	-69
2	-972	-1 79	-1230	-1 20	-1537	-1966	-23 2	-98	-1229	-818	-828	-1330	-1512	-1533	-1602	-17 6	-15	-715	-956	-690	-300	-295	-252	-68
26	-958	-1 61	-1193	-1371	-1 86	-1908	-2298	-1005	-1189	-797	-80	-128	-1 57	-1 79	-1569	-1720	-1525	-71	-9 2	-682	-300	-295	-252	-67
27	-93	-1 73	-1176	-1 60	-1391	-13 5	-2276	-1603	-1161	-767	-779	-123	-1 29	-1395	-1558	-1723	-1536	-709	-917	-669	-295	-288	-2 9	-69
28	-956	-1 78	-1218	-1 99	-1390	-1813	-2372	-1593	-1213	-80	-81	-131	-1512	-150	-1592	-17 1	-15 2	-713	-939	-680	-298	-292	-251	-68
29	-958	-1506	-1256	-163	-16 7	-1722	-2 62	-16 7	-1259	-832	-8 2	-1396	-1623	-1615	-16 8	-1785	-1571	-710	-9 0	-680	-296	-288	-250	-70
30	-962	-1510	-1262	-16 5	-1660	-19 9	-2 92	-1658	-1269	-8 0	-850	-1 1	-16 2	-1639	-1655	-1789	-1575	-713	-9	-683	-297	-290	-251	-69
31	-958	-1 98	-12 6	-1610	-1628	-1926	-2 57	-1639	-12 7	-825	-835	-1375	-1596	-1582	-1562	-1769	-1562	-713	-9 1	-681	-298	-291	-251	-69
32	-963	-1509	-1262	-16 2	-1660	-1978	-2511	-1665	-1267	-837	-8 8	-1 00	-1628	-1613	-1651	-1787	-157	-713	-9	-683	-297	-290	-251	-69
33	-959	-1 97	-12 5	-1603	-1621	-19 0	-2 69	-1639	-12 5	-821	-833	-1363	-1582	-1561	-1626	-1768	-1562	-713	-9 1	-681	-298	-291	-251	-69
3	-961	-1505	-1257	-1635	-1653	-19 6	-2 7	-165	-1262	-833	-8	-1396	-1626	-1622	-16 6	-1782	-1570	-713	-9 3	-682	-297	-291	-251	-69
35	-961	-1506	-1256	-1626	-1637	-1912	-2 65	-16 6	-1261	-83	-8	-1396	-1621	-161	-16 7	-1783	-1571	-713	-9 3	-682	-297	-290	-251	-69
36	-960	-1508	-1255	-1607	-1608	-1882	-2 88	-1631	-1259	-832	-8 3	-1380	-1601	-1586	-16 5	-178	-1573	-712	-9 2	-682	-297	-290	-251	-69
37	-961	-1507	-1258	-1638	-1653	-1936	-2 78	-165	-1265	-837	-8 7	-1 07	-163	-1630	-1651	-1786	-1572	-712	-9 3	-682	-297	-290	-251	-69
38	-962	-1508	-1261	-16 8	-1666	-19 6	-2 65	-1659	-1269	-8 0	-8 9	-1 17	-16 5	-16 5	-165	-1787	-1573	-713	-9	-682	-297	-290	-251	-69
39	-961	-1510	-1262	-1653	-1671	-1961	-2502	-1665	-1270	-8 1	-851	-1 20	-1650	-16 9	-1657	-1790	-1575	-712	-9 3	-682	-297	-290	-251	-69
0	-960	-1508	-1259	-16 0	-1658	-19 7	-2 86	-1650	-1266	-838	-8 8	-1 12	-1639	-1638	-165	-1787	-1573	-712	-9 2	-682	-297	-290	-251	-69
2	-968	-1517	-1276	-1673	-1687	-197	-2511	-1678	-1286	-8 9	-859	-1 39	-1658	-1655	-1665	-1796	-1583	-71	-950	-685	-298	-291	-252	-69
3	-963	-1508	-1261	-16 7	-1663	-1951	-2 90	-1661	-1268	-838	-8 8	-1 16	-1631	-1629	-16 9	-1783	-1573	-713	-9 5	-683	-298	-291	-251	-69
	-972	-1525	-1272	-1651	-16 1	-1939	-2 91	-1661	-1268	-727	-801	-1159	-1658	-1589	-1665	-1801	-1592	-71	-95	-688	-297	-290	-252	-69
5	-931	-1399	-1219	-15 1	-1559	-186	-2 12	-1589	-1216	-808	-822	-1320	-1506	-1525	-1 28	-1600	-1 59	-698	-915	-668	-297	-286	-2 6	-69
6	-930	-1391	-1211	-1525	-15	-1850	-2399	-1578	-1206	-801	-81	-1305	-1 90	-1508	-1519	-1595	-1 50	-699	-91	-668	-298	-289	-2 9	-69
8	-278	-278	-1189	-1590	-1596	-1908	-2373	-1627	-1093	-939	-981	-1365	-1 30	-1553	-772	-666	-535	-335	- 18	-160	-73	-67	-150	-56
51	-370	-6 0	-1 19	-2095	-2122	-23 1	-27 1	-1966	-1 3	-1075	-1132	-1869	-21 2	-2150	-1326	-1188	-852	-569	- 18	-322	-1 6	-136	-20	-58
55	-9 0	-1525	-532	-597	-660	-887	-1231	-730	- 52	- 05	-360	-580	-617	-6 6	-981	-138	-1622	-525	-1031	-729	-2	-229	-20	-63
56	-970	-1530	-556	-623	-687	-922	-1279	-759	- 73	- 23	-378	-603	-6	-673	-1017	-1 16	-1628	-528	-1059	-7 2	-255	-2 6	-212	-63
57	-836	-1510	-116	-1611	-1658	-1961	-2501	-165	-1211	-8 3	-8 8	-1 1	-1636	-1638	-165	-1795	-1582	-705	-810	-611	-291	-283	-2 8	-68
58	-986	-1567	-1339	-1727	-1732	-2018	-25	-1712	-132	-858	-870	-1 70	-1713	-1710	-1687	-1839	-1627	-675	-952	-697	-2	-227	-235	-6
59	-950	-1528	-1236	-161	-163	-19 3	-2 87	-16	-108	-831	-825	-1388	-1602	-1608	-16 9	-1803	-159	-712	-928	-3	-298	-292	-2 7	-70
60	-566	-1308	-795	-1178	-1268	-1622	-21 8	-1325	-855	-720	-695	-1116	-122	-1256	-1367	-1592	-1 58	-501	-558	- 62	-265	-253	-227	- 9
61	-700	-1 26	-983	-139	-1 68	-1812	-23 3	-1502	-1033	-778	-773	-1269	-1 32	-1 53	-1506	-171	-15	- 86	-689	-5 6	-276	-262	-236	-63
62	-961	-1 89	-123	-1502	-1509	-1656	-1756	-1 0	-1233	-816	-827	-1325	-1526	-1511	-1612	-1758	-155	-71	-9	-68	-299	-293	-252	-68
63	-1006	-156	-1333	-1720	-1727	-201	-25 1	-1709	-1311	-857	-868	-1 66	-1707	-170	-168	-1836	-1623	-673	-972	-70	-239	-220	-23	-6
6	-718	-1 51	-11 9	-1690	-1751	-20 7	-2528	-1709	-1301	-866	-913	-1519	-1759	-1758	-1666	-1773	-15 3	-690	-701	-551	-253	-236	-66	-66
65	-758	-1 3	-1071	-1531	-1599	-1922	-2 57	-1603	-1135	-828	-826	-1375	-1578	-1588	-1665	-1757	-1527	-689	-7 5	-571	-290	-267	-235	-66
66	-739	-1 35	-10 9	-151	-1585	-191	-2 52	-1590	-1119	-825	-822	-1367	-1566	-1577	-1662	-1755	-152	-688	-725	-560	-279	-232	-235	-66
67 (Minimum Margins; > >)	278	278	461	559	575	770	1098	680	324	298	256	454	486	525	665	666	535	335	418	34	73	67	66	49
68 (N-1 Criteria; > >)					500	500	500	500	100			250		250										
7	-697	-1231	-780	-1119	-1205	-153	-2007	-1262	-723	-607	-568	-1031	-1201	-1198	-125	-1 6	-1331	-659	-69	-553	-299	-28	-235	-68
75	-72	-138	-8 6	-1315	-1 0	-1713	-2182	-1 29	-800	-701	-671	-1212	-1 20	-1 07	-1 71	-1668	-1 82	-651	-717	-563	-277	-261	-237	-72
76	- 68	-753	- 57	-510	-5 6	-859	-121	-629	- 7	-280	-263	- 5	-511	-517	-631	-811	-891	-615	- 87	- 2	-31	-290	-208	-62
77	-638	-1095	-70	-882	-922	-1199	-16 3	-1030	-687	-396	-360	-721	-879	-869	-1017	-1263	-1215	-6 5	-637	-518	-300	-279	-226	-67
78	-685	-1290	-798	-1111	-1155	-1 8	-1915	-12 6	-786	- 65	- 1	-88	-1121	-1097	-1262	-1522	-1397	-6 2	-680	-5 1	-280	-259	-231	-71
79	-720	-1336	-857	-1280	-1351	-165	-2133	-1397	-8 5	-591	- 96	-1111	-1329	-1326	-1392	-1616	-1 3	-650	-71	-562	-28	-266	-23	-71
80	- 68	-753	- 57	-510	-5 6	-859	-121	-626	- 7	-280	-263	- 5	-511	-517	-631	-809	-891	-615	- 87	- 3	-31	-290	-208	-62
81	-638	-1096	-70	-882	-922	-1199	-16 3	-1030	-687	-396	-360	-721	-879	-869	-1017	-1263	-1215	-6 5	-637	-518	-300	-279	-226	-67
82	-685	-1290	-798	-1111	-1155	-1 8	-1915	-12 6	-786	- 65	- 1	-88	-1121	-1097	-1262	-1522	-1397	-6 2	-680	-5 1	-280	-259	-231	-71
83	-720	-1336	-857	-1280	-1351	-165	-2133	-1397	-8 5	-591	- 96	-1111	-1329	-1326	-1392	-1616	-1 3	-650	-71	-562	-28	-266	-23	-71
8	-969	-1507	-1265	-16 2	-16 9	-1925	-2 63	-1657	-1267	-833	-8 6	-1 12	-1598	-1582	-1635	-1770	-1572	-715	-951	-686	-299	-292	-252	-69
85	-9 2	-1606	-12	-1753	-1760	-2007	-2516	-1737	-1307	-885	-895	-1513	-1735	-1687	-1763	-1887	-1676	-699	-923	-672	-281	-271	-2 9	-72
86	-867	-117	-1165	-1 09	-1 25	-17 2	-229	-1 92	-1153	-772	-79	-1200	-1335	-1376	-1062	-1271	-1230	-662	-855	-639	-295	-277	-236	-70
87	-831	-1128	-1077	-1268	-1288	-1608	-21 8	-1378	-1053	-661	-669	-1070	-1197	-1233	-1022	-1225	-1183	-655	-822	-621	-297	-278	-232	-69
88	-9 7	-1 29	-12 2	-1583	-1599	-1906	-2 52	-1620	-12 0	-820	-830	-1353	-1553	-1566	-1370	-1662	-1 87	-706	-930	-676	-298	-292	-251	-69
89	-97	-1521	-1263	-1622	-1592	-1886	-2 5	-1638	-1253	-696	-780	-1105	-1620	-1505	-16 6	-1786	-1588	-716	-956	-689	-298	-291	-252	-69
91	-961	-150	-125	-163	-16 8	-1933	-2 68	-1651	-1258	-832	-838	-1 02	-1618	-1613	-1617	-177	-1569	-713	-9 3	-682	-297	-290	-251	-69
92	-966	-1512	-1270	-1660	-1673	-1955	-2 89	-1668	-1277	-8 2	-8 9	-1 25	-16 5	-1638	-1632	-1786	-1578	-713	-9 8	-68	-297	-290	-251	-69
93	-881	-1233	-1160	-1 08	-1 25	-1739	-2289	-1 90	-11 6	-765	783	-1199	-13 2	-1378	-12 3	-1359	-1289	-675	-869	-6 6	-297	-283	-2 2	-69
9	-927	-1385	-1203	-1510	-1528	-1831	-2377	-1566	-1195	-79	-803	-1291	-1 75	-1 91	-1 86	-158	-1	-698	-911	-666	-297	-287	-2 7	-69
95	-956	-1218	-1523	-1538	-1837	-2337	-1585	-1206	-791	-805	-1279	-1 83	-1 35	-1572	-1727	-1535	-71	-939	-680	-299	-29	-252	-68	-68
96	-959	-1 98	-12 6	-1603	-1621	-1938	-2 66	-1639	-12 6	-821	-833	-1363	-1582	-1560	-1627	-1768	-1562	-713	-9 1	-681	-298	-291	-251	-69
97	-958	-1 92	-12 0	-1588	-1606	-1901	-2 15	-1625	-1238	-815	-827	-13 7	-1568	-15 9	-1616	-1760	-1556	-713	-9 0	-680	-298	-292	-251	-69
98	-957	-1 93	-1233	-1583	-1610	-1927	-2 55	-1627	-122	-778	-807	-12 7	-1551	-1552	-1611	-1759	-1557	-712	-939	-680	-297	-291	-251	-69
99	-961	-1505	-1250	-1621	-16 8	-1965	-2 95	-1652	-12 6	-792	-821	-1278	-159	-1605	-1636	-1778	-1569	-712	-9 3	-682	-297	-290	-251	-69
100	-958	-1501	-12	-1613	-16 1	-1932	-2 58	-16 1	-12 0	-787	-816	-1268	-1590	-161	-1630	-1773	-1565	-712	-9 0	-681	-297	-290	-251	-69
101	-958	-1 90	-1233	-1550	-1569	-1957	-2 66	-1621	-1222	-798	-81	-1290	-1502	-1 8	-1596	-1752	-155	-713	-9 0	-680	-298	-291	-251	-69
102	-957	-1 91	-1237	-1579	-1597	-191	-2 25	-162	-123	-810	-82	-1331	-1551	-1525	-1610	-1758	-1555	-713	-9 0	-680	-298	-292	-251	-69
103	-95	-1 60	-1197	-1 37	-132	-1715	-2282	-1552	-1183	-781	-793	-1252	-1 39	-1 13	-1552	-1710	-1522	-71	-937	-679	-299	-29	-251	-68
10	-856	-1363	-995	-1315	-1366	-170	-2236	-1 27	-830	-269	- 0	-1210	-13	-13 0	-1 0	-1597	-1 28	-696	-8 6	-636	-305	-295	-2 5	-67
105	-885	-1531	-110	-16 0	-1676	-1983	-2 9	-1669	-986	-32	- 82	-1 88	-1683	-1661	-1671	-182	-1603	-687	-871	-6 7	-287	-276	-2 6	-71
106	-856	-1363	-995	-1315	-1366	-170	-2236	-1 27	-830	-269	- 0	-1210	-13	-13 0	-1 0	-1597	-1 28	-696	-8 6	-636	-305	-295	-2 5	-67
107	-885	-1531	-110	-16 0	-1676	-1983	-2 9	-1669	-986	-32	- 82	-1 88	-1683	-1661	-1671	-182	-1603	-687	-871	-6 7	-287	-276	-2 6	-71
112	-803	-1238	-1096	-1 86	-1539	-1868	-2 36	-1576	-1130	-798	-801	-1306	-1 86	-1507	-1 5	-1 51	-1300	-67	-790	-603	-285	-270	-2 3	-33
113 (Minimum Margins; > >)	468	753	457	510	546	859	1214	626	474	269	69	445	511	517	631	809	714	615	487	299	277	252	68	33
11 (N-2 Criteria; > >)					00	00	00	00	100			200		200										

INE #	Voltage Dev ation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOAD NG	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Voltage	COMMEN
				Base Case Overloads (Areas 59 99 Area 10) Exclud ng GSUs					
5					S DNEY 115 / 230 #1	109.99%			
6					CTTNWD N - KETTLECK 115 #1	103.93%			
8	1	3MIKNOLL 3 5	5.	1	BR DGER - BRIDGE&A 3 5 #1	11 .55%	1	PTRSNFUR 69 @ 0.886	
9	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	103.02%	-	None	
10	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.33%	-	None	
11	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	99.62%	-	None	
12	8	BIGGRASS 69	5.3	0	BR DGER - ROCKSPGS 230 #1	81.98%	-	None	
13	5	PTRSNFRG 69	5.	0	GLENCANY 230 / 3 5 #1		1	PTRSNFUR 69 @ 0.896	
1	10	PTRSNFRG 69	6.8	0	HARD N 230 / 115 #1	92.52%	1	PTRSNFUR 69 @ 0.88	
15	0	- - -	- - -	0	D LLON S 161 / 69 #1	92.92%	-	None	
16	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.3 %	-	None	
17	0	- - -	- - -	2	GRACE - SODA 138 #1	115. 3%	-	None	
18	0	- - -	- - -	0	GRACE - SODA 138 #1	78.57%	-	None	Bypass Resolves OL
19	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87.1 %	-	None	
20	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.3 %	-	None	
21	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87.18%	-	None	
22	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.3 %	-	None	
23	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.33%	-	None	
2	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.97%	-	None	
26	0	- - -	- - -	0	LOCUST - MORA 138 #1	83.09%	-	None	
27	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.3 %	-	None	
28	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	7 . 9%	-	None	
29	0	- - -	- - -	0	LOCUST - MORA 138 #1	89.10%	-	None	
30	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	75.69%	-	None	
31	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.3 %	-	None	
32	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.33%	-	None	
33	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.3 %	-	None	
3	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.11%	-	None	
35	0	- - -	- - -	0	LOCUST - MORA 138 #1	87.65%	-	None	
36	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.3 %	-	None	
37	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.3 %	-	None	
38	0	- - -	- - -	0	LOCUST - MORA 138 #1	90.5 %	-	None	
39	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.3 %	-	None	
0	0	- - -	- - -	0	LOCUST - MORA 138 #1	83.00%	-	None	
2	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.33%	-	None	
3	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.3 %	-	None	
	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	88.36%	-	None	
5	0	- - -	- - -	0	GRACE - SODA 138 #1	7 .33%	-	None	
6	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.37%	-	None	
7				P CASE DIVERGED					
8	108	GREATDIV 3 .5	1 2	6	BR DGER 3 5 / 230 #2	112.9 %	16	MUSTANG 115 @ 0 862	
9					PLATTE - LATHAM 230 #1	91.60%			
50					M NERS - PLATTE 230 #1	108.22%			
51	9	WYOPO 3 5	7.3	6	BR DGER 3 5 / 230 #2	109.75%	-	None	
52					PLATTE - LATHAM 230 #1	88.29%			
53					M NERS - PLATTE 230 #1	105. 8%			
5				P CASE DIVERGED					
55	0	BONANZA 3 5	5.0	0	BR DGER - BRIDGE&A 3 5 #1	96.87%	-	None	
56	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	96. 0%	-	None	
57	0	- - -	- - -	2	AEOLUS 500 / 230 #2	10 .95%	-	None	
58	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	87.93%	-	None	
59	0	- - -	- - -	0	MINERS - PLATTE 230 #1	80.88%	-	None	
60	0	- - -	- - -	6	BONANZA - VERNAL 138 #1	119.58%	-	None	
61	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	77.22%	-	None	Gen Trip resolves overload
62	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.3 %	-	None	
63	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	89.20%	-	None	
6	0	- - -	- - -	0	RIVERTON - WYOPO 230 #1	83.36%	-	None	
65	0	- - -	- - -	0	BR DGER - ROCKSPGS 230 #1	87.62%	-	None	Negative Vdevs > 10%
66	0	- - -	- - -	0	BR DGER - ROCKSPGS 230 #1	87.55%	-	None	
73	26	3MIKNOLL 3 5	6.9	2	BRIDGER - BR DGE&A 3 5 #1	126.19%	-	None	2321 83 Amps
7	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	110.95%	-	None	20 1. 3 Amps
75	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	96. 8%	-	None	
76	0	BIGGRASS 69	6.6	1	BR DGER - ROCKSPGS 230 #1	109.80%	1	PTRSNFUR 69 @ 0.890	
77	0	PTRSNFRG 69	6.5	0	BR DGER - ROCKSPGS 230 #1	89. 3%	1	PTRSNFUR 69 @ 0.887	
78	0	PTRSNFRG 69	7.	0	HARD N 230 / 115 #1	91.66%	1	PTRSNFUR 69 @ 0.878	
79	0	- - -	- - -	0	JEFFERSN - JFRSNPHA 161 #1	77. 2%	-	None	
80	0	BIGGRASS 69	6.6	1	BR DGER - ROCKSPGS 230 #1	109.80%	1	PTRSNFUR 69 @ 0.890	
81	0	PTRSNFRG 69	6.5	0	BR DGER - ROCKSPGS 230 #1	89. 3%	1	PTRSNFUR 69 @ 0.887	
82	0	PTRSNFRG 69	7.	0	HARD N 230 / 115 #1	91.66%	1	PTRSNFUR 69 @ 0.878	
83	0	- - -	- - -	0	JEFFERSN - JFRSNPHA 161 #1	77. 2%	-	None	w/ P18 Caps & Load Drop
8	0	- - -	- - -	0	INTERMT - NTERMTX 3 5 #1	73.33%	-	None	
85	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	79. %	-	None	Gen Trip Not Req'd
86	0	- - -	- - -	0	GRACE - SODA 138 #1	8 . 1%	-	None	
87	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	79.18%	-	None	
88	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.35%	-	None	
89	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	90.38%	-	None	
91	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.3 %	-	None	
92	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.33%	-	None	
93	0	- - -	- - -	0	GRACE - SODA 138 #1	78.78%	-	None	
9	0	- - -	- - -	0	GRACE - SODA 138 #1	76.13%	-	None	
95	0	- - -	- - -	0	HUNT 138 / 230 #2	76.62%	-	None	
96	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.3 %	-	None	
97	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.21%	-	None	
98	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.3 %	-	None	
99	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.3 %	-	None	
100	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.1 %	-	None	
101	0	- - -	- - -	0	INTERMT - INTERMTX 3 5 #1	73.3 %	-	None	
102	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	78.9 %	-	None	
103	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	73.68%	-	None	
10	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	97.99%	-	None	
105	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	88.71%	-	None	
106	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	97.99%	-	None	
107	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	88.71%	-	None	
112	0	- - -	- - -	1	SPR NGER - GLADSTON 115 #1	108. 0%	-	None	
117	2	WYOPO 3 5	5.2	0	BRIDGER 3 5 / 230 #2	97.0 %	-	None	
118					PLATTE - LATHAM 230 #1	81.16%			
119					M NERS - PLATTE 230 #1	98.5 %			
122	2	WYOPO 3 5	5.3	1	BRIDGER 3 5 / 230 #2	91. %	-	None	
123					PLATTE - LATHAM 230 #1	82.60%			Based on ERate=521 MVA
12					M NERS - PLATTE 230 #1	99.75%			Based on ERate=521 MVA
127	0	- - -	- - -	0	BRIDGER 3 5 / 230 #2	79.25%	1	PTRSNFUR 69 @ 885	
128					PLATTE - LATHAM 230 #1	76. 3%			Based on ERate=521 MVA
129					M NERS - PLATTE 230 #1	93.53%			Based on ERate=521 MVA
131	All Contingencies Converged Indicating Positive Reactive Margin								

1) Voltage V olations > 5% for Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line Side) and Transformer tertiary buses.

Appendix 3-5 Pg. 1 - - - Post-transient Results For Bridger / Anticline West vs. Aeolus Southbound

BASE CASE / P PA H FLOWS — Gen Drop

INE #	CON NGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Br dger West 500	Br dger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana Idaho P18)	ot 4a	Bonanza West	ot 1a (30)	daho S erra	PDCI	COI	Path 26	PP DC	Pavant PP onder	RedB H Allen (ot 2C)	Pinto 4Corners 2B1)	Sigurd G enC (2B 2)	daho Area System osses	Pace Area System osses	Bridger Gen Tr ps	Aeolus Gen Trip
3		**Lower Right Nomogram Point High Side**																										
		egwstg1 8h5 2250 3900 2400 1700 2 sav	1700	2115	1500	2 00	-2250	21	203	50	-5 5	1 7	-200	2071	695	59	176	2996	2850	1028	180	7	511	299	185	257	700		
5																												
6																												
7																												
8																												
9																												
10																												
11		**Level "B" Contingencies**																										
12	B01	Anticline – Populus 500 kV Line	2028	160	0	3276	-1855	120	287	592	-815	58	-207	1888	73	622	1	2996	2710	910	180	70	520	301	185	373	716	0	0
13	B01a	Anticline – Populus 500 kV Line Drop Br dger G1	1962	1762	0	2937	-1831	-125	250	553	-10 2	98	-226	1989	7 0	65	128	2996	2615	873	180	60	77	268	172	336	702	575	0
1	B01g	Anticline – Populus 500 kV Line JBG1 KinpCap	1962	1762	0	2937	-1831	-125	250	553	-10 2	98	-226	1989	7 0	65	128	2996	2615	873	180	60	77	268	172	336	702	575	0
15	B02	Anticline 500 / 3 5 kV Transformer	1718	2087	1583	2308	-22 5	2	195	95	-5 3	1 6	-202	2066	69	597	175	2996	2851	1026	180	7	512	300	185	2 9	70	0	0
16	B03	Br dger – Populus 3 5 kV Line	1760	2028	1702	2032	-2118	373	251	553	-587	129	-202	2038	712	597	169	2996	2828	1012	180	50	509	296	18	26	718	0	0
17	B03a	Br dger – Populus 3 5 kV Line Bypass 1/2 3MK S	1792	1979	1787	1851	-20 5	370	279	583	-588	117	-211	2016	719	598	167	2996	282	1006	180	52	510	296	18	252	719		
18	B0	Br dger – 3Mileknoll 3 5 kV Line	1802	1963	17 9	1853	-1995	373	298	602	-58	11	-235	2013	722	603	165	2996	2819	1002	180	50	505	293	182	278	732	0	0
19	B05	Br dger 3 5 / 230 kV Transformer	1701	211	1 99	2397	-22 8	20	20	505	-5 6	1 7	-200	2071	696	59	175	2996	28 9	1026	180	7	512	300	185	257	700	0	0
20	B06	3M leknoll – Goshen 3 5 kV Line	1721	2082	158	2257	-2227	00	217	519	-562	136	-215	2056	701	59	171	2996	2831	101	180	50	513	300	185	252	722	0	0
21	B06a	3M leknoll – Goshen 3 5 kV Line Bypas 3MK Cap	17 2	2051	1627	2680	-2163	0	238	5 1	-558	131	-219	20	705	595	170	2996	2833	1013	180	51	512	299	185	252	712	0	0
22	B07	Kinport – Goshen 3 5 kV Line	1698	2117	1 82	2 23	-2250	29	202	503	-539	1 7	-209	2072	69	595	176	2996	28 7	1029	180	6	511	299	185	261	700	0	0
23	B08	Kinport – Borah 3 5 kV Line	1701	2113	1 96	2 03	-22 6	2	203	50	-5	1 7	-201	2071	696	595	176	2996	2850	1028	180	7	511	299	185	258	700	0	0
2	B09	Populus – Borah 500 kV Line	1718	2086	1 26	2 0	-2235	399	208	509	-560	1 1	-201	2061	697	595	168	2996	2838	1017	180	52	51	301	185	266	700	0	0
25	B10	Borah 500 / 3 5 kV Trans ormer	1709	2105	1 58	2 32	-2222	1	206	507	-527	1 9	-206	2072	697	597	176	2996	2858	1038	180	5	507	296	183	262	699	0	0
26	B11	Borah 3 5 / 230 kV Trans ormer	1702	2112	1 88	2 06	-2239	29	206	508	-539	1 7	-207	2071	695	595	176	2996	28 8	1030	180	6	511	299	185	261	700	0	0
27	B12	Populus – Cedar Hi l 500 kV Line	1703	2108	1 91	2 01	-2256	05	203	50	-562	1	-198	2067	695	593	176	2996	28 0	1019	180	9	515	302	186	257	700	0	0
29	B1	Cedar H ll – Hemingway 500 kV Line	1705	210	1 86	2 02	-2251	0	20	505	-563	1	-198	2066	695	593	176	2996	2839	1019	180	9	51	301	185	258	701	0	0
30	B15	Midpoint – Hemingway 500 kV Line	170	2121	1 92	2 1	-2203	81	206	507	- 6	158	-211	2085	701	603	152	2996	289	1063	180	8	96	288	180	265	701	0	0
31	B16	Borah – Midpoint 500 kV Line	170	2108	1 93	2399	-2250	11	20	505	-55	1 5	-199	2068	695	59	173	2996	28 2	1023	180	9	513	300	185	258	701	0	0
32	B17	Midpoint 500 / 3 5 kV Transformer	170	2113	1 86	2 12	-2239	33	20	505	-506	150	-20	2075	697	597	1 6	2996	2867	1038	180	56	506	296	183	265	700	0	0
33	B18	Midpoint 3 5 / 230 kV Transformer	1700	211	1500	2 00	-2250	20	203	50	-5 7	1 7	-200	2071	695	59	176	2996	28 8	1026	180	7	512	300	185	257	700	0	0
3	B19	Borah – Ade aide #2 3 5 kV Line	1702	2111	1 99	2397	-2252	15	203	50	-550	1 6	-199	2070	695	59	173	2996	28 6	102	180	9	513	300	185	258	700	0	0
35	B20	Adelaide – M dpoint #2 3 5 kV Line	1700	211	1 99	2 01	-22 7	25	203	50	-5	1 8	-201	2072	695	595	177	2996	2851	1028	180	6	511	299	185	257	700	0	0
36	B21	Borah – Ade aide – M dpoint #1 3 5 kV Line	1702	2112	1 98	2399	-22 8	20	203	505	-5 7	1 7	-200	2070	695	59	175	2996	28 8	1026	180	7	512	299	185	258	700	0	0
37	B22	Borah – Hunt 230 kV Line	1701	2113	1 99	2399	-2250	19	203	50	-5 7	1 7	-200	2071	695	59	175	2996	28 8	1026	180	8	512	300	185	257	700	0	0
38	B23	Midpoint – Boise Bench #3 230 kV Line	1701	211	1 99	2 00	-22 8	23	203	50	-5 3	1 8	-201	2072	695	59	175	2996	2850	1028	180	7	511	299	185	257	700	0	0
39	B2	Midpoint – Ra tle Snake 230 kV Line	1701	2116	1 99	2 02	-22 5	30	203	50	-53	1 9	-202	2073	696	595	172	2996	2855	1031	180	8	510	298	18	258	700	0	0
0	B25	Midpoint – Dram 230 kV Line	1701	2113	1 99	2 00	-22 9	22	203	50	-5 5	1 7	-200	2071	695	59	175	2996	28 9	1027	180	7	511	299	185	257	700	0	0
1	B26	Ra tle Snake – Boise Bench 230 kV Line	1701	2113	1 99	2399	-2251	19	203	50	-5 9	1 6	-200	2070	695	59	176	2996	28 5	1025	180	7	512	300	185	259	700	0	0
2	B27	Dram – Bo se Bench 230 kV Line	1701	211	1500	2 00	-22 9	22	203	50	-5	1 8	-201	2072	695	59	175	2996	2850	1027	180	7	511	299	185	257	700	0	0
3	B28	Hemingway 500/230 kV Transformer	1701	211	1 99	2 00	-22 9	21	203	50	-5	1 7	-200	2071	695	59	175	2996	28 9	1027	180	7	511	299	185	258	700	0	0
5	B30	Populus – Borah #1 3 5 kV Line	1699	2115	150	2398	-2256	17	202	50	-5 9	1 6	-200	2071	695	593	175	2996	28 6	102	180	8	513	300	185	257	700	0	0
6	B31	Populus – Borah #2 3 5 kV Line	1700	211	1502	2398	-225	17	203	50	-5 9	1 6	-200	2070	695	59	17	2996	28 7	102	180	8	513	300	185	257	700	0	0
7	B32	Populus – Kinport 3 5 kV Line	1699	211	1 93	2 06	-2256	17	20	505	-5 8	1 5	-205	2069	69	593	173	2996	28 3	1023	180	9	513	301	185	260	700	0	0
8	B33	Populus – Ben Lomond #3 3 5 kV Line	1772	203	1 37	2333	-2059	86	239	5 1	- 96	15	-198	2065	717	612	191	2996	2897	1076	180	28	85	279	177	252	72	0	0
9	B3	Populus – Terminal 3 5 kV Line	1762	20 5	1 53	2350	-2098	78	220	521	-502	152	-198	206	71	608	188	2996	2891	1068	180	31	90	283	179	253	711	0	0
50	B35	Aeolus – Anticline 500 kV Line																											
51	B35a	Aeolus – Anticline 500 kV Line	2192	759	670	202	-1751	-179	160	60	-1090	60	-2	1859	730	699	122	2996	2591	852	180	62	72	26	170	2 6	768	0	600
52	B35g	Aeolus – Anticline 500 kV Line	2218	757	67	2029	-17 3	-1 5	159	59	-1058	72	-261	1893	727	691	123	2996	2590	850	180	65	83	270	17	2 3	755	0	600
53	B36	Aeolus – Mona 500 kV Line																											
5	B36a	Aeolus – Mona 500 kV Line	0	305	1957	2695	-3131	260	300	605	-739	122	-223	1927	852	7 2	208	2996	2896	1136	180	- 5	335	160	130	30	731	0	600
55	B37	Aeolus 500 / 230 kV Transformer	1687	2099	1 88	2399	-22 9	12	20	506	-555	139	-201	20 8	701	601	175	2996	28 5	1025	180	7	510	298	18	257	699	0	0
56	B38	Aeolus – Windstar 230 kV Line	16 1	2006	1 6	2376	-22	362	201	502	-602	101	-207	1938	722	635	172	2996	2830	101	180	5	501	289	181	257	707	0	0
57	B39	Aeolus – Freezeout 230 kV Line	1695	2123	1 96	2 06	-2251	21	206	507	-5 5	1 8	-200	207	696	593	176	2996	28 9	1027	180	7	512	299	185	258	701	0	0
58	B 0	Bonanza –Mona 3 5kV Line	1825	21 0	1521	2 76	-2 0	327	261	565	-6 3	11	-210	22 3	1 0	189	179	2996	2786	965	180	22	5	232	160	271	7 7	0	0
59	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza F	1815	2098	1 7	2 13	-2 83	19	230	532	-769	159	-219	2181	93	97	173	2996	2772	1001	180	13	27	227	157	270	706	0	0
60	B 1	Hemingway – Summer Lake 500kV ine	1703	2109	1 95	2399	-2252	13	20	505	-556	1 7	-200	2069	695	59	177	2996	28 0	1022	180	8	513	301	185	257	701	0	0
61																												
62																											N-1 Cri eria; > >	
63		**Level "C" Contingencies**																										
66	C02	Br dger – Populus #1 # 2 3 5 kV Lines	185	1872	2039	1390	-1892	283	336	6 3	-666	90	-206	1962	7 5	606	157	2996	2796	981	180	5	503	290	181	257	768	0	0
67	C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1789	2035	1867	1257	-1891	36	286	591	-896	135	-225	207	7 6	638	1 2	2996	2699	9 3	180		62	258	169	2 3	737	575	0
68	C03	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV	1890	1791	20 8	1218	-17 8	279	392	702	-666	66	-2 5	1916	758	616	152	2996	278	972	180	5	93	281	177	280	785	0	0
69	C03a	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV	1826	1962	1900	1078	-176	33	337	6 3	-896	117	-258	2037	756	6 2	137	2996	26 5	968	180	3	55	253	167	255	750	575	0
70	C03b	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV	1762	2125	1736	932	-1760	-22	288	592	-1136	161	-272	21 8	759	677	121	2996	2591	897	180	33	13	218	153	2 5	73	1150	0
71	C03c	Br dger–3MK Bridge-Pop#1 3 5 RAS; 2JBG Path	1760	2121	1738	929	-1799	-165	283	587	-1082	160	-261	21 1	75	668	127	2996	2617	910	180	35	2	227	157	238	726	1150	0
72	C0	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV	1890	1791	20 8	1218	-17 8	279	392	702	-666	66	-2 5	1916	758	616	152	2996	278	972	180	5	93	281	177	280	785	0	0
73	C0 a	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV	1826	1962	1900	1078	-176	33	337	6 3	-896	117	-258	2037	756	6 2	137	2996	26 5	968	180	3	55	253	167	255	750	575	0
7	C0 b	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV	1762	2125	1736	932	-1760	-22	288	592	-1136	161	-272	21 8	759	677	121	2996	2591	897	180	33	13	218	153	2 5	73	1150	0
75	C0 c	Br dger–3MK Bridge-Pop#2 3 5 RAS; 2JBG Path	1760	2121	1738	929	-1799	-165	283	587	-1082	160	-261	21 1	75	668	127	2996	2617	910	180	35	2	227	157	238	726	1150	0
76	C05	Borah – Populus 3 5 kV DLO	1698	2115	1509	2392	-226	07	203	50	-556	1 5	-201	2069	69	592	172	2996	28 1	1019	180	50	515	302	186	258	700	0	0
77	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1651	2237	1399	2115	-2207	131	173	7	-813	176	-222	215	706	629	15	2996	2733	973	180	0	71	267	172	2 3	692	575	0
78	C06	Populus – Ben Lomond 3 5 kV DLO	1916	187	1312	2195	-1668	621	312	617	-395	170	-193	2053	760	650	225	2996	300	1179	180	-15	26	232	160	2	783	0	0
79	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2	193	18 3	1372	2071	-1617	621	332	638	-39	161	-200	2037	765	650	223	2996	3001	1175	180	-1	26	231	160	236	782	0	0
80	C07	Ben Lomond – Terminal 3 5 kV DLO	171	2100	1 9	239	-2227	33	199	500	-536	1 8	-199	2069	700	596	178	2996	2858	1035	180		507	296	18	256	701	0	0
81	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lin	1697	211	1 96	2 03	-2266	07	20	505	-55	1 3	-207	2067	693	592	170	2996	2836	1018	180	51	516	302	186	261	699	0	0
83	C09	Populus – Borah #2 3 5 kV Treasure on – Brady	1705	2108	1 86	2395	-222	28	216	517	-5 0	1 9	-200	2072	696	596	177	2996	2853	1033	180	5	509	298	18	257	703	0	0
8	C10	Populus – Borah #1 3 5 kV Treasureton – Brady	170	2110	1 87	2395	-2227	28	215	517	-5 0	1 9	-200	2072	695	596	177	2996	2853	1032	180	5	509	298	18	256	703	0	0
85	C11	Populus – Ben Lomond #2 Populus Terminal 3 5	1865	1930	1365	225	-1822	575	267	571	- 29	162	-19	205	7 6	63	212	2996	2963	11 1	180	2	50	251	167	2 7	7	0	0
86	C12	Populus – Terminal 3 5 kV Treasureton – Brady	1770	2036	1 33	23 5	-2060	92	235	537	- 91	155	-197	2065	716	611	192	2996	2900	1077	180	28	85	279	177	252	715	0	0
87	C13	Borah – Adelaide #2 Borah–ADT–Midpoint #1 3	1703	2107	1 99	2391	-2260	398	20	505	-562	1	-197	2066	695	593	167	2996	2836	1018	180	52	515	302	186	260	701	0	0
88	C1	Borah – Adelaide #2 M dpoint - Ade aide #2 3 5 k	1702	2112	1 99	2399	-22 9	19	203	50	-5 8	1 7	-200	2070	695	59	175	2996	28 7	1026	180	8	512	300	185	258	700	0	0
89	C15	Borah – Adelaide #2 Borah – Hunt 230 kV ines	1702	2111	1 99	2396	-2253	12	203	50	-552	1 6	-199	2069	695	59	172	2996	28	1023	180	9	513	300	185	258	701	0	0
90	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV	1702	2112	1 95	2 02	-22 5	22	20	505	-5 5	1 7	-201	2071	696	595	176	2996	28 8	1028	180	7	511	299	185	259	700	0	0
91	C18	Borah – Kinport M dpoint – Adela de #2 3 5 kV lin	1701	211	1 96	2 0	-22	27	203	50	-5 2	1 8	-202	2072	696	595	178	2996	2851	1030	180	6	510	299	18	258	700	0	0
92	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV line	1702	2113	1 96	2 02	-22 7	22	203	50	-5 5	1 7	-201	2071	696	595	176	2996	28 9	1028	180	7	511	299	185	258	700	0	0
93	C20	Borah–Adel–Midpoint #1 Midpoint – Adelaide #2	1702	211	1 96	2 0	-2236	36	20	505	-539	1 9	-202	2073	696	596	182	2996	2853	103	180	3	509	297	18	259	700	0	0
9	C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 k	1702	2111	1 98	2398	-22 9	17	203	505	-5 9	1 6	-200	2070	695	59	17	2996	28 6	1025	180	8	512	300	185	258	701	0	0
95	C23	Borah – Adel #2 3 5 kV Borah – M dpoint 500 kV	1705	210	1 91	2395	-2255	399	20	506	-562	1 3	-198	2065	695	593	169	2996	2836	1018	180	51	515	302	186	260	701	0	0
96	C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV L	1760	2028	1698	2036	-2116	375	251	55	-586	129	-205	2038	712	598	169	2996	2827	1012	180	50	509	296	18	267	719	0	0
97	C2 a	Br dger – Populus #1 Goshen – Kinport 3 5 kV L	1703	2166	1552	1826	-2083	108	21	515	-83	16	-228	2130	720	633	152	2996	272	967	180	39	66	262	171	252	705	575	0
98	C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV lin	1760	2028	1698	2036	-2116	375	251	55	-586	129	-205	2038	712	598	169	2996	2827	1012	180	50	509	296	18	267	719	0	0
99	C25a	Br dger – Populus #2 Goshen – Kinport 3 5 kV lin	1703	2166	1552	1826	-2083	108	21	515	-83	16	-228	2130	720	633	152	2996	272	967	180	39	66	262	171	252	705	575	0
10	C28x	Palo Verde - Trip 1&2, w/ FACRI	1775	2110	1 80	2 00	-2 29	2 9	216	518	-713	180	-223	2119	710	599	179	2996	3781	2258	180	18	637	08	228	267	765		
105																												
163																											N-2 Cri eria > >	
16																												
165																												
166		**Margin est w/ Path C SB at 5% of 2250 MW**																										
167		**egwstg1 8h5byp 2363 3970 2400 1514 sav**	151	2207	1570	2 00	-2363	60	203	50	-535	1 6	-280	1986	708	589	203	2996	273	918	180	31	6	266	171	25	687		
168																												

REAC IVE MARGIN MVAR (Gray shaded cells are the min mum margins)

INE #	CON NGENCY#	Aeolus 500	Monanx 500	Antic in 500	Popu us 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Br dger 345	oshen 345	3 Mi Knoll 345	K nport 345	Popu us 345	Borah 345	Ben Lomond 345	erm nal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	adstone 230
12	B01	-518	-792	- 52	-759	-780	-1022	-1 11	-892	- 18	- 15	-361	-630	-672	-722	-756	-761	-905	-652	-558	- 79	-306	-287	-22	-68
13	B01a	-520	-92	- 88	-923	-9 3	-1208	-1617	-10 9	- 9	-509	- 6	-772	-833	-883	-911	-856	-1072	-6 7	-5 9	- 70	-291	-268	-22	-72
1	B01g	-520	-92	- 88	-923	-9 3	-1208	-1617	-10 9	- 9	-509	- 6	-772	-833	-883	-911	-856	-1072	-6 7	-5 9	- 70	-291	-268	-22	-72
15	B02	-667	-1319	-7 7	-1 65	-1528	-1858	-1851	-15 2	-1015	-822	-801	-1311	-1 72	-9 3	-328	-1096	-681	-713	-676	-580	-321	-301	-2 7	-76
16	B03	-756	-1208	-937	-1177	-1236	-1572	-2076	-1315	-880	-673	-657	-1055	-1179	-1205	-10 9	-1053	-1323	-699	-7 5	-618	-331	-309	-2 3	-7
17	B03a	-709	-1086	-806	-996	-1050	-1361	-18 5	-11 6	-758	- 10	-538	-885	-98	-1015	-917	-892	-1200	-68	-698	-588	-333	-309	-238	-7
18	B0	-650	-916	-693	-750	-765	-1010	-1 3	-882	-626	-326	-305	-582	-705	-706	-711	-7 7	-1008	-677	-6 5	-556	-331	-301	-232	-7
19	B05	-856	-138	-1150	-1 62	-1508	-1860	-239	-116	-11 2	-813	-816	-129	-1 7	-1 78	-1158	-1075	-1509	-713	-831	-66	-322	-305	-2 5	-76
20	B06	-832	-1316	-1108	-1360	-1397	-1727	-2250	-1 65	-1103	-576	-713	-1138	-13 0	-1350	-1105	-1022	-1 31	-710	-806	-653	-332	-311	-2 8	-75
21	B06a	-805	-12 8	-1029	-12	-1282	-1610	-2135	-1369	-996	-536	- 8	-1037	-1218	-1230	-1077	-102	-1371	-705	-773	-638	-331	-310	-2 6	-75
22	B07	-858	-1377	-1080	-137	-1 25	-1776	-2321	-1 86	-963	-285	- 38	-1252	-136	-1386	-11 2	-115	-150	-71	-833	-666	-326	-305	-2 7	-76
23	B08	-857	-1377	-1135	-1 36	-1 89	-18 1	-2372	-1150	-1121	-767	-787	-1182	-1 09	-1 62	-1157	-1080	-1501	-71	-832	-665	-327	-306	-2 8	-76
2	B09	-8 7	-13 9	-1100	-1310	-1 17	-1798	-2333	-1 60	-109	-678	-789	-12 7	-1382	-1 30	-1152	-1152	-1 72	-712	-823	-660	-327	-307	-2 7	-76
25	B10	-853	-1372	-113	-1	-1 26	-183	-2368	-1172	-1118	-783	-793	-1229	-1388	-1368	-11 2	-1129	-1 95	-711	-829	-663	-326	-30	-2 7	-76
26	B11	-860	-1377	-1122	-1 2	-1 69	-1817	-235	-1520	-1120	-763	-78	-1229	-1 01	-1 36	-11 2	-1080	-1502	-71	-835	-667	-327	-305	-2 7	-76
27	B12	-851	-1369	-1105	-1265	-1 15	-1891	-2295	-922	-1106	-797	-800	-123	-1357	-1 03	-1152	-11 6	-1 97	-715	-827	-66	-328	-308	-2 8	-76
29	B1	-838	-13 3	-1069	-1222	-1359	-1827	-2033	-9 7	-1066	-77	-775	-1185	-1300	-13 5	-1107	-1109	-1 62	-713	-815	-656	-328	-307	-2 7	-76
30	B15	-816	-1319	-1032	-12 1	-1215	-12 7	-2167	-1 39	-1007	-721	-726	-1077	-1211	-1210	-1097	-1025	-1 38	-707	-793	-6 1	-323	-297	-2	-77
31	B16	-8 7	-1352	-1099	-132	-1257	-1776	-231	-1 81	-1085	-775	-780	-1197	-1329	-13 9	-115	-1073	-1 7	-713	-822	-660	-327	-306	-2 7	-76
32	B17	-85	-1380	-1139	-1 2	-1 81	-125	-23 0	-1527	-1132	-805	-788	-1275	-1 25	-926	-1182	-1202	-1505	-712	-829	-66	-327	-305	-2 7	-76
33	B18	-860	-1386	-1150	-1 57	-1 98	-18 7	-2388	-15 5	-11 6	-812	-817	-1290	-1 2	-1 70	-11 1	-1063	-1511	-71	-835	-667	-328	-307	-2 8	-76
3	B19	-856	-1372	-113	-962	-1 68	-183	-2368	-1526	-1123	-796	-802	-1253	-1 00	-1 17	-11 0	-1117	-1 95	-71	-831	-665	-328	-307	-2 8	-76
35	B20	-859	-138	-11 6	-1 8	-1 92	-1875	-2 0	-1167	-1139	-806	-812	-1273	-1 2	-1 1	-1156	-1073	-1509	-71	-83	-666	-327	-307	-2 8	-76
36	B21	-855	-1371	-1131	-1 16	-1 59	-1359	-2376	-1523	-1119	-791	-798	-1239	-1386	-1396	-1195	-107	-1 9	-71	-830	-66	-327	-307	-2 8	-76
37	B22	-858	-1380	-11 3	-1	-1 88	-1851	-2381	-1538	-1136	-699	-809	-1268	-1 23	-1 9	-11 9	-1095	-1505	-71	-833	-666	-328	-307	-2 8	-76
38	B23	-856	-1379	-1139	-1 32	-1 69	-1800	-2365	-1526	-1132	-699	-808	-1267	-1 16	-1 39	-1191	-1070	-1503	-71	-831	-665	-328	-306	-2 8	-76
39	B2	-855	-1379	-1135	-1 1	-1	-17 9	-2357	-1509	-1128	-698	-805	-1252	-1 00	-1 15	-1153	-1071	-1505	-713	-830	-66	-327	-306	-2 8	-76
0	B25	-858	-1381	-11 3	-1 5	-1 85	-1827	-2373	-1535	-1137	-807	-811	-1278	-1 28	-1 55	-1162	-1117	-1506	-71	-832	-665	-327	-307	-2 8	-76
1	B26	-859	-1383	-11 8	-1 57	-1500	-1330	-1865	-15 5	-11 3	-708	-815	-1289	-1 1	-1 70	-123	-1060	-150	-71	-83	-666	-328	-307	-2 8	-76
2	B27	-859	-1385	-11 8	-1 58	-1502	-1852	-2387	-15 6	-11	-812	-793	-1291	-1 3	-1 72	-1165	-1086	-1509	-71	-833	-666	-328	-307	-2 8	-76
3	B28	-859	-138	-11 7	-1 53	-1 97	-18 6	-2372	-1535	-111	-811	-815	-1288	-1 39	-1 68	-1185	-1073	-1509	-71	-83	-666	-328	-307	-2 8	-76
5	B30	-865	-1395	-1166	-1 91	-1538	-1 05	-2 20	-1197	-116	-826	-830	-1323	-1 6	-150	-1171	-11 5	-1521	-715	-8 0	-670	-328	-308	-2 9	-76
6	B31	-861	-1383	-1151	-1 63	-1510	-1850	-239	-1551	-11 5	-71	-818	-1297	-1 3	-1 75	-1208	-1116	-1507	-715	-835	-667	-328	-307	-2 8	-76
7	B32	-858	-1369	-1123	-1390	-1 33	-1779	-232	-150	-110	-691	-7 9	-1056	-139	-1383	-11 9	-10 7	-1 93	-715	-833	-666	-327	-307	-2 8	-76
8	B33	-807	-1162	-107	-88	-1360	-1711	-22 9	-1 36	-1052	-75	-762	-1158	-1279	-1318	-933	-906	-1266	-692	-788	-639	-327	-297	-2 1	-76
9	B3	-813	-1185	-1077	-1323	-136	-1716	-1612	-1 39	-1029	-615	-687	-116	-1285	-800	-1052	-9 6	-1289	-696	-793	-6 3	-328	-302	-2	-76
50	B35	P CASE DIVERGED																							
51	B35a	- 17	-629	-12 3	-1690	-1716	-2006	-2399	-1701	-1252	-911	-950	-1 78	-1601	-1665	-8 2	-728	-798	-596	- 55	-358	-22	-185	-206	-68
52	B35g	-568	-1038	-1 05	-1975	-1985	-220	-2538	-1615	-1 7	-1032	-1069	-1753	-1993	-1999	-1198	-1113	-1261	-639	-61	-501	-265	-231	-223	-69
53	B36	P CASE DIVERGED																							
5	B36a	-1037	-137	-701	-730	-788	-1039	-1 27	-873	-571	- 76	- 3	-683	-718	-761	-820	-888	-1 59	-5 1	-1106	-817	-299	-251	-203	-71
55	B37	-7 3	-1359	-1053	-1 05	-1 57	-1315	-23 5	-1507	-1089	-801	-795	-125	-139	-1 27	-11 1	-107	-1 83	-706	-709	-588	-321	-297	-2 5	-75
56	B38	-872	-1 57	-1212	-153	-1579	-1923	-2393	-1596	-1193	-830	-8 6	-1353	-1512	-1536	-1173	-1113	-1579	-682	-83	-676	-298	-261	-23	-72
57	B39	-766	-1366	-1092	-1 38	-1 89	-18 2	-2377	-1155	-1130	-811	-812	-1282	-1 31	-1 62	-1167	-1077	-150	-71	-7 0	-120	-328	-307	-2 8	-76
58	B 0	-509	-111	-705	-976	-1050	-136	-18 8	-1131	-7 6	-630	-602	-91	-977	-102	-927	-906	-1253	- 85	- 97	- 2	-301	-267	-22	-60
59	B 0a	-623	-1236	-816	-11 3	-1202	-1530	-1996	-1281	-889	-697	-680	-1036	-1130	-1169	-101	-10 6	-1379	- 2	-607	-523	-309	-272	-231	-73
60	B 1	-8	-1359	-1098	-131	-1352	-1562	-169	-1332	-1088	-776	-782	-119	-1319	-13 2	-1126	-1068	-1 82	-713	-820	-659	-327	-306	-2 7	-76
61		**417**	**629**	**452**	**730**	**765**	**1010**	**1411**	**873**	**418**	**285**	**305**	**582**	**672**	**706**	**328**	**728**	**681**	**442**	**455**	**120**	**224**	**185**	**203**	**60**
62						500	500	500	500	100			250		250										
66	C02	-507	-803	-507	-6 0	-330	-929	-1297	-781	- 77	-386	-356	-596	-668	-679	-672	-70	-900	-650	-517	- 6	-336	-306	-22	-71
67	C02a	-610	-10 3	-686	-902	-982	-1273	-1690	-106	-627	-5 2	-503	-8 2	-9 9	-959	-890	-895	-1161	-658	-603	-523	-325	-292	-231	-75
68	C03	-2 8	-337	-227	-218	-229	-319	- 60	-279	-258	-125	-123	-182	-20	-211	-236	-266	- 0	- 30	-267	-260	-291	-2 7	-169	-69
69	C03a	- 6	-723	- 77	-516	-531	-683	-1026	-606	- 82	-2 8	-237	-396	- 8	- 86	-527	-578	-806	-618	- 73	- 26	-323	-280	-21	-7
70	C03b	-515	-897	-5 3	-631	-6 8	-8 2	-116	- 28	-5 3	-303	-286	-512	-618	-61	-666	-731	-993	-626	-519	- 58	-307	-258	-220	-78
71	C03c	-580	-1016	-6 9	-836	-883	-1135	-1502	-979	-6	- 3	-389	-391	-828	-8 0	-82	-872	-1125	-621	-569	-501	-311	-269	-225	-78
72	C0	-2 8	-335	-227	-218	-229	-319	- 60	-279	-258	-126	-123	-182	-20	-211	-236	-266	- 0	- 30	-267	-260	-289	-2 7	-166	-69
73	C0 a	-219	-722	- 7	-516	-530	-705	-990	-606	- 82	-2 8	-237	- 07	- 73	- 86	-527	-578	-806	-3 5	- 73	- 26	-322	-280	-21	-7
7	C0 b	-508	-897	-5 5	-635	-6 1	- 7	-1159	-765	-5 3	-303	-286	-511	-618	-60	-678	-731	-993	-626	-519	- 58	-307	-258	-220	-78
75	C0 c	-575	-1006	-659	-835	-883	-113	-1510	-979	-6	- 3	-317	-726	-836	-8 5	-835	-837	-1125	-6 1	-566	-501	-311	-269	-225	-78
76	C05	-866	-1381	-1161	-1 83	-1538	-1870	-2 0	-1570	-115	-823	-828	-89	-730	-1 85	-11 9	-1079	-1503	-715	-8 1	-671	-328	-308	-2 9	-76
77	C05a	-825	-1 60	-1109	-1511	-1559	-1871	-2363	-1582	-1155	-850	-837	-13 9	-1 51	-1505	-1190	-1123	-1598	-699	-800	-6 6	-31	-28	-2 5	-79
78	C06	-661	-711	-916	-109	-1136	-1 51	-1979	-12 6	-89	-653	-661	-95	-10 2	-1082	-550	-580	-769	-619	-651	-555	-320	-272	-169	-77
79	C06a	-620	-652	-820	-957	-973	-1265	-1769	-1107	-797	-539	-538	-817	-881	-932	-510	-522	-707	-60	-612	-529	-322	-271	-212	-76
80	C07	-8 9	-1272	-1133	-1 09	-1 52	-1805	-23 2	-1509	-1118	-792	-800	-12 3	-1383	-1 17	-1101	-1079	-1375	-710	-826	-663	-328	-308	-2 8	-76
81	C08	-860	-1362	-1121	-1399	-1 20	-1758	-2306	-1 99	-1099	-671	-7 1	-1029	-137	-1337	-111	-1063	-1 86	-71	-835	-667	-328	-307	-2 8	-76
83	C09	-857	-1357	-1139	-1 38	-1 85	-1835	-2369	-1532	-1088	-800	-797	-1273	-1 05	-1 8	-1116	-10 8	-1 78	-712	-832	-665	-327	-303	-2 5	-76
8	C10	-861	-1369	-1155	-1 66	-151	-1863	-2399	-155	-11 0	-70	-809	-1298	-766	-1 77	-11 9	-1070	-1 92	-713	-836	-667	-327	-303	-2 5	-76
85	C11	-707	-883	-966	-1155	-119	-153	-1311	-1298	-9 1	-681	-690	-1009	-1100	-11	-723	-688	-95	-653	-705	-592	-325	-287	-232	-76
86	C12	-805	-1152	-1060	-1293	-1335	-1686	-2221	-1 15	-1030	-739	-738	-1135	-1252	-1293	-978	-917	-1253	-692	-785	-639	-327	-297	-2 1	-76
87	C13	-853	-1353	-111	-136	-919	-1812	-2316	-1 93	-106	-768	-73	-1178	-1318	-1301	-112	-1081	-1 75	-71	-829	-663	-328	-308	-2 8	-76
88	C1	-856	-1371	-1132	-1 17	-1 61	-18 8	-2377	-1131	-1120	-792	-799	-12 0	-1387	-1397	-1151	-1075	-1 95	-71	-831	-66	-327	-307	-2 8	-76
89	C15	-855	-1367	-1128	-1 07	-970	-1331	-2352	-1516	-111	-786	-793	-1227	-1376	-1388	-1123	-1059	-1 90	-71	-830	-66	-328	-307	-2 8	-76
90	C16	-853	-1363	-1099	-1392	-1 3	-1833	-2358	-1506	-1096	-7 9	-771	-11 0	-1353	-1383	-11 0	-1055	-1 85	-713	-828	-663	-327	-306	-2 7	-76
91	C18	-856	-1376	-1132	-1 2	-1 77	-1859	-2386	-1529	-1116	-762	-78	-1168	-1391	-1 29	-1155	-1121	-1500	-713	-831	-665	-327	-306	-2 7	-76
92	C19	-856	-1373	-1129	-1 19	-1 73	-1836	-2363	-1521	-1112	-757	-780	-1159	-1388	-1 37	-1186	-1101	-1 96	-713	-831	-66	-327	-306	-2 8	-76
93	C20	-8 9	-1360	-1111	-1359	-1 03	-1872	-2386	-1 98	-1090	-76	-776	-1167	-1311	-1290	-1122	-1053	-1 83	-712	-825	-661	-327	-305	-2 7	-76
9	C21	-85	-1366	-1125	-1397	-1 1	-18 2	-2361	-1513	-1109	-780	-789	-1212	-1361	-1365	-880	-1168	-1 89	-71	-829	-663	-328	-306	-2 8	-76
95	C23	-8	-1336	-1080	-1277	-120	-1722	-2265	-1033	-1060	-755	-71	-11 9	-127	-1277	-1130	-1107	-1 5	-713	-820	-658	-328	-307	-2 7	-76
96	C2	-757	-1183	-835	-1070	-1131	-1 51	-1957	-1222	-70	-230	-3 5	-616	-1077	-639	-997	-960	-130	-698	-730	-61	-330	-307	-2 2	-7
97	C2 a	-7 7	-1303	-871	-1178	-1239	-1560	-2050	-1311	-7 0	-26	-386	-1096	-1193	-1206	-1106	-1028	-1 30	-685	-730	-605	-317	-285	-2 1	-78
98	C25	-7 5	-1183	-838	-1076	-1131	-1 51	-1957	-1222	-70	-230	-3 5	-993	-1077	-1089	-990	-991	-1305	-698	-7 2	-61	-330	-307	-2 2	-7
99	C25a	-7 7	-129	-871	-1178	-1238	-1560	-2050	-1311	-7 0	-26	-386	-1096	-1193	-1206	-1109	-1029	-1 30	-685	-730	-605	-317	-285	-2 1	-78
10	C28x	-688	-1073	-837	-1188	-12 1	-1567	-2028	-1322	-936	-708	-700	-1065	- 78	-1206	-981	-902	-1161	-677	-673	-567	-315	-276	-236	-
105		**219**	**335**	**227**	**218**	**229**	**319**	**460**	**279**	**258**	**125**	**123**	**182**	**204**	**211**	**236**	**266**	**404**	**345**	**267**	**260**	**289**	**247**	**166**	**44**
163						00	00	00	00	100			200		200										

INE #	CON NGENCY#	Voltage Deviation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyom ng Path 18 Buses < 90 pu P Voltage	COMMEN
3					**Base Case Overloads (Areas 59 99 Area 10) Exclud ng GSUs**					
						GADSBY 138 / 6 #1	1 6 02%			Not re ated to Path C Loading
5						S DNEY 115 / 230 #1	110 22%			
6						GRACE - SODA 138 #1	109. 5%			
7						CTTNWD N - KETTLECK 115 #1	10 . 1%			
8						GADSBY - TERMINAL 138 #2	102 29%			
9						BRIDGER - BRIDGE&A 3 5 #1	101 93%			
10						3MIKNOLL - SODA 138 #1	100. 3%			
11					**CON INGENCY LOADINGS**					
12	B01	0	- - -	- - -	2	BRIDGER - BR DGE&A 3 5 #1	11 .16%	-	None	2100.53 Amps
13	B01a	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	103.10%	-	None	1897 06 Amps
1	B01g	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	103.10%	-	None	
15	B02	0	- - -	- - -	0	GRACE - SODA 138 #1	89 55%	-	None	
16	B03	0	- - -	- - -	2	BRIDGER - BRIDGE&A 3 5 #1	102 82%	-	None	
17	B03a	0	- - -	- - -	0	DILLON S 161 / 69 #1	95.75%	-	None	
18	B0	1	AMPS 69	5	0	BRIDGER - ROCKSPGS 230 #1	87 05%	-	None	
19	B05	0	- - -	- - -	0	- - -	- - -	-	None	
20	B06	0	- - -	- - -	2	GRACE - SODA 138 #1	135 36%	-	None	Mit ga ed in B06a
21	B06a	0	- - -	- - -	0	GRACE - SODA 138 #1	9 82%	-	None	
22	B07	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	9 55%	-	None	
23	B08	0	- - -	- - -	0	- - -	- - -	-	None	
2	B09	0	- - -	- - -	0	POPULUS 3 5 / 500 #1	7 06%	-	None	
25	B10	0	- - -	- - -	0	- - -	- - -	-	None	
26	B11	0	- - -	- - -	0	GRACE - SODA 138 #1	9 39%	-	None	
27	B12	0	- - -	- - -	0	- - -	- - -	-	None	
29	B1	0	- - -	- - -	0	- - -	- - -	-	None	
30	B15	0	- - -	- - -	0	HIL TOP - H LTOPPS 3 5 #1	77 66%	-	None	
31	B16	0	- - -	- - -	0	- - -	- - -	-	None	
32	B17	0	- - -	- - -	0	HIL TOP - H LTOPPS 3 5 #1	77.16%	-	None	
33	B18	0	- - -	- - -	0	- - -	- - -	-	None	
3	B19	0	- - -	- - -	0	- - -	- - -	-	None	
35	B20	0	- - -	- - -	0	- - -	- - -	-	None	
36	B21	0	- - -	- - -	0	- - -	- - -	-	None	
37	B22	0	- - -	- - -	0	- - -	- - -	-	None	
38	B23	0	- - -	- - -	0	- - -	- - -	-	None	
39	B2	0	- - -	- - -	0	- - -	- - -	-	None	
0	B25	0	- - -	- - -	0	- - -	- - -	-	None	
1	B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	7 . 6%	-	None	
2	B27	0	- - -	- - -	0	BOISEBCH 138 / 230 #1	73.92%	-	None	
3	B28	0	- - -	- - -	0	- - -	- - -	-	None	
5	B30	0	- - -	- - -	0	- - -	- - -	-	None	
6	B31	0	- - -	- - -	0	- - -	- - -	-	None	
7	B32	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	91.95%	-	None	
8	B33	0	- - -	- - -	0	GRACE - SODA 138 #1	99 23%	-	None	
9	B3	0	- - -	- - -	0	GRACE - SODA 138 #1	95 37%	-	None	
50	B35	P CASE DIVERGED								
51	B35a	55	WYOPO 3 5	9.3	0	DAVEJOHN - DAVEJTPS 115 #1	96 22%	-	None	
52	B35g	0	- - -	- - -	0	JEFFERSN - JFRSNPHA 161 #1	103.18%	-	None	
53	B36	P CASE DIVERGED								
5	B36a	0	- - -	- - -	2	GRACE - SODA 138 #1	109 59%	-	None	
55	B37	0	- - -	- - -	2	AEOLUS 500 / 230 #2	100 09%	-	None	
56	B38	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	89. 6%	-	None	
57	B39	0	- - -	- - -	0	- - -	- - -	-	None	
58	B 0	0	- - -	- - -	5	S DNEY 115 / 230 #1	107 60%	-	None	
59	B 0a	0	- - -	- - -	0	GRACE - SODA 138 #1	95 01%	-	None	
60	B 1	0	- - -	- - -	0	- - -	- - -	-	None	
66	C02	0	3M KNOLL 3 5	6.8	5	BRIDGER - BR DGE&A 3 5 #1	128 5 %	-	None	2365.17 Amps
67	C02a	0	- - -	- - -	2	BRIDGER - BR DGE&A 3 5 #1	113 58%	-	None	2089 9 Amps
68	C03	0	AMPS 69	9.1	1	BRIDGER - ROCKSPGS 230 #1	117 56%	1	PTRSNFUR 69 @ .877	
69	C03a	0	PTRSNFRG 69	7.8	0	BRIDGER - ROCKSPGS 230 #1	95 58%	1	PTRSNFUR 69 @ .883	
70	C03b	0	PTRSNFRG 69	9.2	0	DILLON S 161 / 69 #1	92 96%	1	PTRSNFUR 69 @ .869	
71	C03c	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	79 58%	-	None	
72	C0	0	AMPS 69	9.1	1	BRIDGER - ROCKSPGS 230 #1	117 56%	1	PTRSNFUR 69 @ .877	
73	C0 a	0	PTRSNFRG 69	7.8	0	BRIDGER - ROCKSPGS 230 #1	95 58%	1	PTRSNFUR 69 @ .883	
7	C0 b	0	PTRSNFRG 69	9.2	0	DILLON S 161 / 69 #1	92 96%	1	PTRSNFUR 69 @ .869	
75	C0 c	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	79 58%	-	None	
76	C05	0	- - -	- - -	0	- - -	- - -	-	None	
77	C05a	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	93.17%	-	None	
78	C06	0	- - -	- - -	3	GRACE - SODA 138 #1	115.11%	-	None	
79	C06a	0	- - -	- - -	1	AMFLS - MALAD 138 #1	88 25%	-	None	Use MVA3 @ 12 MVA
80	C07	0	- - -	- - -	0	- - -	- - -	-	None	
81	C08	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	93.1 %	-	None	
83	C09	0	- - -	- - -	1	GRACE - SODA 138 #1	10 . 3%	-	None	Bypass 1/2 3MK SC
8	C10	0	- - -	- - -	1	GRACE - SODA 138 #1	10 36%	-	None	Bypass 1/2 3MK SC
85	C11	0	- - -	- - -	1	GRACE - SODA 138 #1	105 62%	-	None	Bypass 1/2 3MK SC
86	C12	0	- - -	- - -	2	GRACE - SODA 138 #1	109 98%	-	None	Bypass 1/2 3MK SC
87	C13	0	- - -	- - -	0	- - -	- - -	-	None	
88	C1	0	- - -	- - -	0	- - -	- - -	-	None	
89	C15	0	- - -	- - -	0	- - -	- - -	-	None	
90	C16	0	- - -	- - -	0	- - -	- - -	-	None	
91	C18	0	- - -	- - -	0	- - -	- - -	-	None	
92	C19	0	- - -	- - -	0	- - -	- - -	-	None	
93	C20	0	- - -	- - -	0	M DPOINT 138 / 230 #1	72 9 %	-	None	
9	C21	0	- - -	- - -	0	- - -	- - -	-	None	
95	C23	0	- - -	- - -	0	- - -	- - -	-	None	
96	C2	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	10 87%	-	None	
97	C2 a	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	96 21%	-	None	
98	C25	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	10 87%	-	None	
99	C25a	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	96 21%	-	None	
10	C28x	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	99 53%	-	None	
167		**All Contingencies (w/ Final RAS) Converged ndicating Positive Reactive Margin**								

1) Voltage Viola ions > 5% for Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line S de) and Transformer ert ary buses.

Appendix 3-5 Pg. 2 - - - Post-transient Results For Bridger / Anticline West vs. Aeolus Southbound

BASE CASE / P PA H FLOWS; Gen Drop

INE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana daho P18)	ot 4a	Bonanza West	ot 1a (30)	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP onder	RedB H Allen (ot 2C)	Pinto 4Corners 2B1)	Sigurd GlenC (2B 2)	daho Area System osses	Pace Area System osses	Bridger Gen Trips	Aeolus Gen Trip
3		**Upper Left Nomogram High Side**																											
		egwstg1 8h5 1550 4100 2400 1610 643 sav	1610	2 0	1700	2 00	-1550	1370	336	6 3	363	123	-225	213	737	60	13	2996	2 90	669	180	92	50	37	211	219	737		
5																													
6																													
8		**Level "B" Contingencies**																											
9	B01	Anticline – Populus 500 kV Line	1981	1822	0	3396	-1126	1000	17	729	32	16	-231	1913	780	636	98	2996	2326	531	180	117	512	373	210	353	773	0	0
10	B01a	Anticline – Populus 500 kV Line Drop Bridger G1	1916	1982	0	3058	-1099	76	383	693	-187	57	-2 9	2021	785	667	83	2996	2236	95	180	107	69	3	199	303	755	575	0
11	B01g	Anticline – Populus 500 kV Line JBG1 KinpCap	1916	1982	0	3058	-1099	76	383	693	-187	57	-2 9	2021	785	667	83	2996	2236	95	180	107	69	3	199	303	755	575	0
12	B01h	Anticline – Populus 500 kV JBG1 KinpCap An ic ine Cap3	1913	2355	0	3068	-1103	770	38	69	-181	60.3	-2 8	2029	78	665	8	2996	2238	96.7	180	107	69 5	3 5	200	202	752	575	0
13	B02	Anticline 500 / 3 5 kV Transformer	163	2368	1788	2296	-15 1	1370	327	63	36	122	-226	n-=0	736	607	13	2996	2 90	666	180	92	505	37	211	210	7 2	0	0
1	B03	Br dger – Populus 3 5 kV Line	1673	231	190	2027	-1 22	1312	382	690	313	103	-226	2098	755	607	127	2996	2 67	6 9	180	95	502	371	210	22	762	0	0
15	B0	Br dger – 3M lekno l 3 5 kV Line	1711	2256	1938	1877	-1322	1302	19	730	306	89	-252	207	763	612	123	2996	2 52	637	180	96	98	368	209	2 2	777	0	0
16	B0 a	Br dger – 3M lekno l 3 5 kV Line																											
17	B05	Br dger 3 5 / 230 kV Transformer	1611	2 03	1699	2397	-15 9	1369	337	6 3	362	123	-225	213	738	60	13	2996	2 89	667	180	92	505	37	211	219	737	0	0
18	B06	3M lekno l – Goshen 3 5 kV Line	1633	2369	1786	2252	-1528	13 1	351	658	3 1	112	-238	2118	7 3	603	129	2996	2 68	653	180	95	506	375	211	215	762	0	0
19	B06a	3M lekno l – Goshen 3 5 kV Line Bypas 3MK Caps	1652	23 0	1825	2652	-1 71	13 2	370	678	3 2	106	-2 1	2106	7 7	60	129	2996	2 69	652	180	96	506	37	211	216	75	0	0
20	B07	Kinport – Goshen 3 5 kV Line	1609	2 06	169	2 09	-1552	137	336	6 2	367	12	-228	2135	737	60	135	2996	2 88	669	180	92	50	37	211	221	737	0	0
21	B08	Kinport – Borah 3 5 kV Line	1612	2 02	1700	2398	-15 9	1369	337	6 3	363	123	-225	213	737	60	13	2996	2 89	668	180	92	50	37	211	220	737	0	0
22	B09	Populus – Borah 500 kV Line	1630	2373	1618	2	-1536	13 1	3 1	6 8	3	117	-226	2123	739	60	125	2996	2 75	656	180	97	507	376	212	231	736	0	0
23	B10	Borah 500 / 3 5 kV Transformer	1616	2399	1676	2 18	-1533	1382	338	6	376	125	-228	2136	739	606	135	2996	2 95	675	180	90	501	372	210	222	736	0	0
2	B11	Borah 3 5 / 230 kV Transformer	1612	2 02	1692	2 0	-15 3	1376	339	6 5	368	123	-230	2135	737	605	135	2996	2 88	670	180	91	503	37	211	222	737	0	0
25	B12	Populus – Cedar Hi l 500 kV Line	1623	2372	1655	2 06	-1583	1287	338	6 5	277	107	-215	2111	73	597	136	2996	2 0	627	180	100	521	38	215	22	736	0	0
27	B1	Cedar H ll – Hemingway 500 kV Line	1626	2368	16 9	2 07	-1580	1285	339	6 6	27	107	-215	2110	735	597	136	2996	2 38	625	180	100	521	38	215	225	737	0	0
28	B15	Midpoint – Hemingway 500 kV Line	1616	2399	1692	2 02	-1535	1379	338	6	380	125	-227	2136	739	606	126	2996	2 98	676	180	93	500	371	210	221	738	0	0
29	B16	Borah – Midpoint 500 kV Line	1618	2386	1682	2396	-1568	1326	338	6	32	115	-219	2123	736	601	126	2996	2 65	6 6	180	100	512	379	213	225	737	0	0
30	B17	Midpoint 500 / 3 5 kV Transformer	6	2 03	688	2	5 0	38	337	6	398	26	228	2 38	739	607	06	2996	2506	678	80	00	99	37	2 0	227	737	0	0
31	B18	Midpoint 3 5 / 230 kV Transformer	1611	2 02	1699	2399	-1551	1367	336	6 3	359	123	-22	213	737	60	136	2996	2 86	666	180	91	505	375	211	220	737	0	0
32	B19	Borah – Adela de #2 3 5 kV Line	1613	2398	1699	239	-1558	1353	337	6 3	351	121	-223	2130	737	603	129	2996	2 80	661	180	96	507	376	212	221	737	0	0
33	B20	Adelaide – Midpoint #2 3 5 kV Line	1611	2 02	1700	2398	-1553	1366	336	6 3	360	123	-22	213	737	603	133	2996	2 87	666	180	93	505	375	211	219	737	0	0
3	B21	Borah – Adela de – Midpoint #1 3 5 kV Line	1613	2398	1700	239	-1558	135	337	6 3	352	121	-223	2131	737	603	129	2996	2 81	662	180	95	507	376	212	220	737	0	0
35	B22	Borah – Hunt 230 kV Line	1612	2 01	1700	2396	-1555	1361	336	6 3	356	122	-223	2133	737	603	132	2996	2 8	66	180	9	506	375	211	221	737	0	0
36	B23	Midpoint – Boise Bench #3 230 kV Line	1612	2 01	1699	2398	-1552	136	336	6 3	356	122	-22	2133	737	603	136	2996	2 83	665	180	92	506	375	211	221	737	0	0
37	B2	Midpoint – Ratt e Snake 230 kV Line	1611	2 02	1699	2399	-1550	1369	336	6 3	362	123	-225	213	737	60	13	2996	2 88	667	180	92	505	37	211	219	737	0	0
38	B25	Midpoint – Dram 230 kV Line	1612	2 02	1699	2398	-1551	1366	336	6 3	359	123	-22	2133	737	60	135	2996	2 86	666	180	92	505	375	211	220	737	0	0
39	B26	Rattle Snake – Bo se Bench 230 kV Line	1611	2 01	1699	2398	-1552	136	336	6 3	356	122	-22	2133	737	603	136	2996	2 81	665	180	92	506	375	211	223	737	0	0
0	B27	Dram – Boise Bench 230 kV Line	1611	2 03	1700	2399	-1550	1370	336	6 3	36	123	-225	2135	737	60	13	2996	2 89	668	180	92	50	37	211	219	737	0	0
1	B28	Hemingway 500/230 kV Transformer	1611	2 02	1698	2 00	-15 9	1370	337	6 3	365	123	-225	213	737	60	133	2996	2 89	669	180	92	50	37	211	221	737	0	0
3	B30	Populus – Borah #1 3 5 kV Line	1609	2 0	1706	2395	-1559	1361	336	6 3	357	122	-225	2133	736	603	132	2996	2 8	663	180	9	507	376	212	220	736	0	0
	B31	Populus – Borah #2 3 5 kV Line	1610	2 02	170	239	-1558	1360	337	6 3	357	122	-225	2133	737	603	132	2996	2 83	663	180	9	506	375	212	220	737	0	0
5	B32	Populus – Kinport 3 5 kV Line	1607	2 07	1696	2 08	-1562	1365	336	6 3	361	122	-230	213	735	603	132	2996	2 82	663	180	9	507	376	212	222	736	0	0
6	B33	Populus – Ben Lomond #3 3 5 kV Line	1658	2351	1660	2356	-1 2	1 15	358	666	398	128	-223	2131	751	615	1 5	2996	2521	700	180	79	86	362	207	217	7 9	0	0
7	B3	Populus – Terminal 3 5 kV Line	1653	2356	1669	2366	-1 8	1 09	3 6	653	393	126	-223	2130	750	613	1 3	2996	2516	695	180	81	89	36	207	218	7 2	0	0
8	B35	Aeolus – Ant c ine 500 kV Line																											
9	B35a	Aeolus – Ant c ine 500 kV Line																											
50	B35g	Aeolus – Ant c ine 500 kV Line	22 0	851	767	1957	-960	730	282	587	-213	21	-293	1878	773	719	76	2996	2205	69	180	112	72	3 3	200	185	836	0	600
51																													
52	B36	Aeolus – Mona 500 kV Line																											
53	B36a	Aeolus – Mona 500 kV Line	0	3258	2089	2692	-2379	1182	1	725	150	95	-2 3	1992	887	7 5	162	2996	2519	760	180	5	330	2 7	162	261	769	0	600
5	B37	Aeolus 500 / 230 kV Transformer	1596	2388	1688	2398	-1550	1359	337	6	353	115	-226	2109	7 3	611	13	2996	2 85	666	180	91	502	372	211	219	736	0	0
55	B38	Aeolus – Windstar 230 kV Line	15 8	2292	16 6	2372	-15 6	1306	332	639	303	77	-231	1993	765	6 7	131	2996	2 70	655	180	89	93	36	208	217	7 7	0	0
56	B39	Aeolus – Freezeout 230 kV Line	588	2 38	685	2 9	556	368	3	65	36	26	22	2 7	739	600	35	2996	2 88	669	80	9	503	373	2	22	7 8	0	0
57	B 0	Bonanza –Mona 3 5kV Line	17 2	2 27	1717	2 82	-1767	1250	38	69	2 2	83	-23	2310	1 5	170	137	2996	2 19	601	180	65	29	306	187	231	793	0	0
58	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1731	2391	1678	2 19	-1802	1132	361	669	131	131	-2 2	225	103	82	132	2996	2 08	637	180	57	1	30	185	22	7 1	0	0
59	B 1	Hemingway – Summer Lake 500kV line	1618	238	168	2393	-1581	1310	337	6 3	290	115	-218	2120	73	597	1 9	2996	2 3	631	180	95	520	383	215	213	738	0	0
60																													
61																												N-1 Criteria; > >	
62																													
63		**Level "C" Contingencies**																											
66	C02	Br dger – Populus #1 # 2 3 5 kV Lines	1771	21	2239	1375	-120	1197	59	772	211	58	-228	2010	790	617	11	2996	2 25	613	180	100	95	36	207	21	830	0	0
67	C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	170	2315	2076	1237	-1199	962	15	726	-7	105	-2 6	2129	789	6 7	101	2996	233	578	180	89	53	336	196	190	792	575	0
68	C03	Br dger – 3M leKnoll Br dger – Populus #1 3 5 kV ines																											
69	C03a	Br dger – 3M leKnoll Br dger – Populus #1 3 5 kV ines w/ RA	1737	2252	2092	1098	-1096	9 9	53	766	-15	86	-273	2096	798	653	96	2996	2319	567	180	90	7	331	19	208	808	575	0
70	C03b	Br dger – 3M leKnoll Br dger – Populus #1 3 5 kV ines w/ RA	1670	2 18	1933	9 7	-1091	695	08	719	-252	131	-285	2211	800	686	81	2996	2228	527	180	79	0	300	183	186	786	1150	0
71	C03c	Br dger–3MK Br dge-Pop#1 3 5 RAS; 2JBG Path18 Caps U	1668	2 13	193	9 3	-1126	761	06	716	-191	131	-279	220	795	678	87	2996	2253	5	180	80	15	309	186	181	775	1150	0
72	C0	Br dger – 3M leKnoll Br dger – Populus #2 3 5 kV ines																											
73	C0 a	Br dger – 3M leKnoll Br dger – Populus #2 3 5 kV ines w/ RA	1737	2252	2092	1098	-1096	9 9	53	766	-15	86	-273	2096	798	653	96	2996	2319	567	180	90	7	331	19	208	808	575	0
7	C0 b	Br dger – 3M leKnoll Br dger – Populus #2 3 5 kV ines w/ RA	1670	2 18	1933	9 7	-1091	695	08	719	-252	131	-285	2211	800	686	81	2996	2228	527	180	79	0	300	183	186	786	1150	0
75	C0 c	Br dger–3MK Br dge-Pop#2 3 5 RAS; 2JBG Path18 Caps U	1668	2 13	193	9 3	-1126	761	06	716	-191	131	-279	220	795	678	87	2996	2253	5	180	80	15	309	186	181	775	1150	0
76	C05	Borah – Populus 3 5 kV DLO	1607	2 03	1715	2382	-1578	1339	337	6 3	3 1	118	-226	2128	735	600	126	2996	2 70	653	180	99	511	379	213	221	737	0	0
77	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1559	2527	1609	2101	-1518	106	309	61	87	1 9	-2 5	2216	7 6	637	109	2996	2368	606	180	88	65	3 7	201	196	729	575	0
78	C06	Populus – Ben Lomond 3 5 kV DLO	1753	22 7	1581	2267	-1165	1512	01	711	71	138	-220	2123	780	639	167	2996	2590	770	180	51	6	33	196	213	778	0	0
79	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1 2 of 3MK Seri	1773	2215	1638	21 9	-1118	1508	18	729	68	130	-226	2108	78	639	166	2996	2586	766	180	52	6	333	196	207	779	0	0
80	C07	Ben Lomond – Terminal 3 5 kV DLO	1621	2392	1695	2395	-1531	1379	333	6 0	370	12	-22	2133	7 1	606	136	2996	2 96	67	180	89	501	372	210	219	737	0	0
81	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	160	2 07	1700	2 03	-1578	13 9	336	6 3	350	118	-232	2130	73	601	127	2996	2 73	653	180	98	511	378	213	223	737	0	0
83	C09	Populus – Borah #2 3 5 kV Treasureton – Brady 230 kV Lin	1612	2 00	1697	2393	-15 6	1365	3 1	6 8	360	123	-225	2133	737	60	133	2996	2 86	666	180	93	505	375	211	220	738	0	0
8	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Line	1611	2 02	1699	239	-15 8	1365	3 1	6 8	360	123	-225	213	737	60	133	2996	2 86	666	180	93	505	375	211	220	738	0	0
85	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1721	2281	1613	2305	-1265	1 78	375	683	6	133	-220	212	770	629	159	2996	2566	7	180	62	61	3	200	215	759	0	0
86	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Line	1656	2353	1660	236	-1 31	1 15	353	660	398	128	-223	2130	751	61	1 5	2996	2519	700	180	79	87	362	207	217	7	0	0
87	C13	Borah – Adela de #2 Borah–ADT–Midpoint #1 3 5 kV lines (R	1616	2387	1701	2378	-158	1308	337	6 3	320	113	-216	2120	735	599	113	2996	2 62	6 0	180	106	515	381	213	223	738	0	0
88	C1	Borah – Adela de #2 M dpoint - Adela de #2 3 5 kV lines (RA	1613	2398	1700	2393	-1559	1353	337	6 3	351	121	-222	2130	737	603	129	2996	2 80	661	180	96	507	376	212	221	737	0	0
89	C15	Borah – Adela de #2 Borah – Hunt 230 kV ines	161	2396	1701	2390	-1565	13 2	336	6 3	3 2	119	-220	2128	737	602	125	2996	2 76	655	180	98	509	377	212	222	737	0	0
90	C16	Borah – Kinport Borah–Adel–M dpoint #1 3 5 kV ines (RA)	1613	2398	1699	2393	-1556	135	337	6 3	352	121	-223	2131	737	603	129	2996	2 81	662	180	95	507	376	212	221	737	0	0
91	C18	Borah – Kinport Midpoint – Ade aide #2 3 5 kV lines (RA?)	1612	2 02	1700	2397	-1551	1366	336	6 3	360	123	-22	2133	737	60	133	2996	2 87	666	180	93	505	375	211	219	737	0	0
92	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV ines (RA)	1612	2 00	1701	2395	-155	1361	336	6 3	356	122	-223	2132	737	603	132	2996	2 8	665	180	9	506	375	211	221	737	0	0
93	C20	Borah–Adel–Midpoint #1 Midpoint – Ade aide #2 3 5 kV lines	1613	2396	1700	2390	-1561	13 8	337	6 3	3 8	120	-222	2129	737	602	127	2996	2 79	659	180	97	508	376	212	220	737	0	0
9	C21	Borah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA	1613	2396	1701	2389	-1565	13 2	336	6 3	3 3	119	-220	2128	737	602	126	2996	2 75	657	180	98	509	377	212	222	737	0	0
95	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1621	2377	1679	2388	-1585	129	338	6 5	300	110	-215	2115	735	598	116	2996	2 9	631	180	106	518	383	21	228	738	0	0
96	C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines	167	2313	1916	2013	-1 21	1310	382	691	311	103	-22	2098	755	607	127	2996	2 67	6 9	180	95	502	371	210	22	763	0	0
97	C2 a	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1615	2 5	1775	1798	-1386	10 6	3 7	65	67	138	-2 6	2193	762	6 2	111	2996	2365	606	180	85	57	3 1	198	199	7 6	575	0
98	C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV lines	167	2313	1916	2013	-1 21	1310	382	691	311	103	-22	2098	755	607	127	2996	2 67	6 9	180	95	502	371	210	22	763	0	0
99	C25a	Br dger – Populus #2 Goshen – Kinport 3 5 kV lines w/ RAS	1615	2 5	1775	1798	-1386	10 6	3 7	65	67	138	-2 6	2193	762	6 2	111	2996	2365	606	180	85	57	3 1	198	199	7 6	575	0
10	C28x	Palo Verde - Trip 1&2, w/ FACRI	1686	2 11	1690	2 07	-1723	1218	3 6	653	215	1 8	-2	2198	757	617	139	2996	3 27	1912	180	65	650	76	250	222	806	0	0
105																													
106																												N-2 Criteria; > >	
107																													
108		**Upper Left Nomogram Low Side**																											
109		**egwstg1 8h5 1450 4100 2400 1581 634 sav**	1581	2390	1700	2 00	-1 50	1 62	318	62	58	125	-216	2080	719	581	132	2996	2 66	6 6	180	100	50	390	217	218	713		
110																													
111																													
155	B35g	Aeolus – Ant c ine 500 kV Line	2221	8 1	76	196	-8 7	837	267	571	-10	31	-283	18 2	757	696	7	2996	2187	9	180	121	76	362	208	182	802	0	600
156																													
21																													
215		**Margin est w/ Br dger West at 5% of 4100 MW**																											
216		**egwstg1 8h8 1300 4305 2520 1653 sav**	1653	2875	1785	2520	-1300	1759	236	539	7	126	-177	2319	777	63	139	2996	2232	21	2005	96	50	3 7	211	230	769		

REAC IVE MARGIN MVAR (Gray shaded cells are the minimum margins)

INE #	CON INGENCY#	Aeolus 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Bridger 345	oshen 345	3 Mi Knoll 345	K nport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	ladstone 230
9	B01	-27	-	-2	-51	- 7	-77	-88	-67	-22	-29	-23	-38	- 0	- 7	-51	- 8	-53	-65	-31	-35	-27	-31	-2	-52
10	B01a	-110	-218	-96	-260	-277	-378	-517	-323	-101	-1 8	-11	-228	-216	-255	-256	-279	-317	-250	-123	-116	-105	-108	-93	-57
11	B01g	-110	-218	-96	-260	-277	-378	-517	-323	-101	-1 8	-11	-228	-216	-255	-256	-279	-317	-250	-123	-116	-105	-108	-93	-57
12	B01h	-327	-588	-29	-673	-69	-916	-1272	-801	-302	-368	-308	-557	-586	-6 3	-660	-6 8	-716	-527	-358	-295	-217	-219	-186	-57
13	B02	- 65	-1115	-523	-1189	-1366	-1720	-2201	-13 9	-930	-808	-771	-1229	-1352	-1379	-1168	-1127	-1272	-673	- 72	- 03	-299	-279	-239	-6
1	B03	-55	-1031	-703	-976	-1061	-1383	-1870	-113	-699	-619	-576	-92	-1011	-10 2	-971	-975	-1125	-650	-5 1	- 5	-309	-286	-230	-62
15	B0	- 36	-7 2	- 80	-579	-613	-830	-1176	-706	- 96	-309	-288	-505	-569	-58	-611	-678	-817	-616	- 39	-37	-305	-27	-210	-61
16	B0 a	- 7	-92	-572	-753	-80	-1060	-1 68	-897	-59	-386	-352	-662	-7 9	-768	-799	-853	-1023	-616	- 68	-392	-289	-257	-218	-65
17	B05	-6 7	-1233	-918	-1315	-1396	-1759	-2290	-1 2	-990	-796	-770	-1225	-1339	-1381	-1209	-1171	-1337	-675	-628	- 97	-297	-28	-237	-6
18	B06	-621	-115	-887	-1191	-1260	-160	-2115	-1330	-938	-570	-666	-1070	-1206	-123	-1100	-1086	-12 8	-670	-60	- 85	-309	-290	-2 0	-6
19	B06a	-59	-1088	-813	-1072	-11 2	-1 72	-1979	-1221	-8 2	-8 2	- 82	-9	-108	-1111	-1111	-1021	-1021	-661	-579	- 69	-309	-287	-236	-63
20	B07	-6 9	-1182	-88	-1296	-1382	-17 7	-2285	-1 29	-865	-306	- 52	-12 9	-1329	-1370	-1203	-115	-1268	-673	-630	-500	-307	-285	-239	-65
21	B08	-650	-1231	-910	-1288	-137	-1736	-2269	-1 20	-970	-750	-7 2	-7 2	-1302	-1361	-1200	-1200	-1332	-676	-631	-500	-500	-287	-2 0	-65
22	B09	-652	-1201	-885	-885	-1331	-1678	-2209	-1329	-9 3	-762	-737	-737	-1259	-1259	-1173	-1173	-1173	-67	-63	-502	-305	-305	-239	-6
23	B10	-6	-1162	-896	-1297	-1320	-173	-2270	-1 25	-955	-751	-739	-1170	-129	-129	-118	-1131	-12 6	-670	-626	- 97	-307	-28	-238	-65
2	B11	-655	-1237	-915	-1281	-1281	-1717	-2252	-1 12	-1 12	-75	-75	-1167	-1298	-1298	-1171	-1171	-13 0	-676	-635	-503	-305	-286	-239	-65
25	B12	-660	-1150	-893	-11 9	-1302	-1787	-2308	-981	-9 8	-758	-7 3	-1163	-1252	-1306	-117	-1120	-123	-676	-6 2	-508	-311	-291	-2 1	-63
27	B1	-65	-1187	-877	-1095	-1095	-1716	-22 7	-893	-928	-751	-729	-1111	-1111	-12 5	-12 5	-12 5	-1286	-1286	-635	-503	-308	-292	-2 1	-63
28	B15	-62	-1180	-8 5	-1128	-1135	-1183	-1183	-13 5	-883	-883	-691	-1036	-1131	-1131	-1121	-1107	-1107	-671	-605	- 76	-302	-283	-238	-65
29	B16	-6 8	-1199	-887	-1183	-1183	-1713	-22 3	-1361	-9 0	-753	-733	-1123	-1219	-12 9	-116	-116	-1300	-677	-629	- 99	-306	-289	-2 0	-6
30	B17	-6 9	-1231	-910	-1291	-1365	-1553	-2230	-1 15	-978	-978	-760	-1199	-1310	-13 7	-1202	-1169	-1169	-67	629	-629	-30	-285	-2 0	-65
31	B18	-653	-1235	-917	-1303	-1380	-1380	-2277	-1 30	-989	-792	-768	-1215	-1215	-1366	-1212	-1173	-1338	-676	-633	-501	-305	-287	-2 1	-6
32	B19	-6 9	-1222	-905	-1270	-13 7	-13 7	-2251	-1 08	-968	-77	-752	-1176	-128	-128	-1190	-1190	-1321	-676	-630	- 99	-305	-288	-2 0	-6
33	B20	-653	-123	-917	-917	-1383	-1777	-2301	-1 37	-988	-789	-789	-120	-120	-13 8	-1209	-1172	-1337	-676	-633	-502	-305	-287	-2 1	-6
3	B21	-6 9	-1219	-905	-905	-905	-17	-2262	-1 07	-966	-771	-750	-1166	-1275	-1297	-1188	-1188	-1320	-676	-630	- 99	-305	-288	-2 0	-6
35	B22	-651	-651	-913	-129	-1373	-1373	-2267	-1 25	-982	-78	-762	-1198	-1313	-1313	-1313	-1168	-1332	-676	-631	-501	-501	-288	-2 1	-6
36	B23	-651	-1231	-912	-1288	-1361	-1699	-2255	-1 18	-981	-786	-762	-1199	-1310	-13	-1205	-1168	-1332	-676	-632	-501	-305	-287	-2 0	-6
37	B2	-651	-1233	-912	-1277	-13 2	-1650	-2256	-1 06	-980	-78	-762	-1189	-1299	-1327	-1205	-1169	-1335	-676	-631	-500	-305	-287	-2 0	-65
38	B25	-651	-1232	-913	-1296	-1373	-172	-2266	-1 25	-98	-789	-765	-1208	-1319	-1357	-1208	-610	-133	-676	-632	-501	-305	-287	-2 0	-6
39	B26	-653	-123	-916	-130	-138	-17 0	-2269	-1 32	-988	-791	-768	-121	-1328	-1368	-1210	-1171	-1336	-676	-633	-501	-305	-288	-2 1	-6
0	B27	-652	-1236	-916	-1308	-1388	-17 9	-2283	-1 36	-989	-793	-769	-1219	-1332	-1372	-1207	-1173	-1339	-676	-632	-501	-305	-287	-2 0	-65
1	B28	-651	-123	-91	-1298	-1377	-1733	-2255	-1 21	-985	-790	-765	-1211	-1322	-1363	-1209	-611	-1337	-676	-631	-500	-305	-287	-2 0	-65
3	B30	-658	-12 6	-930	-1335	-1 21	-1781	-2315	-1 60	-1006	-805	-781	-12 5	-13 6	-1 03	-1222	-1182	-1350	-677	-638	-505	-306	-288	-2 1	-6
	B31	-653	-1235	-917	-1306	-1391	-1751	-2282	-1 35	-987	-791	-767	-1219	-1316	-1373	-1206	-1168	-1335	-677	-63	-502	-305	-288	-2 1	-6
5	B32	-662	-1257	-930	-1318	-1388	-17 5	-2286	-1	-993	-707	-732	-1061	-13 3	-1355	-1226	-1189	-1363	-678	-6 2	-507	-305	-288	-2 1	-65
6	B33	-625	-1075	-879	-1205	-1280	-1633	-2166	-13 5	-935	-75	-735	-1118	-1207	-1256	-96	-970	-1159	-655	-607	- 85	-30	-281	-233	-65
7	B3	-626	-1076	-876	-1200	-1273	-162	-2157	-1339	-931	-750	-730	-1111	-1201	-12 9	-10 3	-978	-1160	-658	-608	- 86	-305	-28	-237	-65
8	B35	P CASE DIVERGED																							
9	B35a	P CASE DIVERGED																							
50	B35g	-216	-515	-1309	-19 6	-1995	-2255	-2675	-1902	-1227	-105	-1066	-1739	-1922	-1975	-1023	-882	-79	- 53	-2 0	-195	-1 1	-123	-189	-52
52	B36	P CASE DIVERGED																							
53	B36a	-580	-1135	-327	-357	- 07	-560	-770	- 51	-256	-263	-23	-366	-381	- 05	-606	-761	-118	- 61	-665	-520	-216	-213	-166	-58
5	B37	-525	-1193	-793	-1227	-1321	-1682	-2216	-1371	-905	-770	-736	-1161	-1261	-1308	-1178	-11	-1303	-66	-500	- 13	-295	-273	-236	-6
55	B38	-67	-131	-986	-1 10	-1 86	-18 2	-2380	-1512	-10 9	-81	-803	-1293	-1 31	-1 65	-1252	-1226	-1 10	-638	-6	-515	-26	-229	-22	-59
56	B39	-529	-11 7	-52	-802	895	-119	-1619	-966	-292	-5 0	- 5	-782	-806	-877	-896	-10 3	-1328	-5 3	-5 2	-5	-119	-12	-79	-65
57	B 0	-263	-817	-399	-71	807	-1069	-1 70	-870	- 71	-522	- 70	-731	-7 6	-805	-818	-881	-1019	- 31	-257	-229	-2 3	-213	-19	- 2
58	B 0a	- 09	-1092	-616	-100	-1101	-1 27	-1886	-1163	-716	-663	-620	-981	-1033	-1091	-1036	-106	-126	- 60	-398	-3 2	-277	-2 5	-218	-59
59	B 1	-655	-1217	-905	-1210	-1275	-1 98	-16 3	-1257	-966	-772	-751	-115	-1255	-1280	-1188	-115	-1317	-679	-636	-50	-307	-290	-2 1	-63
60		**216**	**515**	**294**	**357**	**407**	**560**	**770**	**451**	**256**	**263**	**234**	**366**	**381**	**405**	**606**	**610**	**716**	**431**	**240**	**5**	**119**	**123**	**79**	**42**
61	N-1 Criteria; > >					500	500	500	500	100			250		250										
66	C02	-232	- 57	-22	-307	-356	- 92	-685	-395	-236	-212	-18	-31	-339	-352	- 05	- 51	-562	- 69	28	-223	-261	-251	-168	-57
67	C02a	-371	-793	- 21	-6 9	-73	-983	-1296	-792	- 12	- 31	-37	-650	-713	-730	-7 1	-771	-898	-589	-37	-325	-289	-263	-209	-63
68	C03	P CASE DIVERGED																							
69	C03a	-217	- 31	-22	-283	313	- 25	-601	-360	-2	-189	-183	-267	-288	-299	-3 5	-393	- 98	-	-22	-203	-2 0	-225	-157	-61
70	C03b	-297	-652	-330	- 69	520	-695	-9 6	-580	-3 3	-293	-276	-	- 87	-503	-552	-620	-753	-526	-300	-265	-2 5	-226	-195	-66
71	C03c	-351	-791	- 08	-629	719	-95	-1292	-777	- 27	- 29	-383	-63	-675	-707	-731	-767	-902	-568	-353	-306	-266	-239	-20	-66
72	C0	P CASE DIVERGED																							
73	C0 a	-217	- 31	-22	-283	313	- 25	-601	-360	-2	-189	-183	-267	-288	-300	-3 5	-393	- 98	- 2	-22	-203	-239	-225	-157	-61
7	C0 b	-297	-652	-330	- 63	520	-695	-9	-580	-3 3	-293	-276	-	- 87	-503	-569	-620	-753	-527	-299	-265	-2 5	-226	-195	-66
75	C0 c	-351	-791	- 19	-625	719	-95	-1292	-777	- 27	- 29	-383	-633	-66	-708	-731	-767	-902	-568	-353	-306	-266	-239	-20	-66
76	C05	-659	-1231	-922	-1309	-1 06	-1759	-2289	-1 1	-989	-792	-769	-1228	-1289	-1376	-1197	-1160	-133	-679	-639	-506	-307	-290	-2 1	-6
77	C05a	-618	-1316	-867	-1360	-1 63	-1811	-2326	-1 88	-989	-822	-795	-1286	-1351	-1 35	-1273	-123	-1 38	-659	-599	- 78	-290	-267	-239	-68
78	C06	-537	-719	-787	-106	-1131	-1 62	-1958	-1215	-8 1	-689	-675	-980	-10 5	-1098	-58	-623	-775	-598	-529	- 35	-300	-267	-212	-65
79	C06a	- 97	-663	-705	-921	980	-1280	-1761	-1073	-736	-581	-561	-8 0	-900	-9 3	-535	-572	-709	-585	- 90	- 09	-300	-26	-203	-6
80	C07	-6 6	-1139	-906	-1260	-1337	-1696	-2232	-139	-967	-775	-752	-1171	-1273	-1317	-1079	-1058	-1225	-671	-627	- 98	-306	-288	-2 1	-6
81	C08	-66	-1250	-925	-1298	-1362	-1712	-2253	-1 2	-980	-680	-716	-1026	-130	-1313	-1210	-1177	-1355	-680	-6	-508	-306	-289	-2 1	-6
83	C09	-651	-1220	-911	-1288	-1370	-1729	-2262	-1 19	-975	-782	-75	-1202	-1297	-1351	-1178	-1153	-1323	-676	-631	-500	-305	-286	-238	-6
8	C10	-656	-123	-923	-1318	-1 00	-1760	-2293	-1 5	-99	-796	-767	-1229	-1328	-1381	-1192	-1166	-1337	-676	-636	-503	-305	-286	-239	-6
85	C11	-566	-8 3	-806	-1080	-11 9	-1 83	-2005	-1230	-856	-697	-682	-998	-1065	-1117	-7	-731	-902	-620	-556	- 5	-303	-276	-226	-65
86	C12	-623	-1062	-867	-1178	-1251	-1599	-2130	-1321	-915	-738	-715	-1092	-1180	-1225	-1015	-960	-11	-655	605	- 8	-30	-282	-23	-65
87	C13	-6 8	-1193	-889	-1197	-1270	-1685	-2187	-1353	-933	-738	-723	-1089	-1192	-1189	-11 7	-1125	-1290	-678	-629	- 99	-307	-290	-2 1	-63
88	C1	-650	-1220	-906	-1266	-13	-1717	-2262	-1 07	-967	-771	-751	-1167	-1276	-1297	-1189	-1156	-1321	-676	-630	-500	-305	-288	-2 0	-6
89	C15	-6 8	-121	-901	-1252	-1328	-1715	-2227	-1392	-960	-763	-7	-1150	-1261	-128	-1181	-1150	-1315	-677	-629	- 99	-306	-288	-2 1	-6
90	C16	-6 8	-121	-897	-12 3	-1326	-1726	-22 2	-1389	-9 6	-731	-725	-1079	-12 6	-1283	-117	-11 9	-131	-676	-628	- 98	-305	-287	-2 0	-6
91	C18	-651	-1229	-910	-1281	-1366	-1758	-2281	-1 20	-967	-7 7	-7 0	-1112	-1288	-133	-1196	-1165	-1330	-676	-632	-501	-305	-287	-2 0	-6
92	C19	-6 9	-1225	-906	-1271	-1357	-1725	-22 9	-1 07	-962	-7 1	-735	-1102	-1282	-1337	-1191	-1161	-1325	-676	-630	- 99	-305	-287	-2 0	-6
93	C20	-6 8	-1210	-897	-1226	-1301	-178	-2283	-1388	-9 7	-7 8	-733	-1105	-1216	-1209	-1167	-11 3	-1310	-676	-629	- 99	-305	-288	-2 0	-6
9	C21	-6 9	-121	-901	-12 7	-132	-1732	-22 1	-1393	-958	-760	-7 2	-11 0	-1252	-1268	-1178	-11 9	-131	-677	-629	- 99	-306	-288	-2 1	-6
95	C23	-6 7	-1179	-875	-1133	-1100	-1662	-2192	-1323	-915	-730	-713	-1068	-1160	-1172	-1133	-1111	-1275	-678	-628	- 99	-307	-291	-2 0	-63
96	C2	-552	-10 3	-658	-95	-1037	-1355	-183	-1111	-592	-2 8	-3 3	-939	-99	-1022	-961	-976	-1128	-651	-539	-	-308	-286	-230	-62
97	C2 a	-5 3	-1160	-671	-1082	-118	-1520	-201	-1237	-638	-28	-383	-1082	-11 3	-1177	-1109	-1093	-1278	-6 1	-529	- 3	-292	-266	-232	-66
98	C25	-552	-1028	-658	-95	-1037	-1355	-183	-1111	-592	-2 8	-3 3	-939	-99	-1022	-961	-976	-1128	-651	-539	-	-308	-286	-230	-62
99	C25a	-5 3	-1160	-682	-1082	-118	-1520	-201	-1237	-638	-28	-383	-1082	-11 3	-1177	-1109	-1088	-1278	-6 1	-529	- 3	-292	-266	-232	-66
10	C28x	- 73	-888	-69	-1033	-1127	-1 65	-1950	-119	-777	-68	-653	-997	-1056	-1111	-9 7	-888	-950	-610	- 60	-387	-286	-255	-227	-2
105		**217**	**431**	**224**	**283**	**313**	**425**	**601**	**360**	**236**	**189**	**183**	**267**	**288**	**299**	**345**	**393**	**498**	**442**	**28**	**203**	**239**	**225**	**157**	**24**
106	N-2 Criteria; > >					00	00	00	00	100			200		200										

INE #	CON INGENCY#	Voltage Deviation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Voltage	COMMEN
3					**Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs**					
						S DNEY 115 / 230 #1	109 63%			
5						CTTNWD N - KETTLECK 115 #1	103. 8%			
6						KELKER W - ROCKISLD 115 #1	99. 5%			
8					**CON NGENCY LOAD NGS**					
9	B01	7	3M KNOLL 3 5	5.8	1	BRIDGER - BR DGE&A 3 5 #1	115.69%	-	None	2130.76 Amps
10	B01a	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	103 90%	-	None	1911 99 Amps
11	B01g	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	103 90%	-	None	
12	B01h	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	103 83%	-	None	
13	B02	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	82.87%	-	None	
1	B03	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	100. 6%	-	None	
15	B0	5	BIGGRASS 69	6.0	0	BR DGER - ROCKSPGS 230 #1	96.78%	1	PTRSNFUR 69 @ 885	
16	B0 a	8	PTRSNFRG 69	6.1	0	PALISADE - ROCKSPGS 230 #1	90.82%			
17	B05	0	- - -	- - -	0	- - -	- - -	-	None	
18	B06	0	- - -	- - -	2	GRACE - SODA 138 #1	121 07%	-	None	Mit gated in B06a
19	B06a	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	88.28%	-	None	
20	B07	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	88. 8%	-	None	
21	B08	0	- - -	- - -	0	- - -	- - -	-	None	
22	B09	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87.98%	-	None	
23	B10	0	- - -	- - -	0	- - -	- - -	-	None	
2	B11	0	- - -	- - -	0	GRACE - SODA 138 #1	77.69%	-	None	
25	B12	0	- - -	- - -	0	LOCUST - MORA 138 #1	82. 6%	-	None	
27	B1	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.59%	-	None	
28	B15	0	- - -	- - -	0	- - -	- - -	-	None	
29	B16	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	7 .86%	-	None	
30	B17	0	- - -	- - -	0	LOCUST - MORA 138 #1	88. 6%	-	None	
31	B18	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	7 .58%	-	None	
32	B19	0	- - -	- - -	0	- - -	- - -	-	None	
33	B20	0	- - -	- - -	0	- - -	- - -	-	None	
3	B21	0	- - -	- - -	0	- - -	- - -	-	None	
35	B22	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.22%	-	None	
36	B23	0	- - -	- - -	0	LOCUST - MORA 138 #1	86.89%	-	None	
37	B2	0	- - -	- - -	0	- - -	- - -	-	None	
38	B25	0	- - -	- - -	0	- - -	- - -	-	None	
39	B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	89.75%	-	None	
0	B27	0	- - -	- - -	0	- - -	- - -	-	None	
1	B28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82. 2%	-	None	
3	B30	0	- - -	- - -	0	- - -	- - -	-	None	
	B31	0	- - -	- - -	0	- - -	- - -	-	None	
5	B32	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	89.28%	-	None	
6	B33	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	86.6 %	-	None	
7	B3	0	- - -	- - -	0	GRACE - SODA 138 #1	78.1 %	-	None	
8	B35					P CASE DIVERGED				
9	B35a					P CASE DIVERGED				
50	B35g	53	WYOPO 3 .5	7.9	7	M NERS 230 0 PLATTE 230.0 #	109 76%	-	None	
51						BRIDGER 3 5 / 230 #2	101 72%			
52	B36					P CASE DIVERGED				
53	B36a	1	BONANZA 3 5	5.1	0	PALISADE - ROCKSPGS 230 #1	98.17%	-	None	
5	B37	0	- - -	- - -	2	AEOLUS 500 / 230 #2	10 0 %	-	None	
55	B38	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	91.76%	-	None	
56	B39	0	- - -	- - -	0	M NERS 230 0 PLATTE 230.0 #	9 .78%	-	None	
57	B 0	6	MOONLAK1 69	6.1	7	BONANZA - VERNAL 138 #1	131 90%	-	None	
58	B 0a	0	- - -	- - -	0	SPRINGER - GLADSTON 115 #1	88.56%	-	None	
59	B 1	0	- - -	- - -	0	H ALLEN - HA PS 3 5 #2	71.15%	-	None	
66	C02	80	3M KNOLL 3 5	7.5	6	BRIDGER - BR DGE&A 3 5 #1	127 90%	-	None	2353 8 Amps
67	C02a	0	- - -	- - -	1	BRIDGER - BR DGE&A 3 5 #1	112.16%	-	None	2063 83 Amps
68	C03					P CASE DIVERGED				
69	C03a	0	PTRSNFUR 69	8.2	3	BR DGER - ROCKSPGS 230 #1	106 08%	1	PTRSNFUR 69 @ 867	
70	C03b	0	PTRSNFRG 69	9.1	0	PALISADE - ROCKSPGS 230 #1	95.17%	1	PTRSNFUR 69 @ 0.859	
71	C03c	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	9 . 9%	-	None	w/ P18 Caps & Load Dr
72	C0					P CASE DIVERGED				
73	C0 a	0	PTRSNFUR 69	8.2	3	BR DGER - ROCKSPGS 230 #1	106 08%	1	PTRSNFUR 69 @ 867	
7	C0 b	0	PTRSNFRG 69	9.1	0	PALISADE - ROCKSPGS 230 #1	95.17%	1	PTRSNFUR 69 @ 0.859	
75	C0 c	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	9 . 9%	-	None	OK w/ P18 Caps & Loa
76	C05	0	- - -	- - -	0	- - -	- - -	-	None	
77	C05a	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	80.85%	-	None	
78	C06	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	93.70%	-	None	
79	C06a	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	96.60%	-	None	
80	C07	0	- - -	- - -	0	- - -	- - -	-	None	
81	C08	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	91.26%	-	None	
83	C09	0	- - -	- - -	0	GRACE - SODA 138 #1	80.90%	-	None	
8	C10	0	- - -	- - -	0	GRACE - SODA 138 #1	80.82%	-	None	
85	C11	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	89. %	-	None	
86	C12	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	85.85%	-	None	
87	C13	0	- - -	- - -	0	HUNT 138 / 230 #2	76.33%	-	None	
88	C1	0	- - -	- - -	0	- - -	- - -	-	None	
89	C15	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.30%	-	None	
90	C16	0	- - -	- - -	0	- - -	- - -	-	None	
91	C18	0	- - -	- - -	0	- - -	- - -	-	None	
92	C19	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.25%	-	None	
93	C20	0	- - -	- - -	0	- - -	- - -	-	None	
9	C21	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.1 %	-	None	
95	C23	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	7 .10%	-	None	
96	C2	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	99.30%	-	None	
97	C2 a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	90.52%	-	None	
98	C25	0	- - -	- - -	0	BRIDGER - BR DGE&A 3 5 #1	99.30%	-	None	
99	C25a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	90.52%	-	None	
10	C28x	0	- - -	- - -	1	SPRINGER - GLADSTON 115 #1	11 03%	-	None	
108					**Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs**					
109						S DNEY 115 / 230 #1	1 6 02%			Not related to Path C L
110						CTTNWD N - KETTLECK 115 #1	103. 8%			
155	B35g		WYOPO 3 .5	6.8	3	M NERS - PLATTE 230 #1	116 3 %			
156						BRIDGER 3 5 / 230 #2	98.22%	1	PTRSNFUR 69 @ 876	
216		**All Contingencies (w/ Final RAS) Converged Indicating Pos tive Reactive Margin**								

1) Voltage Vio ations > 5% for Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line S de) and Transformer tert ary buses.

Appendix 3-6 - - - Post-transient Results For Bridger / Anticline West vs. Bonanza West

BASE CASE / P PA H FLOWS (with Gen Drop)

CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeo us South	Aeo us West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	M dpo nt West	Montana SE	Montana daho (P18)	ot 4a	Bonanza West	ot 1a (30)	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant IPP Gonder	RedB H A len (ot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Bridger Gen Trips	Aeolus Gen Tr p
	egwstg1 8h6 4100 2400 1579 785 sav	1580	2707	1700	2 00	-1 38	1 71	3 8	655	62	133	-213	2123	785	6 2	136	2996	2510	691	2005	92	50	388	216	218	713		
	evel "B" Contingencies																											
B01	Ant c ine – Populus 500 kV Line	1968	2125	0	3393	-1005	1110	28	7 0	139	30	-219	1916	822	667	100	2996	2351	556	2005	118	513	388	216	3 7	7 2	0	0
B01a	Ant c ine – Populus 500 kV Line Drop Bridger G1	1900	2292	0	3050	-983	863	393	703	-90	70	-237	2016	82	69	85	2996	2258	521	2005	106	69	358	205	298	726	575	0
B01g	Ant c ine – Populus 500 kV Line JBG1 KinpCap	1896	2298	0	3058	-989	868	392	702	-86	71	-238	2019	823	693	86	2996	2260	523	2005	106	69	359	205	296	725	575	0
B02	Ant c ine 500 / 3 5 kV Transformer	1596	2686	1776	2316	-1 3	1 7	3 0	6 7	65	133	-21	2119	78	6	136	2996	2511	692	2005	92	505	388	217	211	716	0	0
B03	Bridger – Populus 3 5 kV Line	16 5	2611	1906	2025	-1310	1 1	393	702	12	11	-21	2089	801	6 3	129	2996	2 89	673	2005	95	503	385	216	223	737	0	0
B0	Bridger – 3Mi eknoll 3 5 kV Line	168	2551	19 1	1877	-1213	1 0	29	7 1	06	100	-2 1	2068	808	6 6	125	2996	2 73	661	2005	96	99	383	215	2 0	751	0	0
B05	Bridger 3 5 / 230 kV Trans ormer	1581	2705	1699	2397	-1 36	1 70	3 9	656	61	133	-213	2122	786	6 2	136	2996	2508	692	2005	92	505	388	217	218	713	0	0
B06	3Mileknoll – Goshen 3 5 kV Line	160	2668	1787	2251	-1 16	1 3	362	670	39	122	-226	2107	791	6 1	131	2996	2 90	677	2005	95	506	388	217	21	737	0	0
B06a	3Mileknoll – Goshen 3 5 kV Line Bypas 3MK Caps	1623	2639	1827	26 8	-1359	1	381	689	1	117	-229	2096	795	6 2	130	2996	2 90	676	2005	96	506	388	217	215	730	0	0
B07	Kinport – Goshen 3 5 kV Line	1579	2709	169	2 10	-1 0	1 75	3 7	65	65	13	-216	212	785	6 2	137	2996	2508	69	2005	91	50	388	217	220	713	0	0
B08	Kinport – Borah 3 5 kV Line	1581	2705	1700	2398	-1 37	1 70	3 8	655	61	13	-213	2123	786	6 2	136	2996	2508	693	2005	92	505	388	217	219	713	0	0
B09	Populus – Bo ah 500 kV Line	1601	2676	1618	2 5	-1 23	1 2	353	660	2	127	-21	2112	787	6 2	127	2996	2 96	680	2005	97	507	389	217	230	712	0	0
B10	Borah 500 / 3 5 kV Transformer	1585	2702	1677	2 17	-1 22	1 82	3 9	656	73	135	-216	212	787	6	136	2996	251	699	2005	90	502	386	216	221	712	0	0
B11	Borah 3 5 / 230 kV Transformer	1581	2706	1692	2 05	-1 31	1 77	350	657	67	13	-218	212	786	6 3	137	2996	2511	693	2005	91	50	387	216	221	71	0	0
B12	Populus – Cedar H ll 500 kV Line	159	2670	1652	2 08	-1 7	1382	350	657	369	116	-201	2099	782	63	138	2996	2 57	6 6	2005	101	522	399	221	22	712	0	0
B1	Cedar Hi l – Hemingway 500 kV Line	1597	2666	16 6	2 08	-1 71	1379	351	658	366	116	-201	2098	782	635	138	2996	2 55	6	2005	101	522	399	221	225	712	0	0
B15	M dpoint – Hemingway 500 kV Line	1585	2701	1692	2 01	-1 27	1 7	3 9	656	70	13	-21	2123	787	6	131	2996	2515	695	2005	93	502	386	216	220	71	0	0
B16	Borah – M dpoint 500 kV Line	1588	2687	1681	2397	-1 58	1 2	3 9	656	20	125	-207	2111	78	638	127	2996	2 85	669	2005	100	513	393	218	22	713	0	0
B17	M dpoint 500 / 3 5 kV Transformer	158	2706	1688	2 10	-1 29	1 81	3 9	656	95	137	-216	2127	787	6 5	109	2996	2527	701	2005	100	99	385	215	226	713	0	0
B18	M dpoint 3 5 / 230 kV Transformer	1581	2705	1699	2399	-1 39	1 68	3 8	655	57	133	-212	2122	785	6 2	138	2996	2506	691	2005	91	505	388	217	219	713	0	0
B19	Borah – Adela de #2 3 5 kV Line	1583	2700	1699	239	-1 7	1 5	3 8	655	9	131	-210	2119	785	6 1	130	2996	2502	68	2005	96	507	390	217	220	713	0	0
B20	Ade a de – Midpoint #2 3 5 kV Line	1581	2705	1700	2398	-1 1	1 66	3 8	655	58	133	-212	2122	785	6 2	135	2996	2507	691	2005	93	506	388	217	218	713	0	0
B21	Borah – Adela de – Midpoint #1 3 5 kV Line	1582	2701	1700	239	-1 7	1 5	3 8	655	50	131	-210	2119	785	6 1	130	2996	2503	685	2005	96	507	390	217	219	713	0	0
B22	Borah – Hunt 230 kV Line	1581	2703	1700	2396	-1 3	1 62	3 8	655	5	132	-211	2121	785	6 1	13	2996	250	689	2005	9	506	389	217	219	713	0	0
B23	M dpoint – Boise Bench #3 230 kV Line	1581	2703	1698	2398	-1 1	1 6	3 8	655	5	132	-211	2121	785	6 1	138	2996	2503	690	2005	92	506	389	217	220	713	0	0
B2	M dpoint – Ratt e Snake 230 kV Line	1581	2705	1699	2399	-1 39	1 69	3 8	655	60	133	-212	2123	785	6 2	137	2996	2508	692	2005	92	505	388	217	218	713	0	0
B25	M dpoint – Dram 230 kV Line	1581	270	1699	2399	-1 39	1 67	3 8	655	57	133	-212	2122	785	6 2	137	2996	2506	691	2005	92	505	388	217	219	713	0	0
B26	Ratt e Snake – Bo se Bench 230 kV Line	1581	270	1699	2398	-1 0	1 65	3 8	655	5	132	-211	2121	785	6 2	138	2996	250	688	2005	92	506	389	217	222	713	0	0
B27	Dram – Boise Bench 230 kV Line	1581	2706	1699	2 00	-1 38	1 71	3 8	655	62	13	-213	2123	786	6 2	136	2996	2509	693	2005	92	505	388	217	218	713	0	0
B28	Hemingway 500/230 kV Transformer	1581	2705	1698	2 00	-1 37	1 71	3 8	655	63	133	-213	2123	786	6 2	135	2996	2509	69	2005	92	50	388	217	220	713	0	0
B30	Populus – Bo ah #1 3 5 kV Line	1578	2707	1706	2395	-1 8	1 61	3 8	655	55	132	-213	2122	78	6 1	13	2996	2503	688	2005	9	507	389	217	219	713	0	0
B31	Populus – Borah #2 3 5 kV Line	1580	2705	170	239	-1 6	1 61	3 8	655	55	132	-213	2121	785	6 1	13	2996	2503	688	2005	9	507	389	217	219	713	0	0
B32	Populus – Kinport 3 5 kV Line	1576	2710	1696	2 09	-1 51	1 66	3 8	655	59	132	-218	2123	78	6 1	13	2996	250	687	2005	9	507	389	217	221	713	0	0
B33	Populus – Ben Lomond #3 3 5 kV Line	1626	2657	1662	2359	-1322	1511	368	676	92	138	-211	2120	797	651	1 5	2996	2538	720	2005	80	88	377	213	216	723	0	0
B3	Populus – Terminal 3 5 kV Line	1620	2663	1671	2370	-13 7	1505	357	66	88	136	-211	2119	796	6 9	1	2996	253	715	2005	82	91	379	213	217	717	0	0
B35	Aeolus – Ant c ine 500 kV Line																											
B35a	Aeolus – Ant c ine 500 kV Line	218	1230	767	1963	-866	793	290	596	-151	20	-258	18 9	812	7 8	78	2996	2232	99	2005	108	60	351	202	185	815	0	600
B35g	Aeolus – Ant c ine 500 kV Line	2218	125	775	1971	-8 5	850	297	602	-96	3	-278	1905	810	738	80	2996	2237	501	2005	112	75	359	207	183	791	0	600
B36	Aeolus – Mona 500 kV Line																											
B36a	Aeolus – Mona 500 kV Line	0	3571	2089	2687	-2280	1273	22	73	2 0	108	-233	1996	911	762	163	2996	2531	776	2005	6	335	265	170	25	738	0	600
B37	Aeolus 500 / 230 kV Transformer	1566	2696	1689	2398	-1 38	1 61	3 9	656	52	125	-21	2100	791	6 9	136	2996	2507	690	2005	91	503	386	216	218	712	0	0
B38	Aeolus – Windstar 230 kV Line	1520	2621	16 8	2375	-1 36	1 08	3	651	03	87	-219	1990	810	681	133	2996	2 92	679	2005	89	93	378	213	216	722	0	0
B39	Aeolus – Freezeout 230 kV Line	1560	2732	1687	2 18	-1 3	1 70	355	663	61	136	-212	213	787	638	136	2996	2510	693	2005	91	50	387	216	220	721	0	0
B 0	Bonanza –Mona 3 5kV Line	1729	2737	1719	2 86	-1675	1338	39	705	327	90	-223	2319	150	170	139	2996	2 36	622	2005	63	28	317	192	230	771	0	0
B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	171	2698	1677	2 22	-1710	1216	37	682	213	1 0	-231	2253	106	89	13	2996	2 23	655	2005	55	11	31	190	222	715	0	0
B 1	Hemingway – Summer Lake 500kV line	1588	2682	1681	2392	-1 77	1398	3 9	655	371	123	-20	2105	782	63	15	2996	2 5	6 5	2005	95	523	399	221	211	713	0	0
	N-1 Criteria > >																											
	evel "C" Contingencies																											
C02	Bridger – Populus #1 # 2 3 5 kV Lines	1751	2 30	22 7	1372	-109	130	68	782	316	71	-216	2011	830	6 8	117	2996	2 8	638	2005	100	96	379	213	210	800	0	0
C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1679	2613	2080	1233	-109	1059	25	736	88	118	-23	2122	828	675	103	2996	235	602	2005	88	5	350	202	186	76	575	0
C03	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines	1782	2369	2257	12 5	-997	1298	50	821	313	52	-252	1979	837	652	113	2996	2 32	626	2005	100	92	375	212	23	807	0	0
C03a	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	1710	2559	2107	1099	-1003	1056	60	77	88	103	-26	2098	83	678	100	2996	23 2	592	2005	89	51	3 7	201	201	77	575	0
C03b	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	1639	2735	19 3	9 7	-1003	790	16	727	-159	1 7	-277	220	83	707	8	2996	22 5	55	2005	77	06	315	189	180	75	1150	0
C03c	Bridger–3MK Br dge-Pop#1 3 5 RAS; 2JBG Path18 Caps UV Load	1638	2729	19	9	-1036	857	1	72	-99	1 7	-269	2197	830	700	90	2996	2273	569	2005	79	17	323	193	175	7 5	1150	0
C0	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines	1782	2369	2257	12 5	-997	1298	50	821	313	52	-252	1979	837	652	113	2996	2 32	626	2005	100	92	375	212	23	807	0	0
C0 a	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	1710	2559	2107	1099	-1003	1056	60	77	88	103	-26	2098	83	678	100	2996	23 2	592	2005	89	51	3 7	201	201	77	575	0
C0 b	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	1639	2735	19 3	9 7	-1003	790	16	727	-159	1 7	-277	220	83	707	8	2996	22 5	55	2005	77	06	315	189	180	75	1150	0
C0 c	Bridger–3MK Br dge-Pop#2 3 5 RAS 2JBG Path18 Caps UV Load	1638	2729	19	9	-1036	857	1	72	-99	1 7	-269	2197	830	700	90	2996	2273	569	2005	79	17	323	193	175	7 5	1150	0
C05	Borah – Populus 3 5 kV DLO	1576	2705	1716	2382	-1 68	1 38	3 8	655	39	128	-21	2117	783	638	127	2996	2 92	675	2005	99	512	393	218	220	71	0	0
C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1527	2837	1607	2100	-1 13	1156	320	625	177	160	-23	2200	791	671	111	2996	2386	629	2005	88	66	360	206	19	705	575	0
C06	Populus – Ben Lomond 3 5 kV DLO	1719	2560	1586	2278	-1083	1597	07	717	557	1 7	-208	211	819	670	166	2996	2598	781	2005	55	53	351	20	213	7 7	0	0
C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Ser es Cap	17 0	2526	16 3	2159	-1037	1593	2	735	55	139	-21	2101	823	670	16	2996	2595	776	2005	56	5	351	20	207	7 8	0	0
C07	Ben Lomond – Terminal 3 5 kV DLO	1588	2698	1696	2397	-1 26	1 76	3 6	653	66	13	-212	2122	788	6 3	137	2996	2513	696	2005	90	502	386	216	218	713	0	0
C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1573	2710	1700	2 03	-1 67	1 9	3 8	655	8	129	-220	2119	782	639	129	2996	2 9	677	2005	98	511	392	218	222	713	0	0
C09	Populus – Bo ah #2 3 5 kV Treasu eton – Brady 230 kV Lines	1582	2703	1698	2393	-1 36	1 65	352	659	57	133	-213	2122	785	6 2	13	2996	2505	691	2005	93	505	388	217	219	71	0	0
C10	Populus – Bo ah #1 3 5 kV Treasureton – Brady 230 kV Lines	1580	2705	1700	239	-1 38	1 65	352	659	58	133	-213	2122	785	6 2	135	2996	2505	691	2005	93	506	388	217	219	71	0	0
C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1686	2593	1618	2313	-1179	1565	383	691	533	1 2	-209	2115	812	662	158	2996	2576	757	2005	65	67	361	207	215	731	0	0
C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1623	2660	1663	2368	-1332	1510	363	670	92	137	-211	2120	797	651	1 5	2996	2538	718	2005	81	90	377	213	217	719	0	0
C13	Borah – Adela de #2 Borah–ADT–M dpoint #1 3 5 kV lines (RA)	1586	2688	1702	2377	-1 75	1 06	3 8	655	17	123	-203	2109	783	637	113	2996	2 82	663	2005	107	516	395	219	222	71	0	0
C1	Borah – Adela de #2 Midpoint - Adela de #2 3 5 kV lines (RA)	1582	2700	1700	2393	-1 7	1 53	3 8	655	9	131	-210	2119	785	6 1	130	2996	2502	68	2005	96	508	390	217	220	713	0	0
C15	Borah – Adela de #2 Borah – Hunt 230 kV lines	1583	2698	1701	2390	-1 5	1 2	3 8	655	0	129	-208	2117	785	6 0	127	2996	2 97	679	2005	98	509	391	218	221	713	0	0
C16	Borah – Kinport Borah–Adel–M dpoint #1 3 5 kV ines RA?)	1583	2700	1700	2393	-1 5	1 5	3 8	655	50	131	-210	2119	785	6 1	130	2996	2503	685	2005	95	507	389	217	219	713	0	0
C18	Borah – Kinport Midpoint – Adelaide #2 3 5 kV ines (RA?)	1581	270	1701	2397	-1 0	1 66	3 8	655	58	133	-212	2122	785	6 2	135	2996	2507	691	2005	93	505	388	217	218	713	0	0
C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA)	1582	2703	1701	2395	-1 2	1 62	3 8	655	5	132	-211	2121	785	6 1	13	2996	2506	688	2005	9	506	389	217	220	713	0	0
C20	Borah–Adel–Midpoint #1 M dpoint – Adela de #2 3 5 kV lines	1583	2698	1701	2390	-1 52	1 5	3 8	655		129	-209	2117	785	6 0	128	2996	2500	681	2005	97	509	391	218	218	713	0	0
C21	Borah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA)	1583	2698	1701	2389	-1 5	1 2	3 8	655	0	129	-208	2117	785	6 0	127	2996	2 97	679	2005	98	509	391	218	221	713	0	0
C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1591	2677	1678	2388	-1 76	1390	350	657	39	119	-202	2103	783	636	117	2996	2 68	651	2005	107	519	397	220	228	71	0	0
C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	16 6	2610	1918	2011	-1309	1 12	393	703	11	11	-213	2089	801	6 3	129	2996	2 88	673	2005	95	503	385	216	222	738	0	0
C2 a	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1580	2766	1782	1797	-1287	11	357	66	162	150	-235	2181	805	67	11	2996	2385	630	2005	83	58	35	20	195	720	575	0
C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV ines	16 6	2610	1918	2011	-1309	1 12	393	703	11	11	-213	2089	801	6 3	129	2996	2 88	673	2005	95	503	385	216	222	738	0	0
C25a	Bridger – Populus #2 Goshen – Kinport 3 5 kV ines w/ RAS	1580	2766	1782	1797	-1287	11	357	66	162	150	-235	2181	805	67	11	2996	2385	630	2005	83	58	35	20	195	720	575	0
C28x	Palo Verde - Trip 1&2, w/ FACRI	1655	270	1680	2398	-1623	1293	356	663	288	167	-23	2165	789	631	1 0	2996	3 59	1956	2005	63	636	88	253	220	777	0	0
	N-2 Criteria; > >																											
	Cut Bonanza West by 100 MW																											
	egwstg1 8h6 4100 2400 1499 685 sav	1 99	2666	1700	2 00	-1213	1672	261	56	679	13	-189	1995	685	5 0	118	2996	2 06	589	180	113	50	23	230	217	675		
B35g	Aeolus – Ant c ine 500 kV Line																											
	Cut Bridger West by 200 MW																											
	egwstg1 8h6 3900 2400 1473 785 sav	1 73	2 76	1500	2 00	-1 92	1250	335	6 1	235	132	-23	1765	785	6	1	2996	2559	739	2005	85	50	368	208	219	6 8		
B35g	Aeolus – Ant c ine 500 kV Line																											
	Margin est w/ Bridger West at 5% of 4100 MW																											
	egwstg1 8h8 4305 2520 1579 754 sav	1579	2835	1785	2520	-1123	1916	208	510	911	128	-158	2192	75	611	127	2996	2090	275	2005	107	50	385	219	231	733		
	Margin est w/ Bonanza West at 5% of 785 MW																											
	egwstg1 8h6 3952 2400 1547 824 sav	15 7	2127	1 82	2 70	-1 33	13 5	219	520	320	130	-22	1788	82	665	153	2996	25 0	720	2005	73	50	355	203	22	656		

REAC IVE MARGIN MVAR (Gray shaded cells are the minimum margins)

CON INGENCY#	Aeo us 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	M dpo nt 500	Hem nway 500	CedarH l 500	Bridger 345	Goshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeo us 230	M ners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
B01	-313	-601	-253	-507	-530	-722	-1009	-623	-229	-273	-722	-722	- 35	- 85	-635	-7 5	-759	- 7	-353	-308	-220	-228	-175	-39
B01a	-368	-759	-325	-7	-769	-101	-1396	-880	-328	-396	-101	-101	-651	-710	-886	-97	-959	- 02	- 02	-330	-227	-219	-190	- 5
B01g	- 03	-820	-366	-916	-9 6	-1230	-1679	-1061	-389	- 81	-392	-762	-808	-881	-1033	-1052	-987	-526	- 35	-355	-237	-229	-198	- 5
B02	-652	-1 67	-717	-1513	-1598	-1922	-2 15	-1585	-1008	-856	-1922	-1922	-157	-1591	-1566	-1610	-1655	-629	-662	-5	-305	-277	-238	-53
B03	-739	-1360	-881	-1192	-1272	-161	-2130	-1332	-836	-697	-161	-161	-12 1	-1256	-1333	-1 22	-1 88	-610	-721	-569	-315	-285	-232	-51
B0	-6 3	-1108	-676	-805	-8 6	-1117	-1557	-9 9	-657	-368	-1117	-1117	-798	-80	-970	-1112	-1239	-590	-635	-519	-313	-277	-218	- 9
B05	-829	-1537	-1115	-1515	-1578	-1928	-2 63	-159	-1130	-8 9	-1928	-1928	-15 9	-1567	-1572	-161	-1678	- 87	-805	-613	-30	-280	-236	-53
B06	-80	-1 65	-1075	-1393	-1 52	-1783	-230	-1 93	-1078	-595	-1783	-1783	-1 21	-1 27	-1 62	-1529	-1598	-238	-313	-603	-315	-233	-239	-52
B06a	-778	-1 09	-997	-1279	-13 1	-1679	-2197	-1 03	-98	-560	-1679	-1679	-1301	-1310	-1386	-1 65	-15 2	-619	-758	-590	-89	-286	-236	-51
B07	-838	-1551	-108	-1 91	-1563	-1918	-635	-1582	-1006	-316	-1918	-1918	-1537	-1551	-1566	-1631	-169	-630	-81	-619	-311	-282	-239	-53
B08	-833	-1523	-1102	-1 89	-1559	-1909	-2 2	-1575	-1109	-801	-1909	-1909	-1511	-1551	-1561	-1612	-1671	-629	-808	-615	-312	-283	-239	-53
B09	-835	-1505	-1077	-1358	-1 85	-1857	-2388	-1 87	-108	-20	-1857	-1857	-1 71	-1509	-1533	-1587	-16 3	-628	-812	-618	-312	-283	-238	-52
B10	-83	-153	-1109	-150	-1 79	-1905	-2 2	-1581	-1116	-822	-1905	-1905	-1503	-1 71	-1558	-1605	-1675	- 65	-810	-617	-311	-282	-200	-53
B11	-837	-15 0	-1108	-1 82	-15 3	-1891	-2 28	-1568	-111	-799	-1891	-1891	-1508	-1528	-1550	-1619	-1683	-629	-813	-618	-312	-282	-239	-53
B12	-852	-1513	-1101	-1327	-1 79	-1951	-2350	-932	-1109	-826	-1951	-1951	-1 53	-1 88	-1535	-1596	-1653	-63	-577	-628	-31	-290	-2 1	-51
B1	-839	-1 89	-1065	-127	-1 22	-1888	-2303	-989	-1069	-176	-1888	-1888	-1393	-1 28	-1509	-1571	-1625	-633	-816	-620	-31	-289	-2 0	-51
B15	-809	-1 93	-103	-1331	-1312	-1322	-2266	-1520	-1028	-77	-1322	-1322	-1339	-132	-1 8	-1556	-1628	-626	-319	-603	-30	-280	-238	-53
B16	-831	-1503	-1076	-1367	-1317	-1807	-2361	-1520	-1079	-812	-1807	-1807	-1 23	-1 30	-1520	-1580	-16 2	-631	-807	-615	-31	-286	-2 0	-52
B17	-831	-1535	-1108	-1 93	-15 9	-1686	-2 00	-1570	-1120	-839	-1686	-1686	-1521	-1533	-1567	-1615	-1678	-627	-807	-615	-311	-281	-239	-5
B18	-835	-1539	-111	-1503	-1562	-1902	-2 8	-1582	-1129	-8 6	-1902	-1902	-1537	-1551	-1565	-1619	-1679	-630	-811	-617	-312	-28	-210	-53
B19	-832	-1523	-1099	-1 70	-1531	-1889	-2 18	-1562	-1108	-830	-1889	-1889	-1 93	-1 97	-1551	-1603	-1662	-630	-52	-615	-313	-28	-186	-53
B20	-835	-1539	-1115	-1503	-1565	-19 0	-2 72	-1591	-1128	-8 3	-19 0	-19 0	-1527	-1531	-1572	-1618	-1678	- 95	-811	-617	-312	-28	-2 0	-53
B21	-832	-1523	-1098	-1 6	-1525	-1902	-2 32	-1 35	-1105	-826	-1902	-1902	-1 81	-1 78	-15 7	-1601	-1661	-630	-807	-615	-313	-28	-2 0	-53
B22	-503	-152	-1110	-1 93	-1555	-1905	-2 36	-1578	-1123	-260	-1905	-1905	-1522	-1535	-1566	-161	-1673	-630	-809	-507	-312	-28	-202	-53
B23	-828	-1 02	-109	-1 87	-15 2	-1872	-2 35	-1572	-1109	-831	-1872	-1872	-1518	-1529	-15 8	-1561	-1 99	-627	-80	-61	-31	-282	-239	-53
B2	-827	-1 0	-109	-1 73	-1520	-1829	-2 3	-1559	-1107	-829	-1829	-1829	-1505	-1509	-15 8	-1562	-1501	-627	-80	-61	-31	-281	-239	-53
B25	-828	-1 0	-1096	-1 96	-1555	-189	-2 5	-1579	-1112	-83	-189	-189	-1529	-15 3	-1551	-1563	-1500	-627	-80	-61	-31	-281	-239	-53
B26	-829	-1 05	-1099	-1505	-1567	-1906	-2 39	-1585	-1115	-836	-1906	-1906	-1538	-1555	-1553	-156	-1501	-627	-805	-61	-31	-282	-239	-53
B27	-828	-1 06	-1100	-1509	-1571	-1919	-2 65	-1590	-1117	-838	-1919	-1919	-15 2	-1559	-1555	-1566	-1503	-627	-80	-61	-31	-281	-239	-53
B28	-827	-1 0	-1096	-1 98	-1560	-1903	-2 37	-1575	-1112	-835	-1903	-1903	-1533	-15 9	-1552	-156	-1501	-627	-80	-61	-31	-281	-239	-53
B30	-835	-1 15	-1115	-1533	-1596	-1937	-2 83	-1608	-1132	-8 6	-1937	-1937	-1556	-1578	-156	-157	-151	-628	-811	-618	-315	-282	-2 0	-53
B31	-836	-1536	-111	-1505	-1568	-1913	-2 50	-1586	-1127	-8	-1913	-1913	-1526	-15 9	-1568	-161	-1676	- 98	-811	-617	-313	-28	-2 0	-53
B32	-839	-1 25	-1110	-1512	-1556	-1902	-2 5	-1590	-1115	-723	-1902	-1902	-1553	-1522	-1566	-1582	-1525	-629	-815	-620	-31	-281	-2 0	-53
B33	-809	-1 16	-1073	-1 03	-1 62	-179	-2353	-1505	-107	-811	-179	-179	-1 08	-1 0	-13 2	-1 32	-15 3	-61	-786	-603	-311	-277	-23	-53
B3	-803	-1282	-1055	-139	-1 53	-1807	-23 8	-1 99	-1059	-800	-1807	-1807	-1398	-1 30	-1 1	-138	-1365	-615	-781	-601	-31	-279	-236	-53
B35	P CASE DIVERGED																							
B35a	-200	-328	-1162	-1523	-1572	-1893	-2376	-1629	-10	-927	-965	-1352	-1371	-1502	-670	-557	- 38	-319	-222	-179	-109	-89	-151	-37
B35g	- 80	-979	-1 39	-2139	-2166	-2388	-2780	-1996	-1 53	-1079	-1110	-1911	-2206	-2201	-1523	-1397	-1203	-515	-523	-396	-209	-17	-203	- 1
B36	P CASE DIVERGED																							
B36a	-903	-1 39	-671	-752	-8 3	-1120	-16 5	-90	-550	-518	- 70	-753	-800	-8 0	-1099	-1 3	-1530	- 5	-973	-70	-282	-23	-193	- 7
B37	-711	-1508	-1010	-1 6	-1517	-187	-2 12	-15	-1065	-83	-816	-1325	-1 8	-1505	-15 5	-1595	-165	-617	-678	-539	-302	-272	-235	-52
B38	-630	-160	-561	-1589	-16 6	-1986	-2511	-16 9	-1177	-321	-868	-1 30	-1622	-1635	-161	-1667	-17	-587	-68	-580	-275	-23	-22	- 7
B39	- 9	-15 9	-1085	-1 81	-15 9	-190	-2 5	-1571	-990	-8 0	-82	-1352	-1517	-1537	-1580	-1631	-1703	-629	-791	-39	-312	-28	-199	-5
B 0	- 05	-12	-566	-912	-1013	-1329	-1800	-1075	-611	-617	-559	-902	-955	-1005	-121	-138	-1519	-388	-395	-3	-260	-217	-192	-26
B 0a	-573	-1372	-811	-1223	-1312	-1663	-2177	-136	-861	-736	-701	-11 5	-1265	-1296	-1 33	-1527	-1510	- 5	-558	- 6	-286	-2 1	-218	- 6
B 1	-836	-1392	-1090	-1 05	-1 5	-1652	-1768	-1 05	-1098	-821	-821	-1309	-1 65	-1 67	-1532	-15 7	-1 88	-631	-813	-620	-317	-286	-2 0	-51
	200	328	253	507	530	722	635	623	229	176	392	722	435	485	635	557	438	238	222	39	89	89	151	26
N-1 Criteria > >					500	500	500	500	100			250		250										
C02	- 51	-853	- 10	-581	-657	-887	-1217	-719	-387	-359	-309	-570	-6 5	-6 9	-810	-913	-100	-55	- 65	- 05	-317	-281	-201	- 5
C02a	-566	-1069	-602	-926	-1021	-1329	-1781	-1083	-555	-553	- 80	-889	-101	-1015	-112	-1192	-117	-563	-563	- 70	-308	-265	-216	-51
C03	-332	-561	-29	-366	- 08	-568	-765	-526	-303	-2 1	-228	-35	-389	- 00	-516	-610	-639	-517	-339	-308	-292	-26	-19	- 3
C03a	-506	-988	-531	-719	-776	-1027	-1 22	-862	-516	-373	-3 2	-6 1	-738	-7 6	-890	-1018	-1131	-5 5	-507	- 32	-303	-258	-202	-50
C03b	-551	-1203	-620	-908	-970	-125	-168	-1055	-610	- 5	- 00	-797	-936	-938	-1117	-1258	-1383	-5 5	-5	- 5	-285	-235	-210	-56
C03c	-226	-1295	-683	-1076	-1162	-1 81	-1921	-122	-672	-57	- 87	-1001	-113	-11 6	-1253	-1370	-1 59	-556	-578	- 78	-290	-2 6	-215	-56
C0	-332	-602	-29	-372	- 13	-567	-801	- 68	-300	-2 0	-228	-35	-389	-397	-518	-626	-702	-502	-351	-31	-29	-26	-169	- 3
C0 a	-506	-988	-531	-719	-776	-1027	-1 22	-862	-516	-373	-3 2	-6 1	-738	-7 6	-890	-1018	-1131	-5 5	-507	- 32	-303	-258	-202	-50
C0 b	-551	-1203	-620	-908	-970	-125	-168	-1055	-610	- 5	- 00	-797	-936	-938	-1117	-1258	-1383	-5 5	-5	- 5	-285	-235	-210	-56
C0 c	-590	-1295	-683	-1076	-1162	-1 81	-1922	-122	-672	-57	- 87	-1000	-113	-11 6	-1253	-1370	-1 59	-556	-578	- 78	-290	-2 6	-215	-56
C05	-8 1	-153	-1117	-1503	-1568	-1893	-2 3	-1587	-1127	-8 0	-838	-1370	-1 98	-1527	-1555	-1605	-1672	-633	-817	-620	-31	-286	-215	-52
C05a	-803	-796	-1077	-155	-1621	-1936	-2 50	-16 3	-1150	-88	-870	-1 37	-1575	-1593	-1658	-1700	-1795	-616	-778	-598	-296	-261	-237	-57
C06	-7 9	-1157	-1013	-127	-1328	-1675	-2209	-1398	-1005	-76	-771	-11 7	-12 5	-1292	-972	-1109	-1258	-576	-732	-575	-308	-265	-221	-5
C06a	-713	-1098	-925	-1137	-1188	-1522	-2009	-1277	-903	-653	-651	-101	-1107	-11 9	-925	-1053	-1197	-567	-699	-556	-308	-265	-217	-53
C07	-828	-1 60	-1097	-1 51	-1512	-1867	-2 03	-15 5	-1099	-826	-821	-1313	-1 69	-1 93	-1362	-1505	-1583	-627	-80	-61	-312	-283	-239	-53
C08	-8 6	-1550	-111	-1 85	-1517	-1852	-2 03	-1568	-1115	-699	-778	-1101	-151	-1 59	-1566	-1623	-1693	-633	-821	-623	-313	-285	-2 0	-53
C09	-833	-1516	-1106	-1 88	-1550	-1891	-2 29	-1572	-1115	-25	-826	-1351	-1509	-1530	-153	-1600	-1667	-629	-552	-616	-312	-282	-192	-53
C10	-838	-1539	- 81	-1516	-1578	-1916	-2 55	-159	-113	-8 7	-838	-1377	-1539	-1558	-1550	-1613	-1679	-630	-813	-618	-312	-282	-213	-53
C11	-767	-12 2	-1016	-1279	-1333	-1682	-2215	-1 02	-1006	-763	-768	-1152	-1257	-1301	-1160	-1210	-1351	-591	-750	-585	-310	-273	-230	-53
C12	-806	-1 03	-1059	-137	-1 32	-1782	-2318	-1 81	-105	-797	-790	-12 2	-1378	-1 08	-1 03	-1 20	-1527	-615	-78	-602	-311	-278	-235	-53
C13	-831	-1 97	-1067	-1392	-1 9	-1816	-2326	-1510	-1071	-796	-798	-1237	-1387	-1360	-1501	-1567	-1631	-632	-807	-615	-31	-288	-137	-52
C1	-832	-1523	-1099	-197	-1525	-1901	-2 30	-1562	-1106	-827	-82	-1315	-1 82	-1 78	-15	-1602	-1662	-630	-808	-615	-313	-28	-2 0	-53
C15	-831	-1517	-1093	-1 50	-1510	-1837	-2386	-15 7	-1099	-820	-819	-1299	-1 67	-1 66	-1538	-1595	-165	-630	-807	-615	-313	-285	-180	-52
C16	-830	-1518	-1085	-1 3	-1510	-1881	-2 15	-1537	-1085	-783	-798	-121	-1 51	-1 66	-1532	-1593	-1655	-629	-806	-61	-312	-28	-171	-53
C18	-83	-1533	-1102	-1 81	-1550	-1925	-2 55	-1575	-1107	-797	-812	-12 7	-1 95	-1519	-1553	-1611	-1672	-630	-809	-616	-312	-283	-239	-53
C19	-831	-1527	-1097	-1 72	-15 1	-1890	-2 20	-1563	-1101	-792	-807	-1236	-1 88	-152	-15 2	-1606	-1667	-629	-538	-615	-312	-28	-239	-53
C20	-831	-1516	-1087	-1 21	-1 82	-1928	-2 39	-15 6	-1087	-80	-808	-1252	-1 15	-1382	-152	-1587	-1651	-630	-807	-615	-313	-285	-2 0	-53
C21	-831	-1518	-1092	-1	-150	-1881	-2398	-15 8	-1097	-205	-816	-1287	-1 55	-1 7	-1535	-1593	-1653	-630	-807	-615	-313	-285	-2 0	-52
C23	-321	-1 85	-1060	-1323	-1260	-172	-2287	-1 83	-1055	-789	-790	-1217	-1359	-1350	-1 87	-1555	-1611	-632	-707	-616	-315	-289	-2 0	-51
C2	-736	-1359	-826	-1162	-12 0	-158	-210	-1306	-711	-257	-385	-1116	-1218	-1222	-1318	-1 21	-1 92	-610	-719	-568	-315	-285	- 1	-51
C2 a	-753	-1551	-92	-1 26	-1530	-1863	-2 02	-15 5	-82	-310	- 62	-1389	-1527	-1522	-1568	-163	-171	-601	-732	-57	-300	-26	-233	-56
C25	-736	-1359	-826	-1162	-12 0	-158	-210	-1306	-711	-257	-385	-1116	-1218	-1222	-1318	-1 21	-1 92	-610	-719	-568	-315	-111	- 1	-51
C25a	-753	-1551	-91	-1 3	-153	-1862	-2378	-15 5	-82	-310	- 62	-1387	-1527	-1531	-1568	-163	-1577	-601	-732	-57	-300	-26	-233	-56
C28x	-219	-15	-9 9	-1327	-1 00	-1758	-22 6	-1 52	-980	-781	-1	-1218	-1353	-1381	-1352	-1330	-1281	-535	-668	-536	-268	-252	-120	-11
	219	154	294	197	408	567	765	468	300	205	144	354	389	397	516	610	639	502	339	308	268	111	41	11
N-2 Criteria; > >					00	00	00	00	100			200		200										

Voltage and loading results

CON INGENCY#	Voltage Dev ation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyom ng Path 18 Buses < 90 pu P Voltage	COMMEN
					Base Case Overloads (Areas 59 99 Area 10) Exclud ng GSUs				
egwstg1 8h6 4100 2400 1579 785 sav					S DNEY 115 / 230 #1	107.55%			
					CTTNWD N - KETTLECK 115 #1	106.52%			
					MONUMENT - FLYHORSE 115 #1	102.39%			
					KETTLECK - FLYHORSE 115 #1	102.25%			
					BONANZA - MONA 3 5 #1	100.52%			
					CON INGENCY LOADINGS				
B01	1	3MIKNOLL 3 5	5.3	2	BR DGER - BR DGE&A 3 5 #1	11 .66%	-	None	2109.65 Amps
B01a	0	- - -	- - -	2	BR DGER - BR DGE&A 3 5 #1	103.21%	-	None	1899.01 Amps
B01g	0	- - -	- - -	2	PALISADE - ROCKSPGS 230 #1	92 79%	-	None	
B02	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	83.18%	-	None	
B03	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	100.00%	-	None	
B0	2	BIGGRASS 69	5.3	0	BR DGER - ROCKSPGS 230 #1	97.16%	-	None	
B05	0	- - -	- - -	0	- - -	- - -	-	None	
B06	0	- - -	- - -	2	GRACE - SODA 138 #1	119.6 %	-	None	Mi igated in B06a
B06a	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	88 91%	-	None	
B07	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	88.10%	-	None	
B08	0	- - -	- - -	0	- - -	- - -	-	None	
B09	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87 65%	-	None	
B10	0	- - -	- - -	0	- - -	- - -	-	None	
B11	0	- - -	- - -	0	- - -	- - -	-	None	
B12	0	- - -	- - -	0	LOCUST - MORA 138 #1	82 29%	-	None	
B1	0	- - -	- - -	0	LOCUST - MORA 138 #1	82. 2%	-	None	
B15	0	- - -	- - -	0	- - -	- - -	-	None	
B16	0	- - -	- - -	0	- - -	- - -	-	None	
B17	0	- - -	- - -	0	LOCUST - MORA 138 #1	88 32%	-	None	
B18	0	- - -	- - -	0	- - -	- - -	-	None	
B19	0	- - -	- - -	0	- - -	- - -	-	None	
B20	0	- - -	- - -	0	- - -	- - -	-	None	
B21	0	- - -	- - -	0	- - -	- - -	-	None	
B22	0	- - -	- - -	0	- - -	- - -	-	None	
B23	0	- - -	- - -	0	LOCUST - MORA 138 #1	87 08%	-	None	
B2	0	- - -	- - -	0	- - -	- - -	-	None	
B25	0	- - -	- - -	0	- - -	- - -	-	None	
B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	89 93%	-	None	
B27	0	- - -	- - -	0	- - -	- - -	-	None	
B28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82. %	-	None	
B30	0	- - -	- - -	0	- - -	- - -	-	None	
B31	0	- - -	- - -	0	- - -	- - -	-	None	
B32	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	89 0 %	-	None	
B33	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	87 05%	-	None	
B3	0	- - -	- - -	0	- - -	- - -	-	None	
B35	P CASE DIVERGED								
B35a	98	RIVERTON 3 5	12 8	8	M NERS 230.0 PLATTE 230.0 #1	116 58%	1	H LLTP1 115 @ 87	
					BR DGER 3 5 / 230 #2	100 63%			
B35g	29	WYOPO 3 5	6.5	5	M NERS 230.0 PLATTE 230.0 #1	102 95%	-	None	
					BR DGER 3 5 / 230 #2	99 00%			Not Lim ting
B36	P CASE DIVERGED								
B36a	10	BONANZA 3 5	6.2	0	SPR NGER - GLADSTON 115 #1	99 37%	-	None	
B37	0	- - -	- - -	2	AEOLUS 500 / 230 #2	102 38%	-	None	Spec Transformers about 10%
B38	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	98 88%	-	None	
B39	0	- - -	- - -	0	M NERS 230.0 PLATTE 230.0 #1	86 71%	-	None	
B 0	12	MOONLAK1 69	7	8	BONANZA - VERNAL 138 #1	13 .60%	-	None	
B 0a	0	- - -	- - -	0	SPR NGER - GLADSTON 115 #1	99 55%	-	None	
B 1	0	- - -	- - -	0	- - -	- - -	-	None	
C02	0	3MIKNOLL 3 5	7.1	7	BR DGER - BR DGE&A 3 5 #1	126.96%	-	None	233 .79 Amps
C02a	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	111.38%	-	None	20 8.16 Amps
C03	1	BIGGRASS 69	10 5		BR DGER - ROCKSPGS 230 #1	120.03%	5	PTRSNFUR 69 @ .861	90 pu voltage violation
C03a	0	BIGGRASS 69	7.9	2	BR DGER - ROCKSPGS 230 #1	103.23%	1	PTRSNFUR 69 @ .869	Mi igated with RAS
C03b	0	PTRSNFRG 69	8.9	0	PALISADE - ROCKSPGS 230 #1	95 37%	3	PTRSNFUR 69 @ .860	
C03c	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	9 3 %	-	None	w/ P18 Caps & Load Drop
C0	1	BIGGRASS 69	10 5		BR DGER - ROCKSPGS 230 #1	120.03%	5	PTRSNFUR 69 @ .861	90 pu voltage violation
C0 a	0	BIGGRASS 69	7.9	2	BR DGER - ROCKSPGS 230 #1	103.23%	1	PTRSNFUR 69 @ .869	Mi igated with RAS
C0 b	0	PTRSNFRG 69	8.9	0	PALISADE - ROCKSPGS 230 #1	95 37%	3	PTRSNFUR 69 @ .860	
C0 c	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	9 3 %	-	None	OK w/ P18 Caps & Load Drop
C05	0	- - -	- - -	0	- - -	- - -	-	None	
C05a	0	- - -	- - -	0	FRANN E - YELOWTLP 230 #1	90 87%	-	None	
C06	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	93. 6%	-	None	
C06a	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	96 32%	-	None	
C07	0	- - -	- - -	0	- - -	- - -	-	None	
C08	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	91.12%	-	None	
C09	0	- - -	- - -	0	- - -	- - -	-	None	
C10	0	- - -	- - -	0	- - -	- - -	-	None	
C11	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	89 53%	-	None	
C12	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	86 28%	-	None	
C13	0	- - -	- - -	0	- - -	- - -	-	None	
C1	0	- - -	- - -	0	- - -	- - -	-	None	
C15	0	- - -	- - -	0	- - -	- - -	-	None	
C16	0	- - -	- - -	0	- - -	- - -	-	None	
C18	0	- - -	- - -	0	- - -	- - -	-	None	
C19	0	- - -	- - -	0	- - -	- - -	-	None	
C20	0	- - -	- - -	0	- - -	- - -	-	None	
C21	0	- - -	- - -	0	- - -	- - -	-	None	
C23	0	- - -	- - -	0	- - -	- - -	-	None	
C2	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	98 82%	-	None	
C2 a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	90 00%	-	None	
C25	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	98 82%	-	None	
C25a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	90 00%	-	None	
C28x	0	YORKCANY 115	7.1		SPR NGER - GLADSTON 115 #1	121.65%	-	None	
Cut Bonanza West by 100 MW					**Base Case Overloads (Areas 59 99 Area 10) Exclud ng GSUs**				
egwstg1 8h6 4100 2400 1499 685 sav					S DNEY 115 / 230 #1	108.55%			
					CTTNWD N - KETTLECK 115 #1	103.39%			
B35g	0	- - -	- - -	2	M NERS 230.0 PLATTE 230.0 #1	99 67%	-	None	
					BR DGER 3 5 / 230 #2	95 71%			
Cut Bridger West by 200 MW					**Base Case Overloads (Areas 59 99 Area 10) Exclud ng GSUs**				
egwstg1 8h6 3900 2400 1473 785 sav					CTTNWD N - KETTLECK 115 #1	106. 3%			
					S DNEY 115 / 230 #1	105.21%			
					MONUMENT - FLYHORSE 115 #1	102.3 %			
					KETTLECK - FLYHORSE 115 #1	102.17%			
					KELKER W - ROCK SLD 115 #1	100.80%			
					BONANZA - MONA 3 5 #1	100.61%			
B35g	0	- - -	- - -	0	M NERS 230.0 PLATTE 230.0 #1	87 36%	-	None	
					PLATTE - LATHAM 230 #1	86 73%			
egwstg1 8h8 4305 2520 1579 754 sav	**All Contingenc es (w/ Final RAS) Converged Indicating Positive Reactive Margin**								
egwstg1 8h6 3952 2400 1547 824 sav	**All Contingenc es (w/ Final RAS) Converged Indicating Positive Reactive Margin**								

1) Voltage Violat ons > 5% for Level B & > 10% for Level C
2) Excluding Ser es Cap Buses (Line Side) and Trans ormer ert ary buses.

- 03

Appendix 3-7 - - - Post-transient Results For Bridger / Anticline West vs. Path 18

BASE CASE / P PA H FLOWS — Gen Drop

CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana Idaho (P18)	ot 4a	Bonanza West	ot 1a (30)	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant IPP Gonder	RedB H Allen (ot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Br dger Gen Trips	Aeolus Gen Tr p
	egwstg1 8h7 jbw18a 4100 2400 1472 337 sav	1 72	260	1700	2 00	-1073	1916	197	98	909	-70	-337	197	678	52	107	22 6	2 50	633	180	126	50	1	226	25	68	0	0
	Level "B" Contingencies																											
B01	Anticline – Populus 500 kV Line	1873	2013	0	3383	-620	1557	28	589	589	-165	-336	1772	722	556	71	2232	2287	96	180	153	516	16	226	380	718	0	0
B01a	Anticline – Populus 500 kV Line Drop Bridger G1	1732	2368	0	2711	-565	1061	216	518	132	-83	-358	1987	739	625	0	2207	2105	19	180	131	26	355	20	292	696	575	0
B01g	Anticline – Populus 500 kV Line JBG1 KinpCap	1800	2193	0	3052	-596	1316	250	553	367	-12	-3 8	1881	729	590	56	2221	2197	60	180	1 2	72	387	215	331	703	575	0
B02	Anticline 500 / 3 5 kV Trans ormer	1 8	2590	1769	2329	-1071	1920	191	92	913	-69	-338	1973	677	526	108	22 6	2 53	635	180	126	505	1	226	2 7	686	0	0
B03	Br dger – Populus 3 5 kV Line	15 1	2502	1909	2016	-9 0	185	2	5 7	855	-89	-33	1939	697	528	100	22 3	2 26	613	180	130	503	11	225	258	711	0	0
B0	Br dger – 3Mi ekno l 3 5 kV Line	1579	2 50	1933	1886	-8 1	1829	282	587	835	-97	-3 1	1923	705	533	9	22 3	2 09	600	180	131	99	09	22	279	728	0	0
B0 c	Br dger – 3Mi ekno l 3 5 kV Kinport Shunt Cap Di lon c3 c5	1573	2 58	19 0	1891	-852	18 0	280	58	8 5	-97	-3 8	1925	703	532	96	22	2 13	603	180	131	500	09	22	275	72	0	0
B0 cx	B0 c Big Grassy 161 Cap 2 MVar	1571	2 58	19 1	1891	-855	18 7	280	58	851	-99	-355	1923	703	532	96	22	2 13	603	180	131	500	10	22	27	723	0	0
B05	Br dger 3 5 / 230 kV Transformer	1 73	2602	1699	2396	-1070	191	199	500	907	-70	-337	197	679	52	107	22 6	2 9	635	180	126	505	1	226	253	68	0	0
B06	3M leknoll – Goshen 3 5 kV Line	1 98	2565	1788	2250	-10 8	1879	212	513	878	-80	-3 1	1959	685	525	101	22 5	2 30	617	180	130	506	1	226	251	712	0	0
B06a	3M leknoll – Goshen 3 5 kV Line Bypas 3MK Caps	1517	2535	1825	2632	-992	1877	230	532	877	-85	-3 2	19 9	689	526	100	22 6	2 27	617	180	130	505	13	225	253	705	0	0
B06b	3M leknoll – Goshen 3 5 kV Line Bypas 3MK Caps B gGrassy Cap	1516	2535	1825	2632	-995	1883	230	532	882	-86	-3 8	19 8	689	525	101	22 6	2 27	617	180	130	506	1	226	252	70		
B07	Kinport – Goshen 3 5 kV Line	1 72	260	170	2397	-1073	191	197	98	907	-69	-336	1975	679	525	108	22 6	2 9	636	180	126	50	1	226	25	685	0	0
B08	Kinport – Bo ah 3 5 kV Line	1 7	2602	1701	2397	-1073	1912	197	98	906	-70	-336	197	679	52	107	22 6	2 8	635	180	126	505	1	226	25	68	0	0
B09	Populus – Borah 500 kV Line	1 95	2570	1612	2 8	-1056	1882	202	50	885	-76	-336	1963	680	525	97	22 6	2 3	621	180	132	507	15	226	269	68	0	0
B10	Borah 500 / 3 5 kV Transformer	1 76	2601	168	2 12	-1062	1922	198	99	915	-68	-338	1976	680	526	107	22 6	2 53	6 0	180	125	502	12	225	255	68	0	0
B11	Borah 3 5 / 230 kV Transformer	1 7	260	1693	2 05	-1067	1918	199	500	910	-69	-338	1976	679	525	108	22 6	2 51	636	180	125	50	13	225	255	686	0	0
B12	Populus – Cedar Hi l 500 kV Line	1 89	2556	16 1	2 08	-1118	1810	199	500	795	-92	-329	19 2	67	515	110	22 2	2383	579	180	137	526	27	230	265	682	0	0
B1	Cedar Hill – Hemingway 500 kV Line	1 92	2552	1635	2 08	-111	1806	200	501	792	-93	-328	19 1	67	515	109	22 2	2381	577	180	138	526	27	230	267	683	0	0
B15	Midpoint – Hemingway 500 kV Line	1 78	2597	1692	2 00	-106	1913	198	99	910	-70	-336	197	680	526	103	22 6	2 52	635	180	127	503	13	225	256	686	0	0
B16	Borah – Midpoint 500 kV Line	1 83	2577	1676	2395	-1100	1855	198	99	852	-82	-332	1957	677	520	95	22	2 1	602	180	137	516	21	228	266	68	0	0
B17	Midpoint 500 / 3 5 kV Trans ormer	1 78	260	1685	2 1	-1059	1927	199	500	9 6	-65	-339	1981	681	529	73	22 8	2 70	6 6	180	136	98	10	22	265	685	0	0
B18	Midpoint 3 5 / 230 kV Trans ormer	1 73	2601	1698	2399	-107	1912	197	98	900	-71	-337	1973	678	52	111	22 7	2 6	631	180	126	506	1	226	255	68	0	0
B19	Borah – Ade aide #2 3 5 kV Line	1 75	2595	1699	2392	-1085	1893	197	98	892	-7	-335	1969	678	523	99	22 6	2 39	623	180	132	508	16	226	256	68	0	0
B20	Ade aide – Midpoint #2 3 5 kV Line	1 73	2601	1701	2396	-1080	1906	197	98	902	-71	-336	1972	678	52	10	22 6	2 5	631	180	128	506	15	226	253	68	0	0
B21	Borah – Ade aide – Midpoint #1 3 5 kV Line	1 75	2595	1700	2391	-1087	1891	197	98	891	-7	-335	1968	678	522	98	22 6	2 39	623	180	132	509	16	227	255	68	0	0
B22	Borah – Hunt 230 kV Line	1 7	2599	1701	2395	-1081	1903	197	98	897	-72	-336	1972	678	523	10	22 6	2 3	628	180	129	507	15	226	256	68	0	0
B23	Midpoint – Boise Bench #3 230 kV Line	1 7	2599	1698	2397	-1077	1906	197	98	895	-72	-336	1971	678	52	111	22 7	2 0	627	180	126	507	15	226	259	68	0	0
B2	Midpoint – Rattle Snake 230 kV Line	1 7	2598	1698	2397	-1079	1903	197	98	890	-73	-336	1971	678	523	112	22 7	2 37	625	180	126	508	16	226	259	68	0	0
B25	Midpoint – Dram 230 kV Line	1 7	2601	1698	2399	-1075	1911	197	98	902	-71	-337	1973	678	52	109	22 6	2 5	631	180	126	506	1	226	256	68	0	0
B26	Rattle Snake – Boise Bench 230 kV Line	1 73	2601	1699	2399	-1075	1911	197	98	903	-71	-337	1973	678	52	109	22 7	2 6	631	180	126	505	1	226	255	68	0	0
B27	Dram – Boise Bench 230 kV Line	1 73	2603	1699	2 00	-1073	1915	197	98	908	-70	-337	1975	679	525	107	22 6	2 9	635	180	126	505	1	226	25	68	0	0
B28	Hemingway 500/230 kV Transformer	1 7	2602	1697	2 02	-1069	1917	197	98	911	-70	-337	1975	679	525	105	22 8	2 50	63	180	127	50	13	225	259	68	0	0
B30	Populus – Borah #1 3 5 kV Line	1 70	260	1707	239	-1085	1903	197	98	899	-72	-338	1973	677	523	10	22 6	2 3	628	180	129	507	15	226	255	68	0	0
B31	Populus – Borah #2 3 5 kV Line	1 72	2602	1705	239	-1083	1902	197	98	899	-72	-337	1972	678	523	10	22 6	2 3	628	180	129	507	15	226	25	685	0	0
B32	Populus – Kinport 3 5 kV Line	1 68	2608	1696	2 10	-1085	1907	197	98	903	-71	-339	1975	677	52	105	22 7	2	629	180	128	507	15	226	257	685	0	0
B33	Populus – Ben Lomond #3 3 5 kV Line	1508	2566	1671	2370	-986	19 5	212	51	931	-67	-336	1972	688	532	11	22 6	2 71	65	180	118	93	06	223	253	689	0	0
B3	Populus – Terminal 3 5 kV Line	150	2569	1677	2377	-100	19 0	20	505	926	-68	-336	1971	687	530	113	22 6	2 66	652	180	120	95	07	223	253	687	0	0
B35	Aeolus – Anticline 500 kV Line																											
B35a	Aeolus – Anticline 500 kV Line	2090	1170	778	1986	- 63	1277	152	53	336	-1 8	-357	1756	718	6 0	50	2220	2178	3	180	1 5	69	38	21	218	77	0	600
B35g	Aeolus – Anticline 500 kV Line	2128	1171	781	198	- 53	1330	152	52	387	-1 1	-393	179	710	626	52	2225	2182	5	180	1 8	82	391	218	215	75	0	600
B36	Aeolus – Mona 500 kV Line																											
B36a	Aeolus – Mona 500 kV Line	0	3387	2057	265	-1831	1731	273	576	70	-79	-3	1877	828	66	130	2223	2 65	708	180	50	351	307	186	282	695	0	600
B36g	Aeolus – Mona 500 kV Line	0	3393	2057	2655	-1829	173	27	578	707	-76	-3	1882	827	662	130	2223	2 65	709	180	50	352	308	186	282	695	0	600
B37	Aeolus 500 / 230 kV Trans ormer	1 59	259	1690	2399	-1072	1906	198	500	899	-77	-338	1953	68	532	107	22 6	2 8	632	180	126	503	12	225	253	68	0	0
B38	Aeolus – Winds ar 230 kV Line	1 13	2529	1652	2379	-1068	1859	196	97	855	-108	-339	1851	706	565	105	22 2	2 35	620	180	12	9	05	223	251	69	0	0
B39	Aeolus – Freezeout 230 kV Line	1 51	2630	1687	2 19	-1078	1915	206	507	907	-68	-337	1985	681	521	108	22 6	2 50	636	180	126	50	13	225	256	691	0	0
B 0	Bonanza –Mona 3 5kV Line	1615	263	172	2 72	-1262	1815	2 7	550	806	-95	-339	2159	130	121	109	22 2	2385	569	180	10	2	357	207	262	722	0	0
B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza P ant	159	2599	1679	2 1	-1303	1686	220	522	686	-53	-3 5	2093	85	36	10	2233	2373	60	180	95	23	353	20	256	679	0	0
B 1	Hemingway – Summer Lake 500kV ine	1 78	2591	1689	2397	-1085	1888	198	99	875	-7	-335	1967	677	522	113	22 3	2 29	616	180	128	511	18	227	252	685	0	0
B51	DaveJon - D fficu ty 230 kV Line	1 15	2531	165	2380	-1068	1861	196	97	857	-107	-339	1853	706	565	105	22 3	2 35	620	180	12	9	05	223	251	692	0	0
B52	Spence - Mustang 230 kV Line	1 88	2 93	1695	2319	-10 7	1867	180	81	863	-112	-3 0	1880	690	552	10	22 3	2 39	626	180	126	500	09	22	2 6	692	0	0
B53	Riverton - At an ic 230 kV Line	1502	2 52	1707	2369	-1110	1860	182	82	856	-1 7	-3 0	1866	685	560	105	22 0	2 52	635	180	12	97	08	22	251	68	0	0
																											N-1 Cr ter a; > >	
	Level "C" Contingencies																											
C02	Br dger – Populus #1 # 2 3 5 kV Lines	1660	2313	2253	13 7	-708	17 0	327	633	756	-127	-328	186	731	536	86	2238	2383	575	180	136	99	07	223	2 3	777	0	0
C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1576	2517	2101	1217	-716	1512	280	58	5 5	-80	-3 8	1985	731	567	7	2227	2295	5 3	180	12	57	379	213	216	739	575	0
C02b	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1501	2701	1927	1081	-707	1253	235	538	306	-37	-359	2095	737	60	58	2215	2199	50	180	113	12	3 7	201	200	717	1150	0
C02c	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1505	269	1919	1080	-702	1253	236	539	307	-39	-362	2092	737	60	57	2215	2197	502	180	113	12	3 7	201	201	717		
C02d	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1505	2693	1919	1079	-705	1259	236	539	311	-39	-372	2091	737	603	58	2215	2201	505	180	113	13	3 8	202	201	719		
C03	Br dger–3MK Bridger–Pop #1 3 5 kV ines	1689	2262	2252	12	-61	1731	36	673	751	-1 0	-350	18 1	738	5 2	82	2239	2366	563	180	137	95	0	222	271	783		
C03a	Br dger–3MK Bridger–Pop #1 3 5 kV Drop JBG1	1612	2 65	2107	1105	-616	1 88	318	623	527	-89	-352	1967	7 0	57	68	2227	2279	532	180	125	52	375	211	238	753	575	0
C03b	Br dger–3MK Bridger–Pop #1 3 5 kV Drop JBG1 BigGrassy Shunt C	153	2655	1950	960	-616	1238	272	576	295	- 5	-365	2081	7	609	53	2215	2186	9	180	11	08	3	200	215	733	1150	0
C03c	Br dger–3MK Bridge-Pop#1 3 5 RAS 2JBG BigGrassy 161 Cap Dr	1533	26 8	19 8	957	-638	1279	270	57	332	- 8	-380	2073	7 0	603	57	2217	2203	50	180	11	1	3 9	202	212	730	1150	0
C0	Br dger–3MK Bridger–Pop #2 3 5 kV ines	1689	2262	2252	12	-61	1731	36	673	751	-1 0	-350	18 1	738	5 2	82	2239	2366	563	180	137	95	0	222	271	783		
C0 a	Br dger–3MK Bridger–Pop #2 3 5 kV Drop JBG1	1612	2 65	2107	1105	-616	1 88	318	623	527	-89	-352	1967	7 0	57	68	2227	2279	532	180	125	52	375	211	238	753	575	0
C0 b	Br dger–3MK Bridger–Pop #2 3 5 kV Drop JBG1 BigGrassy Shunt C	153	2655	1950	960	-616	1238	272	576	295	- 5	-365	2081	7	609	53	2215	2186	9	180	11	08	3	200	215	733	1150	0
C0 c	Br dger–3MK Bridger-Pop#2 3 5 RAS; 2JBG BigGrassy 161 Cap D	1533	26 8	19 8	957	-638	1279	270	57	332	- 8	-380	2073	7 0	603	57	2217	2203	50	180	11	1	3 9	202	212	730	1150	0
C05	Borah – Populus 3 5 kV DLO	1 67	2601	1719	2377	-1110	1871	198	99	877	-77	-337	1966	675	520	96	22 6	2 27	612	180	135	51	19	228	255	687	0	0
C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1 17	27 6	1615	2103	-1050	1597	170	70	62	- 2	-3 9	2061	688	558	79	2233	2323	567	180	12	68	388	216	229	678	575	0
C06	Populus – Ben Lomond 3 5 kV DLO	1577	2 93	161	2309	-807	2011	2 3	5 5	981	-60	-335	1968	708	5 8	128	22 6	2515	698	180	101	70	390	217	250	701	0	0
C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Ser es Cap	1599	2 59	1669	2192	-759	2002	261	56	975	-67	-337	1955	712	5 8	126	22 5	2510	692	180	102	70	390	217	2 6	703	0	0
C07	Ben Lomond – Terminal 3 5 kV DLO	1 80	2595	1696	2397	-1062	1920	195	96	911	-70	-337	1973	681	526	108	22 6	2 52	639	180	125	503	12	225	25	68	0	0
C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1 65	2607	1701	2 0	-110	188	197	98	887	-75	-3 0	1971	675	521	99	22 6	2 31	617	180	133	511	18	227	258	688	0	0
C08a	Populus – Kinport Populus – Borah #2 3 5 kV Lines w/ RAS	1 1	2752	1597	2128	-10 6	1607	169	70	632	- 0	-351	206	688	559	81	2233	2327	570	180	123	66	387	216	231	680		
C09	Populus – Borah #2 3 5 kV Treasureton – Brady 230 kV Lines	1 72	2601	170	2393	-1082	1902	198	99	898	-72	-337	1972	678	523	10	22 6	2 3	628	180	129	507	15	226	255	685	0	0
C10	Populus – Borah #1 3 5 kV Treasure on – Brady 230 kV Lines	1 71	2603	1706	239	-108	1902	197	98	899	-72	-337	1973	677	523	10	22 6	2 3	628	180	129	507	15	226	255	685	0	0
C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	155	2516	1636	233	-878	1986	22	526	962	-63	-335	1968	701	5 1	122	22 6	2 99	681	180	107	78	396	220	252	693	0	0
C12	Populus – Terminal 3 5 kV Treasu eton – Brady 230 kV Lines	1505	2568	167	2376	-999	19 1	205	507	927	-68	-336	1971	688	531	113	22 6	2 66	653	180	119	95	07	223	253	687	0	0
C13	Borah – Ade aide #2 Borah–ADT–Midpoint #1 3 5 kV lines (RA)	1 80	2575	1701	2369	-1126	1828	197	98	8 8	-86	-329	1953	675	517	75	22 5	2 10	593	180	1 7	520	23	229	259	685	0	0
C1	Borah – Ade aide #2 Midpoint - Ade aide #2 3 5 kV lines (RA)	1 75	2595	1700	2390	-1088	1890	197	98	890	-7	-335	1968	678	522	98	22 6	2 38	622	180	132	509	17	227	256	68	0	0
C15	Borah – Ade aide #2 Borah – Hunt 230 kV ines	1 76	2590	1701	2385	-1096	1876	197	98	878	-77	-333	1965	677	521	9	22 5	2 30	61	180	136	512	18	227	259	68	0	0
C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV lines (RA)	1 76	259	1702	2388	-1087	1889	197	98	890	-7	-33	1968	678	522	98	22 6	2 39	622	180	132	509	16	227	255	685	0	0
C18	Borah – Kinport Midpoint – Adelaide #2 3 5 kV ines (RA)	1 7	2600	1703	2393	-1079	190	197	98	900	-72	-336	1972	678	523	10	22 6	2	631	180	129	506	15	226	253	68	0	0
C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA?)	1 7	2598	1703	2391	-1081	1900	197	98	895	-72	-335	1971	678	523	103	22 6	2 2	627	180	129	507	15	226	256	68	0	0
C20	Borah–Adel–M dpoint #1 Midpoint – Ade aide #2 3 5 kV lines	1 76	2589	1703	2382	-1102	1869	197	98	878	-78	-333	1963	677	520	91	22 5	2 31	613	180	137	513	19	227	253	68	0	0
C21	Borah-Adel-Midpoint #1 3 5 kV Bo ah-Hunt 230 kV lines (RA)	1 76	2590	1702	238	-1099	1873	197	98	876	-78	-333	196	677	521	93	22 5	2 29	613	180	136	512	18	227	258	68	0	0
C23	Borah – Adel #2 3 5 kV Borah – M dpoint 500 kV Lines	1 87	2562	1671	2383	-1125	1811	199	500	818	-90	-327	19 6	675	516	81	22 3	2393	577	180	1 8	52	26	230	273	685	0	0
C2	Br dger – Populus #1 Goshen – Kinpo t 3 5 kV Lines	15	2 98	1932	198	-935	18 7	2 6	5 9	8 9	-89	-330	1938	698	528	99	22 3	2 26	612	180	130	503	11	225	255	712	0	0
C25	Br dger – Populus #2 Goshen – Kinpo t 3 5 kV ines	15	2 98	1932	198	-935	18 7	2 6	5 9	8 9	-89	-330	1938	698	528	99	22 3	2 26	612	180	130	503	11	225	255	712	0	0
C28x	Palo Verde - Trip 1&2, w/ FACRI	1550	2626	1692	2 10	-1229	1770	208	509	767	- 0	-3	20 6	697	536	111	2110	3387	1881	180	101	639	516	260	255	753	0	0
																											N-2 Cr ter a; > >	
	Marg n est w/ Br dger West at 5% of 4100 MW																											
	egwstg1 8h7 jbw18a 4305 2520 1531 337 sav	1531	2821	1785	2520	-960	2209	195	96	1207	-99	-337	2079	70	551	97	2299	2337	523	180	137	505	35	23	271	755		
	Marg n est w/ Path 18 at 5% of 337 MW																											
	egwstg1 8h7 jbw18a 4100 2400 1475 354 sav	1 75	2603	1700	2 00	-1056	19 2	195	96	888	-52	-35	1977	678	52	105	2231	2 6	6 5	180	127	50	10	22	258	696		

REAC IVE MARGIN MVAR (Gray shaded cells are the min mum margins)

CON INGENCY#	Aeolus 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Bridger 345	Goshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
B01																								
B01a	-603	-1350	-5 6	-1009	-1006	-1036	-1121	-1028	-578	-551	-503	-86	-955	-970	-130	-1565	-1608	-660	-637	-500	-262	-258	-227	-67
B01g	-682	-1317	-599	-922	-919	-999	-1120	-980	-567	-507	- 75	-778	-871	-875	-1211	-1 61	-1516	-677	-723	-560	-291	-277	-229	-63
B02	-8 8	-1757	-880	-1381	-1335	-12 7	-135	-1261	-1032	-765	-792	-1287	-1 85	-1399	-1690	-1830	-192	-7 1	-860	-670	-323	-319	-255	-69
B03	-9 6	-1615	-982	-1102	-107	-1031	-1151	-106	-906	-617	-655	-995	-11 3	-1089	-1396	-1623	-1753	-728	-92	-682	-33	-325	-250	-67
B0	-813	-1316	-722	-608	-576	-625	-738	-6 1	-711	-256	-2 5	- 52	-580	-539	-838	-1160	-1 58	-716	-813	-633	-331	-31	-239	-66
B0 c	-880	-1 50	-857	-782	-7 1	-783	-91	-802	-827	-335	-313	-593	-755	-702	-1032	-1382	-1601	-720	-867	-657	-333	-318	-2 2	-66
B0 cx	-895	-1 85	-892	-8 5	-800	-833	-966	-853	-858	-370	-3 2	-650	-822	-762	-109	-1 37	-1635	-721	-879	-663	-33	-319	-2 3	-66
B05	-10 1	-1791	-1236	-1 23	-1381	-1262	-136	-1315	-1185	-758	-820	-1277	-1 69	-1 11	-1682	-1828	-1928	-7 1	-1010	-721	-322	-321	-253	-69
B06	-1006	-1708	-1163	-1219	-1126	-1068	-118	-1118	-1129	- 88	-739	-973	-12 1	-1125	-1519	-1712	-18 8	-738	-979	-709	-332	-325	-255	-68
B06a	-978	-1652	-1082	-1117	-10 0	-100	-1123	-10 9	-10 2	- 5	- 89	-88	-1125	-1026	-1 18	-1652	-1797	-73	-955	-698	-333	-32	-253	-67
B06b	-988	-1670	-1111	-1166	-1086	-10 0	-1159	-1085	-1073	- 87	- 97	-939	-1183	-1079	-1 59	-1679	-1809	-735	-962	-701	-333	-325	-253	-67
B07	-10 7	-1800	-1198	-1 15	-1381	-1269	-1373	-1321	-1071	-280	- 36	-1296	-1 63	-1398	-1667	-1837	-19 0	-7 2	-1017	-725	-328	-322	-256	-69
B08	-10 3	-1787	-1221	-1 07	-1363	-12 5	-13 8	-1302	-1170	-717	-796	-1182	-1 2	-1392	-1668	-1820	-1923	-7 2	-1012	-723	-328	-323	-256	-69
B09	-10 5	-1755	-1187	-1298	-1166	-11 1	-126	-12 5	-113	-713	-776	-1192	-1375	-1293	-1623	-1782	-1886	-7 0	-1016	-725	-328	-322	-25	-68
B10	-10	-1788	-1231	-1 19	-1268	-12 0	-13 6	-1300	-1178	-73	-80	-1232	-1 36	-13 7	-166	-1819	-1925	-7 1	-101	-72	-328	-322	-255	-69
B11	-10 6	-1791	-1219	-1392	-1352	-1239	-13	-129	-1166	-702	-785	-1210	-1 28	-1376	-1653	-1821	-1929	-7 1		-72	-328	-322	-255	-69
B12	-1069	-1767	-1225	-1300	-13 1	-1209	-1228	-836	-1182	-7 9	-812	-1233	-1 05	-1365	-1650	-1799	-1889	-7 6	-1039	-737	-331	-327	-257	-66
B1	-1053	-17 1	-1179	-12 1	-1273	-11 6	-116	-963	-113	-727	-78	-1179	-1339	-1299	-1607	-1769	-1865	-7 5	-102	-729	-330	-327	-257	-66
B15	-1017	-17 2	-1128	-12 8	-1159	-979	-1217	-1217	-1075	-688	-7 5	-1099	-1263	-1189	-1563	-1756	-1882	-739	-988	-711	-327	-321	-25	-69
B16	-10 2	-1752	-118	-1308	-1221	-1008	-1159	-1205	-1135	-726	-78	-118	-1355	-1292	-1615	-1779	-1882	-7 3	-1012	-723	-329	-325	-256	-67
B17	-1037	-1781	-1210	-1376	-1327	-1223	-1309	-1272	-1159	-732	-798	-1218	-1 06	-1309	-1651	-1813	-1920	-739	-1007	-720	-327	-321	-255	-69
B18	-10 3	-1788	-1227	-1 0	-13 8	-1221	-1297	-1278	-1180	-752	-815	-1260	-1 8	-1383	-1673	-1823	-192	-7 2	-1013	-723	-328	-323	-256	-68
B19	-10 0	-1775	-1210	-1377	-1325	-1166	-127	-1260	-1161	-7 1	-803	-1231	-1 1	-135	-1651	-1805	-1908	-7 2	-1010	-722	-328	-32	-256	-68
B20	-10 7	-1791	-1238	-1 26	-1388	-12 8	-1355	-1319	-1192	-756	-821	-1270	-1 62	-1 03	-1681	-1827	-1927	-7 2	-1016	-725	-328	-323	-256	-68
B21	-10 2	-1776	-1213	-1382	-13 0	-1176	-1286	-1273	-116	-7 1	-803	-1229	-1 13	-135	-1651	-1806	-1908	-7 2	-1011	-722	-329	-32	-256	-68
B22	-10 2	-178	-122	-1399	-1339	-1187	-1286	-1271	-1177	-750	-813	-1253	-1 2	-1378	-1668	-1818	-1918	-7 2	-1012	-722	-328	-32	-256	-68
B23	-10 2	-178	-1220	-1385	-1317	-1176	-121	-1236	-1173	-7 8	-811	-12 7	-1 33	-1356	-1665	-1817	-1918	-7 2	-1011	-722	-328	-323	-256	-68
B2	-10 3	-1785	-1223	-1390	-1321	-1175	-1199	-1232	-1177	-750	-813	-1250	-1 36	-1362	-1668	-1818	-1919	-7 2	-1013	-723	-328	-32	-256	-68
B25	-10 2	-1786	-1225	-1399	-1339	-1209	-1279	-1268	-1178	-751	-81	-1257	-1 5	-1376	-1671	-1821	-1922	-7 2	-1012	-722	-328	-323	-256	-68
B26	-10	-1789	-1230	-1 11	-1358	-1231	-1307	-1287	-118	-75	-817	-1265	-1 5	-1392	-1677	-182	-1925	-7 2	-1013	-723	-328	-323	-256	-68
B27	-10	-1791	-1235	-1 2	-1378	-1259	-1361	-1313	-1189	-757	-820	-1275	-1 65	-1 08	-1683	-1828	-1928	-7 2	-101	-723	-328	-323	-256	-69
B28	-1039	-1783	-1215	-1377	-1292	-1139	-12 5	-1238	-1168	-7 5	-807	-12 1	-1 27	-1332	-1663	-1817	-1920	-7 1	-1008	-721	-328	-323	-256	-69
B30	-1050	-1799	-12 8	-1 0	-1365	-12 2	-135	-1315	-1203	-758	-826	-128	-1 79	-1377	-1693	-1836	-1936	-7 3	-1019	-726	-328	-32	-256	-68
B31	-10 5	-1789	-1229	-1 11	-13 1	-122	-133	-1296	-1182	-7 7	-813	-1259	-1 9	-1353	-167	-1823	-192	-7 2	-101	-72	-328	-323	-256	
B32	-1053	-1808	-1231	-1 05	-1337	-1227	-13 1	-1298	-117	-630	-75	-1007	-1 61	-1338	-1683	-18 1	-19 7	-7 3	-1022	-728	-328	-323	-256	-69
B33	-1028	-1707	-1190	-1321	-128	-1188	-1301	-12 2	-1139	-728	-793	-1183	-13 0	-1301	-1506	-1677	-1832	-733	-998	-716	-328	-321	-253	-69
B3	-1026	-1693	-1179	-1308	-1272	-1179	-1293	-1233	-1128	-721	-78	-1169	-132	-1286	-1593	-1668	-1816	-73	-997	-716	-328	-322	-25	-69
B35	P CASE DIVERGED																							
B35a	-586	-988	-1261	-1687	-1597	-1 05	-1 71	-1 7	-1297	-8 5	-963	-1 82	-1735	-1639	-1 03	-1281	-1175	-632	-635	- 69	-192	-171	-211	-58
B35g	-816	-1533	-1935	-178	-1537	-1582	-1600	-1510	-967	-1080	-1717	-2028	-1865	-1883	-18	-1785	-669	-873	-626	-2 3	-230	-236	-61	
B36	P CASE DIVERGED																							
B36a	-1161	-1801	-922	-923	960	-1001	-1107	-995	-782	-588	-581	-869	-966	-955	-1293	-1716	-1992	-606	-1189	-816	-306	-287	-232	-66
B36g	-1180	-1806	-9 5	-9 2	977	-1010	-111	-1008	-802	-597	-592	-886	-987	-97	-1312	-1731	-1997	-608	-1205	-82	-312	-305	-2 0	-66
B37	-932	-1772	-116	-1386	-1359	-1250	-1358	-1301	-11	-755	-815	-12 8	-1 29	-1380	-1662	-1829	-1923	-736	-888	-660	-323	-317	-253	-68
B38	-1052	-1859	-1293	-1 92	-1 25	-1279	-1376	-13 9	-1236	-763	-83	-1309	-1526	-1 55	-1709	-1867	-1981	-711	-1006	-732	-292	-275	-2 3	-6
B39	-1013	-1807	-1205	-1 10	-1382	-1261	-136	-1319	-11 8	-753	-802	-125	-1 8	-1397	-1679	-1839	-19 6	-7 1		-59	-328	-32	-252	-69
B 0	-722	-16 3	-876	-108	-1113	-1108	-121	-1121	-870	-656	-660	-1001	-1119	-1105	-1 20	-1677	-1817	- 90	-70	-561	-300	-285	-235	-51
B 0a	-851	-1762	-105	-1267	-1256	-116	-1256	-1218	-103	-710	-752	-11 8	-1305	-1269	-1562	-1801	-1939	- 97	-828	-633	-31	-301	-2 6	-66
B 1	-1025	-1761	-11 1	-1131	-1037	-860	-80	-915	-1105	-70	-769	-1079	-12 0	-1099	-1581	-1783	-1898	-7 2	-996	-717	-328	-323	-256	-68
B51	-1066	-18 7	-1286	-1 7	-1 16	-1278	-1375	-13 2	-1221	-762	-832	-1305	-1515	-1 50	-1706	-186	-1978	-710	-1021	-737	-291	-272	-2 3	-6
B52	-836	-1723	-1189	-1 0	-1368	-12 8	-13 8	-1298	-1225	-761	-858	-1291	-1 96	-1 09	-1661	-1796	-1873	-723	-810	-620	-255	-257	-2	-66
B53	-875	-1715	-1085	-1308	-1300	-1210	-1310	-1258	-1068	-735	-777	-1188	-1352	-131	-16 6	-178	-186	-721	-850	-636	-320	-267	-227	-66
	586	**988**	**546**	**608**	**576**	**625**	**738**	**641**	**567**	**256**	**245**	**452**	**580**	**539**	**838**	**1160**	**669**	**490**	**626**	**59**	**192**	**171**	**61**	**51**
N-1 Cr ter a; > >					500	500	500	500	100			250		250										
C02	-611	-1109	- 97	-528	-551	-587	-682	-587	- 79	-315	-326	- 91	-56	-5 5	-76	-1039	-125	-689	-6 0	-533	-336	-31	-227	-62
C02a	-812	-1526	-821	-990	-960	-957	-1062	-96	-7 3	-565	-570	-900	-1031	-970	-1283	-1551	-1686	-695	-799	-621	-328	-313	-2 2	-67
C02b	-822	-1679	-883	-11 6	-1100	-10 9	-1126	-1079	-813	-656	-651	-10 9	-119	-1118	-1 83	-1718	-18 7	-685	-805	-621	-312	-298	-2	-72
C02c	-802	-1635	-836	-105	-1012	-971	-10 8	-1002	-767	-621	-612	-967	-1098	-1026	-1 00	-16 7	-1799	-683	-788	-611	-311	-297	-2 3	-72
C02d	-805	-1637	-8 0	-1058	-1017	-97	-1052	-1006	-771	-62	-615	-972	-110	-1032	-1 0	-1651	-1801	-683	-790	-612	-311	-297	-2 3	-72
C03	- 73	-817	-367	-279	278	-32	- 05	-317	- 23	-150	-1 7	-229	-272	-262	- 17	-586	-97	-662	-500	- 66	-332	-300	-201	-61
C03a	-675	-1196	-612	-508	- 95	-550	-6 5	-552	-611	-2 5	-235	- 00	- 89	- 65	-732	-1021	-1351	-678	-683	-558	-32	-299	-228	-67
C03b	-757	-1 7	-759	-756	-726	-7 7	-836	-768	-7 1	-3 8	-326	-599	-735	-69	-1053	-1399	-16 5	-673	-7 6	-588	-310	-289	-236	-71
C03c	-785	-1530	-813	-85	-819	-830	-923	-850	-791	-399	-366	-689	-8	-79	-115	-1 9	-170	-678	-770	-602	-313	-29	-238	-71
C0	- 73	-817	-367	-279	-278	-32	- 05	-317	- 23	-150	-1 7	-229	-272	-262	- 17	-586	-97	-662	-500	- 66	-332	-300	-201	-61
C0 a	-675	-1196	-612	-508	- 95	-550	-6 5	-552	-611	-2 5	-235	- 00	- 89	- 65	-732	-1021	-1351	-678	-683	-558	-32	-299	-228	-67
C0 b	-757	-1 7	-759	-756	-726	-7 7	-836	-768	-7 1	-3 8	-326	-599	-735	-69	-1053	-1399	-16 5	-673	-7 6	-588	-310	-289	-236	-71
C0 c	-785	-1530	-813	-85	-819	-830	-923	-850	-791	-399	-366	-689	-8	-79	-115	-1 9	-170	-678	-770	-602	-313	-29	-238	-71
C05	-10 8	-1785	-1223	-1392	-1259	-1150	-1280	-1262	-1176	-728	-801	-1231	-1 25	-1215	-1662	-181	-1918	-7		-726	-329	-32	-256	-68
C05a	-1012	-1885	-1220	-1 65	-13 1	-1208	-1319	-1325	-1205	-777	-8	-1308	-1506	-1296	-1771	-1915	-20 8	-729	-981	-708	-316	-309	-255	-71
C06	-1001	-15 3	-11 9	-1207	-1169	-110	-1235	-1152	-1095	-696	-771	-1073	-1190	-1172	-1206	-1 27	-1652	-715	-97	-705	-328	-316	-2 7	-69
C06a	-968	-1 90	-10 9	-1068	-1033	-997	-1131	-10 0	-995	-575	-627	-929	-10	-1023	-1168	-1389	-1602	-711	-9	-691	-330	-316	-2	-68
C07	-1038	-1718	-1209	-1359	-1322	-1222	-1332	-127	-1157	-736	-798	-1215	-1388	-13 1	-1350	-1715	-1838	-739	-1008	-721	-328	-323	-256	-69
C08	-1052	-1801	-1206	-1362	-12 1	-11 2	-1272	-12	-11 5	-585	-719	-913	-1 18	-1201	-1656	-1826	-19 0	-7	-1021	-727	-328	-323	-256	-68
C08a	-101	-1899	-1200	-1 26	-1319	-1202	-1311	-1306	-1167	-628	-75	-975	-1 93	-1282	-176	-1929	-2067	-728	-98	-709	-315	-307	-25	-72
C09	-10 3	-1783	-1218	-1389	-131	-1196	-1309	-127	-1172	-7 0	-80	-12 1	-1 30	-1322	-16 5	-1813	-1918	-7 2	-1012	-723	-328	-323	-255	-68
C10	-10 8	-1795	-1238	-1 19	-1338	-1216	-1330	-129	-1193	-751	-817	-1267	-1 61	-13 7	-166	-1827	-1930	-7 3	-1017	-725	-328	-323	-256	-68
C11	-1003	-1581	-113	-1198	-1169	-1101	-1226	-1151	-1079	-689	-757	-1070	-119	-1172	-1390	-1 88	-1691	-721	-976	-706	-329	-320	-250	-69
C12	-102	-1686		-1289	-12 7	-115	-1269	-1212	-1117	-71	-775	-1151	-130	-1261	-1563	-1658	-1809	-73	-99	-715	-328	-322	-25	-69
C13	-1037	-1738	-1170	-1290	-1213	-9 3	-1067	-1132	-1118	-713	-772	-11 8	-1318	-1250	-1587	-1759	-1865	-7	-1008	-720	-330	-326	-256	-67
C1	-10 2	-1775	-1213	-1381	-1336	-1169	-1281	-1270	-116	-7 1	-803	-1229	-1 13	-1352	-1651	-1806	-1908	-7 2	-1011	-722	-329	-32	-256	-68
C15	-1038	-1761	-1198	-13 8	-1277	-1075	-1181	-1206	-1150	-73	-795	-1207	-1387	-1322	-163	-1793	-1896	-7 3	-1008	-721	-329	-32	-256	-68
C16	-10 0	-1769	-1198	-136	-1322	-1161	-1273	-1261	-11 5	-702	-779	-11 3	-1389	-1339	-1635	-1797	-1903	-7 2	-1009	-721	-328	-32	-256	-68
C18	-10 5	-1787	-122	-1 08	-1371	-1232	-13 1	-1307	-1172	-716	-796	-1178	-1 37	-1388	-1665	-1819	-1921	-7 2	-101	-72	-328	-323	-256	-68
C19	-10 0	-1780	-1210	-1381	-1321	-1170	-1270	-1258	-1158	-710	-788	-1161	-1 16	-1359	-1652	-1809	-1912	-7 2	-1010	-722	-328	-323	-256	-68
C20	-10	-1765	-1208	-1367	-13 6	-1138	-1263	-1279	-1157	-730	-795	-1195	-1379	-1305	-1630	-1795	-1898	-7 3	-101	-72	-329	-32	-256	-68
C21	-10 0	-1762	-1201	-1355	-1293	-108	-1193	-1220	-1152	-733	-795	-120	-1386	-1323	-1633	-1793	-1896	-7 3	-1010	-722	-329	-32	-256	-68
C23	-10 0	-1727	-1156	-12 7	-1165	-868	-1020	-111	-110	-707	-762	-1129	-1289	-1221	-1571	-17 5	-1851	-7	-1011	-722	-330	-326	-256	-66
C2	-937	-1608	-923	-1080	-1066	-1037	-1161	-106	-79	-221	-3 1	-989	-1113	-1061	-1355	-1619	-175	-728	-917	-680	-33	-325	-250	-66
C25	-937	-1608	-923	-1080	-1066	-1037	-1161	-106	-79	-221	-3 1	-989	-1113	-1061	-1355	-1619	-175	-728	-917	-680	-33	-325	-250	-66
C28x	-886	-1 61	-1069	-1252	-1232	-1159	-1267	-1209	-10 3	-701	-7 9	-1128	-128	-12 9	-1 96	-1573	-1559	-701	-862	-6 8	-317	-30	-2 8	-29
	473	**817**	**367**	**279**	**278**	**324**	**405**	**317**	**423**	**150**	**147**	**229**	**272**	**262**	**417**	**586**	**974**	**662**	**500**	**466**	**310**	**289**	**201**	**29**
N-2 Cr ter a; > >					00	00	00	00	100			200		200										

CON INGENCY#	Vo tage Deviation	WORS VOL AGE DEVIA ION [2]	dV %	# of P Overloads	WORS LOAD NG	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Vo tage	COMMEN
					Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs				
Base case					SHELBY - GLCRWND2 115 #1	116.50%			
					OCUST - MORA 138 #1	110.52%			
					S DNEY 115 / 230 #1	108.35%			
					HELENA 69 / 100 #2	10 .19%			
					CTTNWD N - KETTLECK 115 #1	103.6 %			
Level "B"					**CON NGENCY LOADINGS**				
B01	0	- - -	- - -	2	BRIDGER - BRIDGE&A 3 5 #1	112.07%	2	PTRSNFLT 230 @ .895	OK - Above 87 UVLS Re ay
B01a		PTRSNFRG 69	6 9	0	PTRSNFLT - AMPS 230 #1	99.0 %	5	PTRSNFLT 230 @ .861	Be ow 87 pu - UVLS Trip Loads
B01g	0	- - -	- - -	2	BR DGER - BRIDGE&A 3 5 #1	101.00%	2	PTRSNFLT 230 @ .881	OK - Above 87 UVLS Re ay
B02	0	- - -	- - -	0	- - -	- - -	-	None	
B03	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	98.28%	-	None	
B0	39	B GGRASS 69	8 8	0	HELENA 69 / 100 #2	98.72%	8	B GGRASS 161 @ 855	
B0 c	6	B GGRASS 69	6.1	1	HELENA 69 / 100 #2	100.12%	6	PTRSNFLT 230 @ .87	OK - Above 87 UVLS Re ay
B0 cx	0	- - -	- - -	1	HELENA 69 / 100 #2	101.25%	3	PTRSNFLT 230 @ .881	OK - Above 87 UVLS Re ay
B05	0	- - -	- - -	0	- - -	- - -	-	None	
B06	0	- - -	- - -	3	GRACE - SODA 138 #1	111.60%	3	PTRSNFLT 230 @ .899	OK - Above 87 UVLS Re ay
B06a	0	- - -	- - -	1	HELENA 69 / 100 #2	101.50%	3	D LLON S 69 @ .889	Not OK per MPC S d
B06b	0	- - -	- - -	0	PTRSNFLT - AMPS 230 #1	90.92%	-	None	Resolved
B07	0	- - -	- - -	0	- - -	- - -	-	None	
B08	0	- - -	- - -	0	- - -	- - -	-	None	
B09	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	85.92%	-	None	
B10	0	- - -	- - -	0	- - -	- - -	-	None	
B11	0	- - -	- - -	0	HUNT 138 / 230 #2	72.01%	-	None	
B12	0	- - -	- - -	0	OCUST - MORA 138 #1	93. 0%	-	None	
B1	0	- - -	- - -	0	OCUST - MORA 138 #1	93.70%	-	None	
B15	0	- - -	- - -	0	- - -	- - -	-	None	
B16	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79.86%	-	None	
B17	0	- - -	- - -	1	OCUST - MORA 138 #1	100.8 %	-	None	Overloaded in base case
B18	0	- - -	- - -	1	M DPO NT 230 / 3 5 #2	123.67%	-	None	Idaho Problem, Not Path 18
B19	0	- - -	- - -	0	HUNT 138 / 230 #2	76.36%	-	None	
B20	0	- - -	- - -	0	- - -	- - -	-	None	
B21	0	- - -	- - -	0	- - -	- - -	-	None	
B22	0	- - -	- - -	0	M DPO NT 138 / 230 #1	86. 0%	-	None	
B23	0	- - -	- - -	0	OCUST - MORA 138 #1	100.63%	-	None	Overloaded in base case
B2	0	- - -	- - -	0	M DPO NT 138 / 230 #1	87.69%	-	None	
B25	0	- - -	- - -	0	OCUST - MORA 138 #1	98. 2%	-	None	
B26	0	- - -	- - -	0	OCUST - MORA 138 #1	99.76%	-	None	
B27	0	- - -	- - -	0	- - -	- - -	-	None	
B28	0	- - -	- - -	0	OCUST - MORA 138 #1	92.97%	-	None	
B30	0	- - -	- - -	0	- - -	- - -	-	None	
B31	0	- - -	- - -	0	- - -	- - -	-	None	
B32	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	87.30%	-	None	
B33	0	- - -	- - -	0	- - -	- - -	-	None	
B3	0	- - -	- - -	0	- - -	- - -	-	None	
B35	P CASE DIVERGED								
B35a	60	GREATDIV 3 5	9 6	2	BRIDGER - BRIDGE&A 3 5 #1	100.90%		D LLON S 69 @ .868	Not OK per MPC S d
B35g	0	- - -	- - -	0	PTRSNFLT - AMPS 230 #1	98.71%	-	None	Resolved
B36	P CASE DIVERGED								
B36a	0	- - -	- - -	1	HELENA 69 / 100 #2	101.06%	2	PTRSNFLT 230 @ .889	OK - Above 87 UVLS Re ay
B36g	0	- - -	- - -	1	HELENA 69 / 100 #2	101.25%	2	PTRSNFLT 230 @ .891	OK - Above 87 UVLS Re ay
B37	0	- - -	- - -	0	AEOLUS 500 / 230 #2	98.96%	-	None	
B38	0	- - -	- - -	0	S DNEY - S DNEYDC 230 #1	96.65%	-	None	
B39	0	- - -	- - -	0	M NERS - PLATTE 230 #1	75.5 %	-	None	
B 0	0	- - -	- - -	3	BONANZA - VERNAL 138 #1	121.06%	-	None	
B 0a	0	- - -	- - -	0	HELENA 69 / 100 #2	102.18%	1	PTRSNFLT 230 @ .898	OK - Above 87 UVLS Re ay
B 1	0	- - -	- - -	0	- - -	- - -	-	None	
B51	0	- - -	- - -	0	S DNEY - S DNEYDC 230 #1	96.79%	-	None	
B52	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	80.98%	-	None	Negative Vdevs in Wyo.
B53	0	- - -	- - -	0	PTRSNFLT - AMPS 230 #1	90 25%	-	None	Negative Vdevs in Wyo.
C02	0	3MIKNOLL 3 5	7 2	2	BR DGER - BRIDGE&A 3 5 #1	125.02%	6	B GGRASS 161 @ 880	OK - Above 87 UVLS Re ay
C02a	0	- - -	- - -	2	BRIDGER - BRIDGE&A 3 5 #1	109.56%	2	PTRSNFLT 230 @ .885	OK - Above 87 UVLS Re ay
C02b	0	B GGRASS 69	6.1	1	HELENA 69 / 100 #2	100.10%	3	PTRSNFLT 230 @ .868	Be ow 87 pu - UVLS Trip Loads
C02c	3	PTRSNFRG 69	6.1	1	HELENA 69 / 100 #2	100.82%	3	PTRSNFLT 230 @ .868	Be ow 87 pu - UVLS Trip Loads
C02d	0	- - -	- - -	1	HELENA 69 / 100 #2	101. 7%	2	AMPS 230 @ 892	OK - Above 87 UVLS Re ay
C03	0	AMPS 69	8 6	0	OCUST - MORA 138 #1	98 69%	5	PTRSNFLT 230 @ .8 9	Be ow 87 pu - UVLS Trip Loads
C03a	1	PTRSNFRG 69	10 0	0	PTRSNFLT - AMPS 230 #1	98.72%	9	PTRSNFLT 230 @ .83	Be ow 87 pu - UVLS Trip Loads
C03b	3	PTRSNFRG 69	11 0	1	PTRSNFLT - AMPS 230 #1	102.32%	6	PTRSNFLT 230 @ .825	Be ow 87 pu - UVLS Trip Loads
C03c	0	- - -	- - -	1	PTRSNFLT - AMPS 230 #1	100.7 %	3	PTRSNFLT 230 @ .877	OK - UVLS Relay Dropped Load
C0	0	AMPS 69	8 6	0	OCUST - MORA 138 #1	98.69%	5	PTRSNFLT 230 @ .8 9	Be ow 87 pu - UVLS Trip Loads
C0 a	1	PTRSNFRG 69	10 0	0	PTRSNFLT - AMPS 230 #1	98.72%	9	PTRSNFLT 230 @ .83	Be ow 87 pu - UVLS Trip Loads
C0 b	3	PTRSNFRG 69	11 0	1	PTRSNFLT - AMPS 230 #1	102.32%	6	PTRSNFLT 230 @ .825	Be ow 87 pu - UVLS Trip Loads
C0 c	0	- - -	- - -	1	PTRSNFLT - AMPS 230 #1	100.7 %	3	PTRSNFLT 230 @ .877	OK - UVLS Relay Dropped Load
C05	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	85.96%	-	None	
C05a	0	- - -	- - -	0	PTRSNFLT - AMPS 230 #1	93.35%	1	PTRSNFLT 230 @ .898	OK - Above 87 UVLS Re ay
C06	0	- - -	- - -	0	SIGURDPS - GLENCANY 230 #1	77.63%	-	None	
C06a	0	- - -	- - -	0	SIGURDPS - GLENCANY 230 #1	77.65%	-	None	
C07	0	- - -	- - -	0	- - -	- - -	-	None	
C08	0	- - -	- - -	0	BRIDGER - BRIDGE&A 3 5 #1	89 86%	-	None	
C08a	0	- - -	- - -	1	HELENA 69 / 100 #2	101.29%	3	PTRSNFLT 230 @ .887	OK - Above 87 UVLS Re ay
C09	0	- - -	- - -	0	- - -	- - -	-	None	
C10	0	- - -	- - -	0	- - -	- - -	-	None	
C11	0	- - -	- - -	0	SIGURDPS - GLENCANY 230 #1	78.6 %	-	None	
C12	0	- - -	- - -	0	- - -	- - -	-	None	
C13	0	- - -	- - -	0	OCUST - MORA 138 #1	98 65%	-	None	
C1	0	- - -	- - -	0	- - -	- - -	-	None	
C15	0	- - -	- - -	0	M DPO NT 138 / 230 #1	86.58%	-	None	
C16	0	- - -	- - -	0	- - -	- - -	-	None	
C18	0	- - -	- - -	0	- - -	- - -	-	None	
C19	0	- - -	- - -	0	M DPO NT 138 / 230 #1	86. 1%	-	None	
C20	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79.10%	-	None	
C21	0	- - -	- - -	0	M DPO NT 138 / 230 #1	85.73%	-	None	
C23	0	- - -	- - -	0	PTRSNFLT - AMPS 230 #1	85.01%	-	None	
C2	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	9 .59%	-	None	
C25	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	9 .59%	-	None	
C28x	0	- - -	- - -		SIGURDPS - GLENCANY 230 #1	102.11%	2	PTRSNFLT 230 @ .888	OK - Above 87 UVLS Re ay
egwstg1 8h7 jbw18a 4305 2520 1531 337 sav	**All Contingenc es (w/ Final RAS) Converged Ind cat ng Positive Reactive Margin**								
egwstg1 8h7 jbw18a 4100 2400 1475 354 sav	**All Contingenc es (w/ Final RAS) Converged Ind cat ng Positive Reactive Margin**								

1) Voltage Vio at ons > 5% for Level B & > 10% or Level C

		CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 345	New Path C (NB-1)	Borah West	Monu Naughtin	West of RS / PH	Midpoint SE	Montana SE	Montana Idaho (P13)	of 4a	Bonanza West	Ir 1k (30)	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant PP Gonder	Red B H Allen (ot 2G)	4Corners (2B1)	S gurd Gen/Cz (2B 2)	Idaho Area System Losses	Idaho System Losses	Sr Elge Gen Trip	Aeolus Gen Trip
1			BASE CASE / P PA H FLOWS																							Gen Drop		
5		**eqwstg1 8h9 mn 4100 2400 2642 1480 332 492 saw**	1 80	26 2	1700	2 00	-927	1931	332	92	9 6	128	-165	1832	520	3	106	2996	2502	686	19 5	128	506	79	251	222	673		
7																												
8		**Level "B" Contingencies**																										
9	B01	An icline – Populus 500 kV Line	1887	2038	0	3370	-73	1571	18	581	626	27	-17	1625	566	375	69	2996	23 2	5 9	19 5	156	520	82	251	3 3	70	0	0
10	B01a	An icline – Populus 500 kV Line Drop Br dger G1	181	2216	0	3037	- 52	1335	383	5 5	08	67	-19	1731	575	10	56	2996	2253	51	19 5	1	76	57	2 3	298	683	575	0
11	B01g	An icline – Populus 500 kV Line JBG1 KinpCap	1810	2222	0	30 5	- 56	13 1	382	5	9	69	-19	173	57	09	57	2996	2256	517	19 5	1	76	57	2 3	288	683	575	0
12	B02	An icline 500 / 3 5 kV Transformer	1 97	2621	1772	2320	927	193	325	8	950	128	-167	1829	519	3 6	106	2996	250	683	19 5	128	507	79	251	21	676	0	0
13	B03	Bridger – Populus 3 5 kV Line	15 9	2539	190	2021	-798	1870	378	539	89	108	-167	1829	519	3 6	106	2996	2 75	666	19 5	132	506	77	250	22	698	0	0
1	B0	Bridger – 3Mi ekno l 3 5 kV Line	1587	2 80	1935	1877	-707	1860	16	578	887	93	-200	1773	5 7	351	95	2996	2 59	650	19 5	133	50	76	250	2 3	712	0	0
15	B05	Bridger 3 5 / 230 kV Trans ormer	1 82	26 0	1699	2396	92	1929	33	93	9 5	128	-167	1832	521	3	106	2996	2501	68	19 5	128	507	79	251	221	673	0	0
16	B06	3Mi ekmill – Goshen 3 5 kV Line	507	2598	79	22	90	899	3 7	507	92	5	82	8	527	3	0	2996	2 78	668	9 5	92	509	79	25	2 8	700	0	0
17	B06a	3Mi ekmill – Goshen 3 5 kV Line Bypass 3MK Caps	1526	2568	1828	262	-850	1899	365	526	921	110	-186	1803	531	3	100	2996	2 77	666	19 5	132	509	79	251	219	692	0	0
18	B07	Kinport – Goshen 3 5 kV Line	1 80	26 3	1695	2 08	928	1935	332	91	950	129	-169	1833	520	3	107	2996	2501	685	19 5	128	507	78	251	223	673	0	0
19	B08	Kinport – Borah 3 5 kV Line	1 82	2639	1701	2397	-926	1928	332	92	9 5	128	-165	1832	520	3	106	2996	2500	68	19 5	128	507	79	251	222	673	0	0
20	B09	Populus – Borah 500 kV Line	150	2606	1611	2 7	-910	1898	337	97	923	121	-167	1820	522	3 5	96	2996	2 86	672	19 5	13	510	80	252	235	673	0	0
21	B10	Bo ah 500 / 3 5 kV Transfo mer	1 8	2635	1688	2 10	917	1937	333	92	953	129	-168	1833	521	3 5	106	2996	2505	688	19 5	127	505	78	251	223	673	0	0
22	B11	Bo ah 3 5 / 230 kV Transfo mer	1 82	26 0	1692	2 0	-921	1937	33	9	952	128	-171	1833	520	3 5	107	2996	2501	686	19 5	127	506	78	251	223	67	0	0
23	B12	Populus – Cedar Hi l 500 kV Line	1502	2585	1628	2 10	-97	1800	335	95	809	103	-1 8	1796	51	332	108	2996	2 25	622	19 5	1 1	532	91	255	23	67	0	0
25	B1	Cedar H il – Hemingway 500 kV Line	1502	2585	1628	2 10	-97	1800	335	95	809	103	-1 8	1796	51	332	108	2996	2 25	622	19 5	1 1	532	91	255	23	67	0	0
26	B15	Midpoint – Hemingway 500 kV Line	1505	2581	1622	2 11	-972	1796	336	95	805	102	-1 8	179	515	332	108	2996	2 22	620	19 5	1 1	532	92	255	235	675	0	0
27	B16	Bo ah – Midpoint 500 kV Line	1 86	2626	1692	2391	-937	1898	333	92	907	122	-160	1822	519	3 1	113	2996	2 79	669	19 5	129	513	82	252	222	67	0	0
28	B17	Adelaide – Midpoint #2 3 5 kV Line	1 91	2 67	1675	2391	-95	19	332	92	929	128	-165	118	335	9	296	2996	2 85	653	19 5	128	51	82	253	223	67	0	0
29	B18	Midpoint 3 5 / 230 kV Transformer	1 8	26 1	1691	2 08	-919	1939	333	92	973	131	-169	1836	522	3 6	85	2996	2512	693	19 5	13	502	76	250	228	672	0	0
30	B19	Bo ah – Ade aide #2 3 5 kV Line	82	2639	699	2399	928	927	332	92	9	28	-65	83	520	3	09	2996	2 98	682	9 5	28	508	79	25	222	673	0	0
31	B20	Adelaide – Midpoint #2 3 5 kV Line	1 83	2638	1701	2396	-932	1932	332	91	929	128	-163	1830	520	3 2	105	2996	2 90	678	19 5	128	50	78	251	22	67	0	0
32	B21	Bo ah – Ade aide – Midpoint #1 3 5 kV Line	1 82	2638	1701	2396	-932	1922	332	91	9 0	127	-16	1831	520	3 3	103	2996	2 98	681	19 5	130	508	79	251	221	673	0	0
33	B22	Bo ah – Hunt 230 kV Line	1 83	2633	1700	2391	-9 0	1906	332	92	929	125	-162	1827	519	3 2	98	2996	2 90	675	19 5	133	511	81	252	222	67	0	0
3	B23	Midpoint – Boise Bench #3 230 kV Line	1 82	2637	1691	2393	-913	1918	332	91	935	127	-163	1830	520	3 3	103	2996	2 9	680	19 5	130	509	80	252	223	673	0	0
35	B2	Midpoint – Rattle Snake 230 kV Line	1 82	2637	1698	2397	-930	1921	332	91	935	126	-16	1830	520	3 3	109	2996	2 93	680	19 5	128	509	80	252	223	673	0	0
36	B25	Midpoint – Dram 230 kV Line	1 82	2639	1699	2398	-928	1926	332	92	9 1	127	-165	1831	520	3	108	2996	2 98	682	19 5	128	508	79	251	222	673	0	0
37	B26	Ra ttle Snake – Bo se Bench 230 kV Line	1 82	2639	1699	2398	-928	1926	332	92	9 0	127	-165	1831	520	3	107	2996	2 9	682	19 5	128	508	79	251	223	673	0	0
38	B27	Dram – Bo se Bench 230 kV Line	1 82	2638	1699	2398	-930	1923	332	91	937	126	-16	1830	520	3 3	108	2996	2 98	682	19 5	128	508	79	251	226	673	0	0
39	B28	Hemingway 500/230 kV Transformer	1 82	26 0	1700	2399	-926	1930	332	92	9 7	129	-166	1833	520	3	106	2996	2501	68	19 5	128	507	79	251	222	673	0	0
1	B30	Populus – Borah #1 3 5 kV Line	1 79	26 1	1707	2393	-938	1917	332	92	937	126	-166	1830	519	3 3	107	2996	2 9	675	19 5	131	508	80	252	223	673	0	0
2	B31	Populus – Borah #2 3 5 kV Line	1 80	2639	1705	2393	-937	1917	332	92	937	126	-166	1830	519	3 3	106	2996	2 9	679	19 5	131	510	80	252	222	67	0	0
3	B32	Populus – Kinport 3 5 kV Line	1 77	26	1695	2 09	9 0	1925	332	91	9	126	-173	1831	518	3 3	103	2996	2 93	680	19 5	130	509	80	252	225	673	0	0
4	B33	Populus – Ben Lomond #3 3 5 kV Line	5 2	2608	67	2373	85	955	3 5	505	965	3	-1	1830	529	3	2	2996	2 7	70	19 5	1	97	73	2 9	22	677	0	0
5	B3	Populus – Terminal 3 5 kV Line	1508	2611	1680	2380	868	1950	338	97	961	130	-16	1829	528	3 9	111	2996	251	697	19 5	123	99	7	250	222	675	0	0
6	B35	Aeolus – Anticline 500 kV Line																										
7	B35a	Aeolus – Anticline 500 kV Line	210	1187	778	1970	320	1309	265		389	38	-21	1603	562	59	50	2996	22 1	503	19 5	1 6	73	5	2 1	177	751	0	600
8	B35a	Aeolus – Anticline 500 kV Line	2116	1205	782	1978	-316	13 0	288	6	19	7	-229	1632	557	50	52	2996	22 3	50	19 5	1 8	79	57	2 3	176	7 3	0	600
9	B36	Aeolus – Mona 500 kV Line																										
50	B36a	Aeolus – Mona 500 kV Line	0	3 27	2069	26 8	-1703	1756	02	56	751	117	-188	1730	685	92	131	2996	2515	757	19 5	52	357	385	219	2 2	670	0	600
51	B37	Aeolus 500 / 230 kV Transformer	1 67	2632	1690	2398	-926	1922	33	93	938	121	-167	1810	526	351	106	2996	2 98	683	19 5	128	505	77	251	221	672	0	0
52	B38	Aeolus – Winds ar 230 kV Line	1 28	2575	1658	2380	-92	1883	331	90	902	92	-172	1721	5 6	379	10	2996	2 88	675	19 5	126	98	72	2 9	218	678	0	0
53	B39	Aeolus – F eezeout 230 kV Line	1 53	2675	1683	2 23	-93	1928	3 2	502	9 3	132	-165	18 6	523	3 0	106	2996	2500	686	19 5	127	505	78	251	22	686	0	0
5	B 0	Bonanza –Mona 3 5kV Line	1593	2665	1722	2 56	-975	1861	372	533	875	107	-1 7	1976	99	36	108	2996	2 7	633	19 5	111	59	1	239	226	693	0	0
55	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza P ant	1571	2629	1677	2 00	-1119	1736	3 6	505	756	1 5	-181	1910	5	327	103	2996	2 38	666	19 5	102	1	37	237	218	661	0	0
56	B 1	Hemingway – Summer Lake 500kV line	1 95	2595	1666	238	-1003	1789	333	92	773	108	-1 7	1798	511	328	139	2996	2395	600	19 5	13	5 0	503	257	209	676	0	0
57	B51	DaveJon - D flicu ty 230 kV Line	1 31	2579	1661	2382	-92	1886	331	90	905	9	-171	1727	5 5	378	10	2996	2 89	675	19 5	126	98	72	2 9	219	675	0	0
58	B52	Spence - Mustang 230 kV Line	1 97	2526	1695	2316	-902	1883	315	7	903	83	-173	1733	531	370	103	2996	2 92	677	19 5	128	502	75	250	212	679	0	0
59	B53	River on - At an ic 230 kV Line	1512	2 8	1708	2366	-966	1879	316	75	898	50	-176	1719	527	380	10	2996	2506	685	19 5	126	500	7	250	218	669	0	0
60	B53a	River on - At an ic 230 kV Line	1512	2 8	1708	2365	-966	1879	316	75	897	50	-176	1719	527	380	10	2996	2506	686	19 5	126	500	7	250	218	668	0	0
61	B61	Pa isades - Raven 230 kV Line	1 97	2619	1715	2 6	-986	1927	211	372	9 3	125	-166	1826	527	3	106	2996	2500	686	19 5	127	50	77	251	226	671		
62	B62	Firehole - Mans ace - BRPP - S.Trona 230 kV Line	1 91	2627	1711	2 29	-961	1933	258	05	9 9	125	-165	1828	530	339	106	2996	2503	68	19 5	128	507	78	251	225	673		
63																												
6																												
65		**Level "C" Contingencies**																										
68	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1669	2352	22 6	1361	57	1766	57	622	803	69	-171	1725	572	353	87	2996	23 6	628	19 5	138	50	7	2 9	207	760	0	0
69	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1588	25	2082	1227	-575	1529	12	575	58	113	-191	1837	577	389	7	2996	23 7	59	19 5	126	60	9	2 1	179	722	575	0
70	C03	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines	70	2295	2257	236	83	1756	60	267	96	663	806	5	2	70	578	357	8	2996	2 20	6 5	19 5	0	503	73	2 9	23	762
71	C03a	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	1620	2 93	2109	1097	90	1531	9	613	588	100	-226	1816	583	392	71	2996	2 59	19 5	125	12	59	8	2 9	196	729	575	0
72	C03b	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	15 1	2678	1950	951	90	1277	0	566	352	1 2	-2 1	1926	590	29	57	2996	22 0	5 6	19 5	1 1	20	231	170	705	1150	0	0
73	C03c	Bridger–3MK Bridge-Pop#1 3 5 RAS JJBG Path18 Caps UV Los	1539	2671	19 7	9 7	-90	1277	0	535	352	02	563	05	1 2	-226	1917	585	21	62	2996	2268	561	19 5	116	23	26	233	167	698	150
7	C0	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines	170	2295	2257	236	83	1767	96	663	806	5	-21	1703	578	353	87	2996	2 20	615	19 5	1 0	503	73	2 9	207	760	0	0
75	C0 a	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	1620	2 93	2109	1097	90	1531	9	613	588	100	-226	1816	583	392	71	2996	2333	58	19 5	127	59	8	2 0	196	729	575	0
76	C0 b	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines	15 1	2678	1950	951	90	1277	0	566	352	1 2	-2 1	1926	590	29	57	2996	22 0	5 6	19 5	1 1	20	231	170	705	1150	0	0
77	C0 b	Bridger–3MK Bridge-Pop#2 3 5 RAS JJBG Path18 Caps UV Los	1539	2671	19 7	9 7	-521	1335	02	563	05	1 2	-226	1917	585	21	62	2996	2268	561	19 5	116	23	26	233	167	698	1150	0
78	C05	Bo ah – Populus 3 5 kV DLO	1 75	2638	1719	2376	-965	1886	333	92	915	120	-167	1823	516	339	95	2996	2 78	663	19 5	137	516	8	253	223	676	0	0
79	C05a	Bo ah – Populus 3 5 kV DLO w/ gen t ripping	1 25	2779	1616	2099	-908	1619	305	63	668	153	-189	1915	531	378	79	2996	2377	619	19 5	126	71	57	2	192	662	575	0
80	C06	Populus – Ben Lomond 3 5 kV DLO	1572	25	1626	2520	-697	2009	371	532	1006	137	-162	1826	5 7	365	12	2996	255	738	19 5	107	77	61	2 5	120	685	0	0
81	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Ser es Ca	1595	2508	1680	2201	-651	2003	389	551	1003	129	-169	1811	552	365	122	2996	25 9	732	19 5	108	78	62	2 5	215	687	0	0
82	C07	Ben Lomond – Terminal 3 5 kV DLO	1 87	263	1697	2397	-918	1933	331	90	9 8	128	-165	1831	522	3 5	107	2996	250	687	19 5	127	505	78	251	222	673	0	0
83	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1 72	26 3	1700	2 02	-961	1903	333	92	929	122	-176	1827	516	3 0	97	2996	2 81	667	19 5	135	51	83	252	226	675	0	0
85	C09	Populus – Borah #2 3 5 kV Treasure on – Brady 230 kV Lines	1 80	2639	1705	2393	-938	1916	332	91	936	126	-166	1829	519	3 2	103	2996	2 93	678	19 5	131	510	80	252	223	67	0	0
86	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1 79	26 1	1707	2393	-939	1916	332	91	936	126	-166	1830	519	3 2	103	2996	2 93	678	19 5	131	510	80	252	223	673	0	0
87	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines	1552	256	16 5	23 3	-760	1987	356	515	989	13	-163	1826	5 1	359	119	2996	25 0	72	19 5	112	85	66	2 7	221	680	0	0
88	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1509	2610	1679	2379	-666	1950	339	98	961	130	-16	1829	528	350	110	2996	251	698	19 5	123	99	7	250	222	675	0	0
89	C13	Bo ah – Ade aide #2 Borah–ADT–Midpoint #1 3 5 kV lines (RA)	1 88	2616	1701	2371	-975	18 5	332	91	885	11	-152	1813	516	336	77	2996	2 65	6 8	19 5	1 7	521	86	25	225	676	0	0
90	C1	Bo ah – Ade aide #2 Midpoint – Adelaide #2 3 5 kV lines (RA)	1 83	2633	1700	2391	-9 0	1905	332	92	928	12	-162	1826	519	3 2	98	2996	2 89	675	19 5	13	511	81	252	223	67	0	0
91	C15	Bo ah – Ade aide #2 Borah – Hunt 230 kV ines	1 8	2629	1701	2387	9 8	1892	332	91	916	122	-159	182	519	3 1	9	2996	2 8	668	19 5	136	513	82	252	222	67	0	0
92	C16	Bo ah – Kinport Borah–Adel-M dpoint #1 3 5 kV lines (RA)	1 8	2632	1701	2389	-939	1905	332	92	928	12	-162	1826	519	3 2	98	2996	2 90	675	19 5	133	511	81	252	223	67	0	0
93	C18	Bo ah – Kinport Midpoint – Ade aide #2 3 5 kV lines (RA?)	1 82	2638	1702	239	-932	1920	332	92	939	127	-16	1830	520	3 3	103	2996	2 97	680	19 5	130	508	79	251	221	673	0	0
9	C19	Bo ah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA)	1 83	2638	1702	2392	-933	1916	332	91	93	126	-162	1829	520	3 3	103	2996	2 9	679	19 5	131	509	80	252	223	673	0	0
95	C20	Bo ah–Adel–M dpoint #1 M dpoint – Adelaide #2 3 5 kV lines	1 8	2628	1702	2383	-952	1887	332	91	917	121	-159	1822	518	3 0	92	2996	2 83	667	19 5	138	51	83	252	220	67	0	0
96	C21	Bo ah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA)	1 8	2629	1702	2385	-950	1890	332	91	915	122	-158	1823	518	3 0	93	2996	2 81	668	19 5	137	51	82	252	22	67	0	0
23	C2	Bo ah – Adel #2 3 5 kV Bo ah – Midpoint 500 kV Lines	1 95	2600	1671	238	-978	1820	33	9	893	108	-156	1790	539	35	81	2996	2 6	633	19 5	1 9	526	89	25	236	676	0	0
98	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	1550	2537	1916	2006	-795	1868	379	5 0	892	108	-166	1798	539	3 7	99	2996	2 75	666	19 5	132	506	77	250	223	699	0	0
99	C2 a	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1 82	270	1787	179	-769	1616	3 3	503	659	1 5	-190	1895	5 9	385	8	2996	2381	62	19 5	120	62	51	2 2	191	677	575	0
100	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines	1550	2537	1916	2006	-795	1868	379	5 0	892	108	-166	1798	539	3 7	99	2996	2 75	666	19 5	132	506	77	250	223	699	0	0
101	C25a	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines w/ RAS	1 82	270	1787	179	-769	1616	3 3	503	659	1 5	-190	1895	5 9	385	8	2996	2381	62	19 5	120	62	51	2 2	191	677	575	0
106	C28x	Pa o Verde - Trip 1&2, w/ FACRI	1556	2650	1690	2 05	-1089	1793	338	97	813	156	-189	1899	5 0	35	111	2996	3 2	1932	19 5	102	6 1	586	276	221	7 0	0	0
107																												
108																												

1) Voltage V olations > 5% for Level B & > 10% for Level C

| | | REAC IVE MARG N MVAR (Gray shaded cells are the minimum margins) | | | | | | | | | | | | | | | | | | |

Appendix 3-8 Pg.2 - - - Post-transient Results For Bridger / Anticline West vs. Monument - Naughton

L NE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	BASE CASE / P PA H FLOWS																									Gen Drop	
			Aeolus Sou h	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana Idaho (P18)	ot 4a	Bonanza West	ot 1a (30)	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant IPP Gonder	RedB H Allen (ot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Br dger Gen Tr ps	Aeolus Gen Trip
3																													
5		egwstg1 8h9 mn 3971 2650 1482 475 640 sav	1 82	2650	1571	2 00	-1060	1698	75	6 0	699	129	-186	18 3	53	375	123	2996	239	576	2113	110	507	36	23	218	672		
6																													
7																													
8																													
9		**Level "B" Contingencies**																											
10	B01	An icline – Populus 500 kV Line	1862	2089	0	3298	-6 2	136	5 6	716	02	36	-193	1651	577	0	89	2996	22	8	2113	136	519	39	23	331	70	0	0
11	B01a	An icline – Populus 500 kV Line Drop Br dger G1	1788	2266	0	2963	-617	1126	51	682	182	75	-212	1756	586	39	75	2996	2152	11	2113	12	75	12	22	281	685	575	0
12	B01g	An icline – Populus 500 kV Line JBG1 KinpCap	178	2272	0	2971	-622	1131	51	681	186	76	-213	1759	585	38	76	2996	2155	13	2113	12	75	12	22	279	683	575	0
13	B02	An icline 500 / 3 5 kV Transformer	1522	2600	1731	2218	-10 6	1703	59	62	705	128	-189	1832	530	380	123	2996	2395	575	2113	110	508	37	23	201	678	0	0
1	B03	Bridger – Populus 3 5 kV Line	1550	25 9	1781	2020	-93	1639	517	68	6 9	110	-188	1807	552	378	116	2996	2368	557	2113	113	506	3	233	220	697	0	0
15	B0	Bridger – 3Mi ekno l 3 5 kV Line	1588	2 92	1815	1877	-8	1631	551	721	6	96	-218	1786	560	382	113	2996	235	5 3	2113	115	50	33	232	238	711	0	0
16	B05	Bridger 3 5 / 230 kV Trans ormer	1 8	26 9	1570	2 01	-1061	1697	7	639	699	129	-186	18 3	53	375	123	2996	2393	57	2113	110	507	36	23	218	672	0	0
17	B06	3Mi eknoll – Goshen 3 5 kV Line	1508	2608	1663	22 2	-1038	1668	88	65	675	117	-202	1825	5 1	37	118	2996	2371	559	2113	11	509	37	23	21	698	0	0
18	B06a	3Mi eknoll – Goshen 3 5 kV Line Bypas 3MK Caps	1527	2579	1702	2626	-985	1668	505	672	676	111	-205	1815	5 5	375	117	2996	2370	558	2113	11	509	37	23	215	691	0	0
19	B07	Kinport – Goshen 3 5 kV Line	1 82	2652	1566	2 07	-1061	1701	7	639	702	130	-189	18	53	375	12	2996	2393	575	2113	110	507	36	23	219	672	0	0
20	B08	Kinport – Borah 3 5 kV Line	8	26 8	57	2397	059	696	75	6 0	698	29	86	8 3	53	375	23	2996	2392	57	2 3	0	507	36	23	2 8	672	0	0
21	B09	Populus – Borah 500 kV Line	150	2618	1 88	2	-10 5	1668	79	6	678	123	-187	1831	536	375	11	2996	2378	563	2113	115	510	38	23	230	672	0	0
22	B10	Bo ah 500 / 3 5 kV Transformer	1 87	26 6	155	2 12	-10 9	1705	76	6 1	707	130	-188	18	535	376	123	2996	2397	579	2113	109	505	35	233	219	672	0	0
23	B11	Bo ah 3 5 / 230 kV Transformer	1 8	26 9	1563	2 0	-105	170	77	6 2	70	129	-191	18	53	375	12	2996	2393	576	2113	109	506	36	23	219	673	0	0
2	B12	Populus – Cedar Hi l 500 kV Line	1500	260	1511	2 09	-1100	1590	77	6 2	586	108	-172	1813	529	365	125	2996	2329	522	2113	120	528	8	238	226	673	0	0
26	B1	Cedar H ll – Hemingway 500 kV Line	1503	2599	1506	2 09	-1098	1587	77	6 2	583	107	-172	1811	530	365	125	2996	2327	520	2113	121	528	8	238	227	67	0	0
27	B15	Midpoint – Hemingway 500 kV Line	1 88	2639	1563	2395	-1061	1682	75	6 0	683	126	-18	1838	53	37	12	2996	238	569	2113	111	509	38	23	218	673	0	0
28	B16	Bo ah – Midpoint 500 kV Line	1 92	2626	15 9	2396	-1083	16 1	76	6 1	6 8	119	-179	1828	532	370	113	2996	2362	5 8	2113	119	517	2	236	225	673	0	0
29	B17	Midpoint 500 / 3 5 kV Transformer	1 86	2650	1561	2 09	-1051	1707	75	6 1	729	132	-189	18 7	536	378	99	2996	2 08	58	2113	117	502	3	233	22	672	0	0
30	B18	Midpoint 3 5 / 230 kV Transformer	1 8	26 8	1570	2399	-1060	1695	75	6 0	69	129	-186	18 2	53	37	125	2996	2390	573	2113	109	508	37	23	218	672	0	0
31	B19	Bo ah – Ade aide #2 3 5 kV Line	1 85	26 3	1570	2393	-1070	1678	75	6 0	68	126	-183	1838	533	373	116	2996	2383	567	2113	11	510	38	23	219	673	0	0
32	B20	Adelaide – M dpoint #2 3 5 kV Line	1 8	26 8	1571	2397	-106	1691	75	6 0	69	128	-185	18 2	53	37	121	2996	2390	572	2113	111	508	37	23	217	672	0	0
33	B21	Bo ah – Ade aide – Midpoint #1 3 5 kV Line	1 85	26 3	1571	2392	-1071	1677	75	6 0	68	126	-183	1838	533	373	116	2996	2383	566	2113	11	510	38	23	218	673	0	0
3	B22	Bo ah – Hunt 230 kV Line	8	26 6	57	2396	066	687	7	639	690	28	8	8	53	37	20	2996	2387	570	2 3	2	509	37	23	2 9	672	0	0
35	B23	Midpoint – Boise Bench #3 230 kV Line	1 8	26 6	1569	2398	-1063	1690	75	6 0	689	127	-185	18 1	53	37	126	2996	2386	571	2113	110	509	37	23	219	672	0	0
36	B2	Midpoint – Rattle Snake 230 kV Line	1 8	26 8	1570	2399	-1061	1695	75	6 0	695	129	-186	18 2	53	375	12	2996	2391	573	2113	110	508	37	23	218	672	0	0
37	B25	Midpoint – Dram 230 kV Line	1 8	26 8	1570	2399	-1061	1693	75	6 0	69	128	-185	18 2	53	37	12	2996	2389	572	2113	110	508	37	23	218	672	0	0
38	B26	Ra tle Snake – Bo se Bench 230 kV Line	1 8	26 7	1569	2398	-1062	1691	75	6 0	691	128	-185	18 1	53	37	125	2996	238	571	2113	110	508	37	23	222	672	0	0
39	B27	Dram – Bo se Bench 230 kV Line	1 8	26 9	1570	2 00	-1059	1698	75	6 0	700	129	-186	18 3	53	375	123	2996	2393	57	2113	110	507	36	23	218	672	0	0
0	B28	Hemingway 500/230 kV Transformer	1 8	26 9	1569	2 01	-1058	1698	75	6 0	701	129	-186	18 3	53	375	122	2996	2393	575	2113	110	507	36	23	219	672	0	0
2	B30	Populus – Borah #1 3 5 kV Line	1 81	2650	1577	239	-1071	1686	75	6 0	691	128	-187	18 2	533	373	120	2996	2386	569	2113	112	509	38	23	219	672	0	0
3	B31	Populus – Borah #2 3 5 kV Line	1 82	26 8	1575	239	-1069	1686	75	6 0	691	127	-186	18 1	533	373	120	2996	2386	569	2113	112	509	38	23	218	673	0	0
	B32	Populus – Kinport 3 5 kV Line	1 79	2653	1565	2 10	-1072	1692	75	6 0	697	128	-192	18 2	532	37	121	2996	2385	570	2113	112	509	38	23	221	672	0	0
5	B33	Populus – Ben Lomond #3 3 5 kV Line	1518	2611	15 1	2370	-973	1726	88	65	721	132	-185	18 0	5	383	130	2996	2 12	595	2113	102	96	29	231	217	677	0	0
6	B3	Populus – Terminal 3 5 kV Line	1515	261	15 7	2376	-988	1722	81	6 6	718	131	-185	18 0	5	381	129	2996	2 10	592	2113	103	97	30	232	217	675	0	0
7	B35	Aeolus – Anticline 500 kV Line																											
8	B35a	Aeolus – Anticline 500 kV Line	2 0	87	632	98	7	068	28	592	3	37	232	609	577	90	66	2996	2 25	386	2 3	29	7	0	223	79	750	0	600
9	B35g	Aeolus – Anticline 500 kV Line	2120	1206	635	1988	- 3	1100	32	596	16	5	-250	1636	571	81	68	2996	2126	386	2113	130	80	13	225	178	7 2	0	600
50	B36	Aeolus – Mona 500 kV Line																											
51	B36a	Aeolus – Mona 500 kV Line	0	3 36	19	26 9	-18 2	1521	539	708	502	117	-208	1739	697	522	1 8	2996	2 08	650	2113	33	357	335	197	2 1	679	0	600
52	B37	Aeolus 500 / 230 kV Transformer	1 69	26 0	1560	2399	-1059	1689	76	6 1	691	122	-187	1821	5 0	382	123	2996	2390	573	2113	109	505	35	233	217	671	0	0
53	B38	Aeolus – Winds ar 230 kV Line	1 29	2582	1527	2382	-1057	16 9	73	638	653	92	-192	1731	560	10	121	2996	2379	565	2113	108	98	29	231	215	677	0	0
5	B39	Aeolus – F eezeout 230 kV Line	1 55	268	1553	2 25	-1069	1695	83	6 9	696	133	-186	1857	537	371	123	2996	2391	577	2113	109	505	35	233	220	686	0	0
55	B 0	Bonanza –Mona 3 5kV Line	1598	267	159	2 58	-1213	1626	512	680	626	108	-192	1991	100	56	126	2996	2337	522	2113	92	58	39	220	223	696	0	0
56	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza P ant	1576	2638	15 8	2 03	-1255	1501	88	65	508	1 5	-201	192	56	3 8	120	2996	2328	55	2113	83	0	390	217	217	663	0	0
57	B 1	Hemingway – Summer Lake 500kV line	1 93	2615	15	2388	-111	159	75	6 0	572	11	-173	1817	527	363	1 8	2996	2315	513	2113	115	532	51	239	208	67	0	0
58	B51	DaveJon - D fficu ty 230 kV Line	1 33	2586	1530	2383	-1057	1652	73	638	657	9	-192	1736	559	09	121	2996	2380	565	2113	108	99	29	232	215	675	0	0
59	B52	Spence - Mustang 230 kV Line	1 99	2536	1565	2317	-103	1650	59	623	656	8	-193	17 5	5 5	00	120	2996	2383	567	2113	110	503	32	232	209	678	0	0
60	B53	River on - At an ic 230 kV Line	151	2 90	1579	2365	-1099	16 5	58	623	6 9	50	-196	1728	5 1	11	121	2996	2397	576	2113	108	500	31	232	21	668	0	0
61	B53a	River on - At an ic 230 kV Line	1515	2 89	1579	236	-1099	16	58	622	6 9	8	-196	1728	5 1	11	121	2996	2397	576	2113	108	500	31	232	21	667		
62	B61	Pa isades - Raven 230 kV Line	1503	2622	1592	2 61	-1138	1695	315	83	696	125	-187	1835	5	375	12	2996	2392	577	2113	108	50	3	233	22	669		
63	B62	Firehole - Mans ace - BRPP - S.Trona 230 kV Line	1 96	2633	1585	2 39	-1106	1700	37	529	701	125	-186	1839	5 7	368	123	2996	2395	57	2113	110	506	35	23	222	672		
6																													N-1 Criteria; > >
65																													
66		**Level "C" Contingencies**																											
69	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1668	2368	2137	1358	-718	15 1	589	760	563	73	-191	1739	585	38	105	2996	2332	522	2113	119	503	31	232	203	758	0	0
70	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1588	2556	196	122	-712	1299	5 9	718	339	115	-210	18 9	590	19	91	2996	2239	8	2113	108	60	0	222	179	721	575	0
71	C03	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines	1703	2311	2151	1236	-630	15 3	622	796	568	57	-229	1716	591	388	102	2996	2317	510	2113	120	501	30	231	226	760	0	0
72	C03a	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	1620	2506	1992	1097	-629	1302	582	75	3	102	-2 3	1830	596	23	88	2996	2226	75	2113	109	59	02	221	195	728	575	0
73	C03b	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	15 2	2689	1825	952	-62	10	5 1	710	105	1 3	-257	1938	603	59	73	2996	2131	36	2113	97	15	372	210	172	706	1150	0
7	C03c	Bridger–3MK Bridge-Pop#1 3 5 RAS; 2JBG Path18 Caps UV Loa	15 0	2681	1822	9 8	-655	110	5 0	708	159	1 3	-2	1928	598	51	78	2996	2159	51	2113	98	2	379	213	168	699	1150	0
75	C0	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines	1703	2311	2151	1236	-630	15 3	622	796	568	57	-229	1716	591	388	102	2996	2317	510	2113	120	501	30	231	226	760	0	0
76	C0 a	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	1620	2506	1992	1097	-629	1302	582	75	3	102	-2 3	1830	596	23	88	2996	2226	75	2113	109	59	02	221	195	728	575	0
77	C0 b	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	15 2	2689	1825	952	-62	10	5 1	710	105	1 3	-257	1938	603	59	73	2996	2131	36	2113	97	15	372	210	172	706	1150	0
78	C0 c	Bridger–3MK Bridge-Pop#2 3 5 RAS; 2JBG Path18 Caps UV Loa	15 0	2681	1822	9 8	-655	110	5 0	708	159	1 3	-2	1928	598	51	78	2996	2159	51	2113	98	2	379	213	168	699	1150	0
79	C05	Bo ah – Populus 3 5 kV DLO	1 78	26 7	1589	2379	-1095	1658	75	6 0	671	122	-187	1835	530	370	113	2996	2370	556	2113	118	515	1	236	219	67	0	0
80	C05a	Bo ah – Populus 3 5 kV DLO w/ gen t ipping	1 27	2788	1 81	2103	-1035	1389	9	613	22	15	-208	1926	5 5	09	97	2996	2268	509	2113	107	71	12	225	191	661	575	0
81	C06	Populus – Ben Lomond 3 5 kV DLO	1589	2537	1 8	2309	-795	1789	516	68	769	139	-182	1836	565	399	1	2996	2 56	638	2113	8	72	1	226	215	690	0	0
82	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Ser es Ca	1611	2501	15 1	2190	-7 9	1785	533	701	766	131	-189	1821	570	00	1 2	2996	2 51	633	2113	86	72	1	226	209	692	0	0
83	C07	Ben Lomond – Terminal 3 5 kV DLO	1 93	2638	1566	2396	-10 3	1705	72	637	70	130	-186	18 2	538	376	125	2996	2398	579	2113	108	50	35	233	217	672	0	0
8	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1 75	2652	1571	2 03	-1091	1673	75	6 0	683	123	-195	1838	530	371	115	2996	2375	559	2113	117	51	0	235	222	67	0	0
86	C09	Populus – Borah #2 3 5 kV Treasure on – Brady 230 kV Lines	1 82	26 8	1575	239	-1069	1685	75	6 0	690	127	-186	18 1	533	37	120	2996	2386	569	2113	112	509	38	23	218	673	0	0
87	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1 81	2650	1576	239	-1070	1686	75	6 0	691	127	-186	18 1	533	373	120	2996	2386	569	2113	112	509	38	23	219	672	0	0
88	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1566	2559	1506	233	-863	1766	99	665	752	136	-183	1835	559	393	138	2996	2 39	623	2113	91	80	19	228	216	682	0	0
89	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1516	2613	15 5	2376	-985	1723	82	6 8	718	131	-185	1839	5	382	129	2996	2 10	593	2113	103	97	30	232	217	675	0	0
90	C13	Bo ah – Ade aide #2 Borah–ADT–Midpoint #1 3 5 kV lines (RA)	1 89	2627	1573	2373	-110	1621	75	6 0	6 5	117	-175	1826	531	368	97	2996	2360	5 1	2113	127	520		236	221	67	0	0
91	C1	Bo ah – Ade aide #2 Midpoint - Adelaide #2 3 5 kV lines (RA)	1 85	26 3	1571	2392	-1072	1676	75	6 0	683	126	-183	1838	533	373	116	2996	2382	566	2113	115	511	39	235	219	673	0	0
92	C15	Bo ah – Ade aide #2 Borah – Hunt 230 kV ines	1 86	2639	1572	2388	-1079	166	7	639	672	12	-180	1836	533	372	112	2996	2377	560	2113	117	513	0	235	221	673	0	0
93	C16	Bo ah – Kinport Borah–Adel–M dpoint #1 3 5 kV lines (RA)	1 86	26 2	1572	2391	-1070	1676	75	6 0	68	126	-183	1838	53	373	116	2996	2383	566	2113	11	510	38	23	219	673	0	0
9	C18	Bo ah – Kinport Midpoint – Ade a de #2 3 5 kV lines (RA?)	1 8	26 7	1572	2395	-106	1689	75	6 0	69	128	-185	18 1	53	37	121	2996	2390	571	2113	112	508	37	23	217	672	0	0
95	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA)	1 85	26 6	1573	239	-1065	1685	7	639	688	128	-18	18 1	53	37	120	2996	2386	570	2113	112	509	37	23	219	672	0	0
96	C20	Borah–Adel–M dpoint #1 Midpoint – Adelaide #2 3 5 kV lines	1 86	2639	1573	2386	-1080	1662	7	639	675	123	-181	1835	533	372	111	2996	2378	560	2113	118	513	0	235	217	673	0	0
97	C21	Borah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA)	1 86	2639	1573	2387	-1080	1662	7	639	672	12	-180	1835	533	372	112	2996	2375	561	2113	117	513	0	235	220	673	0	0
98	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1 96	261	15 6	2385	-1105	1602	76	6 1	616	112	-173	1819	531	367	101	2996	23 3	529	2113	128	52	6	237	230	67	0	0
99	C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines	1551	25 8	179	2003	-931	1637	518	685	6 6	109	-186	1807	553	378	116	2996	2368	557	2113	113	506	3	233	219	698	0	0
100	C2 a	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1 8	2713	1659	1793	-901	1382	85	651	10	1 6	-209	1906	563	15	101	2996	2270	513	2113	102	62	06	223	190	677	575	0
101	C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV lines	1551	25 8	179	2003	-931	1637	518	685	6 6	109	-186	1807	553	378	116	2996	2368	557	2113	113	506	3	233	219	698	0	0
102	C25a	Br dger – Populus #2 Goshen – Kinport 3 5 kV lines w/ RAS	1 8	2713	1659	1793	-901	1382	85	651	10	1 6	-209	1906	563	15	101	2996	2270	513	2113	102	62	06	223	190	677	575	0
107	C28x	Palo Verde - Trip 1&2 w/ FACRI	1557	2657	1560	2 05	-1221	1557	80	6 5	563	156	-208	1908	552	38	128	2996	3327	1820	2113	85	6 2	53	265	218	737	0	0
108																													
109																													N-2 Criteria; > >
110																													
111																													
112		**Margin est w/ Br dger West at 5% of 4100 MW**																											
113		**egwstg1 8h9 mn 4305 2520 2844 1465 332 491 sav**	1 65	28	1785	2520	-736	2266	332	91	1299	129	-127	2031	559	399	8	2996	2501	682	17	1 9	50	522	252	2 3	718		
11																													
115		**Margin est w/ Monument Naughton > 5% of 475 MW**																											
116		**egwstg1 8h9 mn 3971 2400 2673 1480 499 666 sav**	1 80	2673	1571	2 00	-1031	172	99	666	725	123	-183	186	538	385	123	2996	2381	56	2113	112	50	38	23	218	679		

L NE #	CON INGENCY#	REAC IVE MARG N MVAR (Gray shaded cells are the minimum margins)																							
		Aeolus 500	Monanx 500	Ant clin 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Bridger 345	Goshen 345	3 Mi Kno l 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
10	B01	-837	-1 12	-670	-878	-892	-1173	-1659	-1026	-5 6	- 6	- 00	-705	-786	-821	-1098	-1 5	-15 0	-812	-903	-652	-293	-288	-223	-7
11	B01a	-855	-1607	-7	-1195	-1207	-1525	-20 2	-1319	-710	-587	-5	-962	-1100	-1129	-1393	-1775	-1701	-807	-902	-6 9	-283	-278	-229	-78
12	B01g	-892	-1651	-788	-133	-13 6	-167	-2208	-1 37	-781	-661	-606	-1086	-12 1	-1270	-1526	-1883	-1738	-809	-933	-669	-287	-279	-230	-78
13	B02	-1016	-195	-10 0	-1883	-1903	-2119	-2566	-176	-1150	-89	-89	-1593	-1903	-188	-19 8	-2132	-20 6	-852	-103	-73	-309	-310	-255	-82
1	B03	-1127	-1872	-1235	-155	-1588	-1873	-2 05	-1591	-1111	-759	-763	-1329	-1579	-1561	-1707	-1983	-19	-8 3	-1103	-7 2	-326	-322	-2 8	-80
15	B0	-1058	-1736	-1055	-1166	-1163	-1 62	-1987	-1280	-982	- 27	-382	-856	-1110	-1086	-1322	-1721	-1817	-835	-10 0	-717	-325	-315	-237	-80
16	B05	-1206	-1992	-1 63	-1826	-1823	-2073	-2590	-1753	-1389	-87	-903	-15 1	-1830	-1809	-1932	-2139	-2066	-853	-117	-767	-312	-316	-25	-82
17	B06	-1181	-1939	-1 17	-1705	-1685	-19 6	-2 3	-1671	-13 9	-607	-788	-1325	-1681	-1638	-1817	-2050	-2009	-850	-1152	-761	-32	-323	-255	-81
18	B06a	-1159	-1901	-13 1	-160	-1592	-1870	-2389	-1610	-1266	-581	-515	-12 7	-1573	-1539	-1737	-2007	-197	-8 8	-1132	-753	-325	-322	-252	-81
19	B07	-1212	-1999	-1 32	-1812	-180	-2079	-2595	-1755	-12	-3 0	-52	-1583	-1815	-1782	-192	-21 7	-2075	-853	-1180	-770	-319	-319	-256	-82
20	B08	-1207	-1989	-1 52	-1811	-1818	-2063	-2577	-17 5	-1376	-826	-878	-1399	-1800	-1808	-1918	-2131	-2062	-853	-1175	-768	-320	-319	-256	-82
21	B09	-1203	-1963	-1 12	-165	-1628	-1981	-2526	-1663	-13 3	-8 3	-871	-1 75	-17 3	-1729	-1887	-2102	-2035	-852	-1173	-768	-319	-319	-255	-81
22	B10	-1207	-1989	-1 60	-1829	-1667	-2058	-2568	-17 6	-1385	-851	-890	-1 82	-178	-1689	-1913	-2133	-2063	-852	-1176	-769	-319	-319	-256	-82
23	B11	-1211	-1993	-1 5	-1803	-1799	-20 9	-257	-1739	-1377	-825	-87	-1 7	-1796	-1782	-1910	-2136	-2068	-853	-1179	-770	-320	-319	-255	-82
2	B12	-1222	-1955	-1 20	-1576	-1677	-2058	-238	-987	-1353	-850	-880	-1	-1679	-1680	-1872	-2085	-2033	-856	-1192	-776	-323	-325	-257	-80
26	B1	-1209	-19 1	-138	-1530	-1630	-2006	-23 1	-1061	-1316	-833	-859	-1 02	-1627	-1629	-18 3	-2061	-2017	-855	-1180	-771	-322	-32	-257	-80
27	B15	-1189	-196	-1383	-1651	-15 8	-1 32	-2330	-1708	-1302	-813	-8	-1367	-1620	-1561	-1838	-2079	-2032	-852	-1159	-762	-319	-319	-255	-82
28	B16	-120	-196	-1 13	-1669	-1522	-1851	-2 29	-1685	-1339	-8 0	-870	-1 3	-1688	-1658	-1867	-2087	-203	-85	-117	-768	-321	-322	-256	-81
29	B17	-1207	-1990	-1 60	-1816	-1808	-1792	-2562	-17 0	-1389	-867	-899	-152	-1812	-1781	-1926	-21 0	-2065	-852	-1176	-769	-319	-318	-256	-82
30	B18	-1209	-1992	-1 62	-1818	-1812	-2056	-2576	-17 6	-139	-872	-903	-1536	-1823	-1799	-1929	-2137	-2066	-853	-1177	-769	-320	-320	-256	-82
31	B19	-1205	-1982	-1 5	-1783	-1780	-2026	-2533	-1728	-1373	-858	-889	-1 96	-1776	-17 0	-1905	-2117	-2053	-853	-117	-768	-320	-320	-256	-82
32	B20	-1209	-1991	-1 62	-1816	-1813	-2081	-2587	-1753	-1393	-869	-902	-1521	-1808	-1771	-1925	-2135	-2065	-853	-1178	-769	-320	-320	-256	-82
33	B21	-1206	-1981	-1	-1777	-177	-2038	-25 2	-1729	-1370	-855	-887	-1 83	-1761	-1716	-1900	-2116	-2053	-85	-117	-768	-320	-320	-256	-82
3	B22	-1207	-1988	-1 57	-1809	-1806	-20 8	-25 9	-17 2	-1388	-865	-898	-1517	-1807	-1782	-1920	-2131	-2061	-853	-1176	-769	-320	-320	-256	-82
35	B23	-1208	-1989	-1 56	-1801	-1789	-2021	-25 1	-1736	-1387	-867	-899	-1519	-1803	-177	-1921	-2132	-2062	-853	-1176	-769	-320	-320	-256	-82
36	B2	-1207	-1991	-1 5	-1780	-1758	-2003	-2579	-172	-1385	-865	-898	-1501	-1780	-17 2	-1918	-2133	-2065	-853	-1176	-769	-320	-320	-256	-82
37	B25	-1208	-1990	-1 59	-1813	-1806	-20 5	-2559	-17 3	-1391	-870	-901	-1530	-1817	-1791	-1926	-213	-206	-853	-1176	-769	-320	-320	-256	-82
38	B26	-1209	-1990	-1 62	-1823	-1819	-2052	-2537	-17 6	-139	-872	-903	-1539	-1828	-1806	-1929	-2135	-206	-853	-1177	-769	-320	-320	-256	-82
39	B27	-1208	-1992	-1 63	-1827	-182	-2069	-2589	-1753	-1396	-873	-905	-15 3	-1833	-1810	-1932	-2139	-2066	-853	-1176	-769	-320	-319	-256	-82
0	B28	-1207	-1991	-1 59	-1816	-1810	-2056	-2583	-17 0	-1391	-871	-902	-1535	-1822	-1799	-1928	-2137	-2065	-853	-1176	-768	-320	-319	-256	-82
2	B30	-121	-1998	-1 75	-18 2	-1830	-2072	-2583	-1761	-1 09	-876	-911	-155	-1835	-1799	-1938	-21 2	-2073	-85	-1182	-771	-320	-320	-257	-82
3	B31	-1209	-1991	-1 60	-1818	-1807	-2051	-2568	-17 6	-1391	-867	-900	-1533	-1809	-1775	-1923	-2130	-206	-85	-1178	-769	-320	-320	-256	-82
	B32	-1217	-200	-1 66	-1818	-1779	-2038	-257	-17 5	-1387	-7 7	-8 3	-1223	-1832	-172	-1935	-21 6	-2082	-85	-1185	-773	-320	-320	-256	-82
5	B33	-1191	-1923	-1 18	-1711	-1709	-1977	-2515	-168	-13 1	-8	-878	-1 0	-1677	-1680	-171	-1990	-1992	-8 7	-1161	-763	-320	-316	-252	-82
6	B3	-1190	-1912	-1 11	-1696	-1696	-1965	-2508	-1676	-1333	-838	-870	-1 27	-1662	-1665	-18 1	-1979	-1979	-8 7	-1160	-763	-320	-318	-25	-82
7	B35																								
8	B35a	-735	-1190	-1 32	-2085	-2102	-233	-2762	-1951	-1 77	-100	-1081	-1830	-2139	-2122	-1756	-16 9	-13 9	-775	-801	-561	-177	-169	-217	-7
9	B35g	-867	-1389	-1537	-2275	-2271	-2 26	-2836	-2020	-1636	-1097	-1162	-2001	-2361	-2323	-19 0	-1869	-1576	-791	-933	-635	-223	-220	-23	-75
50	B36																								
51	B36a	-1331	-2017	-118	-13 5	-1 1	-1770	-2310	-1 59	-1011	-790	-7 8	-122	-138	-1 01	-1692	-2157	-2230	-756	-1358	-853	-296	-283	-231	-81
52	B37	-1090	-1992	-1386	-1789	-1817	-2075	-2593	-1752	-1353	-876	-905	-15 3	-1825	-1807	-1932	-21 9	-2078	-8 9	-10 5	-71	-315	-313	-253	-81
53	B38	-1226	-20 2	-1529	-189	-1872	-2113	-2615	-1787	-1 7	-885	-922	-158	-1885	-1859	-1955	-2183	-2113	-835	-1179	-786	-285	-276	-2 5	-79
5	B39	-1138	-2015	-1037	-1283	-1361	-1733	-2309	-1 20	-833	-767	-68	-1187	-1288	-13 3	-1756	-2151	-2090	-8 7	-11 2	-6	-189	-213	-150	-82
55	B 0	-989	-1865	-1217	-1589	-1639	-1955	-2501	-1636	-1189	-830	-833	-1 05	-1627	-1630	-1789	-2071	-1968	-573	-967	-683	-307	-303	-2 2	-71
56	B 0a	-1086	-19	-1360	-1752	-1783	-20 9	-2568	-1736	-1317	-863	-886	-1509	-1777	-1766	-187	-21 9	-2032	-537	-1061	-725	-312	-306	-2 9	-81
57	B 1	-1222	-1966	-1 52	-1702	-1679	-177	-18	-1550	-138	-860	-895	-1 69	-1731	-1692	-1896	-2101	-20	-857	-1191	-776	-323	-32	-258	-80
58	B51	-123	-2037	-1521	-188	-1866	-2109	-2612	-1783	-1 3	-88	-919	-1578	-1878	-1853	-1952	-2179	-2108	-836	-1189	-78	-28	-275	-2 5	-79
59	B52	-1001	-1950	-1 11	-1866	-1889	-2138	-2606	-179	-1 3	-892	-953	-1623	-1928	-1903	-1953	-21 0	-20 7	-8 3	-972	-686	-25	-2 5	-2	-80
60	B53	-10 0	-19 3	-1312	-1719	-1762	-20 1	-2571	-1716	-1283	-869	-882	-1502	-1768	-1756	-19	-2130	-203	-839	-101	-696	-316	-275	-231	-80
61	B53a	-1020	-1936	-1293	-1703	-17 9	-2036	-2567	-1708	-1269	-867	-878	-1 96	-175	-17 5	-19 2	-2129	-2032	-839	-99	-687	-303	-2 2	-231	-80
62	B61	-1186	-1973	-1 05	-1758	-1769	-2032	-2566	-1721	-133	-858	-876	-1 95	-1771	-1751	-195	-213	-20 7	-8 8	-1156	-763	-321	-319	-253	-82
63	B62	-1189	-1975	-1 15	-1770	-1779	-20 0	-2572	-1727	-13	-862	-881	-150	-1780	-1762	-193	-2130	-20 9	-8 7	-1159	-763	-319	-318	-251	-81
6		**735**	**1190**	**670**	**878**	**892**	**1173**	**1659**	**987**	**546**	**340**	**382**	**705**	**786**	**821**	**1098**	**1445**	**1349**	**537**	**801**	**6**	**177**	**169**	**150**	**71**
65						500	500	500	500	100			250		250										
66																									
69	C02	-912	-1575	-805	-1051	-1133	-1 56	-19 0	-1195	-69	-53	-501	-9 8	-1125	-111	-1253	-1598	-1701	-820	-910	-665	-333	-321	-225	-78
70	C02a	-999	-1789	-101	-1389	-1 66	-1769	-2272	-1 86	-879	-68	-659	-1229	-1 82	-1 56	-1567	-1911	-1885	-819	-98	-69	-322	-312	-238	-81
71	C03	-830	-1 27	-718	-820	-835	-1103	-1552	-957	-660	-363	-332	-6 9	-785	-779	-95	-1293	-1577	-810	-8 0	-632	-331	-312	-208	-77
72	C03a	-953	-1689	-952	-1167	-1179	-1 69	-1977	-1292	-877	- 61	- 09	-878	-1133	-109	-1301	-1702	-1800	-812	-9 0	-675	-322	-307	-227	-81
73	C03b	-989	-1851	-1062	-1377	-1391	-1669	-2183	-1 69	-993	-522		-1027	-1360	-129	-1536	-1952	-1951	-807	-972	-688	-309			-8
7	C03c	-1016	-1881	-1121	-15 7	-1586	-1855	-23 3	-1591	-10 5	-6 2	-527	-1251	-1586	-15 6	-1669	-20	-1978	-812	-998	-700	-312	-299	-238	-8
75	C0	-830	-1 27	-718	-820	-835	-1103	-1552	-957	-660	-363	-332	-6 9	-785	-779	-95	-1293	-1577	-810	-8 0	-632	-331	-312	-208	-77
76	C0 a	-953	-1689	-952	-1167	-1179	-1 69	-1977	-1292	-877	- 61	- 09	-878	-1133	-109	-1301	-1702	-1800	-812	-9 0	-675	-322	-307	-227	-81
77	C0 b	-989	-1851	-1062	-1377	-1391	-1669	-2183	-1 69	-993	-522		-1027	-1360	-129	-1536	-1952	-1951	-807	-972	-688	-309			-8
78	C0 c	-1016	-1881	-1121	-15 7	-1586	-1855	-23 3	-1591	-10 5	-6 2	-527	-1251	-1586	-15 6	-1669	-20	-1978	-812	-998	-700	-312	-299	-238	-8
79	C05	-121	-1989	-1 57	-1802	-1771	-2006	-252	-173	-1386	-855	-893	-1515	-176	-1691	-1906	-2113	-2062	-855	-1182	-771	-321	-322	-257	-81
80	C05a	-1187	-2081	-1 60	-1915	-1888	-2092	-2596	-1815	-1 3	-916	-9 3	-1623	-1913	-180	-2028	-22 3	-2159	-8 5	-1156	-761	-308	-306	-257	-8
81	C06	-1161	-1789	-1363	-1560	-1560	-18 7	-2398	-1587	-1278	-809	-8 8	-1311	-1 79	-151	-1380	-17 3	-1855	-833	-1133	-752	-319	-310	-2	-82
82	C06a	-1133	-17 9	-127	-1 32	-1 3	-1733	-2287	-1 96	-118	-698	-718	-1187	-13 7	-1378	-13 3	-1706	-1817	-829	-1108	-7 3	-320	-309	-2 0	-82
83	C07	-1202	-1930	-1 0	-1753	-17 6	-2016	-2552	-1713	-1363	-853	-883	-1 71	-172	-1719	-1555	-2020	-1996	-851	-1171	-767	-320	-320	-256	-82
8	C08	-1218	-2001	-1 51	-1778	-1710	-1971	-2520	1717	-1367	-711	-817	-1153	-1785	-1609	-1913	-2128	-2077	-855	-1186	-773	-320	-320	-257	-82
86	C09	-1207	-1988	-1 52	-1803	-1791	-2031	-25 7	1736	-1383	-861	-891	-1519	-1796	-1756	-1888	-2121	-2061	-85	-1176	-769	-320	-320	-256	-82
87	C10	-1212	-1995	-1 68	-1828	-181	-2051	-2562	1750	-1 00	-870	-902	-15 0	-1822	-1780	-1902	-2133	-2069	-85	-1180	-770	-320	-320	-256	-82
88	C11	-1166	-1818	-1359	-1569	-1568	-1853	-2 03	1593	-127	-805	-8 0	-1316	-1 96	-152	-1596	-180	-1882	-838	-1138	-75	-320	-31	-2 9	-82
89	C12	-1188	-1909	-1 01	-1681	-1679	-19 5	-2 83	166	-1323	-832	-861	-1 12	-16 7	-16 6	-1805	-1970	-1976	-8 7	-1158	-762	-320	-318	-253	-82
90	C13	-1203	-1953	-1 10	-1690	-168	-1901	-2391	167	-1330	-825	-859	-1395	-1653	-1580	-18 5	-2070	-2027	-855	-1173	-767	-322	-323	-257	-81
91	C1	-1206	-1982	-1	-1776	-1773	-2035	-2538	1729	-1371	-855	-887	-1 83	-1761	-1715	-1900	-2116	-2053	-85	-1175	-768	-320	-320	-256	-82
92	C15	-120	-1977	-1 37	-1761	-1757	-1992	-2 81	1713	-1363	-8 8	-882	-1 66	-17 5	-170	-1890	-2107	-20 7	-85	-1173	-767	-321	-321	-256	-81
93	C16	-120	-1978	-1 31	-1760	-1765	-2026	-2530	1720	-1351	-809	-861	-1352	-1730	-1710	-1886	-2107	-20 9	-853	-1173	-767	-320	-320	-256	-82
9	C18	-1208	-1988	-1 50	-1799	-180	-2069	-2575	17	-1373	-822	-875	-138	-1776	-1765	-1910	-2127	-2061	-853	-1176	-769	-320	-320	-256	-82
95	C19	-1206	-1985	-1 5	-1791	-1798	-2037	-2536	1733	-1368	-818	-871	-1375	-177	-1778	-1905	-2122	-2057	-853	-117	-768	-320	-320	-256	-82
96	C20	-1206	-1975	-1 29	-1726	-1721	-20 0	-2527	1717	-13 9	-83	-870	-1 08	-1676	-1596	-1867	-2099	-20 5	-85	-1175	-768	-321	-321	-256	-81
97	C21	-1205	-1976	-1 36	-1753	-1750	-2005	-2 89	1715	-1361	-8 5	-879	-1 51	-1729	-1679	-1885	-2105	-20 7	-85	-117	-768	-321	-321	-256	-81
98	C23	-1203	-19 2	-1388	-160	-1 5	-17 0	-2331	16 5	-1310	-818	-8 9	-1370	-1609	-1561	-1826	-205	-2015	-855	-1173	-768	-322	-32	-256	-80
99	C2	-1126	-187	-1186	-1526	-1557	-1869	-2 07	-1579	-952	-28	- 33	-1370	-1555	-1531	-1686	-1987	-1950	-8 3	-1102	-7 3	-326	-322	-2 8	-80
100	C2 a	-11 7	-2025	-1317	-18 1	-1855	-2120	-2605	178	-1108	-339	-51	-1636	-1892	-18 5	-19 6	-2206	-2105	-836	-1119	-7 9	-313	-309	-252	-83
101	C25	-1126	-187	-1186	-1526	-1557	-1869	-2 07	1579	-952	-28	- 33	-1370	-1555	-1531	-1686	-1987	-1950	-8 3	-1102	-7 3	-326	-322	-2 8	-80
102	C25a	-11 7	-2025	-1317	-18 1	-1855	-2120	-2605	178	-1108	-339	-51	-1636	-1892	-18 5	-19 6	-2206	-2105	-836	-1119	-7 9	-313	-309	-252	-83
107	C28x	-1081	-1639	-13	-1717	-175	-2035	-2587	1721	-1300	-852	-875	-1 80	-1738	-1732	-1738	-1807	-1711	-830	-1055	-720	-311	-302	-2 9	-51
108																									
109		**830**	**1427**	**718**	**820**	**835**	**1103**	**1552**	**957**	**660**	**284**	**332**	**649**	**785**	**779**	**954**	**1293**	**1577**	**807**	**840**	**632**	**308**	**299**	**208**	**51**
110						00	00	00	00	100			200		200										

L NE #	CON INGENCY#	Vo tage Deviation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyom ng Path 18 Buses < 90 pu P Voltage	COMMEN
					Base Case Overloads (Areas 59 99 Area 10) Exc uding GSUs					
5						S DNEY 115 / 230 #1	109 86%			
6						CTTNWD N - KETTLECK 115 #1	10 .71%			
7						CURRANTC - MONA 3 5 #1	100 67%			
8						KELKER W - ROCK SLD 115 #1	100.17%			
9					**CON NGENCY LOADINGS**					
10	B01	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	110 88%	-	None	20 0 20 Amps
11	B01a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	99.69%	-	None	183 3 Amps
12	B01g	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	99. 2%	-	None	
13	B02	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	79.31%	-	None	
1	B03	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	98.87%	-	None	
15	B0	0	- - -	- - -	0	MONUMENT - MONU PST 230 #1	92.85%	-	None	
16	B05	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
17	B06	0	- - -	- - -	1	GRACE - SODA 138 #1	110 56%	-	None	
18	B06a	0	- - -	- - -	0	MONUMENT - MONU PST 230 #1	85.05%	-	None	
19	B07	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
20	B08	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
21	B09	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	86.56%	-	None	
22	B10	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
23	B11	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
2	B12	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.28%	-	None	
26	B1	0	- - -	- - -	0	LOCUST - MORA 138 #1	82. 0%	-	None	
27	B15	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .20%	-	None	
28	B16	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .21%	-	None	
29	B17	0	- - -	- - -	0	LOCUST - MORA 138 #1	88.20%	-	None	
30	B18	0	- - -	- - -	0	M DPO NT 230 / 3 5 #2	82.20%	-	None	
31	B19	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .20%	-	None	
32	B20	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
33	B21	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .20%	-	None	
3	B22	0	- - -	- - -	0	M DPO NT 230 / 3 5 #2	79.53%	-	None	
35	B23	0	- - -	- - -	0	LOCUST - MORA 138 #1	87.87%	-	None	
36	B2	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
37	B25	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
38	B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	90.7 %	-	None	
39	B27	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
0	B28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.81%	-	None	
2	B30	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
3	B31	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
	B32	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	88.13%	-	None	
5	B33	0	- - -	- - -	0	MONUMENT - MONU PST 230 #1	82.16%	-	None	
6	B3	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .21%	-	None	
7	B35				**P CASE DIVERGED**					
8	B35a	55	GREATDIV 3 .5	9.5	1	M NERS 230.0 PLATTE 230 0 #1	102.10%	-	None	
9	B35g	0	- - -	- - -	1	M NERS 230.0 PLATTE 230 0 #1	100 0 %	-	None	
50	B36				**P CASE DIVERGED**					
51	B36a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	92.01%	-	None	
52	B37	0	- - -	- - -	2	AEOLUS 500 / 230 #2	100. 5%	-	None	
53	B38	0	- - -	- - -	0	DAVEJOHN - W NDSTAR 230 #1	99.89%	-	None	
5	B39	17	BA RO L 57	8.3	0	M NERS 230.0 PLATTE 230 0 #1	87.00%	-	None	
55	B 0	0	- - -	- - -	0	BONANZA - VERNAL 138 #1	96.22%	-	None	
56	B 0a	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	82.68%	-	None	
57	B 1	0	- - -	- - -	0	LOCUST - MORA 138 #1	87.67%	-	None	
58	B51	0	- - -	- - -	0	DAVEJOHN - LAR.RIVR 230 #1	8 .02%	-	None	
59	B52	0	- - -	- - -	0	CASPERPP 230 / 115 #1	92.36%	-	None	
60	B53	0	- - -	- - -	0	CASPERPP 230 / 115 #1	87.79%	-	None	Negative Vdevs
61	B53a	0	- - -	- - -	0	CASPERPP 230 / 115 #1	87.79%	-	None	
62	B61	0	- - -	- - -	0	MANSFACE - F REHOLE 230 0 #1	86.06%			
63	B62	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	93.88%	-	None	
69	C02	0	3MIKNOLL 3 5	6.	1	BR DGER - BR DGE&A 3 5 #1	12 59%	-	None	2292. 6 Amps
70	C02a	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	109 91%	-	None	2022 38 Amps
71	C03	0	- - -	- - -	3	MONUMENT - MONU PST 230 #1	105 09%	-	None	
72	C03a	0	PTRSNFRG 69	5.0	0	MONUMENT - MONU PST 230 #1	98.18%	-	None	
73	C03b	0	PTRSNFRG 69	5.8	0	D LLON S 161 / 69 #1	92.78%	-	None	
7	C03c	0	- - -	- - -	0	MONUMENT - MONU PST 230 #1	90.89%	-	None	
75	C0	0	- - -	- - -	3	MONUMENT - MONU PST 230 #1	105 09%	-	None	
76	C0 a	0	PTRSNFRG 69	5.0	0	MONUMENT - MONU PST 230 #1	98.18%	-	None	
77	C0 b	0	PTRSNFRG 69	5.8	0	D LLON S 161 / 69 #1	92.78%	-	None	
78	C0 c	0	- - -	- - -	0	MONUMENT - MONU PST 230 #1	90.89%	-	None	
79	C05	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	86.58%	-	None	
80	C05a	0	- - -	- - -	0	CASPERPP 230 / 115 #1	78.26%	-	None	
81	C06	0	- - -	- - -	0	MONUMENT - MONU PST 230 #1	86.90%	-	None	
82	C06a	0	- - -	- - -	0	MONUMENT - MONU PST 230 #1	89.78%	-	None	
83	C07	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .20%	-	None	
8	C08	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	90. 7%	-	None	
86	C09	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
87	C10	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
88	C11	0	- - -	- - -	0	MONUMENT - MONU PST 230 #1	83 95%	-	None	
89	C12	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 22%	-	None	
90	C13	0	- - -	- - -	0	HUNT 138 / 230 #2	77 80%	-	None	
91	C1	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 20%	-	None	
92	C15	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79 6 %	-	None	
93	C16	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 20%	-	None	
9	C18	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 .19%	-	None	
95	C19	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79 55%	-	None	
96	C20	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 20%	-	None	
97	C21	0	- - -	- - -	0	M DPO NT 138 / 230 #1	79.16%	-	None	
98	C23	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	7 21%	-	None	
99	C2	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	97 05%	-	None	
100	C2 a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87 92%	-	None	
101	C25	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	97 05%	-	None	
102	C25a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87 92%	-	None	
107	C28x	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	99 05%	-	None	
113		**All Cont ngenc es (w/ Final RAS) Converged ndicat ng Positive Reactive Margin**								
116		**All Cont ngenc es (w/ Final RAS) Converged ndicat ng Positive Reactive Margin**								

1) Vol age V olations > 5% for Level B & > 10% for Level C

Appendix 3-9 Pg.1 - - - Post-transient Results For Bridger / Anticline West vs. Rock Springs - Firehole West

CON INGENCY#	CON INGENCY / BASE CASE NAME	BASE CASE / P PA H FLOWS																									Gen Drop	
		Aeo us South	Aeo us West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	M dpo nt West	Montana SE	Montana daho P18)	ot 4a	Bonanza West	ot 1a (30)	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP onder	RedB H A len (ot 2C)	Pinto 4Corners 2B1)	Sigurd GlenC (2B 2)	daho Area System osses	Pace Area System osses	Bridger Gen Trips	Aeolus Gen Tr p
	egwstg1 8h9 RF 4100 2400 2638 1482 096 489 sav	1 82	2638	1700	2 00	-1029	18 2	95	89	858	127	-177	1831	519	3	107	2996	2597	781	18	128	506	80	252	221	666		
	Level "B" Contingenc es																											
B01	Anticline – Populus 500 kV Line	1889	203	0	3370	-573	1 8	182	579	539	26	-185	1623	565	375	70	2996	2 37	6 6	18	156	520	83	252	3 3	69	0	0
B01a	Anticline – Populus 500 kV Line Drop Br dger G1	1816	2211	0	3037	-553	12 6	1 7	5 2	320	66	-20	1729	57	10	56	2996	23 5	608	18	1	75	58	2 3	291	676	575	0
B01g	Anticline – Populus 500 kV Line JBG1 KinpCap	1812	2218	0	30 5	-557	1252	1 6	5 1	325	67	-205	1731	573	10	57	2996	23 8	610	18	1	75	58	2 3	289	675	575	0
B02	Anticline 500 / 3 5 kV Transformer	1 98	2618	1771	2322	-102	18 5	89	82	861	127	-178	1827	518	3 6	107	2996	2599	779	18	128	507	80	252	21	669	0	0
B03	Br dger – Populus 3 5 kV Line	1550	2536	1903	2023	-899	1782	1 1	537	806	107	-179	179	537	3 7	100	2996	2570	762	18	132	506	78	251	22	689	0	0
B0	Br dger – 3Mileknoll 3 5 kV Line	1589	2 76	1936	187	-80	1773	180	577	800	92	-211	1771	5 5	351	96	2996	2555	7 6	18	13	50	77	251	2 2	703	0	0
B05	Br dger 3 5 / 230 kV Transformer	1 83	2636	1699	2396	-1026	18 0	97	91	857	126	-177	1830	520	3	107	2996	2596	779	18	128	507	80	252	220	666	0	0
B06	3Mi eknoll – Goshen 3 5 kV Line	1507	2596	1790	22	-1006	1811	110	50	833	11	-193	1812	526	3 3	101	2996	2573	76	18	132	509	81	252	217	691	0	0
B06a	3Mi eknoll – Goshen 3 5 kV Line Bypas 3MK Caps	1527	2565	1827	263	-950	1811	129	523	83	109	-197	1801	530	3	101	2996	2573	762	18	133	509	80	252	218	68	0	0
B07	Kinport – Goshen 3 5 kV Line	1 81	26 0	1695	2 09	-1030	18 6	95	88	862	127	-181	1832	519	3	107	2996	2596	781	18	128	506	80	252	222	666	0	0
B08	Kinport – Borah 3 5 kV Line	1 8	2636	1701	2397	-1028	18 0	96	89	856	127	-177	1830	519	3	107	2996	2595	779	18	128	507	80	252	221	666	0	0
B09	Populus – Borah 500 kV Line	1505	2603	1612	2 7	-1012	1810	100	9	835	120	-178	1818	521	3	97	2996	2580	767	18	13	509	81	252	23	666	0	0
B10	Borah 500 / 3 5 kV Transformer	1 86	263	168	2 12	-1018	18 8	96	90	865	128	-180	1832	520	3 5	107	2996	2599	78	18	127	505	79	251	222	666	0	0
B11	Borah 3 5 / 230 kV Transformer	1 8	2637	1692	2 0	-1023	18 8	98	92	863	127	-183	1831	519	3 5	107	2996	2596	782	18	128	506	79	252	223	667	0	0
B12	Populus – Cedar Hill 500 kV Line	1502	2585	1632	2 10	-107	1719	98	92	729	103	-161	1796	513	333	109	2996	252	721	18	1 0	530	92	256	232	667	0	0
B1	Cedar H ll – Hemingway 500 kV Line	1505	2581	1626	2 10	-1071	1715	99	93	725	102	-161	179	51	333	108	2996	2521	719	18	1 1	531	92	256	233	668	0	0
B15	Midpoint – Hemingway 500 kV Line	1 88	262	1692	2393	-1036	1815	96	90	827	122	-173	1822	518	3 2	111	2996	2578	768	18	129	512	82	253	221	667	0	0
B16	Borah – Midpoint 500 kV Line	1 93	2612	1676	2395	-1055	1779	97	90	800	115	-169	181	517	339	96	2996	2562	750	18	139	518	86	25	230	667	0	0
B17	Midpoint 500 / 3 5 kV Transformer	1 85	2638	1691	2 08	-1021	1851	96	90	885	130	-180	183	521	3 6	85	2996	2607	790	18	135	502	78	251	227	665	0	0
B18	Midpoint 3 5 / 230 kV Transformer	1 83	2636	1699	2399	-1030	1838	95	89	852	126	-177	1830	519	3	109	2996	2593	778	18	128	507	80	252	221	666	0	0
B19	Borah – Adelaide #2 3 5 kV Line	1 85	2630	1700	2392	-10 0	1820	95	89	8 2	12	-17	1826	518	3 2	99	2996	2585	771	18	133	510	82	252	223	667	0	0
B20	Adelaide – M dpoint #2 3 5 kV Line	1 83	2635	1701	2397	-103	183	95	89	853	126	-176	1829	519	3 3	10	2996	2593	776	18	130	508	81	252	220	666	0	0
B21	Borah – Adelaide – M dpoint #1 3 5 kV Line	1 85	2630	1700	2392	-10 1	1819	95	89	8 2	123	-17	1825	518	3 2	99	2996	2585	771	18	133	510	82	252	222	667	0	0
B22	Borah – Hunt 230 kV Line	1 8	263	1701	2396	-1035	1830	95	89	8 8	125	-175	1828	519	3 3	10	2996	2589	775	18	130	509	81	252	222	666	0	0
B23	Midpoint – Bo se Bench #3 230 kV Line	1 8	263	1699	2397	-1032	1833	95	89	8 7	125	-176	1828	519	3 3	109	2996	2588	775	18	128	509	81	252	223	666	0	0
B2	Midpoint – Rat le Snake 230 kV Line	1 83	2636	1699	2399	-1030	1838	95	89	853	126	-177	1830	519	3	108	2996	2593	778	18	128	508	80	252	221	666	0	0
B25	Midpoint – Dram 230 kV Line	1 8	2635	1699	2398	-1030	1837	95	89	852	126	-176	1829	519	3 3	108	2996	2592	777	18	128	508	80	252	222	666	0	0
B26	Ra tle Snake – Boise Bench 230 kV Line	1 83	2635	1699	2398	-1032	183	95	89	8 9	125	-176	1828	519	3 3	109	2996	2587	776	18	128	508	81	252	225	666	0	0
B27	Dram – Bo se Bench 230 kV Line	1 83	2637	1700	2 00	-1028	18 1	95	89	858	127	-177	1831	519	3	107	2996	2596	780	18	128	507	80	252	221	666	0	0
B28	Hemingway 500 230 kV Trans ormer	1 83	2637	1698	2 00	-1027	18 2	95	89	859	127	-177	1831	519	3	105	2996	2596	781	18	129	506	80	252	222	666	0	0
B30	Populus – Borah #1 3 5 kV Line	1 80	2638	1707	239	-10 0	1829	95	89	8 9	125	-178	1829	518	3 2	10	2996	2588	77	18	131	509	81	252	222	666	0	0
B31	Populus – Borah #2 3 5 kV Line	1 82	2636	1705	2393	-1039	1829	96	89	8 9	125	-178	1828	518	3 2	10	2996	2589	77	18	131	509	81	252	221	666	0	0
B32	Populus – Kinport 3 5 kV Line	1 78	26 1	1695	2 09	-10 2	1836	95	89	855	125	-18	1830	517	3 3	10	2996	2588	775	18	130	509	81	252	22	666	0	0
B33	Populus – Ben Lomond #3 3 5 kV Line	1516	2601	1672	2371	-9 6	1868	110	50	878	130	-176	1828	529	351	113	2996	2613	798	18	121	96	7	250	220	670	0	0
B3	Populus – Terminal 3 5 kV Line	1510	2607	1679	2379	-967	1862	101	95	873	129	-176	1827	528	350	111	2996	2610	79	18	123	98	75	250	221	668	0	0
B35	Aeolus – An icline 500 kV Line																											
B35a	Aeolus – An icline 500 kV Line	2106	1181	778	1968	- 23	1215	8	1	296	36	-22	1599	562	60	50	2996	2331	595	18	1 7	72	55	2 2	178	7 7	0	600
B35g	Aeolus – An icline 500 kV Line	2117	1201	783	1977	- 21	12 8	51	3	327	5	-2 1	1629	557	50	52	2996	2333	596	18	1 8	78	58	2	177	738	0	600
B36	Aeolus – Mona 500 kV Line																											
B36a	Aeolus – Mona 500 kV Line	0	3 2	2070	26 8	-1805	1667	166	562	663	115	-199	1727	68	93	131	2996	2607	850	18	52	357	387	220	2 2	660	0	600
B37	Aeolus 500 / 230 kV Transformer	1 69	2628	1690	2398	-1029	1832	97	90	8 9	120	-178	1808	525	351	106	2996	2593	779	18	128	505	79	251	220	665	0	0
B38	Aeolus – Windstar 230 kV Line	1 29	2571	1658	2380	-1026	179	9	88	813	90	-183	1720	5 5	379	105	2996	2582	771	18	126	98	73	250	218	671	0	0
B39	Aeolus – Freezeout 230 kV Line	1 55	2671	1683	2 23	-1036	1839	105	99	855	130	-177	18	522	3 0	107	2996	2595	782	18	127	505	79	252	223	679	0	0
B 0	Bonanza –Mona 3 5kV Line	159	2662	1722	2 56	-1175	1773	135	531	787	106	-18	197	99	36	109	2996	25 2	729	18	111	59	3	2 0	226	685	0	0
B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1572	2625	1677	2 00	-1220	16 7	109	503	669	1	-193	1908	5	327	10	2996	2531	760	18	102	1	39	238	218	653	0	0
B 1	Hemingway – Summer Lake 500kV line	1 96	259	1668	2385	-1100	1709	96	90	695	108	-160	1799	511	329	138	2996	2 96	700	18	13	538	503	257	208	669	0	0
B51	DaveJon - Di ficulty 230 kV Line	1 33	2575	1661	2382	-1026	1797	9	88	816	92	-183	1725	5	378	105	2996	2583	771	18	126	98	7	250	218	668	0	0
B52	Spence - Mustang 230 kV Line	1 99	2523	1695	2316	-100	1793	78	71	81	81	-185	1731	531	370	10	2996	2586	773	18	128	502	76	251	212	673	0	0
B53	River on - Atlant c 230 kV Line	151	2 82	1708	2367	-1070	1789	79	72	808	9	-188	1718	526	380	105	2996	2601	779	18	127	500	75	250	218	665	0	0
B53a	River on - Atlant c 230 kV Line	151	2 80	1708	2366	-1070	1788	79	72	807	7	-188	1718	526	380	105	2996	2602	780	18	127	500	75	250	217	66		
B61	Palisades - Raven 230 kV Line	1 99	2616	1715	2 6	-1090	1837	-26	370	853	12	-178	1825	527	3	107	2996	2595	781	18	127	50	78	251	226	668		
B62	Firehole - Mansface - BRPP - S.Trona 230 kV Line	1 9	2621	1712	2 32	-1063	18 7	23	396	863	123	-177	1825	529	338	107	2996	2599	779	18	128	507	80	252	22	668		
																											N-1 Criteria; > >	
	Level "C" Contingenc es																											
C02	Br dger – Populus #1 # 2 3 5 kV Lines	1670	2351	22	1366	-67	1681	221	619	718	69	-182	172	570	353	88	2996	2532	725	18	138	50	76	250	207	7 7	0	0
C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1589	25 2	2080	1231	-675	1 2	176	572	97	112	-201	1835	576	389	7	2996	2 0	688	18	126	60	50	2 1	181	711	575	0
C03	Br dger – 3MileKnoll Bridger – Populus #1 3 5 kV lines	1706	2291	2258	1235	-579	1682	260	661	721	53	-221	1699	577	357	85	2996	2516	712	18	1 0	503	75	2 9	231	750	0	0
C03a	Br dger – 3MileKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	1622	2 88	2109	1095	-587	1 3	21	612	500	98	-236	181	582	392	72	2996	2 26	677	18	127	58	9	2 1	197	718	575	0
C03b	Br dger – 3MileKnoll Bridger – Populus #1 3 5 kV lines w/ RAS	15	267	1950	9 9	-588	1186	168	56	262	1 1	-250	192	590	29	57	2996	2332	639	18	116	13	21	231	171	697	1150	0
C03c	Br dger–3MK Bridge-Pop#1 3 5 RAS; 2JBG Path18 Caps UV Load	15 1	2666	19 8	9 5	-619	12 6	166	562	316	1 0	-236	191	58	21	62	2996	2360	65	18	117	22	27	23	168	690	1150	0
C0	Br dger – 3MileKnoll Bridger – Populus #2 3 5 kV lines	1706	2291	2258	1235	-579	1682	260	661	721	53	-221	1699	577	357	85	2996	2516	712	18	1 0	503	75	2 9	231	750	0	0
C0 a	Br dger – 3MileKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	1622	2 88	2109	1095	-587	1 3	21	612	500	98	-236	181	582	392	72	2996	2 26	677	18	127	58	9	2 1	197	718	575	0
C0 b	Br dger – 3MileKnoll Bridger – Populus #2 3 5 kV lines w/ RAS	15	267	1950	9 9	-588	1186	168	56	262	1 1	-250	192	590	29	57	2996	2332	639	18	116	13	21	231	171	697	1150	0
C0 c	Br dger–3MK Bridge-Pop#2 3 5 RAS; 2JBG Path18 Caps UV Load	15 1	2666	19 8	9 5	-619	12 6	166	562	316	1 0	-236	191	58	21	62	2996	2360	65	18	117	22	27	23	168	690	1150	0
C05	Borah – Populus 3 5 kV DLO	1 77	2635	1719	2377	-1066	1799	96	90	828	119	-179	1822	515	339	96	2996	2573	759	18	137	516	85	253	222	668	0	0
C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1 27	2776	1615	2099	-1009	1530	68	61	579	152	-200	1913	531	378	80	2996	2 69	713	18	126	70	58	2	192	656	575	0
C06	Populus – Ben Lomond 3 5 kV DLO	1583	2531	1618	2312	-776	1928	138	53	92	136	-173	1823	5 9	367	126	2996	265	837	18	105	73	61	2 5	219	679	0	0
C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1 2 of 3MK Series Cap	1605	2 95	1673	2193	-729	1923	157	553	920	128	-180	1809	55	367	12	2996	26 9	832	18	106	7	61	2 5	213	680	0	0
C07	Ben Lomond – Terminal 3 5 kV DLO	1 8	2635	1699	2399	-1027	18 1	95	89	858	127	-177	1830	520	3	107	2996	2596	780	18	128	506	80	252	221	666	0	0
C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1 75	26 0	1700	2 03	-1062	1815	96	89	8 1	121	-187	1825	515	3 0	98	2996	2577	763	18	135	51	8	253	225	668	0	0
C09	Populus – Borah #2 3 5 kV Treasure on – Brady 230 kV Lines	1 82	2635	1703	2393	-1036	1829	97	91	8 9	125	-177	1828	518	3 3	10	2996	2589	775	18	131	509	81	252	222	667	0	0
C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1 81	2637	1705	2393	-1037	1829	97	90	8 9	125	-178	1829	518	3 3	10	2996	2589	775	18	131	509	81	252	222	666	0	0
C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1558	2555	16 1	2338	-8 9	1903	120	515	905	133	-17	1823	5 2	360	120	2996	2636	821	18	111	83	66	2 7	220	673	0	0
C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1512	2605	1676	2378	-961	186	10	98	87	129	-176	1827	528	350	112	2996	2611	795	18	122	98	75	250	221	668	0	0
C13	Borah – Adelaide #2 Borah–ADT–Midpoint #1 3 5 kV lines (RA)	1 89	261	1702	2372	-1075	1760	96	89	800	113	-165	1812	516	337	79	2996	2561	7 5	18	1 7	521	87	25	22	668	0	0
C1	Borah – Adelaide #2 M dpoint - Adelaide #2 3 5 kV ines (RA)	1 85	2630	1700	2391	-10 2	1818	95	89	8 0	123	-17	1825	518	3 2	99	2996	258	771	18	13	511	82	252	222	667	0	0
C15	Borah – Adelaide #2 Borah – Hunt 230 kV lines	1 86	2627	1701	2387	-10 9	1805	95	89	829	121	-171	1823	518	3 1	95	2996	2579	76	18	136	513	83	253	22	667	0	0
C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV lines (RA?)	1 85	2629	1701	2390	-10 0	1818	96	89	8 1	123	-17	1825	518	3 2	99	2996	2585	771	18	133	510	82	252	222	667	0	0
C18	Borah – Kinport M dpoint – Adela de #2 3 5 kV lines (RA)	1 8	2635	1702	239	-1033	1832	95	89	852	126	-176	1829	519	3 3	10	2996	2592	776	18	130	508	81	252	221	666	0	0
C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV ines (RA?)	1 8	2633	1702	2393	-1035	1828	95	89	8 6	125	-175	1828	519	3 3	10	2996	2589	775	18	131	509	81	252	222	666	0	0
C20	Borah–Adel–Midpoint #1 Midpoint – Adelaide #2 3 5 kV ines	1 86	2626	1702	2385	-1051	1801	95	89	831	120	-171	1821	517	3 0	93	2996	2579	76	18	137	513	83	253	220	667	0	0
C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 kV ines (RA)	1 86	2626	1702	2386	-1050	1803	95	89	828	121	-171	1822	518	3 1	95	2996	2579	763	18	136	513	83	253	223	667	0	0
C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1 96	2598	1672	2385	-1077	1737	97	91	766	108	-162	180	515	335	83	2996	25 1	731	18	1 8	525	90	255	23	668	0	0
C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines	1551	2535	191	2009	-897	1781	1 2	537	805	107	-177	179	538	3 7	100	2996	2570	762	18	132	506	78	251	223	690	0	0
C2 a	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1 83	2701	1785	1797	-872	1526	106	500	570	1	-201	189	5 8	385	85	2996	2 73	718	18	120	61	52	2 2	192	670	575	0
C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV lines	1551	2535	191	2009	-897	1781	1 2	537	805	107	-177	179	538	3 7	100	2996	2570	762	18	132	506	78	251	223	690	0	0
C25a	Br dger – Populus #2 Goshen – Kinport 3 5 kV lines w/ RAS	1 83	2701	1785	1797	-872	1526	106	500	570	1	-201	189	5 8	385	85	2996	2 73	718	18	120	61	52	2 2	192	670	575	0
C28x	Palo Verde - T ip 1&2, w/ FACRI	1557	26 7	1690	2 05	-1192	1702	102	96	722	15	-200	1898	539	355	111	2996	3536	2025	18	103	6 1	586	276	221	733	0	0
																											N-2 Criteria > >	

CON INGENCY#	REAC IVE MARGIN MVAR (Gray shaded cells are the m nimum marg ns)																							
	Aeo us 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	M dpo nt 500	Heminway 500	CedarH l 500	Bridger 345	oshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeo us 230	M ners 230	Mustang 230	Riverton 230	onahGas 230	ladstone 230
B01	-79	-1 1	-621	-790	-803	-1065	-1526	-936	- 87	-398	-355	-629	-703	-73	-1075	-1 02	-1663	-820	-868	-630	-28	-288	-221	-66
B01a	-833	-1703	-717	-1127	-1137	-1 52	-1967	-1260	-665	-5 9	-506	-899	-1031	-1059	-1 0	-1768	-1867	-815	-88	-635	-275	-277	-223	-70
B01g	-871	-1756	-763	-1267	-1278	-1605	-21 1	-1382	-7 0	-62	-569	-1022	-1172	-1200	-15 6	-1888	-1907	-817	-919	-656	-280	-278	-22	-70
B02	-990	-2107	-1006	-177	-1800	-20 7	-2519	-1716	-1071	-866	-8 3	-1502	-1777	-1769	-2001	-2192	-2257	-862	-1009	-723	-311	-31	-2 8	-75
B03	-1107	-2006	-1155	-1 53	-1 99	-179	-2332	-1518	-10	-737	-727	-1260	-1 88	-1 76	-1786	-2037	-21 0	-852	-108	-733	-323	-322	-2	-73
B0	-1032	-1853	-972	-1073	-1082	-1381	-1888	-1197	-910	- 12	-372	-822	-1032	-1017	-1 00	-1787	-1996	-8	-1017	-706	-323	-317	-236	-73
B05	-1191	-2137	-1395	-1735	-17	-2012	-25	-1697	-1325	-861	-875	-1 83	-17 9	-1730	-2000	-2202	-2271	-861	-1161	-760	-310	-316	-2 6	-75
B06	-1165	-2078	-13 2	-161	-1608	-1886	-2397	-1610	-1280	-597	-76	-1291	-1602	-1567	-1889	-2108	-2209	-859	-1137	-75	-322	-323	-2 9	-7
B06a	-11 1	-20 0	-126	-1508	-1511	-1801	-2336	-15 2	-1197	-569	-511	-1210	-1 92	-1 6	-1811	-2060	-2170	-856	-1115	-7 5	-322	-322	-2 7	-7
B07	-1199	-21 5	-1360	-1715	-1723	-201	-2550	-1695	-1180	-337	-519	-1519	-1727	-1702	-1992	-2209	-2281	-862	-1168	-76	-316	-318	-2 9	-75
B08	-1193	-2133	-1382	-1717	-1735	-1999	-2530	-1687	-1310	-815	-8 9	-13 7	-1716	-1726	-1987	-2193	-2266	-862	-1163	-762	-317	-318	-2 9	-75
B09	-1190	-2101	-13 3	-1565	-1572	-1923	-2 75	-1599	-1276	-826	-839	-1 12	-1656	-16 8	-1955	-2161	-2235	-860	-1162	-762	-316	-318	-2 8	-75
B10	-119	-2136	-1392	-1738	-1607	-1997	-2522	-1690	-1321	-8 1	-863	-1 29	-1705	-1620	-1983	-2196	-2269	-861	-116	-762	-316	-318	-2 8	-75
B11	-1197	-2138	-138	-1709	-1717	-198	-252	-1681	-1311	-81	-8 6	-1 16	-1712	-1700	-1979	-2197	-2273	-862	-1167	-76	-317	-318	-2 8	-75
B12	-1212	-2079	-13 8	-1 81	-1585	-1981	-2350	-981	-1283	-829	-8 6	-1373	-158	-1587	-193	-2137	-2216	-865	-1183	-771	-320	-32	-250	-73
B1	-1198	-2062	-1312	-1 35	-1536	-1928	-2307	-102	-12 5	-809	-823	-1330	-1532	-1536	-1903	-2112	-2197	-86	-1170	-766	-320	-32	-250	-73
B15	-1179	-2101	-131	-1563	-1 77	-1389	-2301	-16 9	-1238	-797	-815	-1312	-15 2	-1 89	-1905	-2137	-2232	-862	-11 9	-756	-317	-319	-2 8	-75
B16	-1191	-2095	-13 0	-1572	-1 6	-1822	-2387	-1618	-1269	-820	-837	-1368	-1598	-1572	-1932	-21	-2229	-863	-1162	-762	-318	-321	-2 9	-7
B17	-1195	-2138	-1393	-1728	-1731	-1753	-2517	-1686	-1325	-855	-871	-1 67	-1732	-1705	-1997	-2205	-227	-861	-116	-763	-316	-317	-2 9	-75
B18	-1195	-2136	-1392	-172	-1729	-1993	-2531	-1688	-1327	-858	-87	-1 7	-1738	-1716	-1998	-2200	-2270	-862	-1165	-763	-317	-319	-2 9	-75
B19	-1192	-2122	-1373	-1688	-1696	-1963	-2 86	-1668	-1305	-8 2	-859	-1 3	-1690	-1657	-1973	-2179	-2255	-862	-1162	-761	-317	-319	-2 9	-75
B20	-1196	-2135	-1393	-1723	-1731	-2020	-25 3	-1696	-1326	-855	-872	-1 61	-172	-1690	-199	-2198	-2269	-862	-1165	-763	-317	-319	-2 9	-75
B21	-1192	-2121	-1372	-1681	-1689	-1976	-2 96	-1669	-1302	-839	-857	-1 21	-1675	-1635	-1969	-2177	-2255	-862	-1162	-762	-317	-319	-2 9	-75
B22	-119	-2131	-1386	-171	-1723	-1986	-2503	-1683	-1320	-851	-868	-1 56	-1722	-1699	-1989	-2193	-2265	-862	-1163	-762	-317	-319	-2 9	-75
B23	-119	-2132	-1386	-1707	-1707	-1957	-2 9	-1677	-1320	-853	-869	-1 57	-1717	-1692	-1990	-219	-2266	-862	-116	-762	-317	-319	-2 9	-75
B2	-119	-213	-1383	-1686	-1676	-1936	-2528	-166	-1317	-850	-867	-1 0	-169	-1661	-1986	-2195	-2268	-862	-116	-762	-317	-319	-2 9	-75
B25	-119	-213	-1389	-1719	-1723	-1981	-2512	-1685	-1323	-856	-871	-1 68	-1731	-1709	-1995	-2197	-2268	-862	-116	-762	-317	-319	-2 9	-75
B26	-1195	-213	-1392	-1728	-1737	-1988	-2 9	-1688	-1327	-858	-87	-1 77	-17 3	-172	-1998	-2198	-2268	-862	-1165	-763	-317	-319	-2 9	-75
B27	-1195	-2137	-139	-1733	-17 2	-2006	-25 1	-1696	-1329	-860	-875	-1 81	-17 7	-1728	-2002	-2202	-2271	-862	-116	-762	-317	-318	-2 9	-75
B28	-119	-2136	-1390	-1722	-1730	-1993	-2531	-1683	-1325	-857	-872	-1 73	-1737	-1717	-1998	-2200	-2270	-862	-116	-762	-317	-318	-2 9	-75
B30	-1200	-21 2	-1 05	-17 7	-17 8	-2009	-2539	-1703	-13 1	-863	-881	-1 92	-1750	-1719	-2007	-2205	-2277	-863	-1169	-765	-317	-319	-2 9	-75
B31	-1196	-2133	-1389	-1722	-1725	-1988	-2523	-1687	-1323	-853	-870	-1 70	-1723	-1695	-1992	-2193	-2268	-862	-1165	-763	-317	-319	-2 9	-75
B32	-120	-21 9	-1395	-1721	-1696	-1973	-2525	-1685	-1319	-736	-816	-1183	-17	-16 6	-2003	-2208	-2285	-863	-1173	-766	-317	-319	-2 9	-75
B33	-1178	-2080	-13 7	-1616	-1625	-1908	-2 9	-1621	-127	-827	-8 6	-1377	-1593	-1597	-1797	-2061	-2205	-856	-11 9	-757	-317	-316	-2 6	-75
B3	-1177	-2068	-1338	-1601	-1611	-1896	-2 0	-1612	-126	-820	-838	-1363	-1577	-1581	-192	-2050	-2191	-857	-11 8	-756	-317	-318	-2 7	-75
B35																								
B35a	-7 2	-1325	-1355	-1992	-2021	-2298	-2766	-190	-1389	-1000	-10 0	-1765	-20 8	-2036	-1831	-1722	-1536	-788	-807	-562	-170	-166	-205	-67
B35g	-872	-1530	-1 57	-2173	-2191	-2 0	-2833	-1988	-15 0	-1092	-1129	-1938	-226	-2238	-200	-1937	-1768	-802	-939	-636	-217	-217	-22	-68
B36																								
B36a	-1315	-2223	-1138	-1291	-1367	-172	-2260	-1 11	-978	-773	-727	-1185	-13 3	-1358	-1830	-2353	-2521	-769	-13 3	-8 5	-293	-285	-230	-7
B37	-1077	-213	-1318	-1700	-1735	-2011	-25 7	-169	-1286	-863	-875	-1 81	-17 0	-172	-2003	-2212	-2285	-858	-103	-707	-312	-312	-2 6	-7
B38	-1212	-2191	-1 60	-1800	-1793	-205	-2575	-1733	-1381	-87	-892	-1523	-1803	-1780	-2026	-22 7	-2326	-8 5	-1167	-780	-282	-276	-238	-72
B39	-1093	-2160	-885	-1152	-1227	-1592	-2156	-1307	-7 5	-716	-628	-1075	-117	-1211	-1509	-2067	-2296	-801	-1108	-6	-173	-18	-118	-76
B 0	-982	-2035	-1163	-1517	-1576	-1897	-2 6	-1581	-1136	-809	-806	-1352	-1561	-1565	-1887	-2157	-2202	-576	-961	-679	-30	-30	-238	-63
B 0a	-1082	-2119	-1309	-1686	-1723	-2003	-2536	-1691	-1268	-85	-863	-1 6	-1718	-1707	-1970	-22 3	-2275	-5 0	-1057	-722	-310	-306	-2 3	-75
B 1	-1218	-2089	-1398	-1630	-1620	-1736	-182	-1508	-1332	-852	-873	-1 2	-1667	-1633	-1971	-2160	-2226	-866	-1187	-773	-321	-325	-251	-72
B51	-1220	-2185	-1 51	-1789	-1786	-20 8	-2570	-1728	-1367	-872	-889	-1517	-1795	-1773	-2022	-22 3	-2320	-8 5	-1176	-778	-281	-27	-238	-72
B52	-988	-2090	-1358	-178	-1822	-2087	-2567	-17 6	-1372	-882	-930		-1855	-1833	-2018	-2202	-2253	-852	-960	-679	-25	-2 6	-237	-73
B53	-1031	-2081	-1250	-1630	-1680	-197	-2511	-1656	-1217	-8 9	-850	-1 36	-1678	-1670	-1988	-2183	-2236	-8 9	-1007	-691	-313	-27	-219	-73
B53a	-1011	-207	-1232	-1613	-1667	-1968	-2506	-16 7	-120	-8 6	-8 7	-1 29	-1665	-1660	-198	-2181	-223	-8 9	-986	-682	-300	-2 1	-219	-73
B61	-1176	-211	-13 3	-1671	-1687	-1967	-2509	-1662	-1270	-8 1	-8 8	-1 33	-1683	-1669	-1953	-2179	-22 7	-858	-11 7	-757	-318	-318	-2 1	-75
B62	-1178	-2115	-13 7	-1675	-1692	-1970	-2512	-166	-1278	-8 3	-850	-1 37	-1688	-167	-1962	-2179	-22 8	-857	-11 8	-757	-317	-317	-2 2	-75
	742	**1325**	**621**	**790**	**803**	**1065**	**1526**	**936**	**487**	**337**	**355**	**629**	**703**	**734**	**1075**	**1402**	**1536**	**540**	**807**	**6**	**170**	**166**	**118**	**63**
					500	500	500	500	100			250		250										
C02	-857	-1687	-71	-935	-102	-1335	-1816	-1090	-623	- 97	- 57	-863	-1023	-1011	-13 3	-1693	-1875	-830	-869	-6 8	-331	-323	-230	-70
C02a	-972	-1932	-936	-1290	-1378	-1695	-2207	-1 08	-818	-661	-625	-116	-1397	-1373	-1652	-1975	-2097	-829	-960	-682	-320	-31	-236	-7
C03	-768	-1521	-627	-731	-782	-10 5	-1 6	-87	-587	-3	-317	-621	-751	-7 7	-10 3	-1 10	-1732	-821	-792	-612	-331	-316	-219	-69
C03a	-923	-182	-876	-1081	-112	-1 19	-1918	-1218	-815	- 7	-399	-8 7	-1092	-1057	-1388	-1807	-1999	-823	-91	-662	-321	-309	-229	-7
C03b	-967	-2000	-1000	-1305	-1338	-163	-2155	-1 11	-9 0	-515	- 50	-1005	-1309	-126	-161	-2032	-2176	-818	-952	-677	-306	-295	-233	-78
C03c	-99	-2031	-1058	-1 68	-1523	-1811	-2316	-1536	-993	-63	-52	-1226	-1525	-1 95	-17 8	-2113	-220	-823	-977	-689	-309	-301	-235	-77
C0	-768	-1521	-627	-731	-782	-10 5	-1 6	-87	-587	-3	-317	-621	-751	-7 7	-10 3	-1 10	-1732	-821	-792	-612	-331	-316	-219	-69
C0 a	-923	-182	-876	-1081	-112	-1 19	-1918	-1218	-815	- 7	-399	-8 7	-1092	-1057	-1388	-1807	-1999	-823	-91	-662	-321	-309	-229	-7
C0 b	-967	-2000	-1000	-1305	-1338	-163	-2155	-1 11	-9 0	-515	- 50	-1005	-1309	-126	-161	-2032	-2176	-818	-952	-677	-306	-295	-233	-78
C0 c	-99	-2031	-1058	-1 68	-1523	-1811	-2316	-1536	-993	-63	-52	-1226	-1525	-1 95	-17 8	-2113	-220	-823	-977	-689	-309	-301	-235	-77
C05	-1199	-2126	-1383	-1699	-1687	-19 2	-2 77	-1670	-1315	-8 0	-861	-1 8	-1675	-1618	-197	-2173	-2261	-86	-1169	-765	-318	-321	-250	-7
C05a	-1176	-22	-1399	-1829	-1817	-20 6	-2569	-1765	-1380	-901	-916	-1565	-183	-17 1	-2088	-230	-2387	-85	-11 6	-755	-305	-305	-2 8	-78
C06	-1150	-1966	-1292	-1 66	-1 76	-1768	-2318	-1515	-1213	-787	-81	-12 5	-1398	-1 33	-1 85	-1836	-208	-8 3	-1123	-7 7	-316	-311	-2 1	-76
C06a	-1121	-1929	-1200	-1335	-13 8	-16 8	-2191	-1 18	-1117	-680	-688	-1121	-1265	-1298	-1 50	-1802	-20 3	-8 0	-1096	-737	-318	-311	-238	-75
C07	-1190	-2078	-1366	-1655	-1661	-19 8	-2 95	-1651	-1291	-837	-851	-1 07	-1636	-163	-1603	-208	-2200	-861	-1160	-761	-317	-318	-2 8	-75
C08	-120	-21 0	-1377	-1675	-1627	-190	-2 65	-1653	-1296	-699	-788	-1116	-1693	-1535	-1980	-2186	-2277	-86	-1173	-767	-317	-319	-2 9	-75
C09	-119	-2130	-1381	-1707	-1708	-1967	-2 98	-1676	-1315	-8 7	-861	-1 56	-1710	-1676	-1958	-2183	-226	-862	-116	-762	-317	-319	-2 9	-75
C10	-1198	-2139	-1397	-1733	-1732	-1989	-2516	-1692	-1333	-857	-872	-1 78	-1736	-1700	-1973	-2196	-227	-863	-1168	-76	-317	-319	-2 9	-75
C11	-1155	-1988	-128	-1 72	-1 82	-1776	-232	-1521	-1205	-782	-805	-1250	-1 12	-1 0	-1700	-1887	-2107	-8 8	-1128	-7 9	-317	-31	-2	-75
C12	-1175	-2065	-1328	-1586	-159	-1876	-2 1	-1600	-125	-813	-829	-13 8	-1562	-1562	-1890	-20 1	-2188	-857	-11 6	-756	-317	-317	-2 7	-75
C13	-1189	-2087	-133	-1590	-159	-18 6	-23 3	-1605	-1259	-805	-826	-1329	-1563	-1 97	-1909	-2126	-2219	-863	-1159	-761	-319	-322	-2 9	-7
C1	-1192	-2122	-1373	-1681	-1689	-1973	-2 92	-1668	-1303	-839	-857	-1 21	-1675	-163	-1969	-2177	-2255	-862	-1162	-762	-317	-320	-2 9	-75
C15	-1190	-211	-136	-166	-1671	-1929	-2 3	-1651	-129	-832	-851	-1 03	-1658	-1621	-1958	-2167	-22 7	-863	-1160	-761	-318	-320	-2 9	-75
C16	-1190	-2118	-1359	-1663	-1680	-196	-2 8	-1659	-1283	-797	-832	-1299	-16 5	-1629	-195	-2168	-2250	-862	-1160	-761	-317	-319	-2 9	-75
C18	-119	-2131	-1380	-1705	-1722	-2008	-2531	-1686	-1307	-811	-8 7	-1333	-1692	-1685	-1979	-2188	-2265	-862	-116	-762	-317	-319	-2 9	-75
C19	-1192	-2127	-137	-1697	-171	-197	-2 90	-167	-1300	-806	-8 2	-1323	-1689	-1695	-197	-2183	-2260	-862	-1162	-761	-317	-319	-2 9	-75
C20	-1192	-2111	-1356	-1630	-1637	-198	-2 85	-165	-1281	-817	-839	-13 9	-1592	-1519	-193	-2158	-22	-863	-1162	-761	-318	-320	-2 9	-7
C21	-1191	-2113	-1363	-1656	-1663	-19 3	-2	-1652	-1291	-828	-8 8	-1389	-16 2	-1597	-1952	-2165	-22 6	-863	-1161	-761	-318	-320	-2 9	-7
C23	-1190	-2068	-1312	-150	-1376	-1711	-2287	-1573	-1238	-795	-81	-1302	-1517	-1 7	-1888	-2107	-2202	-863	-1161	-761	-319	-323	-2 9	-73
C2	-1105	-2008	-1102	-1 18	-1 61	-1787	-2333	-1 98	-888	-279	- 22	-129	-1 56	-1 38	-1762	-20 0	-21 6	-852	-1082	-733	-323	-322	-2	-73
C2 a	-1132	-218	-12 8	-175	-1779	-2068	-2577	-1731	-1051	-337	-50	-1577	-1811	-1770	-201	-2267	-233	-8 6	-1106	-7 2	-310	-308	-2 5	-77
C25	-1105	-2008	-1102	-1 18	-1 61	-1787	-2333	-1 98	-888	-279	- 22	-129	-1 56	-1 38	-1762	-20 0	-21 6	-852	-1082	-733	-323	-322	-2	-73
C25a	-1132	-218	-12 8	-175	-1779	-2068	-2577	-1731	-1051	-337	-50	-1577	-1811	-1770	-201	-2267	-233	-8 6	-1106	-7 2	-310	-308	-2 5	-77
C28x	-1069	-1715	-1281	-1635	-1679	-1976	-2538	-1665	-1239	-838	-8 7	-1 23	-1667	-1661	-1792	-18 7	-1800	-838	-10	-71	-308	-302	-2 2	-39
	768	**1521**	**627**	**731**	**782**	**1045**	**1464**	**874**	**587**	**279**	**317**	**621**	**751**	**747**	**1043**	**1410**	**1732**	**818**	**792**	**612**	**305**	**295**	**219**	**39**
					00	00	00	00	100			200		200										

CON INGENCY#	Voltage Dev ation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOAD NG	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Vo tage	COMMEN
				Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs					
					SIDNEY 115 / 230 #1	109.9 %			
					CTTNWD N - KETTLECK 115 #1	10 .17%			
					CURRANTC - MONA 3 5 #1	100.72%			
				CON INGENCY LOADINGS					
B01	1	3M KNOLL 3 5	5.2	1	BR DGER - BR DGE&A 3 5 #1	113.79%	-	None	2093.7 Amps
B01a	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	102.52%	-	None	1886. 1 Amps
B01g	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	102.25%	-	None	
B02	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	83 01%	-	None	
B03	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	99 69%	-	None	
B0	0	- - -	- - -	0	DAVEJOHN - LAR RIVR 230 #1	78 83%	-	None	
B05	0	- - -	- - -	0	- - -	- - -	-	None	
B06	0	- - -	- - -	2	GRACE - SODA 138 #1	113.65%	-	None	
B06a	0	- - -	- - -	0	GRACE - SODA 138 #1	77 03%	-	None	
B07	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87 5 %	-	None	
B08	0	- - -	- - -	0	- - -	- - -	-	None	
B09	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87 50%	-	None	
B10	0	- - -	- - -	0	- - -	- - -	-	None	
B11	0	- - -	- - -	0	- - -	- - -	-	None	
B12	0	- - -	- - -	0	SIGURD - SIGURDPS 230 #1	88 60%	-	None	
B1	0	- - -	- - -	0	SIGURD - SIGURDPS 230 #1	88 62%	-	None	
B15	0	- - -	- - -	0	- - -	- - -	-	None	
B16	0	- - -	- - -	0	M DPOINT 138 / 230 #1	73.76%	-	None	
B17	0	- - -	- - -	0	LOCUST - MORA 138 #1	87 86%	-	None	
B18	0	- - -	- - -	0	M DPOINT 230 / 3 5 #2	85 09%	-	None	
B19	0	- - -	- - -	0	- - -	- - -	-	None	
B20	0	- - -	- - -	0	- - -	- - -	-	None	
B21	0	- - -	- - -	0	- - -	- - -	-	None	
B22	0	- - -	- - -	0	M DPOINT 138 / 230 #1	79. 6%	-	None	
B23	0	- - -	- - -	0	LOCUST - MORA 138 #1	87 97%	-	None	
B2	0	- - -	- - -	0	- - -	- - -	-	None	
B25	0	- - -	- - -	0	- - -	- - -	-	None	
B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	90 85%	-	None	
B27	0	- - -	- - -	0	- - -	- - -	-	None	
B28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.73%	-	None	
B30	0	- - -	- - -	0	- - -	- - -	-	None	
B31	0	- - -	- - -	0	- - -	- - -	-	None	
B32	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	89.1 %	-	None	
B33	0	- - -	- - -	0	GRACE - SODA 138 #1	70 28%	-	None	
B3	0	- - -	- - -	0	- - -	- - -	-	None	
B35	**P CASE DIVERGED**								
B35a	59	GREATDIV 3 5	9 9	2	MINERS 230 0 PLATTE 230 0 #1	102.17%	-	None	
B35g	0	- - -	- - -	1	MINERS 230 0 PLATTE 230 0 #1	100.05%	-	None	
B36	**P CASE DIVERGED**								
B36a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	92 62%	-	None	
B37	0	- - -	- - -	0	AEOLUS 500 / 230 #2	99 95%	-	None	
B38	0	- - -	- - -	0	DAVEJOHN - W NDSTAR 230 #1	100.0 %	-	None	
B39	13	BA RO L 57	8.2	0	MINERS 230 0 PLATTE 230 0 #1	87 01%	-	None	No Wyo. voltages below .90 pu
B 0	0	- - -	- - -	0	BONANZA - VERNAL 138 #1	90 93%	-	None	
B 0a	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	87 39%	-	None	
B 1	0	- - -	- - -	0	SIGURD - SIGURDPS 230 #1	89 31%	-	None	
B51	0	- - -	- - -	0	DAVEJOHN - LAR RIVR 230 #1	8 . 0%	-	None	
B52	0	- - -	- - -	0	CASPERPP 230 / 115 #1	93.11%	-	None	
B53	0	- - -	- - -	0	CASPERPP 230 / 115 #1	88 22%	-	None	Negative Vdevs
B53a	0	- - -	- - -	0	CASPERPP 230 / 115 #1	88 2 %	-	None	
B61	0	- - -	- - -	0	GRACE - SODA 138 #1	70 57%	-	None	
B62	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	70 21%	-	None	
C02	0	3M KNOLL 3 5	6.6	2	BR DGER - BR DGE&A 3 5 #1	125.62%	-	None	2311.31 Amps
C02a	0	- - -	- - -	1	BR DGER - BR DGE&A 3 5 #1	110.68%	-	None	2036.57 Amps
C03	0	POPULUS 500	5.1	0	D LLON S 161 / 69 #1	93 38%	-	None	
C03a	0	- - -	- - -	0	D LLON S 161 / 69 #1	93 28%	-	None	
C03b	0	PTRSNFRG 69	5.6	0	D LLON S 161 / 69 #1	93 00%	-	None	
C03c	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	86 23%	-	None	
C0	0	POPULUS 500	5.1	0	D LLON S 161 / 69 #1	93 38%	-	None	
C0 a	0	- - -	- - -	0	D LLON S 161 / 69 #1	93 28%	-	None	
C0 b	0	PTRSNFRG 69	5.6	0	D LLON S 161 / 69 #1	93 00%	-	None	
C0 c	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	86 23%	-	None	
C05	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	87 5 %	-	None	
C05a	0	- - -	- - -	0	SIGURD - SIGURDPS 230 #1	82 96%	-	None	
C06	0	- - -	- - -	0	SIGURD - SIGURDPS 230 #1	83. 5%	-	None	
C06a	0	- - -	- - -	0	SIGURD - SIGURDPS 230 #1	83. 7%	-	None	
C07	0	- - -	- - -	0	- - -	- - -	-	None	
C08	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	91 65%	-	None	
C09	0	- - -	- - -	0	- - -	- - -	-	None	
C10	0	- - -	- - -	0	- - -	- - -	-	None	
C11	0	- - -	- - -	0	SIGURD - SIGURDPS 230 #1	8 29%	-	None	
C12	0	- - -	- - -	0	GRACE - SODA 138 #1	71 20%	-	None	
C13	0	- - -	- - -	0	HUNT 138 / 230 #2	77 98%	-	None	
C1	0	- - -	- - -	0	- - -	- - -	-	None	
C15	0	- - -	- - -	0	M DPOINT 138 / 230 #1	79 59%	-	None	
C16	0	- - -	- - -	0	- - -	- - -	-	None	
C18	0	- - -	- - -	0	- - -	- - -	-	None	
C19	0	- - -	- - -	0	M DPOINT 138 / 230 #1	79. 8%	-	None	
C20	0	- - -	- - -	0	M DPOINT 138 / 230 #1	7 .13%	-	None	
C21	0	- - -	- - -	0	M DPOINT 138 / 230 #1	79 02%	-	None	
C23	0	- - -	- - -	0	FOURCORN - PINTO PS 3 5 #1	82 21%	-	None	
C2	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	98 2 %	-	None	
C2 a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	88 99%	-	None	
C25	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	98 2 %	-	None	
C25a	0	- - -	- - -	0	BR DGER - BR DGE&A 3 5 #1	88 99%	-	None	
C28x	0	- - -	- - -		GLENCANY 230 / 3 5 #1	102.75%	-	None	

1) Vol age Violations > 5% for Level B & > 10% for Level C

Appendix 3-9 Pg.2 - - - Post-transient Results For Bridger / Anticline West vs. Rock Springs - Firehole West

INE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	BASE CASE / P PA H FLOWS																								Gen Drop	
			Aeo us South	Aeo us West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naughtn	West of RS / FH	M dpo nt West	Montana SE	Montana Idaho P18)	ot 4a	Bonanza West	ot 1a (30)	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP onder	RedB H Allen (ot 2C)	Pinto 4Corners 2B1)	Sigurd GlenC (2B 2)	daho Area Sys em osses	Pace Area System osses	Bridger Gen Tr ps	Aeolus Gen Trip
3																													
5		egwstg1 8h9 RF 3972 2400 2650 1482 241 640 sav	1 82	2650	1572	2 00	-1092	1671	2 1	6 0	672	128	-190	18 3	533	375	12	2996	2 27	610	2159	110	50	37	23	218	666		
6																													
7																													
8		**Level "B" Con ingenc es**																											
9	B01	Ant c ine – Populus 500 kV Line	1863	2086	0	3300	-67	1338	309	713	375	35	-196	1650	576	05	89	2996	2276	81	2159	136	516	0	23	331	696	0	0
10	B01a	Ant c ine – Populus 500 kV Line Drop Bridger G1	1790	2263	0	296	-6 9	1099	278	680	15	7	-215	1755	585	39	75	2996	2185		2159	12	72	13	225	282	678	575	0
11	B01g	Ant c ine – Populus 500 kV Line JBG1 KinpCap	1785	2270	0	2971	-653	110	278	679	159	75	-216	1757	58	39	76	2996	2187	6	2159	12	73	13	225	280	677	575	0
12	B02	Ant c ine 500 / 3 5 kV Transformer	1521	2600	1732	2219	-1078	1676	226	62	678	127	-192	1832	530	380	123	2996	2 28	608	2159	111	505	37	23	201	672	0	0
13	B03	Bridger – Populus 3 5 kV Line	550	25 9	782	2020	965	6 3	282	683	622	09	9	807	552	378	7	2996	2 0	590	2 59	3	503	35	233	22	690	0	0
1	B0	Bridger – 3M leknoll 3 5 kV Line	1588	2 91	1817	1877	-875	1605	316	719	617	9	-222	1785	560	383	113	2996	2387	576	2159	115	501	33	233	238	70	0	0
15	B05	Bridger 3 5 / 230 kV Transformer	1 8	26 8	1572	2 01	-1093	1670	239	638	672	128	-190	18 3	53	375	12	2996	2 26	608	2159	110	505	37	23	218	666	0	0
16	B06	3Milekno l – Goshen 3 5 kV Line	1507	2608	166	22 3	-1070	16 1	25	65	6 8	116	-205	1825	5 0	375	118	2996	2 0	593	2159	11	506	38	23	21	692	0	0
17	B06a	3Milekno l – Goshen 3 5 kV Line Bypas 3MK Caps	1527	2579	1703	2629	-1016	16 2	271	671	6 9	110	-208	181	5	376	118	2996	2 03	591	2159	11	506	37	23	215	685	0	0
18	B07	Kinport – Goshen 3 5 kV Line	1 82	2652	1567	2 08	-1093	167	2 0	639	675	129	-193	18	533	375	12	2996	2 26	609	2159	110	50	37	23	219	666	0	0
19	B08	Kinport – Borah 3 5 kV Line	1 8	26 8	1572	2398	-1091	1669	2 1	6 0	671	128	-189	18 3	53	375	123	2996	2 25	608	2159	110	505	37	23	218	667	0	0
20	B09	Populus – Borah 500 kV Line	150	2617	1 90	2	-1076	16 1	2 5	6	652	122	-191	1831	535	376	11	2996	2 11	596	2159	115	507	38	23	230	666	0	0
21	B10	Borah 500 / 3 5 kV Trans ormer	1 87	26 6	1555	2 12	-1080	1678	2 1	6 1	680	129	-192	18	535	377	12	2996	2 30	612	2159	109	502	36	23	219	666	0	0
22	B11	Borah 3 5 / 230 kV Trans ormer	1 8	26 9	156	2 05	-1086	1677	2 3	6 2	677	128	-195	18 3	53	376	12	2996	2 25	610	2159	109	50	36	23	219	667	0	0
23	B12	Populus – Cedar Hill 500 kV Line	1500	2605	1513	2 09	-1131	1565	2 3	6 2	561	108	-176	1813	529	366	126	2996	2363	557	2159	120	525	9	238	226	667	0	0
25	B1	Cedar Hi l – Hemingway 500 kV Line	1502	2600	1508	2 09	-1129	1562	2 3	6 2	558	107	-176	1812	529	366	125	2996	2361	555	2159	121	525	9	238	227	668	0	0
26	B15	Midpoint – Hemingway 500 kV Line	1 88	26 0	1565	2396	-1091	1657	2 1	6 0	659	126	-188	1838	53	375	12	2996	2 18	603	2159	111	506	38	23	218	668	0	0
27	B16	Borah – M dpoint 500 kV Line	92	2626	55	2396	5	6 5	2	6	622	8	82	828	532	37	3	2996	2395	58	2 59	20	5	3	236	225	667	0	0
28	B17	Midpoint 500 / 3 5 kV Transformer	1 86	2650	1562	2 09	-1083	1680	2 1	6 1	702	131	-193	18 7	535	378	99	2996	2 38	619	2159	117	500	3	233	22	666	0	0
29	B18	Midpoint 3 5 / 230 kV Transformer	1 83	26 8	1571	2399	-1092	1668	2 1	6 0	667	128	-189	18 2	533	375	126	2996	2 23	606	2159	110	505	37	23	218	666	0	0
30	B19	Borah – Adelaide #2 3 5 kV Line	1 85	26 3	1572	2393	-1102	1651	2 1	6 0	658	125	-187	1838	533	37	117	2996	2 16	600	2159	115	508	39	235	219	667	0	0
31	B20	Ade a de – Midpoint #2 3 5 kV Line	1 83	26 8	1572	2397	-1096	166	2 0	6 0	668	127	-189	18 2	533	375	121	2996	2 23	605	2159	112	506	38	23	217	666	0	0
32	B21	Borah – Adelaide – M dpoint #1 3 5 kV Line	1 85	26 3	1572	2392	-1102	1650	2 1	6 0	658	125	-187	1838	533	373	117	2996	2 16	600	2159	115	508	39	235	218	667	0	0
33	B22	Borah – Hunt 230 kV Line	1 8	26 6	1573	2396	-1097	1660	2 0	639	663	127	-187	18 1	533	37	121	2996	2 20	603	2159	112	506	38	23	219	666	0	0
3	B23	Midpoint – Bo se Bench #3 230 kV Line	1 8	26 6	1570	2398	-1095	1663	2 1	6 0	662	126	-188	18 1	533	37	126	2996	2 19	60	2159	110	506	38	23	219	666	0	0
35	B2	Midpoint – Ratt e Snake 230 kV Line	1 83	26 8	1571	2399	-1093	1668	2 1	6 0	669	128	-189	18 2	533	375	12	2996	2 2	607	2159	110	505	37	23	218	666	0	0
36	B25	Midpoint – Dram 230 kV Line	1 8	26 7	1571	2399	-1093	1667	2 1	6 0	667	127	-189	18 2	533	375	125	2996	2 22	606	2159	110	505	37	23	218	666	0	0
37	B26	Ratt e Snake – Boise Bench 230 kV Line	1 8	26 7	1571	2398	-109	166	2 1	6 0	66	126	-188	18 1	533	37	126	2996	2 17	605	2159	110	506	38	23	222	666	0	0
38	B27	Dram – Boise Bench 230 kV Line	83	26 9	57	2 00	09	67	2	6 0	673	28	90	8 3	53	375	23	2996	2 26	608	2 59	0	50	37	23	2 8	666	0	0
39	B28	Hemingway 500/230 kV Transformer	1 8	26 9	1570	2 01	-1090	1671	2 1	6 0	67	128	-190	18 3	53	375	122	2996	2 26	609	2159	110	50	37	23	219	666	0	0
1	B30	Populus – Borah #1 3 5 kV Line	8	2650	578	239	02	659	2	6 0	66	27	90	8	532	37	2	2996	2 9	603	2 59	2	507	38	235	2 9	666	0	0
2	B31	Populus – Borah #2 3 5 kV Line	1 82	26 8	1576	239	-1101	1659	2 1	6 0	66	126	-190	18 1	533	37	121	2996	2 19	603	2159	113	507	38	235	218	667	0	0
3	B32	Populus – Kinport 3 5 kV Line	1 78	2653	1567	2 10	-110	1665	2 0	6 0	669	127	-196	18 2	532	37	121	2996	2 18	60	2159	112	507	38	235	221	667	0	0
	B33	Populus – Ben Lomond #3 3 5 kV Line	1519	2610	15 2	2369	-1003	1700	25	65	695	131	-188	18 0	5	383	130	2996	2 5	629	2159	102	93	30	232	217	672	0	0
5	B3	Populus – Terminal 3 5 kV Line	1515	261	15 8	2376	-1020	1696	2 7	6 6	691	130	-188	1839	5 3	382	129	2996	2 3	625	2159	103	95	31	232	217	669	0	0
6	B35	Aeolus – Ant c ine 500 kV Line																											
7	B35a	Aeolus – Ant c ine 500 kV Line	2112	1183	632	1979	- 78	1038	192	590	10	35	-235	1606	577	91	67	2996	2156	18	2159	129	71	10	223	180	7 6	0	600
8	B35g	Aeolus – Ant c ine 500 kV Line	2120	1203	636	1986	- 75	1071	197	595	135	3	-253	163	571	82	68	2996	2158	19	2159	131	77	1	225	179	738	0	600
9	B36	Aeolus – Mona 500 kV Line																											
50	B36a	Aeolus – Mona 500 kV Line	0	3 3	19 5	2650	-187	1 9	303	706	75	115	-211	1738	695	522	1 8	2996	2 1	68	2159	33	353	336	197	2 1	672	0	600
51	B37	Aeolus 500 / 230 kV Transformer	1 69	26 0	1561	2399	-1091	1662	2 2	6 1	66	121	-191	1820	5 0	382	123	2996	2 23	607	2159	110	503	36	23	217	666	0	0
52	B38	Aeolus – Windstar 230 kV Line	1 29	2582	1528	2382	-1089	1622	238	637	626	91	-195	1730	559	11	121	2996	2 12	598	2159	108	95	30	232	215	672	0	0
53	B39	Aeolus – Freezeout 230 kV Line	1 55	2682	1555	2 25	-1101	1667	2 7	6 7	668	131	-189	1857	536	371	12	2996	2 2	610	2159	109	503	36	23	220	681	0	0
5	B 0	Bonanza –Mona 3 5kV Line	1598	267	1596	2 58	-12	1599	277	678	599	107	-196	1990	100	56	126	2996	2370	556	2159	93	56	395	220	223	689	0	0
55	B 0a	Bonanza –Mona 3 5kV Line RAS T ip Bonanza Plant	1576	2637	15 9	2 03	-1287	1 73	25	653	81	1	-205	192	55	3 8	121	2996	2360	588	2159	8	38	391	218	217	657	0	0
56	B 1	Hemingway – Summer Lake 500kV ine	1 93	2616	15 6	2389	-11 5	1570	2 1	6 0	5 8	11	-177	1818	527	363	1 7	2996	2350	5 8	2159	115	529	51	239	208	668	0	0
57	B51	DaveJon - Dif iculty 230 kV Line	1 33	2586	1531	2383	-1089	1625	238	637	629	93	-195	1736	558	09	121	2996	2 13	599	2159	108	96	30	232	215	669	0	0
58	B52	Spence - Mustang 230 kV Line	1 99	2536	1566	2316	-1066	1623	225	62	628	83	-197	17 5	5 5	01	120	2996	2 16	601	2159	110	500	33	233	209	673	0	0
59	B53	Riverton - Atlant c 230 kV Line	1515	2 90	1580	2366	-1133	1617	22	623	622	9	-200	1728	5 0	12	121	2996	2 29	609	2159	108	98	32	232	215	66	0	0
60	B53a	Riverton - Atlant c 230 kV Line	1515	2 88	1580	2365	-1133	1616	22	622	621	7	-200	1728	5 0	12	121	2996	2 30	609	2159	108	97	32	232	215	663		
61	B61	Pal sades - Raven 230 kV Line	150	2621	1593	2 62	-1173	1666	77	80	667	12	-190	1835	5	376	12	2996	2 25	609	2159	109	501	3	233	22	666		
62	B62	Fireho e - Mansface - BRPP - S.Trona 230 kV Line	1 97	2630	1588	2 2	-1138	1676	1 0	520	677	12	-190	1837	5 7	368	12	2996	2 29	607	2159	110	50	36	23	222	668		
63																												N-1 Criteria; > >	
6																													
65		**Level "C" Con ingenc es**																											
68	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1668	2366	2138	1360	-750	1515	351	757	537	71	-19	1738	58	385	105	2996	2365	555	2159	119	501	32	232	20	7 9	0	0
69	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1588	2555	1965	1225	-7	1273	313	716	313	11	-213	18 8	590	20	91	2996	2271	518	2159	108	58	0	222	180	713	575	0
70	C03	Bridger – 3M leKno l Br dger – Populus #1 3 5 kV ines	170	2309	215	1236	-661	1518	38	792	5 2	56	-232	1715	590	389	102	2996	2350	5	2159	120	99	30	231	227	752	0	0
71	C03a	Bridger – 3M leKno l Br dger – Populus #1 3 5 kV ines w/ RAS	1621	250	199	1097	-660	1275	3 5	751	317	100	-2 6	1828	596	23	88	2996	2259	508	2159	109	56	03	222	195	721	575	0
72	C03b	Bridger – 3M leKno l Br dger – Populus #1 3 5 kV ines w/ RAS	15 3	2687	1827	951	-65	1017	306	708	77	1 2	-259	1937	603	60	73	2996	2163	69	2159	98	12	373	211	172	700	1150	0
73	C03c	Bridger–3MK B idge-Pop#1 3 5 RAS; 2JBG Path18 Caps UV Loa	15 1	2679	182	9 7	-685	1077	30	707	132	1 2	-2 8	1927	597	51	78	2996	2191	83	2159	99	21	379	213	169	692	1150	0
7	C0	Bridger – 3M leKno l Br dger – Populus #2 3 5 kV ines	170	2309	215	1236	-661	1518	38	792	5 2	56	-232	1715	590	389	102	2996	2350	5	2159	120	99	30	231	227	752	0	0
75	C0 a	Bridger – 3M leKno l Br dger – Populus #2 3 5 kV ines w/ RAS	1621	250	199	1097	-660	1275	3 5	751	317	100	-2 6	1828	596	23	88	2996	2259	508	2159	109	56	03	222	195	721	575	0
76	C0 b	Bridger – 3M leKno l Br dger – Populus #2 3 5 kV ines w/ RAS	15 3	2687	1827	951	-65	1017	306	708	77	1 2	-259	1937	603	60	73	2996	2163	69	2159	98	12	373	211	172	700	1150	0
77	C0 c	Bridger–3MK Br dge-Pop#2 3 5 RAS; 2JBG Path18 Caps UV Loa	15 1	2679	182	9 7	-685	1077	30	707	132	1 2	-2 8	1927	597	51	78	2996	2191	83	2159	99	21	379	213	169	692	1150	0
78	C05	Borah – Populus 3 5 kV DLO	1 77	26 7	1590	2379	-1126	1632	2 1	6 0	6	121	-191	1835	530	370	11	2996	2 03	590	2159	118	513	2	236	219	668	0	0
79	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1 27	2788	1 82	2102	-1066	1362	215	613	395	153	-212	1926	5 5	09	97	2996	2301	5 2	2159	107	68	13	225	191	656	575	0
80	C06	Populus – Ben Lomond 3 5 kV DLO	1592	2533	1 83	2307	-820	1765	282	68	7	138	-186	1835	566	01	1 5	2996	2 90	673	2159	8	69	1	226	215	68	0	0
81	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Series Ca	161	2 97	15 0	2188	-77	1760	299	701	7 1	131	-192	1820	570	01	1 3	2996	2 86	667	2159	85	69	1	226	209	686	0	0
82	C07	Ben Lomond – Terminal 3 5 kV DLO	1 91	26 0	1568	2396	-1078	1677	238	637	677	129	-189	18 2	536	377	125	2996	2 30	612	2159	108	502	35	23	218	666	0	0
83	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1 75	2652	1572	2 03	-1123	16 6	2 1	6 0	656	122	-198	1838	529	371	116	2996	2 08	592	2159	117	511	1	235	222	668	0	0
85	C09	Populus – Borah #2 3 5 kV Treasureton – Brady 230 kV Lines	1 82	26 8	1575	239	-1099	1659	2 1	6 1	66	126	-190	18 1	533	37	121	2996	2 19	603	2159	112	507	38	235	218	667	0	0
86	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1 81	26 9	1576	239	-1100	1659	2 1	6 1	66	127	-190	18 1	532	37	121	2996	2 19	603	2159	112	507	38	235	219	667	0	0
87	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1568	2557	1506	2333	-891	17 1	265	665	726	135	-186	1835	559	39	139	2996	2 73	657	2159	91	78	20	228	216	676	0	0
88	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1517	2612	15 5	2375	-101	1697	2 9	6 8	692	131	-188	1839	5	382	129	2996	2	626	2159	103	9	30	232	217	669	0	0
89	C13	Borah – Adelaide #2 Borah–ADT–Midpoint #1 3 5 kV ines (RA)	1 89	2628	157	237	-1135	1596	2 1	6 0	619	116	-179	1826	530	369	98	2996	2393	575	2159	127	517		237	221	668	0	0
90	C1	Borah – Adelaide #2 M dpoint - Ade a de #2 3 5 kV ines (RA)	1 85	26 3	1572	2392	-1103	16 9	2 1	6 0	656	125	-187	1838	533	373	116	2996	2 15	600	2159	115	508	39	235	219	667	0	0
91	C15	Borah – Adelaide #2 Borah – Hunt 230 kV lines	1 86	2639	1573	2388	-1110	1637	2 0	639	6 6	123	-18	1835	532	372	113	2996	2 08	595	2159	117	510	0	235	221	667	0	0
92	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV ines (RA?)	1 85	26 2	1573	2391	-1102	1650	2 1	6 0	657	125	-187	1838	533	373	117	2996	2 16	600	2159	115	508	39	235	219	667	0	0
93	C18	Borah – Kinport M dpoint – Adelaide #2 3 5 kV lines (RA)	1 8	26 7	1573	2395	-1095	1663	2 1	6 0	667	127	-188	18 1	533	375	121	2996	2 23	605	2159	112	506	38	23	217	667	0	0
9	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA?)	1 8	26 5	157	239	-1097	1659	2 0	6 0	662	127	-187	18 0	533	37	121	2996	2 19	603	2159	112	506	38	23	219	667	0	0
95	C20	Borah–Adel–Midpoint #1 Midpoint – Adela de #2 3 5 kV ines	1 86	2639	157	2387	-1111	1636	2 0	6 0	6 8	123	-18	1835	532	372	112	2996	2 11	59	2159	118	510	0	235	217	667	0	0
96	C21	Borah-Adel-Midpoint #1 3 5 kV Borah Hunt 230 kV ines (RA)	1 86	2639	157	2387	-1111	1636	2 0	639	6 5	123	-18	1835	532	372	112	2996	2 08	59	2159	118	510	0	235	220	667	0	0
97	C23	Borah – Adel #2 3 5 kV Borah – M dpoint 500 kV Lines	1 95	261	15 7	2386	-1136	1577	2 2	6 1	591	111	-177	1819	530	367	102	2996	2377	563	2159	128	521	7	237	229	668	0	0
98	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	1551	25 7	1795	200	-963	1611	283	68	620	108	-189	1806	552	378	117	2996	2 01	590	2159	113	503	35	233	219	691	0	0
99	C2 a	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1 8	2712	1659	179	-933	135	251	650	383	1 5	-212	1905	562	15	101	2996	2303	5 6	2159	103	60	07	223	191	671	575	0
100	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines	1551	25 7	1795	200	-963	1611	283	68	620	108	-189	1806	552	378	117	2996	2 01	590	2159	113	503	35	233	219	691	0	0
101	C25a	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines w/ RAS	1 8	2712	1659	179	-933	135	251	650	383	1 5	-212	1905	562	15	101	2996	2303	5 6	2159	103	60	07	223	191	671	575	0
106	C28x	Palo Verde - Trip 1&2, w/ FACRI	1558	2657	1561	2 05	-1255	1528	2 6	6 5	53	155	-211	1908	552	385	128	2996	3359	1852	2159	85	6 0	535	266	218	731	0	0
107																													
108																												N-2 Criteria; > >	
109																													
110																													
111		**Margin est w/ Bridger West at 5% of 4100 MW**																											
112		egwstg1 8h9 RF 4305 2520 2840 1479 095 489 sav	1 79	28 0	1785	2520	-811	2200	95	89	1235	130	-136	20	569	15	83	2996	2575	758	16	152	503	52	252	2 3	722		
113																													
11		**Margin est w/ RS / FH > 5% of 640 MW**																											
115		egwstg1 8h9 RF 3972 2400 2678 1479 271 672 sav	1 79	2678	1572	2 00	-1057	1702	271	672	70	125	-186	1870	538	387	122	2996	2 09	593	2159	112	50	39	235	218	675		

INE #	CON INGENCY#	REAC IVE MARGIN MVAR (Gray shaded ce ls are the min mum margins)																							
		Aeo us 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	M dpo nt 500	Heminway 500	CedarHil 500	Bridger 345	oshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeo us 230	M ners 230	Mustang 230	Riverton 230	onahGas 230	ladstone 230
9	B01	-77	-1255	-608	-807	-821	-108	-15	-952	- 85	- 10	-36	-6 8	-719	-753	-1009	-1332	-1335	-805	-8 5	-616	-281	-281	-212	7
10	B01a	-803	-1 29	-688	-112	-1136	-1 51	-1960	-1256	-6 5	-55	-508	-90	-1027	-1059	-1293	-1657	-1 90	-801	-85	-617	-273	-270	-219	78
11	B01g	-8 2	-1 72	-733	-1267	-1279	-1608	-213	-1382	-716	-629	-572	-1030	-1171	-1203	-1 33	-1787	-1527	-802	-890	-6 0	-278	-271	-221	78
12	B02	-1008	-1786	-1033	-18	-1865	-2100	-2561	-1758	1091	-891	-869	-1556	-1839	-1833	-1902	-2097	-18 0	-8 7	-1026	-729	-306	-303	-2 7	82
13	B03	-1116	-1702	-1182	-1505	-15 1	-18 0	-2379	-1561	1050	-752	-737	-129	-152	-1516	-1670	-1950	-1739	-838	-1092	-736	-322	-315	-2 1	80
1	B0	-10 5	-1577	-1000	-1123	-1127	-1 31	-19 7	-12 5	-919	- 2	-381	-851	-1072	-1057	-129	-167	-161	-830	-1028	-710	-321	-308	-229	80
15	B05	-1195	-1821	-1 1	-1775	-1779	-2050	-2582	-173	1329	-871	-883	-1507	-1776	-1760	-1887	-2106	-1859	-8 7	-116	-761	-308	-309	-2 5	82
16	B06	-1172	-1769	-1367	-1665	-1653	-1929	-2 38	-1652	1287	-607	-768	-1320	-16 1	-1607	-1777	-2020	-180	-8 5	-11 3	-756	-321	-317	-2 8	81
17	B06a	-11 9	-173	-1290	-1561	-1557	-18 8	-2383	-1587	120	-580	-51	-12 0	-1532	-1505	-1701	-1975	-1769	-8 2	-1122	-7 8	-321	-315	-2 5	81
18	B07	-1202	-1829	-1378	-1756	-1761	-2052	-2588	-1732	1182	-339	-522	-15 6	-1757	-1736	-1880	-2116	-1868	-8 8	-1171	-765	-316	-312	-2 8	82
19	B08	-1197	-1817	-1 01	-1758	-1771	-2038	-2569	-172	1313	-82	-857	-1370	-17	-1757	-1875	-2098	-1855	-8 8	-1166	-763	-316	-313	-2 8	82
20	B09	-119	-1793	-1361	-1606	-1600	-1957	-251	-1638	1280	-839	-8 9	-1 39	-1688	-1680	-18	-2070	-1828	-8 7	-116	-763	-316	-312	-2 7	81
21	B10	-1198	-1818	-1 10	-1777	-16 0	-203	-2561	-1727	1322	-8 9	-869	-1 9	-1728	-16 3	-1869	-2100	-1856	-8 7	-1167	-763	-316	-312	-2 8	82
22	B11	-1201	-1822	-1 03	-17 9	-1752	-2022	-2563	-1717	131	-823	-85	-1 1	-1739	-1730	-1866	-2103	-1861	-8 8	-1170	-765	-316	-312	-2 8	82
23	B12	-1212	-1793	-1370	-1531	-1635	-2036	-2381	-986	1292	-8 7	-860	-1 13	-1627	-163	-1831	-205	-1828	-851	-1183	-771	-319	-318	-250	80
25	B1	-1199	-1777	-133	-1 8	-1587	-198	-2338	-1050	1255	-827	-838	-1369	-1575	-1582	-1801	-2030	-1812	-850	-1170	-766	-319	-317	-2 9	80
26	B15	-1179	-1792	-1330	-1597	-150	-1 15	-2326	-1685	1239	-806	821	-1332	-156	-1513	-1793	-20 8	-1826	-8 7	-11 9	-756	-316	-312	-2 7	-81
27	B16	-1195	-179	-1362	-1618	-1 83	-1850	-2 25	-1663	1277	-835	8 8	-1 00	-163	-1610	-1825	-2056	-1828	-8 9	-116	-762	-317	-315	-2 9	-81
28	B17	-1198	-1819	-1 10	-176	-1762	-1778	-25 9	-1720	1326	-86	878	-1 88	-1756	-1731	-1883	-2107	-1858	-8 7	-1167	-763	-316	-311	-2 8	-82
29	B18	-1199	-1821	-1 12	-1766	-1766	-2031	-2569	-1725	-1331	-869	882	-1500	-1768	-17 9	-1886	-2105	-1859	-8 8	-1168	-76	-317	-313	-2 9	-82
30	B19	-1196	-1812	-139	-1732	-173	-200	-2528	-1707	-1310	-85	868	-1 60	-1721	-1690	-1862	-2085	-18 7	-8 8	-1165	-763	-317	-31	-2 9	-81
31	B20	-1200	-1820	-1 12	-1765	-1767	-2058	-2581	-1733	-1330	-866	880	-1 86	-1753	-1722	-1882	-2103	-1858	-8 8	-1169	-76	-317	-313	-2 9	-82
32	B21	-1196	-1811	-1393	-1725	-1728	-2017	-2537	-1708	-1308	-851	865	-1 8	-1706	-1668	-1858	-208	-18 6	-8 8	-1165	-763	-317	-31	-2 9	-81
33	B22	-1198	-1816	-1 07	-1757	-1760	-2025	-25	-1721	-1325	-862	877	-1 82	-1752	-1732	-1877	-2098	-1855	-8 8	-1167	-763	-317	-313	-2 9	-82
3	B23	-1198	-1817	-1 06	-17 9	-17	-1996	-2536	-1715	-132	-86	877	-1 83	-17 7	-172	-1878	-2099	-1855	-8 8	-1167	-763	-317	-313	-2 9	-82
35	B2	-1198	-1819	-1 03	-1729	-1713	-197	-2570	-1702	1322	-862	876	-1 67	-1725	-1693	-1875	-2101	-1858	-8 8	-1167	-76	-317	-313	-2 9	82
36	B25	-1198	-1819	-1 09	-1761	-1760	-2019	-2552	-1722	1328	-867	-880	-1 9	-1761	-17 1	-1883	-2102	-1857	-8 8	-1167	-763	-317	-313	-2 9	82
37	B26	-1199	-1819	-1 12	-1770	-1773	-2027	-2533	-1725	1331	-869	-882	-1502	-1772	-1755	-1886	-2103	-1857	-8 8	-1168	-76	-317	-313	-2 9	82
38	B27	-1199	-1821	-1 13	-1775	-1778	-20	-2580	-1733	1333	-871	-883	-1506	-1777	-1760	-1889	-2106	-1859	-8 8	-1167	-76	-317	-313	-2 9	82
39	B28	-1198	-1820	-1 09	-1763	-1766	-2031	-2568	-1719	1329	-868	-880	-1 98	-1766	-17 9	-1885	-210	-1858	-8 8	-1167	-763	-316	-313	-2 8	82
1	B30	-120	-1828	-1 25	-1792	-1787	-20 9	-2578	-17 2	13 6	-87	890	-1520	-1781	-1753	-1896	-2110	-1866	-8 9	-1173	-766	-317	-31	-2 9	-82
2	B31	-1200	-1819	-1 10	-1765	-1763	-2028	-2562	-1726	1328	-865	879	-1 98	-175	-1729	-1880	-2098	-1858	-8 9	-1169	-76	-317	-313	-2 9	82
3	B32	-1208	-1836	-1 16	-1766	-1735	-2013	-2565	-1725	1325	-7 6	827	-1205	-1776	-1681	-1892	-2115	-1876	-8 9	-1176	-767	-317	-313	-2 9	-82
	B33	-1181	-1755	-1367	-1658	-1662	-19 9	-2 93	-1659	1279	-839	855	-1 03	-1623	-1630	-167	-1955	-1788	-8 1	-1151	-757	-316	-309	-2 5	-82
5	B3	-1180	-17	-1360	-16 5	-16 9	-1938	-2 85	-1651	1270	-833	8 8	-1391	-1608	-1615	-1798	-19 5	-1775	-8 2	-1150	-757	-316	-311	-2 7	-82
6	B35																								
7	B35a	-713	-1023	-1382	-2017	-20 2	-2306	-27 7	-1923	1396	-999	-1055	-1781	-206	-2056	-1635	-1519	-1138	-765	-781	-5 7	-168	-160	-206	7
8	B35g	-85	-1232	-1 96	-2216	-2228	-2 15	-2825	-2009	1566	-109	-11	-1966	-2295	-227	-18 3	-1769	-1371	-783	-920	-626	-217	-211	-225	75
9	B36																								
50	B36a	-1318	-1865	-1125	-1279	-1352	-1709	-22 6	-1 06	-9 3	-76	-713	-1173	-1318	-1337	-1659	-2118	-2020	-7 9	-13 5	-8 6	-291	-276	-223	80
51	B37	-1080	-1828	-1336	-17 1	-1770	-20 9	-258	-1730	1289	-873	-883	-1505	-1768	-1755	-1889	-2116	-1872	-8	-1036	-708	-311	-306	-2 6	81
52	B38	-1216	-1870	-1 78	-18 0	-1826	-2088	-2608	-1767	1383	-883	-899	-15	-1828	-1808	-1912	-2150	-1905	-830	-1169	-781	-281	-269	-237	79
53	B39	-776	-1 92	- 05	-559	-638	-883	-1233	-689	- 15	- 16	-320	-599	-563	-6	-893	-1323	-1881	-619	-8 2	-2	-82	-87	-56	82
5	B 0	-976	-1711	-116	-1533	-1591	-1919	-2 69	-1602	1125	-815	-808	-1361	-1567	-1575	-17 9	-2017	-1767	-567	-955	-676	-302	-296	-23	71
55	B 0a	-1075	-1781	-1307	-1699	-1732	-2018	-2551	-1710	1253	-857	-861	-1 66	-1718	-1712	-1831	-209	-1827	-532	-1050	-718	-308	-299	-2 1	81
56	B 1	-1212	-1803	-1 00	-1652	-1639	-1757	-18 1	-1530	1321	-857	-87	-1 37	-1677	-16 6	-1853	-2069	-1839	-852	-1181	-770	-319	-318	-250	80
57	B51	-122	-1865	-1 70	-1829	-1820	-2083	-2606	-1763	1369	-881	-896	-1539	-1821	-1801	-1908	-21 5	-1900	-830	-1179	-778	-280	-268	-237	79
58	B52	-992	-179	-1373	-1821	-1853	-2118	-2600	-1777	1369	-891	-936	-1591	-1880	-1861	-1906	-210	-1839	-838	-963	-680	-252	-2 0	-237	80
59	B53	-1031	-1779	-1257	-1657	-1706	-2006	-25 5	-1686	1210	-858	-85	-1 53	-1697	-1692	-188	-2089	-182	-83	-1006	-690	-313	-27	-221	80
60	B53a	-1011	-1777	-1239	-16 1	-169	-2000	-2539	-1676	1196	-855	-850	-1 6	-1683	-1681	-1882	-2087	-1821	-833	-985	-681	-301	-2 2	-220	80
61	B61	-1177	-1796	-1358	-1706	-1719	-2001	-25 5	-1695	1272	-850	-853	-1 5	-1708	-1696	-18 9	-2086	-1833	-8 3	-11 8	-758	-318	-313	-2 0	81
62	B62	-1180	-1800	-1363	-1713	-1725	-2007	-2550	-1698	1280	-853	-856	-1 59	-1715	-1702	-185	-2085	-1835	-8	-1150	-758	-317	-312	-2 1	81
63		**713**	**1023**	**405**	**559**	**638**	**883**	**1233**	**689**	**415**	**339**	**320**	**599**	**563**	**644**	**893**	**1323**	**1138**	**532**	**781**	**2**	**82**	**87**	**56**	**71**
6						500	500	500	500	100			250		250										
65																									
68	C02	-886	-1 37	-7 8	-1005	-1088	-1 09	-1897	-1165	-636	-522	- 7	-911	-1081	-1069	-1231	-155	-1505	-815	-896	-657	-329	-31	-216	77
69	C02a	-985	-1630	-955	-1336	-1 19	-1732	-22 1	-1 7	-817	-67	-631	-1193	-1 35	-1 10	-153	-1858	-1677	-813	-970	-686	-318	-305	-231	81
70	C03	-802	-130	-66	-79	-831	-1097	-1587	-987	-599	-363	-331	-6 6	-780	-776	-9 0	-1268	-1387	-80	-825	-622	-327	-305	-199	77
71	C03a	-937	-1537	-895	-1126	-1162	-1 58	-197	-1260	-811	- 58	- 07	-871	-1120	-108	-1275	-1657	-1592	-806	-927	-666	-318	-300	-218	80
72	C03b	-971	-1683	-1002	-1327	-1355	-16 8	-2158	-1 30	-922	-518	- 51	-1015	-1323	-1278	-1 98	-1899	-1732	-801	-955	-678	-303	-287	-228	8
73	C03c	-999	-1716	-1063	-1 90	-15	-1828	-2326	-1558	-97	-638	526	-12 1	-15 2	-1511	-1630	-198	-1760	-806	-982	-690	-306	-292	-231	83
7	C0	-802	-130	-66	-79	-831	-1097	-1587	-935	-599	-363	-331	-6 6	-780	-776	-9 0	-1268	-1387	-80	-825	-622	-327	-305	-199	77
75	C0 a	-937	-1537	-895	-1126	-1162	-1 58	-1961	-1260	-811	- 58	- 07	-871	-1120	-108	-1275	-1657	-1592	-806	-927	-666	-318	-300	-218	80
76	C0 b	-971	-1683	-1002	-1327	-1355	-16 8	-2158	-1 30	-922	-518	- 51	-1015	-1323	-1278	-1 98	-1899	-1732	-801	-955	-678	-303	-287	-228	8
77	C0 c	-999	-1716	-1063	-1 90	-15	-1828	-2326	-1558	-97	-638	526	-12 1	-15 2	-1511	-1630	-198	-1760	-806	-982	-690	-306	-292	-231	83
78	C05	-120	-1821	-1 07	-1751	-1733	-1988	-2520	-1715	132	-85	-873	-1 8	-1711	-1660	-186	-2081	-1856	-850	-1173	-766	-318	-315	-2 9	81
79	C05a	-1176	-1909	-1 09	-1860	-18 6	-2071	-2587	-1793	1376	-909	-921	-158	-1853	-1765	-1979	-2200	-19 8	-8 0	-11 5	-755	-305	-299	-2 9	8
80	C06	-11 8	-1621	-1312	-1509	-151	-1815	-2370	-1557	1217	-802	-82	-127	-1 29	-1 66	-13 5	-169	-165	-826	-1121	-7 6	-315	-303	-236	82
81	C06a	-1120	-1583	-1221	-1381	-1389	-1699	-22 9	-1 61	1122	-695	701	-115	-1298	-133	-1308	-165	-1617	-823	-1095	-736	-316	-302	-233	82
82	C07	-1192	-1763	-1389	-1700	-1700	-1990	-2537	-1690	1300	-8 9	-861	-1 37	-1669	-1669	-1522	-1987	-1792	-8 6	-1162	-762	-317	-313	-2 8	82
83	C08	-1208	-1832	-1 00	-1727	-1672	-19 9	-2511	-1697	1305	-711	-802	-11 0	-1730	-1577	-1871	-2096	-1872	-850	-1177	-768	-317	-31	-2 9	81
85	C09	-1198	-1816	-1 02	-1752	-17 8	-2009	-25 0	-1716	1320	-859	-869	-1 8	-17 1	-1711	-18 2	-2089	-185	-8 8	-1167	-763	-317	-313	-2 8	82
86	C10	-1203	-182	-1 18	-1778	-1771	-2030	-2556	-1731	1337	-869	-880	-1507	-1768	-1735	-1857	-2102	-1863	-8 9	-1171	-765	-317	-313	-2 9	82
87	C11	-1155	-1652	-1307	-1517	-1521	-1823	-2375	-1562	1212	-797	-817	-1279	-1 5	-1 75	-1557	-176	-1682	-832	-1127	-7 8	-316	-307	-2 1	82
88	C12	-1178	-17 0	-1350	-1629	-1632	-1918	-2 60	-1639	1261	-826	-838	-1375	-1593	-1596	-1760	-1936	-1772	-8 2	-11 8	-756	-316	-311	-2 6	82
89	C13	-119	-1788	-1359	-16 0	-1639	-1891	-2388	-1652	1268	-820	-838	-1361	-1600	-153	-1802	-2039	-1821	-850	-116	-762	-318	-316	-2 9	81
90	C1	-1197	-1812	-139	-1725	-1727	-201	-2533	-1708	1309	-851	-866	-1 8	-1706	-1667	-1858	-208	-18 7	-8 9	-1166	-763	-317	-31	-2 9	81
91	C15	-1195	-1807	-1387	-1710	-1712	-1972	-2 77	-1693	1301	-8	-860	-1 31	-1691	-1655	-18 7	-2075	-18 1	-8 9	-1165	-762	-317	-31	-2 9	81
92	C16	-119	-1808	-1380	-1706	-1718	-200	-2525	-1698	1288	-807	-8 0	-1323	-1675	-1661	-18 3	-2076	-18 2	-8 8	-116	-762	-317	-313	-2 8	81
93	C18	-1198	-1816	-1399	-17 6	-1758	-20 6	-2569	-1723	1310	-820	-85	-1355	-1720	-1716	-1867	-2095	-185	-8 8	-1167	-763	-317	-313	-2 9	82
9	C19	-1196	-1815	-139	-1739	-1751	-201	-2531	-1712	1305	-815	-850	-13 6	-1717	-1727	-1862	-2090	-1850	-8 8	-1165	-763	-317	-313	-2 9	82
95	C20	-1196	-1805	-1378	-167	-1676	-2023	-2523	-169	1287	-829	-8 9	-1376	-1622	-1550	-182	-2068	-1839	-8 9	-1165	-763	-317	-31	-2 9	81
96	C21	-1196	-1806	-1385	-1702	-170	-1985	-2 86	-1693	1298	-8 0	-858	-1 17	-1675	-1631	-18 2	-2073	-18 1	-8 9	-1165	-763	-317	-31	-2 9	81
97	C23	-119	-1776	-1337	-155	-1 15	-17 0	-2328	-1622	12 8	-812	-827	-1336	-1556	-1515	-178	-2023	-1809	-850	-116	-762	-318	-317	-2 9	80
98	C2	-1115	-1707	-1127	-1 72	-1509	-1833	-2382	-15	-893	-282	- 28	-1330	-1 99	-1 82	-1651	-1953	-17 5	-837	-1091	-737	-322	-315	-2 1	80
99	C2 a	-1135	-1852	-1258	-1788	-1807	-2092	-2596	-1758	10 5	-337	-505	-1596	-1832	-1793	-1902	-2160	-189	-831	-1108	-7 2	-309	-302	-2	83
100	C25	-1115	-1707	-1127	-1 72	-1509	-1833	-2382	-15	-893	-282	- 28	-1330	-1 99	-1 82	-1651	-1953	-17 5	-837	-1091	-737	-322	-315	-2 1	80
101	C25a	-1135	-1852	-1258	-1788	-1807	-2092	-2596	-1758	10 5	-337	-505	-1596	-1832	-1793	-1901	-2160	-189	-831	-1108	-7 2	-309	-302	-2	83
106	C28x	-1069	-1556	-1291	-1661	-1701	-2002	-2565	-1692	123	-8	-8 9	-1 35	-1678	-1677	-1699	-1751	-1603	-82	-10 3	-713	-307	-295	-2 1	51
107		**802**	**1304**	**664**	**794**	**831**	**1097**	**1587**	**935**	**599**	**282**	**331**	**646**	**780**	**776**	**940**	**1268**	**1387**	**801**	**825**	**622**	**303**	**287**	**199**	**51**
108						00	00	00	00	100			200		200										

INE #	CON INGENCY#	Voltage Deviation	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Voltage	COMMEN
					Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs					
5						S DNEY 115 / 230 #1	109.86%			
6						CTTNWD N - KETTLECK 115 #1	10 .70%			
7						KELKER W - ROCKISLD 115 #1	100.16%			
8					**CON INGENCY LOAD NGS**					
9	B01	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	111.1 %	-	None	0 .90 Amps
10	B01a	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	99 93%	-	None	838.78 Amps
11	B01g	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	99 66%	-	None	
12	B02	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	79 50%	-	None	
13	B03	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	99 0 %	-	None	
1	B0	0	- - -	- - -	0	RAVEN - RHONE P 3 .5 #1	83 06%	-	None	
15	B05	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
16	B06	0	- - -	- - -	2	GRACE - SODA 138 #1	111.89%	-	None	
17	B06a	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.15%	-	None	
18	B07	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	86 62%	-	None	
19	B08	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
20	B09	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	86.72%	-	None	
21	B10	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
22	B11	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
23	B12	0	- - -	- - -	0	LOCUST - MORA 138 #1	82 25%	-	None	
25	B1	0	- - -	- - -	0	LOCUST - MORA 138 #1	82 37%	-	None	
26	B15	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.13%	-	None	
27	B16	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.13%	-	None	
28	B17	0	- - -	- - -	0	LOCUST - MORA 138 #1	88.17%	-	None	
29	B18	0	- - -	- - -	0	MIDPOINT 230 / 3 5 #2	81 58%	-	None	
30	B19	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
31	B20	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
32	B21	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
33	B22	0	- - -	- - -	0	MIDPOINT 230 / 3 5 #2	79 52%	-	None	
3	B23	0	- - -	- - -	0	LOCUST - MORA 138 #1	87.75%	-	None	
35	B2	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
36	B25	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
37	B26	0	- - -	- - -	0	LOCUST - MORA 138 #1	90 61%	-	None	
38	B27	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
39	B28	0	- - -	- - -	0	LOCUST - MORA 138 #1	82.73%	-	None	
1	B30	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
2	B31	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
3	B32	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	88 30%	-	None	
	B33	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.1 %	-	None	
5	B3	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.1 %	-	None	
6	B35					**P CASE DIVERGED**				
7	B35a	58	GREATDIV 3 5	9.7	1	MINERS 230 0 PLATTE 230.0 #1	101.97%	-	None	
8	B35g	0	- - -	- - -	1	MINERS 230 0 PLATTE 230.0 #1	99 99%	-	None	
9	B36					**P CASE DIVERGED**				
50	B36a	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	92 27%	-	None	
51	B37	0	- - -	- - -	2	AEOLUS 500 / 230 #2	100. %	-	None	
52	B38	0	- - -	- - -	0	DAVEJOHN - W NDSTAR 230 #1	99 87%	-	None	
53	B39	22	BA RO L 57	9 6	0	MINERS 230 0 PLATTE 230.0 #1	88 07%	-	None	
5	B 0	0	- - -	- - -	0	BONANZA - VERNAL 138 #1	96.16%	-	None	
55	B 0a	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	82.77%	-	None	
56	B 1	0	- - -	- - -	0	LOCUST - MORA 138 #1	87 51%	-	None	
57	B51	0	- - -	- - -	0	DAVEJOHN - LAR.RIVR 230 #1	83 93%	-	None	
58	B52	0	- - -	- - -	0	CASPERPP 230 / 115 #1	92 33%	-	None	
59	B53	0	- - -	- - -	0	CASPERPP 230 / 115 #1	87.77%	-	None	Negative Vdevs
60	B53a	0	- - -	- - -	0	CASPERPP 230 / 115 #1	87 80%	-	None	
61	B61	0	- - -	- - -	0	MANSFACE - FIREHOLE 230 0 #1	86 32%	-	None	
62	B62	0	- - -	- - -	0	PALISADE - ROCKSPGS 230 #1	93 53%	-	None	
68	C02	0	3M KNOLL 3 5	6 5	1	BR DGER - BRIDGE&A 3 5 #1	12 .8 %	-	None	297.00 Amps
69	C02a	0	- - -	- - -	1	BR DGER - BRIDGE&A 3 5 #1	110.10%	-	None	025.75 Amps
70	C03	0	RHONE P 3 5	5 5	3	BR DGER - ROCKSPGS 230 #1	103.35%	-	None	
71	C03a	0	PTRSNFRG 69	5 2	0	D LLON S 161 / 69 #1	92 98%	-	None	
72	C03b	0	PTRSNFRG 69	6 0	0	D LLON S 161 / 69 #1	92 65%	-	None	
73	C03c	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	81 5 %	-	None	
7	C0	0	RHONE P 3 5	5 5	3	BR DGER - ROCKSPGS 230 #1	103.35%	-	None	
75	C0 a	0	PTRSNFRG 69	5 2	0	D LLON S 161 / 69 #1	92 98%	-	None	
76	C0 b	0	PTRSNFRG 69	6 0	0	D LLON S 161 / 69 #1	92 65%	-	None	
77	C0 c	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	81 5 %	-	None	
78	C05	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	86.72%	-	None	
79	C05a	0	- - -	- - -	0	CASPERPP 230 / 115 #1	78 23%	-	None	
80	C06	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.17%	-	None	
81	C06a	0	- - -	- - -	0	DAVEJOHN - LAR.RIVR 230 #1	77 93%	-	None	
82	C07	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.13%	-	None	
83	C08	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	90 62%	-	None	
85	C09	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
86	C10	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
87	C11	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.17%	-	None	
88	C12	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.1 %	-	None	
89	C13	0	- - -	- - -	0	HUNT 138 / 230 #2	77.71%	-	None	
90	C1	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
91	C15	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79 63%	-	None	
92	C16	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
93	C18	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.12%	-	None	
9	C19	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79 5 %	-	None	
95	C20	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.13%	-	None	
96	C21	0	- - -	- - -	0	MIDPOINT 138 / 230 #1	79.17%	-	None	
97	C23	0	- - -	- - -	0	NTERMT - NTERMTX 3 5 #1	77.1 %	-	None	
98	C2	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	97 31%	-	None	
99	C2 a	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	88.18%	-	None	
100	C25	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	97 31%	-	None	
101	C25a	0	- - -	- - -	0	BR DGER - BRIDGE&A 3 5 #1	88.18%	-	None	
106	C28x	0	- - -	- - -	0	GLENCANY 230 / 3 5 #1	99.11%	-	None	
112						**All Contingencies (w/ Final RAS) Converged Indicating Positive Reactive Margin**				
115						**All Contingencies (w/ Final RAS) Converged Indicating Positive Reactive Margin**				

1) Vo tage V o at ons > 5% for Level B & > 10% for Level C

Appendix 3-10 - - - Post-transient Results For Bridger / Anticline West vs. MSTI

			BASE CASE / P PA H FLOWS																								Gen Drop	
LINE #	CON NGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	Monu Naugh n	West of RS / FH	Midpoint West	Montana SE	Montana Idaho P18)	ot 4a	Bonanza West	ot 1a (30)	daho S erra	PDCI	COI	Path 26	PP DC	Pavant IPP Gonder	RedB H Al en (ot 2C)	P nto 4Corners 2B1)	S gurd GlenC (2B 2)	daho Area System Losses	Pace Area System Losses	B idger Gen Trips	Aeolus Gen Trp
3																												
		egwstg1 8h7 jbwc msti 1496 4100 2400 1502 298 sav	1502	2686	1700	2 00	-12 8	1750	267	570	2187	127	-298	2059	660	501	122	2996	2308	93	180	113	50	88	253	239	702		
5																												
6																												
7																												
8																												
9		**evel "B" Contingencies**																										
10	B01	Ant c ine – Populus 500 kV Line	1901	2083	0	337	-808	1368	3 9	657	190	16	-296	18 1	70	532	88	2996	2152	361	180	1 0	521	91	253	356	732	0	0
11	B01a	Ant c ine – Populus 500 kV Line Drop Bridger G1	1828	2256	0	3037	-787	1120	31	620	1705	52	-309	19 3	711	563	75	2996	2062	32	180	128	75	67	2 5	297	71	575	0
12	B01g	Ant c ine – Populus 500 kV Line JBG1 KinpCap	182	2262	0	30 5	-793	1126	313	619	1718	52	-310	19 5	710	563	76	2996	206	326	180	128	75	67	2 5	295	712	575	0
13	B02	Ant c ine 500 / 3 5 kV Transformer	1521	2663	1789	230	-12 3	1753	258	561	2191	127	-299	2055	659	50	122	2996	2311	95	180	113	505	88	253	231	705	0	0
1	B03	Bridger – Populus 3 5 kV Line	1570	258	1908	2019	-1120	1686	312	617	2138	106	-297	2022	678	50	116	2996	2286	7	180	116	50	86	252	2 1	726	0	0
15	B0	Bridger – 3M leknoll 3 5 kV Line	1607	2529	1937	1883	-1025	1668	3 8	655	211	9	-313	2003	686	509	112	2996	2269	61	180	117	502	8	252	258	7 1	0	0
16	B0 c	Bridger – 3M leknoll 3 5 kV Line	1601	2537	19	1887	-103	1678	3 6	653	2126	95	-318	2005	685	508	113	2996	2272	6	180	117	502	85	252	256	738	0	0
17	B05	Bridger 3 5 / 230 kV Transformer	1503	268	1699	2397	-12 7	17 8	267	571	2186	127	-298	2058	661	501	122	2996	2307	95	180	113	505	88	253	239	702	0	0
18	B06	3Milekno l – Goshen 3 5 kV Line	1527	26 6	1787	2251	-1226	1716	281	585	2159	116	-307	20 2	667	501	117	2996	2287	80	180	116	507	88	253	235	727	0	0
19	B06a	3Milekno l – Goshen 3 5 kV Line Bypas 3MK Caps	15 6	2616	1825	26 0	-1170	1715	299	603	2157	110	-308	2031	671	502	116	2996	2287	78	180	117	507	88	253	235	720	0	0
20	B07	Kinport – Goshen 3 5 kV Line	502	2687	700	2 02	2 8	750	266	570	2 88	28	298	2060	660	50	22	2996	2307	96	80	3	505	88	253	2 0	702	0	0
21	B08	Kinport – Borah 3 5 kV Line	150	268	1701	2398	-12 8	17 7	267	570	2185	127	-298	2059	661	501	122	2996	2306	95	180	113	505	88	253	239	702	0	0
22	B09	Populus – Borah 500 kV Line	520	2658	632	2 35	238	72	270	57	2 77	20	298	20 8	66	50	5	2996	2296	8	80	7	508	89	253	2 7	70	0	0
23	B10	Borah 500 / 3 5 kV Trans ormer	1508	2682	1678	2 17	-1232	1760	268	572	219	130	-301	2061	662	503	122	2996	2312	502	180	111	502	86	252	2 2	702	0	0
2	B11	Borah 3 5 / 230 kV Trans ormer	150	2685	1692	2 05	-12 1	175	269	572	2190	128	-301	2060	661	502	122	2996	2309	96	180	112	50	87	253	2 1	703	0	0
25	B12	Populus – Cedar Hill 500 kV Line	1526	2623	1619	2 13	-1308	160	270	57	2017	98	-28	2017	65	88	12	2996	2218	20	180	128	537	50	258	259	701	0	0
27	B1	Cedar Hi l – Hemingway 500 kV Line	1529	2619	1613	2 13	-1306	1600	271	57	2010	98	-28	2016	655	88	12	2996	2217	15	180	129	537	50	258	260	702	0	0
28	B15	M dpoint – Hemingway 500 kV Line	1512	2656	1696	2372	-1303	1658	266	570	191	119	-290	2038	655	89	158	2996	2220	28	180	113	53	502	258	250	706	0	0
29	B16	Borah – M dpoint 500 kV Line	1509	2669	1685	2397	-1263	1712	267	571	2161	119	-29	20 8	659	98	116	2996	2289	77	180	119	512	91	25	2 3	702	0	0
30	B17	M dpoint 500 / 3 5 kV Transformer	1513	2689	1677	2 23	-1221	1780	269	573	2201	1 2	-306	207	666	509	67	2996	2339	513	180	129	92	81	251	261	705	0	0
31	B18	M dpoint 3 5 / 230 kV Transformer	150	2683	1698	2399	-12 9	17 5	267	570	2171	127	-298	2058	660	501	126	2996	2302	92	180	112	506	89	253	2 0	702	0	0
32	B19	Borah – Adelaide #2 3 5 kV Line	1505	2678	1699	2393	-1259	1729	267	570	2173	12	-296	205	660	99	115	2996	2300	85	180	117	509	90	25	2 0	702	0	0
33	B20	Ade a de – Midpoint #2 3 5 kV Line	1503	2683	1701	2397	-1253	17 2	266	570	218	126	-297	2057	660	500	120	2996	2305	93	180	11	506	89	253	239	702	0	0
3	B21	Borah – Adelaide – M dpoint #1 3 5 kV Line	505	2678	700	2392	260	728	267	570	2 75	2	296	2053	660	99	5	2996	2298	87	80	7	509	90	25	239	702	0	0
35	B22	Borah – Hunt 230 kV Line	150	2681	1701	2395	-1256	1737	266	570	2176	125	-296	2056	660	500	119	2996	2302	89	180	115	507	89	253	2 0	702	0	0
36	B23	M dpoint – Bo se Bench #3 230 kV Line	50	2680	699	2396	25	737	267	570	2 59	25	297	2055	660	500	27	2996	2295	85	80	3	508	90	25	2 6	702	0	0
37	B2	M dpoint – Rat le Snake 230 kV Line	150	2680	1699	2396	-1256	1735	266	570	2152	12	-296	2055	660	500	128	2996	2293	8	180	112	509	90	25	2 5	702	0	0
38	B25	M dpoint – Dram 230 kV Line	150	2682	1699	2398	-1251	17 3	267	570	2173	126	-297	2057	660	501	12	2996	2302	90	180	113	507	89	253	2 2	702	0	0
39	B26	Ratt e Snake – Boise Bench 230 kV Line	150	2683	1699	2398	-1251	17 3	267	570	217	126	-297	2057	660	501	12	2996	2302	90	180	113	507	89	253	2 2	702	0	0
0	B27	D am – Boise Bench 230 kV Line	1503	268	1700	2399	-12 8	17 8	267	570	2186	128	-298	2059	661	501	122	2996	2307	95	180	113	505	88	253	239	702	0	0
1	B28	Hemingway 500 230 kV Transformer	150	268	1698	2 01	-12 6	1750	267	570	2187	127	-298	2059	661	502	120	2996	2308	9	180	113	50	88	253	2 3	702	0	0
3	B30	Populus – Borah #1 3 5 kV Line	1501	2685	1706	2395	-1259	1738	266	570	2182	125	-299	2057	659	500	119	2996	2302	91	180	115	507	89	253	2 0	702	0	0
	B31	Populus – Borah #2 3 5 kV Line	1502	268	170	239	-1257	1738	267	570	2180	125	-298	2056	660	500	119	2996	2301	91	180	115	507	89	253	239	702	0	0
5	B32	Populus – Kinport 3 5 kV Line	1 99	2689	1696	2 09	-1260	17 3	266	570	218	126	-302	2059	659	500	120	2996	2303	90	180	115	507	89	253	2 1	702	0	0
6	B33	Populus – Ben Lomond #3 3 5 kV Line	15 3	26 3	1667	2365	-11 7	1785	283	588	2209	132	-297	2057	672	510	129	2996	2331	517	180	103	91	80	250	239	709	0	0
7	B3	Populus – Terminal 3 5 kV Line	1538	26 8	1675	237	-1170	1778	27	578	220	130	-297	2056	671	508	128	2996	2327	512	180	105	9	81	251	239	705	0	0
8	B35	Aeolus – An ic ine 500 kV Line																											
9	B35a	Aeolus – An ic ine 500 kV Line	2122	120	757	1967	-655	1066	216	518	1692	12	-325	179	701	618	68	2996	20 2	306	180	131	72	63	2 3	181	791	0	600
50	B35g	Aeolus – An ic ine 500 kV Line	216	121	762	1969	-636	1126	218	520	1737	29	-357	18 5	692	603	69	2996	20 5	307	180	13	8	69	2 7	181	771	0	600
51	B36	Aeolus – Mona 500 kV Line																											
52	B36a	Aeolus – Mona 500 kV Line	0	3 79	2061	2659	-2035	15 7	338	6 5	200	10	-309	1939	815	6	1 9	2996	2321	565	180	3	3 8	387	220	260	709	0	600
53	B36g	Aeolus – Mona 500 kV Line	0	3 85	2061	2659	-2032	1551	3 1	6 8	2007	107	-309	19 5	81	6 2	1 9	2996	2321	566	180	3	3 9	387	221	260	708	0	600
5	B37	Aeolus 500 / 230 kV Transformer	1 89	2675	1689	2399	-12 8	1739	268	571	2180	119	-299	2036	666	508	122	2996	2306	92	180	112	503	87	253	239	701	0	0
55	B38	Aeolus – Windstar 230 kV Line	1 1	2602	16 9	2376	-12 7	168	26	567	21 3	81	-302	1925	689	5 3	120	2996	2292	83	180	110	9	80	251	23	710	0	0
56	B39	Aeolus – Freezeout 230 kV Line	1 82	2711	1687	2 19	-125	17 8	27	578	2185	130	-298	2070	663	98	122	2996	2308	96	180	112	50	87	253	2 1	709	0	0
57	B 0	Bonanza –Mona 3 5kV Line	1638	2711	1722	2 71	-1 2	16 2	313	619	2095	9	-302	2232	128	111	126	2996	22 7	33	180	90	2	0	238	2	738	0	0
58	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1618	2673	1677	2 09	-1 8	1510	286	591	1989	136	-308	2163	82	23	121	2996	2232	6	180	81	2	36	236	232	693	0	0
59	B 1	Hemingway – Summer Lake 500kV line	1523	2623	165	2378	-1365	1555	267	571	18	106	-283	2013	6 7	77	173	2996	21 7	366	180	123	562	516	262	222	706	0	0
60	B51	DaveJon - Dif iculty 230 kV Line	1 3	2603	1650	2376	-12 7	1686	26	567	21	82	-302	1926	689	5 3	120	2996	2292	83	180	110	9	80	251	235	708	0	0
61	B52	Spence - Mustang 230 kV Line	1518	256	1693	2313	-1225	1692	2 9	552	2150	76	-303	1953	672	529	119	2996	2298	86	180	113	500	8	252	229	709	0	0
62	B53	Riverton - Atlant c 230 kV Line	1535	2517	1706	2363	-129	1682	250	553	21 5	0	-30	1937	667	539	120	2996	2311	95	180	111	98	83	251	235	702	0	0
63																												
6																											N-1 Criteria; > >	
65																												
66		**evel "C" Contingencies**																										
69	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1682	2396	2251	1356	-901	1568	390	699	20 7	61	-29	19 1	712	511	105	2996	22	38	180	122	502	83	251	223	788	0	0
70																												
71	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1606	2585	2088	1220	-903	1322	3 5	652	1857	103	-308	205	712	5 2	92	2996	215	02	180	110	58	59	2 3	189	750	575	0
72	C02b	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1531	2761	1910	1080	-898	105	301	606	1638	1 0	-320	2157	717	577	78	2996	2057	361	180	99	1	31	23	163	725	1150	0
73	C03	Bridger – 3M leKnoll Br dger – Populus #1 3 5 kV ines	1712	23 2	2255	12	-806	1560	26	738	2027	7	-319	1916	720	518	101	2996	2228	25	180	123	99	81	250	2 7	79	0	0
7	C03a	Bridger – 3M leKnoll Br dger – Populus #1 3 5 kV ines w/ RA	635	2537	2 09	0	8	3 6	380	689	8 0	92	328	2035	7 9	5 7	89	2996	2	392	80		55	57	2 2	205	760	575	0
75	C03b	Bridger – 3M leKnoll Br dger – Populus #1 3 5 kV ines w/ RA	1561	2719	19 8	953	-815	10 9	335	6 2	1625	132	-335	21	723	581	75	2996	20 7	353	180	99	11	29	233	173	738	1150	0
76	C03c	Bridger–3MK Bridge-Pop#1 3 5 RAS 2JBG Path18 Caps U	558	27 0	9 5	9 9	8 8	3	333	639	686	3	329	2 33	7 8	572	80	2996	2075	368	80	0	2	36	235	7	730	50	0
77	C0	Bridger – 3M leKnoll Br dger – Populus #2 3 5 kV ines	1712	23 2	2255	12	-806	1560	26	738	2027	7	-319	1916	720	518	101	2996	2228	25	180	123	99	81	250	2 7	79	0	0
78	C0 a	Bridger – 3M leKnoll Br dger – Populus #2 3 5 kV ines w/ RA	1635	2537	2109	1101	-81	1316	380	689	18 0	92	-328	2035	719	5 7	89	2996	21 1	392	180	111	55	57	2 2	205	760	575	0
79	C0 b	Bridger – 3M leKnoll Br dger – Populus #2 3 5 kV ines w/ RA	1561	2719	19 8	953	-815	10 9	335	6 2	1625	132	-335	21	723	581	75	2996	20 7	353	180	99	11	29	233	173	738	1150	0
80	C0 c	Bridger–3MK Bridge-Pop#2 3 5 RAS; 2JBG Path18 Caps U	1558	2710	19 5	9 9	-8 8	1113	333	639	1686	131	-329	2133	718	572	80	2996	2075	368	180	101	21	36	235	171	730	1150	0
81	C05	Borah – Populus 3 5 kV DLO	1 98	2682	1716	2381	-1280	1712	267	570	2168	120	-299	2051	657	97	113	2996	2290	77	180	120	513	92	25	239	703	0	0
82	C05a	Borah – Populus 3 5 kV DLO w/ gen tripping	1 7	2819	1609	2102	-1226	1 27	238	5 1	19 5	1 7	-312	2136	669	533	98	2996	2188	30	180	109	66	66	2 6	202	692	575	0
83	C06	Populus – Ben Lomond 3 5 kV DLO	162	2559	1602	2295	-9 0	1862	318	62	2259	1 2	-296	2053	696	530	1 6	2996	2381	567	180	83	61	62	2 5	238	72	0	0
8	C06a	Populus – Ben Lomond 3 5 kV DLO Bypass 1/2 of 3MK Seri	16 5	2525	1658	2178	-893	1855	335	6 2	2252	13	-299	2039	700	530	1	2996	2376	562	180	8	61	63	2 5	232	726	0	0
85	C07	Ben Lomond – Terminal 3 5 kV DLO	1509	2678	1697	2397	-1239	1753	265	569	2189	128	-298	2058	662	502	123	2996	2310	98	180	112	503	87	253	239	702	0	0
86	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1 96	2688	1701	2 03	-1277	172	267	570	217	122	-303	205	657	98	115	2996	2293	80	180	119	512	91	25	2 1	70	0	0
87	C08a	Populus – Kinport Populus – Borah #2 3 5 kV Lines w/ RAS																											
88	C09	Populus – Borah #2 3 5 kV T easureton – Brady 230 kV Lin	1503	2683	1700	239	-1251	17 0	269	573	2181	126	-298	2057	660	500	120	2996	2302	92	180	11	507	89	253	239	703	0	0
89	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Line	1502	268	1702	239	-1252	17 0	269	573	2183	126	-298	2057	660	500	120	2996	2303	92	180	11	507	89	253	2 0	702	0	0
90	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1596	2587	1629	2325	-102	1832	296	601	2238	137	-296	2052	688	522	139	2996	2362	5 7	180	91	73	70	2 7	239	71	0	0
91	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Line	15 0	26 5	1669	2373	-1159	1782	278	582	2206	131	-297	2056	671	509	129	2996	2329	515	180	10	92	81	251	239	706	0	0
92	C13	Borah – Adelaide #2 Borah–ADT–Midpoint #1 3 5 kV lines (R	1509	2661	1701	2373	-129	1671	267	570	21 1	112	-289	2039	657	9	97	2996	2277	61	180	130	520	95	255	239	703	0	0
93	C1	Borah – Adelaide #2 M dpoint - Adela de #2 3 5 kV ines (RA	1505	2678	1700	2392	-1260	1727	267	570	217	123	-296	2053	660	99	115	2996	2299	85	180	118	509	90	25	2 0	702	0	0
9	C15	Borah – Adelaide #2 Borah – Hunt 230 kV lines	1506	267	1701	2387	-1270	1712	266	570	2160	121	-293	2050	659	98	111	2996	2292	78	180	121	512	91	25	2 1	702	0	0
95	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV ines (RA?)	1506	2677	1700	2391	-1259	1727	267	570	2175	123	-295	2053	660	99	115	2996	2300	86	180	117	509	90	25	239	702	0	0
96	C18	Borah – Kinport M dpoint – Adelaide #2 3 5 kV lines (RA)	150	2682	1701	2395	-1252	17 1	267	570	218	126	-297	2057	660	501	120	2996	2305	93	180	11	506	89	253	239	702	0	0
97	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV ines (RA?)	1505	2680	1702	2393	-1255	1735	266	570	2175	125	-296	2056	660	500	119	2996	2302	88	180	115	507	89	253	2 0	702	0	0
98	C20	Borah–Adel–Midpoint #1 Midpoint – Adela de #2 3 5 kV ines	1506	267	1701	2387	-1268	171	267	570	2172	121	-29	2050	659	98	112	2996	2295	82	180	120	511	91	25	237	702	0	0
99	C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 kV ines (RA	1506	2673	1702	2386	-1270	1711	266	570	2161	120	-293	2050	659	98	111	2996	2292	78	180	121	512	92	25	2 0	702	0	0
100	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	5 2	2656	68	2387	283	675	268	57	2 39	2	289	2038	658	95	07	2996	2273	6	80	26	5 9	95	255	2	702	0	0
101	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	1572	2581	1927	199	-1117	1680	313	619	2136	105	-293	2020	679	50	115	2996	2286	7	180	116	50	86	252	239	727	0	0
102	C2 a	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines w/ RAS	1501	27 3	1795	1782	-1102	1 35	276	580	19 7	133	-336	2112	685	537	102	2996	2185	30	180	105	60	62	2	200	707	575	0
103	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines	1572	2581	1927	199	-1117	1680	313	619	2136	105	-293	2020	679	50	115	2996	2286	7	180	116	50	86	252	239	727	0	0
10	C25a	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines w/ RAS	1501	27 3	1795	1782	-1102	1 35	276	580	19 7	133	-336	2112	685	537	102	2996	2185	30	180	105	60	62	2	200	707	575	0
109	C28x	Palo Verde - Trip 1&2, w/ FACRI	1582	2697	1691	2 07	-1 13	1598	272	576	2097	1 6	-309	2123	681	51	128	2996	3253	1752	180	88	658	589	278	238	776	0	0
110																												
111																											N-2 Criteria; > >	
112																												
113																												
11		**Margin est w/ Bridger West at 5% of 4100 MW**																										
115		egwstg1 8h7 jbwc msti 1496 4305 2400 1527 274 sav	1527	28 5	1823	2 83	-1021	21 1	205	506	2588	130	-27	2125	657	86	106	2996	2210	393	180	127	503	521	250	269	7 7	0	0
116																												
117																												
118		**Margin est w/ MS I at 5% of 1500 MW**																										
119		egwstg1 8h7 jbwc msti 1579 4100 2400 1504 292 sav	150	2681	1701	2 00	-1238	175	261	56	2267	127	-292	2055	659	98	120	2996	2298	81	180	112	50	92	25	2 3	702	0	0
120																												

	REAC IVE MARGIN MVAR (Gray shaded cells are the m nimum margins)																							
LINE #	Aeolus 500	Monanx 500	Antic in 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarH l 500	Bridger 345	Goshen 345	3 Mi Knoll 345	K nport 345	Populus 345	Borah 345	Ben Lomond 345	erm nal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
10	-506	-1012	- 06	-669	-677	-8 5	-1219	-790	-355	-355	-308	-5 9	-595	-627	-87	10 3	-12 1	-687	-562	- 55	27	-282	-218	- 0
11	-558	-1195	- 85	-907	-91	-1107	-15 9	-1037	- 71	- 8	- 19	-75	-821	-859	-1151	1383	-1 75	-681	-596	- 72	265	-268	-220	- 6
12	-603	-1289	-5 3	-1070	1078	-1287	-1766	-1196	-5 5	-572	- 88	-899	-978	-1022	-1330	1 92	-1563	-683	-639	-502	27	-270	-222	- 6
13	-758	-17 7	-819	-1551	159	-1759	-2093	-153	-1067	-852	-8 7	-1 13	-1619	-1600	-1793	18 2	-1958	-7 6	-767	-609	306	-307	-2	-53
1	-86	-16 1	-986	-12	1292	-1501	-1907	-1329	-925	-701	-703	-1133	-1293	-1283	-1555	1658	-1792	-73	-83	-63	316	-31	-2 0	-51
15	-768	-1 23	-77	-836	-8 2	-1012	-1378	-9	-7 8	-3 9	-325	-6 5	-819	-787	-1119	1357	-1576	-721	-757	-593	31	-305	-231	-50
16	-811	-1518	-879	-993	1002	-1185	-1587	-1096	-8 9	- 25	-385	-781	-981	-9 7	-1276	1 76	-1673	-725	-790	-613	316	-308	-23	-50
17	-9 6	-1708	-1223	-15 5	1581	-1780	-2139	-1560	-1211	-8 1	-872	-1396	-1588	-1578	-1792	18 3	-1963	-7 6	-916	-668	305	-310	-2 3	-53
18	-922	-1731	-1171	-1 07	1 26	-1597	-196	-1 39	-1158	-575	-758	-116	-1 35	-1396	-1675	17 9	-1888	-7	-895	-660	317	-315	-16	-52
19	-899	-1683	-1079	-1302	1321	-150	-1891	-1360	-1068	-53	-501	-1073	-1320	-1266	-1591	1693	-1837	-7 0	-873	-270	268	-180	-2 3	-52
20	-953	-1809	-119	-1538	1576	-1771	-21 5	-1560	-1086	-316	- 90	-1 31	-1593	-1570	-1786	1850	-197	-7 7	-923	-673	311	-312	-2 5	-53
21	-9 9	-1796	-1209	-1523	156	-1765	-2125	-15 6	-1193	-795	-8 5	-1282	-1555	-1563	-1779	183	-1958	-7 7	-918	-671	312	-312	-2 1	-53
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23	-9 9	-1795	-1215	-1533	1 73	-1758	-2113	-15	-1198	-81	-853	-13 1	-15	-1 8	-1772	1831	-1958	-635	-919	-671	311	-311	-2 5	-5
2	-952	-1800	-1211	-1513	15 7	-17 7	-2117	-1537	-119	-305	-8 2	-1331	-15 9	-15 0	-1771	1837	-1965	-7 7	-709	-672	311	-311	-2 5	-53
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28	-9 2	-1735	-1173	-1 7	1 08	-13 0	-1971	-1519	-1153	-807	-823	-1291	-1 71	-1 27	-171	1785	-1886	-7 9	-91	-668	316	-315	-2 7	-50
29	-9 6	-1771	-1177	-1 15	13 6	-1609	-2010	-1 93	-1160	-809	-829	-1301	-1 71	-1 5	-1739	1807	-1929	-7 8	-917	-670	313	-31	-2 6	-52
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32	-9 8	-178	-120	-1501	1535	-1727	-2077	-1527	-1190	-825	-856	-1350	-1535	-151	-1767	182	-19 5	-7 8	-918	-671	312	-31	-2 6	-53
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36	-9 9	-1791	-121	-151	15	-1729	-20 5	-1529	-1203	-83	-865	-1370	-1557	-1539	-1782	183	-1953	-7 8	-919	-671	312	-313	-2 1	-53
37	-950	-1791	-1215	-1513	15 2	-1730	-20 8	-1530	-1205	-291	-865	-1367	-155	-1536	-1781	183	-1953	-7 8	-920	-672	312	-31	-2 6	-53
38	-9 9	-1796	-1216	-1525	1557	-17 8	-205	-15 0	-1206	-836	-867	-1378	-1567	-1553	-1786	1837	-1957	-7 7	-919	-671	312	-313	-2 3	-53
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1	-9 8	-1797	-1213	-1522	1555	-17	-2102	-1538	-1203	-83	-86	-1376	-156	-1552	-1785	1835	-1959	-7 7	-918	-670	312	-312	-2 2	-53
3	-956	-1808	-1236	-1563	1592	-1781	-2106	-1572	-1229	-8 5	-880	-1 11	-1600	-1577	-1803	1850	-1972	-7 8	-926	-675	312	-31	-2 6	-53
	-952	-1798	-1220	-1535	156	-1758	-2091	-1552	-1210	-835	-868	-1386	-1570	-1550	-1786	1837	-1960	-7 8	-922	-672	312	-313	-2 6	-53
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7	-931	-1697	-117	-1 28	1 62	-167	-205	-1 73	-1153	-803	-836	-1285	-1 2	-1 7	-1685	166	-18 2	-739	-902	-663	312	-311	-2	-53
8	P CASE DIVERGED																							
9	- 63	-867	-1327	-1860	1883	-200	-2377	-808	-13 6	-938	-1016	-1657	-1923	-1891	-1 19	1268	-1163	-633	-506	-379	177	-163	-201	- 0
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51	P CASE DIVERGED																							
52	-108	-1869	-891	-1007	1073	-130	-1701	-1126	-79	636	-60	-955	-10 1	-1063	-1 2	1773	-2080	-612	-1111	-775	290	-276	-222	-50
53	-1103	-187	-915	-1028	109	-1326	-1725	-11 7	-813	6 7	-617	-97	-1063	-108	-1 30	1782	-2086	-61	-1127	-783	296	-292	-228	-50
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58	-768	-258	-1039	-138	1 30	-16 9	-207	-1 55	-106	79	-797	-1263	-1 19	-1 22	-1686	1793	-1992	- 91	-7 6	-582	297	-288	-198	-50
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63	**463**	**258**	**406**	**669**	**677**	**845**	**1219**	**790**	**355**	**266**	**308**	**308**	**595**	**627**	**874**	**1043**	**1163**	**484**	**296**	**48**	**177**	**163**	**164**	**32**
6					500	500	500	500	100			250		250										
69	-596	-121	-532	-687	-7 3	-926	-1258	-811	- 96	- 08	-378	-6 7	-7 3	-733	-1026	1215	-1377	-695	-609	-507	320	-309	-223	- 6
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72	-721	-1690	-818	-1187	1252	-1	-1895	-1303	-762	-68	-6 1	-1105	-1278	-1251	-15 0	167	-1878	-635	-708	-567	296	-283	-23	-57
73	- 8	-966	- 19	- 53	- 73	-596	-8	-5	- 17	-236	-227	-386	- 5	- 8	-670	-89	-1102	-67	-503	- 35	316	-295	-207	-
7	P CASE DIVERGED																							
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77	- 8	-966	- 19	- 53	- 73	-596	-8	-5	- 17	-236	-227	-386	- 5	- 8	-670	-89	-1102	-67	-503	- 35	316	-295	-207	-
78	P CASE DIVERGED																							
79	-221	-1558	-767	-981	-98	-11 5	-1561	-1096	-7 9	- 32	-392	-772	-970	-926	-1289	1521	-1756	-68	-253	-5 8	273	-278	-1 6	-57
80	-733	-163	-835	-11 3	1188	-1369	-1761	-1259	-586	-55	- 78	-991	-1188	-1162	-1 38	1618	-1817	-691	-711	-566	299	-285	-230	-56
81	-957	-179	-1222	-1532	15 9	-1719	-2088	-15 7	-1208	-827	-865	-1381	-15 6	-1 98	-177	1827	-195	-750	-927	-675	313	-315	-2 6	-53
82	-928	-1913	-1207	-1623	1630	-1800	-2193	-1623	-12 8	-877	-903	-1 59	-16 3	-1581	-1380	191	-2098	-736	-890	-660	301	-299	-2 5	-57
83	-891	-1518	-1135	-132	1352	-1569	-1961	-1388	-1106	-771	-815	-1183	-1300	-132	-1230	1379	-16 8	-715	-867	-6 7	311	-301	-235	-5
8	-859	-1 68	-10 5	-1192	1216	-1 32	-18 2	-1278	-1008	-651	-681	-10 9	-1162	-1181	-1195	1339	-1595	-710	-838	-633	312	-300	-232	-53
85	-9 6	-1725	-1202	-1 85	1518	-1727	-2101	-1518	-1182	-820	-851	-1336	-1512	-1508	-1 88	1723	-1867	-7 6	-916	-670	312	-313	-2 5	-53
86	-961	-1811	-1215	-1510	1501	-1683	-2076	-1528	-1192	- 10	-796	-1075	-1557	-1 37	-1780	18 2	-1976	-736	-930	-677	312	-313	-2 6	-53
87																								
88	-950	-1792	- 9	-1518	15 6	-1737	-2082	-1537	-1200	-828	-857	-1369	-1553	-1529	-175	1826	-195	-7 7	-669	-671	312	-312	-2 5	-53
89	-95	-1802	-1229	-15 6	1573	-1761	-2128	-1557	-1219	-839	-869	-1395	-1583	-1556	-1771	1838	-1965	-682	-92	-67	312	-312	-2 5	-53
90	-900	-1571	-1128	-1322	1353	-1569	-1965	-1388	-1099	-768	-806	-1185	-1306	-1326	-1 31	1 56	-1699	-72	-876	-650	312	-306	-239	-5
91	-928	-1691	-1165	-1 09	1 0	-1651	-2032	-1 56	-11 2	-796	-826	-1268	-1 22	-1 25	-1652	1651	-183	-738	-900	-662	312	-310	-2 3	-5
92	- 36	-1755	-1178	-1 27	1 60	-158	-193	-1 72	-115	-796	-831	-1267	-1 2	-139	-1702	1790	-1906	-750	-921	-672	31	-317	-2 7	-52
93	-9 9	-178	-1206	-1500	153	-1738	-209	-1532	-1191	-266	-855	-13 3	-1529	-1501	-1766	182	-19 5	-7 8	-919	-671	312	-31	-23	-53
9	-520	-1778	-1198	-1 81	1515	-1686	-2015	-1508	-1181	-816	-8 9	-1325	-1511	-1 86	-175	1816	-1935	-7 8	-599	-671	313	-315	-2 6	-53
95	-9 7	-1780	-1192	-1 80	1521	-1728	-2075	-1519	-1170	-780	-830	-12 2	-1501	-1 89	-1750	1815	-19 0	-7 8	-917	-670	312	-313	-22	-53
96	-950	-1795	-1211	-1519	1561	-1773	-2125	-15 9	-1193	-793	-8	-127	-15 3	-15 0	-1775	1832	-1957	-7 7	-920	-672	312	-313	-2 6	-53
97	-9 8	-1789	-1203	-150	15 5	-1730	-20 6	-1529	-1185	-779	-839	-1262	-1532	-1538	-1767	1826	-19 9	-7 8	-918	-670	312	-313	-2 6	-53
98	-950	-1778	-1198	-1 69	1507	-17 6	-2079	-1529	-1176	-806	-8 3	-1291	-1 76	-1 22	-17 1	1811	-1935	-7 8	-920	-672	313	-315	-2 6	-53
99	-9 9	-1776	-1198	-1 79	151	-1699	-2027	-151	-1181	-2 3	-8 8	-1317	-150	-1 73	-1751	1815	-1935	-7 8	-600	-671	313	-315	-2 6	-52
100	-9 7	-1750	-1157	-136	1290	-150	-1919	-1 56	-1120	-790	-822	-12 9	-1 11	-1380	-170	178	-1905	-7 9	- 93	- 82	31	-317	-2 6	-52
101	-860	-16 0	-9 3	-1228	1275	-1 80	-1916	-1319	-803	-263	- 02	-1157	-128	-1261	-1619	1660	-1797	-732	-831	-633	300	-315	-2 1	-51
102	-898	-1863	-1138	-633	1717	-1885	-2252	-1657	-1031	-378	-563	-158	-1776	-17 3	-1861	1891	-205	-728	-871	-6 9	307	-306	-2 3	-56
103	-860	-16 0	-9 3	-1228	1275	-1 80	-1909	-1319	-803	-263	- 02	-1157	-1282	-1261	-1535	1660	-1797	-733	-831	-630	300	-315	-2 1	-51
10	-898	-1863	-1138	-1666	1717	-1885	-2252	-1657	-1031	-378	-563	-158	-1776	-17 3	-1 8	1888	-205	-728	-871	-6 9	307	-306	-2 3	-56
109	-719	-1 22	- 78	-1332	1380	-159	-2015	-1 15	-1031	-765	-783	-1218	-136	-1368	-1566	15 3	-1517	-511	-7 8	-592	301	-285	-191	-6
110	**221**	**966**	**419**	**453**	**473**	**596**	**844**	**544**	**417**	**236**	**227**	**386**	**454**	**448**	**670**	**894**	**1102**	**511**	**253**	**435**	**273**	**278**	**141**	**6**
111					00	00	00	00	100			200		200										

LINE #	Voltage Deviation	WORS VOL AGE DEVIA ON [2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Vo tage	COMMEN
3				**Base Case Overloads (Areas 59 99 Area 10) Excluding GSUs**					
					SIDNEY 115 / 230 #1	109. 5%			
5					LOCUST - MORA 138 #1	106. 0%			
6					CTTNWD N - KETTLECK 115 #1	102 78%			
7					SPENCE - W LDHRSE 230 #1	102 73%			
8									
9				**CON INGENCY LOADINGS**					
10	1	3MIKNOLL 3 5	5 2	2	BRIDGER - BR DGE&A 3 5 #1	112 70%	-	None	
11	0	---	---	1	BRIDGER - BR DGE&A 3 5 #1	101. 1%	-	None	
12	0	---	---	1	BRIDGER - BR DGE&A 3 5 #1	101.10%	-	None	
13	0		---	0	---	---	-	None	
1	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	98.58%	-	None	
15	8	B GGRASS 69	7 0	0	BRIDGER - ROCKSPGS 230 #1	89.35%	2	D LLON S 69 @ 0.883	a & b are worse for P18
16	5	B GGRASS 69	6.1	0	BRIDGER - ROCKSPGS 230 #1	89.33%	-	None	
17	0	---	---	0	---	---	-	None	
18	0	---	---	2	GRACE - SODA 138 #1	115. 1%	-	None	
19	0	---	---	0	GRACE - SODA 138 #1	78.66%	-	None	
20	0	---	---	0	---	---	-	None	
21	0	---	---	0	---	---	-	None	
22	0	---	---	0	M DPO NT 230 / 3 5 #2	80.08%	-	None	
23	0	---	---	0	---	---	-	None	
2	0	---	---	0	M DPO NT 230 / 3 5 #2	85.15%	-	None	
25	0	---	---	0	SIGURDPS - GLENCANY 230 #1	98.95%	-	None	
27	0	---	---	0	SIGURDPS - GLENCANY 230 #1	98.99%	-	None	
28	0	---	---	0	M DPO NT 230 / 3 5 #2	105.10%	-	None	
29	0	---	---	0	M DPO NT 230 / 3 5 #2	79.83%	-	None	
30	0	---	---	0	LOCUST - MORA 138 #1	99. 9%	-	None	
31	0	---	---	1	M DPO NT 230 / 3 5 #2	150 6 %	-	None	
32	0	---	---	0	M DPO NT 230 / 3 5 #2	79.76%	-	None	
33	0	---	---	0	---	---	-	None	
3	0	---	---	0	M DPO NT 230 / 3 5 #2	79. 9%	-	None	
35	0	---	---	0	M DPO NT 230 / 3 5 #2	89.88%	-	None	
36	0	---	---	0	LOCUST - MORA 138 #1	98.33%	-	None	
37	0	---	---	0	M DPO NT 138 / 230 #1	88 62%	-	None	
38	0	---	---	0	LOCUST - MORA 138 #1	95.38%	-	None	
39	0	---	---	0	LOCUST - MORA 138 #1	98.2 %	-	None	
0	0	---	---	0	---	---	-	None	
1	0	---	---	0	LOCUST - MORA 138 #1	89.72%	-	None	
3	0	---	---	0	---	---	-	None	
	0	---	---	0	---	---	-	None	
5	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	87.38%	-	None	
6	0	---	---	0	PALISADE - ROCKSPGS 230 #1	75.83%	-	None	
7	0	---	---	0	---	---	-	None	
8	P CASE DIVERGED								
9	68	GREATDIV 3 5	10.5	3	MINERS 230 0 PLATTE 230 0 #1	103.1 %	-	None	
50	0	---	---	2	M NERS 230 0 PLATTE 230 0 #1	99.07%	-	None	
51	P CASE DIVERGED								
52	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	93.13%	-	None	
53	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	92.60%	-	None	
5	0	---	---	2	AEOLUS 500 / 230 #2	100 78%	-	None	
55	0	---	---	0	DAVEJOHN - DAVEJTPS 115 #1	87.58%	-	None	
56	0	---	---	0	M NERS 230 0 PLATTE 230 0 #1	8 .59%	-	None	
57	0	---	---	1	BONANZA - VERNAL 138 #1	125 08%	-	None	
58	0	---	---	0	SIGURDPS - GLENCANY 230 #1	91.23%	-	None	RAS M tigates all over oads and Vdevs
59	0	---	---	0	SIGURDPS - GLENCANY 230 #1	101 65%	-	None	OL not re a ed to GWW Project
60	0	---	---	0	DAVEJOHN - DAVEJTPS 115 #1	88 6 %	-	None	
61	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	81.21%	-	None	Negative Vdevs
62	0	---	---	0	BRIDGER - ROCKSPGS 230 #1	9 21%	-	None	Negative Vdevs
69	2	3MIKNOLL 3 5	6 8	2	BRIDGER - BR DGE&A 3 5 #1	125 08%	-	None	
70					BRIDGER - ROCKSPGS 230 #1	107.16%			
71	0	---	---	1	BRIDGER - BR DGE&A 3 5 #1	109 81%	-	None	
72	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	95.58%	-	None	
73	3	B GGRASS 69	12.5	3	BRIDGER - ROCKSPGS 230 #1	119 07%	6	D LLON S 69 @ 8 6	
7	0	TEMPLEVW	5.	0	BRIDGER - ROCKSPGS 230 #1	97 69%		D LLON S 69 @ 852	
75	1	D LLON S 69	10.1	0	DILLON S 161 / 69 #1	93.11%		D LLON S 69 @ 8 3	
76	0	---	---	0	JEFFERSN - JFRSNPHA 161 #1	99 58%	-	None	90 pu voltage v o at ons
77	3	B GGRASS 69	12.5	3	BRIDGER - ROCKSPGS 230 #1	119 07%	6	D LLON S 69 @ 8 6	
78	0	TEMPLEVW	5.	0	BRIDGER - ROCKSPGS 230 #1	97 69%		D LLON S 69 @ 852	
79	1	D LLON S 69	10.1	0	DILLON S 161 / 69 #1	93.11%		D LLON S 69 @ 8 3	
80	0	---	---	0	JEFFERSN - JFRSNPHA 161 #1	99 58%	-	None	90 pu voltage v o at ons
81	0	---	---	0	---	---	-	None	
82									
83	0	---	---	0	SIGURDPS - GLENCANY 230 #1	91.13%	-	None	
8	0	---	---	0	SIGURDPS - GLENCANY 230 #1	91.17%	-	None	
85	0	---	---	0	---	---	-	None	
86	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	89. 8%	3	PTRSNFUR 69 @ .8 9	
87									Gen Trip Not Req d
88	0	---	---	0	GRACE - SODA 138 #1	73 20%	-	None	
89	0	---	---	0	GRACE - SODA 138 #1	73.11%	-	None	
90	0	---	---	0	SIGURDPS - GLENCANY 230 #1	92 39%	-	None	
91	0	---	---	0	GRACE - SODA 138 #1	76.16%	-	None	
92	0	---	---	0	HUNT 138 / 230 #2	82 22%	-	None	
93	0	---	---	0	M DPO NT 230 / 3 5 #2	79 56%	-	None	
9	0	---	---	0	M DPO NT 230 / 3 5 #2	88. 0%	-	None	
95	0	---	---	0	M DPO NT 230 / 3 5 #2	79 51%	-	None	
96	0	---	---	0	---	---	-	None	
97	0	---	---	0	M DPO NT 230 / 3 5 #2	89 88%	-	None	
98	0	---	---	0	M DPO NT 230 / 3 5 #2	77 27%	-	None	
99	0	---	---	0	M DPO NT 230 / 3 5 #2	87 90%	-	None	
100	0	---	---	0	M DPO NT 138 / 230 #1	80 03%	-	None	
101	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	95 71%	-	None	
102	0	---	---	0	SIGURDPS - GLENCANY 230 #1	90 71%	-	None	
103	0	---	---	0	BRIDGER - BR DGE&A 3 5 #1	95 71%	-	None	
10	0	---	---	0	SIGURDPS - GLENCANY 230 #1	90 71%	-	None	
109	7	CLAYTON 12 5	12.	5	SIGURDPS - GLENCANY 230 #1	116.70%	-	None	
115	**All Contingencies (w/ Final RAS) Except Palo Verde 2 3 Converged Indicating Positive Reactive Marg n**								
119	**All Contingencies (w/ Final RAS) Converged Indicating Pos tive Reactive Margin**								

1) Voltage Violations > 5% for Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line Side) and Transfo mer tertiary buses.

Appendix 3-11 Pg. 1 - - - Post-transient Results For Path C Southbound vs. Idaho - Montana (Path 18)

BASE CASE / P PA H FLOWS — RAS AC IO

L NE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	O 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	ot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant IPP Gonder	RedB H Allen (ot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Bridger Gen RAS MW	Aeolus Gen rip MW
3																													
		egwstg1 8h8 pcs 2250 p18 337 sav	1666	1581	16 1	1897	-2250	271	57	0	297	-707	120	-337	1 5	608	187	2996	3127	1287	180	38	539	313	198	221	61	0	0
5		evel "B" Contingencies																											
6	B01	Ant c ine – Populus 500 kV Line	2021	1028	0	2870	-183	-37	8	88	386	-982	28	-337	1251	6 7	15	2996	2978	1160	180	65	555	317	200	320	626	0	0
7	B01a	Ant c ine – Populus 500 kV Line RAS Trip Bridger Unit	1958	118	0	2528	-1797	-290	516	53	350	-1217	69	-350	1356	655	137	2996	2880	1121	180	5	509	288	187	296	61	575	0
8	B02	Ant c ine 500 / 3 5 kV Trans ormer	1579	1717	13 1	2261	-2292	273	3	31	328	-707	126	-333	1 75	613	189	2996	3128	1289	180	37	5 0	313	198	2 8	593	0	0
9	B03	Bridger – Populus 3 5 kV Line	1713	1515	1788	1622	-21 7	23	59	37	33	-739	107	-336	1 19	622	181	2996	3110	127	180	1	538	311	197	226	626	0	0
10	B0	Bridger – 3M leknoll 3 5 kV Line	1750	1 61	1833	1 6	-2036	22	65	80	378	-7 5	97	-3 7	1 01	631	177	2996	3103	1266	180	1	53	307	196	235	6 2	0	0
11	B05	Bridger 3 5 / 230 kV Transformer	1667	1581	16 0	1890	-22	270	56	5	301	-708	119	-337	1	609	186	2996	3126	128	180	39	5 0	313	198	220	613	0	0
12	B06	3Milekno l – Goshen 3 5 kV Line	1682	1558	1701	1796	-2230	253	57	10	307	-721	113	-3 2	1 3	613	183	2996	3113	1277	180	1	5 1	313	198	218	628	0	0
13	B06k	3Milekno l – Goshen 3 5 kV Line RAS (Bypass 1/2 Se ies Cap)	1692	15 3	1720	17 7	-2200	25	57	20	317	-720	111	-3 3	1 29	615	183	2996	311	1276	180	1	5 0	313	198	217	62	0	0
1	B07	Kinport – Goshen 3 5 kV Line	1663	1587	1621	1927	-225	277	57	-2	295	-702	121	-3 1	1 8	607	188	2996	3125	1288	180	38	539	312	198	22	61	0	0
15	B08	Kinport – Borah 3 5 kV Line	1668	1580	1637	1901	-22 6	27	57	1	297	-705	121	-337	1 6	609	187	2996	3127	1287	180	38	539	312	198	222	61	0	0
16	B09	Populus – Borah 500 kV Line	168	155	1570	1935	-2237	250	57	5	301	-720	115	-337	1 35	609	178	2996	3115	1276	180	3	5 2	31	198	228	613	0	0
17	B10	Borah 500 / 3 5 kV Trans ormer	1677	1571	159	1932	-2218	293	61		300	-686	123	-3 0	1 7	611	187	2996	3137	1298	180	35	53	309	196	225	613	0	0
18	B11	Borah 3 5 / 230 kV Trans ormer	1668	1579	1631	1903	-22 0	277	58		300	-703	121	-3 0	1 6	608	187	2996	3126	1288	180	38	539	312	198	225	613	0	0
19	B12	Populus – Cedar Hi l 500 kV Line	1666	1582	16 6	1895	-2255	270	56	-1	296	-708	120	-337	1 5	608	187	2996	3125	128	180	39	5 1	313	198	220	613	0	0
20	B1	Cedar Hi l – Hemingway 500 kV Line	1668	1579	1639	1897	-22 9	269	57	0	297	-708	120	-337	1 5	609	186	2996	312	1285	180	39	5 0	313	198	221	61	0	0
21	B15	M dpoint – Hemingway 500 kV Line	1670	1593	1631	1920	-219	3	67		300	-607	136	-3	1 66	615	158	2996	3183	1330	180	39	520	301	193	230	615	0	0
22	B16	Borah – Midpoint 500 kV Line	1669	1577	1636	1897	-22 9	267	57	1	297	-709	120	-336	1	609	185	2996	3123	128	180	0	5 0	313	198	222	61	0	0
23	B17	M dpoint 500 / 3 5 kV Trans ormer	1671	1580	1626	1911	-2238	283	60	2	298	-66	12	-3 0	1 50	611	15	2996	31 7	1298	180	8	53	309	196	229	613	0	0
2	B18	M dpoint 3 5 / 230 kV Trans ormer	1667	1580	16 1	1896	-2251	270	57	0	297	-708	120	-337	1 5	608	188	2996	3125	1285	180	38	5 0	313	198	221	61	0	0
25	B19	Borah – Adelaide #2 3 5 kV Line	1668	1578	16 0	1895	-2251	266	57	1	297	-710	119	-336	1	608	18	2996	3123	128	180	0	5 0	313	198	222	61	0	0
26	B20	Adela de – M dpoint #2 3 5 kV Line	1667	1581	16 1	1898	-22 7	276	57	0	297	-70	121	-337	1 6	609	189	2996	3128	1287	180	37	539	312	198	221	61	0	0
27	B21	Borah – Adelaide – M dpoint #1 3 5 kV Line	1668	1579	1639	1897	-22 7	272	57	1	297	-707	120	-337	1 5	609	187	2996	3126	1286	180	38	539	312	198	222	61	0	0
28	B22	Borah – Hunt 230 kV Line	1667	1580	16 1	1896	-2250	270	57	0	297	-708	120	-337	1 5	608	186	2996	3125	1285	180	39	5 0	313	198	221	61	0	0
29	B23	M dpoint – Bo se Bench #3 230 kV Line	1668	1580	16 0	1897	-22 8	273	57	0	297	-70	121	-337	1 6	609	186	2996	3127	1287	180	39	539	312	198	221	61	0	0
30	B2	M dpoint – Rat le Snake 230 kV Line	1667	1583	16 1	1899	-22 5	280	58	0	297	-696	123	-338	1 8	609	183	2996	3132	1290	180	39	538	311	197	221	61	0	0
31	B25	M dpoint – Dram 230 kV Line	1667	1580	16 0	1897	-22 9	272	57	0	297	-706	121	-337	1 5	609	186	2996	3127	1286	180	39	5 0	312	198	221	61	0	0
32	B26	Ratt e Snake – Boise Bench 230 kV Line	1667	1580	16 0	1896	-2251	269	57	0	297	-710	120	-336	1	608	187	2996	3122	128	180	39	5 0	313	198	223	61	0	0
33	B27	Bo se Bench - Dram 230 kV Line	1667	1581	16 1	1897	-22 9	272	57	0	297	-705	121	-337	1 5	609	186	2996	3127	1286	180	39	5 0	312	198	221	61	0	0
3	B28	Hemingway 500 230 kV Transfo mer	1667	1580	16 0	1897	-22 9	271	57	0	297	-705	120	-337	1 5	609	186	2996	3126	1286	180	39	539	312	198	222	61	0	0
35	B30	Populus – Borah #1 3 5 kV Line	1666	1582	16 5	1895	-2255	269	56	0	296	-709	120	-337	1 5	608	186	2996	312	128	180	39	5 1	313	198	221	613	0	0
36	B31	Populus – Borah #2 3 5 kV Line	1667	1581	16 3	1895	-2253	268	56	0	297	-709	120	-337	1 5	608	186	2996	3125	128	180	39	5 0	313	198	221	61	0	0
37	B32	Populus – Kinport 3 5 kV Line	1663	158	16 0	190	-2261	266	56	-1	296	-710	119	-339	1 5	607	185	2996	3121	1281	180	0	5 2	31	199	223	613	0	0
38	B33	Populus – Ben Lomond #3 3 5 kV Line	17 0	1 99	1578	1830	-2058	336	75	37	33	-657	128	-335	1 0	630	202	2996	317	133	180	20	513	295	191	216	63	0	0
39	B3	Populus – Terminal 3 5 kV Line	1730	1510	1593	18 8	-2098	327	71	17	31	-66	125	-335	1 39	628	199	2996	3165	1327	180	23	518	298	192	217	622	0	0
0	B35	Aeolus – An icline 500 Line	2198	701	1076	1673	-1805	-23	529	-18	279	-967	13	-350	1158	635	153	2996	2985	116	180	62	5 7	312	197	218	709	0	0
1	B35a	B35 dropping 600MW of Aeolus gen inse tion of Aeolus 500kV	1962	611	10 5	1627	-1897	-183	518	-27	269	-1120	10	-356	1 1	629	1 6	2996	2928	1162	180	6	50	287	187	22	628	0	597
2	B35d	B35a insertion/addit on of 2 Mustang 230kV and 1 River on 230kV	1958	619	10 9	1633	-1900	-176	515	-26	270	-1113	110	-356	1 2	627	1 7	2996	2929	116	180	6	505	288	187	22	626	0	597
3	B35g	B35d insertion/addit on of 2 D llon S 69kV caps Path 18 Shunt Up	1973	61	1050	1627	-1900	-162	512	-29	267	-1100	109	-372	1 32	625	1 7	2996	2927	1162	180	8	510	290	189	222	623	0	597
	B36	Aeolus – Mona 500kV Line												P CASE DIVERGED															
5	B36a	B36 dropping 600MW of Aeolus gen inse tion of 3 Aeolus 500kV	0	2 76	2073	2195	-3101	113	619	99	398	-895	103	-3 7	1305	785	217	2996	3169	1388	180	-50	367	195	1 6	260	636	0	597
6	B36d	B36a insertion of 2 Mustang 230kV and 1 Riverton 230kV caps	0	2 72	2073	2195	-3100	115	618	100	398	-893	106	-3 7	1309	785	217	2996	3169	1388	180	-50	367	195	1 6	260	635	0	597
7	B36g	B36d insertion of 2 Chappel C 230kV caps	0	2 72	207	219	-3099	116	617	100	398	-892	107	-3 7	1311	78	217	2996	3169	1388	180	-50	368	195	1 7	259	635	0	597
8	B36k	xtreme version of B36a includes insertion of 1 more Aeolus 500kV	0	2500	2105	2186	-3115	125	612	98	397	-88	111	-3 7	1329	780	218	2996	3171	1390	180	-50	370	197	1 7	257	635	0	597
9	B36n	xtreme version of B36d includes insertion of 1 more Aeolus 500kV	0	2 96	2106	2186	-3113	127	610	99	397	-882	11	-3 7	1332	780	218	2996	3171	1390	180	- 9	370	198	1 8	257	63	0	597
50	B36ak	B36a RAS (Bypass 1/2 Ser es Cap)	0	2 58	2126	2090	-3056	110	622	121	20	-896	95	-3 9	1286	793	216	2996	3169	1387	180	-50	36	192	1 5	255	637	0	597
51	B37	Aeolus 500 / 230 kV Trans ormer	1656	1568	1631	1895	-22 8	262	63	2	298	-715	11	-337	1 26	613	186	2996	3122	128	180	38	538	311	198	221	61	0	0
52	B38	Aeolus – Windstar 230 kV Line	1630	1515	1608	1883	-22 3	236	82	1	297	-7 0	9	-339	1365	627	185	2996	311	1277	180	37	533	307	196	221	616	0	0
53	B39	Aeolus – Freezeout 230 kV Line	1652	1606	1629	1911	-2252	271	5	8	305	-707	122	-337	1 53	610	187	2996	3125	1288	180	38	539	312	198	222	618	0	0
5	B 0	Bonanza –Mona 3 5kV Line	1791	1608	166	1967	-2 11	199	99	53	350	-782	99	-3 0	1611	121	190	2996	3070	1229	180	18	82	263	178	231	6 3	0	0
55	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1775	1572	1623	1919	-2 3	89	3	29	326	-886	131	-3 5	1555	87	18	2996	3059	1258	180	10	66	259	175	233	619	0	0
56	B 1	Hemingway – Summer Lake 500kV line	1667	1585	16 2	1900	-2236	291	59	1	298	-682	125	-339	1 51	610	182	2996	3138	1297	180	38	535	310	197	225	61	0	0
57																													
58																													N-1 C iteri
59		evel "C" Contingencies																											
60	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1793	1398	20 2	1139	-1969	169	6	103	01	-795	82	-335	1371	6 5	172	2996	3086	1251	180	5	535	307	196	22	655	0	0
61	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1725	1558	187	995	-1957	-89	98	55	353	-1035	125	-3 8	1 78	650	156	2996	2986	1212	180	3	90	278	183	219	633	575	0
62	C02b	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1659	171	1697	8 9	-1937	-356	53	9	306	-128	168	-359	158	656	138	2996	2885	1171	180	23		2 7	170	221	619	1150	0
63	C03	Bridger – 3M leKnoll Br dger – Populus #1 3 5 kV ines	1829	13 3	208	979	-1857	167	68	1 8	7	-79	70	-35	1350	653	169	2996	3076	12 3	180	5	532	305	195	232	667	0	0
6	C03a	Bridger – 3M leKnoll Br dger – Populus #1 3 5 kV ines w/ RAS	1760	1505	1932	825	-1851	-95	502	98	396	-1038	11	-362	1 59	658	152	2996	2977	1205	180	35	87	276	182	223	6 7	575	0
65	C03b	Bridger – 3M leKnoll Br dger – Populus #1 3 5 kV ines w/ RAS	169	166	1770	669	-1835	-366	537	51	3 8	-1292	158	-368	1567	66	13	2996	2876	116	180	23	1	2	168	223	636	1150	0
66	C03d	C03a Big Grassy & Amps Shunt (Path 18 RAS)	1758	1506	193	825	-1858	-85	500	97	395	-1029	111	-375	1 57	657	153	2996	2975	1203	180	35	88	277	182	222	6 6	575	0
67	C03e	C03b Big Grassy & Amps Shunt (Path 18 RAS)	1692	166	1772	669	-18 3	-356	536	9	3 7	-1282	155	-381	156	663	135	2996	2876	1160	180	2	2	2 5	169	221	63	1150	0
68	C0	Bridger – 3M leKnoll Br dger – Populus #2 3 5 kV ines	1829	13 3	208	979	-1857	167	68	1 8	7	-79	70	-35	1350	653	169	2996	3076	12 3	180	5	532	305	195	232	667	0	0
69	C0 a	Bridger – 3M leKnoll Br dger – Populus #2 3 5 kV ines w/ RAS	1760	1505	1932	825	-1851	-95	502	98	396	-1038	11	-362	1 59	658	152	2996	2977	1205	180	35	87	276	182	223	6 7	575	0
70	C0 b	Bridger – 3M leKnoll Br dger – Populus #2 3 5 kV lines w/ RAS	169	166	1770	669	-1835	-366	537	51	3 8	-1292	158	-368	1567	66	13	2996	2876	116	180	23	1	2	168	223	636	1150	0
71	C0 d	C0 a Big Grassy & Amps Shunt (Path 18 RAS)	1758	1506	193	825	-1858	-85	500	97	395	-1029	111	-375	1 57	657	153	2996	2975	1203	180	35	88	277	182	222	6 6	575	0
72	C0 e	C0 b Big Grassy & Amps Shunt (Path 18 RAS)	1692	166	1772	669	-18 3	-356	536	9	3 7	-1282	155	-381	156	663	135	2996	2876	1160	180	2	2	2 5	169	221	63	1150	0
73	C05	Borah – Populus 3 5 kV DLO	166	1582	16 8	1892	-2261	263	55	-1	296	-713	119	-337	1	607	185	2996	3121	1280	180	1	5 2	31	199	221	613	0	0
7	C06	Populus – Ben Lomond 3 5 kV DLO	1888	1335	1 51	1691	-166	71	513	112	11	-556	1 5	-331	1 31	676	235	2996	3278	1 33	180	-21	55	256	17	209	685	0	0
75	C06k	Populus – Ben Lomond 3 5 kV DLO RAS (Bypass 1/2 Ser es Cap)	190	1310	1 97	159	-1621	69	51	128	28	-557	139	-33	1 20	680	23	2996	3276	1 30	180	-21	55	256	17	20	685	0	0
76	C07	Ben Lomond – Terminal 3 5 kV DLO	1680	1567	1636	1891	-2228	282	59	-	292	-698	121	-336	1 3	613	189	2996	3135	1293	180	36	536	310	197	220	61	0	0
77	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1661	1585	16 3	1901	-2269	259	55	-1	296	-715	118	-3 0	1 3	606	182	2996	3116	1278	180	2	5	315	199	223	613	0	0
78	C09	Populus – Borah #2 3 5 kV Treasu eton – Brady 230 kV Lines	1672	157	1625	1893	-2220	281	59	1	311	-699	123	-336	1 7	609	189	2996	3132	1292	180	36	537	311	197	220	616	0	0
79	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1671	1576	1627	1892	-2222	281	59	1	311	-699	123	-337	1 7	609	189	2996	3132	1292	180	36	537	311	197	220	616	0	0
80	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1836	1392	1503	1752	-1820	25	97	66	363	-589	136	-332	1 31	661	223	2996	3239	1397	180	-5	78	272	181	211	650	0	0
81	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1739	1501	1571	18 2	-2056	3 3	7	3	331	-651	129	-33	1 1	630	203	2996	3178	1335	180	19	513	295	191	216	626	0	0
82	C12k	Populus – Terminal 3 5 kV Treasure on – Brady 230 kV Lines R	1757	1 7	1617	17 2	-2010	3 0	75	52	3 9	-653	123	-337	1 30	63	202	2996	3175	1333	180	20	513	295	191	211	627	0	0
83	C13	Borah – Adelaide #2 Borah–ADT–M dpoint #1 3 5 kV lines (RA)	1669	1576	16 0	1891	-2258	255	56	1	297	-718	118	-335	1 1	608	180	2996	3116	1279	180	3	5 2	31	199	22	61	0	0
8	C1	Borah – Adelaide #2 M dpoint - Adela de #2 3 5 kV ines (RA)	1668	1579	16 0	1897	-22 8	271	57	1	297	-708	120	-337	1 5	609	187	2996	3125	1286	180	38	5 0	312	198	222	61	0	0
85	C15	Borah – Adelaide #2 Borah – Hunt 230 kV lines	1668	1578	16 0	1895	-2252	26	56	1	297	-711	119	-336	1 3	608	18	2996	3122	1283	180	0	5 1	313	198	222	61	0	0
86	C16	Borah – Kinport Borah–Adel–M dpoint #1 3 5 kV lines (RA)	1668	1579	1635	1901	-22	27	58	1	297	-705	121	-337	1 6	609	188	2996	3127	1288	180	38	539	312	198	223	61	0	0
87	C18	Borah – Kinport M dpoint – Adelaide #2 3 5 kV lines (RA)	1667	1581	1637	1902	-22 3	278	58	1	297	-703	122	-338	1 7	609	189	2996	3129	1289	180	37	538	312	198	222	61	0	0
88	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV ines (RA?)	1668	1580	1636	1900	-22 6	273	57	1	297	-706	121	-337	1 5	609	187	2996	3126	1287	180	38	539	312	198	222	61	0	0
89	C20	Borah–Adel–Midpoint #1 M dpoint – Adelaide #2 3 5 kV ines	1668	1583	1636	190	-2233	290	59	1	298	-697	123	-338	1 9	610	19	2996	3133	129	180	3	536	310	197	223	61	0	0
90	C21	Borah-Adel M dpoint #1 3 5 kV Borah-Hunt 230 kV ines (RA)	1668	1579	1639	1897	-22 8	270	57	1	297	-708	120	-337	1 5	609	186	2996	3125	1286	180	39	5 0	313	198	222	61	0	0
91	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1670	1575	1635	1895	-2253	259	56	1	298	-715	118	-335	1 2	608	182	2996	3119	1281	180	1	5 1	31	198	223	61	0	0
92	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	1709	1520	1778	16 1	-2151	237	59	35	333	-736	108	-338	1 22	621	182	2996	3110	1276	180	0	538	311	197	229	625	0	0
93	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines	1709	1520	1778	16 1	-2151	237	59	35	333	-736	108	-338	1 22	621	182	2996	3110	1276	180	0	538	311	197	229	625	0	0
9	C28x	Pa o Verde Genera ion – Trip Two Un ts	17 3	1581	1622	1903	-2 0	117	57	11	308	-857	152	-3 6	1503	618	190	2996	069	2515	180	13	686	09	2 2	231	676	0	0
95	C28y	Pa o Verde Genera ion – Trip Two Un ts	17 3	1580	1621	1903	-2 0	116	55	11	307	-858	153	-3 6	1501	617	190	2996	065	2511	180	13	686	09	2 2	231	676	0	0
96																													
97		**Margin est w/ Path 18 at 5% of 337 MW**																											N-2 C iteri
98		**egwstg1 8h8 pcs 2250 p18 354 sav**	1668	1581	16 1	1897	-2250	286	56	0	297	-692	122	-35	1 6	608	187	2996	3118	128	180	39	5 0	313	198	220	619	0	0
99		**Margin est w/ Path C at 5% of 2250 MW**																											
100		**egwstg1 8h8 pcs 2362 p18 337 sav**	1705	1557	1617	1897	-2362	135	78	1	297	-855	137	-337	1 63	630	198	2996	296	1392	180	30	96	273	186	228	612	0	0

REAC IVE MARGIN MVAR (Gray shaded cells are the minimum margins)

L NE #	Aeolus 500	Monanx 500	Ant cl n 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Bridger 345	Goshen 345	3 Mi Kno l 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
3																								
5																								
6	-1262	-1825	-1107	-1331	-13 0	-1631	-2063	-1 08	-961	-670	-6 0	-109	-1256	-1276	-1 57	-15 3	-2052	-807	-1326	-866	-3 6	-332	-2 0	-85
7	-1269	-1936	-11 8	-1 20	-1 23	-1672	2038	-1 51	-10 7	-711	-698	-1173	-1369	-1370	-1530	-1606	-2187	-800	-1327	-861	-335	-323	-2 0	-87
8	-15 5	-23 9	-1 86	-1787	-1707	-1985	-2 5	-1739	-97	-79	-753	-1368	-1597	-1618	-1716	-1726	-2588	-8 7	-1566	-97	-370	-362	-260	-91
9	-1528	-2182	-1370	-15 2	-15 3	-1816	-2252	-1576	-1165	-760	-766	-1281	-1503	-1 99	-1580	-1620	-2 01	-836	-15	-935	-361	-351	-25	-89
10	-1383	-2010	-1121	-1078	-1052	-1327	-1786	-1196	-1006	- 13	-376	-792	-990	-969	-1269	-1 6	-2213	-827	-1 30	-91	-362	-3 6	-2 8	-89
11	-1660	-2279	-1627	-178	-1753	-2001	-2 35	-1730	-1 2	-857	-883	-1 60	-1721	-1711	-1680	-1697	-250	-8 3	-1656	-953	-352	-3 9	-255	-90
12	-16 3	-22 5	-1570	-1678	-1635	-189	-2332	-1659	-1383	-630	-758	-1292	-1601	-1568	-1639	-1665	-2 68	-8 2	-1639	-9 9	-360	-352	-257	-90
13																								
1	-1658	-2286	-153	-1695	-1670	-1959	-2 22	-1693	-1179	-3 5	- 98	-1 35	-163	-161	-1682	-1708	-2513	-8 5	-1658	-955	-356	-3 9	-256	-90
15	-165	-227	-160	-1755	-173	-1986	-2 19	-171	-1399	-806	-8 9	-131	-1673	-1695	-1665	-1686	-2 98	-8	-1653	-953	-357	-350	-256	-90
16	-1650	-225	-1591	-1659	-1582	-1918	-2386	-1673	-1 02	-839	-866	-1 2	-1675	-1663	-1662	-168	-2 78	-8 3	-1652	-95	-357	-350	-256	-90
17	-165	-2266	-1615	-1766	-1628	-1971	-2 07	-1713	-1397	-823	-855	-1373	-1635	-1556	-1659	-1686	-2 91	-8 2	-1653	-953	-356	-3 8	-255	-90
18	-1659	-2275	-160	-17 3	-171	-1967	-2 07	-1706	-1397	-807	-8	-1375	-1665	-1670	-1665	-1710	-2500	-8	-1658	-95	-357	-3 9	-256	-90
19	-1657	-2280	-1569	-1583	-1673	-2037	-2275	-975	-1 02	-856	-880	-1 20	-1636	-1651	-1680	-1709	-2509	-8 5	-1656	-955	-357	-351	-257	-90
20	-1635	-2265	-1529	-153	-1623	-1985	-2232	-1071	-1363	-833	-859	-1375	-158	-1599	-1656	-1686	-2 90	-8	-1638	-952	-357	-350	-256	-90
21	-1596	-22 5	-1 71	-15 1	-1 3	-1373	-2159	-1632	-1278	-76	-797	-12 5	-1 60	-1 21	-1605	-16 5	-2 65	-838	-1601	-9 3	-35	-3	-253	-91
22	-16 0	-2262	-1560	-16 1	-1 80	-1829	-2337	-1682	-1371	-827	-855	-137	-1603	-1588	-16 8	-167	-2 85	-8	-16 1	-951	-357	-350	-256	-90
23	-165	-2275	-1615	-1758	-1718	-1729	-2383	-1705	-1 17	-8 7	-875	-1 35	-1692	-1676	-1685	-1700	-2501	-8 2	-1652	-953	-356	-3 9	-256	-90
2	-1660	-2279	-1627	-1779	-17	-199	-2 32	-1726	-1 32	-858	-88	-1 57	-1716	-170	-1692	-1701	-250	-8	-1657	-95	-357	-350	-257	-90
25	-1652	-2270	-1606	-17 8	-1718	-1973	-2 05	-1713	-1 08	-8 3	-871	-1 21	-167	-1650	-1672	-1680	-2 9	-8	-1652	-953	-357	-350	-256	-90
26	-1658	-2278	-1621	-1767	-1735	-2009	-2 1	-1728	-1 22	-851	-879	-1 36	-1691	-1667	-1682	-1693	-250	-8	-1656	-95	-357	-350	-256	-90
27	-1651	-2270	-1600	-1736	-1705	-1980	-2 12	-1711	-1 01	-838	-867	-1 05	-165	-1623	-1669	-1693	-2 9	-8	-1651	-953	-357	-350	-256	-90
28	-1656	-2275	-1617	-176	-1733	-1989	-2 18	-1721	-1 19	-8 8	-876	-1 33	-1693	-1680	-1676	-1692	-2500	-8	-165	-953	-357	-350	-256	-90
29	-165	-2275	-1613	-1751	-1712	-1952	-2 08	-1711	-1 16	-8 8	-876	-1 32	-1686	-1670	-1681	-1688	-2 99	-8	-1653	-953	-357	-350	-256	-90
30	-165	-2276	-1605	-1725	-1677	-1919	-2 17	-1692	-1 09	-8 5	-873	-1 1	-1660	-1637	-1672	-1698	-2502	-8	-1652	-953	-357	-350	-256	-90
31	-1656	-2276	-1619	-1766	-1730	-1975	-2 1	-1718	-1 23	-852	-879	-1	-1702	-1688	-1677	-1699	-2500	-8	-165	-953	-357	-350	-256	-90
32	-1658	-2277	-1625	-1780	-17 8	-1990	-2 07	-1725	-1 29	-856	-883	-1 56	-1717	-1706	-1683	-1706	-2501	-8	-1656	-95	-357	-350	-257	-90
33	-1658	-2278	-1626	-1781	-17 9	-1997	-2 29	-1728	-1 30	-856	-883	-1 57	-1718	-1708	-1680	-1692	-2503	-8	-1655	-95	-357	-350	-256	-90
3	-1658	-2277	-1623	-177	-17 3	-199	-2 31	-1717	-1 28	-855	-882	-1 5	-1713	-1703	-1687	-1690	-2502	-8	-1655	-95	-357	-350	-256	-90
35	-1669	-228	-16 7	-181	-1775	-2015	-2 52	-17 8	-1 52	-871	-897	-1 87	-1738	-1720	-1693	-1712	-2512	-8 5	-1663	-955	-357	-351	-257	-90
36	-1660	-2277	-1629	-1788	-1751	-1992	-2 30	-1732	-1 33	-859	-886	-1 6	-1711	-1695	-1686	-1691	-2502	-8	-1657	-95	-357	-350	-257	-90
37	-1672	-2289	-1639	-1792	-1725	-1979	-2 32	-1733	-1 31	-768	-835	-1181	-17 0	-1652	-1688	-1706	-2518	-8 5	-1667	-957	-357	-350	-257	-90
38	-1605	-2097	-15 9	-1659	-1636	-1906	-2360	-1656	-1356	-818	-8 7	-13 9	-1573	-1579	-1 25	-1 92	-229	-828	-1608	-9 2	-357	-3 5	-251	-90
39	-1607	-2116	-15 6	-1650	-1626	-1901	-235	-1651	-1353	-816	-8 5	-13	-1559	-1569	-1527	-1520	-231	-830	-1610	-9 3	-358	-3 8	-253	-90
0	-516	-1216	-956	-1337	-138	-1696	-21 5	-1 32	-96	-768	-7	-1187	-13 1	-1356	-1 83	-1 66	-1623	-780	-565	- 3	-268	-250	-216	-83
1	-1370	-19 8	-1121	-1563	-1597	-1878	2260	-159	-1190	-856	-856	-1378	-1585	-1581	-1705	-1675	-22	-811	-1 60	-937	-316	-310	-2 5	-89
2	-1395	-196	-1153	-1611	-16 3	-1915	2293	-1627	-1229	-875	-880	-1 18	-1637	-1631	-1721	-1696	-2262	-815	-1 87	-9 8	-3 0	-335	-255	-89
3	-1 36	-2105	-1209	-1717	-17 6	-200	2363	-1697	-1299	-931	-927	-1520	-175	-17 5	-181	-1782	-2 6	-822	-1530	-967	-3 3	-3 0	-258	-90
											P CASE DIVERGED													
5	-1612	-2177	-1128	-1026	-1055	-13 0	1778	-1159	-872	-602	-597	-896	-981	-1012	-1206	-1 39	-2 5	-712	-1701	-990	-335	-312	-228	-88
6	-1633	-2182	-1150	-10 6	-107	-1363	1802	-1178	-891	-612	-607	-912	-1002	-1031	-1228	-1 86	-2 61	-71	-1718	-993	-3 0	-327	-235	-88
7	-16 6	-2189	-1173	-1069	-1096	-1387	-1827	-1199	-912	-621	-619	-931	-102	-1053	-1261	-1 57	-2 70	-716	-1728	-995	-3 1	-332	-2 7	-88
8	-18 7	-2206	-1201	-1093	-1153	-1 57	1898	-1228	-926	-678	-66	-1006	-1097	-1128	-1307	-1 86	-2 93	-720	-1951	-1082	-3 3	-322	-235	-89
9	-1865	-2211	-1223	-1116	-1172	-1 78	1921	-1250	-9 5	-688	-676	-1023	-1116	-11 8	-1321	-1500	-2 99	-722	-1967	-1086	-3 8	-337	-2 2	-89
50																								
51	-1561	-227	-1559	-17 8	-1730	-1990	-2 2	-1715	-1396	-85	-877	-1 5	-1697	-1690	-1687	-1699	-2507	-8 1	-1556	-92	-35	-3 7	-255	-90
52	-1651	-2312	-1659	-1808	-1765	-2011	-2 36	-1738	-1 9	-859	-886	-1 68	-1735	-1723	-1689	-1711	-2537	-830	-1627	-960	-3 2	-333	-250	-89
53	-1596	-2289	-1598	-1756	-1722	-1986	-2 23	-1712	-1365	-8 6	-86	-1 31	-1682	-1676	-1678	-1702	-2517	-8 3	-1590	-87	-357	-350	-253	-90
5	-138	-2126	-1326	-1 89	-1501	-1800	-2250	-1550	-1185	-769	-783	-1255	-1 5	-1 58	-15 5	-1590	-2363	-596	-1 02	-890	-3 7	-338	-2	-81
55	-1 60	-2167	-1 09	-155	-1552	-1821	-2235	-1587	-1253	-780	-805	-1290	-1500	-1502	-1563	-160	-2 01	-530	-1 7	-909	-350	-339	-2 8	-88
56	-1628	-2266	-1529	-158	-1553	-1659	-1703	-1 75	-13 7	-815	-8 3	-1337	-1557	-1537	-16 6	-1672	-2 89	-8 2	-1630	-9 9	-356	-3 8	-256	-90
57	**516**	**1216**	**956**	**1026**	**1052**	**1327**	**1703**	**975**	**872**	**345**	**376**	**792**	**981**	**969**	**1206**	**1439**	**1623**	**530**	**565**	**87**	**268**	**250**	**216**	**81**
58	> >				500	500	500	500	100			200		200										
59																								
60	-1218	-197	-922	-1131	-1179	-1 70	-1897	-1256	-760	-581	-5 8	-982	-1156	-11 9	-1363	-1 96	-220	-819	-1283	-868	-366	-352	-2 7	-88
61	-1336	-2120	-1119	-132	-13 6	-1592	-196	-1398	-917	-658	-6 9	-1117	-1326	-1308	-1 83	-1569	-2350	-815	-1377	-892	-355	-3 2	-2 8	-91
62																								
63	-1089	-1810	-805	-8 6	-856	-110	-1513	-978	-720	-375	-3 7	-666	-80	-796	-1100	-13 1	-2038	-810	-1173	-828	-366	-3 7	-2 1	-87
6	-1253	-1989	-1013	-1015	-991	-1236	1639	-112	-903	- 11	-376	-756	-9 3	-917	-12 3	-1 9	-2211	-808	-130	-871	-357	-338	-2 3	-90
65	-1290	-2097	-1103	-1057	-101	-123	1599	-11 5	-979	- 1	-380	-767	-973	-93	-1279	-1508	-2322	-800	-1333	-87	-3 0	-32	-2 2	-92
66	-1281	-2020	-1061	-109	-1071	-132	-1735	-1199	-939	- 52	- 08	-825	-102	-998	-1313	-1 87	-22 6	-809	-1328	-878	-358	-3 0	-2 5	-90
67	-1316	-2131	-1156	-11 1	-1097	-1323	1688	-1220	-1020	- 55	- 11	-838	-1058	-1018	-13 9	-15 7	-2358	-801	-1356	-880	-3 1	-326	-2 3	-92
68	-1089	-1810	-805	-8 6	-856	-110	-1513	-978	-720	-375	-3 7	-666	-80	-796	-1100	-13 5	-2038	-810	-1173	-828	-366	-3 7	-2 1	-87
69	-1253	-1989	-1013	-1015	-991	-1236	1639	-112	-903	- 11	-376	-756	-9 3	-917	-12 3	-1 9	-2211	-808	-130	-871	-357	-338	-2 3	-90
70	-1290	-2097	-1103	-1057	-101	-123	1599	-11 5	-979	- 1	-380	-767	-973	-93	-1279	-1508	-2322	-800	-1333	-87	-3 0	-32	-2 2	-92
71	-1281	-2020	-1061	-109	-1071	-132	-1735	-1199	-939	- 52	- 08	-825	-102	-998	-1313	-1 88	-22 6	-809	-1328	-878	-358	-3 0	-2 5	-90
72	-1316	-2131	-1156	-11 1	-1097	-1323	-1688	-1220	-1020	- 55	- 11	-838	-1058	-1018	-13 9	-15 3	-2358	-801	-1356	-880	-3 1	-326	-2 3	-92
73	-1669	-2279	-16 2	-1812	-1761	-1981	-2 32	-17 9	-1 7	-871	-897	-1 88	-1703	-1665	-1669	-170	-250	-8 5	-166	-956	-357	-351	-257	-90
7	-1 86	-1718	-1 33	-1505	-1 92	-1791	-2280	-1562	-1253	-770	-796	-1219	-1397	-1 22	-1032	-1160	-186	-787	-1 98	-913	-357	-333	-237	-91
75																								
76	-16 8	-2191	-1595	-1707	-1676	-1951	-2 00	-1689	-139	-8 1	-866	-1396	-1620	-1625	-1 3	-1587	-2390	-8 0	-16 6	-952	-358	-351	-256	-90
77	-1675	-2287	-1636	-1788	-1696	-19 1	-2 10	-1729	-1 29	-75	-826	-11 3	-1727	-158	-1677	-1697	-2516	-8 6	-1670	-957	-357	-351	-257	-90
78	-1655	-2259	-161	-1768	-1733	-1976	-2 15	-1721	-1 11	-8 6	-865	-1 3	-1687	-167	-1632	-1666	-2 81	-8 3	-165	-953	-356	-3 8	-25	-90
79	-1663	-2267	-1633	-179	-1758	-1998	-2 37	-1737	-1 29	-858	-876	-1 66	-1713	-1700	-165	-1676	-2 90	-8 3	-1659	-95	-357	-3 8	-255	-90
80	-1523	-1863	-1 9	-1517	-1503	-1795	-2275	-1569	-1267	-772	-801	-1230	-1 09	-1 33	-1225	-1277	-2027	-80	-1533	-923	-358	-3 1	-2 5	-91
81	-1599	-2089	-1526	-1627	-1605	-1882	-2338	-1637	-1328	-801	-821	-1321	-1533	-15 5	-1 8	-1 79	-2283	-828	-1602	-9 1	-357	-3 5	-250	-90
82																								
83	-16 6	-2261	-1571	-1682	-1653	-1912	23 3	-1691	-1369	-818	-850	-13 5	-1578	-1520	-16 0	-1667	-2 83	-8	-16 7	-952	-357	-351	-256	-90
8	-1652	-2271	-1601	-1737	-1706	-1979	2 12	-1712	-1 02	-839	-868	-1 06	-1655	-1623	-1667	-1680	-2 9	-8	-1652	-953	-357	-350	-256	-90
85	-1650	-2268	-1595	-1727	-1697	-1958	-238	-1705	-1395	-833	-863	-1392	-16 3	-1615	-1659	-1678	-2 91	-8	-1650	-953	-357	-350	-256	-90
86	-16 6	-2266	-1578	-1708	-1688	-196	2397	-1696	-1370	-790	-83	-1273	-1611	-1607	-1653	-1677	-2 89	-8 3	-16 6	-952	-357	-350	-256	-90
87	-1653	-227	-1599	-1738	-1717	-1993	2 26	-1713	-1391	-802	-8 5	-1298	-16 7	-1652	-1665	-1692	-2 99	-8	-1653	-953	-357	-350	-256	-90
88	-1651	-2271	-159	-1735	-1716	-197	2 03	-1706	-1387	-797	-8 1	-1289	-16 6	-1665	-1659	-1680	-2 95	-8	-1651	-953	-357	-350	-256	-90
89	-16	-2267	-1565	-166	-1635	-1980	2 13	-1689	-1360	-811	-8 3	-1322	-155	-1 92	-16 8	-1673	-2 90	-8 3	-16	-952	-356	-3 9	-256	-90
90	-16 9	-2267	-1589	-1713	-1683	-1965	2392	-1702	-1387	-827	-858	-1373	-1622	-1586	-1657	-1679	-2 91	-8	-16 9	-952	-357	-350	-256	-90
91	-163	-225	-1532	-1591	-1 26	-1758	228	-1663	-13 3	-811	-8 0	-1326	-15 2	-1510	-1633	-1670	-2 76	-8	-1636	-951	-357	-350	-256	-90
92	-1511	-2190	-1257	-1 58	-1 58	-1761	2232	-1523	-919	-310	- 20	-1259	-1 2	-1 05	-1572	-1633	-2 11	-836	-15 1	-937	-360	-350	-25	-90
93	-1511	-2190	-1257	-1 58	-1 58	-1761	-2232	-1523	-919	-310	- 20	-1259	-1 2	-1 05	-1570	-1633	-2 11	-836	-15 1	-937	-360	-350	-25	-90
9	-1 97	-2021	-1 33	-1565	-1557	-1818	-2169	-1593	-1267	-776	-803	-1287	-150	-1503	-15	-1586	-2191	-826	-1506	-917	-351	-336	-2 9	-67
95	-1500	-202	-1 36	-1568	-1559	-1820	-2172	-159	-1269	-777	-80	-1289	-1506	-1505	-15	-1582	-2195	-827	-1508	-918	-351	-336	-250	-13
96	**1089**	**1718**	**805**	**846**	**856**	**1104**	**1513**	**978**	**720**	**310**	**347**	**666**	**804**	**796**	**1032**	**1160**	**1864**	**787**	**1173**	**828**	**340**	**324**	**237**	**67**
97	> >				00	00	00	00	100			250		250										
98																								
99																								
100																								

L NE #	Voltage Violations	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Voltage	COMMEN
3									
5									
6	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5	98.01%	0	- - -	
7	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115	91.91%	0	- - -	
8	0	- - -	- - -	0	GRACE 138 SODA 138 #1	88.87%	0	- - -	
9	0	- - -	- - -	0	GRACE 138 SODA 138 #1	88.1 %	0	- - -	
10	8	BIGGRASS 69	6.	0	PTRSNFLT 230 AMPS 230 #	85.17%	0	- - -	Neg Vdevs in Wyo , P18 & Mont.
11	0	- - -	- - -	0	- - -	- - -	0	- - -	
12	0	- - -	- - -	2	GRACE 138 SODA 138 #1	112.19%	0	- - -	
13	0	- - -	- - -	0	GRACE 138 SODA 138 #1	92.68%	0	- - -	
1	0	- - -	- - -	0	- - -	- - -	0	- - -	
15	0	- - -	- - -	0	- - -	- - -	0	- - -	
16	0	- - -	- - -	0	POPULUS 3 5 POPULUS 500	83.95%	0	- - -	
17	0	- - -	- - -	0	- - -	- - -	0	- - -	
18	0	- - -	- - -	0	GRACE 138 SODA 138 #1	82.99%	0	- - -	
19	0	- - -	- - -	0	- - -	- - -	0	- - -	
20	0	- - -	- - -	0	- - -	- - -	0	- - -	
21	0	- - -	- - -	0	PTRSNFLT 230 AMPS 230 #	83.63%	0	- - -	
22	0	- - -	- - -	0	- - -	- - -	0	- - -	
23	0	- - -	- - -	0	- - -	- - -	0	- - -	
2	0	- - -	- - -	0	- - -	- - -	0	- - -	
25	0	- - -	- - -	0	- - -	- - -	0	- - -	
26	0	- - -	- - -	0	- - -	- - -	0	- - -	
27	0	- - -	- - -	0	- - -	- - -	0	- - -	
28	0	- - -	- - -	0	- - -	- - -	0	- - -	
29	0	- - -	- - -	0	- - -	- - -	0	- - -	
30	0	- - -	- - -	0	- - -	- - -	0	- - -	
31	0	- - -	- - -	0	- - -	- - -	0	- - -	
32	0	- - -	- - -	0	- - -	- - -	0	- - -	
33	0	- - -	- - -	0	- - -	- - -	0	- - -	
3	0	- - -	- - -	0	- - -	- - -	0	- - -	
35	0	- - -	- - -	0	- - -	- - -	0	- - -	
36	0	- - -	- - -	0	- - -	- - -	0	- - -	
37	0	- - -	- - -	0	- - -	- - -	0	- - -	
38	0	- - -	- - -	0	GRACE 138 SODA 138 #1	87.86%	0	- - -	
39	0	- - -	- - -	0	GRACE 138 SODA 138 #1	8 .03%	0	- - -	
0	39	LATHAM 3 5	8.	1	DAVEJOHN 115 DAVEJTPS 115	10 .03%	0	- - -	
1	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	91.75%	0	- - -	
2	5	BA RO L 57	-5.	0	DAVEJOHN - DAVEJTPS 115 #1	91.70%	0	- - -	Only Neg Vdevs in Wyoming
3	9	BA RO L 57	-6 2	0	DAVEJOHN - DAVEJTPS 115 #1	91.09%	0	- - -	Only Neg Vdevs in Wyoming
					P CASE DIVERGED				
5	0	- - -	- - -	0	GRACE 138 SODA 138 #1	97.7 %	0	- - -	
6	0	- - -	- - -	0	GRACE 138 SODA 138 #1	97.67%	0	- - -	
7	0	- - -	- - -	0	GRACE 138 SODA 138 #1	97.65%	0	- - -	
8	16	BA RO L 57	-8 9	0	GRACE 138 SODA 138 #1	97.35%	0	- - -	Only Neg Vdevs in Wyoming
9	18	BA RO L 57	-9.1	0	GRACE 138 SODA 138 #1	97.27%	0	- - -	Only Neg Vdevs in Wyoming
50	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	95.67%			
51	0	- - -	- - -	0	AEOLUS 500 / 230 #2	83. 5%	0	- - -	
52	0	- - -	- - -	0	DAVEJOHN - DAVEJTPS 115 #1	91. 7%	0	- - -	
53	0	- - -	- - -	0	- - -	- - -	0	- - -	
5	0	- - -	- - -	0	R FLE CU 69 / 138 #T2	93.99%	0	- - -	
55	0	- - -	- - -	0	PTRSNFLT - AMPS 230 #1	8 .02%	0	- - -	
56	0	- - -	- - -	0	- - -	- - -	0	- - -	
57									
58									
59									
60	0	- - -	- - -	2	BR DGER 3 5 BR DGE&A 3 5	102.1 %	0	- - -	
61	0	- - -	- - -	0	GRACE 138 SODA 138 #1	90.66%	0	- - -	
62	0	- - -	- - -	0	PTRSNFLT - AMPS 230 #1	90.96%			
63	0	PTRSNFRG 69	6 5	0	PTRSNFLT - AMPS 230 #1	86.8 %	0	- - -	
6	0	PTRSNFRG 69	8 6	0	PTRSNFLT - AMPS 230 #1	90.60%	1	PTRSNFUR 69 0 @ 0 896	
65	2	PTRSNFRG 69	11.	0	PTRSNFLT - AMPS 230 #1	9 .5 %	1	PTRSNFUR 69 0 @ 0 869	
66	0	PTRSNFRG 69	5 3	0	PTRSNFLT - AMPS 230 #1	91.70%	0	- - -	
67	0	PTRSNFRG 69	8.1	0	PTRSNFLT - AMPS 230 #1	95.71%	0	- - -	
68	0	PTRSNFUR 69	6.	0	PTRSNFLT - AMPS 230 #1	86.8 %	0	- - -	
69	0	PTRSNFRG 69	8 6	0	PTRSNFLT - AMPS 230 #1	90.60%	1	PTRSNFUR 69 0 @ 0 896	
70	2	PTRSNFRG 69	11.	0	PTRSNFLT - AMPS 230 #1	9 .5 %	1	PTRSNFUR 69 0 @ 0 869	
71	0	PTRSNFRG 69	5 3	0	PTRSNFLT - AMPS 230 #1	91.70%	0	- - -	
72	0	PTRSNFRG 69	8.1	0	PTRSNFLT - AMPS 230 #1	95.71%	0	- - -	
73	0	- - -	- - -	0	- - -	- - -	0	- - -	
7	0	- - -	- - -	1	GRACE 138 SODA 138 #1	103.50%	0	- - -	
75	0	- - -	- - -	0	GRACE 138 SODA 138 #1	89.52%			
76	0	- - -	- - -	0	- - -	- - -	0	- - -	
77	0	- - -	- - -	0	- - -	- - -	0	- - -	
78	0	- - -	- - -	0	GRACE 138 SODA 138 #1	9 .36%	0	- - -	
79	0	- - -	- - -	0	GRACE 138 SODA 138 #1	9 .28%	0	- - -	
80	0	- - -	- - -	0	GRACE 138 SODA 138 #1	9 .15%	0	- - -	
81	0	- - -	- - -	0	GRACE 138 SODA 138 #1	99.83%	0	- - -	
82	0	- - -	- - -	0	GRACE 138 SODA 138 #1	86.52%			
83	0	- - -	- - -	0	- - -	- - -	0	- - -	
8	0	- - -	- - -	0	- - -	- - -	0	- - -	
85	0	- - -	- - -	0	- - -	- - -	0	- - -	
86	0	- - -	- - -	0	- - -	- - -	0	- - -	
87	0	- - -	- - -	0	- - -	- - -	0	- - -	
88	0	- - -	- - -	0	- - -	- - -	0	- - -	
89	0	- - -	- - -	0	- - -	- - -	0	- - -	
90	0	- - -	- - -	0	- - -	- - -	0	- - -	
91	0	- - -	- - -	0	- - -	- - -	0	- - -	
92	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5	86.26%	0	- - -	
93	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5	86.26%	0	- - -	
9	0	- - -	- - -	0	LAGUNATP 69 YUCCA W 69	95.52%	0	- - -	
95	0	HESSBDW 115	-5.6	0	LAGUNATP 69 YUCCA W 69	95.51%	0	- - -	
96									
97					A l Con ingenc es (w/ F nal RAS) Converged Indicat ng Posi ive Reactive Margin				
98									
99					A l Con ingenc es (w/ F nal RAS) Converged Indicat ng Posi ive Reactive Margin				
100									

1) Vo tage V o at ons > 5% for Level B & > 10% for Level C
2) Excluding Ser es Cap Buses (Line S de) and Transformer ert ary buses.

Appendix 3-11 Pg. 2 - - - Post-transient Results For Path C Southbound vs. Idaho - Montana (Path 18)

BASE CASE / P PA H FLOWS

INE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeo us South	Aeo us West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	O 1A	Monu Naughtn	West of RS/FH	M dpo nt West	Montana SE	Montana daho (P18)	ot 4a	Bonanza West	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP Gonder	RedB H A len (ot 2C)	Pinto 4Corners 2B1)	Sigurd GlenC (2B 2)	daho Area System osses	Pace Area System osses	Bridger Gen RAS MW	Aeo us Gen rip MW
3																													
		egwstg1 8h8 pcs 2250 p18 285 sav	1697	1636	1679	1929	-2250	28	500	0	297	-693	126	-285	15 6	6 2	186	2996	3105	126	180	38	53	303	195	223	623	0	0
5		**Level "B" Contingenc es**																											
6	B01	Anticline – Populus 500 kV Line	205	1073	0	2926	-1829	-33	528	91	390	-976	30	-288	13 5	682	153	2996	2953	113	180	6	5 9	307	197	326	636	0	0
7	B01a	Anticline – Populus 500 kV Line RAS Trip Bridger Un	1993	1229	0	2583	-1792	-282	560	55	353	-1208	70	-30	1 9	689	135	2996	2853	1092	180	5	503	278	18	301	623	575	0
8	B02	Anticline 500 / 3 5 kV Transformer	1611	1771	1377	229	-2291	285	86	31	328	-69	133	-280	1577	6 6	188	2996	3106	1266	180	37	53	30	196	250	601	0	0
9	B03	Br dger – Populus 3 5 kV Line	17 5	1568	1827	1650	-21 5	2 6	503	38	335	-725	112	-285	1520	655	180	2996	3088	1250	180	0	532	301	195	228	635	0	0
10	B0	Br dger – 3Mileknoll 3 5 kV Line	1782	1512	1872	1 88	-2032	239	507	82	380	-729	101	-302	1500	66	176	2996	3080	12 3	180	0	528	298	193	237	652	0	0
11	B05	Br dger 3 5 / 230 kV T ansfo mer	1698	1635	1678	1920	-22 3	282	99	5	302	-695	125	-285	15 5	6 3	185	2996	3103	1262	180	38	53	303	196	222	622	0	0
12	B06	3Mi eknoll – Goshen 3 5 kV Line	171	1612	1739	182	-2230	266	500	11	307	-707	118	-292	1535	6 6	182	2996	3091	1252	180	0	535	303	196	219	638	0	0
13	B06k	3Mi eknoll – Goshen 3 5 kV Line RAS (Bypass 1/2 S	1723	1597	1759	1775	-2199	268	500	21	318	-705	116	-29	1529	6 8	181	2996	3092	1252	180	0	535	303	196	218	63	0	0
1	B07	Kinport – Goshen 3 5 kV Line	1693	16 2	1658	1960	-225	291	500	-2	295	-687	127	-291	15 9	6 1	187	2996	310	126	180	37	533	303	195	226	623	0	0
15	B08	Kinport – Borah 3 5 kV Line	1699	1635	167	1932	-22 6	286	500	1	297	-691	127	-286	15 7	6 2	186	2996	3106	1265	180	37	533	302	195	22	623	0	0
16	B09	Populus – Borah 500 kV Line	1715	1608	1606	1968	-2236	262	500	5	301	-706	121	-285	1536	6 3	177	2996	309	1253	180	3	536	30	196	230	622	0	0
17	B10	Borah 500 / 3 5 kV Transformer	1708	1626	1631	196	-2218	307	50		300	-672	130	-290	15 9	6	186	2996	3118	1276	180	35	528	299	19	227	622	0	0
18	B11	Borah 3 5 / 230 kV Transformer	1699	163	1668	193	-22 0	290	501		300	-689	127	-290	15 7	6 2	186	2996	3106	1265	180	37	533	302	195	226	622	0	0
19	B12	Populus – Cedar Hill 500 kV Line	1697	1636	1682	1927	-2255	280	99	-1	296	-697	126	-285	15 6	6 1	186	2996	3101	1261	180	38	535	30	196	222	622	0	0
20	B1	Cedar H ll – Hemingway 500 kV Line	1700	1633	1675	1929	-2250	279	500	1	297	-697	126	-285	15 5	6 2	185	2996	3102	1261	180	38	535	303	196	223	623	0	0
21	B15	Midpoint – Hemingway 500 kV Line	1701	16 8	1669	1951	-219	357	510		300	-592	1 2	-29	1566	6 8	157	2996	3161	1306	180	39	51	291	190	231	623	0	0
22	B16	Borah – Midpoint 500 kV Line	1700	1632	1673	1929	-22 9	278	500	1	298	-697	126	-285	15 5	6 2	18	2996	3103	1261	180	39	535	303	196	22	623	0	0
23	B17	Midpoint 500 / 3 5 kV Transformer	1702	163	166	19 2	-2238	296	503	2	298	-650	130	-288	1551	6	153	2996	3125	127	180	7	528	299	19	231	622	0	0
2	B18	Midpoint 3 5 / 230 kV Transformer	1698	1635	1679	1928	-2251	283	500	0	297	-695	126	-285	15 6	6 2	186	2996	3103	1262	180	38	53	303	196	223	623	0	0
25	B19	Borah – Adelaide #2 3 5 kV Line	1699	1633	1677	1927	-2251	278	500	1	297	-697	126	-28	15 5	6 2	183	2996	3102	1261	180	39	535	303	196	223	623	0	0
26	B20	Adelaide – M dpoint #2 3 5 kV Line	1698	1636	1678	1930	-22 6	288	500	0	297	-691	127	-286	15 7	6 2	188	2996	3105	1265	180	37	533	302	195	223	622	0	0
27	B21	Borah – Adelaide – M dpoint #1 3 5 kV Line	1699	163	1677	1929	-22 7	28	500	1	297	-69	127	-285	15 6	6 2	186	2996	310	1263	180	38	53	303	195	223	623	0	0
28	B22	Borah – Hunt 230 kV Line	1699	1635	1678	1928	-2250	282	500	0	297	-69	126	-285	15 6	6 2	185	2996	310	1263	180	38	53	303	196	223	623	0	0
29	B23	Midpoint – Bo se Bench #3 230 kV Line	1699	1635	1678	1929	-22 8	285	500	0	297	-691	127	-285	15 7	6 2	18	2996	3106	126	180	38	53	303	195	222	623	0	0
30	B2	Midpoint – Ra tle Snake 230 kV Line	1698	1637	1678	1931	-22 5	292	501	0	297	-682	129	-287	15 9	6 3	182	2996	3110	1268	180	38	532	302	195	223	623	0	0
31	B25	Midpoint – Dram 230 kV Line	1699	1635	1678	1929	-22 9	28	500	0	297	-692	127	-285	15 7	6 2	185	2996	310	1263	180	38	53	303	195	222	623	0	0
32	B26	Ra tle Snake – Boise Bench 230 kV Line	1699	163	1678	1928	-2251	281	500	0	297	-697	126	-285	15 6	6 2	186	2996	3102	1262	180	38	535	303	196	225	623	0	0
33	B27	Boise Bench - Dram 230 kV Line	1698	1635	1678	1929	-22 9	285	500	0	297	-692	127	-285	15 7	6 2	185	2996	3105	126	180	38	53	303	195	222	623	0	0
3	B28	Hemingway 500 230 kV Transformer	1698	1635	1678	1929	-22 9	28	500	0	297	-692	126	-285	15 6	6 2	185	2996	3105	126	180	38	53	303	195	223	623	0	0
35	B30	Populus – Borah #1 3 5 kV Line	1697	1637	1683	1927	-2255	281	99	-1	296	-695	126	-285	15 6	6 1	185	2996	3102	1261	180	39	535	30	196	222	622	0	0
36	B31	Populus – Borah #2 3 5 kV Line	1698	1635	1680	1927	-2253	280	99	0	297	-695	126	-285	15 6	6 2	185	2996	3102	1261	180	39	535	303	196	223	623	0	0
37	B32	Populus – Kinport 3 5 kV Line	169	1639	1677	1935	-2262	279	99	-1	296	-696	125	-288	15 6	6 0	18	2996	3099	1259	180	0	536	30	196	22	622	0	0
38	B33	Populus – Ben Lomond #3 3 5 kV Line	1771	155	1616	1862	-2058	3 9	518	37	33	-6 3	13	-283	15 2	66	201	2996	3153	1310	180	19	506	285	188	218	6 3	0	0
39	B3	Populus – Terminal 3 5 kV Line	1761	1566	1631	1880	-2098	3 0	51	17	31	-6 9	132	-283	15 0	661	198	2996	31 6	1302	180	22	512	288	189	219	632	0	0
0	B35	Aeolus – Anticline 500 Line	2233	72	1097	1692	-1800	-28	579	-19	278	-969	10	-30	1232	672	151	2996	2957	1137	180	62	539	300	19	219	730	0	0
1	B35a	B35 dropping 600MW of Aeolus gen insertion of	2002	636	1067	16 7	-1889	-180	566	-29	268	-1115	102	-310	1 95	66	1	2996	2899	1132	180	6	97	276	18	22	6 1	0	597
2	B35d	B35a insertion/addit on of 2 Mus ang 230kV and 1 R	1997	6 5	1071	165	-1892	-173	563	-27	269	-1108	108	-310	1507	663	1 5	2996	2900	113	180	6	98	277	18	22	639	0	597
3	B35g	B35d insertion/addit on of 2 Di lon S 69kV caps Pa	INVALID CON INGENCY WI HOU PA H 18 SHUN S																										
	B36	Aeolus – Mona 500kV Line	P CASE DIVERGED																										
5	B36a	B36 dropping 600MW of Aeolus gen insertion of 3	0	2552	2113	2237	-3112	129	66	103	02	-878	10	-300	1395	819	216	2996	31 8	1365	180	-52	356	181	1 2	263	6 7	0	597
6	B36d	B36a insertion of 2 Mus ang 230kV and 1 Riverton 2	0	25 8	2113	2237	-3110	131	663	10	02	-876	107	-300	1399	819	217	2996	31 8	136	180	-52	357	181	1 2	263	6 7	0	597
7	B36g	B36d insertion of 2 Chappel C 230kV caps	0	25 7	211	2237	-3110	132	662	10	02	-875	108	-300	1 01	818	217	2996	31 7	136	180	-52	357	182	1 2	263	6 6	0	597
8	B36k	Extreme vers on of B36a includes insert on of 1 more A	0	2576	21 6	2229	-3126	1 1	657	102	00	-867	113	-299	1 19	81	218	2996	3151	1367	180	-52	359	183	1 3	261	6 6	0	597
9	B36n	Extreme version of B36d includes insert on of 1 more A	0	2572	21 6	2229	-312	1 3	655	102	01	-865	115	-299	1 23	81	218	2996	3150	1367	180	-52	360	18	1 3	260	6 5	0	597
50	B36ak	B36a RAS (Bypass 1/2 Series Cap)	0	2532	2166	2130	-3065	127	667	126	25	-879	95	-303	137	827	215	2996	31 7	1363	180	-53	353	178	1 1	259	6 9	0	597
51	B37	Aeolus 500 / 230 kV Transformer	1686	1622	1668	1927	-22 8	27	506	2	298	-702	120	-286	1526	6 7	185	2996	3102	1261	180	38	533	302	195	223	623	0	0
52	B38	Aeolus – Windstar 230 kV Line	1658	156	16 3	1913	-22 3	2 5	528	0	297	-729	97	-288	1 59	661	183	2996	3092	1252	180	37	527	297	193	223	626	0	0
53	B39	Aeolus – Freezeout 230 kV Line	168	1659	1668	19 2	-2252	283	97	8	30	-69	128	-285	155	6 3	186	2996	3106	1265	180	37	53	303	195	22	627	0	0
5	B 0	Bonanza –Mona 3 5kV Line	1827	166	1702	2002	-2 21	207	122	55	353	-773	103	-290	1720	128	189	2996	30 6	120	180	16	73	250	17	233	656	0	0
55	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plan	1812	1629	1662	1955	-2 52	99	367	32	329	-875	135	-296	1665	9	183	2996	303	1231	180	9	57	2 6	172	235	630	0	0
56	B 1	Hemingway – Summer Lake 500kV ine	1698	1639	1679	1932	-2235	303	503	1	298	-668	131	-287	1552	6	181	2996	3118	1273	180	37	529	300	19	226	623	0	0
57			1826	1 8	2082	1160	-1963	179	507	106	0	-783	86	-285	1 70	679	171	2996	3063	1227	180		529	297	193	226	666	0	0
58																												N-1 Criteri	
59		**Level "C" Contingenc es**																											
60	C02	Br dger – Populus #1 # 2 3 5 kV Lines	1826	1 8	2082	1160	-1963	179	507	106	0	-783	86	-285	1 70	679	171	2996	3063	1227	180		529	297	193	226	666	0	0
61	C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1758	1608	1916	1015	-1952	-75	5 0	57	355	-1019	128	-301	1577	683	15	2996	2961	1185	180	33	83	268	180	220	6 3	575	0
62	C02b	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	P CASE DIVERGED																										
63	C03	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV lin	1862	1391	212	995	-18 9	180	511	152	52	-780	73	-310	1 7	687	167	2996	3053	1219	180	5	526	295	192	23	678	0	0
6	C03a	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV lin	1793	155	1973	8 1	-18	-78	5	101	00	-1020	116	-320	1556	691	151	2996	2952	1177	180	3	80	265	179	22	657	575	0
65	C03b	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV lin	721	1699	1801	680	-1832	-363	56	53	350	-1292	156	-329	16 0	686	138	2996	2899	1171	180	25	39	239	167	22	6 2	1150	0
66	C03d	C03a Big Grassy & Amps Shunt (Path 18 RAS)	INVALID CON INGENCY WI HOU PA H 18 SHUN																										
67	C03e	C03b Big Grassy & Amps Shunt (Path 18 RAS)	INVALID CON INGENCY WI HOU PA H 18 SHUN																										
68	C0	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV lin	1862	1391	212	995	-18 9	180	511	152	52	-780	73	-310	1 7	687	167	2996	3053	1219	180	5	526	295	192	23	678	0	0
69	C0 a	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV lin	1793	155	1973	8 1	-18	-78	5	101	00	-1020	116	-320	1556	691	151	2996	2952	1177	180	3	80	265	179	22	657	575	0
70	C0 b	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV lin	727	1712	1813	68	-1830	-3 6	579	5	351	-1270	159	-329	1663	697	133	2996	2851	113	180	23	35	233	166	223	6 5	1150	0
71	C0 d	C0 a Big Grassy & Amps Shunt (Path 18 RAS)	INVALID CON INGENCY WI HOU PA H 18 SHUN																										
72	C0 e	C0 b Big Grassy & Amps Shunt (Path 18 RAS)	INVALID CON INGENCY WI HOU PA H 18 SHUN																										
73	C05	Borah – Populus 3 5 kV DLO	1696	1637	1686	1923	-2261	27	98	-1	296	-700	125	-285	15 5	6 1	183	2996	3098	1258	180	0	537	30	196	223	622	0	0
7	C06	Populus – Ben Lomond 3 5 kV DLO	1916	1393	1 91	1722	-1663	85	556	113	12	-5 1	151	-278	1532	709	23	2996	3257	1 11	180	-23	8	2 5	171	211	695	0	0
75	C06k	Populus – Ben Lomond 3 5 kV DLO RAS (Bypass 1	1932	1367	1537	162	-1620	83	557	130	29	-5 2	1 5	-282	1520	713	233	2996	3255	1 08	180	-22	8	2 5	171	205	695	0	0
76	C07	Ben Lomond – Terminal 3 5 kV DLO	1711	1622	1673	1923	-2228	29	502	-	292	-685	127	-28	15 5	6 6	188	2996	3112	1270	180	35	530	300	19	222	623	0	0
77	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1692	16 0	1680	1933	-2270	271	97	-1	296	-701	12	-289	15 5	639	181	2996	3095	125	180	2	538	306	197	225	622	0	0
78	C09	Populus – Borah #2 3 5 kV Treasure on – Brady 23	1703	1629	1662	192	-2220	293	502	1	311	-686	129	-285	15 8	6 3	188	2996	3111	1270	180	35	531	301	195	222	625	0	0
79	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 23	1702	1631	1665	192	-2223	293	502	1	311	-686	129	-285	15 9	6 2	188	2996	3111	1269	180	35	531	301	195	222	625	0	0
80	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV	1865	1 50	15 2	178	-1819	39	5 0	67	36	-57	1 2	-279	1532	69	222	2996	3219	1373	180	-6	71	261	178	213	660	0	0
81	C12	Populus – Terminal 3 5 kV T easureton – Brady 230	1769	1557	1610	187	-2056	356	517	3	331	-638	135	-282	15 2	663	202	2996	3156	1312	180	18	507	285	188	218	635	0	0
82	C12k	Populus – Terminal 3 5 kV Treasu eton – Brady 23	1787	1529	1655	1772	-2009	35	518	53	350	-638	129	-286	1530	667	201	2996	315	1310	180	19	507	285	188	212	636	0	0
83	C13	Borah – Adelaide #2 Borah–ADT–Midpoint #1 3 5 k	1700	1630	1677	1923	-2258	267	99	1	297	-705	12	-283	15 3	6 2	179	2996	3096	1255	180	2	537	30	196	226	623	0	0
8	C1	Borah – Adelaide #2 M dpoint - Ade aide #2 3 5 kV l	1699	163	1677	1928	-22 8	283	500	1	297	-69	127	-285	15 6	6 2	185	2996	310	1263	180	38	53	303	196	22	623	0	0
85	C15	Borah – Adelaide #2 Borah – Hunt 230 kV ines	1699	1633	1677	1926	-2252	277	99	1	297	-698	126	-28	15 5	6 2	183	2996	3102	1260	180	39	535	30	196	22	623	0	0
86	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV line	1700	163	1672	1933	-22	286	501	1	297	-692	127	-286	15 7	6 2	187	2996	3106	1265	180	37	533	302	195	22	623	0	0
87	C18	Borah – Kinport M dpoint – Adela de #2 3 5 kV lines	1699	1636	167	193	-22 3	291	501	1	297	-689	128	-286	15 8	6 2	188	2996	3107	1267	180	36	532	302	195	22	623	0	0
88	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (R	1699	163	167	1932	-22 6	285	500	1	297	-692	127	-286	15 7	6 2	186	2996	3106	1265	180	37	533	303	195	22	623	0	0
89	C20	Borah–Adel–Midpoint #1 Midpoint – Adelaide #2 3 5	1699	1637	167	1935	-2233	303	502	1	298	-68	130	-287	1550	6 3	193	2996	3112	1272	180	33	530	301	195	22	623	0	0
90	C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 kV l	1699	163	1676	1928	-22 8	283	500	1	297	-69	127	-285	15 6	6 2	185	2996	310	1263	180	38	53	303	196	22	623	0	0
91	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lin	1701	1629	1672	1927	-2253	271	99	1	298	-702	125	-28	15 3	6 2	181	2996	3098	1257	180	1	536	30	196	22	623	0	0
92	C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV Line	17 1	157	1816	1672	-21 9	251	503	36	333	-721	113	-288	1522	65	181	2996	3089	1251	180	0	532	301	195	231	635	0	0
93	C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV lines	17 1	157	1816	1672	-21 9	251	503	36	333	-721	113	-288	1522	65	181	2996	3089	1251	180	0	532	301	195	231	635	0	0
9	C28x	Palo Verde Genera ion – Trip Two Units	1773	1637	1660	1935	-2 0	135	501	11	308	-838	155	-299	1603	652	189	2996	032	2 79	180	12	680	00	2 0	232	685	0	0
95	C28y	Palo Verde Genera ion – Trip Two Units	1772	1636	1660	193	-2 0	13	99	11	307	-838	156	-298	1601	651	189	2996	028	2 7	180	12	679	399	239	232	68	0	0
96																													
97		**Margin est w/ Path 18 at 5% of 285 MW**																										N-2 Criteri	
98		**egwstg1 8h8 pcs 2250 p18 299 sav**	1697	163	1678	1927	-2250	295	99	0	297	-682	123	-299	15 3	6 1	186	2996	3102	1261	180	38	535	30	196	222	625	0	0
99		**Margin est w/ Path C at 5% of 2250 MW**																											
100		**egwstg1 8h8 pcs 2362 p18 285 sav**	1730	1603	16 9	1923	-2363	137	51	0	297	-85	126	-285	15 6	658	199	2996	3183	13 0	180	29	503	273	187	232	621	0	0

REAC IVE MARG N MVAR (Gray shaded ce ls are the minimum margins)

INE #	CON INGENCY#	Aeo us 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	M dpo nt 500	Heminway 500	CedarH l 500	Bridger 345	oshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeo us 230	M ners 230	Mustang 230	Riverton 230	onahGas 230	ladstone 230
6	B01	-1161	1735	-1016	-1251	-1261	-1551	-1991	#####	-879	-632	-597	-1025	-1171	-1195	-138	-1532	-1988	-790	-1229	-828	-338	-329	-238	-81
7	B01a	#####	#####	-1065	-1362	-1366	-1620	-1992	-1 09	-971	-681	-665	#####	-130	-1310	-1 72	-1601	-2113	-783	#####	-823	-325	-319	-237	-8
8	B02	-1 72	-2302	-1 23	-1715	-16	-193	-2 03	-1696	-936	-767	-723	-131	-1530	-155	-1676	-1716	-2538	-83	-1 9	-951	-365	-359	-258	-88
9	B03	-1 35	-2130	-1282	-1 63	-1 7	-1758	-2199	-1522	-1098	-731	-731	-1223	-1 29	-1 29	#####	-1608	-23 5	-822	-1 55	-91	-356	-3 8	-252	-87
10	B0	-1286	-1952	-103	-1016	-996	-1267	-1722	-11 0	-935	- 0	-369	-751	-93	-917	-1208	-1 20	#####	-813	-1336	-883	-357	-3	-2 6	-86
11	B05	-157	-2233	-15 5	-1715	-1693	#####	-239	-1688	#####	-831	-853	-1 08	-165	-16 9	-1665	-1685	#####	-830	-1579	-935	-3 7	-3 6	-253	-88
12	B06	-1555	-2196	-1 88	-1610	-1578	-18 6	-2289	-1617	-1321	-621	-737	-12 9	-1536	-151	-1612	-1655	-2 15	-828	-1560	-930	-355	-3 9	#####	-87
13	B06k																								
1	B07	-1569	-22 1	-1	-1610	-1595	-1899	#####	-1638	-111	#####	- 71	-1372	1551	-1539	-1652	-1686	#####	-831	-1577	-937	-351	-3 5	-25	-88
15	B08	-1567	2227	#####	-168	-1673	-1939	-2377	-1670	-1339	-780	-819	-1266	1605	-1632	-1655	-1689	-2 8	-830	-1571	#####	-352	-3 6	#####	-88
16	B09	#####	2207	#####	-1592	-153	-1875	#####	-1629	-13 1	-812	#####	-1370	1606	-1601	-16 3	-1665	-2 28	-829	-1571	-935	-352	-3 7	-25	-87
17	B10	-1568	-2220	-1532	-1697	-1581	-1926	-2366	-1671	-1339	-797	-825	#####	1570	-1 99	-16 3	-1673	-2 1	-828	-1572	-935	#####	-3 5	-253	-88
18	B11	-1573	-2228	-1522	-1672	-1653	#####	-236	-1661	-1338	-781	-81	-1323	#####	-1606	-16 6	#####	-2 51	-830	-1578	-936	-352	-3 6	-25	-88
19	B12	-1569	-2233	#####	-1515	#####	-1991	-2261	-972	-13 1	-827	-8 8	-1363	-1566	-158	#####	-1705	#####	-831	-1577	#####	-352	-3 7	-255	-88
20	B1	-15 6	-2217	-1 6	-1 66	-1559	-1937	-2218	-10	-1301	-80	-826	#####	-151	#####	-163	-1675	-2 39	-830	-1558	-933	-352	-3 7	-25	-88
21	B15	-1507	-2197	-1388	-1 72	-1377	-133	-2132	-1587	-1218	-738	-766	#####	#####	-1362	#####	#####	-2 15	-825	-1517	-92	-3 9	#####	-251	-89
22	B16	-1552	2215	-1 77	-1570	-1 23	-1798	-2300	-1635	-1311	-799	-823	-1318	-153	-1523	-1630	-1678	-2 35	#####	-1561	-933	-352	-3 7	-25	-88
23	B17	-1567	-2228	-1533	-1689	-1659	#####	-23 2	-1663	-1357	-821	-8	-1382	-1625	-161	#####	-1697	-2 52	-829	-1572	-935	-351	-3 6	-25	#####
2	B18	-157	-2233	-15 5	-1709	-1683	-19 5	#####	-1683	-1371	-831	-85	-1 03	-16 9	-16 1	-1663	-1693	-2 55	-831	-1578	-936	-352	#####	-25	-88
25	B19	-1566	-222	#####	-1677	-1656	-1928	#####	-1669	-13 7	-815	-8 0	-1367	-1606	-1587	-16 6	-167	-2 5	-830	-1570	-935	#####	-3 7	-25	-88
26	B20	-1572	-2232	-1539	-1696	-1673	-196	-2 00	-168	-1362	-82	-8 8	-1382	-162	-1605	#####	#####	-2 5	-830	#####	-936	-352	-3 7	-25	-88
27	B21	-1565	-2223	-1518	-1665	-16 3	-1935	-2371	-1667	-13 1	-811	-836	#####	-1586	-1560	-16 9	-1670	-2	-830	-1569	-935	-352	-3 7	#####	-88
28	B22	-1570	-2229	-1535	-169	-1672	-19	-2376	-1677	-1359	-821	#####	-1379	-1626	-1617	-1656	-1680	-2 51	-830	#####	-935	#####	-3 7	-25	-88
29	B23	-1568	-2228	-1530	-1681	-1651	-1901	-2366	-1667	-1356	-822	-8 5	-1379	-1618	-1607	#####	-1686	#####	-830	-1572	-935	-352	-3 7	-25	-88
30	B2	-1567	-2230	-1523	-165	-1616	-186	-2375	-16 8	-1350	-818	-8 2	-1360	-1593	-157	-1655	-1687	-2 53	#####	-1572	-935	-352	-3 6	-25	-88
31	B25	-1569	-2229	-1536	-1695	-1669	-1926	#####	-1675	-1362	-825	-8 9	-1391	-163	-1625	-1657	-1681	-2 51	-830	-157	-935	#####	-3 7	-25	-88
32	B26	-1572	-2230	-15 3	-1710	#####	#####	#####	-1682	-1368	-829	-852	-1 02	-16 9	-16 3	-1661	-168	-2 53	-831	-1576	-936	-352	#####	-25	-88
33	B27	-1572	-2231	-15 3	-1711	-1688	-1950	-2387	-1685	-1369	-830	-853	-1 0	-1651	-16	-1668	-1685	-2 5	-830	-1576	-935	#####	-3 7	-25	-88
3	B28	-1571	-2231	-15 1	-170	-1682	-19 5	-2389	#####	-1367	-829	-852	-1 00	-16 5	-1639	-1660	-168	-2 53	-830	-1576	-935	#####	-3 7	-25	-88
35	B30	-1582	-2239	-1565	-17 3	-1715	#####	-2 11	-1707	-1391	-8	-866	-1 3	-1671	-1660	-1682	-1688	#####	-831	-1586	-937	-352	-3 7	-255	-88
36	B31	-157	#####	-15 6	#####	-1691	-19 8	-2389	-1689	-1372	-832	-855	-1 10	-16	-163	-1668	-1683	-2 53	-831	-1578	#####	-352	-3 7	-255	-88
37	B32	-1586	-22	-1556	-1721	-166	-1931	-2388	-1690	-1372	-7 3	-805	-11 3	#####	-1589	-1689	-1695	-2 70	-832	-1591	-939	-352	-3 7	-255	-88
38	B33	-1517	-20 8	-1 6	-1585	-1572	-1851	-2312	-1609	-1291	-789	-81	-1293	-1505	-151	-1 08	-1 82	-22 1	-81	-1526	-923	-352	-3 2	-2 9	#####
39	B3	-1519	-2067	-1 61	-1577	-1562	-18 6	-2307	-1603	#####	-787	-812	-1288	-1 91	-150	-1523	-1502	-2263	#####	#####	-92	-353	-3 5	-251	-88
0	B35	- 1	-10 6	-88	-12 1	-1292	-1605	-2053	#####	-877	-732	-701	-1113	-12 3	-1263	-1380	-1 16	-1 67	#####	#####	-356	-2 7	-231	-210	-79
1	B35a	-1296	1876	-1086	-151	-1551	-1839	#####	-1558	-11 9	-838	-832	-1337	-153	-153	-168	-1662	-2170	-793	-138	-90	-307	-302	-2 1	-86
2	B35d	-1322	1892	-1117	#####	-1597	-1880	-2260	#####	-1188	-856	-855	-1380	#####	-158	#####	-1677	-2188	-797	-1 13	-916	-331	-328	-251	-87
3	B35g	INVALID CON INGENCY WI HOU PA H 18 SHUN S																							
	B36	P CASE DIVERGED																							
5	B36a	-1501	21 1	-998	-91	#####	-1217	-16 1	-1051	-773	-550	-538	-807	-877	#####	-1106	#####	-2 0	-688	-1607	-968	-328	-306	-22	-85
6	B36d	-1525	21 6	-1021	-935	-968	-12 2	-1672	-1072	-793	#####	-5 9	-825	-897	-929	-1133	-1 20	-2 12	#####	-1625	-973	-333	-322	-231	-85
7	B36g	-15 3	-215	-10 6	-958	-992	-1269	-1701	#####	-813	-571	-561	-8	-920	-952	-1166	-1 3	#####	-692	-1637	-976	-335	-327	-2 2	-85
8	B36k	-17 6	2170	-1073	-981	#####	#####	-17 9	-1118	-828	-618	-599	-902	-981	-1011	-12 0	-1 55	-2	-696	-1860	-106	-336	-316	#####	-86
9	B36n	-1767	#####	#####	-1002	-1055	#####	#####	-1139	-8 7	-628	-611	-922	-1003	-103	-1262	-1 79	-2 51	-699	-1877	-1067	#####	-332	-238	-86
50	B36ak																								
51	B37	-1 72	-2227	-1 75	-1675	-1667	-1939	-2380	-1670	-1328	-826	-8 6	-1390	-1627	-162	-1660	-1686	-2 57	-827	-1 79	-90	-3 9	-3 3	-252	-87
52	B38	-1569	2269	-1581	-17 3	#####	-1966	#####	-1698	-139	-83	-857	-1 18	-1671	-1663	-167	-1717	-2 91	-815	-1555	-9 2	-335	-328	-2 7	-86
53	B39	-1512	-22 2	-1516	-1687	#####	#####	-2381	-1669	#####	-820	-83	-1378	1616	-161	-1661	-1685	-2 67	#####	-1510	-86	-352	#####	-251	-88
5	B 0	-127	2070	-1221	-1383	-1 17	-1726	-2188	-1 77	-1098	-737	-7	-1189	-1358	-1375	-1 86	-1578	-2313	-590	-1295	-859	-3 0	-333	#####	-77
55	B 0a	-1355	-2119	-1310	-1 6	-1 78	-1758	-218	-1528	-1172	-752	-770	-1230	1 22	-1 31	-1529	-1596	-2353	#####	-137	#####	#####	-33	-2 5	-85
56	B 1	-1539	-2218	-1 6	-1515	-1 92	-1613	-1665	-1 31	-1286	-787	-811	-1282	1 89	-1 73	-16 0	-1660	-2 39	-828	-15 9	-930	-351	-3 5	-253	#####
57		**414**	**1046**	**884**	**914**	**968**	**1217**	**1641**	**972**	**773**	**404**	**369**	**751**	**877**	**917**	**1106**	**1416**	**1467**	**590**	**1229**	**86**	**247**	**231**	**210**	**77**
58		; > >				500	500	500	500	100			200		200										
59																									
60	C02	-1101	#####	-825	-1031	-1090	-1380	-1806	-1169	-685	-5 3	-50	#####	1067	-1061	-1285	-1 78	-2136	-80	-1173	-825	-358	-3 9	#####	-85
61	C02a	-123	#####	-1030	-12 2	-1280	-1536	-1915	-1339	-852	-632	-616	-106	1260	#####	-1 27	-155	-2288	-799	#####	-856	-3 6	-339	-2 6	#####
62	C02b	P CASE DIVERGED																							
63	C03	-970	-1697	-709	-769	-790	-1028	-1 19	-903	-6 1	-36	-337	-617	-7 1	-736	-1022	-1303	#####	-79	-1057	-77	#####	-3 5	-238	-85
6	C03a	-11 8	1912	-928	-96	-9 9	-1191	-1593	-1081	-835	- 06	-371	-727	#####	-879	-1188	-1 29	-21	-791	-1207	#####	-3 9	-336	-2 1	-88
65	C03b	-1193	201	-1030	-1026	-993	-1215	-1580	-1121	#####	- 16	-381	-753	-952	-917	-1238	-1 92	-2263	-783	-1238	-835	-332	#####	-239	#####
66	C03d	INVALID CON INGENCY WI HOU PA H 18 SHUN S																							
67	C03e	INVALID CON INGENCY WI HOU PA H 18 SHUN S																							
68	C0	-970	-1697	-709	-769	-790	-1028	-1 19	-903	-6 1	-36	-337	-617	-7 1	-736	-1022	-1311	#####	-79	-1057	-77	#####	-3 5	-238	-85
69	C0 a	-11 8	1912	-928	-96	-9 9	-1191	-1593	-1081	-835	- 06	-371	-727	#####	-879	-1188	-1 0	-21	-791	-1207	#####	-3 9	-336	-2 1	-88
70	C0 b	-1193	201	-1030	-1026	-993	-1215	-1580	-1121	#####	- 16	-381	-753	-952	-917	-1238	-1 93	-2263	-783	-1238	-835	-332	#####	-239	9089
71	C0 d	INVALID CON INGENCY WI HOU PA H 18 SHUN S																							
72	C0 e	INVALID CON INGENCY WI HOU PA H 18 SHUN S																							
73	C05	-1583	2233	-1560	-17 1	-1703	-1938	-2392	-1707	-138	#####	-866	-1 3	1637	#####	-1652	-169	#####	-832	-1587	-938	-353	-3 8	#####	-88
7	C06	-1396	-1667	-13 2	-1 22	-1 21	-1726	-2222	-150	-1179	#####	#####	-1160	#####	#####	-1021	-11 7	-1812	-771	-1 17	-890	-352	-330	#####	-89
75	C06k																								
76	C07	-1561	#####	-1511	-1635	-1613	-1900	-2355	-16 3	-1333	#####	-83	-13 1	1551	-1560	-1391	-1568	-23 2	-827	-1567	-933	-353	-3 8	-25	-88
77	C08	-1589	-22 2	-155	-1716	-1636	-189	-2367	-1686	-1370	-729	-797	-1108	1658	-1527	-1660	-1687	-2 68	-833	-159	-939	-352	-3 8	-255	-88
78	C09	-1569	2212	-1531	-1698	#####	-1931	-2373	-1678	-1350	-819	-835	-1390	-1620	-1613	#####	-1660	-2 31	-829	#####	-935	-351	-3	-252	-88
79	C10	-1577	2219	-1550	-172	-1698	-195	#####	-1695	-1369	-832	-8 6	-1 13	-16 6	#####	-1625	-1679	-2 0	-830	#####	#####	-352	-3 5	-253	-88
80	C11	-1 32	-1812	#####	-1 38	-1 3	-1732	-2220	-1513	-1195	-7 1	-765	-1172	1339	-1365	-1213	-1282	-197	-788	-1 53	-902	-353	-337	-2 3	-88
81	C12	-1511	20 0	-1 1	-155	-15 1	-1825	-2290	-1588	-126	-772	#####	#####	-1 6	#####	-1 6	-1 68	-2231	-81	#####	-922	-352	-3 2	-2 8	#####
82	C12k																								
83	C13	-1559	2213	-1 87	-1610	-1590	-1871	-2305	-16	-1308	-790	-817	-1290	-1510	-1 58	-162	-1662	-2 32	-831	-1566	#####	-352	-3 7	-25	-88
8	C1	-1565	-222	#####	-1666	#####	-1935	-2370	-1668	-13 2	-811	-836	-1352	#####	-1561	-16 8	-1685	#####	-830	#####	-935	-352	-3 7	-25	-88
85	C15	-1563	-2221	-1512	-1656	#####	-191	-23 3	#####	-1335	#####	#####	-1338	1575	-1552	-1638	-1667	-2 2	-830	-1568	-93	#####	-3 7	-25	-88
86	C16	-1560	-2219	-1 95	-1636	#####	-1919	-2355	-1650	-1311	-76	#####	-122	15 3	-15 5	-1630	-1682	#####	-830	-1566	#####	-352	-3 6	-25	-88
87	C18	-1567	-2227	-1516	-1667	-1656	#####	-2385	-1668	-1332	-776	-815	-1250	1579	-1589	-165	-1693	-2 9	#####	-1571	#####	-352	-3 6	-25	-88
88	C19	-1565	222	-1512	-1663	-1653	-1928	-2361	#####	-1327	-770	-810	-12 1	-1578	-1601	-1650	-167	-2 5	-830	-1569	-935	-352	-3 6	-25	-88
89	C20	-1556	-2219	-1 83	-1593	-1572	-1938	-2373	-16 2	-1300	#####	-811	-1269	1 88	-1 31	-1625	-1666	-2 0	-829	-1563	-933	-351	-3 6	-25	-88
90	C21	#####	-2221	-1506	-16 2	-1621	-1922	#####	-1657	#####	-800	-826	-1320	155	-1523	-1635	-1676	-2 1	-830	-1567	-93	-352	-3 7	#####	-88
91	C23	-15 6	-2206	#####	-1520	-1368	#####	#####	-1615	#####	-782	-807	-1270	1 73	#####	-1615	-1659	-2 25	#####	-1555	-932	-352	-3 7	-25	-88
92	C2	-1 1	2138	-1159	-1360	-1372	-1680	-2159	-1 52	-851	-293	-390	-1185	-133	-1319	-1521	-1612	-2357	-822	-1 7	-916	-355	-3 7	-251	#####
93	C25	-1 1	-2138	-1159	-1360	-1372	-1680	-2159	-1 52	-851	-293	-390	-1185	133	-1319	-1521	-1613	-2357	-822	-1 7	-916	-355	-3 7	-251	#####
9	C28x	#####	#####	-13 6	-1 91	-1 97	-1767	-2122	-15 5	-1197	-752	-773	-1237	1 0	-1	-1519	-1561	-21 0	-808	-1 16	-893	-3 6	-333	#####	-62
95	C28y	-1 06	-1971	-13 9	-1 9	-1 99	-1769	-2126	#####	#####	-753	-77	-1239	1 3	#####	-1520	-156	-21	-809	-1 18	-89	-3 6	#####	-2 7	-129
96		**970**	**1667**	**709**	**769**	**790**	**1028**	**1419**	**903**	**641**	**293**	**337**	**617**	**741**	**736**	**1021**	**1147**	**1812**	**771**	**1057**	**774**	**332**	**330**	**238**	**62**
97		; > >				00	00	00	00	100			250		250										

INE #	CON INGENCY#	Voltage Violations	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Voltage	COMMEN
6	B01	0	- - -	- - -	1	BRIDGER 3 5 BRIDGE&A 3 5 #1	100.2 %	0	- - -	Note: Br dger-3 M le Kno l
7	B01a	0	- - -	- - -	0	BRIDGER 3 5 BRIDGE&A 3 5 #1	89 97%	0	- - -	Note: Br dger-3 M le Kno l
8	B02	0	- - -	- - -	0	GRACE 138 SODA 138 #1	89 66%	0	- - -	
9	B03	0	- - -	- - -	0	GRACE 138 SODA 138 #1	899.00%	0	- - -	
10	B0	5	B GGRASS 69	6	0	DON 138 P NGREE 138 #1	81 2 %	0	- - -	Neg Vdevs in Wyo., P18 & Mont.
11	B05	0	- - -	- - -	0	- - -	- - -	0	- - -	
12	B06	0	- - -	- - -	2	GRACE 138 SODA 138 #1	########	0	- - -	
13	B06k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	9 2 %			
1	B07	0	- - -	- - -	0	BRIDGER 3 5 BRIDGE&A 3 5 #1	80 65%	0	- - -	Bridger-3 Mi e Knoll
15	B08	0	- - -	- - -	0	- - -	- - -	0	- - -	
16	B09	0	- - -	- - -	0	POPULUS 3 5 POPULUS 500 #1	85 27%	0	- - -	
17	B10	0	- - -	- - -	0	POPULUS 3 5 POPULUS 500 #1	80.17%	0	- - -	
18	B11	0	- - -	- - -	0	GRACE 138 SODA 138 #1	83 87%	0	- - -	
19	B12	0	- - -	- - -	0	- - -	- - -	0	- - -	
20	B1	0	- - -	- - -	0	- - -	- - -	0	- - -	
21	B15	0	- - -	- - -	0	- - -	- - -	0	- - -	
22	B16	0	- - -	- - -	0	- - -	- - -	0	- - -	
23	B17	0	- - -	- - -	0	- - -	- - -	0	- - -	
2	B18	0	- - -	- - -	0	- - -	- - -	0	- - -	
25	B19	0	- - -	- - -	0	- - -	- - -	0	- - -	
26	B20	0	- - -	- - -	0	- - -	- - -	0	- - -	
27	B21	0	- - -	- - -	0	- - -	- - -	0	- - -	
28	B22	0	- - -	- - -	0	- - -	- - -	0	- - -	
29	B23	0	- - -	- - -	0	- - -	- - -	0	- - -	
30	B2	0	- - -	- - -	0	- - -	- - -	0	- - -	
31	B25	0	- - -	- - -	0	- - -	- - -	0	- - -	
32	B26	0	- - -	- - -	0	- - -	- - -	0	- - -	
33	B27	0	- - -	- - -	0	- - -	- - -	0	- - -	
3	B28	0	- - -	- - -	0	- - -	- - -	0	- - -	
35	B30	0	- - -	- - -	0	- - -	- - -	0	- - -	
36	B31	0	- - -	- - -	0	- - -	- - -	0	- - -	
37	B32	0	- - -	- - -	0	- - -	- - -	0	- - -	
38	B33	0	- - -	- - -	0	GRACE 138 SODA 138 #1	88 67%	0	- - -	
39	B3	0	- - -	- - -	0	GRACE 138 SODA 138 #1	8 83%	0	- - -	
0	B35	61	LATHAM 3 5	9.8	2	DAVEJOHN 115 DAVEJTPS 115 #1	102.92%	0	- - -	
1	B35a	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	90. 8%	0	- - -	
2	B35d	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	90. %	0	- - -	Wyoming Vdevs Only
3	B35g	INVALID CON INGENCY WI HOU PA H 18 SHUN S								
	B36	P CASE DIVERGED								
5	B36a	0	- - -	- - -	0	GRACE 138 SODA 138 #1	996.00%	0	- - -	
6	B36d	0	- - -	- - -	0	GRACE 138 SODA 138 #1	98 98%	0	- - -	
7	B36g	0	- - -	- - -	0	GRACE 138 SODA 138 #1	98 96%	0	- - -	
8	B36k	10	BAIROIL 57	-8.1	0	GRACE 138 SODA 138 #1	98 68%	0	- - -	Wyoming Neg Vdevs Only
9	B36n	10	BAIROIL 57	-8.	0	GRACE 138 SODA 138 #1	98 60%	0	- - -	Wyoming Neg Vdevs Only
50	B36ak	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	93 87%			
51	B37	0	- - -	- - -	0	AEOLUS 500 AEOLUS 230 #2	85 3 %	0	- - -	
52	B38	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	89 53%	0	- - -	
53	B39	0	- - -	- - -	0	- - -	- - -	0	- - -	
5	B 0	0	- - -	- - -	0	FLAMGORG 138 FLAMGORG 230 #	9 58%	0	- - -	
55	B 0a	0	- - -	- - -	0	GRACE 138 SODA 138 #1	8 23%	0	- - -	
56	B 1	0	- - -	- - -	0	- - -	- - -	0	- - -	
60	C02	0	- - -	- - -	2	BRIDGER 3 5 BRIDGE&A 3 5 #1	10 .35%	0	- - -	Note: Br dger-3 M le Kno l
61	C02a	0	- - -	- - -	0	GRACE 138 SODA 138 #1	91.78%	0	- - -	
62	C02b	P CASE DIVERGED								
63	C03	0	PTRSNFRG 69	5.8	0	POPULUS 3 5 POPULUS 500 #1	81.16%	1	**P RSNFUR 69 @ 0 901**	**Nomogram Point**
6	C03a	0	PTRSNFRG 69	7.5	0	POPULUS 3 5 POPULUS 500 #1	81 89%	1	PTRSNFUR 69 @ 0.885	
65	C03b	0	PTRSNFRG 69	9.8	0	PTRSNFLT 230 AMPS 230 #1	83 89%	2	PTRSNFUR 69 @ 0.863	
66	C03d	INVALID CON INGENCY WI HOU PA H 18 SHUN S								
67	C03e	NVALID CON INGENCY WI HOU PA H 18 SHUN S								
68	C0	0	PTRSNFUR 69	5.8	0	POPULUS 3 5 POPULUS 500 #1	81.16%	1	**P RSNFUR 69 @ 0 901**	**Nomogram Point**
69	C0 a	0	PTRSNFUR 69	7.	0	POPULUS 3 5 POPULUS 500 #1	81 89%	1	PTRSNFUR 69 @ 0.885	
70	C0 b	0	PTRSNFRG 69	9.8	0	PTRSNFLT 230 AMPS 230 #1	83 91%	2	PTRSNFUR 69 @ 0.863	
71	C0 d	INVALID CON INGENCY WI HOU PA H 18 SHUN S								
72	C0 e	INVALID CON INGENCY WI HOU PA H 18 SHUN S								
73	C05	0	- - -	- - -	0	- - -	- - -	0	- - -	
7	C06	0	- - -	- - -	1	GRACE 138 SODA 138 #1	10 . 0%	0	- - -	
75	C06k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	908.00%			
76	C07	0	- - -	- - -	0	- - -	- - -	0	- - -	
77	C08	0	- - -	- - -	0	- - -	- - -	0	- - -	
78	C09	0	- - -	- - -	0	GRACE 138 SODA 138 #1	959.00%	0	- - -	
79	C10	0	- - -	- - -	0	GRACE 138 SODA 138 #1	951.00%	0	- - -	
80	C11	0	- - -	- - -	0	GRACE 138 SODA 138 #1	951.00%	0	- - -	
81	C12	0	- - -	- - -	1	GRACE 138 SODA 138 #1	100.60%	0	- - -	
82	C12k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	871.00%			
83	C13	0	- - -	- - -	0	- - -	- - -	0	- - -	
8	C1	0	- - -	- - -	0	- - -	- - -	0	- - -	
85	C15	0	- - -	- - -	0	- - -	- - -	0	- - -	
86	C16	0	- - -	- - -	0	- - -	- - -	0	- - -	
87	C18	0	- - -	- - -	0	- - -	- - -	0	- - -	
88	C19	0	- - -	- - -	0	- - -	- - -	0	- - -	
89	C20	0	- - -	- - -	0	- - -	- - -	0	- - -	
90	C21	0	- - -	- - -	0	- - -	- - -	0	- - -	
91	C23	0	- - -	- - -	0	- - -	- - -	0	- - -	
92	C2	0	- - -	- - -	0	BRIDGER 3 5 BRIDGE&A 3 5 #1	88. 0%	0	- - -	Note: Br dger-3 M le Kno l
93	C25	0	- - -	- - -	0	BRIDGER 3 5 BRIDGE&A 3 5 #1	88. 0%	0	- - -	Note: Br dger-3 M le Kno l
9	C28x	0	- - -	- - -	0	LAGUNATP 69 YUCCA W 69 #1	95 50%	0	- - -	
95	C28y	0	HESSBDW 115	-5.	0	LAGUNATP 69 YUCCA W 69 #1	95 50%	0	- - -	
98		**All Contingencies (w/ Final RAS) Converged Indicating Pos tive Reactive Marg n**								
100		**All Contingencies (w/ Final RAS) Converged Indicating Pos tive Reactive Marg n**								

1) Vol age Violations > 5% for Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line S de) and Transformer tert ary buses.

BASE CASE / P PA H FLOWS | RAS AC IO | REAC IVE MARGIN MVAR (Gray shaded ce ls are the min mum margins)

| LINE # | CON INGENCY/ | CON INGENCY/ BASE CASE NAME | Aeolus South | Aeolus West | Br dger West 500 | Br dger West 345 | New Path C (NB±) | Borah West | O 1A | Mona Naughtin | West of RSRH | Midpoint West | Montana SE | Montana idaho (115) | of 4a | Bonanza West | Idaho Sierra | PDCI | COI | Path 26 | PP DC | Pavant IPP Gondr | NSTR H Kim (ct | Hemi Cornerst (1B1) | Sigurd G ore (2B 2) | Idaho Area System cases | Pace Area System cases | Br dger GenRAS MW | Aeolus Gen rip MW | Aeolus 500 | Mona rx 500 | Anticl ne 500 | Pogu us 500 | Borah 500 | Midpoint 500 | Hem mmg 500 | Cedar Hill 500 | Br dger 345 | ostrm 345 | 3 Mi Knol 345 | Kinport 345 | Pogu us 345 | Borah 345 | Ben Lomond 345 | ermnal 345 | Mona 345 | Bonanza 345 | Aeolus 230 | Mines 230 | Murray 230 | Riverton 230 | cnstrCoal 230 | alstone 230 | Voltage Violations | WORS VOL AGE[2] | dV % | # of P Overloads | WORS LOADING | % of MVA2 | Wyoming Path 18 Buses < 90 pu P Voltage | # of Buses < 90 pu | COMMEN |
|---|---|---

Appendix 3-12 Pg. 2 - - - Post-transient Results For Path C Southbound vs. Bonanza West

BASE CASE / P PA H FLOWS (RAS AC ION)

INE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Pa h C (NB=)	Borah West	O 1A	Monu Naughtn	West of RS/FH	M dpo nt West	Montana SE	Montana daho (P18)	ot 4a	Bonanza West	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP Gonder	RedB H Al en (ot 2C)	into 4Corners 2B1)	Sigurd G enC 2B 2)	daho Area System osses	Pace Area System osses	Br dger Gen RAS MW	Aeolus Gen rip MW
3																													
		egwstg1 8h8 pcs 2250 bw 749 sav	1729	1806	1 73	2229	-2250	358	600	-2	377	-633	12	-280	1876	7 9	196	2996	3026	1189	180	36	295	215	167	2	601	0	0
5		**evel "B" Contingencies**																											
6	B01	Ant c ine – Populus 500 kV Line	2053	1305	0	3093	-1863	71	626	80	61	-889	0	-282	1700	78	165	2996	2887	1071	180	59	307	217	168	350	618	0	0
7	B01a	Ant c ine – Populus 500 kV Line RAS Trip Br dger Un	1987	1 6	0	2755	-1827	-171	658	3	2	-1113	80	-298	1805	791	1 8	2996	2793	1036	180	9	259	186	155	321	607	575	0
8	B02	Ant c ine 500 / 3 5 kV Transformer	1710	1838	1 17	2302	-2261	359	596		383	-633	126	-279	1885	750	196	2996	3026	1189	180	35	296	216	168	250	596	0	0
9	B03	Bridger – Populus 3 5 kV Line	1786	1726	1663	1885	-2127	313	603	2	22	-671	108	-280	18 5	76	189	2996	3006	1175	180	38	293	213	166	251	618	0	0
10	B0	Bridger – 3Mi eknoll 3 5 kV Line	1823	1671	170	1730	-2015	312	608	85	66	-670	97	-299	1826	772	185	2996	3000	1168	180	39	288	209	165	262	631	0	0
11	B05	Bridger 3 5 / 230 kV Trans ormer	1730	1805	1 72	222	-22 6	357	600	0	379	-635	123	-280	1875	750	195	2996	3025	1188	180	36	296	216	168	2	601	0	0
12	B06	3Mileknoll – Goshen 3 5 kV Line	17 9	1777	1550	2099	-2228	337	600	10	389	-650	115	-289	1862	75	191	2996	3010	1177	180	39	297	216	168	2 0	621	0	0
13	B06k	3Mileknoll – Goshen 3 5 kV Line RAS Bypass 1/2 S	1759	1761	1572	20 5	-2195	339	600	21	01	-6 8	112	-290	1856	756	191	2996	3011	1177	180	39	296	215	167	2 0	615	0	0
1	B07	Kinport – Goshen 3 5 kV Line	1727	1809	1 60	22 7	-2252	362	600	-	375	-630	12	-283	1877	7 8	196	2996	302	1190	180	35	295	215	167	2 7	601	0	0
15	B08	Kinport – Borah 3 5 kV Line	1731	180	1 69	2230	-22 6	360	600	-2	377	-632	12	-280	1876	750	196	2996	3026	1190	180	35	295	215	167	2 5	601	0	0
16	B09	Populus – Borah 500 kV Line	17 6	1780	1 05	2265	-2237	337	600	2	381	-6 6	119	-280	1867	750	187	2996	3015	1179	180	0	298	217	168	252	601	0	0
17	B10	Borah 500 / 3 5 kV Transformer	1739	1796	1 29	2261	-2220	378	603	1	380	-615	126	-28	1878	751	196	2996	3036	1200	180	33	290	212	166	2 8	601	0	0
18	B11	Borah 3 5 / 230 kV Transformer	1731	1803	1 62	223	-22 0	36	601	1	380	-629	12	-28	1876	7 9	196	2996	3025	1191	180	35	295	215	167	2 7	601	0	0
19	B12	Populus – Cedar H ll 500 kV Line	1727	1810	1 81	2227	-2253	363	600	-	375	-628	125	-280	1879	7 9	196	2996	3029	1190	180	36	295	215	167	2	600	0	0
20	B1	Cedar Hi l – Hemingway 500 kV Line	1729	1807	1 76	2228	-22 7	36	600	-3	376	-627	126	-281	1878	750	195	2996	3028	1191	180	36	295	215	167	2 5	601	0	0
21	B15	M dpoint – Hemingway 500 kV Line	1732	1820	1 66	2252	-2187	3	611	1	380	-517	1 2	-291	1899	756	163	2996	3092	12 1	180	37	272	201	161	25	603	0	0
22	B16	Borah – M dpoint 500 kV Line	1732	1801	1 68	2228	-2250	352	600	-2	377	-637	123	-279	187	7 9	193	2996	3021	1186	180	37	296	216	168	2 6	601	0	0
23	B17	M dpoint 500 / 3 5 kV Transformer	1735	1803	1 5	22 5	-223	373	60	-1	379	-58	128	-28	1881	752	157	2996	30 9	1203	180	7	288	211	165	255	601	0	0
2	B18	M dpoint 3 5 / 230 kV Transformer	1730	180	1 72	2228	-2250	356	600	-3	376	-637	123	-279	1875	7 9	197	2996	3023	1187	180	35	296	216	168	2 5	601	0	0
25	B19	Borah – Adela de #2 3 5 kV Line	1731	1802	1 72	2225	-2253	351	599	-2	377	-638	123	-279	187	7 9	193	2996	3021	1186	180	38	297	216	168	2 5	601	0	0
26	B20	Ade a de – Midpoint #2 3 5 kV Line	1730	1805	1 72	2229	-22 8	361	600	-3	376	-632	12	-280	1876	7 9	197	2996	3027	1189	180	35	295	215	167	2	601	0	0
27	B21	Borah – Adela de – Midpoint #1 3 5 kV Line	1731	1803	1 71	2227	-22 9	355	600	-2	377	-636	123	-279	1875	7 9	195	2996	302	1188	180	36	296	216	168	2 5	601	0	0
28	B22	Borah – Hunt 230 kV Line	1731	180	1 72	2227	-2251	355	600	-3	376	-636	123	-279	1875	7 9	195	2996	302	1187	180	36	296	216	168	2 5	601	0	0
29	B23	M dpoint – Boise Bench #3 230 kV Line	1731	180	1 72	2228	-22 9	357	600	-2	377	-63	12	-280	1876	7 9	195	2996	3025	1188	180	36	296	215	167	2 5	601	0	0
30	B2	M dpoint – Ratt e Snake 230 kV Line	1730	1805	1 72	2229	-22 8	360	600	-2	377	-630	125	-280	1877	750	19	2996	3027	1190	180	36	295	215	167	2	601	0	0
31	B25	M dpoint – Dram 230 kV Line	1731	180	1 72	2228	-22 9	357	600	-2	377	-63	12	-280	1876	7 9	195	2996	3025	1188	180	36	296	215	168	2	601	0	0
32	B26	Ratt e Snake – Bo se Bench 230 kV Line	1730	180	1 72	2228	-2250	356	600	-2	377	-636	123	-279	1875	7 9	196	2996	3023	1187	180	36	296	216	168	2 5	601	0	0
33	B27	Boise Bench - Dram 230 kV Line	1730	1805	1 72	2228	-22 9	359	600	-2	377	-632	12	-280	1876	7 9	195	2996	3026	1189	180	36	296	215	167	2	601	0	0
3	B28	Hemingway 500/230 kV Transformer	1731	180	1 71	2229	-22 8	359	600	-2	377	-631	12	-280	1876	750	19	2996	3025	1190	180	36	295	215	167	2 6	601	0	0
35	B30	Populus – Bo ah #1 3 5 kV Line	1728	1806	1 76	2227	-2256	35	599	-3	376	-636	123	-280	1876	7 9	195	2996	3023	1186	180	37	297	216	168	2	600	0	0
36	B31	Populus – Borah #2 3 5 kV Line	1730	1805	1 7	2226	-2253	35	599	-3	376	-636	123	-280	1875	7 9	195	2996	3023	1186	180	37	297	216	168	2	601	0	0
37	B32	Populus – Kinport 3 5 kV Line	1726	1809	1 70	2236	-2261	353	599	-3	376	-636	123	-283	1876	7 8	19	2996	3020	118	180	38	298	217	168	2 6	600	0	0
38	B33	Populus – Ben Lomond #3 3 5 kV Line	1805	1722	1 08	2161	-2056	2	617	3	1	-58	131	-277	1871	770	211	2996	3076	12 0	180	16	266	196	159	239	626	0	0
39	B3	Populus – Terminal 3 5 kV Line	1799	1729	1 20	2175	-2086	19	61	15	395	-587	129	-277	1869	769	210	2996	3072	123	180	19	270	198	160	2 0	61	0	0
0	B35	Aeolus – Ant c ine 500 Line	2327	7 9	788	1965	-17 1	-16	700	-2	356	-966	-21	-302	1 80	786	155	2996	2850	1039	180	61	295	206	163	2 0	738	0	0
1	B35a	B35 dropping 600MW of Aeolus gen inser ion of	211	657	757	1921	-1813	-152	682	-33	3 6	-1095	77	-308	1763	776	1 8	2996	2799	10 1	180	8	258	185	15	2 5	637	0	597
2	B35d	B35a inser ion/addi ion of 2 Mustang 230kV and 1 R	2108	666	761	1929	-1817	-1 5	679	-31	3 8	-1088	82	-308	177	775	1 9	2996	2801	10 2	180	8	259	186	155	2 5	63	0	597
3	B35g	B35d inser ion/addi ion of 2 D llon S 69kV caps Pa	2118	660	762	192	-1820	-125	676	-3	3 5	-1070	80	-332	1777	77	150	2996	2798	1039	180	9	26	189	156	2 2	630	0	597
	B36	Aeolus – Mona 500kV Line	P CASE DIVERGED																										
5	B36a	B36 dropping 600MW of Aeolus gen inser ion of 3	0	2761	1932	25 2	-313	207	751	103	85	-815	100	-295	1728	905	227	2996	3086	1311	180	-57	96	81	107	293	656	0	597
6	B36d	B36a inser ion of 2 Mustang 230kV and 1 Riverton 2	0	2757	1932	25 3	-3132	209	750	103	85	-813	103	-295	1733	905	227	2996	3086	1311	180	-57	97	81	107	292	655	0	597
7	B36g	B36d inser ion of 2 Chappel C 230kV caps	0	2756	1932	25 2	-3131	210	750	10	86	-812	10	-295	1735	905	227	2996	3086	1311	180	-57	97	82	108	292	65	0	597
8	B36k	xtreme version of B36a includes insertion of 1 more A	0	2768	1936	25 3	-3136	210	7 9	10	86	-812	103	-295	1736	905	227	2996	3086	1312	180	-57	97	82	108	292	655	0	597
9	B36n	xtreme version of B36d includes insertion of 1 more A	0	276	1936	25	-313	212	7 8	105	87	-810	106	-295	17 0	905	228	2996	3086	1312	180	-57	98	82	108	292	65	0	597
50	B36ak	B36a RAS (Bypass 1/2 Ser es Cap)	0	27 0	1996	2 20	-308	205	75	127	510	-816	90	-299	1706	911	226	2996	3086	1311	180	-58	92	77	106	288	657	0	597
51	B37	Aeolus 500 / 230 kV Transformer	1719	1791	1 61	2227	-22 8	3 9	606	-1	378	-6 2	117	-281	1855	75	195	2996	3021	1187	180	36	29	21	167	2	600	0	0
52	B38	Aeolus – Windstar 230 kV Line	1677	1709	1 23	2209	-22 1	306	636	-3	376	-682	85	-28	1760	773	193	2996	3008	1176	180	3	286	207	16	2 5	609	0	0
53	B39	Aeolus – Freezeout 230 kV Line	1715	1829	1 62	22 3	-2252	358	597	5	385	-63	126	-279	1883	750	196	2996	302	1190	180	35	295	215	167	2 5	60	0	0
5	B 0	Bonanza –Mona 3 5kV Line	1876	1835	1502	2306	-2 2	269	173	58	39	-725	97	-286	2071	163	199	2996	296	1129	180	11	221	151	1 1	258	655	0	0
55	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plan	1859	1800	1 59	2258	-2 72	161	32	33	13	-827	131	-292	2013	132	193	2996	295	1159	180		20	1 7	139	259	621	0	0
56	B 1	Hemingway – Summer Lake 500kV line	172	1830	1 91	2239	-2196	7	610	-2	377	-523	139	-289	1899	755	17	2996	3091	12 2	180	33	272	201	161	259	602	0	0
57																													
58																													N-1 Criteri
59		**evel "C" Contingencies**																											
60	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1882	1586	1987	1288	-1919	237	608	120	502	-736	77	-280	1788	790	178	2996	2978	11 7	180	3	289	208	16	2 3	661	0	0
61	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1811	17 8	1812	1152	-1905	-9	6 1	72	53	-966	119	-296	189	79	162	2996	2881	1111	180	33	2 2	177	151	236	636	575	0
62	C02b	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	17 2	1905	1631	1013	-1882	-26	676	25	05	1202	161	-311	1998	799	1	2996	2787	1072	180	23	193	1 5	137	235	621	1150	0
63	C03	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lin	P CASE DIVERGED																										
6	C03a	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lin	18	1697	1855	1001	-1800	-6	6	11	96	-960	108	-318	1876	800	159	2996	287	1105	180	33	239	175	150	2	6	575	0
65	C03b	Bridger – 3Mi eKnoll Bridger – Populus #1 3 5 kV lin	1775	1858	1688	853	-1782	-265	679	66	7	-1201	151	-327	1981	805	1 1	2996	2779	1067	180	23	190	1 2	135	2 0	633	1150	0
66	C03d	C03a B g Grassy & Amps Shunt (Path 18 RAS)	18 2	1698	1856	1001	-1807	2	6 3	113	95	-953	106	-329	187	799	159	2996	2872	110	180	33	2 0	176	150	2 3	6 2	575	0
67	C03e	C03b B g Grassy & Amps Shunt (Path 18 RAS)	1773	1858	1689	853	-1789	-258	678	65	6	-119	1 8	-338	1979	80	1 2	2996	2778	1065	180	23	192	1 3	136	239	630	1150	0
68	C0	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lin	P CASE DIVERGED																										
69	C0 a	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lin	18	1697	1855	1001	-1800	-6	6	11	96	-960	108	-318	1876	800	159	2996	287	1105	180	33	239	175	150	2	6	575	0
70	C0 b	Bridger – 3Mi eKnoll Bridger – Populus #2 3 5 kV lin	1775	1858	1688	853	-1782	-265	679	66	7	-1201	151	-327	1981	805	1 1	2996	2779	1067	180	23	190	1 2	135	2 0	633	1150	0
71	C0 d	C0 a B g Grassy & Amps Shunt (Path 18 RAS)	18 2	1698	1856	1001	-1807	2	6 3	113	95	-953	106	-329	187	799	159	2996	2872	110	180	33	2 0	176	150	2 3	6 2	575	0
72	C0 e	C0 b B g Grassy & Amps Shunt (Path 18 RAS)	1773	1858	1689	853	-1789	-258	678	65	6	-119	1 8	-338	1979	80	1 2	2996	2778	1065	180	23	192	1 3	136	239	630	1150	0
73	C05	Borah – Populus 3 5 kV DLO	1727	1806	1 80	2222	-2263	3 6	598	-3	376	-6 2	122	-280	187	7 8	193	2996	3018	1181	180	39	299	218	168	2 5	600	0	0
7	C06	Populus – Ben Lomond 3 5 kV DLO	1953	1557	1278	2023	-1656	562	65	110	92	- 80	1 8	-273	1860	812	2 6	2996	3186	13 6	180	-26	202	152	1 1	229	687	0	0
75	C06k	Populus – Ben Lomond 3 5 kV DLO RAS (Bypass 1	1971	1529	1333	1911	-1609	561	655	128	511	- 80	1 1	-277	18 8	816	2	2996	318	13 3	180	-25	202	152	1 1	223	686	0	0
76	C07	Ben Lomond – Terminal 3 5 kV DLO	1755	1778	1 61	2217	-2206	379	60	-11	368	-617	125	-279	1872	758	201	2996	30 2	120	180	30	287	209	165	2 2	603	0	0
77	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	172	1809	1 73	2233	-2270	3 5	598	-3	376	-6 2	121	-28	187	7 7	191	2996	3015	1179	180	0	300	218	169	2 7	600	0	0
78	C09	Populus – Borah #2 3 5 kV Treasu eton – Brady 23	173	1800	1 60	222	-2228	36	602	8	387	-629	125	-279	1877	750	197	2996	3029	1193	180	3	29	21	167	2	602	0	0
79	C10	Populus – Borah #1 3 5 kV T easureton – Brady 230	1733	1801	1 62	2225	-2230	36	601	8	387	-629	125	-280	1877	7 9	197	2996	3029	1192	180	3	29	21	167	2	602	0	0
80	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV	1906	1609	1329	2079	-1802	520	6 0	65	5	-510	1 0	-273	1860	799	23	2996	3151	1309	180	-11	226	168	1 8	232	6 9	0	0
81	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230	1805	1722	1 03	2171	-2053	32	617	28	08	-577	132	-276	1870	770	212	2996	3080	12 2	180	16	266	196	159	239	616	0	0
82	C12k	Populus – Terminal 3 5 kV Treasure on – Brady 230	1825	1691	1 57	2056	-2002	31	617	8	29	-577	125	-281	1858	77	211	2996	3078	1239	180	16	266	195	159	232	617	0	0
83	C13	Borah – Adela de #2 Borah–ADT–M dpoint #1 3 5 kV	1733	1798	1 73	2219	-2263	333	598	-2	377	-650	120	-277	1870	7 9	185	2996	3013	1177	180	2	300	218	169	2 8	601	0	0
8	C1	Borah – Adela de #2 Midpoint - Adela de #2 3 5 kV l	1731	1803	1 71	2227	-2250	35	600	-2	377	-637	123	-279	1875	7 9	19	2996	3023	1187	180	37	296	216	168	2 5	601	0	0
85	C15	Borah – Adela de #2 Borah – Hunt 230 kV lines	1732	1801	1 72	222	-2255	3 7	599	-2	377	-6 1	122	-278	1873	7 9	191	2996	3019	118	180	38	297	217	168	2 6	601	0	0
86	C16	Borah – Kinport Borah–Adel–M dpoint #1 3 5 kV ine	1732	1803	1 68	2229	-22 6	357	600	-2	377	-635	12	-280	1875	750	195	2996	302	1189	180	36	295	215	167	2 6	601	0	0
87	C18	Borah – Kinport Midpoint – Adelaide #2 3 5 kV ines	1731	1805	1 69	2231	-22 5	362	600	-2	377	-631	125	-281	1877	750	198	2996	3027	1191	180	3	295	215	167	2 5	601	0	0
88	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (R	1731	1803	1 69	2229	-22 8	357	600	-2	377	-63	12	-280	1876	750	195	2996	302	1189	180	36	295	215	167	2 6	601	0	0
89	C20	Borah–Adel–Midpoint #1 M dpoint – Adela de #2 3 5	1731	1805	1 69	2231	-2239	369	601	-2	377	-629	125	-281	1878	750	200	2996	3029	119	180	33	293	21	167	2 6	601	0	0
90	C21	Borah-Adel-Midpoint #1 3 5 kV Borah-Hunt 230 kV l	1731	1802	1 72	2226	-2251	351	600	-2	377	-638	123	-279	187	7 9	193	2996	3021	1186	180	37	297	216	168	2 6	601	0	0
91	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lin	173	1798	1 67	2225	-2256	3 0	599	-2	377	-6 5	121	-278	1872	7 9	189	2996	3016	1180	180	0	299	217	168	2 7	602	0	0
92	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	178	1728	1665	1886	-2129	313	603	2	22	-672	108	-280	18 6	76	189	2996	3005	1175	180	38	293	213	166	251	618	0	0
93	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV ines	178	1728	1665	1886	-2129	313	603	2	22	-672	108	-280	18 6	76	189	2996	3005	1175	180	38	293	213	166	251	618	0	0
9	C28x	Palo Ve de Gene ation – Trip Two Un ts	1807	1803	1 55	2233	-2 07	205	609	7	386	-783	153	-293	1931	765	199	2996	39 7	2396	180	9	57	322	217	252	659	0	0
95	C28y	Palo Ve de Gene ation – Trip Two Un ts	1806	1801	1 5	2232	-2 06	20	608	7	386	-78	153	-293	1928	76	199	2996	39 3	2392	180	9	56	321	217	252	659	0	0
96																													
97		**Margin est w/ Bonaza West at 5% of 749 MW**																											N-2 Criteri
98		**egwstg1 8h8 pcs 2250 bw 786 sav**	1733	1813	1 79	2237	-2250	372	580	2	381	-620	117	-280	1889	786	196	2996	3012	1176	180	36	296	210	166	2	607	0	0
99		**Margin est w/ Path C at 5% of 2250 MW**																											
100		**egwstg1 8h8 pcs 2362 bw 749 sav**	1761	1768	1 39	2215	-2362	205	627	0	379	-798	119	-28	1869	7 9	207	2996	3092	12 9	180	25	296	185	155	25	605	0	0

REAC IVE MARGIN MVAR (Gray shaded cells are the minimum margins)

INE #	CON INGENCY#	Aeolus 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	M dpo nt 500	Hem nway 500	CedarH l 500	Br dger 345	oshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	M ners 230	Mustang 230	Riverton 230	onahGas 230	ladstone 230
6	B01	-113	-1725	-9 6	-11 9	-1159	-1 20	-1785	-1238	-808	-585	-5 9	-9 3	-1073	-1098	-1 58	-1797	-2020	-695	-1222	-856	-3 1	-318	-2 0	-75
7	B01a	-1137	-1857	-993	-1283	-1289	-1511	-1796	-1322	-913	-650	-628	-1062	-1231	-1238	-1601	-1922	-2166	-686	-1211	-8 6	-330	-307	-2 0	-79
8	B02	-138	-22 7	-1358	-1828	-1757	-1977	-2287	-1729	-1038	-829	-797	-1 30	-1677	-1690	-1923	-21 9	-2531	-7 6	-1 18	-953	-355	-337	-259	-82
9	B03	-1 70	-2118	-136	-1550	-15 6	-1782	-2116	-1556	-1175	-756	-759	-1285	-1519	-1508	-1768	-2017	-2383	-731	-1 7	-939	-358	-337	-255	-81
10	B0	-13 7	-1930	-11 0	-1103	-1076	-1332	-1731	-120	-1032	-399	-366	-790	-1018	-997	-1386	-1738	-2177	-720	-1382	-91	-359	-332	-2 9	-80
11	B05	-1581	-22 3	1616	-180	-1768	-1981	-2295	-1717	-1 39	-863	-886	-1 79	-17 8	-1737	-1922	-21 0	-2513	-7	-156	-962	-3 8	-333	-256	-82
12	B06	-155	-2195	-1563	-1688	-1637	-1866	-2163	-16 1	-1 02	-606	-768	-1299	-1612	-1580	-18 6	-2077	-2 61	-7 0	-15 0	-957	-357	-337	-259	-82
13	B06k																								
1	B07	-1586	-2250	-15 1	-1737	-1706	-1962	-2298	-1698	-1212	-328	-505	-1 80	-1683	-1663	-1906	-21 0	-2522	-7 5	-1571	-965	-353	-33	-258	-82
15	B08	-1580	-2238	1597	-1779	-1753	-1966	-2283	-1706	-1 18	-812	-855	-133	-1706	-1725	-1905	-2127	-2507	-7	-1565	-963	-353	-33	-258	-82
16	B09	-1577	-2218	-1576	-1672	-1581	-1890	-2236	-1660	-1 11	-8 0	-866	-1 36	-1693	-1680	-1895	-2117	-2 87	-7 3	-156	-96	-353	-33	-258	-82
17	B10	-1578	-2230	-1601	-178	-1630	-19 9	-226	-1701	-1 13	-828	-859	-1393	-1665	-1585	-1892	-2121	-2 98	-7 2	-1563	-963	-352	-333	-257	-82
18	B11	-158	-22 0	-1598	-1767	-173	-19 9	-2277	-1698	-1 17	-812	-851	-1 00	-1699	-1699	-1898	-2129	-2510	-7	-1568	-96	-353	-33	-258	-82
19	B12	-1583	-2250	-1577	-1622	-1708	-2023	-2079	-9 9	-1 32	-867	-891	-1 53	-1682	-1696	-1918	-21 5	-252	-7 5	-1567	-966	-35	-335	-259	-82
20	B1	-1567	-223	-1537	-157	-1659	-1969	-203	-1089	-1393	-8 6	-869	-1 09	-1630	-16	-1891	-2121	-250	-7	-155	-962	353	-33	-258	-82
21	B15	-1527	-2206	-1 69	-1570	-1 65	-1392	-1956	-1622	-1299	-776	-805	-1275	-1 98	-1 60	-1825	-2073	-2 70	-736	-1518	-9 9	350	-327	-255	-83
22	B16	-1571	-2227	-1560	-1671	-1507	-1765	-2155	-1677	-1395	-837	-863	-1 01	-1639	-1623	-1882	-2112	-2 9	-7	-1558	-961	353	-33	-258	-82
23	B17	-1573	-223	-159	-1761	-1716	-1690	-2217	-1681	-1 22	-8 7	-872	-1 3	-1703	-1686	-1908	-2129	-2503	-7 1	-1558	-961	352	-333	-257	-82
2	B18	-1583	-22 3	-1616	-1798	-1758	-1970	-2285	-171	-1 7	-862	-888	-1 77	-17 3	-1729	-1920	-2139	-2513	-7	-1567	-96	353	-335	-258	-82
25	B19	-1579	-2235	-1597	-1771	-1735	-19 8	-2253	-1703	-1 26	-8 9	-875	-1 3	-1703	-1678	-1901	-212	-2502	-7	-156	-963	353	-335	-258	-82
26	B20	-1582	-22 3	-1613	-1792	-1755	-1989	-229	-1719	1 2	-858	-88	-1 59	-172	-1698	-1916	-2137	-2512	-7	-1566	-96	353	-33	-258	-82
27	B21	-1578	-223	-159	-1760	-1725	-1956	-2260	-1703	1 20	-8 5	-872	-1 28	-1686	-1653	-1897	-2122	-2502	-7	-1563	-963	353	-33	-258	-82
28	B22	-1581	-22 0	-1609	-1788	-1751	-1966	-2268	-1711	1 38	-85	-881	-1 55	-172	-1709	-1912	-2133	-2509	-7	-1565	-963	353	-335	-258	-82
29	B23	-1580	-2239	-1605	-1776	-1732	-1936	-2255	-1703	1 35	-856	-881	-1 56	-1718	-1700	-1911	-2132	-2508	-7	-156	-963	353	-33	-258	-82
30	B2	-1580	-22 0	-1601	-1751	-1699	-190	-2291	-1688	1 31	-853	-879	-1 38	-169	-1669	-1908	-2133	-2510	-7	-156	-963	353	-33	-258	-82
31	B25	-1581	-22 1	-1610	-1789	-17 9	-1956	-2267	-1709	1 1	-858	-88	-1 67	-1732	-1717	-1915	-2135	-2510	-7	-1565	-963	353	-335	-258	-82
32	B26	-1582	-22 2	-1616	-1802	-1765	-1972	-2252	-171	1 7	-862	-887	-1 79	-17 7	-173	-1920	-2137	-2511	-7	-1566	-96	353	-335	-258	-82
33	B27	-1582	-22 3	-1616	-1803	-1766	-1977	-2290	-1718	1 7	-862	-887	-1 80	-17 8	-1736	-1921	-2139	-2512	-7	-1566	-96	353	-335	-258	-82
3	B28	-1581	-22 1	-1610	-1789	-1753	-1962	-2282	-1702	1 1	859	-88	-1 71	-1736	-172	-1917	-2136	-2510	-7	-1565	-963	353	-33	-258	-82
35	B30	-1589	-22 9	-1637	-183	-1790	-1993	-2299	-1737	1 69	875	-900	-1507	-1765	-17 6	-1931	-21 6	-2521	-7 5	-1572	-966	35	-335	-259	-82
36	B31	-158	-22 2	-1619	-1808	-1766	-1971	-2283	-1721	1 50	86	-889	-1 8	-1739	-1720	-1917	-213	-2511	-7 5	-1568	-96	-353	-335	-258	-82
37	B32	-1593	-2255	-1630	-1812	-17 3	-1961	-2289	-1722	1 9	75	-838	-1199	-1769	-1677	-1930	-21 8	-2528	-7 6	-1576	-967	-35	-335	-259	-82
38	B33	-1529	-2053	-15 1	-1675	-16 6	-1883	-22 2	-16 6	1373	82	-853	-1366	-1591	-1599	-1651	-1897	-2287	-722	-1518	-9 9	-353	-329	-253	-82
39	B3	-1530	-2060	-1539	-1671	-16 1	-1880	-2239	-16 3	1372	823	-851	-1363	-1583	-1593	-1751	-191	-229	-72	-1520	-950	-35	-332	-255	-82
0	B35	-195	- 67	-88	-1252	-1320	-1599	-195	-13 2	-80	781	-732	-1166	-1260	-1306	-1180	-1171	-982	- 53	-222	-179	-161	-1 2	-187	-68
1	B35a	-1025	-1680	-1223	-168	-1705	-1928	-212	-16 9	-1285	-911	-913	-1 89	-1717	-1705	-1936	-2000	-2025	-677	-1107	-793	-291	-269	-236	-78
2	B35d	-1056	-1701	-1251	-1728	-17 9	-1958	-2135	-1677	-132	-920	-935	-1523	-1765	-1752	-1955	-2017	-20 5	-682	-1139	-810	-31	-295	-2 6	-78
3	B35g	-1105	-1851	-1327	-1868	-1885	-2066	-2211	-1760	-1 22	-999	-1000	-1659	-1923	-1905	-2068	-2158	-2235	-692	-1190	-838	-318	-302	-2 9	-79
	B36	P CASE DIVERGED																							
5	B36a	-1 82	-2029	-89	-821	-850	-1085	-1 32	-9 6	-698	-510	- 98	-725	-783	-813	-1072	-152	-2262	-553	-1610	-998	-326	-291	-22	-77
6	B36d	-1505	-2035	-917	-839	-868	-1106	-1 57	-96	-716	-519	-509	-7 0	-801	-831	-1091	-15 7	-2270	-556	-1630	-1003	-331	-306	-231	-77
7	B36g	-1521	-20 3	-939	857	-887	-1128	-1 83	-983	-735	-530	-520	-757	-819	-850	-1112	-1572	-2281	-558	-16 5	1005	-333	-310	-2 2	-78
8	B36k	-1551	-2039	-911	-837	-868	-1107	-1 59	-96	-711	-528	-510	-7 7	-801	-830	-1105	-1561	-2276	-555	-1683	-103	-328	-293	-226	-78
9	B36n	-1573	-20 6	-93	-856	-887	-1129	-1 85	-983	-730	-5 1	-520	-766	-819	-851	-1126	-1581	-2285	-558	-170	-1039	-333	-308	-233	-78
50	B36ak																								
51	B37	-1 80	-2235	-15 8	-177	-1753	-197	-2289	-1709	-1 1	-863	-885	-1 73	-1732	-172	-1918	-21 1	-2516	-739	-1 53	-926	-350	-331	-256	-82
52	B38	-1587	-2287	-1672	-18 1	-1793	-1996	-2283	-1735	-1 77	-868	-895	-1501	-1777	-1762	-1933	-2159	-2552	-716	-15 6	-97	-329	-305	-2 8	-79
53	B39	-1502	-2253	-1593	-1789	-1751	-1973	-2295	-1712	-1 17	-857	-875	-1 67	-1727	-1718	-1918	-21 2	-2525	-7	-1 82	-115	-35	-335	-256	-82
5	B 0	-1208	-2036	-1210	-1 08	-1 38	-171	-2079	-1 78	-111	-7 9	-758	-1218	-1383	-1 02	-1669	-19 2	-2355	-528	-1219	-8 8	-337	-315	-2 2	-68
55	B 0a	-1309	-2102	-1316	-1501	-1508	-1751	-2066	-1531	-1202	-768	-786	-1268	-1 62	-1 71	-1719	-1985	-2 07	- 85	-1311	-882	3 2	-317	-2 6	-77
56	B 1	-1538	-2233	-1 93	-1566	-1531	-1602	-1530	-1 32	-13 0	-809	-83	-1331	-1553	-1530	-1871	-2108	-2501	-738	-1527	-952	-350	-329	-256	-8
57		**195**	**467**	**884**	**821**	**850**	**1085**	**1432**	**946**	**698**	**328**	**366**	**725**	**783**	**813**	**1072**	**1171**	**982**	**453**	**222**	**115**	**161**	**142**	**187**	**68**
58		> >				500	500	500	500	100			200		200										
60	C02	-1159	-1826	-915	-1101	-11 8	-1 08	-1763	-1212	-766	-558	-528	-957	-113	-1120	-1 75	-1773	-2115	-703	-1225	-873	-366	-338	-2 6	-78
61	C02a	-1266	-2006	-1099	-1320	-13 3	-1552	-1806	-1369	-919	-650	-639	-1120	-13 1	-131	-16 8	-192	-2290	-699	-1307	-895	35	-327	-2 9	-82
62	C02b																								
63	C03	P CASE DIVERGED																							
6	C03a	-119	-1861	-1015	-1039	-101	-1223	-15 1	-1131	-919	- 03	-370	-7 8	-972	-928	-1336	-1712	-21 1	-689	-12 5	-87	-356	-32	-2 3	-81
65	C03b	-1219	-1995	-1095	-110	-1062	-1252	-1508	-1163	-99	- 19	-38	-793	-1031	-983	-1 30	-1821	-2277	-680	-1260	-877	-3 2	-308	-2 3	-8
66	C03d	-1219	-1893	-105	-1110	-1089	-1305	-161	-1195	-950	- 1	-399	-815	-1050	-1008	-1 10	-1770	-2175	-691	-1266	-879	357	-325	-2	-81
67	C03e	-12 2	-2025	-1137	-1180	-1137	-1330	-157	-1226	-1026	- 57	- 13	-862	-1109	-106	-150	-1875	-2311	-681	-1279	-882	3 2	-310	-2	-8
68	C0	P CASE DIVERGED																							
69	C0 a	-119	-1861	-1015	-1039	-101	-1223	-15 1	-1131	-919	- 03	-370	-7 8	-972	-928	-1336	-1712	-21 1	-689	-12 5	-87	-356	-32	-2 3	-81
70	C0 b	-1219	-1995	-1095	-110	-1062	-1252	-1508	-1163	-99	- 19	-38	-793	-1031	-983	-1 30	-1821	-2277	-680	-1260	-877	-3 2	-308	-2 3	-8
71	C0 d	-1219	-1893	-105	-1110	-1089	-1305	-161	-1195	-950	- 1	-399	-815	-1050	-1008	-1 10	-1770	-2175	-691	-1266	-879	357	-325	-2	-81
72	C0 e	-12 2	-2025	-1137	-1180	-1137	-1330	-157	-1226	-1026	- 57	- 13	-862	-1109	-106	-150	-1875	-2311	-681	-1279	-882	3 2	-310	-2	-8
73	C05	-1590	-22 1	-1632	-1830	-1771	-1957	-2266	-1735	-1 61	-873	-899	-150	-1727	-1679	-1913	-2127	-2511	-7 6	-1573	-966	-35	-335	-259	-82
7	C06	-1386	-16 9	-1 21	-1512	-1 96	-1767	-2175	-1553	-1267	-776	-80	-1230	-1 01	-1 30	-1237	-1 7	-1837	-667	-1387	-909	-353	-316	-238	-83
75	C06k																								
76	C07	-1565	-213	-1595	-17 8	-1713	-19 6	-2279	-1691	-1 25	-85	-878	-1 31	-1669	-1673	-15	-2010	-2373	-736	-1551	-960	-35	-336	-259	-82
77	C08	-1595	-2252	-1627	-1805	-1709	-1923	-2260	-1717	-1 5	-732	-827	-1157	-1752	-1602	-1920	-2136	-252	-7 7	-1578	-968	35	-335	-259	-82
78	C09	-1581	-2228	-1607	-1791	-17 9	-1953	-2270	-1711	-1 32	-85	-873	-1 66	-1719	-1700	-187	-2112	-2 9	-7 3	-1565	-963	-353	-333	-257	-82
79	C10	-1586	-2236	-1625	-1817	-1773	-1975	-2286	-1726	-1 51	-865	-88	-1 88	-17 5	-1725	-1888	-212	-250	-7	-1569	-96	-353	-333	-257	-82
80	C11	-1 32	-178	-1 2	-1531	-1512	-1775	-217	-1561	-128	-781	-809	-12 5	-1 21	-1 9	-1 23	-1615	-1983	-687	-1 30	-923	35	-325	-2 6	-82
81	C12	-1525	-20 1	-152	-1651	-1621	-1861	-2226	-1631	-1351	-811	-833	-13 3	-1560	-1570	-1705	-1891	-2272	-722	-1515	-9 8	-353	-330	-253	-82
82	C12k																								
83	C13	-1575	-2222	-1566	-1705	-1672	-1861	-2159	-1680	-1388	-825	-85	-1366	-1608	-15 8	-1863	-2098	-2 87	-7 5	-1561	-962	-35	-335	-258	-82
8	C1	-1578	-2235	-1595	-1761	-1726	-1955	-2258	-1703	-1 21	-8 6	-872	-1 29	-1686	-1653	-1898	-2123	-2503	-7	-156	-963	353	-335	-258	-82
85	C15	-1577	-2232	-1589	-1750	-1716	-1928	-2220	-1695	-1 1	-8 0	-868	-1 1	-167	-16 5	-1890	-2117	-2 99	-7	-1563	-963	353	-335	-258	-82
86	C16	-1575	-2230	-157	-173	-1709	-19 1	-2250	-1689	-1391	-798	-8 0	-129	-16 5	-1639	-1881	-2111	-2 96	-7	-1561	-962	353	-33	-258	-82
87	C18	-1580	-2239	-159	-1765	-17 0	-197	-228	-1706	-1 12	-809	-852	-1319	-1682	-1685	-1900	-2125	-2507	-7	-1565	-963	353	-33	-258	-82
88	C19	-1578	-2236	-1589	-1760	-1736	-1951	-2258	-1698	-1 07	-80	-8 7	-1310	-1679	-1696	-1895	-2121	-2503	-7	-156	-963	-353	-33	-258	-82
89	C20	-1573	-2229	-1566	-1696	-1665	-195	-2251	-1688	-1385	-821	-851	-13 9	-1593	-1529	-1869	-2108	-2 96	-7 3	-1559	-961	353	-33	-258	-82
90	C21	-1577	-2231	-158	-1738	-1705	-1936	-2228	-169	-1 08	-835	-86	-1397	-1655	-1618	-1885	-2115	-2 98	-7	-1562	-962	353	-335	-258	-82
91	C23	-1567	-2218	-1536	-1623	-1 5	-1669	-2087	-1659	-1369	-821	-8 8	-1353	-1579	-15 6	-1857	-209	-2 83	-7	-1555	-961	353	-335	-258	-82
92	C2	-1 56	-2122	-1267	-1 71	-1 75	-1752	-2116	-1518	-939	-282	- 22	-1287	-1 51	-1 3	-17 7	-2017	-2388	-731	-1 68	-9 0	-358	-336	-255	-81
93	C25	-1 56	-2122	-1267	-1 71	-1 75	-1752	-2116	-1518	-939	-282	- 22	-1287	-1 51	-1 3	-17 7	-2017	-2388	-731	-1 68	-9 0	358	-336	-255	-81
9	C28x	-1 20	-2009	-1 17	-1587	-1576	-1798	-1995	-158	-1283	-788	-813	-1315	-153	-1533	-17 2	-1960	-2238	-713	-1 13	-915	-3 7	-319	-251	-5
95	C28y	-1 2	-2012	-1 21	-1591	-1579	-1800	-1999	-1586	-1286	-789	-81	-1317	-1537	-1536	-17	-1962	-22 2	-71	-1 17	-916	-3 7	-320	-251	-121
96		**1159**	**1649**	**915**	**1039**	**1014**	**1223**	**1508**	**1131**	**766**	**282**	**370**	**748**	**972**	**928**	**1237**	**1474**	**1837**	**667**	**1225**	**873**	**342**	**308**	**238**	**54**
97		> >				00	00	00	00	100			250		250										

INE #	CON INGENCY#	Voltage Violations	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Voltage	COMMEN
6	B01	0	- - -	- - -	1	BR DGER 3 5 BR DGE&A 3 5 #1	105.08%	0	- - -	Bridger-3 M le Knoll 3 5kV
7	B01a	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5 #1	9 59%	0	- - -	
8	B02	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5 #1	83 07%	0	- - -	
9	B03	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5 #1	93 99%	0	- - -	
10	B0	6	BIGGRASS 69	6.1	0	- - -	- - -	0	- - -	Neg Vdevs in Wyo., P18 & Mont.
11	B05	0	- - -	- - -	0	- - -	- - -	0	- - -	
12	B06	0	- - -	- - -	2	GRACE 138 SODA 138 #1	121.72%	0	- - -	Other O/L 3MK-Soda
13	B06k	0	- - -	- - -	1	GRACE 138 SODA 138 #1	100.62%			
1	B07	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5 #1	85 33%	0	- - -	Bridger-3 M le Knoll 3 5kV
15	B08	0	- - -	- - -	0	- - -	- - -	0	- - -	
16	B09	0	- - -	- - -	0	- - -	- - -	0	- - -	
17	B10	0	- - -	- - -	0	- - -	- - -	0	- - -	
18	B11	0	- - -	- - -	0	GRACE 138 SODA 138 #1	8 95%	0	- - -	
19	B12	0	- - -	- - -	0	- - -	- - -	0	- - -	
20	B1	0	- - -	- - -	0	- - -	- - -	0	- - -	
21	B15	0	- - -	- - -	0	LOCUST 138 MORA 138 #1	88 31%	0	- - -	
22	B16	0	- - -	- - -	0	- - -	- - -	0	- - -	
23	B17	0	- - -	- - -	0	LOCUST 138 MORA 138 #1	87 2 %	0	- - -	
2	B18	0	- - -	- - -	0	- - -	- - -	0	- - -	
25	B19	0	- - -	- - -	0	- - -	- - -	0	- - -	
26	B20	0	- - -	- - -	0	- - -	- - -	0	- - -	
27	B21	0	- - -	- - -	0	- - -	- - -	0	- - -	
28	B22	0	- - -	- - -	0	- - -	- - -	0	- - -	
29	B23	0	- - -	- - -	0	- - -	- - -	0	- - -	
30	B2	0	- - -	- - -	0	- - -	- - -	0	- - -	
31	B25	0	- - -	- - -	0	- - -	- - -	0	- - -	
32	B26	0	- - -	- - -	0	- - -	- - -	0	- - -	
33	B27	0	- - -	- - -	0	- - -	- - -	0	- - -	
3	B28	0	- - -	- - -	0	- - -	- - -	0	- - -	
35	B30	0	- - -	- - -	0	- - -	- - -	0	- - -	
36	B31	0	- - -	- - -	0	- - -	- - -	0	- - -	
37	B32	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	83 66%	0	- - -	Bridger-3 Mile Knoll 3 5kV
38	B33	0	- - -	- - -	0	GRACE 138 SODA 138 #1	90.13%	0	- - -	
39	B3	0	- - -	- - -	0	GRACE 138 SODA 138 #1	86. 7%	0	- - -	
0	B35	79	LATHAM 3 5	12 3	2	PLATTE 230 LATHAM 230 #1	100.86%	0	- - -	Vdevs in Areas 65 and 73
1	B35a		GREATDIV 3 5	5.3	0	DAVEJOHN 115 DAVEJTPS 115 #1	85 52%	0	- - -	Only Vdevs in Wyoming
2	B35d	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	85 60%	0	- - -	
3	B35g	5	BIGGRASS 69	-8 3	0	DAVEJOHN 115 DAVEJTPS 115 #1	85 2 %	0	- - -	Neg Vdevs in Wyo., P18 & Mont.
	B36	P CASE DIVERGED								
5	B36a	0	- - -	- - -	1	GRACE 138 SODA 138 #1	101.10%	0	- - -	
6	B36d	0	- - -	- - -	1	GRACE 138 SODA 138 #1	101.00%	0	- - -	
7	B36g	0	- - -	- - -	1	GRACE 138 SODA 138 #1	100.95%	0	- - -	
8	B36k	9	BA RO L 57	-6 2	1	GRACE 138 SODA 138 #1	101.00%	0	- - -	Neg Vdevs in Wyo., P18 & Mont.
9	B36n	9	BA RO L 57	-6.	1	GRACE 138 SODA 138 #1	100.90%	0	- - -	Only Vdevs in Wyoming
50	B36ak	9	PTRSNFUR 69	5.8	0	EMMAPARK 138 UPALCO 138 #1	95 56%	0	- - -	Vdevs in Areas 65 & P18
51	B37	0	- - -	- - -	0	AEOLUS 500 AEOLUS 230 #2	93.1 %	0	- - -	
52	B38	0	- - -	- - -	0	AEOLUS 230 DUNLAPTP 230 #1	8 .13%	0	- - -	
53	B39	0	- - -	- - -	0	- - -	- - -	0	- - -	
5	B 0	5	MOONLAK1 69	5.8	3	EMMAPARK 138 UPALCO 138 #1	130.07%	0	- - -	Only Vdevs in Wyoming
55	B 0a	0	- - -	- - -	0	EMMAPARK 138 UPALCO 138 #1	100 00%	0	- - -	Nomogram Point Lim tation #1
56	B 1	0	- - -	- - -	0	- - -	- - -	0	- - -	
60	C02	0	3M KNOLL 3 5	5.	2	BR DGER 3 5 BR DGE&A 3 5 #1	117.10%	0	- - -	Bridger-3 Mile Knoll 3 5kV
61	C02a	0	- - -	- - -	1	BR DGER 3 5 BR DGE&A 3 5 #1	103.09%	0	- - -	Bridger-3 M le Knoll 3 5kV
62	C02b	0	PTRSNFRG 69	6.	0	BR DGER 3 5 BR DGE&A 3 5 #1	89 60%	0	PTRSNFUR 69 0 @ 0 899	
63	C03	P CASE DIVERGED								
6	C03a	0	PTRSNFRG 69	7.8	0	EMMAPARK 138 UPALCO 138 #1	82 93%	1	PTRSNFUR 69 0 @ 0 886	
65	C03b	1	PTRSNFRG 69	10.1	0	PTRSNFLT 230 AMPS 230 #1	83 2 %	1	PTRSNFUR 69 0 @ 0 86	Neg Vdevs in P18 & Mont.
66	C03d	0	- - -	- - -	0	EMMAPARK 138 UPALCO 138 #1	82 80%	0	- - -	
67	C03e	0	PTRSNFRG 69	7	0	PTRSNFLT 230 AMPS 230 #1	8 27%	1	PTRSNFUR 69 0 @ 0 893	
68	C0	P CASE DIVERGED								
69	C0 a	0	PTRSNFRG 69	7.7	0	EMMAPARK 138 UPALCO 138 #1	82 93%	1	PTRSNFUR 69 0 @ 0 886	
70	C0 b	1	PTRSNFRG 69	10.1	0	PTRSNFLT 230 AMPS 230 #1	83 2 %	1	PTRSNFUR 69 0 @ 0 86	Vdevs in Wyo., P18 & Mont.
71	C0 d	0	- - -	- - -	0	EMMAPARK 138 UPALCO 138 #1	82 80%	0	- - -	
72	C0 e	0	PTRSNFRG 69	7	0	PTRSNFLT 230 AMPS 230 #1	8 27%	1	PTRSNFUR 69 0 @ 0 893	
73	C05	0	- - -	- - -	0	- - -	- - -	0	- - -	
7	C06	0	- - -	- - -	1	GRACE 138 SODA 138 #1	106.0 %	0	- - -	
75	C06k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	90 36%			
76	C07	0	- - -	- - -	0	- - -	- - -	0	- - -	
77	C08	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5 #1	8 66%	0	- - -	Bridger-3 Mile Knoll 3 5kV
78	C09	0	- - -	- - -	0	GRACE 138 SODA 138 #1	93 09%	0	- - -	
79	C10	0	- - -	- - -	0	GRACE 138 SODA 138 #1	93 01%	0	- - -	
80	C11	0	- - -	- - -	0	GRACE 138 SODA 138 #1	96 88%	0	- - -	
81	C12	0	- - -	- - -	0	GRACE 138 SODA 138 #1	98 97%	0	- - -	
82	C12k	0	- - -	- - -	0	- - -	- - -	0		
83	C13	0	- - -	- - -	0	- - -	- - -	0	- - -	
8	C1	0	- - -	- - -	0	- - -	- - -	0	- - -	
85	C15	0	- - -	- - -	0	- - -	- - -	0	- - -	
86	C16	0	- - -	- - -	0	- - -	- - -	0	- - -	
87	C18	0	- - -	- - -	0	- - -	- - -	0	- - -	
88	C19	0	- - -	- - -	0	- - -	- - -	0	- - -	
89	C20	0	- - -	- - -	0	- - -	- - -	0	- - -	
90	C21	0	- - -	- - -	0	- - -	- - -	0	- - -	
91	C23	0	- - -	- - -	0	- - -	- - -	0	- - -	
92	C2	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5 #1	9 .7 %	0	- - -	Bridger-3 M le Knoll 3 5kV
93	C25	0	- - -	- - -	0	BR DGER 3 5 BR DGE&A 3 5 #1	9 .7 %	0	- - -	
9	C28x	0	- - -	- - -	0	LAGUNATP 69 YUCCA W 69 #1	95 35%	0	- - -	
95	C28y	0	HESSBDW 13 8	-5 2	0	LAGUNATP 69 YUCCA W 69 #1	95 35%	0	- - -	
98		**All Contingencies (w/ Final RAS) Converged Indicating Pos tive Reactive Marg n**								
100		**All Contingencies (w/ Final RAS) Converged Indicating Pos tive Reactive Marg n**								

1) Vol age Violations > 5% for Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line S de) and Transformer tert ary buses.

Appendix 3-13 - - - Post-transient Results For Path C Southbound vs. MSTI Project

BASE CASE / P PA H FLOWS — RAS AC ION

L NE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	O 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	ot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Pa h 26	IPP DC	Pavant IPP Gonder	RedB H Allen (ot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Bridger Gen RAS MW	Aeolus Gen r p MW
3																													
		egwstg1 8h8 pcs 2250 msts 1500 sav	170	1781	1 56	2202	-2250	189	528	1	380	629	128	-150	1818	696	20	2996	3080	11 9	180	26	296	96	21	198	572	0	0
5		Level "B" Contingenc es																											
6	B01	An icline – Populus 500 kV Line	2027	1279	0	3051	-1873	-103	553	80	62	395	39	-15	1639	730	175	2996	29 6	1035	180	9	311	100	215	290	587	0	0
7	B01a	An icline – Populus 500 kV Line RAS Trip Bridger Unit	1960	1 3	0	2707	-18	-355	583		2	177	75	-172	1738	737	160	2996	2853	1000	180	39	266	68	20	25	57	575	0
8	B02	An icline 500 / 3 5 kV Transformer	168	1815	1 02	227	-2262	190	525	7	386	632	130	-1 9	1828	697	20	2996	3081	11 9	180	26	297	96	21	20	567	0	0
9	B03	Bridger – Populus 3 5 kV Line	1759	1702	16 3	1865	-2133	1 5	531	3	23	590	111	-152	1788	711	198	2996	3060	1135	180	29	295	93	213	202	588	0	0
10	B0	Bridger – 3M leknoll 3 5 kV Line	1797	16 6	1690	1701	-2023	15	535	86	68	585	100	-186	1767	719	195	2996	305	1127	180	29	292	90	212	211	599	0	0
11	B05	Bridger 3 5 / 230 kV Transformer	1705	1780	1 55	2197	-22 6	188	528	3	382	628	128	-151	1818	697	203	2996	3079	11 7	180	26	297	96	21	197	572	0	0
12	B06	3Mi ekno l – Goshen 3 5 kV Line	172	1751	1535	2070	-2229	171	528	13	393	612	118	-165	180	702	199	2996	306	1137	180	29	298	96	21	193	591	0	0
13	B06k	3Mi ekno l – Goshen 3 5 kV Line RAS (Bypass 1/2 Ser es Cap)	173	1735	1557	2015	-2197	17	528	2	0	613	115	-167	1798	70	199	2996	3065	1137	180	29	298	96	21	192	585	0	0
1	B07	Kinport – Goshen 3 5 kV Line	1701	1785	1 37	2229	-225	199	528	-1	378	637	128	-160	1820	696	205	2996	3079	1150	180	26	296	96	21	202	571	0	0
15	B08	Kinport – Borah 3 5 kV Line	1706	1779	1 51	2205	-22 5	192	529	1	380	631	129	-152	1819	697	205	2996	3080	1150	180	26	296	95	21	199	572	0	0
16	B09	Populus – Borah 500 kV Line	1716	1762	1 09	2226	-22 1	173	528		383	621	12	-151	1811	697	198	2996	3070	11 3	180	29	299	97	21	201	571	0	0
17	B10	Borah 500 / 3 5 kV Transformer	1716	1770	1 05	2239	-2215	216	532		38	6 9	132	-159	1821	699	20	2996	3092	1162	180	23	290	91	212	203	571	0	0
18	B11	Borah 3 5 / 230 kV Transformer	1707	1778	1 3	2208	-2239	199	529	5	38	636	128	-160	1818	697	205	2996	3079	1151	180	25	296	95	21	202	571	0	0
19	B12	Populus – Cedar Hill 500 kV Line	1709	1768	1 0	220	-2268	152	525	1	380	592	121	-1 5	1809	695	205	2996	3058	1130	180	30	305	101	216	198	571	0	0
20	B1	Cedar H ll – Hemingway 500 kV Line	1712	1765	1 3	220	-2263	152	525	2	381	588	122	-1 6	1808	696	20	2996	3056	1130	180	30	30	101	215	199	572	0	0
21	B15	Midpoint – Hemingway 500 kV Line	1711	1769	1 51	2191	-2262	160	525	2	381	532	127	-1 8	1812	696	21	2996	30 9	1128	180	27	305	101	216	199	57	0	0
22	B16	Borah – Midpoint 500 kV Line	170	1787	1 62	2203	-223	218	531	1	380	63	135	-156	1826	698	206	2996	3090	1160	180	23	292	92	213	199	572	0	0
23	B17	Midpoint 500 / 3 5 kV Transformer	1715	1780	1 27	2229	-2219	231	536	5	38	678	1 1	-166	1832	702	1 1	2996	3120	1173	180	5	283	87	210	222	573	0	0
2	B18	Midpoint 3 5 / 230 kV Transformer	1705	1779	1 55	2201	-2250	186	528	1	380	622	127	-150	1818	697	206	2996	3076	11 6	180	26	298	96	21	199	572	0	0
25	B19	Borah – Adelaide #2 3 5 kV Line	1706	1778	1 5	2200	-2250	185	528	1	380	625	128	-150	1817	697	202	2996	3077	11 6	180	27	297	96	21	198	572	0	0
26	B20	Adelaide – Midpoint #2 3 5 kV Line	1705	1781	1 55	2203	-22 5	195	529	1	380	633	129	-151	1820	697	206	2996	3082	1151	180	25	296	95	21	198	572	0	0
27	B21	Borah – Adelaide – M dpoint #1 3 5 kV Line	1706	1779	1 5	2202	-22 6	191	529	1	380	629	129	-151	1819	697	20	2996	3080	11 9	180	26	296	95	21	199	572	0	0
28	B22	Borah – Hunt 230 kV Line	1706	1779	1 55	2201	-2250	187	528	1	380	626	128	-150	1818	697	203	2996	3078	11 7	180	27	297	96	21	198	572	0	0
29	B23	Midpoint – Bo se Bench #3 230 kV Line	1706	1778	1 55	2200	-2251	18	528	1	380	619	127	-150	1817	697	205	2996	307	11 5	180	26	298	97	21	200	572	0	0
30	B2	Midpoint – Rat le Snake 230 kV Line	1705	1779	1 55	2200	-2251	185	528	1	380	623	127	-150	1817	697	205	2996	3076	11 6	180	26	298	97	21	198	572	0	0
31	B25	Midpoint – Dram 230 kV Line	1706	1779	1 55	2201	-2250	186	528	1	380	62	128	-150	1818	697	20	2996	3076	11 7	180	26	297	96	21	199	572	0	0
32	B26	Rat le Snake – Boise Bench 230 kV Line	1706	1778	1 55	2200	-2251	185	528	1	380	622	127	-150	1817	697	205	2996	307	11 6	180	26	298	96	21	201	572	0	0
33	B27	Bo se Bench - Dram 230 kV Line	1706	1780	1 55	2201	-22 9	189	528	1	380	630	128	-151	1818	697	203	2996	3080	11 8	180	26	297	96	21	198	572	0	0
3	B28	Hemingway 500/230 kV Trans ormer	1706	1779	1 5	2202	-22 8	190	528	1	380	631	128	-151	1818	697	202	2996	3080	11 9	180	27	296	96	21	199	572	0	0
35	B30	Populus – Borah #1 3 5 kV Line	170	1781	1 58	2200	-225	186	528	0	379	629	128	-150	1818	696	203	2996	3079	11 6	180	27	298	97	21	198	571	0	0
36	B31	Populus – Borah #2 3 5 kV Line	1705	1780	1 57	2200	-2252	186	528	1	380	628	128	-150	1818	697	203	2996	3078	11 7	180	27	297	96	21	198	572	0	0
37	B32	Populus – Kinport 3 5 kV Line	1701	1783	1 53	2209	-2261	186	527	0	379	629	126	-155	1818	695	202	2996	3075	11 3	180	28	299	98	21	199	570	0	0
38	B33	Populus – Ben Lomond #3 3 5 kV Line	1780	1697	1391	2135	-205	257	5 6	37	17	675	137	-1 9	181	718	219	2996	3129	1200	180	7	267	7	207	19	597	0	0
39	B3	Populus – Terminal 3 5 kV Line	177	170	1 0	21 9	-208	252	5 3	18	398	672	135	-1 8	1812	717	217	2996	3125	119	180	9	271	77	208	195	586	0	0
0	B35	Aeolus – An icline 500 Line	2309	733	776	19 1	-17 7	-182	620	-20	359	3 3	-18	-175	1 37	731	166	2996	291	1006	180	53	305	93	212	181	691	0	0
1	B35a	B35 dropping 600MW of Aeolus gen insertion of Aeolus 500kV,	2080	6 1	7 3	1896	-1832	-332	605	-29	350	205	73	-182	1702	722	160	2996	2861	1007	180	38	26	67	20	181	599	0	597
2	B35d	B35a insertion/add tion of 2 Mustang 230kV and 1 Riverton 230kV c	207	650	7 7	190	-1835	-325	602	-27	352	212	79	-182	1713	721	161	2996	2862	1008	180	38	265	68	20	181	597	0	597
3	B35g	B35d insertion/add tion of 2 Dil on S 69kV caps Path 18 Shunt Upg	2085	6 5	7 7	1901	-1837	-315	599	-30	3 9	228	78	-195	1717	720	162	2996	2860	1005	180	39	269	70	205	180	59	0	597
	B36	Aeolus – Mona 500kV Line	P CASE DIVERGED																										
5	B36a	B36 dropping 600MW of Aeolus gen insertion of 3 Aeolus 500kV,	0	2712	1911	2501	-3131	35	686	100	82	53	10	-173	1670	865	237	2996	31 0	1271	180	-6	107	- 1	165	23	622	0	597
6	B36d	B36a insertion of 2 Mustang 230kV and 1 Riverton 230kV caps	0	2708	1911	2502	-3129	38	685	101	83	56	107	-173	167	865	238	2996	31 0	1271	180	-6	108	- 1	166	23	621	0	597
7	B36g	B36d insertion of 2 Chappel C 230kV caps	0	2707	1911	2501	-3128	38	68	102	83	57	108	-173	1676	865	238	2996	31 0	1271	180	-6	109	- 0	166	23	620	0	597
8	B36k	Extreme version of B36a includes insert on of 1 more Aeolus 500kV ca	0	2718	1915	2502	-3133	38	68	102	8	57	106	-173	1677	86	238	2996	31 0	1272	180	-6	108	- 1	166	23	621	0	597
9	B36n	Extreme version of B36d includes insert on of 1 more Aeolus 500kV ca	0	2715	1915	2502	-3131	0	683	102	8	59	109	-172	1681	86	238	2996	31 0	1271	180	-6	109	- 0	166	233	621	0	597
50	B36ak	B36a RAS (Bypass 1 2 Series Cap)	0	2692	1976	2379	-308	37	688	12	507	8	9	-181	16 8	871	236	2996	31 0	1270	180	-6	10	-	16	228	622	0	597
51	B37	Aeolus 500 / 230 kV Transformer	169	1766	1	2200	-22 8	180	53	2	381	622	121	-151	1798	702	203	2996	3076	11 6	180	26	296	95	213	198	571	0	0
52	B38	Aeolus – Windstar 230 kV Line	165	1687	1 07	2182	-22 3	137	563	1	380	588	89	-156	1705	721	201	2996	306	1137	180	25	288	87	211	197	578	0	0
53	B39	Aeolus – Freezeout 230 kV Line	1690	180	1	2216	-2252	189	525	9	388	629	130	-150	1826	698	20	2996	3079	1150	180	26	296	96	21	199	575	0	0
5	B 0	Bonanza –Mona 3 5kV Line	18 1	1807	1 83	2273	-2 31	107	13	57	38	5 7	102	-159	1998	155	208	2996	3025	1096	180		230	33	19	206	620	0	0
55	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1823	1768	1 38	2223	-2 6	-8	393	32	11	6	13	-166	1936	123	203	2996	301	1125	180	-	213	29	192	20	588	0	0
56	B 1	Hemingway – Summer Lake 500kV line	1716	1752	1 32	2191	-230	91	518	1	380	81	118	-1 0	1797	692	227	2996	3001	108	180	31	323	113	219	188	57	0	0
57																													
58																													N-1 Criteria
59		Level "C" Contingenc es																											
60	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1853	1566	1961	1280	-193	69	535	118	500	526	80	-155	1730	736	188	2996	3033	1108	180	33	293	90	212	193	627	0	0
61	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1782	1722	1782	11 2	-1925	-188	567	71	51	306	117	-173	1830	7 0	17	2996	2938	1072	180	23	2 8	58	201	177	601	575	0
62	C02b	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	171	1873	1597	999	-1907	- 53	601	25	0	71	153	-190	1926	7 5	157	2996	28 1	1035	180	13	201	2	189	167	585	1150	0
63	C03	Bridger – 3M leKno l Bridger – Populus #1 3 5 kV ines	1887	1509	1998	1126	-1826	87	539	162	5 6	530	67	-195	1708	7 3	186	2996	302	1101	180	3	291	87	211	20	630	0	0
6	C03a	Bridger – 3M leKno l Bridger – Populus #1 3 5 kV ines w/ RAS	1816	1669	1833	979	-1822	-175	570	113	95	308	105	-207	1810	7 6	171	2996	2929	1065	180	2	2 6	56	200	183	608	575	0
65	C03b	Bridger – 3M leKno l Bridger – Populus #1 3 5 kV ines w/ RAS	17 7	1823	1661	828	-1810	- 5	603	66	6	71	1 2	-219	1908	751	155	2996	2833	1029	180	1	199	22	189	169	595	1150	0
66	C03d	C03a Big Grassy & Amps Shunt (Path 18 RAS)	181	1670	1835	979	-1828	-171	569	112	9	315	10	-213	1809	7 6	172	2996	2929	1065	180	2	2 7	56	201	182	607	575	0
67	C03e	C03b Big Grassy & Amps Shunt (Path 18 RAS)	17 5	182	1663	828	-1816	- 1	602	65	5	78	1 1	-226	1907	751	155	2996	2832	1028	180	1	200	23	189	168	59	1150	0
68	C0	Bridger – 3M leKno l Bridger – Populus #2 3 5 kV ines	1887	1509	1998	1126	-1826	87	539	162	5 6	530	67	-195	1708	7 3	186	2996	302	1101	180	3	291	87	211	20	630	0	0
69	C0 a	Bridger – 3M leKno l Bridger – Populus #2 3 5 kV ines w/ RAS	1816	1669	1833	979	-1822	-175	570	113	95	308	105	-207	1810	7 6	171	2996	2929	1065	180	2	2 6	56	200	183	608	575	0
70	C0 b	Bridger – 3M leKno l Bridger – Populus #2 3 5 kV ines w/ RAS	17 7	1823	1661	828	-1810	- 5	603	66	6	71	1 2	-219	1908	751	155	2996	2833	1029	180	1	199	22	189	169	595	1150	0
71	C0 d	C0 a Big Grassy & Amps Shunt (Path 18 RAS)	181	1670	1835	979	-1828	-171	569	112	9	315	10	-213	1809	7 6	172	2996	2929	1065	180	2	2 7	56	201	182	607	575	0
72	C0 e	C0 b Big Grassy & Amps Shunt (Path 18 RAS)	17 5	182	1663	828	-1816	- 1	602	65	5	78	1 1	-226	1907	751	155	2996	2832	1028	180	1	200	23	189	168	59	1150	0
73	C05	Borah – Populus 3 5 kV DLO	1703	1781	1 61	2197	-2259	181	527	0	379	627	126	-150	1817	696	202	2996	3076	11 3	180	28	299	97	21	198	571	0	0
7	C06	Populus – Ben Lomond 3 5 kV DLO	1930	1532	1261	1998	-1652	399	58	112	9	77	155	-1	1805	762	253	2996	32 0	1306	180	-35	20	27	191	188	659	0	0
75	C06k	Populus – Ben Lomond 3 5 kV DLO RAS Bypass 1/2 Series Cap)	19 8	150	1317	1885	-1606	01	585	130	513	772	1 8	-152	1793	766	251	2996	3238	1303	180	-3	20	27	191	181	658	0	0
76	C07	Ben Lomond – Terminal 3 5 kV DLO	1731	1753	1	2190	-2206	210	532	-7	372	6 5	129	-1 9	1815	705	209	2996	3096	1165	180	20	288	89	212	197	57	0	0
77	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1699	178	1 56	2207	-2269	179	526	0	379	625	125	-156	1816	69	200	2996	3071	1139	180	30	301	99	215	199	570	0	0
78	C09	Populus – Borah #2 3 5 kV Treasureton – Brady 230 kV Lines	1709	1775	1 3	2198	-2226	197	530	12	391	635	130	-150	1820	697	205	2996	308	1153	180	2	29	9	213	198	573	0	0
79	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1708	1776	1	2198	-2228	196	530	11	391	636	130	-150	1820	697	206	2996	3085	1153	180	25	295	9	213	197	573	0	0
80	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1883	158	1312	2053	-1798	356	569	67	8	7	1 7	-1 5	1805	7 9	2 1	2996	320	1269	180	-20	227		197	190	622	0	0
81	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1781	1697	1386	21 5	-2050	266	5 6	32	11	681	137	-1 8	181	718	220	2996	313	1202	180	6	267	7	207	19	588	0	0
82	C12k	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines RA	1801	1666	1 1	2029	-2000	267	5 6	51	32	680	131	-155	1801	723	219	2996	3132	1199	180	7	267	7	207	188	588	0	0
83	C13	Borah – Adelaide #2 Borah–ADT–M dpoint #1 3 5 kV ines (RA)	1707	1775	1 5	2197	-2255	175	527	1	380	617	126	-1 9	1815	697	198	2996	3072	11 3	180	29	299	97	21	200	572	0	0
8	C1	Borah – Adelaide #2 M dpoint - Adelaide #2 3 5 kV ines (RA)	1706	1779	1 5	2202	-22 6	191	528	1	380	629	128	-151	1818	697	20	2996	3079	11 9	180	26	296	96	21	199	572	0	0
85	C15	Borah – Adelaide #2 Borah – Hunt 230 kV lines	1707	1777	1 55	2199	-2252	182	528	1	380	622	127	-1 9	1817	697	201	2996	3076	11 5	180	28	298	97	21	198	572	0	0
86	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV lines (RA?)	1707	1779	1 50	2205	-22 2	195	529	2	381	632	129	-153	1819	697	205	2996	3081	1151	180	25	295	95	21	200	572	0	0
87	C18	Borah – Kinport M dpoint – Ade a de #2 3 5 kV lines (RA?)	1706	1781	1 51	2207	-22 1	199	529	1	380	636	129	-153	1820	697	207	2996	3083	1152	180	2	295	95	213	200	572	0	0
88	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV ines (RA?)	1706	1779	1 51	220	-22 6	191	529	1	380	629	128	-152	1818	697	20	2996	3079	11 9	180	26	296	95	21	199	572	0	0
89	C20	Borah–Adel–Midpoint #1 Midpoint – Adelaide #2 3 5 kV ines	1706	1783	1 51	2209	-2229	216	531	2	381	6 3	132	-155	1823	698	213	2996	3089	1160	180	20	292	92	213	201	572	0	0
90	C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 kV ines (RA)	1706	1778	1 5	2201	-22 7	189	528	1	380	627	128	-151	1818	697	20	2996	3079	11 8	180	26	297	96	21	199	572	0	0
91	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1705	1786	1 61	2203	-223	216	531	1	380	631	135	-156	1826	698	205	2996	3089	1160	180	23	292	92	213	200	572	0	0
92	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	1756	1706	1636	1878	-2136	1 9	531	2	22	595	111	-157	1789	710	199	2996	3060	1136	180	28	295	9	213	205	587	0	0
93	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines	1756	1706	1636	1878	-2136	1 9	531	2	22	595	111	-157	1789	710	199	2996	3060	1136	180	28	295	9	213	205	587	0	0
9	C28x	Pa o Verde Generat on – Trip Two Units	178	1773	1 35	2203	-2 1	32	537	11	390	9	155	-172	1871	713	209	2996	01	2367	180	0	60	220	25	202	62	0	0
95	C28y	Pa o Verde Generat on – Trip Two Units	1783	1772	1 3	2202	-2 13	31	536	10	390	9	156	-172	1868	712	208	2996	011	2362	180	0	59	219	253	202	62	0	0
96																													
97		**Margin est w/ MS I at 5% of 1500 MW**																											N-2 Criteria
98		**egwstg1 8h8 pcs 2250 msts 1575 sav**	1707	177	1 50	2199	-22 9	181	527	2	381	683	127	-151	1815	696	203	2996	3073	11	180	26	296	98	215	198	572	0	0
99		**Margin est w/ Path C at 5% of 2250 MW**																											
100		**egwstg1 8h8 pcs 2362 msts 1500 sav**	17 1	1752	1 29	2198	-2362	7	5 8	2	381	77	13	-151	1828	716	21	2996	3110	1177	180	15	297	97	201	201	581	0	0

REAC IVE MARGIN MVAR Gray shaded cells are the minimum margins)

L NE #	CON INGENCY#	Aeolus 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Bridger 345	Goshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
6	B01	-1135	-1781	-936	-1166	-1168	-1 20	-1955	-1282	-795	-586	-5 6	-9 9	-1082	-1106	-1 62	-1813	-2115	-7 1	-1226	-852	339	-315	-2 2	-63
7	B01a	-1156	-1917	-1006	-1322	-1311	-1512	-2036	-1393	-916	661	-637	-1087	-1263	-1265	-1623	-19 9	-2252	-735	-1227	-8 7	-328	-301	-2 2	-67
8	B02	-1 79	-2336	-1 3	-1798	-1722	-1990	-2568	-175	-978	-81	-760	-1389	-162	-16 2	-1921	-219	-263	-787	-1512	-983	359	-336	-260	-72
9	B03	-1 93	-2215	-1351	-1550	-155	-1818	-2373	-1597	11 6	-762	-7 8	-1293	-1520	-151	-1805	-2078	-2 95	-773	-1521	-966	362	-335	-256	-70
10	B0	-1366	-205	-11 5	-1166	-11 1	-1393	-1937	-1283	1025	- 66	- 16	-875	-1080	-1062	-1 57	-1852	-2318	-763	-1 19	-9	363	-328	-250	-69
11	B05	-1627	-2327	-1611	-1806	-1775	-2019	-2579	-1758	1 12	-866	-876	-1 81	-17 7	-1737	-1963	-2181	-2611	-785	-1631	-985	352	-332	-258	-72
12	B06	-1610	-228	-1559	-1710	-1666	-1911	-2 75	-169	1376	656	-750	-1331	-1633	-1608	-1913	-2129	-2565	-782	-1615	-981	360	-335	-260	-71
13	B06k																								
1	B07	-162	-2336	-1519	-1720	-169	-1966	-2552	-172	1175	353	- 99	-1 67	-1658	-16 6	-1921	-218	-2623	-786	-163	-988	356	-332	-259	-72
15	B08	-1621	-2323	-1591	-1780	-1760	-2005	-256	-17 5	1391	816	-8 3	-1335	-1703	-1725	-1936	-2170	-2606	-785	-1630	-986	357	-333	-259	-72
16	B09	-1618	-2310	-1576	-1685	-1597	-1937	-2537	-1703	1395	851	-862	-1 50	-1709	-169	-1938	-2167	-259	-78	-1631	-987	357	-332	-259	-71
17	B10	-1617	-2313	-1595	-1783	-16 5	-1987	-25 6	-1739	1383	832	-8 7	-1392	-1659	-1580	-1920	-2162	-2596	-782	-1627	-985	356	-331	-258	-72
18	B11	-1625	-2323	-1592	-1771	-17 2	-1985	-25 9	-1737	1391	821	-8 1	-1 0	-1699	-1701	-1931	-2171	-2608	-785	-163	-987	-357	-332	-259	-72
19	B12	-1631	-2321	-1561	-1603	-169	-2066	-2 8	-993	1393	865	-873	-1 38	-1658	-1675	-19 2	-2175	-2608	-787	-1639	-990	-358	-335	-260	-71
20	B1	-1608	-2306	-1521	-155	-16	-2012	-2 07	-1089	135	8 3	-852	-139	-1606	-1622	-1903	-2152	-2589	-786	-1622	-986	-358	-33	-260	-71
21	B15	-159	-2291	-1517	-16 0	-1515	-1 16	-2390	-1721	132	806	-823	-1321	-1552	-1508	-185	-2123	-2568	-785	-1608	-982	-357	-333	-259	-71
22	B16	-1602	-2316	-15 5	-1667	-1508	-1857	-2 96	-1712	1363	838	-850	-1398	-163	-1619	-1910	-2158	-2599	-78	-1613	-982	-356	-331	-259	-72
23	B17	-1593	-2307	-1557	-1718	-1678	-1711	-2 19	-1688	1366	838	-8 7	-1 10	-1660	-16 3	-1913	-2157	-2589	-780	-1603	-980	-355	-332	-258	-72
2	B18	-1626	-2326	-1610	-1798	-1763	-2002	-2568	-1752	1 19	866	-876	-1 75	-17 0	-1727	-1958	-2179	-2610	-785	-1633	-987	-357	-33	-260	-72
25	B19	-1620	-2319	-1592	-1772	-17 2	-1995	-2553	-17 3	1399	852	-86	-1 3	-1703	-1678	-1935	-2166	-2602	-785	-1628	-986	-357	-333	-259	-72
26	B20	-1625	-2327	-1608	-1793	-1761	-2031	-2589	-1759	1 1	862	-873	-1 60	-1722	-1697	-195	-2178	-2611	-785	-1632	-986	-357	-333	-259	-72
27	B21	-1618	-2319	-1587	-1761	-1730	-2003	-2561	-17 1	1393	8 8	-861	-1 28	-168	-1652	-1929	-2165	-2602	-785	-1628	-985	-357	-333	-259	-72
28	B22	-162	-232	-160	-1789	-1758	-2010	-2565	-1751	1 11	858	-870	-1 56	-172	-1709	-19 8	-2175	-2608	-785	-1631	-986	-357	-333	-259	-72
29	B23	-162	-2323	-1603	-1782	-17 2	-1975	-2550	-17 3	1 11	861	-872	-1 60	-1721	-170	-19 9	-217	-2607	-785	-1631	-986	-357	-33	-260	-72
30	B2	-1625	-2325	-1599	-1760	-1711	-1932	-2558	-1728	1 07	859	-871	-1	-1698	-167	-19 7	-2175	-2609	-785	-1632	-987	-357	-33	-260	-72
31	B25	-162	-232	-1607	-1793	-1758	-1995	-2560	-17 9	1 15	863	-87	-1 69	-173	-1720	-195	-2176	-2608	-785	-1631	-986	-357	-333	-260	-72
32	B26	-1626	-2325	-1612	-1806	-177	-201	-2562	-1755	1 21	866	-876	-1 80	-17 8	-1737	-1958	-2178	-2609	-785	-1632	-986	-357	-33	-260	-72
33	B27	-1626	-2326	-1613	-1807	-1775	-2016	-2578	-1759	1 22	867	-877	-1 81	-17 9	-1738	-1960	-2180	-2611	-785	-1632	-986	-357	-333	-260	-72
3	B28	-162	-2325	-1607	-1795	-1763	-2002	-2553	-17	1 17	86	-875	-1 7	-1739	-1728	-1956	-2178	-2609	-785	-1631	-986	-357	-333	-259	-72
35	B30	-1636	-2333	-1633	-1839	-1801	-2037	-2601	-1779	1 3	882	-891	-1511	-1768	-1750	-1975	-2186	-2619	-786	-16 0	-988	-357	-33	-260	-72
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37	B32	-16 0	-2338	-1626	-1821	-175	-2000	-2577	-1766	1 25	782	-833	-1210	-177	-1685	-197	-2188	-2626	-787	-16	-990	-357	-33	-260	-72
38	B33	-1571	-2138	-153	-1675	-1653	-1918	-2 83	-1680	13 6	827	-8 1	-1366	-1591	-1600	-1693	-1933	-2387	-765	-158	-973	-357	-328	-25	-72
39	B3	-1572	-21 5	-1532	-1669	-16 7	-1916	-2 81	-1678	13 5	826	-8 0	-1363	-1582	-1593	-1808	-1951	-239	-767	-1585	-97	358	-331	-256	-72
0	B35	-3 1	-795	-939	-132	-1363	-1596	-2167	-1 29	-898	-791	-7 5	-1200	-1326	-1350	-1505	-1505	-1320	-6 8	-382	-302	222	-18	-207	-56
1	B35a	-1122	-1808	-1206	-1676	-1683	-189	-2 8	-1683	1261	-91	-897	-1 71	-1697	-1682	-1998	-2076	-2166	-731	-1205	-8 2	301	-267	-2 1	-67
2	B35d	-1151	-1826	-1236	-172	-1732	-19 1	-2 91	-1718	1302	-931	-919	-1515	-17 9	-173	-2025	-2091	-218	-735	-1235	-857	32	-295	-250	-67
3	B35g	-1197	-1973	-1320	-1887	-1895	-2105	-2635	-1822	1 08	-1025	-992	-1672	-1930	-191	-213	-2225	-2375	-7 3	-128	-881	328	-308	-253	-68
	B36	P CASE DIVERGED																							
5	B36a	-1516	-2128	-938	-867	-897	-1131	-1589	-1007	-72	-537	-516	-765	-825	-859	-112	-1593	-2 00	-618	-1650	1020	333	-286	-230	-67
6	B36d	-15 0	-2133	-961	-887	-917	-1159	-162	-1029	-7 3	5 8	-527	-783	-8 5	-879	-1138	-1617	-2 07	-620	-1671	-1027	-339	-302	-236	-67
7	B36g	-1558	-21 0	-98	-908	-938	-1182	-1652	-1050	-761	-558	-538	-800	-865	-899	-1161	-16 5	-2 17	-623	-1685	-1031	3 0	-307	-2 7	-67
8	B36k	-1586	-2138	-955	-88	-916	-115	-1618	-1027	-737	-553	-522	-785	-8 5	-870	-1162	-16 9	-2 1	-621	-1723	1060	336	-290	-232	-67
9	B36n	-1609	-21 3	-978	-906	-937	-1181	-1651	-10 9	-756	-566	-536	-806	-865	-893	-1188	-1680	-2 22	-62	-17	1065	3 1	-306	-239	-67
50	B36ak																								
51	B37	-1520	-2320	-15	-1776	-1760	-2011	-2572	-17 9	1391	-867	-87	-1 73	-1732	-1725	-1957	-218	-2616	-781	-1527	-952	35	-330	-258	-71
52	B38	-1639	-2369	-1666	-1850	-1796	-202	-258	-177	1 51	-87	-88	-1 99	-1776	-1760	-1976	-2202	-26 9	-761	-1618	-997	335	-306	-250	-68
53	B39	-15 8	-2337	-1591	-179	-1757	-2009	-2572	-17 9	1390	-860	-863	-1 63	-1725	-1717	-19 8	-218	-2623	-785	-15 3	-115	358	-33	-258	-72
5	B 0	-1275	-2127	-12 8	-1 8	-1 65	-17 7	-2316	-1532	1129	-76	-761	-1239	-1 08	-1 25	-1690	-200	-2 37	-5 9	-1303	-89	3	-316	-2 6	-55
55	B 0a	-1378	-2185	-1353	-1539	-1533	-1781	-23 0	-1588	1216	785	-792	-1291	-1 86	-1 97	-17 6	-20 3	-2 83	-502	-1 0	-92	-3 8	-31	-250	-66
56	B 1	-1632	-2306	-1582	-1683	-16 3	-1763	-1892	-1562	1396	858	-869	-1 18	-1653	-1632	-1927	-2158	-2588	-788	-16 0	-989	359	-339	-261	-70
57		**341**	**795**	**936**	**867**	**897**	**1131**	**1589**	**993**	**724**	**353**	**416**	**765**	**825**	**859**	**1124**	**1505**	**1320**	**502**	**382**	**115**	**222**	**184**	**207**	**55**
58		> >				500	500	500	500	100			200		200										
60	C02	-1160	-1967	-886	-1107	-1156	-1 28	-19 6	-12	-728	565	-515	-971	-11 6	-113	-1 96	-1865	-226	-7 8	-12 3	-880	367	-335	-2 8	-67
61	C02a	-1292	-213	-1102	-13 8	-136	-1576	-2102	-1 30	-90	668	-638	-11 9	-1370	-13 3	-1686	-201	-2 25	-7 6	-1338	-910	-357	-320	-250	-71
62	C02b																								
63	C03	-1065	-1815	-815	-917	-936	-1178	-1657	-1056	-722	- 32	-391	-7 8	-891	-888	-1272	-1668	-211	-738	-1157	-8 3	-367	-329	-2 1	-66
6	C03a	-1230	-2015	-10 5	-113	-111	-1318	-1837	-12	-923	- 83	- 30	-876	-1079	-1050	-1 72	-1859	-2302	-738	-1287	-891	-359	-316	-2 5	-70
65	C03b	-1267	-2137	-11 7	-1201	-11	-1275	-1793	-1279	1015	- 96	- 2	-905	-1132	-1083	-15 8	-1957	-2 31	-732	-1310	-89	-3 2	-293	-2 5	-7
66	C03d	-1253	-20 1	-1083	-1202	-1188	-1399	-1927	-1307	-950	521	- 58	-9 0	-115	-1125	-1539	-1908	-2331	-739	-1302	-897	-360	-319	-2 6	-70
67	C03e	-1287	-216	-1188	-1277	-1225	-136	-1891	-13 9	10 6	536	- 70	-97	-1215	-116	-1618	-2005	-2 57	-733	-132	-899	3	-298	-2 6	-7
68	C0	-1065	-1818	-815	-917	-936	-1178	-1657	-1056	-722	- 32	-391	-7 8	-891	-888	-1272	-1668	-211	-738	-1157	-8 3	367	-329	-2 1	-66
69	C0 a	-1230	-2015	-10 5	-113	-111	-1318	-1837	-12	-923	- 83	- 30	-876	-1079	-1050	-1 72	-1859	-2302	-738	-1287	-891	-359	-316	-2 5	-70
70	C0 b	-1267	-2137	-11 7	-1201	-11	-1275	-1793	-1279	1015	- 96	- 2	-905	-1132	-1083	-15 8	-1957	-2 31	-732	-1310	-89	-3 2	-293	-2 5	-7
71	C0 d	-1253	-20 1	-1083	-1202	-1188	-1399	-1927	-1307	-950	521	- 58	-9 0	-115	-1125	-1539	-1908	-2331	-739	-1302	-897	360	-319	-2 6	-70
72	C0 e	-1287	-216	-1188	-1277	-1225	-136	-1891	-13 9	10 6	-536	- 70	-97	-1215	-116	-1618	-2005	-2 57	-733	-132	-899	3	-298	-2 6	-7
73	C05	-1636	-2325	-1627	-1837	-1787	-2009	-2585	-1780	1 37	-882	-891	-1512	-1731	-1692	-1950	-2166	-2608	-786	-16 0	-989	357	-33	-260	-72
7	C06	-1 6	-1738	-1 13	-1509	-1 97	-1790	-2360	-1573	12 2	-778	-791	-1229	-1397	-1 31	-1269	-1509	-1935	-71	-1 67	-938	356	-31	-239	-72
75	C06k																								
76	C07	-1612	-2218	-1589	-1750	-1720	-1985	-2551	-1730	1398	-858	-867	-1 33	-1668	-1673	-1583	-20 6	-2 72	-778	-1618	-983	358	-335	-261	-72
77	C08	-16 2	-233	-1625	-1818	-1727	-1965	-2557	-1763	1 23	-769	-827	-1173	-1761	-1620	-1961	-2175	-2621	-787	-16 6	-990	357	-33	-260	-72
78	C09	-1622	-2311	-1602	-179	-1758	-1996	-2560	-1751	1 05	859	-862	-1 68	-1720	-1703	-1910	-2153	-2592	-78	-1630	-986	356	-331	-258	-72
79	C10	-1630	-2319	-1621	-1821	-1783	-2019	-2583	-1768	1 2	871	-873	-1 91	-17 6	-1728	-1928	-216	-2601	-78	-1635	-987	357	-331	-258	-72
80	C11	-1 83	-1871	-1 33	-1528	-1516	-1802	-2369	-1585	1258	782	-796	-12	-1 20	-1 9	-1 67	-1650	-2082	-733	-150	-950	358	-323	-2 7	-72
81	C12	-156	-2126	-151	-16 8	-1627	-1896	-2 61	-166	132	813	-820	-13 2	-1558	-1570	-1758	-1926	-2371	-765	-1577	-972	-357	-328	-25	-72
82	C12k																								
83	C13	-1613	-2309	-1557	-170	-1675	-19 0	-250	-1717	1359	826	-8 2	-136	-1603	-15	-1887	-21	-2590	-785	-162	-985	-357	-333	-259	-72
8	C1	-1619	-2320	-1589	-1762	-1731	-2002	-2560	-17 2	139	8 9	-861	-1 28	-168	-1652	-1930	-2166	-2602	-785	-1628	-985	-357	-333	-259	-72
85	C15	-1617	-2316	-1582	-1751	-1721	-1980	-2535	-1733	1386	8 2	-856	-1 13	-1672	-16 3	-1920	-2161	-2599	-785	-1627	-985	357	-333	-259	-72
86	C16	-1613	-2315	-1565	-1733	-1713	-1987	-25 5	-1726	1362	800	-828	-129	-16 0	-1637	-190	-215	-2597	-78	-1623	-985	-357	-332	-259	-72
87	C18	-1620	-2323	-1586	-1765	-17	-2015	-2573	-17	1383	812	-8 0	-1320	-1677	-1682	-1929	-2168	-2606	-785	-1630	-986	-357	-333	-259	-72
88	C19	-1619	-2320	-1581	-1760	-17 1	-199	-25 9	-1735	1378	807	-835	-1310	-1675	-169	-1922	-216	-2603	-785	-1628	-986	-357	-333	-259	-72
89	C20	-1610	-2315	-1555	-169	-1663	-2010	-2566	-1721	135	823	-839	-13 7	-1586	-1523	-1892	-2152	-2597	-78	-1620	-98	-356	-332	-259	-72
90	C21	-1616	-2316	-1576	-1738	-1708	-1989	-25	-1731	1379	837	-852	-1396	-1651	-161	-191	-2159	-2599	-785	-1626	-985	-357	-333	-259	-72
91	C23	-1595	-2309	-1518	-1617	-1 53	-179	-2 5	-1692	133	821	-83	-13 8	-1572	-15 0	-1877	-21 3	-2590	-783	-1607	-982	-356	-330	-259	-72
92	C2	-1 7	-2222	-122	-1 50	-1 52	-1737	-2317	-1532	-888	306	- 05	-126	-1 22	-1 06	-17	-2079	-2505	-77	-1512	-968	-361	-33	-256	-70
93	C25	-1 7	-2222	-122	-1 50	-1 52	-1737	-2317	-1532	-888	306	- 05	-126	-1 22	-1 06	-17	-2079	-2505	-77	-1512	-968	361	-33	-256	-70
9	C28x	-1 7	-2092	-1399	-1556	-1538	-1726	-2300	-1598	12 5	-782	-79	-1287	-1501	-1 96	-1750	-2005	-2333	-752	-1 69	-9 2	350	-307	-252	-38
95	C28y	-1 52	-2096	-1 03	-1560	-15 1	-1728	-230	-1600	12 9	-783	-795	-1289	-150	-1 99	-1752	-2008	-2338	-75	-1 72	-9 3	350	-307	-252	-10
96		**1065**	**1738**	**815**	**917**	**936**	**1178**	**1657**	**1056**	**722**	**306**	**391**	**748**	**891**	**888**	**1269**	**1509**	**1935**	**714**	**1157**	**843**	**342**	**293**	**239**	**38**
97		> >				00	00	00	00	100			250		250										

L NE #	CON INGENCY#	Vo tage Vio ations	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Vo tage	COMMEN
6	B01	0	- - -	- - -	1	BR DGER 3 5 BRIDGE&A 3 5 #1	10 . 1%	0	- - -	Br dger-3 Mi e Kno l 3 5kV
7	B01a	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	93.89%	0	- - -	
8	B02	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	83.02%	0	- - -	
9	B03	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	93.53%	0	- - -	
10	B0	0	- - -	- - -	0	DON 138 P NGREE 138 #1	82.51%	0	- - -	
11	B05	0	- - -	- - -	0	- - -	- - -	0	- - -	
12	B06	0	- - -	- - -	2	GRACE 138 SODA 138 #1	120.18%	0	- - -	
13	B06k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	99.22%			
1	B07	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	87.02%	0	- - -	Br dger-3 Mi e Kno l 3 5kV
15	B08	0	- - -	- - -	0	- - -	- - -	0	- - -	
16	B09	0	- - -	- - -	0	- - -	- - -	0	- - -	
17	B10	0	- - -	- - -	0	- - -	- - -	0	- - -	
18	B11	0	- - -	- - -	0	GRACE 138 SODA 138 #1	83.52%	0	- - -	
19	B12	0	- - -	- - -	0	- - -	- - -	0	- - -	
20	B1	0	- - -	- - -	0	- - -	- - -	0	- - -	
21	B15	0	- - -	- - -	0	LOCUST 138 MORA 138 #1	80.91%	0	- - -	
22	B16	0	- - -	- - -	0	- - -	- - -	0	- - -	
23	B17	0	- - -	- - -	0	LOCUST 138 MORA 138 #1	91.73%	0	- - -	
2	B18	0	- - -	- - -	0	M DPO NT 230 M DPO NT 3 5 #2	90.32%	0	- - -	
25	B19	0	- - -	- - -	0	- - -	- - -	0	- - -	
26	B20	0	- - -	- - -	0	- - -	- - -	0	- - -	
27	B21	0	- - -	- - -	0	- - -	- - -	0	- - -	
28	B22	0	- - -	- - -	0	- - -	- - -	0	- - -	
29	B23	0	- - -	- - -	0	LOCUST 138 MORA 138 #1	85.93%	0	- - -	
30	B2	0	- - -	- - -	0	- - -	- - -	0	- - -	
31	B25	0	- - -	- - -	0	- - -	- - -	0	- - -	
32	B26	0	- - -	- - -	0	LOCUST 138 MORA 138 #1	87.38%	0	- - -	
33	B27	0	- - -	- - -	0	- - -	- - -	0	- - -	
3	B28	0	- - -	- - -	0	LOCUST 138 MORA 138 #1	81.27%	0	- - -	
35	B30	0	- - -	- - -	0	- - -	- - -	0	- - -	
36	B31	0	- - -	- - -	0	- - -	- - -	0	- - -	
37	B32	0	- - -	- - -	0	BRIDGER 3 5 BRIDGE&A 3 5 #1	83.6 %	0	- - -	Br dger-3 Mi e Kno l 3 5kV
38	B33	0	- - -	- - -	0	GRACE 138 SODA 138 #1	88.22%	0	- - -	
39	B3	0	- - -	- - -	0	GRACE 138 SODA 138 #1	8 .58%	0	- - -	
0	B35	67	LATHAM 3 .5	10 9	0	DAVEJOHN 115 DAVEJTPS 115 #1	99.88%	0	- - -	Area 65 & 73 Vdevs
1	B35a	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	87. 2%	0	- - -	
2	B35d	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	87 50%	0	- - -	
3	B35g	15	DILLON S 69	-11.1	0	DAVEJOHN 115 DAVEJTPS 115 #1	87.13%	0	- - -	Neg Vdevs in Wyo , P18 & Mont.
	B36	P CASE DIVERGED								
5	B36a	0	- - -	- - -	0	GRACE 138 SODA 138 #1	98.57%	0	- - -	
6	B36d	0	- - -	- - -	0	GRACE 138 SODA 138 #1	98. 7%	0	- - -	
7	B36g	0	- - -	- - -	0	GRACE 138 SODA 138 #1	98. 3%	0	- - -	
8	B36k	10	BA RO L 57	-6.9	0	GRACE 138 SODA 138 #1	98. 7%	0	- - -	Only Neg Vdevs in Wyo.
9	B36n	10	BA RO L 57	-7.1	0	GRACE 138 SODA 138 #1	98.37%	0	- - -	Only Neg Vdevs in Wyo.
50	B36ak	0	- - -	- - -	0	EMMAPARK 138 UPALCO 138 #1	87.8 %			
51	B37	0	- - -	- - -	0	AEOLUS 500 AEOLUS 230 #2	92.11%	0	- - -	
52	B38	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	8 .65%	0	- - -	
53	B39	0	- - -	- - -	0	- - -	- - -	0	- - -	
5	B 0	0	- - -	- - -	3	EMMAPARK 138 UPALCO 138 #1	120.1 %	0	- - -	
55	B 0a	0	- - -	- - -	0	EMMAPARK 138 UPALCO 138 #1	90.07%	0	- - -	
56	B 1	0	- - -	- - -	0	LOCUST 138 MORA 138 #1	85.88%	0	- - -	
60	C02	0	- - -	- - -	2	BR DGER 3 5 BRIDGE&A 3 5 #1	115 85%	0	- - -	Br dger-3 Mi e Kno l 3 5kV
61	C02a	0	- - -	- - -	1	BR DGER 3 5 BRIDGE&A 3 5 #1	101 82%	0	- - -	
62	C02b	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	88.27%			
63	C03	0	- - -	- - -	0	BR DGER 230 ROCKSPGS 230 #1	95.15%	0	- - -	
6	C03a	0	- - -	- - -	0	DON 138 P NGREE 138 #1	80.58%	0	- - -	
65	C03b	0	PTRSNFRG 69	5 5	0	DON 138 P NGREE 138 #1	80.22%	0	- - -	
66	C03d	0	- - -	- - -	0	- - -	- - -	0	- - -	
67	C03e	0	- - -	- - -	0	- - -	- - -	0	- - -	
68	C0	0	- - -	- - -	0	BR DGER 230 ROCKSPGS 230 #1	95.15%	0	- - -	
69	C0 a	0	- - -	- - -	0	DON 138 P NGREE 138 #1	80.58%	0	- - -	
70	C0 b	0	PTRSNFRG 69	5 5	0	DON 138 P NGREE 138 #1	80.22%	0	- - -	
71	C0 d	0	- - -	- - -	0	- - -	- - -	0	- - -	
72	C0 e	0	- - -	- - -	0	- - -	- - -	0	- - -	
73	C05	0	- - -	- - -	0	- - -	- - -	0	- - -	
7	C06	0	- - -	- - -	1	GRACE 138 SODA 138 #1	10 01%	0	- - -	
75	C06k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	88. %			
76	C07	0	- - -	- - -	0	- - -	- - -	0	- - -	
77	C08	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	8 . 3%	0	- - -	Br dger-3 Mi e Kno l 3 5kV Line
78	C09	0	- - -	- - -	0	GRACE 138 SODA 138 #1	91.33%	0	- - -	
79	C10	0	- - -	- - -	0	GRACE 138 SODA 138 #1	91.27%	0	- - -	
80	C11	0	- - -	- - -	0	GRACE 138 SODA 138 #1	9 .88%	0	- - -	
81	C12	0	- - -	- - -	0	GRACE 138 SODA 138 #1	97.13%	0	- - -	
82	C12k	0	- - -	- - -	0	- - -	- - -			
83	C13	0	- - -	- - -	0	- - -	- - -	0	- - -	
8	C1	0	- - -	- - -	0	- - -	- - -	0	- - -	
85	C15	0	- - -	- - -	0	- - -	- - -	0	- - -	
86	C16	0	- - -	- - -	0	- - -	- - -	0	- - -	
87	C18	0	- - -	- - -	0	- - -	- - -	0	- - -	
88	C19	0	- - -	- - -	0	- - -	- - -	0	- - -	
89	C20	0	- - -	- - -	0	M DPOINT 138 M DPO NT 230 #1	80.96%	0	- - -	
90	C21	0	- - -	- - -	0	- - -	- - -	0	- - -	
91	C23	0	- - -	- - -	0	- - -	- - -	0	- - -	
92	C2	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	96.10%	0	- - -	Br dger-3 Mi e Kno l 3 5kV Line
93	C25	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	96.10%	0	- - -	
9	C28x	0	- - -	- - -	1	SPRINGER 115 GLADSTON 115 #1	10 66%	0	- - -	
95	C28y	0	- - -	- - -	1	SPRINGER 115 GLADSTON 115 #1	106.13%	0	- - -	
98		**All Contingencies (w/ Final RAS) Converged ndicating Positive Reactive Margin**								
100		**All Contingencies (w/ Final RAS) Converged ndicating Positive Reactive Margin**								

1) Vol age V olations > 5% or Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line S de) and Transformer ter iary buses.

Appendix 3-14 - - - Post-transient Results For Path C Southbound vs. Monument - Naughton

BASE CASE / P PA H FLOWS; RAS AC IO

L NE #	CON INGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	O 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	ot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant IPP Gonder	RedB H Allen (ot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Bridger Gen RAS MW	Aeolus Gen r p MW
		egwstg1 8h8 pcs 2250 mn 475 x93 sav	170	1762	1 76	1873	-2250	32	6 0	75	760	-965	121	-279	1873	722	205	2996	2989	1131	180	25	23	197	159	233	653		
5		**Level "B" Contingencies**																											
6	B01	Anticline – Populus 500 kV Line	202	1266	0	2762	-1896	-251	667	530	819	-1219	3	-282	1693	758	175	2996	2853	1015	180	7	3	199	160	325	678	0	0
7	B01a	Anticline – Populus 500 kV Line RAS Trip Bridger Unit	1961	1 2	0	2 15	-18 9	- 98	699	502	790	-1 8	73	-298	1800	766	158	2996	275	976	180	37	386	167	1 5	305	665	575	0
8	B02	Anticline 500 / 3 5 kV Transformer	1668	1820	13 9	2029	-2270	33	63	86	772	-965	12	-277	1888	72	206	2996	2989	1131	180	2	2	198	159	2	6 6	0	0
9	B03	Br dger – Populus 3 5 kV Line	1751	1697	1628	1601	-2155	-	6 3	503	790	-996	107	-279	18 8	736	200	2996	297	1118	180	26	20	19	157	239	669	0	0
10	B0	Br dger – 3Mileknol 3 5 kV Line	1789	16	1675	1 50	-2056	-11	6 8	532	821	-1000	97	-295	1830	7 5	196	2996	2967	1113	180	26	15	190	156	2 8	690	0	0
11	B05	Br dger 3 5 / 230 kV Transformer	1705	1761	1 77	1875	-2253	32	6 0	72	757	-965	121	-279	1873	722	205	2996	2988	1130	180	25	23	197	159	23	653	0	0
12	B06	3M leknoll – Goshen 3 5 kV Line	1720	1739	1539	1768	-2231	15	6 0	8	770	-979	113	-286	1863	727	201	2996	2976	1119	180	27	2	197	159	230	670	0	0
13	B06k	3M leknoll – Goshen 3 5 kV Line RAS (Bypass 1/2 Series Cap)	1730	1725	1559	1721	-2203	16	6 1	92	778	-977	111	-288	1857	729	201	2996	2977	1119	180	27	23	197	159	230	667	0	0
1	B07	Kinport – Goshen 3 5 kV Line	1700	1768	1 55	190	-225	39	6 0	73	758	-960	122	-285	1876	721	206	2996	2990	1132	180	2	23	197	159	237	65	0	0
15	B08	Kinport – Borah 3 5 kV Line	1706	1761	1 71	1877	-22 6	35	6 1	75	760	-963	121	-280	187	723	206	2996	2990	1132	180	2	22	197	158	235	653	0	0
16	B09	Populus – Borah 500 kV Line	1720	1738	1 13	1908	-2239	13	6 0	78	763	-976	116	-280	1865	723	198	2996	2979	1121	180	29	25	198	159	2 0	653	0	0
17	B10	Borah 500 / 3 5 kV Trans ormer	1715	1752	1 27	1910	-2217	55	6	77	762	-9	12	-28	1875	725	206	2996	3003	11 3	180	21	17	193	157	238	653	0	0
18	B11	Borah 3 5 / 230 kV Trans ormer	1706	1760	1 66	1878	-22 1	38	6 1	77	763	-961	121	-28	187	722	206	2996	2990	1132	180	2	22	197	158	237	653	0	0
19	B12	Populus – Cedar Hi l 500 kV Line	1699	1773	1 9	1868	-22 5	5	6 1	7	759	-9 3	125	-282	1881	723	205	2996	3000	1139	180	23	20	195	158	233	652	0	0
20	B1	Cedar H ll – Hemingway 500 kV Line	1702	1770	1 88	1870	-22 0	5	6 2	7	759	-9 2	126	-282	1880	723	20	2996	3002	11 1	180	23	19	19	157	23	653	0	0
21	B15	Midpoint – Hemingway 500 kV Line	1707	1779	1 68	1900	-218	12	652	76	761	-8 0	1 0	-291	1898	730	170	2996	3059	118	180	26	398	181	152	2 5	656	0	0
22	B16	Borah – Midpoint 500 kV Line	1706	1761	1 75	1873	-22 5	37	6 1	75	760	-960	122	-280	1875	723	205	2996	2992	1133	180	2	22	196	158	23	65	0	0
23	B17	Midpoint 500 / 3 5 kV Transformer	1709	1760	1 60	1887	-2237	5	6 3	76	761	-919	12	-283	1878	725	170	2996	3011	11 2	180	35	17	193	157	2 2	653	0	0
2	B18	Midpoint 3 5 / 230 kV Transformer	1705	1761	1 77	1872	-2250	31	6 0	75	760	-967	120	-279	1873	722	206	2996	2987	1129	180	2	2	197	159	233	653	0	0
25	B19	Borah – Adelaide #2 3 5 kV Line	1706	1760	1 75	1871	-2250	29	6 0	75	760	-967	120	-279	1873	722	20	2996	2987	1128	180	25	2	198	159	23	653	0	0
26	B20	Adelaide – M dpoint #2 3 5 kV Line	1705	1763	1 75	187	-22 5	38	6 1	75	760	-962	122	-280	1875	723	208	2996	2990	1132	180	23	22	197	158	233	653	0	0
27	B21	Borah – Adelaide – M dpoint #1 3 5 kV Line	1706	1761	1 7	1873	-22 6	35	6 0	75	760	-96	121	-280	187	723	206	2996	2990	1131	180	2	23	197	159	23	653	0	0
28	B22	Borah – Hunt 230 kV Line	1705	1761	1 76	1872	-22 9	32	6 0	75	760	-965	121	-279	1873	722	205	2996	2988	1129	180	25	23	197	159	233	653	0	0
29	B23	Midpoint – Boise Bench #3 230 kV Line	1705	1762	1 75	1873	-22 7	35	6 0	75	760	-960	122	-280	187	723	203	2996	2991	1131	180	25	22	197	158	233	653	0	0
30	B2	Midpoint – Ra tle Snake 230 kV Line	1705	176	1 76	1875	-22	2	6 1	75	760	-952	123	-281	1877	723	201	2996	2996	1135	180	25	21	196	158	23	653	0	0
31	B25	Midpoint – Dram 230 kV Line	1705	1761	1 76	1872	-22 8	33	6 0	75	760	-963	121	-280	187	723	20	2996	2989	1130	180	25	23	197	159	233	653	0	0
32	B26	Ra tle Snake – Boise Bench 230 kV Line	1705	1761	1 76	1872	-2250	30	6 0	75	760	-968	120	-279	1873	722	206	2996	2987	1128	180	25	2	198	159	235	653	0	0
33	B27	Boise Bench - Dram 230 kV Line	1705	1762	1 76	1872	-22 9	33	6 0	75	760	-963	121	-280	187	723	20	2996	2989	1130	180	25	23	197	159	233	653	0	0
3	B28	Hemingway 500 230 kV Transformer	1705	1761	1 75	1873	-22 9	32	6 0	75	760	-96	121	-279	1873	722	20	2996	2989	1130	180	25	23	197	159	23	653	0	0
35	B30	Populus – Borah #1 3 5 kV Line	1703	1763	1 79	1871	-225	31	6 0	75	760	-966	120	-280	1873	722	205	2996	2986	1128	180	25	2	198	159	233	653	0	0
36	B31	Populus – Borah #2 3 5 kV Line	1705	1762	1 77	1871	-2252	30	6 0	75	760	-966	120	-280	1873	722	205	2996	2987	1128	180	25	2	198	159	233	653	0	0
37	B32	Populus – Kinport 3 5 kV Line	1701	1765	1 75	1879	-2261	28	639	75	760	-968	119	-282	1873	721	203	2996	2983	1125	180	26	26	199	159	235	652	0	0
38	B33	Populus – Ben Lomond #3 3 5 kV Line	1781	1679	1 13	1808	-2060	97	658	502	789	-916	128	-277	1867	7	221	2996	3039	1180	180	5	393	176	150	229	682	0	0
39	B3	Populus – Terminal 3 5 kV Line	1775	1685	1 2	1821	-2085	9	655	88	77	-918	126	-277	1866	7 3	219	2996	3036	1175	180	7	397	179	151	229	668	0	0
0	B35	Aeolus – Anticline 500 Line	P CASE DIVERGED																										
1	B35a	B35 dropping 600MW of Aeolus gen insertion of Aeolus 500kV	2058	689	819	1570	-18 9	- 60	716	1	725	-1 12	83	-306	1792	7 7	160	2996	2769	989	180	35	385	166	1 5	2 1	682	0	600
2	B35d	B35a insertion/addit on of 2 Mustang 230kV and 1 River on 230kV c	2051	699	823	1577	-1850	- 51	712	7	731	-1 03	89	-305	1805	7 5	160	2996	2771	990	180	35	387	167	1 6	2 0	679	0	600
3	B35g	B35d insertion/addit on of 2 Di lon S 69kV caps Path 18 Shunt Upg	2063	69	825	1570	-1853	- 27	707	6	730	-1381	87	-33	1810	7 2	162	2996	2768	987	180	37	393	171	1 8	237	673	0	600
	B36	Aeolus – Mona 500kV Line	P CASE DIVERGED																										
5	B36a	B36 dropping 600MW of Aeolus gen insertion of 3 Aeolus 500kV,	0	2702	1928	2208	-3158	-127	793	526	817	-1156	90	-29	1719	885	237	2996	30 6	1250	180	-71	222	55	95	282	720	0	600
6	B36d	B36a insertion of 2 Mus ang 230kV and 1 River on 230kV caps	0	2697	1927	2207	-3153	-12	792	531	822	-1153	93	-29	172	88	237	2996	30 6	12 9	180	-70	22	56	95	282	718	0	600
7	B36g	B36d insertion of 1 Chappel C 230kV caps	0	2695	1926	2203	-31 8	-123	791	538	829	-1152	95	-29	1727	883	237	2996	30 5	12 8	180	-70	225	57	96	281	717	0	600
8	B36k	Extreme vers on of B36a includes insert on of 1 more Aeolus 500kV ca	0	272	1952	2201	-316	-115	787	53	825	-11 5	99	-29	17 2	881	238	2996	30 8	1251	180	-70	227	59	96	279	715	0	600
9	B36n	Extreme vers on of B36d includes insert on of 1 more Aeolus 500kV ca	0	2720	1952	2199	-3159	-112	785	539	830	-11 2	102	-29	17 8	881	238	2996	30 8	1251	180	-69	228	60	97	278	71	0	600
50	B36ak	B36a RAS (Bypass 1/2 Series Cap)	0	2685	1986	2108	-3121	-130	795	536	829	-1158	81	-297	1697	891	236	2996	30 8	1250	180	-72	217	51	93	279	726	0	600
51	B36v	B36d insertion of 3 Chappel C 230kV caps	0	2692	192	2196	-3137	-121	790	551	8 2	-11 9	99	-29	1733	882	237	2996	30 3	12 7	180	-68	228	60	97	279	71	0	600
52	B37	Aeolus 500 / 230 kV Transformer	1693	17 8	1 65	1871	-22 9	22	6 6	76	761	-975	11	-280	1852	727	205	2996	2987	1128	180	2	22	196	158	23	65	0	0
53	B38	Aeolus – Windstar 230 kV Line	1656	1672	1 30	1853	-22 3	-18	675	71	756	-1013	83	-28	1761	7 6	202	2996	2972	1116	180	23	1	188	155	235	661	0	0
5	B39	Aeolus – Freezeout 230 kV Line	1700	1769	1 73	1877	-2251	32	639	77	762	-965	121	-279	1876	723	205	2996	2989	1130	180	25	23	197	159	23	65	0	0
55	B 0	Bonanza –Mona 3 5kV Line	1853	1795	1505	1957	-2 56	-6	207	513	801	-106	93	-286	2070	1 1	208	2996	292	1068	180	-1	3 7	129	131	2 7	708	0	0
56	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1835	1755	1 58	1903	-2 85	-181	93	95	782	-1175	130	-292	2007	102	202	2996	2912	1101	180	-9	329	125	128	251	672	0	0
57	B 1	Hemingway – Summer Lake 500kV ine	1701	1779	1 89	1881	-2213	9	6 7	75	760	-888	132	-286	1890	726	191	2996	3035	1166	180	23	08	187	15	2 3	653	0	0
58																													
59																													
60		**Level "C" Contingencies**																											
61	C02	Br dger – Populus #1 # 2 3 5 kV Lines	1833	1581	1892	112	-199	-68	6 8	5 9	839	-1051	82	-280	1801	759	191	2996	2951	1098	180	29	15	189	155	238	707	0	0
62	C02a	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	1763	17 3	1715	979	-1968	-319	682	51	802	-1285	123	-295	1908	763	17	2996	2850	1058	180	20	369	158	1 2	235	681	575	0
63	C02b	Br dger – Populus #1 # 2 3 5 kV Lines w/ RAS	P CASE DIVERGED																										
6	C03	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV lines	1869	1526	1937	973	-1896	-69	653	577	870	-1050	68	-302	1778	768	187	2996	29 2	1092	180	29	11	185	15	2 7	723	0	0
65	C03a	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV lines w/ RAS	1798	1692	177	817	-187	-32	686	5	835	-1287	111	-313	1889	771	171	2996	28 1	1051	180	20	365	15	1 0	2 0	700	575	0
66	C03b	Br dger – 3MileKnoll Br dger – Populus #1 3 5 kV lines w/ RAS	P CASE DIVERGED																										
67	C03d	C03a Big Grassy & Amps Shunt (Path 18 RAS)	1796	1692	1776	817	-1880	-316	685	5	83	-1280	109	-323	1888	770	171	2996	28 0	1050	180	20	366	155	1 0	239	698	575	0
68	C03e	C03b Big Grassy & Amps Shunt (Path 18 RAS)	P CASE DIVERGED																										
69	C0	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV lines	1869	1526	1937	973	-1896	-69	653	577	870	-1050	68	-302	1778	768	187	2996	29 2	1092	180	29	11	185	15	2 7	723	0	0
70	C0 a	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV lines w/ RAS	1798	1692	177	817	-187	-32	686	5	835	-1287	111	-313	1889	771	171	2996	28 1	1051	180	20	365	15	1 0	2 0	700	575	0
71	C0 b	Br dger – 3MileKnoll Br dger – Populus #2 3 5 kV lines w/ RAS	P CASE DIVERGED																										
72	C0 d	C0 a Big Grassy & Amps Shunt (Path 18 RAS)	1796	1692	1776	817	-1880	-316	685	5	83	-1280	109	-323	1888	770	171	2996	28 0	1050	180	20	366	155	1 0	239	698	575	0
73	C0 e	C0 b Big Grassy & Amps Shunt (Path 18 RAS)	P CASE DIVERGED																										
7	C05	Borah – Populus 3 5 kV DLO	1703	1763	1 82	1869	-2257	27	639	75	760	-969	120	-280	1873	722	20	2996	298	1126	180	26	25	198	159	233	652	0	0
75	C06	Populus – Ben Lomond 3 5 kV DLO	1935	1511	1287	1676	-1671	233	697	551	8 3	-816	1 2	-273	185	791	256	2996	3152	1291	180	- 0	325	128	129	221	755	0	0
76	C06k	Populus – Ben Lomond 3 5 kV DLO RAS (Bypass 1/2 Ser es Cap)	1952	1 85	1335	1582	-1633	231	697	560	853	-817	136	-277	18 2	79	255	2996	3151	1290	180	- 0	323	126	129	216	759	0	0
77	C07	Ben Lomond – Terminal 3 5 kV DLO	1732	1732	1 63	1860	-2201	55	6 5	68	752	-9 7	122	-278	1869	732	211	2996	3006	11 6	180	18	1	191	156	232	655	0	0
78	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1699	1766	1 77	1877	-2267	22	638	75	760	-972	118	-283	1872	720	201	2996	2980	1122	180	28	27	200	160	235	652	0	0
79	C09	Populus – Borah #2 3 5 kV Treasure on – Brady 230 kV Lines	1710	1756	1 62	1870	-2225	0	6 2	8	770	-959	123	-279	1875	723	207	2996	2995	1136	180	22	20	195	158	233	656	0	0
80	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1709	1758	1 6	1869	-2227	0	6 2	8	770	-959	123	-279	1875	723	207	2996	299	1135	180	22	21	196	158	233	656	0	0
81	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1886	1563	133	1727	-1806	19	682	523	812	-8 3	136	-273	1856	777	2	2996	3116	1253	180	-2	351	1 6	137	223	710	0	0
82	C12	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines	1783	1676	1 06	1817	-2051	107	658	98	785	-908	128	-276	1867	7 5	223	2996	30 5	118	180	3	392	176	150	229	672	0	0
83	C12k	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines RA	1801	16 9	1 52	1719	-2008	105	659	512	800	-909	122	-280	1856	7 9	221	2996	30 3	1182	180		392	175	1 9	22	676	0	0
8	C13	Borah – Adelaide #2 Borah–ADT–Midpoint #1 3 5 kV lines (RA)	1707	1758	1 75	1869	-225	22	639	75	760	-972	119	-278	1871	722	201	2996	2985	1126	180	27	25	198	159	236	65	0	0
85	C1	Borah – Adelaide #2 M dpoint - Ade aide #2 3 5 kV lines (RA)	1706	1761	1 75	1873	-22 6	35	6 0	75	760	-96	121	-280	187	723	206	2996	2989	1131	180	2	23	197	159	23	653	0	0
86	C15	Borah – Adelaide #2 Borah – Hunt 230 kV ines	1706	1760	1 75	1871	-2250	28	6 0	75	760	-967	120	-279	1873	723	203	2996	2987	1128	180	26	2	198	159	23	65	0	0
87	C16	Borah – Kinport Borah–Adel–Midpoint #1 3 5 kV lines (RA?)	1706	1761	1 70	1878	-22 2	38	6 1	75	760	-962	122	-281	187	723	207	2996	2992	1133	180	23	22	196	158	235	65	0	0
88	C18	Borah – Kinport M dpoint – Adela de #2 3 5 kV lines (RA)	1705	1762	1 71	1879	-22 2	1	6 1	75	760	-960	122	-281	1875	723	209	2996	2992	113	180	22	21	196	158	235	653	0	0
89	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV lines (RA?)	1706	1761	1 71	1877	-22 5	35	6 1	75	760	-963	121	-280	187	723	206	2996	2990	1132	180	2	22	197	158	235	653	0	0
90	C20	Borah–Adel–Midpoint #1 Midpoint – Adelaide #2 3 5 kV ines	1706	1765	1 70	1882	-2229	58	6 3	75	760	-952	125	-282	1879	72	216	2996	2999	11 2	180	18	18	19	157	235	653	0	0
91	C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA)	1706	1761	1 7	187	-22 5	35	6 1	75	760	-963	121	-280	187	723	206	2996	2990	1131	180	2	22	197	158	23	653	0	0
92	C23	Borah – Adel #2 3 5 kV Borah – M dpoint 500 kV Lines	1707	1760	1 7	1872	-22 6	33	6 1	75	760	-962	122	-280	187	723	203	2996	2991	1131	180	25	23	197	158	235	65	0	0
93	C2	Br dger – Populus #1 Goshen – Kinport 3 5 kV Lines	17 7	1703	1616	1623	-2159	1	6 3	501	788	-992	108	-282	1851	735	201	2996	297	1118	180	26	20	19	157	2 2	669	0	0
9	C25	Br dger – Populus #2 Goshen – Kinport 3 5 kV lines	17 7	1703	1616	1623	-2159	1	6 3	501	788	-992	108	-282	1851	735	201	2996	297	1118	180	26	20	19	157	2 2	669	0	0
95	C28x	Palo Verde Genera ion – Trip Two Uni s	1787	1768	1 62	1885	-2 18	-122	656	81	767	-1116	1 5	-293	19 2	7 5	209	2996	389	2332	180	-3	573	302	208	2 5	719	0	0
96	C28y	Palo Verde Genera ion – Trip Two Uni s	1787	1767	1 61	188	-2 18	-123	655	81	767	-1117	1 6	-293	19 0	7	208	2996	3890	2328	180	-3	572	301	208	2 5	718	0	0
97																													
98		**Margin est w/ Bonaza West at 5% of 785 MW**																										N-2 Cri er	
99		**egwstg1 8h8 pcs 2250 mn 499 x93 sav**	1707	1761	1 72	185	-2250	11	6 3	99	786	-986	126	-280	1877	721	205	2996	3002	11 2	180	22	18	19	157	23	657		
100		**Marg n est w/ Path C at 5% of 1849 MW**																											
101		**egwstg1 8h8 pcs 2362 mn 475 x93 sav**	1739	1733	1 9	1869	-2362	-110	6 9	75	760	-1118	131	-280	1880	7 0	215	2996	3076	121	180	1	385	168	1 7	2	657		

REAC IVE MARG N MVAR (Gray shaded cells are the minimum margins)

L NE #	CON INGENCY#	Aeolus 500	Monanx 500	Anticlin 500	Populus 500	Borah 500	Midpoint 500	Heminway 500	CedarHil 500	Bridger 345	Goshen 345	3 Mi Knoll 345	Kinport 345	Populus 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	Gladstone 230
5																									
6	B01	-925	-1 90	-771	-963	-982	-1232	-1627	-1076	-636	-537	- 82	-811	-880	-92	-959	1237	-1708	-653	-1006	-726	-317	-277	-17	-76
7	B01a	-920	-1622	-801	-1053	-1068	-1312	-1668	-11 3	-720	-589	-5 7	-891	-983	-101	-1057	13 7	-1858	-6 3	-990	-712	-303	-266	-179	-79
8	B02	-1227	-20 8	-1250	-161	-1561	-18 9	-223	-1622	-892	-788	-738	-1276	-1 51	-1 79	-1 11	1618	-2271	-71	-12 8	-863	-3 1	-313	-212	-83
9	B03	-1286	-1891	-1173	-1315	-1322	-1610	-2030	-1399	-97	-715	-697	-1110	-1253	-1271	-12 7	1 73	-2091	-698	-1297	-853	-338	-305	-201	-82
10	B0	-1113	-1607	-900	-833	-820	-10 1	-1 36	-951	-751	-335	-308	-61	-758	-750	-82	1079	-1818	-680	-1160	-81	-337	-293	-182	-81
11	B05	-1 07	-202	-1 26	-157	-1563	-1851	-2238	-1602	-1232	-828	-830	-1317	-1 95	-1512	-1 09	1607	-2237	-709	-1397	-87	-326	-303	-208	-83
12	B06	-1388	-1982	-1377	-1 85	-1 6	-1738	-2103	-1525	-1190	-588	-723	-118	-1399	-1 03	-13 3	1551	-2191	-707	-1381	-872	-338	-308	-210	-83
13	B06k	-1367	-1952	-132	-1 19	-1 01	-1682	-2067	-1 77	-11 2	-568	-587	-1128	-133	-1337	-1300	1521	-2160	-705	-1362	-867	-339	-307	-207	-82
1	B07	-1 09	-2038	-1352	-1529	-1518	-1816	-2231	-1572	-1039	-318	- 8	-1319	-1 53	-1 63	-1387	1609	-2252	-711	-1 03	-880	-33	-305	-211	-83
15	B08	-1 0	-2022	-1 05	-15 5	-15 3	-1829	-222	-1582	-1202	-778	-798	-1195	-1 5	-1 9	-1396	1598	-2233	-710	-1398	-877	-335	-306	-211	-83
16	B09	-1 01	-2002	-1389	-1 73	-1 35	-1777	-2189	-15 6	-1201	-808	-812	-1279	-1 51	-1 68	-1390	1591	-221	-709	-1397	-878	-335	-306	-210	-83
17	B10	-1 00	-2009	-1 0	-1552	-1 89	-1818	-2207	-1582	-1193	-790	-799	-1232	-1 17	-137	-1381	1589	-2220	-707	-139	-876	-33	-30	-209	-83
18	B11	-1 07	-2022	-1 05	-153	-1525	-1807	-2212	-1572	-1200	-778	-795	-12 1	-1 6	-1 73	-1387	1598	-223	-710	-1 01	-878	-335	-305	-210	-83
19	B12	-1 07	-20 2	-1393	-1 36	-1519	-1902	-2053	-9 8	-1226	-831	-835	-1301	-1 58	-1 86	-1 17	1622	-2259	-710	-1398	-879	-336	-307	-213	-83
20	B1	-1387	-2021	-1351	-1382	-1 6	-18 1	-2007	-1035	-118	-807	-810	-1252	-1 00	-1 29	-1386	1612	-223	-709	-138	-87	-335	-305	-211	-83
21	B15	-1336	-1980	-1267	-1337	-1265	-1269	-191	-1 79	-1079	-727	-737	-1107	-1255	-12 2	-1301	1533	-218	-700	-1336	-860	-331	-297	-206	-8
22	B16	-1392	-2011	-1369	-1 52	-133	-1726	-2129	-1551	-1182	-797	-803	-1239	-1399	-1 06	-1376	158	-2221	-709	-1387	-87	-335	-306	-211	-83
23	B17	-1399	-2020	-1 09	-15 7	-1528	-1615	-2181	-1573	-1216	-815	-820	-1291	-1 68	-1 79	-1 05	1605	-2233	-708	-1393	-875	-335	-305	-211	-83
2	B18	-1 10	-2030	-1 28	-157	-1558	-183	-2237	-1600	-1236	-828	-832	-1315	-1 95	-1508	-1 16	1612	-22 2	-711	-1 01	-878	-336	-307	-212	-83
25	B19	-1 03	-2019	-1 07	-15 2	-1530	-1830	-2210	-158	-1212	-812	-818	-1280	-1 55	-1 58	-1396	1597	-2230	-710	-1397	-877	-336	-307	-211	-83
26	B20	-1 08	-2028	-1 22	-1563	-1551	-186	-22	-1600	-1228	-822	-827	-1297	-1 76	-1 78	-1 10	1609	-22 0	-710	-1 00	-878	-335	-307	-212	-83
27	B21	-1 01	-2018	-1 03	-1532	-1520	-1839	-2216	-1580	-1206	-808	-81	-1266	-1 0	-1 36	-1392	1596	-2229	-710	-1396	-876	-335	-306	-211	-83
28	B22	-1 06	-2025	-1 18	-1559	-15 7	-18 2	-2223	-1593	-122	-818	-823	-1292	-1 7	-1 86	-1 05	1606	-2236	-710	-1399	-877	-336	-307	-212	-83
29	B23	-1 0	-2023	-1 13	-15 5	-1526	-1793	-2213	-1580	-1220	-818	-823	-1290	-1 66	-1 75	-1 0	160	-2235	-710	-1397	-877	-335	-307	-211	-83
30	B2	-1 02	-202	-1 06	-152	-1 96	-17 3	-2219	-1559	-121	-81	-819	-127	-1 8	-1 8	-1 00	160	-2236	-710	-1395	-876	-335	-306	-211	-83
31	B25	-1 05	-2025	-1 18	-1559	-15 3	-1819	-2219	-1589	-1226	-822	-826	-1302	-1 80	-1 92	-1 08	1613	-2237	-710	-1398	-877	-336	-307	-212	-83
32	B26	-1 08	-2027	-1 25	-1572	-1559	-18 0	-2212	-1599	-1233	-826	-830	-1313	-1 93	-1508	-1 13	1609	-2239	-711	-1 00	-878	-336	-307	-212	-83
33	B27	-1 08	-2028	-1 26	-157	-1561	-18	-2232	-1600	-123	-826	-831	-131	-1 9	-1510	-1 15	-1611	-22 0	-710	-1 00	-878	-336	-307	-212	-83
3	B28	-1 07	-2027	-1 23	-1567	-155	-1837	-2237	-1588	-1231	-825	-829	-1311	-1 90	-1505	-1 13	-1609	-2239	-710	-1 00	-878	-336	-307	-212	-83
35	B30	-1 17	-2038	-1 50	-1612	-1598	-1878	-2256	-1629	-1258	-8 3	-8 7	-13 9	-1520	-1539	-1 29	1622	-2252	-711	-1 09	-880	-336	-308	-213	-83
36	B31	-1 10	-2028	-1 30	-1582	-1570	-1850	-2235	-1608	-1237	-830	-83	-1323	-1 90	-1510	-1 1	-1609	-22 0	-711	-1 02	-879	-336	-307	-212	-83
37	B32	-1 21	-20 5	-1 3	-1596	-1559	-18 1	-2239	-161	-12 3	-739	-798	-1121	-1525	-1 85	-1 27	-162	-2262	-712	-1 13	-882	-336	-308	-213	-83
38	B33	-1327	-1770	-1297	-1 02	-1395	-1692	-2135	-1 77	-1106	-767	-767	-116	-1303	-1332	-1122	132	-19 3	-68	-1329	-856	-33	-296	-195	-83
39	B3	-1338	-180	-1310	-1 10	-1 02	-1698	-2138	-1 81	-1121	-768	-773	-1171	-1308	-1339	-1221	1378	-1983	-689	-1337	-859	-335	-301	-201	-83
0	B35	P CASE DIVERGED																							
1	B35a	-1080	-1580	-1106	-1501	15 1	-180	-2076	-1536	-1118	-869	-856	-1351	-1508	-152	-1 30	-15 0	-1856	-6 0	-1160	-803	-27	-236	-190	-80
2	B35d	-1115	-1609	-11 8	-1566	1598	-185	-2095	-1582	-1171	-888	-889	-1399	-1576	-1582	-1 56	-156	-1888	-6 6	-1197	-822	-297	-263	-201	-80
3	B35g	-1168	-1779	-12	-1739	1767	-1998	-2190	-1700	-1282	-982	-972	-1567	-1763	-1767	-1586	-169	-2101	-657	-1253	-850	-303	-272	-208	-81
	B36	P CASE DIVERGED																							
5	B36a	-1121	-1702	- 93	- 73	-502	-663	-900	-571	-375	-33	-308	- 38	- 8	- 82	- 82	-687	-1720	- 71	-1278	-865	-277	-22	-125	-78
6	B36d	-117	-1701	-531	-506	-529	-706	-958	-615	- 0	-35	-329	- 66	- 78	-51	-510	-727	-1936	- 85	-1337	-88	-289	-2 0	-133	-78
7	B36g	-1215	-1636	-577	-539	-576	-762	-1031	-663	- 39	-379	-356	-505	-519	-557	-551	-783	-1772	- 99	-1383	-899	-297	-2 7	-1 6	-78
8	B36k	-1396	-1639	-580	-576	-620	-808	-1227	-702	- 83	- 13	- 0	-539	-561	-59	-573	-812	-1776	- 77	-1580	-1002	-298	-235	-13	-78
9	B36n	-1 3	-1667	-615	-618	-6 7	-828	-1290	-737	-512	- 32	- 25	-567	-592	-62	-600	-2008	-1809	- 86	-1637	-1011	-305	-251	-1 2	-79
50	B36ak	-930	-1 76	-310	-291	-282	- 12	-593	-362	-2 1	-202	-193	-265	-272	-292	-306	- 6	-1 19	-371	-1088	-785	-236	-203	-117	-77
51	B36v	-131	-1721	-673	-6 0	-677	-873	-1175	-761	-513	- 32	- 09	-58	-607	-6 5	-635	-895	-1868	- 63	-1 58	-92	-307	-262	-172	-78
52	B37	-1306	-2016	-1350	-15	-1538	-1828	-222	-1581	-1196	-821	-821	-1299	-1 71	-1 89	-1 05	1605	-2235	-70	-1292	-837	-331	-302	-209	-82
53	B38	-1 02	-2060	-1 55	-1586	-1570	-1851	-2225	-1608	-1233	-826	-830	-1322	-1502	-1518	-1 18	1616	-2265	-680	-1371	-88	-309	-273	-200	-80
5	B39	-13 6	-2029	-1 06	-1566	-155	-18 2	-2236	-1596	-1205	-823	-823	-1307	-1 8	-1501	-1 11	1609	-22 1	-710	-1337	-108	-336	-307	-210	-83
55	B 0	-966	-1718	-918	-1089	-1127	-1 07	-18 5	-1216	-809	-6 9	-627	-950	-1039	-107	-1056	1313	-1990	- 78	-988	-72	-312	-269	-172	-69
56	B 0a	-109	-183	-1063	-1215	-122	-1 99	-1900	-131	-935	-688	-681	-1029	-11	-1169	-1155	1399	-2085	- 63	-1108	-776	-320	-278	-186	-79
57	B 1	-1371	-2017	-1336	-1 10	-1395	-1555	-1593	-1373	-1159	-783	-789	-1209	-1367	-1367	-1371	1585	-2228	-705	-1366	-869	-333	-302	-210	-8
58		**920**	**1476**	**310**	**291**	**282**	**412**	**593**	**362**	**241**	**202**	**193**	**265**	**272**	**292**	**306**	**446**	**1419**	**371**	**988**	**108**	**236**	**203**	**117**	**69**
59						500	500	500	500	100			200		200										
60																									
61	C02	-957	-1551	-727	-858	-892	-1136	-1517	-986	-576	- 89	-	-751	-8 6	-857	-908	116	-1790	-668	-1029	-759	-3 2	-298	-177	-80
62	C02a	-1067	-1768	-883	-1053	-1073	-1318	-1675	-1157	-708	-587	-552	-905	-1026	-1033	-1086	13 5	-1986	-663	-1108	-789	-330	-289	-188	-83
63	C02b	P CASE DIVERGED																							
6	C03	-7 8	-1287	-562	-535	-536	-697	-989	-639	- 72	-255	-239	- 15	- 91	- 92	-566	-767	-1 69	-638	-8 6	-665	-337	-283	-153	-79
65	C03a	-9 1	-1509	-7 1	-73	-72	-912	-123	-838	-639	-322	-298	-551	-672	-662	-761	101	-1762	-6 5	-1010	-7 0	-329	-279	-172	-82
66	C03b	P CASE DIVERGED																							
67	C03d	-978	-1577	-78	-808	-798	-1002	-13	-916	-67	-362	-331	-617	-7 7	-737	-831	1091	-1819	-6 9	-1037	-756	-330	-282	-175	-82
68	C03e	P CASE DIVERGED																							
69	C0	-7 8	-1176	-562	-535	-536	-697	-990	-639	- 72	-255	-239	- 15	- 91	- 92	-566	-767	-1 69	-638	-8 6	-66	-337	-283	-153	-79
70	C0 a	-9 1	-1509	-7 1	-73	-72	-912	-123	-838	-639	-322	-298	-551	-672	-662	-761	101	-1762	-6 5	-1010	-7 0	-329	-279	-172	-82
71	C0 b	P CASE DIVERGED																							
72	C0 d	-978	-1577	-78	-808	-798	-1002	-13	-916	-67	-362	-331	-617	-7 7	-737	-831	1091	-1819	-6 9	-1037	-756	-330	-282	-175	-82
73	C0 e	P CASE DIVERGED																							
7	C05	-1 18	-2032	-1 8	-161	-1599	-1863	-2237	-1633	-1253	-8 5	-8 9	-1355	-1 90	-151	-1 15	1607	-22 6	-712	-1 10	-881	-336	-308	-213	-83
75	C06	-1060	-1137	-1011	-109	-1095	-1378	-18 6	-1218	-8 5	-627	-610	-903	-990	-1025	-635	-761	-1265	-596	-1087	-770	-325	-263	-1 6	-83
76	C06k	-990	-1072	-903	-952	-953	-1209	-16 9	-1120	-7 9	-52	-50	-77	-857	-88	-588	-711	-1201	-58	-1029	-7 9	-325	-259	-139	-83
77	C07	-1388	-1929	-1386	-1 96	-1 81	-1781	-2199	-15 7	-1188	-803	-806	-12 6	-1392	-1 20	-1152	152	-2123	-703	-1381	-873	-337	-309	-210	-83
78	C08	-1 2	-20	-1	-1597	-15 5	-1820	-2220	-161	-12 3	-720	-79	-1091	-1513	-1 8	-1 20	1617	-2261	-713	-1 16	-883	-336	-308	-213	-83
79	C09	-1 00	-2000	-1 03	-1550	-15 3	-1826	-2218	-1586	-1196	-812	-80	-1296	-1 53	-1 8	-13 7	1566	-2208	-708	-1395	-876	-33	-303	-206	-83
80	C10	-1 07	-2009	-1 23	-1579	-1571	-1853	-22 0	-1608	-1217	-825	-816	-1322	-1 83	-1513	-1362	1580	-2220	-708	-1 00	-877	-335	-303	-207	-83
81	C11	-1169	-1 01	-1115	-1189	-118	-1 79	-19 9	-1301	-9	-67	-669	-980	-1076	-1113	-852	1000	-1550	-635	-1188	-811	-332	-283	17	-83
82	C12	-1320	-1766	-127	-1369	1366	-1665	-2112	-1 51	-1072	-7 6	-735	-1137	-1266	-130	-11 7	1328	-1939	-68	-1321	-855	-33	-296	-19	-83
83	C12k	-1268	-1706	-1169	-1229	-1226	-1520	-1975	-1333	-977	-6 0	-616	-1006	-1127	-1159	-1062	-1258	-1876	-677	-1278	-8	-33	-29	-189	-83
8	C13	-1398	-2008	-1380	-1 87	-1 75	-1798	-21 7	-1560	-1179	-789	-798	-121	-1379	-13 9	-1363	1577	-2218	-710	-139	-876	-336	-307	-211	-83
85	C1	-1 02	-2019	-1 05	-1533	-1521	-1839	-2216	-1582	-1208	-809	-815	-1267	-1 1	-1 37	-1393	1597	-2230	-710	-1396	-877	-335	-306	-211	-83
86	C15	-1 01	-2016	-1398	-152	-1513	-1821	-2190	-157	-1201	-802	-810	-125	-1 31	-1 29	-1385	1592	-2226	-710	-1396	-876	-336	-307	-211	-83
87	C16	-1397	-2012	-1381	-1502	-1 99	-1819	-2202	-1560	-1175	-762	-782	-1157	-1 01	-1 18	-1372	1581	-2222	-709	-1393	-876	-335	-306	-210	-83
88	C18	-1 03	-2022	-1 00	-1533	-1530	-18 5	-2230	-1580	-1196	-77	-79	-1183	-1 35	-1 60	-1391	1596	-2233	-710	-1397	-877	-335	-306	-211	-83
89	C19	-1 02	-2019	-1395	-1527	-1526	-1822	-2209	-1572	-1191	-768	-790	-1173	-1 31	-1 68	-1385	1592	-2229	-710	-1396	-877	-335	-306	-211	-83
90	C20	-1393	-2012	-1373	-1 71	-1 59	-1853	-221	-155	-1171	-781	-791	-1195	-1361	-1327	-1362	1580	-2221	-708	-1388	-87	-33	-305	-210	-83
91	C21	-1399	-2015	-1393	-1512	-1501	-1830	-2197	-1570	-119	-797	-805	-1239	-1 1	-1 05	-1380	1589	-2225	-710	-139	-876	-335	-306	-211	-83
92	C23	-1386	-2002	-13 6	-1 10	-1285	-1650	-207	-1531	-1156	-781	-788	-1196	-13 9	-13 0	-1352	1568	-2211	-709	-1381	-873	-335	-306	-210	-83
93	C2	-1276	-1897	-1093	-1271	-1286	-1578	-2009	-1368	-790	-281	- 05	-1119	-1227	-1235	-1215	1 65	-2102	-699	-1292	-855	-338	-30	-201	-83
9	C25	-1276	-1897	-1093	-1271	-1286	-1578	-2009	-1368	-790	-281	- 05	-1119	-1227	-1235	-1215	1 65	-2102	-699	-1292	-855	-338	-30	-201	-83
95	C28x	-1192	-1732	-11 9	-1282	-1280	-15 6	-1723	-1360	-1011	-71	-713	-1075	-1201	-122	-1179	1380	-1910	-669	-1196	-810	-325	-28	-196	-5
96	C28y	-1196	-1737	-115	-1285	-128	-1550	-1730	-1363	-1015	-716	-715	-1078	-1205	-1228	-1182	1383	-1915	-671	-1200	-812	-325	-285	-196	-121
97		**748**	**1072**	**562**	**535**	**536**	**697**	**989**	**639**	**472**	**255**	**239**	**415**	**491**	**492**	**566**	**711**	**1201**	**584**	**846**	**664**	**325**	**259**	**139**	**54**
98		; > >				00	00	00	00	100			250		250										
99																									
100																									
101																									

L NE #	CON INGENCY#	Vo tage Vio ations	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOADING	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Vo tage	COMMEN
6	B01	0	- - -	- - -	0	BRIDGER 3 5 BRIDGE&A 3 5 #1	95.00%	0	- - -	
7	B01a	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	86.03%	0	- - -	
8	B02	0	- - -	- - -	0	- - -	- - -	0	- - -	
9	B03	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	85.50%	0	- - -	
10	B0	7	BIGGRASS 161	6	0	MONUMENT 230 MONU PST 230 #1	90.78%	0	- - -	Vdevs Path 18 Buses
11	B05	0	- - -	- - -	0	- - -	- - -	0	- - -	
12	B06	0	- - -	- - -	1	GRACE 138 SODA 138 #1	105.32%	0	- - -	
13	B06k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	86.32%	0	- - -	
1	B07	0	- - -	- - -	0	- - -	- - -	0	- - -	
15	B08	0	- - -	- - -	0	- - -	- - -	0	- - -	
16	B09	0	- - -	- - -	0	POPULUS 3 5 POPULUS 500 #1	81.7 %	0	- - -	
17	B10	0	- - -	- - -	0	- - -	- - -	0	- - -	
18	B11	0	- - -	- - -	0	- - -	- - -	0	- - -	
19	B12	0	- - -	- - -	0	- - -	- - -	0	- - -	
20	B1	0	- - -	- - -	0	- - -	- - -	0	- - -	
21	B15	0	- - -	- - -	0	- - -	- - -	0	- - -	
22	B16	0	- - -	- - -	0	- - -	- - -	0	- - -	
23	B17	0	- - -	- - -	0	- - -	- - -	0	- - -	
2	B18	0	- - -	- - -	0	- - -	- - -	0	- - -	
25	B19	0	- - -	- - -	0	- - -	- - -	0	- - -	
26	B20	0	- - -	- - -	0	- - -	- - -	0	- - -	
27	B21	0	- - -	- - -	0	- - -	- - -	0	- - -	
28	B22	0	- - -	- - -	0	- - -	- - -	0	- - -	
29	B23	0	- - -	- - -	0	- - -	- - -	0	- - -	
30	B2	0	- - -	- - -	0	- - -	- - -	0	- - -	
31	B25	0	- - -	- - -	0	- - -	- - -	0	- - -	
32	B26	0	- - -	- - -	0	- - -	- - -	0	- - -	
33	B27	0	- - -	- - -	0	- - -	- - -	0	- - -	
3	B28	0	- - -	- - -	0	- - -	- - -	0	- - -	
35	B30	0	- - -	- - -	0	- - -	- - -	0	- - -	
36	B31	0	- - -	- - -	0	- - -	- - -	0	- - -	
37	B32	0	- - -	- - -	0	- - -	- - -	0	- - -	
38	B33	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	85.37%	0	- - -	
39	B3	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	82.77%	0	- - -	
0	B35	P CASE DIVERGED								
1	B35a	11	WYOPO 3 5	5 6	0	MINERS 230 PLATTE 230 #1	85.20%	0	- - -	Vdevs in Area 65 & 73
2	B35d	0	- - -	- - -	0	MINERS 230 PLATTE 230 #1	8 .62%	0	- - -	
3	B35g	9	D LLON S 69	-10.1	0	DAVEJOHN 115 DAVEJTPS 115 #1	83.70%	0	- - -	Vdevs Path 18 Buses
	B36	P CASE DIVERGED								
5	B36a	65	CHMNY BU 69	9 7	0	GRACE 138 SODA 138 #1	92. 1%	0	- - -	Vdevs in Area 62, 65 & 73
6	B36d	50	CHMNY BU 69	8 3	0	GRACE 138 SODA 138 #1	92.17%	0	- - -	Vdevs in Area 65
7	B36g	17	BLACKSFK 3 .5	6	0	MONUMENT 230 MONU PST 230 #1	92.11%	0	- - -	Vdevs in Area 65
8	B36k	9	BAIROIL 57	-6.6	0	MONUMENT 230 MONU PST 230 #1	91.20%	0	- - -	Vdevs in Area 65
9	B36n	28	BAIROIL 57	-6.9	0	MONUMENT 230 MONU PST 230 #1	91.9 %	0	- - -	Vdevs in Area 65
50	B36ak	1 8	CHMNY BU 69	11.	0	BRIDGER 230 ROCKSPGS 230 #1	93.55%		PTRSNFUR 69 0 @ 0.893	Vdevs in Area 60, 62, 65 & 73
51	B36v	0	- - -	- - -		MONUMENT 230 MONU PST 230 #1	9 .73%	0	- - -	
52	B37	0	- - -	- - -	0	AEOLUS 500 AEOLUS 230 #2	88. 6%	0	- - -	
53	B38	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	82.91%	0	- - -	
5	B39	0	- - -	- - -	0	- - -	- - -	0	- - -	
55	B 0		MOONLAK1 69	5 3	5	BONANZA 138 VERNAL 138 #1	128. 0%	0	- - -	
56	B 0a	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	8 . 0%	0	- - -	
57	B 1	0	- - -	- - -	0	- - -	- - -	0	- - -	
61	C02	0	- - -	- - -	1	BRIDGER 3 5 BRIDGE&A 3 5 #1	101.20%	0	- - -	B idger-3 M le Knoll 3 5kV Line
62	C02a	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	87.6 %	0	- - -	
63	C02b	P CASE DIVERGED								
6	C03	0	B GGRASS 69	6 3	1	BRIDGER 230 ROCKSPGS 230 #1	103.65%	1	PTRSNFUR 69 0 @ 0 896	
65	C03a	0	PTRSNFRG 69	7 8	0	MONUMENT 230 MONU PST 230 #1	93.1 %	1	PTRSNFUR 69 0 @ 0 881	
66	C03b	P CASE DIVERGED								
67	C03d	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	93.10%	0	- - -	
68	C03e	P CASE DIVERGED								
69	C0	0	B GGRASS 69	6 3	1	BRIDGER 230 ROCKSPGS 230 #1	103.65%	1	PTRSNFUR 69 0 @ 0 896	
70	C0 a	0	PTRSNFRG 69	7 8	0	MONUMENT 230 MONU PST 230 #1	93.1 %	1	PTRSNFUR 69 0 @ 0 881	
71	C0 b	P CASE DIVERGED								
72	C0 d	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	93.10%	0	- - -	
73	C0 e	P CASE DIVERGED								
7	C05	0	- - -	- - -	0	- - -	- - -	0	- - -	
75	C06	0	CHMNY BU 69	6.1	0	GRACE 138 SODA 138 #1	97.68%	0	- - -	
76	C06k	0	CHMNY BU 69	7 2	0	BRIDGER 230 ROCKSPGS 230 #1	96.72%	0	- - -	
77	C07	0	- - -	- - -	0	- - -	- - -	0	- - -	
78	C08	0	- - -	- - -	0	- - -	- - -	0	- - -	
79	C09	0	- - -	- - -	0	GRACE 138 SODA 138 #1	83.82%	0	- - -	
80	C10	0	- - -	- - -	0	GRACE 138 SODA 138 #1	83.73%	0	- - -	
81	C11	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	89.05%	0	- - -	
82	C12	0	- - -	- - -	0	GRACE 138 SODA 138 #1	90.19%	0	- - -	
83	C12k	0	- - -	- - -	0	MONUMENT 230 MONU PST 230 #1	87.13%	0	- - -	
8	C13	0	- - -	- - -	0	- - -	- - -	0	- - -	
85	C1	0	- - -	- - -	0	- - -	- - -	0	- - -	
86	C15	0	- - -	- - -	0	- - -	- - -	0	- - -	
87	C16	0	- - -	- - -	0	- - -	- - -	0	- - -	
88	C18	0	- - -	- - -	0	- - -	- - -	0	- - -	
89	C19	0	- - -	- - -	0	- - -	- - -	0	- - -	
90	C20	0	- - -	- - -	0	- - -	- - -	0	- - -	
91	C21	0	- - -	- - -	0	- - -	- - -	0	- - -	
92	C23	0	- - -	- - -	0	- - -	- - -	0	- - -	
93	C2	0	- - -	- - -	0	BRIDGER 3 5 BRIDGE&A 3 5 #1	85.57%	0	- - -	
9	C25	0	- - -	- - -	0	BRIDGER 3 5 BRIDGE&A 3 5 #1	85.57%	0	- - -	
95	C28x	0	- - -	- - -	0	HARD N 230 HARD N 115 #1	92.8 %	0	- - -	
96	C28y	0	HESSBDW 13 8	-5.2	0	HARD N 230 HARD N 115 #1	92.85%	0	- - -	
99		**All Contingenc es (w/ Final RAS) Converged ndicating Positive Reactive Margin**								
101		**All Contingenc es (w/ Final RAS) Converged ndicating Positive Reactive Margin**								

1) Vo tage V olations > 5% for Level B & > 10% for Level C
2) Excluding Series Cap Buses (Line Side) and Transformer ter iary buses.

Appendix 3-15 - - - Post-transient Results For Path C Southbound vs. Rock Springs / Firehole West

BASE CASE / P PA H FLOWS — RAS AC IO

INE #	CON NGENCY#	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Br dger West 500	Br dger West 345	New Pa h C (NB=)	Borah West	O 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana daho P18)	ot 4a	Bonanza West	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant IPP Gonder	RedB H A len (ot 2C)	Pinto 4Corners 2B1)	Sigurd G enC (2B 2)	daho Area System osses	Pace Area System osses	Br dger Gen RAS MW	Aeolus Gen rip MW
		egwstg1 8h8 pcs 2250 rsfh 640 x93 sav	1693	178	1508	1963	-2250	1 7	626	33	6 0	-8 3	128	279	1876	725	198	2996	2931	1071	180	32	7	217	166	232	6	0	0
5		evel "B" Contingencies																											
6	B01	Ant c ine – Populus 500 kV Line	2019	1277	0	2863	-1877	-1	653	0	71	-1103	1	282	169	761	168	2996	2791	953	180	56	59	219	167	328	666	0	0
7	B01a	Ant c ine – Populus 500 kV Line RAS Trip Bridger Unit	1956	1 35	0	2519	-1836	-391	686	372	681	-1333	80	297	1800	769	151	2996	2693	913	180	6	13	187	153	305	653	575	0
8	B02	Ant c ine 500 / 3 5 kV Trans ormer	1657	18 2	1380	2119	-2268	1 7	620	3 6	653	-8	131	277	1891	727	199	2996	2930	1072	180	32	8	217	166	2	636	0	0
9	B03	Bridger – Populus 3 5 kV Line	17 2	1715	1667	167	-21 6	108	629	369	676	-876	11	279	1850	739	193	2996	291	1057	180	3	5	21	165	238	660	0	0
10	B0	Bridger – 3Milekno l 3 5 kV Line	1780	1661	1713	1519	-20 1	102	63	05	715	-880	103	296	1831	7 8	189	2996	2907	1052	180	3	0	210	163	2 7	679	0	0
11	B05	Bridger 3 5 / 230 kV Transformer	1695	1782	1508	1963	-2250	1 6	627	333	639	-8	128	279	1876	726	198	2996	2929	1070	180	32	8	217	166	232	6	0	0
12	B06	3Mi ekno l – Goshen 3 5 kV Line	1710	1759	157	1853	-2230	128	626	3	651	-858	120	287	1865	730	19	2996	2917	1059	180	35	9	217	166	229	661	0	0
13	B06k	3Mi ekno l – Goshen 3 5 kV Line RAS (Bypass 1/2 Series Cap)	1720	17	159	1803	-2200	130	627	35	661	-856	117	288	1859	732	19	2996	2918	1060	180	35	8	217	166	228	658	0	0
1	B07	Kinpo t – Goshen 3 5 kV Line	1690	1789	1 89	1992	-225	153	627	332	638	-839	129	285	1879	72	200	2996	2931	1072	180	32	7	217	166	236	6 5	0	0
15	B08	Kinpo t – Borah 3 5 kV Line	1695	1783	150	1967	-22 6	1 9	627	33	6 0	-8 2	129	280	1877	726	199	2996	2931	1072	180	32	7	216	166	233	6 5	0	0
16	B09	Populus – Borah 500 kV Line	1710	1759	1 3	1999	-2238	127	627	337	6	-855	123	280	1867	727	191	2996	2920	1061	180	37	50	218	166	239	6	0	0
17	B10	Borah 500 / 3 5 kV Transformer	170	177	1 61	1998	-2218	169	630	337	6 3	-823	131	28	1878	728	199	2996	29	1083	180	29	2	213	16	237	6	0	0
18	B11	Borah 3 5 / 230 kV Transformer	1696	1781	1 97	1969	-22 0	152	627	337	6 3	-839	128	283	1877	726	199	2996	2932	1073	180	31	7	216	166	236	6	0	0
19	B12	Populus – Cedar Hi l 500 kV Line	1691	1790	1520	1960	-22 9	158	627	333	639	-832	130	280	1880	726	198	2996	2935	1075	180	31	6	216	166	232	6	0	0
20	B1	Cedar H ll – Hemingway 500 kV Line	1693	1787	151	1962	-22	158	628	33	6 0	-832	131	281	1880	726	198	2996	2937	1076	180	32	5	215	165	233	6 5	0	0
21	B15	M dpoint – Hemingway 500 kV Line	1697	1798	1500	1988	-2189	229	638	336	6 2	-731	1 5	289	1898	732	167	2996	2993	1119	180	33	25	202	160	2 3	6 6	0	0
22	B16	Borah – Midpoint 500 kV Line	1696	1781	1505	1963	-22 6	1 7	627	33	6 0	-8 2	129	279	1876	726	197	2996	2931	1071	180	33	7	217	166	233	6 5	0	0
23	B17	M dpoint 500 / 3 5 kV Trans ormer	1699	1782	1 92	1977	-2237	159	630	335	6 1	-799	132	283	1881	728	165	2996	2951	1082	180	2	1	213	16	2 1	6	0	0
2	B18	M dpoint 3 5 / 230 kV Trans ormer	169	1783	1508	1963	-2250	1 6	626	33	6 0	-8 5	128	279	1876	725	199	2996	2928	1069	180	32	8	217	166	232	6	0	0
25	B19	Borah – Adelaide #2 3 5 kV Line	1695	1781	1507	1961	-2251	1 2	626	33	6 0	-8 6	128	279	1875	726	197	2996	2928	1069	180	33	8	217	166	233	6 5	0	0
26	B20	Adela de – M dpoint #2 3 5 kV Line	169	178	1507	1965	-22 6	152	627	33	6 0	-8 1	129	280	1878	726	201	2996	2931	1072	180	31	7	216	166	232	6	0	0
27	B21	Borah – Adelaide – Midpoint #1 3 5 kV Line	1695	1782	1506	1963	-22 6	1 8	627	33	6 0	-8 3	128	279	1877	726	199	2996	2931	1071	180	32	7	217	166	233	6 5	0	0
28	B22	Borah – Hunt 230 kV Line	1695	1782	1507	1963	-22 9	1 6	627	33	6 0	-8	128	279	1876	726	198	2996	2929	1070	180	33	8	217	166	232	6	0	0
29	B23	M dpoint – Bo se Bench #3 230 kV Line	1695	1783	1507	196	-22 7	1 9	627	33	6 0	-8 0	129	280	1877	726	197	2996	2932	1072	180	33	7	216	166	232	6	0	0
30	B2	M dpoint – Rat le Snake 230 kV Line	169	1785	1508	1966	-22	156	628	33	6 0	-831	131	281	1879	726	19	2996	2937	1075	180	33	6	215	165	233	6	0	0
31	B25	M dpoint – Dram 230 kV Line	1695	1783	1507	1963	-22 8	1 7	627	33	6 0	-8 2	128	279	1877	726	198	2996	2930	1071	180	32	8	217	166	232	6	0	0
32	B26	Ratt e Snake – Boise Bench 230 kV Line	1695	1782	1507	1962	-2250	1	626	33	6 0	-8 7	128	279	1876	725	199	2996	2928	1069	180	32	8	217	166	23	6	0	0
33	B27	Bo se Bench - Dram 230 kV Line	169	1783	1508	1963	-22 9	1 8	627	33	6 0	-8 2	129	280	1877	726	198	2996	2930	1071	180	32	8	217	166	232	6	0	0
3	B28	Hemingway 500 230 kV Transformer	1695	1783	1507	1963	-22 9	1 7	627	33	6 0	-8 2	128	279	1876	726	197	2996	2930	1071	180	33	8	217	166	233	6	0	0
35	B30	Populus – Borah #1 3 5 kV Line	1693	178	1511	1962	-225	1	626	333	639	-8 5	128	279	1876	725	198	2996	2927	1068	180	33	9	217	166	232	6	0	0
36	B31	Populus – Borah #2 3 5 kV Line	169	1783	1509	1962	-2252	1	626	33	6 0	-8 5	128	279	1876	725	198	2996	2928	1069	180	33	8	217	166	232	6	0	0
37	B32	Populus – Kinport 3 5 kV Line	1690	1787	1506	1970	-2261	1 2	625	333	639	-8 6	127	282	1876	72	197	2996	2925	1066	180	3	50	218	167	23	6 3	0	0
38	B33	Populus – Ben Lomond #3 3 5 kV Line	1768	1701	1 5	1897	-2058	212	6	367	67	-79	135	277	1871	7 7	21	2996	2980	1119	180	13	19	197	158	227	671	0	0
39	B3	Populus – Terminal 3 5 kV Line	1762	1709	1 57	1911	-2089	207	6 1	3 9	656	-797	133	277	1869	7 6	212	2996	2975	111	180	15	23	200	159	228	658	0	0
0	B35	Aeolus – An icline 500 Line	2217	768	862	1702	-1802	-252	738	293	599	-1202	30	302	1 39	770	158	2996	2753	923	180	53	33	198	157	23	808	0	0
1	B35a	B35 dropping 600MW of Aeolus gen insertion of Aeolus 500kV	2061	687	836	1656	-18 0	-353	70	299	605	-1297	87	306	1788	750	153	2996	2708	926	180		11	187	153	236	676	0	600
2	B35d	B35a insertion/addit on of 2 Mustang 230kV and 1 River on 230kV	2055	696	8 0	1663	-18 2	-3	700	30	609	-1289	9	306	1802	7 8	153	2996	2710	928	180		12	188	153	236	673	0	600
3	B35g	B35d insertion/addit on of 2 D llon S 69kV caps Path 18 Shunt Up	2067	691	8 2	1657	-18 6	-320	695	302	607	-1266	91	33	1807	7 6	155	2996	2707	925	180	5	18	191	155	233	666	0	600
	B36	Aeolus – Mona 500kV Line	P CASE DIVERGED																										
5	B36a	B36 dropping 600MW of Aeolus gen insertion of 3 Aeolus 500kV	0	2713	1952	2281	-3133	-13	779	13	72	-103	101	29	1729	885	230	2996	2981	1183	180	-61	256	81	105	278	699	0	600
6	B36d	B36a insertion of 2 Mustang 230kV and 1 Riverton 230kV caps	0	2708	1951	2281	-3130	-10	777	16	727	-1031	10	29	173	885	230	2996	2980	1183	180	-60	257	81	106	278	698	0	600
7	B36g	B36d insertion of 1 Chappel C 230kV caps	P CASE DIVERGED																										
8	B36k	xtreme version of B36a includes insertion of 1 more Aeolus 500kV c	0	2736	1977	2275	-31 2	-1	772	17	728	-1023	109	293	1752	882	231	2996	2983	1185	180	-60	260	8	107	275	695	0	600
9	B36n	xtreme version of B36d includes insertion of 1 more Aeolus 500kV c	0	2731	1977	2275	-3139	2	771	20	731	-1020	112	293	1758	882	231	2996	2983	1185	180	-59	261	85	107	275	69	0	600
50	B36ak	B36a RAS (Bypass 1/2 Ser es Cap)	0	2695	2010	217	-3091	-15	781	30	7 3	-1035	91	297	1708	891	228	2996	2981	1182	180	-61	251	77	10	27	702	0	600
51	B36v	B36d insertion of 3 Chappel C 230kV caps	0	2703	19 9	2275	-3120	-7	776	26	737	-1028	108	29	17 1	88	230	2996	2979	1181	180	-59	259	8	107	276	695	0	600
52	B37	Aeolus 500 / 230 kV Trans ormer	1682	1770	1 97	1962	-22 8	137	633	335	6 1	-853	121	280	1855	731	198	2996	2928	1068	180	32	6	215	165	233	6	0	0
53	B38	Aeolus – Windstar 230 kV Line	16	1692	1 62	19	-22 2	96	662	332	638	-891	91	28	176	7 9	196	2996	291	1056	180	31	38	208	163	233	652	0	0
5	B39	Aeolus – Freezeout 230 kV Line	1688	179	1503	1969	-2251	1 6	625	337	6 3	-8	129	279	1880	726	198	2996	2930	1071	180	32	8	217	166	233	6 6	0	0
55	B 0	Bonanza –Mona 3 5kV Line	18 1	1815	1536	20	-2 50	52	195	383	692	-9 2	101	285	2073	1 2	202	2996	2865	1008	180	7	37	150	139	2 5	696	0	0
56	B 0a	Bonanza –Mona 3 5kV Line RAS Trip Bonanza Plant	1823	1776	1 89	1991	-2 82	-67	81	362	670	-105	137	292	2010	103	196	2996	2853	10 0	180	-1	356	1 6	136	2 8	660	0	0
57	B 1	Hemingway – Summer Lake 500kV line	1692	1795	1516	1969	-2223	190	632	33	6 0	-789	136	28	1888	728	188	2996	2962	1095	180	31	37	210	163	239	6 5	0	0
58	B61	Rock Springs - Pal sades 230kV Line	1715	1761	1527	2026	-2331	1 1	627	17	8	-8 9	12	280	1870	735	199	2996	2930	1072	180	30	3	213	16	238	652	0	0
59	B62	irehole - Monument 230kV Line	1708	1761	1532	2021	-2275	19	611	286	83	-800	118	276	1858	737	202	2996	29 9	1077	180	3	56	222	168	235	6 6	0	0
60																													
61																													
62		evel "C" Contingencies																											
63	C02	Bridger – Populus #1 # 2 3 5 kV Lines	1827	159	19 2	1167	-1971	1	63	27	738	-935	87	279	1800	763	183	2996	2890	1035	180	38	1	209	163	235	698	0	0
6	C02a	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1757	1755	1768	1025	-1951	-211	668	386	695	-1169	128	295	1908	767	167	2996	2789	995	180	28	395	178	1 9	230	673	575	0
65	C02b	Bridger – Populus #1 # 2 3 5 kV Lines w/ RAS	1691	1912	1588	881	-1927	- 73	705	3	651	-1 13	168	309	2013	773	1 9	2996	2689	95	180	17	3 7	1	13	233	659	###	0
66	C03	Bridger – 3MileKnoll Br dger – Populus #1 3 5 kV lines	1862	1539	1983	1015	-1866	1	638	63	776	-932	7	303	1778	771	180	2996	2881	1029	180	38	37	206	161	2 5	711	0	0
67	C03a	Bridger – 3MileKnoll Br dger – Populus #1 3 5 kV lines w/ RAS	1792	170	182	863	-1852	-21	672	22	733	-1170	116	313	1889	775	16	2996	2780	989	180	28	391	175	1 8	236	689	575	0
68	C03b	Bridger – 3MileKnoll Br dger – Populus #1 3 5 kV lines w/ RAS	1725	1863	1657	708	-1831	- 80	708	381	690	-1 18	158	322	1996	781	1 6	2996	2680	9 8	180	18	3	1 1	133	236	677	###	0
69	C03d	C03a Big Grassy & Amps Shunt (Path 18 RAS)	1790	170	1825	862	-1858	-206	671	22	733	-1162	11	32	1887	77	16	2996	2779	988	180	28	392	176	1 8	235	687	575	0
70	C03e	C03b Big Grassy & Amps Shunt (Path 18 RAS)	1723	186	1659	708	-1837	- 72	707	380	689	-1 10	156	333	199	780	1 6	2996	2679	9 6	180	18	3 5	1 2	133	23	67	###	0
71	C0	Bridger – 3MileKnoll Br dger – Populus #2 3 5 kV lines	1862	1539	1983	1015	-1866	1	638	63	776	-932	7	303	1778	771	180	2996	2881	1029	180	38	37	206	161	2 5	711	0	0
72	C0 a	Bridger – 3MileKnoll Br dger – Populus #2 3 5 kV lines w/ RAS	1792	170	182	863	-1852	-21	672	22	733	-1170	116	313	1889	775	16	2996	2780	989	180	28	391	175	1 8	236	689	575	0
73	C0 b	Bridger – 3MileKnoll Br dger – Populus #2 3 5 kV lines w/ RAS	1725	1863	1657	708	-1831	- 80	708	381	690	-1 18	158	322	1996	781	1 6	2996	2680	9 8	180	18	3	1 1	133	236	677	###	0
7	C0 d	C0 a Big Grassy & Amps Shunt (Path 18 RAS)	1790	170	1825	862	-1858	-206	671	22	733	-1162	11	32	1887	77	16	2996	2779	988	180	28	392	176	1 8	235	687	575	0
75	C0 e	C0 b Big Grassy & Amps Shunt (Path 18 RAS)	1723	186	1659	708	-1837	- 72	707	380	689	-1 10	156	333	199	780	1 6	2996	2679	9 6	180	18	3 5	1 2	133	23	67	###	0
76	C05	Borah – Populus 3 5 kV DLO	1692	1785	151	1959	-2259	139	625	333	639	-8 9	127	280	1875	725	197	2996	2925	1066	180	3	50	218	167	233	6	0	0
77	C06	Populus – Ben Lomond 3 5 kV DLO	1918	1537	1319	1761	-1666	3 7	683	30	7 2	-69	151	273	1860	792	2 9	2996	3089	1227	180	-30	355	151	139	219	736	0	0
78	C06k	Populus – Ben Lomond 3 5 kV DLO RAS (Bypass 1/2 Ser es Cap)	1935	1511	1368	1661	-1625	3 5	683		757	-69	1 5	277	18 8	796	2 7	2996	3087	122	180	-30	35	150	138	21	738	0	0
79	C07	Ben Lomond – Terminal 3 5 kV DLO	1717	1759	1 97	1952	-2209	166	630	327	633	-829	129	278	1873	733	203	2996	29	108	180	27	0	211	16	231	6 6	0	0
80	C08	Populus – Kinport Populus – Borah #2 3 5 kV Lines	1688	1788	1509	1968	-2269	136	62	333	639	-851	126	283	1875	723	19	2996	2921	1062	180	36	52	220	167	23	6 3	0	0
81	C09	Populus – Borah #2 3 5 kV Treasureton – Brady 230 kV Lines	1699	1777	1 93	1959	-222	15	629	3 5	652	-838	130	279	1878	726	200	2996	2936	1076	180	30	5	215	165	232	6 7	0	0
82	C10	Populus – Borah #1 3 5 kV Treasureton – Brady 230 kV Lines	1698	1779	1 95	1959	-2226	155	628	3 5	651	-838	130	279	1878	726	201	2996	2936	1076	180	30	5	215	165	231	6 7	0	0
83	C11	Populus – Ben Lomond #2 Populus Terminal 3 5 kV Lines.	1870	1590	1367	1816	-1808	306	667	393	702	-722	1	273	1861	778	236	2996	3053	1190	180	-15	379	168	1 6	222	695	0	0
8	C12	Populus – Terminal 3 5 kV Treasure on – Brady 230 kV Lines	1769	1700	1 38	1907	-2052	220	6	363	671	-787	136	276	1871	7 7	215	2996	2985	1123	180	12	18	196	158	227	661	0	0
85	C12k	Populus – Terminal 3 5 kV Treasureton – Brady 230 kV Lines R	1788	1673	1 86	180	-2006	218	6 5	380	688	-788	130	280	1860	751	21	2996	2983	1121	180	12	18	196	157	222	66	0	0
86	C13	Borah – Adelaide #2 Bo ah–ADT–M dpoint #1 3 5 kV lines (RA)	1696	1779	1507	1958	-2256	133	626	33	6 0	-853	126	278	1873	725	193	2996	2925	1065	180	36	50	218	167	235	6 5	0	0
87	C1	Borah – Adelaide #2 Midpoint - Adelaide #2 3 5 kV lines (RA)	1695	1782	1506	1963	-22 7	1 7	627	33	6 0	-8	128	279	1876	726	199	2996	2930	1071	180	32	7	217	166	233	6 5	0	0
88	C15	Borah – Adelaide #2 Bo ah – Hunt 230 kV lines	1696	1781	1507	1961	-2251	1 1	626	33	6 0	-8 7	127	279	1875	726	196	2996	2928	1068	180	3	8	217	166	233	6 5	0	0
89	C16	Borah – Kinport Borah–Adel–M dpoint #1 3 5 kV lines (RA)	1696	1782	1502	1967	-22 3	151	627	33	6 0	-8 1	129	280	1877	726	200	2996	2932	1073	180	31	6	216	166	23	6 5	0	0
90	C18	Borah – Kinport Midpoint – Adelaide #2 3 5 kV lines (RA)	1695	178	1503	1969	-22 2	15	627	33	6 0	-839	129	281	1878	726	202	2996	2933	107	180	30	6	216	166	233	6	0	0
91	C19	Borah – Kinport 3 5 kV Borah – Hunt 230 kV ines (RA?)	1695	1782	1503	1967	-22 6	1 9	627	33	6 0	-8 2	129	280	1877	726	199	2996	2931	1072	180	32	7	216	166	23	6 5	0	0
92	C20	Borah–Adel–Midpoint #1 M dpoint – Adelaide #2 3 5 kV lines	1695	1785	1503	1971	-2231	169	629	33	6 1	-832	132	282	1881	727	207	2996	2939	1081	180	27	3	21	165	23	6 5	0	0
93	C21	Borah-Adel-M dpoint #1 3 5 kV Borah-Hunt 230 kV lines (RA)	1695	1782	1506	1963	-22 6	1 8	627	33	6 0	-8 3	128	279	1876	726	199	2996	2931	1071	180	32	7	217	166	233	6 5	0	0
9	C23	Borah – Adel #2 3 5 kV Borah – Midpoint 500 kV Lines	1697	1779	150	1962	-22 9	1 1	626	33	6 0	-8 6	128	279	1875	726	195	2996	2929	1069	180	3	8	217	166	23	6 5	0	0
95	C2	Bridger – Populus #1 Goshen – Kinport 3 5 kV Lines	1739	1721	1658	1692	-2150	112	629	367	675	-873	11	282	1852	738	19	2996	291	1058	180	3	5	21	165	2 0	660	0	0
96	C25	Bridger – Populus #2 Goshen – Kinport 3 5 kV lines	1739	1721	1658	1692	-2150	112	629	367	675	-873	11	282	1852	738	19	2996	291	1058	180	3	5	21	165	2 0	660	0	0
97	C28x	Pa o Verde Generation – Trip Two Units	1775	1789	1 9	197	-2 15	-7	6 1	3	651	-993	153	293	19 5	7 7	202	2996	3839	2278	180	5	596	321	215	2 3	710	0	0
98	C28y	Pa o Verde Generation – Trip Two Units	177	1788	1 93	1973	-2 15	-8	6 0	3	650	-99	153	293	19 2	7 6	202	2996	3836	227	180	5	596	320	21	2 3	709	0	0
99																													
100		Margin est w/ Rocksprings Firehole West at 5% of 640 MW																											
101		egwstg1 8h8 pcs 2250 rsfh 672 x93 sav	1696	1782	1502	19 1	-2250	120	630	36	672	-870	13	279	1881	725	198	2996	29 6	1085	180	30	2	213	16	232	6 7	0	0
102		Marg n est w/ Path C at 5% of 2250 MW																											
103		egwstg1 8h8 pcs 2362 rsfh 640 x93 sav	1726	17 8	1 76	1956	-2362	-	639	33	6 0	-996	121	279	1872	7 0	206	2996	3012	1150	180	19	13	189	156	2 2	6 5	0	0

REAC IVE MARGIN MVAR Gray shaded ce ls are the minimum marg ns)

INE #	CON NGENCY#	Aeolus 500	Monanx 500	Antic in 500	Popu us 500	Borah 500	Midpoint 500	Hem nway 500	CedarHil 500	Br dger 345	oshen 345	3 Mi Knoll 345	K nport 345	Popu us 345	Borah 345	Ben Lomond 345	erminal 345	Mona 345	Bonanza 345	Aeolus 230	Miners 230	Mustang 230	Riverton 230	onahGas 230	adstone 230
5																									
6	B01	-977	-1558	-8 0	-1075	-1088	-1360	-1781	-1182	-727	-572	-528	-891	-993	-1026	-109	-1371	-176	-667	-10 8	-753	-326	-298	-203	-7
7	B01a	-963	-1672	-862	-1172	-1182	-1 35	-1801	-1251	-793	-622	-593	-978	-110	-1125	-1193	-1 76	-1896	-655	-102	-735	-312	-286	-207	-78
8	B02	-1228	-2075	-1251	-1693	-16 1	-1911	-2317	-1671	-962	-799	-762	-1335	-15 0	-1563	-1503	-1698	-228	-72	-12 8	-868	-3 7	-327	-236	-82
9	B03	-1303	-1932	-1228	-1 10	-1 17	-1697	-212	-1 7	-10 9	-729	-725	-1183	-1359	-1370	-13 9	-156	-2125	-708	-1312	-860	-3 5	-322	-227	-81
10	B0	-1161	-1709	-970	-936	-923	-1171	-1591	-1057	-867	-355	-328	-68	-861	-850	-9	-1216	-1889	-69	-1192	-827	-3 5	-31	-211	-80
11	B05	-1 19	-2055	-1 72	-1658	-1639	-1908	-2321	-1652	-1311	-83	-851	-1375	-1586	-1595	-1500	-1687	-2251	-720	-1 08	-883	-33	-319	-232	-82
12	B06	-1398	-2012	-1 23	-1560	-1529	-1801	-2190	-1577	-1271	-589	-7 0	-122	-1 78	-1 66	-1 3	-163	-2206	-718	-1390	-879	-3 5	-323	-235	-81
13	B06k	-1378	-1985	-1373	-1 95	-1 68	-17 8	-2157	-1532	-122	-569	-593	-1171	-1 13	-1 03	-1395	-1607	-2179	-715	-1373	-875	-3 5	-322	-232	-81
1	B07	-1 19	-2065	-1390	-1586	-1571	-1867	-2311	-1613	-1093	-31	- 81	-1359	-1521	-1517	-1 80	-1689	-226	-721	-1 12	-887	-3 1	-320	-235	-82
15	B08	-1 16	-2051	-1 51	-1629	-1621	-1889	-2306	-163	-1286	-78	-817	-12 2	-15 3	-1579	-1 85	-1678	-22 6	-720	-1 09	-885	-3 2	-321	-235	-82
16	B09	-1 12	-2031	-1 3	-15 5	-1 97	-1830	-2271	-1595	-1285	-81	-832	-1338	-15 0	-1550	-1 79	-1670	-2227	-719	-1 05	-885	-3 2	-321	-23	-81
17	B10	-1 12	-20 0	-1 53	-1636	-15 3	-1876	-2290	-163	-1280	-798	-820	-1289	-1506	-1 52	-1 71	-1670	-2235	-717	-1 05	-88	-3 1	-319	-23	-82
18	B11	-1 19	-2052	-1 51	-1616	-1601	-1868	-229	-162	-1285	-78	-813	-1295	-1535	-155	-1 77	-1683	-22 8	-720	-1 12	-886	-3 1	-320	-23	-82
19	B12	-1 17	-206	-1 33	-1 89	-1580	-1953	-2136	-957	-1300	-836	-852	-13 7	-1530	-1556	-1502	-1698	-2265	-721	-1 09	-887	-3 2	-321	-236	-82
20	B1	-1398	-20 5	-1392	-1 38	-1528	-1895	-2091	-10 9	-1260	-812	-829	-1301	-1 7	-1501	-1 72	-1672	-22 2	-720	-1392	-882	-3 1	-320	-235	-82
21	B15	-1355	-2012	-1320	-1 18	-1336	-1310	-2003	-15 1	-1165	-739	-761	-1165	-13 1	-1319	-1 00	-1616	-220	-711	-1353	-868	-338	-313	-230	-83
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23	B17	-1 12	-2050	-1 57	-1631	-1605	-1658	-226	-1625	-1299	-823	-8 1	-1351	-1559	-1563	-1 95	-168	-22 6	-718	-1 0	-883	-3 1	-320	-235	-82
2	B18	-1 21	-2057	-1 73	-1656	-163	-1897	-2319	-1650	-1317	-83	-852	-137	-1585	-1591	-150	-1691	-225	-721	-1 12	-886	-3 2	-322	-236	-82
25	B19	-1 1	-20 7	-1 53	-1625	-1607	-188	-2291	-1635	-1295	-819	-838	-1339	-15	-1539	-1 8	-1675	-22 2	-720	-1 07	-885	-3 2	-321	-235	-82
26	B20	-1 19	-2056	-1 68	-16	-1626	-1919	-2326	-1651	-1309	-828	-8 7	-135	-156	-1558	-1 98	-1687	-2252	-720	-1 11	-885	-3 2	-321	-235	-82
27	B21	-1 13	-20 7	-1 9	-1613	-1595	-1892	-2298	-1632	-1289	-815	-83	-1323	-1527	-1515	-1 80	-167	-22 2	-720	-1 06	-88	-3 2	-321	-235	-82
28	B22	-1 18	-2053	-1 6	-1 6	-1623	-1897	-2305	-16	-1306	-82	-8 3	-1350	-1563	-1568	-1 9	-168	-22 9	-720	-1 10	-885	-3 2	-321	-235	-82
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32	B26	-1 19	-2055	-1 71	-1656	-1637	-1897	-229	-16 9	-131	-832	-850	-1372	-158	-1592	-1501	-1687	-2251	-721	-1 11	-886	-3 2	-322	-236	-82
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35	B30	-1 28	-206	-1 9	-1692	-1670	-1929	-2337	-1676	-1337	-8 9	-866	-1 05	-1608	-1616	-1516	-1698	-2263	-721	-1 17	-888	-3 2	-322	-236	-82
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37	B32	-1 32	-2071	-1 87	-1671	-1625	-1893	-2319	-1660	-1321	-737	-810	-11 3	-1611	-155	-151	-1701	-2271	-722	-1 21	889	-3 2	-322	-237	-82
38	B33	-1353	-1828	-1373	-1512	-1 99	-1788	-2235	-1555	-1217	-787	-803	-12 7	-1 19	-1 1	-1221	-1 22	-2001	-697	-1351	866	-3 1	-313	-222	-82
39	B3	-1359	-185	-1377	-1513	-1 99	-1786	-2232	-1555	-1222	-785	-80	-12 8	-1 16	-1 1	-132	-1 69	-2030	-700	-1356	-869	-3 2	-318	-227	-82
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1	B35a	-1090	-1578	-1158	-1581	-1611	-1876	-2185	-1595	-119	-882	-881	-1 02	-1593	-1597	-1508	-1601	-18 6	-651	-1171	-812	-280	-250	-212	-78
2	B35d	-112	-160	-1193	-1635	-1662	-1917	-220	-1635	-12 1	-897	-907	-1 3	-1652	-16 9	-1533	-1626	-1872	-656	-1207	831	-303	-277	-223	-79
3	B35g	-1176	-1769	-128	-1800	-182	-205	-2299	-17 1	-135	-989	-985	-1603	-183	-1827	-1658	-1750	-2081	-667	-1261	858	-308	-286	-229	-79
	B36	P CASE DIVERGED																							
5	B36a	-1308	-1790	-70	-680	-720	-919	-1283	-80	-537	- 5	- 22	-62	-65	-693	-705	-987	-1953	-519	-1 39	-922	-307	-257	-165	-77
6	B36d	-13 2	-1808	-738	-708	-751	-965	-1310	-837	-565	- 62	- 0	-650	-682	-721	-731	-101	-1975	-52	-1 72	-932	-313	-273	-173	-77
7	B36g	P CASE DIVERGED																							
8	B36k	-1567	-18 7	782	-785	-828	-1070	-1 39	-926	-629	-525	-50	-725	-765	-802	-788	-1065	-2022	-530	-1711	-1027	-313	-267	-173	-78
9	B36n	-1598	-1865	816	-822	-86	-1106	-1 82	-95	-657	-5 1	-520	-750	-79	-830	-812	-1089	-20 1	-535	-1729	-1032	-319	-282	-180	-78
50	B36ak	-1159	-1821	533	-50	-539	-707	-96	-610	- 07	-332	-308	- 62	- 8	-51	-5 6	-776	-179	-512	-1327	890	-299	-250	-153	-76
51	B36v	-1 20	-188	8 7	-801	-838	-107	-1 3	-929	-659	-510	- 93	-725	-769	-806	-8	-1139	-2065	-537	-152	9 5	-319	-292	-211	-77
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53	B38	-1 1	-209	-1512	-1683	-1657	-1918	-2313	-166	-1327	-836	-855	-1388	-160	-1611	-1509	-1697	-228	-691	-1382	-891	-316	-288	-22	-78
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55	B 0	-1013	-1817	-1023	-1213	-1252	-155	-2002	-1326	-929	-695	-692	-1068	-1189	-1215	-1208	-1 39	-2079	- 93	-1031	-7 6	-321	-292	-203	-67
56	B 0a	-1129	-1902	-11 9	-1323	-13 6	-1626	-2030	-1 10	-10 0	-720	-730	-1131	-1276	-1297	-1283	-1510	-2155	- 75	-113	-789	-327	-297	-21	-77
57	B 1	-1388	-20 5	-1388	-1 82	-1 65	-1608	-1658	-1 19	-12 3	-79	-813	-1266	-1 51	-1 5	-1 63	-1666	-22 0	-716	-1382	-878	-3 0	-318	-23	-82
58	B61	-1377	-1997	-1383	-15 9	-1539	-1822	-2257	-1579	-1228	-79	-806	-1288	-1 77	-1 91	-1 22	-1632	-2187	-712	-1375	-878	-3 3	-321	-226	-81
59	B62	-1 01	-2019	-1 28	-1606	-1593	-1871	-2308	-1619	-1278	-813	-828	-1333	-1535	-15 6	-1 68	-1652	-2211	-720	-1398	-885	-3 5	-328	-23	-81
60		**7**	**18**	**171**	**126**	**166**	**141**	**165**	**198**	**133**	**128**	**91**	**86**	**116**	**119**	**46**	**46**	**42**	**23**	**8**	**7**	**8**	**6**	**10**	**66**
61						500	500	500	500	100			200		200										
62																									
63	C02	-1007	-1650	-791	-97	-1013	-128	-1690	-110	-651	-526	- 89	-850	-973	-978	-10 5	-1289	-1865	-683	-1062	-782	-350	-320	-207	-78
6	C02a	-1097	-1821	-953	-1161	-1193	-1 2	-1799	-1260	-78	-61	-595	-999	-1151	-1152	-1209	-1 51	-2036	-675	-1131	-806	-338	-308	-216	-82
65	C02b	-1076	-1912	-988	-1196	-1219	-1 30	-1720	-1271	-81	-63	-631	-102	-1192	-1183	-126	-1530	-2135	-659	-1102	-786	-320	-289	-218	-8
66	C03	-858	-1373	-656	-670	-669	-863	-1210	-790	-585	-299	-280	-507	-61	-608	-707	-9 6	-16 2	-66	-938	-718	-350	-310	-190	-78
67	C03a	-1007	-1637	-831	-855	-8 2	-1055	-1 18	-967	-7 1	-350	-325	-630	-787	-766	-892	-1165	-1852	-662	-1050	-772	-339	-302	-203	-81
68	C03b	-1016	-1761	-882	-905	-880	-1083	-1 06	-996	-789	-366	-3 0	-668	-838	-815	-982	-1273	-1972	-6 9	-1050	-76	-322	-285	-208	-8
69	C03d	-1035	-1682	-87	-928	-919	-11 5	-1515	-1038	-775	-389	-356	-696	-863	-8 3	-960	-1237	-1897	-665	-1077	-783	-339	-30	-205	-81
70	C03e	-10 2	-1801	-929	-983	-956	-1166	-1 98	-1070	-826	- 05	-370	-736	-91	-891	-1050	-13	-2016	-651	-1073	-775	-323	-287	-210	-8
71	C0	-858	-1373	-656	-670	-669	-863	-1210	-790	-585	-299	-280	-507	-61	-608	-707	-9 6	-16 2	-66	-938	-718	-350	-310	-190	-78
72	C0 a	-1007	-1637	-831	-855	-8 2	-1055	-1 18	-967	-7 1	-350	-325	-630	-787	-766	-892	-1165	-1853	-662	-1050	-772	-339	-302	-203	-81
73	C0 b	-1016	-1761	-882	-905	-880	-1083	-1 06	-996	-789	-366	-3 0	-668	-838	-815	-982	-1273	-1972	-6 9	-1050	-76	-322	-285	-208	-8
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75	C0 e	-10 2	-1801	-929	-983	-956	-1166	-1 98	-1069	-826	- 05	-370	-736	-91	-891	-1050	-13	-2016	-651	-1073	-775	-323	-287	-210	-8
76	C05	-1 29	-2058	-1 90	-1692	-1665	-1907	-231	-1678	-1332	-8 9	-867	-1 09	-1575	-1577	-1501	-1683	-2255	-722	-1 18	-888	-3 3	-322	-237	-82
77	C06	-1170	-1308	-1180	-128	-1272	-1580	-2072	-1386	-1015	-705	-70	-10 7	-1165	-1197	-766	-913	-1	-630	-1179	-807	-336	-292	-18	-82
78	C06k	-1115	-1256	-1078	-11	-113	-1 28	-191	-1263	-925	-596	-587	-921	-1032	-1059	-730	-873	-1391	-622	-113	-792	-337	-289	-179	-82
79	C07	-1 01	-1960	-1 36	-1581	-1565	-1851	-2285	-1605	-1276	-812	-829	-1307	-1 91	-1511	-1238	-1591	-2137	-71	-139	-881	-3 3	-323	-23	-82
80	C08	-1 3	-2069	-1 86	-1669	-160	-1865	-2298	-1658	-1320	-718	-802	-1108	-1598	-1500	-1506	-1692	-2270	-723	-1 23	-890	-3 2	-322	-237	-82
81	C09	-1 13	-2033	-1 5	-1637	-1618	-1881	-2300	-1639	-1288	-821	-830	-1355	-15 8	-1561	-1 39	-16 9	-2226	-718	-1 06	-88	-3 1	-318	-231	-82
82	C10	-1 20	-20 2	-1 73	-166	-16 5	-1906	-2321	-1659	-1308	-83	-8 1	-1380	-1576	-1588	-1 53	-1669	-2236	-719	-1 11	-885	-3 1	-318	-232	-82
83	C11	-1237	-1528	-1238	-1339	-1329	-163	-2106	-1 30	-1082	-723	-737	-1097	-1222	-1257	-976	-112	-1669	-657	-12 5	-833	-3 0	-306	-206	-82
8	C12	-13 7	-182	-13 9	-1 80	-1 68	-1760	-2208	-1531	-1183	-767	-775	-1218	-1380	-1 08	-1255	-1 25	-1996	-696	-13 6	-865	-3 0	-313	-221	-82
85	C12k	-1306	-1773	-1250	-13 3	-1336	-1631	-2090	-1 26	-1093	-66	-651	-1088	-12 5	-1270	-1177	-1368	-19 2	-692	-1310	855	-3 1	-312	-217	-81
86	C13	-1 10	-2036	-1 25	-1562	-15 7	-18	-222	-1611	-1260	-795	-817	-1266	-1 59	-1 22	-1 51	-1670	-2230	-720	-1 01	-88	-3 2	-322	-235	-81
87	C1	-1 1	-20 7	-1 50	-161	-1596	-1892	-2298	-1633	-1290	-815	-835	-132	-1528	-1516	-1 81	-167	-22 2	-720	-1 07	-88	-3 2	-321	-235	-82
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89	C16	-1 09	-20 1	-1 27	-1583	-1576	-187	-228	-1613	-1259	-768	-802	-1202	-1 86	-1 98	-1 62	-1662	-2235	-720	-1 01	-883	-3 1	-320	-23	-82
90	C18	-1 15	-2051	-1 7	-161	-1606	-1901	-2312	-1632	-1280	-780	-81	-1227	-1521	-15 1	-1 80	-1676	-22 6	-720	-1 08	-885	-3 1	-321	-235	-82
91	C19	-1 13	-20 8	-1 2	-1610	-1603	-1879	-2291	-1625	-1275	-77	-809	-1218	-1519	-1551	-1 75	-1672	-22 2	-720	-1 06	-88	-3 2	-321	-235	-82
92	C20	-1 05	-20 0	-1 19	-15	-1530	-190	-2295	-1606	-1253	-788	-811	-12	-1 0	-1396	-1 52	-1660	-2235	-719	-1397	-882	-3 1	-319	-23	-82
93	C21	-1 11	-20	-1 39	-1591	-1575	-1882	-2276	-1622	-1277	-80	-825	-1293	-1 99	-1 81	-1 69	-1668	-2238	-720	-1 0	-88	-3 2	-321	-235	-82
9	C23	-1398	-2030	-1391	-1 79	-13 2	-1690	-2152	-1582	-1237	-788	-808	-12 8	-1 27	-1 11	-1 1	-16 8	-2223	-720	-1393	-881	-3 2	-321	-23	-82
95	C2	-1288	-1937	-1130	-1336	-13 8	-16 7	-2098	-1 22	-839	-276	- 0	-1173	-1301	-1300	-1319	-1559	-213	-709	-1305	-861	-3 5	-321	-226	-81
96	C25	-1288	-1937	-1130	-1336	-13 8	-16 7	-2098	-1 22	-839	-276	- 0	-1173	-1301	-1300	-1319	-1559	-213	-709	-1305	-861	-3 5	-321	-226	-81
97	C28x	-1220	-1782	-1225	-1391	-1395	-1661	-193	-1 56	-110	-739	-752	-1168	-1325	-13 3	-1298	-1 86	-19 9	-681	-1219	-820	-332	-301	-222	-52
98	C28y	-1225	-1786	-1229	-1395	-1399	-166	-1937	-1 58	-1108	-7 0	-753	-1170	-1328	-13 6	-1300	-1 88	-1953	-683	-1223	-822	-332	-302	-222	-119
99		**858**	**1256**	**656**	**670**	**669**	**863**	**1210**	**790**	**585**	**276**	**280**	**507**	**614**	**608**	**707**	**873**	**1391**	**622**	**938**	**718**	**320**	**285**	**179**	**52**
100						00	00	00	00	100			250		250										
101																									
102																									
103																									

INE #	CON NGENCY#	Voltage Violations	WORS VOL AGE[2]	dV %	# of P Overloads	WORS LOAD NG	% of MVA2	# of Buses < 90 pu	Wyoming Path 18 Buses < 90 pu P Voltage	COMMEN
6	B01	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	98 25%	0	- - -	
7	B01a	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	87 87%	0	- - -	
8	B02	0	- - -	- - -	0	GRACE 138 SODA 138 #1	80 03%	0	- - -	
9	B03	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	85.1 %	0	- - -	
10	B0	7	B GGRASS 69	6.	0	DON 138 P NGREE 138 #1	81 35%	0	- - -	All Vdevs > 5% a e P18/Wyo.
11	B05	0	- - -	- - -	0	- - -	- - -	0	- - -	
12	B06	0	- - -	- - -	2	GRACE 138 SODA 138 #1	111.12%	0	- - -	
13	B06k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	91 3 %	0	- - -	
1	B07	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	80 39%	0	- - -	
15	B08	0	- - -	- - -	0	- - -	- - -	0	- - -	
16	B09	0	- - -	- - -	0	POPULUS 3 5 POPULUS 500 #1	80 50%	0	- - -	
17	B10	0	- - -	- - -	0	- - -	- - -	0	- - -	
18	B11	0	- - -	- - -	0	- - -	- - -	0	- - -	
19	B12	0	- - -	- - -	0	- - -	- - -	0	- - -	
20	B1	0	- - -	- - -	0	- - -	- - -	0	- - -	
21	B15	0	- - -	- - -	0	- - -	- - -	0	- - -	
22	B16	0	- - -	- - -	0	- - -	- - -	0	- - -	
23	B17	0	- - -	- - -	0	- - -	- - -	0	- - -	
2	B18	0	- - -	- - -	0	- - -	- - -	0	- - -	
25	B19	0	- - -	- - -	0	- - -	- - -	0	- - -	
26	B20	0	- - -	- - -	0	- - -	- - -	0	- - -	
27	B21	0	- - -	- - -	0	- - -	- - -	0	- - -	
28	B22	0	- - -	- - -	0	- - -	- - -	0	- - -	
29	B23	0	- - -	- - -	0	- - -	- - -	0	- - -	
30	B2	0	- - -	- - -	0	- - -	- - -	0	- - -	
31	B25	0	- - -	- - -	0	- - -	- - -	0	- - -	
32	B26	0	- - -	- - -	0	- - -	- - -	0	- - -	
33	B27	0	- - -	- - -	0	- - -	- - -	0	- - -	
3	B28	0	- - -	- - -	0	- - -	- - -	0	- - -	
35	B30	0	- - -	- - -	0	- - -	- - -	0	- - -	
36	B31	0	- - -	- - -	0	- - -	- - -	0	- - -	
37	B32	0	- - -	- - -	0	- - -	- - -	0	- - -	
38	B33	0	- - -	- - -	0	GRACE 138 SODA 138 #1	8 26%	0	- - -	
39	B3	0	- - -	- - -	0	GRACE 138 SODA 138 #1	80. 9%	0	- - -	
0	B35	125	LATHAM 3 .5	17.5	5	PLATTE 230 LATHAM 230 #1	111.02%		BA RO L 115 0 @ 0 838	32 Vdevs > 5% outside P18/Wyo.
1	B35a	9	WYOPO 3 .5	5 5	0	M NERS 230 PLATTE 230 #1	8 3 %	0	- - -	1 Vdev > 5% outside P18/Wyo.
2	B35d	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	8 20%	0	- - -	
3	B35g	9	D LLON S 69	-10.1	0	D LLON S 161 D LLON S 69 #1	95 68%	0	- - -	All Vdevs > 5% a e P18/Wyo.
	B36	P CASE DIVERGED								
5	B36a	17	CHMNY BU 69	6 5	0	GRACE 138 SODA 138 #1	95 55%	0	- - -	All Vdevs > 5% a e in Wyoming
6	B36d	5	CHMNY BU 69	5.	0	GRACE 138 SODA 138 #1	95 38%	0	- - -	All Vdevs > 5% a e in Wyoming
7	B36g	P CASE DIVERGED								
8	B36k	1	BAIROIL 57	-7.2	0	GRACE 138 SODA 138 #1	95.10%	0	- - -	All Vdevs > |5%| are in Wyoming
9	B36n	9	BAIROIL 57	-7.	0	GRACE 138 SODA 138 #1	9 9 %	0	- - -	All Vdevs > |5%| are in Wyoming
50	B36ak	5	CHMNY BU 69	7.	1	SIDNEY 115 S DNEY 230 #1	109.98%	1	PTRSNFUR 69.0 @ 0 89	6 Vdevs > 5% ou s de P18/Wyo.
51	B36v	0	- - -	- - -	0	GRACE 138 SODA 138 #1	9 9 %	0	- - -	
52	B37	0	- - -	- - -	0	AEOLUS 500 AEOLUS 230 #2	89 07%	0	- - -	
53	B38	0	- - -	- - -	0	DAVEJOHN 115 DAVEJTPS 115 #1	82 57%	0	- - -	
5	B39	0	- - -	- - -	0	- - -	- - -	0	- - -	
55	B 0	2	MOONLAK1 69	5.1	5	BONANZA 138 VERNAL 138 #1	12 . 0%	0	- - -	
56	B 0a	0	- - -	- - -	0	GRACE 138 SODA 138 #1	80 0 %	0	- - -	
57	B 1	0	- - -	- - -	0	- - -	- - -	0	- - -	
58	B61	0	- - -	- - -	0	MANSFACE 230 F REHOLE 230 #1	86. 9%	0	- - -	
59	B62	0	- - -	- - -	0	PALISADE 230 ROCKSPGS 230 #1	85 61%	0	- - -	
63	C02	0	- - -	- - -	1	BRIDGER 3 5 BRIDGE&A 3 5 #1	105. 2%	0	- - -	
6	C02a	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	91 31%	0	- - -	
65	C02b	0	PTRSNFRG 69	6 3	0	HARD N 230 HARD N 115 #1	92 58%	1	PTRSNFUR 69.0 @ 0 895	
66	C03	0	B GGRASS 69	6 3	0	BR DGER 230 ROCKSPGS 230 #1	92 20%	1	PTRSNFUR 69.0 @ 0 897	
67	C03a	0	PTRSNFUR 69	7 6	0	- - -	- - -	1	PTRSNFUR 69.0 @ 0 882	
68	C03b	1	PTRSNFRG 69	10	0	HARD N 230 HARD N 115 #1	92 5 %		PTRSNFUR 69.0 @ 0 86	All Vdevs > 10% are on P18
69	C03d	0	- - -	- - -	0	- - -	- - -	0	- - -	
70	C03e	0	PTRSNFRG 69	6 9	0	HARD N 230 HARD N 115 #1	92 36%	1	PTRSNFUR 69.0 @ 0 890	
71	C0	0	B GGRASS 69	6 3	0	BR DGER 230 ROCKSPGS 230 #1	92 20%	1	PTRSNFUR 69.0 @ 0 897	
72	C0 a	0	PTRSNFUR 69	7 7	0	- - -	- - -	1	PTRSNFUR 69.0 @ 0 882	
73	C0 b	1	PTRSNFRG 69	10	0	HARD N 230 HARD N 115 #1	92 5 %		PTRSNFUR 69.0 @ 0 86	All Vdevs > 10% are on P18
7	C0 d	0	- - -	- - -	0	- - -	- - -	0	- - -	
75	C0 e	0	PTRSNFRG 69	6 9	0	HARD N 230 HARD N 115 #1	92 36%	1	PTRSNFUR 69.0 @ 0 890	
76	C05	0	- - -	- - -	0	- - -	- - -	0	- - -	
77	C06	0	- - -	- - -	1	GRACE 138 SODA 138 #1	100.90%	0	- - -	
78	C06k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	86 39%	0	- - -	
79	C07	0	- - -	- - -	0	- - -	- - -	0	- - -	
80	C08	0	- - -	- - -	0	- - -	- - -	0	- - -	
81	C09	0	- - -	- - -	0	GRACE 138 SODA 138 #1	88.70%	0	- - -	
82	C10	0	- - -	- - -	0	GRACE 138 SODA 138 #1	88 62%	0	- - -	
83	C11	0	- - -	- - -	0	GRACE 138 SODA 138 #1	91 31%	0	- - -	
8	C12	0	- - -	- - -	0	GRACE 138 SODA 138 #1	9 .75%	0	- - -	
85	C12k	0	- - -	- - -	0	GRACE 138 SODA 138 #1	80 89%	0	- - -	
86	C13	0	- - -	- - -	0	- - -	- - -	0	- - -	
87	C1	0	- - -	- - -	0	- - -	- - -	0	- - -	
88	C15	0	- - -	- - -	0	- - -	- - -	0	- - -	
89	C16	0	- - -	- - -	0	- - -	- - -	0	- - -	
90	C18	0	- - -	- - -	0	- - -	- - -	0	- - -	
91	C19	0	- - -	- - -	0	- - -	- - -	0	- - -	
92	C20	0	- - -	- - -	0	- - -	- - -	0	- - -	
93	C21	0	- - -	- - -	0	- - -	- - -	0	- - -	
9	C23	0	- - -	- - -	0	- - -	- - -	0	- - -	
95	C2	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	88 39%	0	- - -	
96	C25	0	- - -	- - -	0	BR DGER 3 5 BRIDGE&A 3 5 #1	88 39%	0	- - -	
97	C28x	0	- - -	- - -	0	HARD N 230 HARD N 115 #1	93.17%	0	- - -	
98	C28y	0	- - -	- - -	0	HARD N 230 HARD N 115 #1	93.19%	0	- - -	
101		A l Con ingenc es (w/ F nal RAS) Converged Indicat ng Posi ive Reactive Margin								
103		A l Con ingenc es (w/ F nal RAS) Converged Indicat ng Posi ive Reactive Margin								

1) Vo tage V o at ons > 5% for Level B & > 10% for Level C
2) Excluding Ser es Cap Buses (Line S de) and Transformer tert ary buses.

Appendix 4 – Dynamic Stability Results Tables

Appendix 4-1 - - - Dynamic Stability Results For Aeolus West vs. Aeolus South

			BASE CASE PATH FLOWS																								Fault		Voltage Deviations									Frequency Deviations						
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South (88)	Aeolus West (87)	Bridger West 500 (86)	Bridger West 345 (19)	New Path C (NB +) (94)	Borah West (17)	Monu Naughton (84)	West of RS / FH (85)	Midpoint West (92)	Montana SE (80)	Montana Idaho (P18)	Tot 4a (37)	Bonanza West (33)	Tot 1a (30)	Idaho Sierra (16)	POCI (65)	COI (66)	Path 26	IPP DC (27)	Pavant-IPP Gonder	RedB H-Allen (Tot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																														
5		**egwstg1 8h8 4100 2400 1500 2672.sav**	1500	2672	1700	2400	-1203	1681	263	567	682	125	-188	2051	688	541	124	2330	2282	465	2150	110	356	412	230	217	661																			
6	**LEVEL "B" CONTINGENCIES**																																													
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
8	B01a	Anticline – Populus 500 kV Line																												0	None								None							
9	B01g	Anticline – Populus 500 kV Line																												0	None								None							
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None								None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None								None							
14	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None								None							
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
16	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None								4	BRIDGER2 22.0	60	fbug	59.476	4	8.293	Bridger backswing UF - OK
17	B09	Bridger – 3M leKno l 345 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59.459	5	8.795	Bridger backswing UF - OK
18	B09a	Bridger – 3M leKno l 345 kV Line																												0	None								3	BRIDGER3 22.0	60	fbug	59.483	3	7.221	Bridger backswing UF - OK
19	B09c	Bridger – 3M leKno l 345 kV Line																												0	None								5	BRIDGER2 22.0	60	fbug	59.443	5	9.115	Bridger backswing UF - OK
20	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None								None							
21	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None								None							
22	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None								None							
23	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None								None							
24	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None								None							
25	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	31	508	EASTNRTH 69	73	vbul	0.00229	99.8%	2.2583	209	107	600	VERNONTP 115	73	fbul	14.564	600	17.35	
26	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
27	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																												0	None								None							
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None								None							
29	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																												0	None								None							
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
32																																														
33																																														
34	**LEVEL "C" CONTINGENCIES**																																													
37	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
38	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
39	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																												0	None								None							
40	C03	Bridger–3M Knoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None								None							
41	C03a	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
42	C03b	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																												0	None								None							
43	C03c	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																												0	None								None							
44	C04	Bridger–3M Knoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None								None							
45	C04a	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
46	C04b	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																												0	None								None							
47	C04c	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																												0	None								None							
48	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
49	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
50	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None								None							
51	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																												0	None								None							
52	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None								None							
53	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
54	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
57	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None								None							
58	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
59	C14	Palo Verde Generation Units 2 & 3																										None		0	None								None							
60																																														
61																																														
62		**egwstg1 8h8 4001 2400 2581 1700 2.sav**	1700	2581	1602	2400	-1614	1225	227	529	184	127	-234	2139	682	482	170	2259	2372	558	2030	64	504	328	189	219	698																			
63	**LEVEL "B" CONTINGENCIES**																																													
64	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
65	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
66	B01g	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
67	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
68	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None								None							
69	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None								None							
71	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None								None							
72	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
73	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None								5	BRIDGER1 22.0	60	fbug	59.435	5	9.341	Bridger backswing UF - OK
74	B09	Bridger – 3M leKno l 345 kV Line																										3Phs	3	0	None								6	BRIDGER1 22.0	60	fbug	59.412	6	10.06	Bridger backswing UF - OK
75	B09a	Bridger – 3M leKno l 345 kV Line																										3Phs	3	0	None								3	BRIDGER1 22.0	60	fbug	59.463	3	8.042	Bridger backswing UF - OK
76	B09c	Bridger – 3M leKno l 345 kV Line																										3Phs	3	0	None								8	BRIDGER1 22.0	60	fbug	59.403	8	10.19	Bridger backswing UF - OK
77	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None								None							
78	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None								None							
80	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None								None							
81	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None								None							
82	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	37	570	MAGCORP 13.8	65	vbug	0.00000	100.0%	7.0958	261	1119	1250	SPRNGCAN 34.5	70	fbug	8.7826	1250	92.29	
83	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
84	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
85	B16	Aeolus – Mona 500 kV Line																										3Phs	3	48	1490	MAGCORP 13.8	65	vbug	0.00000	100.0%	7.3583	599	1099	None						
86	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	None								None							BLNDL G2 Unstable
87	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	None								None							BLNDL G2 Unstable
88	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
89																																														
90																																														
91	**LEVEL "C" CONTINGENCIES**																																													
94	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
95	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
96	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
97	C03	Bridger–3M Knoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None								None							
98	C03a	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
99	C03b	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
100	C03c	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
101	C04	Bridger–3M Knoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None								None							
102	C04a	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
103	C04b	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
104	C04c	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
105	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
106	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
107	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None								None							
108	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None								None							
109	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None								None							
110	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
111	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
114	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None								None							
115	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
116	C14	Palo Verde Generation Units 2 & 3																										None		0	None								None							

Appendix 4-2 Pg. 1 - - - Dynamic Stability Results For Aeolus West vs. Bonanza West

			BASE CASE PATH FLOWS																									Fault			Voltage Deviations								Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana Idaho (P18)	Tot 4a	Bonanza West	Tot 1a (30)	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Devia-tions	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Devia-tions	Max Time, Cycles	Freq. Dip Devia-tions	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Devia-tions	Max Time (Cycles)	Comments
4																																														
5		**egwstg1 8h6 1526 750 2672.sav**	1551	2672	1694	2397	-1337	1549	283	588	543	133	-198	2140	750	620	132	2996	2173	355	2140	96	504	368	207	216	693																			
6	**LEVEL "B" CONTINGENCIES**																																													
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None								None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None								None							
14	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None								None							
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
16	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None								4	BRIDGER2 22.0	60	fbug	59.472	4	8.39	Bridger backswing UF - OK
17	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59.444	5	9.12	Bridger backswing UF - OK
18	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None								3	BRIDGER3 22.0	60	fbug	59.480	3	7.324	Bridger backswing UF - OK
19	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59.437	5	9.236	Bridger backswing UF - OK
20	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None								None							
21	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None								None							
22	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None								None							
23	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None								None							
24	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None								None							
25	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	34	519	PODOLAK 115	73	vbul	0.00543	99.5%	4.1708	227	291.1	1129	SIDNEYDC 230	73	fbug	24.233	1129	136	
26	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
27	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	2	ANTICLIN 500	65	vbus	0.786215	26.3%	1.6583	2	23.47	None							
29	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (500)																										3Phs	3	0	None								None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (500)																										3Phs	3	0	None								None							
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
32																																														
33	**LEVEL "C" CONTINGENCIES**																																													
36	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
37	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
38	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
39	C03	Bridger–3MiKnoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None								None							
40	C03a	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
41	C03b	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
42	C03c	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
43	C04	Bridger–3MiKnoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None								None							
44	C04a	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
45	C04b	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
46	C04c	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
47	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
48	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
49	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None								None							
50	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None								None							
51	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None								None							
52	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
53	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
56	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None								None							
57	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
58	C14	Palo Verde Generation Units 2 & 3																										None		0	None								None							
59																																														

Appendix 4-2 Pg. 2 - - - Dynamic Stability Results For Aeolus West vs. Bonanza West

LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	BASE CASE PATH FLOWS: Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana Idaho P18)	Tot 4a	Bonanza West	Tot 1a (30)	daho Sierra	PDCI	COI	Path 26	PP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners 2B1)	Sigurd GlenC (2B 2)	daho Area System osses	Pace Area System osses	Fault: Fault Type	Fault Duration, Cycles	Unstable Gens	Voltage Deviations: Dip Devia-tions	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Devia-tions	Max Time, Cycles	Frequency Deviations: Freq. Dip Devia-tions	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Devia-tions	Max Time (Cycles)	Comments
4																																															
5		**egwstg1 8h6 4055 2384 1591 785 2666.sav**	1591	2666	1672	2383	-1492	1384	352	659	367	127	-221	2091	785	639	145	2265	2479	660	2103	84	504	370	209																						
6	**LEVEL "B" CONTINGENCIES**																																														
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None							
14	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None									None							
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None							
16	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.454	5	8.78	Bridger backswing UF - OK
17	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.431	5	9.497	Bridger backswing UF - OK
18	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									3	BRIDGER3 22.0	60	fbug	59.470	3	7.655	Bridger backswing UF - OK
19	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.418	5	9.669	UF below WECC Exceptions
20	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None							
21	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None							
22	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None							
23	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None							
24	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None							
25	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	35	578	WILDHRSE 230	65	vbus	0.00404	99.6%	9.3457	249	1116	1146	RIVERTON 230	65	fbus	21.019	269	130.8	
26	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
27	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	185	ANTICLIN 500	65	vbus	0.72651	32.0%	1.7333	185	31.2	None							Bonanza OEL trips disabled
29	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
31	B16x	Aeolus – Mona 500 kV + Aeolus Gen Drop (600) + Bnza Cap-60 MVar																										3Phs	3	0	None									None							
32	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None							
33																																															
34	**LEVEL "C" CONTINGENCIES**																																														
37	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
38	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
39	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
40	C03	Bridger–3MiKnoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None									None							
41	C03a	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
42	C03b	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
43	C03c	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
44	C04	Bridger–3MiKnoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None									None							
45	C04a	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
46	C04b	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
47	C04c	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
48	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
49	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
50	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None							
51	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None							
52	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None							
53	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None							
54	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
57	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None									None							
58	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
59	C14	Palo Verde Generation Units 2 & 3																										None		0	None									None							
60																																															
61		**egwstg1 8h6 3967 2362 1617 785 2566.sav**	1617	2566	1604	2362	-1618	1193	335	641	160	128	-238	2012	785	626	162	2247	2425	606	2203	66	504	330	191																						
62	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.453	5	8.794	Bridger backswing UF - OK
63	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.428	5	9.515	Bridger backswing UF - OK
64	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									3	BRIDGER1 22.0	60	fbug	59.470	3	7.613	Bridger backswing UF - OK
65	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.418	5	9.619	Bridger backswing UF - OK
66	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	35	577	KORTES 115	73	vbus	0.00273	99.7%	10.246	243	1111	1291	TESORO 13.8	65	fbug	14.6	1291	121.6	
67	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	1	None									None							
68	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	1	None									None							
69	B16	Aeolus – Mona 500 kV Line																										3Phs	3	1	96	BONANZA 24	65	vbug	0.402646	0.60379	11.708	17	523.5	None							BONANZA Trip on OEL
70	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 24	65	vbug	0.418215	0.58847	11.717	21	523	None							BONANZA Trip on OEL
71	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 24	65	vbug	0.421337	0.58527	11.717	17	520.8	None							BONANZA Trip on OEL
72																																															
73		**egwstg1 8h6 3911 2369 1565 785 2466.sav**	1565	2466	1542	2369	-1566	1192	294	599	157	129	-237	2080	785	622	164	2247	2424	605	2203	67	504	331	191																						
74	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.453	5	8.794	Bridger backswing UF - OK
75	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.428	5	9.515	Bridger backswing UF - OK
76	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									3	BRIDGER1 22.0	60	fbug	59.470	3	7.613	Bridger backswing UF - OK
77	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.418	5	9.619	Bridger backswing UF - OK
78	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	35	577	KORTES 115	73	vbus	0.00273	100%	10.246	243	1111	1291	TESORO 13.8	65	fbug	14.6	1291	121.6	
79	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	1	None									None							
80	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	1	None									None							
81	B16	Aeolus – Mona 500 kV Line																										3Phs	3	1	112	BONANZA 24	65	vbug	0.402646	60%	11.708	108	523.7	None							BONANZA Trip on OEL
82	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 24	65	vbug	0.418215	59%	11.717	21	523	None							BONANZA Trip on OEL
83	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 24	65	vbug	0.421337	59%	11.717	17	520.8	None							BONANZA Trip on OEL
84																																															
85		**egwstg1 8h6 3708 32302 1497 785 2266.sav**	1497	2266	1406	2302	-1671	922	313	618	-118	133	-262	2002	785	629	170	2203	2502	681	2203	57	506	307	181																						
86	B16	Aeolus – Mona 500 kV Line																										3Phs	3	1	21	BONANZA 24	65	vbug	0.412975	59%	11.708	17	521.3	None							BONANZA Trip on OEL
87	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 24	65	vbug	0.424311	58%	13.179	17	433	None							BONANZA Trip on OEL
88	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 24	65	vbug	0.424915	58%	13.217	17	430.8	None							BONANZA Trip on OEL
89																																															
90		**egwstg1 8h6 3514 2279 1463 785 2166.sav**	1463	2166	1335	2279	-1690	819	310	615	-223	127	-270	1937	785	631	174	2186	2538	717	2203	56	495	299	178																						
91	B16	Aeolus – Mona 500 kV Line																										3Phs	3	1	21	BONANZA 24	65	vbug	0.414003	59%	11.708	17	521.3	None							BONANZA Trip on OEL
92	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 24	65	vbug	0.425513	58%	13.254	17	428.5	None							BONANZA Trip on OEL
93	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	1	None									None							

Appendix 4-3 - - - Dynamic Stability Results For Aeolus West vs. Tot1a

			BASE CASE PATH FLOWS																									Fault			Voltage Deviations									Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South (88)	Aeolus West (87)	Bridger West 500 (96)	Bridger West 345 (19)	New Path C (NB +) (94)	Borah West (17)	Monu Naughtn (84)	West of RS / FH (85)	Midpoint West (92)	Montana SE (80)	Montana Idaho (P18)	Tot 4a (37)	Bonanza West (33)	Tot 1a (30)	Idaho Sierra (16)	PDCI (65)	COI (66)	Path 26	IPP DC (27)	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time Cycles)	Comments
4																																															
5		**egwstg1 8h6 aw1a 2672 550.sav**	1588	2672	1674	2375	-1482	1388	342	649	375	135	-220	2095	710	550	141	2260	2518	700	2103	83	503	381	213	216	695																				
6	**LEVEL "B" CONTINGENCIES**																																														
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None								None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None								None							
14	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None								None							
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
16	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59.454	5	8.772	Bridger backswing UF - OK
17	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59.432	5	9.481	Bridger backswing UF - OK
18	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None								3	BRIDGER3 22.0	60	fbug	59.470	3	7.654	Bridger backswing UF - OK
19	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None								3	BRIDGER3 22.0	60	fbug	59.418	3	9.657	UF below WECC Exceptions
20	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None								None							
21	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None								None							
23	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None								None							
24	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None								None							
25	B15	Aeolus – Antic ine 500 kV Line																										3Phs	3	39	577	MAGCORP 13.8	65	vbug	0.00000	100.0%	14.971	291	1116	1413	SIDNEYDC 230	73	fbug	18.124	1413	106	
26	B15a	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
27	B15g	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	166	ANTICLIN 500	65	vbus	0.72823	31.8%	1.7333	162	30.88	None						
29	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
32																																															
33	**LEVEL "C" CONTINGENCIES**																																														
36	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
37	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
38	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																												0	None								None							
39	C03	Bridger–3M Knoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None								None							
40	C03a	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
41	C03b	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																												0	None								None							
42	C03c	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																												0	None								None							
43	C04	Bridger–3M Knoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None								None							
44	C04a	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
45	C04b	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																												0	None								None							
46	C04c	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																												0	None								None							
47	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
48	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
49	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None								None							
50	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																												0	None								None							
51	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None								None							
52	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
53	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
56	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None								None							
57	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
58	C14	Palo Verde Generation Units 2 & 3																										None		0	None								None							
59																																															

Appendix 4-4 - - - Dynamic Stability Results For Bridger / Anticline West vs. Aeolus South

BASE CASE PATH FLOWS

LINE #	Aeolus South (88)	Aeolus West (87)	Bridger West 500 (96)	Bridger West 345 (19)	New Path C (NB +) (94)	Borah West (17)	Monu Naughtn (84)	West of RS / FH (85)	Midpoint West (92)	Montana SE (80)	Montana Idaho (P18)	Tot 4a (37)	Bonanza West (33)	Tot 1a (30)	Idaho Sierra (16)	PDCI (65)	COI (66)	Path 26	IPP DC (27)	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses
5	1499	2596	1700	2400	-1123	1749	189	490	747	130	-177	2046	705	553	127	2357	2133	315	2005	106	504	396	218	216	668
61	1700	2661	1700	2400	-1457	1450	226	528	419	129	-210	2087	734	604	158	2311	2188	372	2105	76	504	336	193	217	710

			Fault			Voltage Deviations									Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																						
5		egwstg1 8h8 4100 2400 1500 2.sav																				
6	LEVEL B CONTINGENCIES																					
7	B01	Anticline – Populus 500 kV Line	3Phs	3	0	None									None							
8	B01a	Anticline – Populus 500 kV Line	3Phs	3	0	None									None							
9	B01g	Anticline – Populus 500 kV Line	3Phs	3	0	None									None							
10	B02	Populus – Borah 500 kV Line	3Phs	3	0	None									None							
11	B03	Populus – Cedar Hill 500 kV Line	3Phs	3	0	None									None							
12	B04	Borah – Midpoint 500 kV Line	3Phs	3	0	None									None							
14	B06	Cedar Hi l – Hemingway 500 kV Line	3Phs	3	0	None									None							
15	B07	Midpoint – Hemingway 500 kV Line	3Phs	3	0	None									None							
16	B08	Bridger – Populus 345 kV Line	3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.479	4	8.211	Bridger backswing UF - OK
17	B09	Bridger – 3MileKno l 345 kV Line	3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.459	5	8.823	Bridger backswing UF - OK
18	B09a	Bridger – 3MileKno l 345 kV Line	3Phs	3	0	None									3	BRIDGER3 22.0	60	fbug	59.486	3	7.173	Bridger backswing UF - OK
19	B09c	Bridger – 3MileKno l 345 kV Line	3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.448	5	9.014	Bridger backswing UF - OK
20	B10	Populus – Borah #1 345 kV Line	3Phs	3	0	None									None							
21	B11	Populus – Borah #2 345 kV Line	3Phs	3	0	None									None							
22	B12	Populus – Kinport 345 kV Line	3Phs	3	0	None									None							
23	B13	Borah – K nport 345 kV L ne	3Phs	3	0	None									None							
24	B14	Borah – Adelaide – Midpoint #1 345 kV Line	3Phs	3	0	None									None							
25	B15	Aeolus – Anticline 500 kV Line	3Phs	3	29	524	DAVEJOHN 69	65	vbus	0.0005	99.95%	7.3958	272	1090	1366	GREATDIV 34.5	65	fbul	27.244	1366	123.5	Resolved w th 15a
26	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop	3Phs	3	0	None									None							
27	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop	3Phs	3	0	None									None							
28	B16	Aeolus – Mona 500 kV Line	3Phs	3	0	None									None							
29	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)	3Phs	3	0	None									None							
30	B17	Hemingway – Summer Lake 500 kV Line	3Phs	3	0	None									None							
31																						
32																						
33	LEVEL "C" CONTINGENCIES																					
36	C02	Bridger – Populus 345 kV Lines 1 & 2	SLG	3	0	None									None							
37	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS	SLG	3	0	None									None							
38	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS	SLG	3	0	None									None							
39	C03	Bridger–3MiKno l + Bridger–Populus #1 345 kV lines	SLG	3	0	None									None							
40	C03a	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS	SLG	3	0	None									None							
41	C03b	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS	SLG	3	0	None									None							
42	C03c	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS	SLG	3	0	None									None							
43	C04	Bridger–3MiKno l + Bridger–Populus #2 345 kV lines	SLG	3	0	None									None							
44	C04a	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS	SLG	3	0	None									None							
45	C04b	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS	SLG	3	0	None									None							
46	C04c	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS	SLG	3	0	None									None							
47	C05	Borah – Populus 345 kV Lines 1 & 2	SLG	3	0	None									None							
48	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS	SLG	3	0	None									None							
49	C06	Populus – Ben Lomond 345 kV Lines 2 & 3	SLG	3	0	None									None							
50	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3	SLG	3	0	None									None							
51	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines	SLG	3	0	None									None							
52	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines	SLG	3	0	None									None							
53	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV ines	SLG	3	0	None									None							
56	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines	SLG	3	0	None									None							
57	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines	SLG	3	0	None									None							
58	C14	Palo Verde Generation Un ts 2 & 3	None		0	None									None							
59																						
60																						
61		egwstg1 8h9 4100 2400 1700 2.sav																				
62	LEVEL "B" CONTINGENCIES																					
63	B01	Anticline – Populus 500 kV Line	3Phs	3	0	None									None							
64	B01a	Anticline – Populus 500 kV Line	3Phs	3	0	None									None							
65	B01g	Anticline – Populus 500 kV Line	3Phs	3	0	None									None							
66	B02	Populus – Borah 500 kV Line	3Phs	3	0	None									None							
67	B03	Populus – Cedar Hill 500 kV Line	3Phs	3	0	None									None							
68	B04	Borah – Midpoint 500 kV Line	3Phs	3	0	None									None							
70	B06	Cedar Hi l – Hemingway 500 kV L ne	3Phs	3	0	None									None							
71	B07	Midpoint – Hemingway 500 kV Line	3Phs	3	0	None									None							
72	B08	Bridger – Populus 345 kV Line	3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.463	4	8.608	
73	B09	Bridger – 3MileKno l 345 kV Line	3Phs	3	0	None									6	BRIDGER2 22.0	60	fbug	59.443	6	9.393	
74	B09a	Bridger – 3MileKno l 345 kV Line	3Phs	3	0	None									3	BRIDGER3 22.0	60	fbug	59.479	3	7.62	
75	B09c	Bridger – 3MileKno l 345 kV Line	3Phs	3	0	None									6	BRIDGER2 22.0	60	fbug	59.427	6	9.659	
76	B10	Populus – Borah #1 345 kV Line	3Phs	3	0	None									None							
77	B11	Populus – Borah #2 345 kV Line	3Phs	3	0	None									None							
78	B12	Popu us – Kinport 345 kV Line	3Phs	3	0	None									None							
79	B13	Borah – Kinport 345 kV Line	3Phs	3	0	None									None							
80	B14	Borah – Adelaide – Midpoint #1 345 kV Line	3Phs	3	0	None									None							
81	B15	Aeolus – Anticline 500 kV Line	3Phs	3	36	534	WYOMONT 230	73	vbul	0.006	99.4%	2.0708	233	340.5	1010	TESORO 13.8	65	fbug	6.1444	1010	56.49	
82	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop	3Phs	3	60	None									None							
83	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop	3Phs	3	60	None									None							
84	B16	Aeolus – Mona 500 kV Line	3Phs	3	45	1363	MAGCORP 13.8	65	vbug	0.00000	100.0%	8.9332	540	1097	None							
85	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)	3Phs	3	0	None									None							
86	B17	Hemingway – Summer Lake 500 kV Line	3Phs	3	0	None									None							
87																						
88																						
89	LEVEL "C" CONTINGENCIES																					
92	C02	Bridger – Populus 345 kV Lines 1 & 2	SLG	3	0	None									None							
93	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS	SLG	3	0	None									None							
94	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS	SLG	3	0	None									None							
95	C03	Bridger–3MiKno l + Bridger–Populus #1 345 kV lines	SLG	3	0	None									None							
96	C03a	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS	SLG	3	0	None									None							
97	C03b	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS	SLG	3	0	None									None							
98	C03c	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS	SLG	3	0	None									None							
99	C04	Bridger–3MiKno l + Bridger–Populus #2 345 kV lines	SLG	3	0	None									None							
100	C04a	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS	SLG	3	0	None									None							
101	C04b	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS	SLG	3	0	None									None							
102	C04c	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS	SLG	3	0	None									None							
103	C05	Borah – Populus 345 kV Lines 1 & 2	SLG	3	0	None									None							
104	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS	SLG	3	0	None									None							
105	C06	Populus – Ben Lomond 345 kV Lines 2 & 3	SLG	3	0	None									None							
106	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3	SLG	3	0	None									None							
107	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines	SLG	3	0	None									None							
108	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines	SLG	3	0	None									None							
109	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV ines	SLG	3	0	None									None							
112	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines	SLG	3	0	None									None							
113	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines	SLG	3	0	None									None							
114	C14	Palo Verde Generation Un ts 2 & 3	None		0	None									None							

Appendix 4-5 - - - Dynamic Stability Results For Bridger / Anticline West vs. Path C Southbound

			BASE CASE PATH FLOWS																								Fault		Voltage Deviations									Frequency Deviations							
INE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South (88)	Aeolus West (87)	Bridger West 500 96)	Bridger West 345 (19)	New Path C (NB +) 94)	Borah West (17)	Monu Naughtn (84)	West of RS / FH (85)	Midpoint West (92)	Montana SE (80)	Montana Idaho P1B)	Tot 4a (37)	Bonanza West (33)	Tot 1a (30)	daho Sierra (16)	PDCI (65)	COI (66)	Path 26	PP D C (27)	Pavant-NPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners 2B1)	Sigurd GenC (2B 2)	daho Area System osses	Pace Area System osses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																														
5		**egwstg1 8h5_2250_3900_2400_1700_2.sav**	1700	2115	1500	2400	-2250	421	203	504	-545	147	-200	2071	695	594	176	2179	2850	1028	1804	47	511	299	185	257	700																			
6	**LEVEL "B" CONTINGENCIES**																																													
7	B01	Antic ine – Populus 500 kV L ne																										3Phs	3	0	None									None						
8	B01a	Antic ine – Populus 500 kV Line																												0	None									None						
9	B01g	Antic ine – Populus 500 kV Line																												0	None									None						
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None						
11	B03	Populus – Cedar Hi l 500 kV Line																										3Phs	3	0	None									None						
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None						
14	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None									None						
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None						
16	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.454	5	8.745	Bridger backswing UF - OK
17	B09	Bridger – 3M leKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.430	5	9.468	Bridger backswing UF - OK
18	B09a	Bridger – 3M leKnoll 345 kV Line																												0	None									3	BRIDGER3 22.0	60	fbug	59.483	3	7.326	Bridger backswing UF - OK
19	B09c	Bridger – 3M leKnoll 345 kV Line																												0	None									5	BRIDGER2 22.0	60	fbug	59.429	5	9.478	Bridger backswing UF - OK
20	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None						
21	B11	Populus – Borah #2 345 kV L ne																										3Phs	3	0	None									None						
22	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None						
23	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None						
24	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None						
25	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	37	553	ALCOVA1 6.6	73	vbug	0.005	99.5%	5.1458	235	16.12	1314	MM LV 13.8	70	fbus	23.995	1314	96.98	Resolved with 15a
26	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None						
27	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																												0	None									None						
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	52	1634	CRCK PST 230	65	vbus	0.000	100%	4.9291	1634	913.6	1306	CRCK PST 230	65	fbus	0	1306	920.2	
29	B16a	Aeolus – Mona 500 kV + Aeo us Gen Drop (600)																										3Phs	3	1	1									None						Blundel #2 Unstable
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																													1									None						Blundel #2 Unstable
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None						
32																																														
33																																														
34	**LEVEL "C" CONTINGENCIES**																																													
37	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None						
38	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
39	C02b	Bridger – Populus 345 kV L nes 1 & 2 w/ RAS																												0	None									None						
40	C03	Bridger–3M Knoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None									None						
41	C03a	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
42	C03b	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																												0	None									None						
43	C03c	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																												0	None									None						
44	C04	Bridger–3MiKnoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None									None						
45	C04a	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
46	C04b	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																												0	None									None						
47	C04c	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																												0	None									None						
48	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None						
49	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
50	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None						
51	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																												0	None									None						
52	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None						
53	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None						
54	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None						
57	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV ines																										SLG	3	0	None									None						
58	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None						
59	C14	Palo Verde Generation Units 2 & 3																										None		0	None									None						
60																																														
61																																														
62		**egwstg1 8h5_1550_4100_2400_1610_643.sav**	1610	2404	1700	2400	-1550	1370	336	643	363	123	-225	2134	737	604	134	2264	2490	669	1804	92	504	374	211	219	737																			
63	**LEVEL "B" CONTINGENCIES**																																													
64	B01	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None						
65	B01a	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None						
66	B01g	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None						
67	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None						
68	B03	Populus – Cedar Hi l 500 kV Line																										3Phs	3	0	None									None						
69	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None						
71	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None									None						
72	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None						
73	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.458	5	8.706	Bridger backswing UF - OK
74	B09	Bridger – 3M leKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.436	5	9.528	Bridger backswing UF - OK
75	B09a	Bridger – 3M leKnoll 345 kV Line																										3Phs	3	0	None									3	BRIDGER3 22.0	60	fbug	59.487	3	7.457	Bridger backswing UF - OK
76	B09c	Bridger – 3M leKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.429	5	9.637	Bridger backswing UF - OK
77	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None						
78	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None						
79	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None						
80	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None						
81	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None						
82	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	37	537	MALL 69	73	vbul	0.00606	99.4%	2.0708	235	248.6	1087	TESORO 13.8	65	fbug	8.7064	1087	120.5	
83	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None						
84	B15g	Aeolus – Anticline 500 kV L ne w/ Aeolus Gen Drop																										3Phs	3	0	None									None						
85	B16	Aeolus – Mona 500 kV Line																										3Phs	3	47	1600	CRCK PST 230	65	vbus	0.00000	100.0%	14.566	1600	1132	None						
86	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None						
87	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None						
88																																														
89																																														
90	**LEVEL "C" CONTINGENCIES**																																													
93	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None						
94	C02a	Bridger – Populus 345 kV L nes 1 & 2 w/ RAS																										SLG	3	0	None									None						
95	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
96	C03	Bridger–3M Knoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None									None						
97	C03a	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
98	C03b	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
99	C03c	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
100	C04	Bridger–3M Knoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None									None						
101	C04a	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
102	C04b	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
103	C04c	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
104	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None						
105	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
106	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None						
107	C06a	Populus – Ben Lomond 345 kV L nes 2 & 3																										SLG	3	0	None									None						
108	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None						
109	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None						
110	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None						
113	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None									None						
114	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None						
115	C14	Palo Verde Generation Units 2 & 3																										None		0	None									None						

Appendix 4-6 - - - Dynamic Stability Results For Bridger / Anticline West vs. Bonanza West

			BASE CASE PA H FLOWS																									Fault		Voltage Deviations									Frequency Deviations							
INE #	CON INGENCY ID	CON INGENCY / BASE CASE NAME	Aeolus South (88)	Aeolus West (87)	Bridger West 500 (96)	Bridger West 345 (19)	New Path C (NB=) 94)	Borah West (17)	Monu Naughtn (84)	West of RS / FH (85)	Midpoint West (92)	Montana SE (80)	Montana Idaho (P18)	ot 4a (37)	Bonanza West (33)	ot 1a (30)	daho Sierra (16)	PDCI (65)	COI (66)	Path 36	PP DC (27)	Pavant PP Gonder	RedB H Allen (ot 2C)	Pinto 4Comers (281)	Sigurd G enC (28 2)	daho Area System osses	Pace Area System osses	ault Type	ault Duration, Cycles	Unstab e Gens	Dip Devia-tions	Bus Name and kV	Area	Type	Minimum (p.u.)	% Devia io n	Time (Sec.)	20/ 0 Cycle Dev a-tions	Max Time, Cycle s	Freq. Dip Devia-tions	Bus Name and kV	Area	Type	Minimu m (Hz)	6 Cycle Devia-tions	Max Time (Cycle s)	Comments
5		**egwstg1 8h6 4100 2400 1502 695 sav**	1610	2 0	1700	2 00	-1550	1370	336	6 3	363	123	-225	213	737	60	13	226	2 90	669	180	92	50	37	211	219	737																				
6		**LEVEL "B" CON INGENC ES**																																												
7	B01	An icline – Populus 500 kV Line																										3Phs	3	0	None								None							
8	B01a	An icline – Populus 500 kV Line																										3Phs	3	0	None								None							
9	B01g	An icline – Populus 500 kV Line																										3Phs	3	0	None								None							
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None								None							
12	B0	Borah – M dpoint 500 kV Line																										3Phs	3	0	None								None							
1	B06	Cedar Hl I – Hemingway 500 kV Line																										3Phs	3	0	None								None							
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
16	B08	Bridger – Populus 3 5 kV Line																										3Phs	3	0	None									BRIDGER2 22.0	60	fbug	59. 78		8.182	Bridger backswing UF - OK
17	B09	Bridger – 3MileKno l 3 5 kV Line																										3Phs	3	0	None									BRIDGER2 22.0	60	fbug	59. 53		8.862	Bridger backswing UF - OK
18	B09a	Bridger – 3MileKno l 3 5 kV Line																										3Phs	3	0	None								3	BRIDGER3 22.0	60	fbug	59. 87	3	7.088	Bridger backswing UF - OK
19	B09c	Bridger – 3MileKno l 3 5 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59. 50	5	8.9 7	Bridger backswing UF - OK
20	B10	Populus – Borah #1 3 5 kV Line																										3Phs	3	0	None								None							
21	B11	Populus – Borah #2 3 5 kV Line																										3Phs	3	0	None								None							
22	B12	Populus – Kinport 3 5 kV Line																										3Phs	3	0	None								None							
23	B13	Borah – Kinport 3 5 kV Line																										3Phs	3	0	None								None							
2	B1	Borah – Adelaide – Midpoint #1 3 5 kV Line																										3Phs	3	0	None								None							
25	B15	Aeolus – An ic ine 500 kV Line																										3Phs	3	33	513	TROWBRDG 115	65	vbul	0.00161	99.8%	6.7583	227	326.2	827	SIDNEYDC 230	73	fbug	13.019	827	91.5	
26	B15a	Aeolus – An ic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
27	B15g	Aeolus – An ic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None								None							
29	B16a	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
30	B16g	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
32																												3Phs	3																	
33		**LEVEL "C" CON INGENC ES**																										3Phs	3																	
36	C02	Bridger – Populus 3 5 kV Lines 1 & 2																										3Phs	3	0	None								None							
37	C02a	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																										3Phs	3	0	None								None							
38	C02b	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																												0	None								None							
39	C03	Bridger–3M Knoll Br dger–Populus #1 3 5 kV lines																										SLG	3	0	None								None							
0	C03a	Bridger–3M Knoll Br dger–Populus #1 3 5 kV w/ RAS																										SLG	3	0	None								None							
1	C03b	Bridger–3M Knoll Br dger–Populus #1 3 5 kV w/ RAS																												0	None								None							
2	C03c	Bridger–3M Knoll Br dger–Populus #1 3 5 kV w/ RAS																												0	None								None							
3	C0	Bridger–3M Knoll Br dger–Populus #2 3 5 kV lines																										SLG	3	0	None								None							
	C0 a	Bridger–3M Knoll Br dger–Populus #2 3 5 kV w/ RAS																										SLG	3	0	None								None							
5	C0 b	Bridger–3M Knoll Br dger–Populus #2 3 5 kV w/ RAS																												0	None								None							
6	C0 c	Bridger–3M Knoll Br dger–Populus #2 3 5 kV w/ RAS																												0	None								None							
7	C05	Borah – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None								None							
8	C05a	Borah – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
9	C06	Populus – Ben Lomond 3 5 kV Lines 2 & 3																										SLG	3	0	None								None							
50	C06a	Populus – Ben Lomond 3 5 kV Lines 2 & 3																												0	None								None							
51	C07	Populus–Kinport Populus–Borah #2 3 5 kV Lines																										SLG	3	0	None								None							
52	C08	Populus–Borah #2 3 5 kV Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
53	C09	Borah – Adelaide #2 Borah – Hunt 230 kV ines																										SLG	3	0	None								None							
56	C12	Borah–Adel–Midpoint #1 Midpoint–Ade aide #2 3 5 kV lines																										SLG	3	0	None								None							
57	C13	Midpoint–Ade aide #2 3 5 kV Borah – Hunt 230 kV ines																										SLG	3	0	None								None							
58	C1	Pa o Verde Generat on Units 2 & 3																										None		0	None								None							
59																																														
60		**egwstg1 8h6_3952_2400_1458_785 sav**	1 58	2526	1552	2 00	-1 09	1373	332	639	365	131	-22	2168	785	6 7	136	22 8	2610	791	186	96	50	393	219	218	660																				
61		**LEVEL "B" CON INGENC ES**																																												
62	B01	An icline – Populus 500 kV Line																										3Phs	3	0	None								None							
63	B01a	An icline – Populus 500 kV Line																										3Phs	3	0	None								None							
6	B01g	An icline – Populus 500 kV Line																										3Phs	3	0	None								None							
65	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
66	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None								None							
67	B0	Borah – M dpoint 500 kV Line																										3Phs	3	0	None								None							
69	B06	Cedar Hl I – Hemingway 500 kV Line																										3Phs	3	0	None								None							
70	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
71	B08	Bridger – Populus 3 5 kV Line																										3Phs	3	0	None									BRIDGER2 22.0	60	fbug	59. 9		7.3 6	Bridger backswing UF - OK
72	B09	Bridger – 3MileKno l 3 5 kV Line																										3Phs	3	0	None									BRIDGER2 22.0	60	fbug	59. 88		7.902	Bridger backswing UF - OK
73	B09a	Bridger – 3MileKno l 3 5 kV Line																										3Phs	3	0	None								3	BRIDGER3 22.0	60	fbug	59.506	3	6.628	Bridger backswing UF - OK
7	B09c	Bridger – 3MileKno l 3 5 kV Line																										3Phs	3	0	None									BRIDGER2 22.0	60	fbug	59. 71		8.15	Bridger backswing UF - OK
75	B10	Populus – Borah #1 3 5 kV Line																										3Phs	3	0	None								None							
76	B11	Populus – Borah #2 3 5 kV Line																										3Phs	3	0	None								None							No .csv fi e !!!!!
77	B12	Populus – Kinport 3 5 kV Line																										3Phs	3	0	None								None							
78	B13	Borah – Kinport 3 5 kV Line																										3Phs	3	0	None								None							
79	B1	Borah – Adelaide – Midpoint #1 3 5 kV Line																										3Phs	3	0	None								None							
80	B15	Aeolus – An ic ine 500 kV Line																										3Phs	3	3	582	FREMONT 115	73	vbus	0.0026	99.7%	16 8 6	292	10 3	1036	MED BOW 115	73	fbul	2 . 95	1036	7 .87	
81	B15a	Aeolus – An ic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	1	None								None							
82	B15g	Aeolus – An ic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	1	None								None							
83	B16	Aeolus – Mona 500 kV Line																										3Phs	3	1	None								None							Bonanza OEL trips disabled
8	B16a	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	1	None								None							Bonanza OEL trips disabled
85	B16g	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	1	None								None							Bonanza OEL trips disabled
86	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
87																																														
88		**LEVEL "C" CON INGENC ES**																																												
91	C02	Bridger – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None								None							
92	C02a	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
93	C02b	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
9	C03	Bridger–3M Knoll Br dger–Populus #1 3 5 kV lines																										SLG	3	0	None								None							
95	C03a	Bridger–3M Knoll Br dger–Populus #1 3 5 kV w/ RAS																										SLG	3	0	None								None							
96	C03b	Bridger–3M Knoll Br dger–Populus #1 3 5 kV w/ RAS																										SLG	3	0	None								None							
97	C03c	Bridger–3M Knoll Br dger–Populus #1 3 5 kV w/ RAS																										SLG	3	0	None								None							
98	C0	Bridger–3M Knoll Br dger–Populus #2 3 5 kV lines																										SLG	3	0	None								None							
99	C0 a	Bridger–3M Knoll Br dger–Populus #2 3 5 kV w/ RAS																										SLG	3	0	None								None							
100	C0 b	Bridger–3M Knoll Br dger–Populus #2 3 5 kV w/ RAS																										SLG	3	0	None								None							
101	C0 c	Bridger–3M Knoll Br dger–Populus #2 3 5 kV w/ RAS																										SLG	3	0	None								None							
102	C05	Borah – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None								None							
103	C05a	Borah – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
10	C06	Populus – Ben Lomond 3 5 kV Lines 2 & 3																										SLG	3	0	None								None							
105	C06a	Populus – Ben Lomond 3 5 kV Lines 2 & 3																										SLG	3	0	None								None							
106	C07	Populus–Kinport Populus–Borah #2 3 5 kV Lines																										SLG	3	0	None								None							
107	C08	Populus–Borah #2 3 5 kV Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
108	C09	Borah – Adelaide #2 Borah – Hunt 230 kV ines																										SLG	3	0	None								None							
111	C12	Borah–Adel–Midpoint #1 Midpoint–Ade aide #2 3 5 kV lines																										SLG	3	0	None								None							
112	C13	Midpoint–Ade aide #2 3 5 kV Borah – Hunt 230 kV ines																										SLG	3	0	None								None							
113	C1	Pa o Verde Generat on Units 2 & 3																										None		1	3	YORKCANY 13.8	10	vbug	0.572989	0. 3729	1 .10	0	0.1 9	3	ROSEBUD 115	10	fbus	.569	3	9.9 6	YORKCANY 13.8 Unstable
11																																														
115		**egwstg1 8h6 3708 32302 1497 785 2266 sav**	1 97	2266	1 06	2302	-1671	922	313	618	-118	133	-262	2002	785	629	170	2203	2502	681	2203	57	506	307	181	216	622																				
116	B16	Aeolus – Mona 500 kV Line																										3Phs	3	1	21	BONANZA 2	65	vbug	0. 12975	0.59356	11.708	17	521.3	None							BONANZA Trip on OEL
117	B16a	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 2	65	vbug	0. 2 311	0.582 1	13.179	17	33	None							BONANZA Trip on OEL
118	B16g	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	1	21	BONANZA 2	65	vbug	0. 2 915	0.58181	13 217	17	30.8	None							BONANZA Trip on OEL
119	C1	Pa o Verde Generat on Units 2 & 3																										None		0	None								None							
120																																														
121		**egwstg1 8h6 3630 2268 1519 785 2202 sav**	1519	2202	1362	2268	-1793	750	326	631	-302	133	-286	1958	785	627	183	2170	258	767	2203	51	82	290	17	220	618	3Phs	3																		
122	B16g	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																												1	21	BONANZA 2	65	vbug	0. 23925	0.58279	13.1 2	17	35.3	None							BONANZA Trip on OEL
123																																														
12		**egwstg1 8h6_3543_2267_1419_785_2066 sav**	1 19	2066	1276	2267	-1673	781	286	590	-262	128	-280	1897	785	630	17	2179	25 9	730	2203	5	92	297	177	218	587	3Phs	3																		
125	B16g	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																												0	None								None							

Appendix 4-7 - - - Dynamic Stability Results For Bridger / Anticline West vs. Path 18

			BASE CASE PATH FLOWS																									Fault			Voltage Deviations									Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South (89)	Aeolus West (87)	Bridger West 500 (96)	Bridger West 345 (19)	New Path C (NB +) (94)	Borah West (17)	Monu Naughtn (84)	West of RS / FH (85)	Midpoint West (92)	Montana SE (80)	Montana Idaho (P18)	Tot 4a (37)	Bonanza West (33)	Tot 1a (30)	Idaho Sierra (16)	PDCI (65)	COI (66)	Path 26	IPP DC (27)	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners (281)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
5		**egwstg1 8h7 jbw18a 4100 2400 1472 337.sav**	1472	2604	1700	2400	-1073	1916	197	498	909	-70	-337	1974	678	524	107	2246	2450	633	1804	126	504	414	226	254	684																				
6	**LEVEL "B" CONTINGENCIES**																																													
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None						
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None						
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None						
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None						
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None						
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None						
14	B06	Cedar H II – Hemingway 500 kV Line																										3Phs	3	0	None									None						
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None						
16	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.462	4	8.605	Bridger backswing UF - OK
17	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.450	5	9.186	Bridger backswing UF - OK
18	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									3	BRIDGER2 22.0	60	fbug	59.478	3	7.614	Bridger backswing UF - OK
19	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									6	BRIDGER3 22.0	60	fbug	59.431	6	9.526	Bridger backswing UF - OK
20	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None						
21	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None						
22	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None						
23	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None						
24	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None						
25	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	34	637	BUFFALO 20	65	vbul	0.000993	99.9%	8.7457	316	1088	None	GLENDO 115	73	fbul	23.872	868	112.5	
26	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None						
27	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None						
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None									None						
29	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None						
30	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None						
31																																														
32	**LEVEL "C" CONTINGENCIES**																																													
35	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None						
36	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
37	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
38	C03	Bridger–3MiKnoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None									None						
39	C03a	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
40	C03b	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
41	C03c	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
42	C04	Bridger–3MiKnoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None									None						
43	C04a	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
44	C04b	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
45	C04c	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
46	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None						
47	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
48	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None						
49	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None						
50	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None						
51	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None						
52	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None						
55	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None									None						
56	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None						
57	C14	Palo Verde Generation Units 2 & 3																										None		0	None									None						
58																																														
59																																														

Appendix 4-8 - - - Dynamic Stability Results For Bridger / Anticline West vs. Monument - Naughton

			BASE CASE PA H FLOWS																								Fault			Voltage Deviations									Frequency Deviations							
LINE #	CON INGENCY ID	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	ot 1a (30)	Monu Naughtn	West of RS / PH	Midpoint West	Montana SE	Montana Idaho (P18)	ot 4a	Bonanza West	Idaho S erra	PDCI	COI	Path 26	IPP DC	Pavant IPP Gonder	RedB H Allen (ot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration Cycles	Unstable Gens	Dip Dev a-tions	Bus Name and kV	Area	Type	Minimum (p.u)	% Deviatio n	Time (Sec.)	20/ 0 Cycle Devia-tions	Max Time, Cycle s	Freq. Dip Devia-tions	Bus Name and kV	Area	Type	Minimu m (Hz)	6 Cycle Devia-tions	Max Time (Cycle s)	Comments
5		egwstg1 8h9 mn 4100 2400 2642 1480 332 492 sav																																												
6	LEVEL "B" CON INGENCIES																																													
7	B01	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None							
8	B01a	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None							
9	B01g	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None							
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None							
12	B0	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None							
1	B06	Cedar Hi l – Hemingway 500 kV Line																										3Phs	3	0	None									None							
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None							
16	B08	Bridger – Populus 3 5 kV Line																										3Phs	3	0	None										BRIDGER2 22 0	60	fbug	59. 88		7.9 6	Bridger backswing UF - OK
17	B09	Bridger – 3Mi eKnoll 3 5 kV Line																										3Phs	3	0	None										BRIDGER2 22 0	60	fbug	59. 73		8.5	Bridger backswing UF - OK
18	B09a	Bridger – 3Mi eKno l 3 5 kV Line																										3Phs	3	0	None									3	BRIDGER3 22 0	60	fbug	59. 92	3	6.98	Bridger backswing UF - OK
19	B09c	Bridger – 3Mi eKnoll 3 5 kV Line																										3Phs	3	0	None										BRIDGER2 22 0	60	fbug	59. 58		8.788	Bridger backswing UF - OK
20	B10	Populus – Borah #1 3 5 kV Line																										3Phs	3	0	None									None							
21	B11	Populus – Borah #2 3 5 kV Line																										3Phs	3	0	None									None							
22	B12	Populus – Kinport 3 5 kV Line																										3Phs	3	0	None									None							
23	B13	Borah – Kinport 3 5 kV Line																										3Phs	3	0	None									None							
2	B1	Borah – Adelaide – Midpoint #1 3 5 kV Line																										3Phs	3	0	None									None							
25	B15	Aeolus – Ant cline 500 kV Line																										3Phs	3	3	75	PLATTE 3 .5	65	vbul	0.00	99 6%	8.1083	190	199.9	701	SIDNEYDC 230	73	fbug	2 33	701	.73	Resolved w th 15a
26	B15a	Aeolus – Ant cline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
27	B15g	Aeolus – Ant cline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None									None							
29	B16a	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
30	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None							
31																																														
32																																														
33	LEVEL "C" CON INGENCIES																																													
36	C02	Bridger – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None									None							
37	C02a	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
38	C02b	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																												0	None									None							
39	C03	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV ines																										SLG	3	0	None									None							
0	C03a	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																										SLG	3	0	None									None							
1	C03b	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																												0	None									None							
2	C03c	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																												0	None									None							
3	C0	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV ines																										SLG	3	0	None									None							
	C0 a	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																										SLG	3	0	None									None							
5	C0 b	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																												0	None									None							
6	C0 c	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																												0	None									None							
7	C05	Borah – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None									None							
8	C05a	Borah – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
9	C06	Populus – Ben Lomond 3 5 kV Lines 2 & 3																										SLG	3	0	None									None							
50	C06a	Populus – Ben Lomond 3 5 kV Lines 2 & 3																												0	None									None							
51	C07	Populus–Kinport Populus–Borah #2 3 5 kV Lines																										SLG	3	0	None									None							
52	C08	Populus–Borah #2 3 5 kV Treastn–Brady 230 kV Lines																										SLG	3	0	None									None							
53	C09	Borah – Adelaide #2 Borah – Hunt 230 kV ines																										SLG	3	0	None									None							
56	C12	Borah–Adel–Midpoint #1 Midpoint–Adelaide #2 3 5 kV lines																										SLG	3	0	None									None							
57	C13	Midpoint–Adelaide #2 3 5 kV Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
58	C1	Palo Verde Generat on Uni s 2 & 3																										None		0	None									None							
59																																														
60																																														
61		egwstg1 8h9 mn 3971 2650 1482 475 640 sav																																												
62	LEVEL "B" CON INGENCIES																																													
63	B01	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None							
6	B01a	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None							
65	B01g	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None							
66	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None							
67	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None							
68	B0	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None							
70	B06	Cedar Hi l – Hemingway 500 kV Line																										3Phs	3	0	None									None							
71	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None							
72	B08	Bridger – Populus 3 5 kV Line																										3Phs	3	0	None										BRIDGER2 22 0	60	fbug	59. 8		8 02	Bridger backswing UF - OK
73	B09	Bridger – 3Mi eKno l 3 5 kV Line																										3Phs	3	0	None										BRIDGER2 22 0	60	fbug	59. 60		8.7	Bridger backswing UF - OK
7	B09a	Bridger – 3Mi eKno l 3 5 kV Line																										3Phs	3	0	None									3	BRIDGER3 22.0	60	fbug	59. 89	3	7.025	Bridger backswing UF - OK
75	B09c	Bridger – 3Mi eKno l 3 5 kV Line																										3Phs	3	0	None									5 5	BRIDGER2 22.0	60	fbug	59. 5	5	8.8	Bridger backswing UF - OK
76	B10	Populus – Borah #1 3 5 kV Line																										3Phs	3	0	None									None							
77	B11	Populus – Borah #2 3 5 kV Line																										3Phs	3	0	None									None							
78	B12	Populus – Kinport 3 5 kV Line																										3Phs	3	0	None									None							
79	B13	Borah – Kinport 3 5 kV Line																										3Phs	3	0	None									None							
80	B1	Borah – Adelaide – Midpoint #1 3 5 kV Line																										3Phs	3	0	None									None							
81	B15	Aeolus – Ant cline 500 kV Line																										3Phs	3	36	85	GUERNSY1 2.	73	vbug	0.001	99 9%	11.521	218	81.88	78	SIDNEYDC 230	73	fbug	3 97	78	57.77	Resolved w th 15a
82	B15a	Aeolus – Ant cline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
83	B15g	Aeolus – Ant cline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
8	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None									None							
85	B16a	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
86	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None							
87																																														
88																																														
89	LEVEL "C" CON INGENCIES																																													
92	C02	Bridger – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None									None							
93	C02a	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
9	C02b	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																												0	None									None							
95	C03	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV ines																										SLG	3	0	None									None							
96	C03a	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																										SLG	3	0	None									None							
97	C03b	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																												0	None									None							
98	C03c	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																												0	None									None							
99	C0	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV ines																										SLG	3	0	None									None							
##	C0 a	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																										SLG	3	0	None									None							
##	C0 b	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																												0	None									None							
##	C0 c	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																												0	None									None							
##	C05	Borah – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None									None							
##	C05a	Borah – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
##	C06	Populus – Ben Lomond 3 5 kV Lines 2 & 3																										SLG	3	0	None									None							
##	C06a	Populus – Ben Lomond 3 5 kV Lines 2 & 3																												0	None									None							
##	C07	Populus–Kinport Populus–Borah #2 3 5 kV Lines																										SLG	3	0	None									None							
##	C08	Populus–Borah #2 3 5 kV Treastn–Brady 230 kV Lines																										SLG	3	0	None									None							
##	C09	Borah – Adelaide #2 Borah – Hunt 230 kV ines																										SLG	3	0	None									None							
##	C12	Borah–Adel–Midpoint #1 Midpoint–Adelaide #2 3 5 kV lines																										SLG	3	0	None									None							
##	C13	Midpoint–Adelaide #2 3 5 kV Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
##	C1	Palo Verde Generat on Uni s 2 & 3																										None		0	None									None							
##																																														

Appendix 4-9 - - - Dynamic Stability Results For Bridger / Anticline West vs. Monument - Naughton

			BASE CASE PA H FLOWS																								Fault		Unstable Gens	Voltage Deviations								Frequency Deviations							
LINE #	CON INGENCY ID	CON INGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB=)	Borah West	ot 1a (30)	Monu Naughtn	West of RS / FH	Midpoint West	Montana SE	Montana Idaho (P18)	ot 4a	Bonanza West	Idaho S erra	PDCI	COI	Path 26	IPP DC	Pavant IPP Gonder	RedB H Alen (ot 2C)	Pinto 4Comers (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles		Dip Devia-tions	Bus Name and kV	Area	Type	Minimum (p.u.)	% Devia io n	Time (Sec.)	20/ 0 Cycle Devia-tions	Max Time, Cyc e s	Freq. Dip Dev a-t ons	Bus Name and kV	Area	Type	Minimu m (Hz)	6 Cycle Devia-tions	Max Time (Cycle s)	Comments
5		**egwstg1 8h9_RF_4100_2400_2638_1482_096_489 sav**																																												
6	**LEVEL "B" CON NGENCIES**																																													
7	B01	Ant cline – Populus 500 kV Line																										3Phs	3	0	None								None							
8	B01a	Ant cline – Populus 500 kV Line																										3Phs	3	0	None								None							
9	B01g	Ant cline – Populus 500 kV Line																										3Phs	3	0	None								None							
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
11	B03	Populus – Cedar H ll 500 kV Line																										3Phs	3	0	None								None							
12	B0	Borah – Midpoint 500 kV Line																										3Phs	3	0	None								None							
1	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None								None							
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
16	B08	Bridger – Populus 3 5 kV Line																										3Phs	3	0	None									BRIDGER2 22.0	60	fbug	59. 79		8.15	Br dger backswing UF - OK
17	B09	Bridger – 3MileKnoll 3 5 kV Line																										3Phs	3	0	None									BRIDGER2 22.0	60	fbug	59. 59		8.7	Br dger backswing UF - OK
18	B09a	Bridger – 3MileKnoll 3 5 kV Line																										3Phs	3	0	None								3	BRIDGER3 22.0	60	fbug	59. 85	3	7.152	Br dger backswing UF - OK
19	B09c	Bridger – 3MileKnoll 3 5 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59. 7	5	8.979	Br dger backswing UF - OK
20	B10	Populus – Borah #1 3 5 kV Line																										3Phs	3	0	None								None							
21	B11	Populus – Borah #2 3 5 kV Line																										3Phs	3	0	None								None							
22	B12	Populus – Kinport 3 5 kV Line																										3Phs	3	0	None								None							
23	B13	Borah – Kinport 3 5 kV Line																										3Phs	3	0	None								None							
2	B1	Borah – Ade aide – Midpoint #1 3 5 kV Line																										3Phs	3	0	None								None							
25	B15	Aeolus – Antic ine 500 kV Line																										3Phs	3	3	91	BAIROIL 57	65	vbul	0.007	99.6%	10.283	216	81.3	711	SIDNEYDC 230	73	fbug	10.02	711	57.57	Resolved with 15a
26	B15a	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
27	B15g	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None								None							
29	B16a	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
30	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
31																																														
32																																														
33	**LEVEL "C" CON NGENCIES**																																													
36	C02	Bridger – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None								None							
37	C02a	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
38	C02b	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																												0	None								None							
39	C03	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV lines																										SLG	3	0	None								None							
0	C03a	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																										SLG	3	0	None								None							
1	C03b	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																												0	None								None							
2	C03c	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																												0	None								None							
3	C0	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV lines																										SLG	3	0	None								None							
	C0 a	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																										SLG	3	0	None								None							
5	C0 b	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																												0	None								None							
6	C0 c	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																												0	None								None							
7	C05	Borah – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None								None							
8	C05a	Borah – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
9	C06	Populus – Ben Lomond 3 5 kV Lines 2 & 3																										SLG	3	0	None								None							
50	C06a	Populus – Ben Lomond 3 5 kV Lines 2 & 3																												0	None								None							
51	C07	Populus–Kinport Populus–Borah #2 3 5 kV Lines																										SLG	3	0	None								None							
52	C08	Populus–Borah #2 3 5 kV Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
53	C09	Borah – Ade aide #2 Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
56	C12	Borah–Adel–Midpoint #1 Midpoint–Ade aide #2 3 5 kV ines																										SLG	3	0	None								None							
57	C13	Midpoint–Ade aide #2 3 5 kV Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
58	C1	Pa o Verde Generation Units 2 & 3																										None		0	None								None							
59																																														
60																																														
61		**egwstg1 8h9_RF_3972_2400_2650_1482_241_640 sav**																																												
62	**LEVEL "B" CON NGENCIES**																																													
63	B01	Ant cline – Populus 500 kV Line																										3Phs	3	0	None								None							
6	B01a	Ant cline – Populus 500 kV Line																										3Phs	3	0	None								None							
65	B01g	Ant cline – Populus 500 kV Line																										3Phs	3	0	None								None							
66	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
67	B03	Populus – Cedar H ll 500 kV Line																										3Phs	3	0	None								None							
68	B0	Borah – Midpoint 500 kV Line																										3Phs	3	0	None								None							
70	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None								None							
71	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
72	B08	Bridger – Populus 3 5 kV Line																										3Phs	3	0	None									BRIDGER2 22.0	60	fbug	59. 75		8.273	Br dger backswing UF - OK
73	B09	Bridger – 3MileKnoll 3 5 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59. 9	5	9.0	Br dger backswing UF - OK
7	B09a	Bridger – 3MileKnoll 3 5 kV Line																										3Phs	3	0	None								3	BRIDGER3 22.0	60	fbug	59. 80	3	7.273	Br dger backswing UF - OK
75	B09c	Bridger – 3MileKnoll 3 5 kV Line																										3Phs	3	0	None								5	BRIDGER2 22.0	60	fbug	59. 1	5	9.105	Br dger backswing UF - OK
76	B10	Populus – Borah #1 3 5 kV Line																										3Phs	3	0	None								None							
77	B11	Populus – Borah #2 3 5 kV Line																										3Phs	3	0	None								None							
78	B12	Populus – Kinport 3 5 kV Line																										3Phs	3	0	None								None							
79	B13	Borah – Kinport 3 5 kV Line																										3Phs	3	0	None								None							
80	B1	Borah – Ade aide – Midpoint #1 3 5 kV Line																										3Phs	3	0	None								None							
81	B15	Aeolus – Antic ine 500 kV Line																										3Phs	3	3	9	PLATTE 230	65	vbus	0.003	99.7%	7.1333	222	227.2	756	SPRNGCAN 230	73	fbul	15.79	756	6.12	Resolved with 15a
82	B15a	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
83	B15g	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
8	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None								None							
85	B16a	Aeolus – Mona 500 kV Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
86	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
87																																														
88																																														
89	**LEVEL "C" CON NGENCIES**																																													
92	C02	Bridger – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None								None							
93	C02a	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
9	C02b	Bridger – Populus 3 5 kV Lines 1 & 2 w/ RAS																												0	None								None							
95	C03	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV lines																										SLG	3	0	None								None							
96	C03a	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																										SLG	3	0	None								None							
97	C03b	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																												0	None								None							
98	C03c	Bridger–3MiKnoll Bridger–Populus #1 3 5 kV w/ RAS																												0	None								None							
99	C0	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV lines																										SLG	3	0	None								None							
100	C0 a	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																										SLG	3	0	None								None							
101	C0 b	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																												0	None								None							
102	C0 c	Bridger–3MiKnoll Bridger–Populus #2 3 5 kV w/ RAS																												0	None								None							
103	C05	Borah – Populus 3 5 kV Lines 1 & 2																										SLG	3	0	None								None							
10	C05a	Borah – Populus 3 5 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
105	C06	Populus – Ben Lomond 3 5 kV Lines 2 & 3																										SLG	3	0	None								None							
106	C06a	Populus – Ben Lomond 3 5 kV Lines 2 & 3																												0	None								None							
107	C07	Populus–Kinport Populus–Borah #2 3 5 kV Lines																										SLG	3	0	None								None							
108	C08	Populus–Borah #2 3 5 kV Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
109	C09	Borah – Ade aide #2 Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
112	C12	Borah–Adel–Midpoint #1 Midpoint–Ade aide #2 3 5 kV ines																										SLG	3	0	None								None							
113	C13	Midpoint–Ade aide #2 3 5 kV Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
11	C1	Pa o Verde Generation Units 2 & 3																										None		0	None								None							
115																																														

Appendix 4-10 - - - Dynamic Stability Results For Bridger / Anticline West vs. MSTI

			BASE CASE PATH FLOWS																									Fault			Voltage Deviations									Frequency Deviations						
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South (88)	Aeolus West (87)	Bridger West 500 (96)	Bridger West 345 (19)	New Path C (NB +) (94)	Borah West (17)	Monu Naughtn (84)	West of RS / FH (85)	Midpoint West (92)	Montana SE (80)	Montana Idaho (P18)	Tot 4a (37)	Bonanza West (33)	Tot 1a (30)	Idaho Sierra (16)	PDCI (65)	COI (66)	Path 26	IPP DC (27)	Pavant+IPP Gonder	RedB H.Allen (Tot 2C	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																														
5		**egwstg1 8h7 jbwc msti 1496 4100 2400 1502 298.sav**	1502	2686	1700	2400	-1248	1750	267	570	2187	127	-298	2059	660	501	122	2431	2308	493	1804	113	504	488	253	239	702																			
6	**LEVEL "B" CONTINGENCIES**																																													
7	B01	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None						
8	B01a	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None						
9	B01g	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None						
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None						
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None						
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	1	None									None						
14	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	1	None									None						
15	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	1	None									None						
16	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.447	5	9.066	Bridger backswing UF - OK
17	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									5	BRIDGER2 22.0	60	fbug	59.443	5	8.2	Bridger backswing UF - OK
18	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									3	BRIDGER3 22.0	60	fbug	59.462	3	1.433	Bridger backswing UF - OK
19	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									6	BRIDGER2 22.0	60	fbug	59.434	6	9.666	Bridger backswing UF - OK
20	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None						
21	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None						
22	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None						
23	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None						
24	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None						
25	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	58	633	CASPERLM 115	73	vbul	0.0054	99.5%	9.9986	381	1105	1440	SC1 15 12.47	65	fbul	0.15	1440	294	Resolved with 15a
26	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None						
27	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																												0	None									None						
28	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None									None						
29	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None						
30	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None						
31																																														
32																																														
33	**LEVEL "C" CONTINGENCIES**																																													
36	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None						
37	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
38	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
39	C03	Bridger–3MiKnoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None									None						
40	C03a	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
41	C03b	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
42	C03c	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None						
43	C04	Bridger–3MiKnoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None									None						
44	C04a	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
45	C04b	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
46	C04c	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None						
47	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None						
48	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None						
49	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None						
50	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None						
51	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None						
52	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None						
53	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None						
56	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None									None						
57	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None						
58	C14	Palo Verde Generation Un ts 2 & 3																										None		0	None									None						

Appendix 4-11 Pg.1 - - - Dynamic Stability Results For Path C Southbound vs. Idaho - Montana (Path 18)

			BASE CASE PATH FLOWS																									Fault			Voltage Deviations									Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	TOT 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	Tot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																															
5		**egwstg1 8h8 pcs 2250 p18 337ts.sav**	**1661**	**1569**	**1632**	**1890**	**2250**	**256**	**441**	**0**	**297**	**724**	**124**	**337**	**1425**	**596**	**190**	**2996**	**3176**	**1314**	**1804**	**40**	**544**	**317**	**199**	**222**	**612**																				
6	**LEVEL "B" CONTINGENCIES**																																														
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None																
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None																
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	**NOT SIMULTATED**																	
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None																
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None																
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None																
13	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None																
14	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None																
15	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None																
16	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.528	4	6.10926	Bridger backswing UF - OK
17	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	**NOT SIMULTATED**																	
18	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	**NOT SIMULTATED**																	
19	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None																
20	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None																
21	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None																
22	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None																
23	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None																
24	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	0	None																
25	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None																
26	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None																
27	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None																
28	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None																
29	B16d	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None																
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None																
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None																
32																																															
33																																															
34	**LEVEL "C" CONTINGENCIES**																																														
35	C01	Anticline – Populus 500 kV Lines 1 & 2																																													
36	C01a	Anticline – Populus 500 kV Lines 1 & 2 w/ RAS																																													
37	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None																
38	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None																
39	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	**NOT SIMULTATED**																	
40	C03	Bridger–3MiKnoll + Bridger–Populus #1 345 kV ines																										SLG	3	0	None																
41	C03a	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None																
42	C03b	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None																
43	C03c	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	**NOT SIMULTATED**																	
44	C03d	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None																
45	C03e	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None																
46	C04	Bridger–3MiKnoll + Bridger–Populus #2 345 kV ines																										SLG	3	0	None																
47	C04a	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None																
48	C04b	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None																
49	C04c	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	**NOT SIMULTATED**																	
50	C04d	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None																
51	C04e	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None																
52	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None																
53	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	**NOT SIMULTATED**																	
54	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None																
55	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	**NOT SIMULTATED**																	
56	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None																
57	C08	Populus–Borah #2 345 kV + Treasm–Brady 230 kV Lines																										SLG	3	0	None																
58	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None																
59	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV ines																										SLG	3	0	None																
60	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None																
61	C14	Palo Verde Generation Units 2 & 3																										None		0	None																

Appendix 4-11 Pg. 2 - - - Dynamic Stability Results For Path C Southbound vs. Idaho - Montana (Path 18)

			BASE CASE PATH FLOWS																									Fault			Voltage Deviations									Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	TOT 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	Tot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																															
5		egwstg1 8h8 pcs 2250 p18 285ts.sav	1690	1622	1668	1920	2250	265	483	0	297	716	123	285	1521	629	190	2996	3152	1293	1804	40	538	308	197	223	619																				
6	LEVEL "B" CONTINGENCIES																																														
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	NOT SIMULTATED																	
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None							
13	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None									None							
14	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None							
15	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									None							
16	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.528	4	6.12042	Bridger backswing UF - OK
17	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	NOT SIMULTATED																	
18	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	NOT SIMULTATED																	
19	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None							
20	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None							
21	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None							
22	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None							
23	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None							
24	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	0	None									None							
25	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
26	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
27	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None									None							
28	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
29	B16d	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None							
32																																															
33																																															
34	LEVEL "C" CONTINGENCIES																																														
35	C01	Anticline – Populus 500 kV Lines 1 & 2																																													
36	C01a	Anticline – Populus 500 kV Lines 1 & 2 w/ RAS																																													
37	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
38	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
39	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																	
40	C03	Bridger–3MiKnoll + Bridger–Populus #1 345 kV ines																										SLG	3	0	None									None							
41	C03a	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
42	C03b	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
43	C03c	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																	
44	C03d	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
45	C03e	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
46	C04	Bridger–3MiKnoll + Bridger–Populus #2 345 kV ines																										SLG	3	0	None									None							
47	C04a	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
48	C04b	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
49	C04c	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																	
50	C04d	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
51	C04e	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
52	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
53	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																	
54	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None							
55	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	NOT SIMULTATED																	
56	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None							
57	C08	Populus–Borah #2 345 kV + Treasm–Brady 230 kV Lines																										SLG	3	0	None									None							
58	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
59	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV ines																										SLG	3	0	None									None							
60	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
61	C14	Palo Verde Generation Units 2 & 3																										None		0	None									None							

Appendix 4-12 Pg. 1 - - - Dynamic Stability Results For Path C Southbound vs. Bonanza West

			BASE CASE PATH FLOWS																								Fault			Voltage Deviations									Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	TOT 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	Tot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																														
5		egwstg1 8h8 pcs 1849 bw 785ts.sav	1606	1972	1560	2341	1850	943	586	0	379	9	126	279	###	785	155	2996	2636	890	1915	71	300	295	201	226	608																				
6	LEVEL "B" CONTINGENCIES																																													
7	B01	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None							
8	B01a	Antic ine – Populus 500 kV Line																										3Phs	3	0	None									None							
9	B01g	Antic ine – Populus 500 kV Line																										3Phs	3	NOT SIMULTATED																
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None							
13	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None									None							
14	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None							
15	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.501	4	7.08929	Bridger backswing UF - OK
16	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.495	4	7.72725	Bridger backswing UF - OK
17	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	NOT SIMULTATED																
18	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	NOT SIMULTATED																
19	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None							
20	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None							
21	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None							
22	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None							
23	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None							
24	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	1	20	LATHAM 34.50	65	vbul	0.76492	26.74	54.279	20	54.279	None							
25	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
26	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
27	B16	Aeolus – Mona 500 kV Line																										3Phs	3	1	22	BONANZA 24.00	65	vbug	0.4109	59.45	518.82	17	519.23	None							
28	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
29	B16d	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None							
32																																														
33																																														
34	LEVEL "C" CONTINGENCIES																																													
35	C01	Antic ine – Populus 500 kV Lines 1 & 2																																												
36	C01a	Antic ine – Populus 500 kV Lines 1 & 2 w/ RAS																																												
37	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
38	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
39	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																
40	C03	Bridger–3MiKnoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None									None							
41	C03a	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
42	C03b	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
43	C03c	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																
44	C03d	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
45	C03e	Bridger–3MiKnoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
46	C04	Bridger–3MiKnoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None									None							
47	C04a	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
48	C04b	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
49	C04c	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																
50	C04d	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
51	C04e	Bridger–3MiKnoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
52	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
53	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																
54	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None							
55	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	NOT SIMULTATED																
56	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None							
57	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None							
58	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
59	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None									None							
60	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
61	C14	Palo Verde Generation Un ts 2 & 3																										None		0	None									None							

Appendix 4-12 Pg. 2 - - - Dynamic Stability Results For Path C Southbound vs. Bonanza West

			BASE CASE PATH FLOWS																								Fault			Voltage Deviations									Frequency Deviations						
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	TOT 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	Tot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C	Pinto 4Corners (28 1)	Sigurd GlenC (28 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	2/0/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																															
5		**egwstg1 8h8 pcs 2250 bw 749ts.sav**	**1726**	**1798**	**1468**	**2227**	**2250**	**351**	**588**	**3**	**376**	**641**	**128**	**280**	**1863**	**749**	**196**	**2996**	**3067**	**1212**	**1804**	**36**	**295**	**220**	**169**	**245**	**599**																				
6	**LEVEL "B" CONTINGENCIES**																																														
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	**NOT SIMULTATED**																	
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None							
13	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None									None							
14	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None							
15	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.503	4	7.03461	Bridger backswing UF - OK
16	B09	Bridger – 3MileKno l 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.498	4	7.65969	Bridger backswing UF - OK
17	B09a	Bridger – 3MileKno l 345 kV Line																										3Phs	3	**NOT SIMULTATED**																	
18	B09c	Bridger – 3MileKno l 345 kV Line																										3Phs	3	**NOT SIMULTATED**																	
19	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None							
20	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None							
21	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None							
22	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None							
23	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None							
24	B15	Aeolus – Antic ine 500 kV Line																										3Phs	3	0	None									None							
25	B15a	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
26	B15g	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
27	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None									None							
28	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
29	B16d	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None							
32																																															
33																																															
34	**LEVEL "C" CONTINGENCIES**																																														
35	C01	Anticline – Populus 500 kV Lines 1 & 2																																													
36	C01a	Anticline – Populus 500 kV Lines 1 & 2 w/ RAS																																													
37	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
38	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
39	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	**NOT SIMULTATED**																	
40	C03	Bridger–3MiKnoll + Bridger–Populus #1 345 kV ines																										SLG	3	0	None									None							
41	C03a	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
42	C03b	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
43	C03c	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	**NOT SIMULTATED**																	
44	C03d	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
45	C03e	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
46	C04	Bridger–3MiKno l + Bridger–Populus #2 345 kV ines																										SLG	3	0	None									None							
47	C04a	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
48	C04b	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
49	C04c	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	**NOT SIMULTATED**																	
50	C04d	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
51	C04e	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
52	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
53	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	**NOT SIMULTATED**																	
54	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None							
55	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	**NOT SIMULTATED**																	
56	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None							
57	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None							
58	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
59	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None									None							
60	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
61	C14	Palo Verde Generation Units 2 & 3																										None		0	None									None							

Appendix 4-13 - - - Dynamic Stability Results For Path C Southbound vs. MSTI Project

			BASE CASE PATH FLOWS																								Fault		Voltage Deviations										Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	TOT 1A	Monu Naughtn	West of RS/F/H	Midpoint West	Montana SE	Montana Idaho (P18)	Tot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																															
5		**egwstg1 8h8_pcs_2250_msts_1500ts.sav**	1701	1773	1450	2199	-2251	179	520	0	379	619	133	-150	1805	691	204	2996	3122	1172	1804	26	298	101	215	198	570																				
6	**LEVEL "B" CONTINGENCIES**																																														
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	NOT SIMULTATED																	
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None							
13	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None									None							
14	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None							
15	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									None							
16	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.524	4	6.31702	Bridger backswing UF - OK
17	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	NOT SIMULTATED																	
18	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	NOT SIMULTATED																	
19	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None							
20	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None							
21	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None							
22	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None							
23	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None							
24	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	0	None									None							
25	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
26	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
27	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None									None							
28	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
29	B16d	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
31	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None							
32																																															
33																																															
34	**LEVEL "C" CONTINGENCIES**																																														
35	C01	Anticline – Populus 500 kV Lines 1 & 2																																													
36	C01a	Anticline – Populus 500 kV Lines 1 & 2 w/ RAS																																													
37	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
38	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
39	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																	
40	C03	Bridger–3M Knoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None									None							
41	C03a	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
42	C03b	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
43	C03c	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																	
44	C03d	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
45	C03e	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
46	C04	Bridger–3M Knoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None									None							
47	C04a	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
48	C04b	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
49	C04c	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																	
50	C04d	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
51	C04e	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
52	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
53	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																	
54	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None							
55	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	NOT SIMULTATED																	
56	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None							
57	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None							
58	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
59	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None									None							
60	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV ines																										SLG	3	0	None									None							
61	C14	Palo Verde Generation Units 2 & 3																										None		0	None									None							

Appendix 4-14 - - - Dynamic Stability Results For Path C Southbound vs. Monument - Naughton

			BASE CASE PATH FLOWS																								Fault			Voltage Deviations									Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	TOT 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	Tot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C)	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Devia tions	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Devia tions	Max Time, Cycles	Freq. Dip Devia tions	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																															
5		egwstg1 8h8 pcs 2250 mn 475 x93.sav	1704	1762	1476	1873	2250	32	640	475	760	965	121	279	1873	722	205	2996	2989	1131	1804	25	423	197	159	233	653																				
6	LEVEL "B" CONTINGENCIES																																														
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None									None							
9	B01g	Anticl ne – Populus 500 kV L ne																										3Phs	3	NOT SIMULTATED																
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None									None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None									None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None									None							
13	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None									None							
14	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None									None							
15	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.495	4	7.33503	Bridger backswing UF - OK
16	B09	Bridger – 3MileKno l 345 kV Line																										3Phs	3	0	None									4	BRIDGER2 22.0	60	fbug	59.491	4	7.84311	Bridger backswing UF - OK
17	B09a	Bridger – 3MileKno l 345 kV Line																										3Phs	3	NOT SIMULTATED																
18	B09c	Bridger – 3MileKno l 345 kV Line																										3Phs	3	NOT SIMULTATED																
19	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None									None							
20	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None									None							
21	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None									None							
22	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None									None							
23	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None									None							
24	B15	Aeolus – Antic ine 500 kV Line																										3Phs	3	0	3	LATHAM 34.50	65	vbul	0.78404	23.08	2.7833	20	39.41	None							
25	B15a	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
26	B15g	Aeolus – Antic ine 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None									None							
27	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None									None							
28	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
29	B16d	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
31	B16v	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None									None							
32	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None									None							
33																																															
34																																															
35	LEVEL "C" CONTINGENCIES																																														
36	C01	Anticline – Populus 500 kV Lines 1 & 2																																													
37	C01a	Anticline – Populus 500 kV Lines 1 & 2 w/ RAS																																													
38	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
39	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None									None							
40	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																
41	C03	Bridger–3MiKno l + Bridger–Populus #1 345 kV ines																										SLG	3	0	None									None							
42	C03a	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
43	C03b	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
44	C03c	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																
45	C03d	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
46	C03e	Bridger–3MiKno l + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None									None							
47	C04	Bridger–3MiKno l + Bridger–Populus #2 345 kV ines																										SLG	3	0	None									None							
48	C04a	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
49	C04b	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
50	C04c	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																
51	C04d	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
52	C04e	Bridger–3MiKno l + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None									None							
53	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None									None							
54	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																
55	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None									None							
56	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	NOT SIMULTATED																
57	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None									None							
58	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None									None							
59	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
60	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None									None							
61	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None									None							
62	C14	Palo Verde Generation Units 2 & 3																										None		0	None									None							

Appendix 4-15 - - - Dynamic Stability Results For Path C Southbound vs. Rock Springs / Firehole West

			BASE CASE PATH FLOWS																									Fault		Voltage Deviations									Frequency Deviations							
LINE #	CONTINGENCY ID	CONTINGENCY / BASE CASE NAME	Aeolus South	Aeolus West	Bridger West 500	Bridger West 345	New Path C (NB +)	Borah West	TOT 1A	Monu Naughtn	West of RS/FH	Midpoint West	Montana SE	Montana Idaho (P18)	Tot 4a	Bonanza West	Idaho Sierra	PDCI	COI	Path 26	IPP DC	Pavant+IPP Gonder	RedB H.Allen (Tot 2C	Pinto 4Corners (2B1)	Sigurd GlenC (2B 2)	Idaho Area System Losses	Pace Area System Losses	Fault Type	Fault Duration, Cycles	Unstable Gens	Dip Deviations	Bus Name and kV	Area	Type	Minimum (p.u.)	% Deviation	Time (Sec.)	20/40 Cycle Deviations	Max Time, Cycles	Freq. Dip Deviations	Bus Name and kV	Area	Type	Minimum (Hz)	6 Cycle Deviations	Max Time (Cycles)	Comments
4																																														
5		egwstg1 8h8 pcs 2250 rsfh 640 x93.sav	1693	1784	1508	1963	2250	147	626	334	640	843	128	279	1876	725	198	2996	2931	1071	1804	32	447	217	166	232	644																				
6	LEVEL "B" CONTINGENCIES																																													
7	B01	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
8	B01a	Anticline – Populus 500 kV Line																										3Phs	3	0	None								None							
9	B01g	Anticline – Populus 500 kV Line																										3Phs	3	NOT SIMULTATED																
10	B02	Populus – Borah 500 kV Line																										3Phs	3	0	None								None							
11	B03	Populus – Cedar Hill 500 kV Line																										3Phs	3	0	None								None							
12	B04	Borah – Midpoint 500 kV Line																										3Phs	3	0	None								None							
13	B06	Cedar Hill – Hemingway 500 kV Line																										3Phs	3	0	None								None							
14	B07	Midpoint – Hemingway 500 kV Line																										3Phs	3	0	None								None							
15	B08	Bridger – Populus 345 kV Line																										3Phs	3	0	None								4	BRIDGER2 22.0	60	fbug	59.495	4	7.32591	Bridger backswing UF - OK
16	B09	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	0	None								4	BRIDGER2 22.0	60	fbug	59.491	4	7.8261	Bridger backswing UF - OK
17	B09a	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	NOT SIMULTATED																
18	B09c	Bridger – 3MileKnoll 345 kV Line																										3Phs	3	NOT SIMULTATED																
19	B10	Populus – Borah #1 345 kV Line																										3Phs	3	0	None								None							
20	B11	Populus – Borah #2 345 kV Line																										3Phs	3	0	None								None							
21	B12	Populus – Kinport 345 kV Line																										3Phs	3	0	None								None							
22	B13	Borah – Kinport 345 kV Line																										3Phs	3	0	None								None							
23	B14	Borah – Adelaide – Midpoint #1 345 kV Line																										3Phs	3	0	None								None							
24	B15	Aeolus – Anticline 500 kV Line																										3Phs	3	0	3	LATHAM 34.50	65	vbul	0.79727	22.42	2.7833	20	33.096	None							
25	B15a	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
26	B15g	Aeolus – Anticline 500 kV Line w/ Aeolus Gen Drop																										3Phs	3	0	None								None							
27	B16	Aeolus – Mona 500 kV Line																										3Phs	3	0	None								None							
28	B16a	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
29	B16d	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
30	B16g	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
31	B16v	Aeolus – Mona 500 kV + Aeolus Gen Drop (600)																										3Phs	3	0	None								None							
32	B17	Hemingway – Summer Lake 500 kV Line																										3Phs	3	0	None								None							
32.1	B61	Rock Springs - Palisades 230kV Line																										3Phs	5	0	None								None							
32.2	B62	Firehole - Monument 230kV Line																										3Phs	5	0	None								None							Isdt9 shed load at Firehole 34.5kV bus
33																																														
34																																														
35	LEVEL "C" CONTINGENCIES																																													
36	C01	Anticline – Populus 500 kV Lines 1 & 2																																												
37	C01a	Anticline – Populus 500 kV Lines 1 & 2 w/ RAS																																												
38	C02	Bridger – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
39	C02a	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	0	None								None							
40	C02b	Bridger – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																
41	C03	Bridger–3M Knoll + Bridger–Populus #1 345 kV lines																										SLG	3	0	None								None							
42	C03a	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
43	C03b	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
44	C03c	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																
45	C03d	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
46	C03e	Bridger–3M Knoll + Bridger–Populus #1 345 kV w/ RAS																										SLG	3	0	None								None							
47	C04	Bridger–3M Knoll + Bridger–Populus #2 345 kV lines																										SLG	3	0	None								None							
48	C04a	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
49	C04b	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
50	C04c	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	NOT SIMULTATED																
51	C04d	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
52	C04e	Bridger–3M Knoll + Bridger–Populus #2 345 kV w/ RAS																										SLG	3	0	None								None							
53	C05	Borah – Populus 345 kV Lines 1 & 2																										SLG	3	0	None								None							
54	C05a	Borah – Populus 345 kV Lines 1 & 2 w/ RAS																										SLG	3	NOT SIMULTATED																
55	C06	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	0	None								None							
56	C06a	Populus – Ben Lomond 345 kV Lines 2 & 3																										SLG	3	NOT SIMULTATED																
57	C07	Populus–Kinport + Populus–Borah #2 345 kV Lines																										SLG	3	0	None								None							
58	C08	Populus–Borah #2 345 kV + Treastn–Brady 230 kV Lines																										SLG	3	0	None								None							
59	C09	Borah – Adelaide #2 + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
60	C12	Borah–Adel–Midpoint #1 + Midpoint–Adelaide #2 345 kV lines																										SLG	3	0	None								None							
61	C13	Midpoint–Adelaide #2 345 kV + Borah – Hunt 230 kV lines																										SLG	3	0	None								None							
62	C14	Palo Verde Generation Units 2 & 3																										None		0	None								None							

Appendix 5 – Gateway West Study Plan

(2010 01 19 V9 - Phase I II GW Study Plan.doc 2/11/2010)

Gateway West Transmission Project

Study Plan

For completion of

WECC Project Rating Process

Phase 2 – Facility Rating

Date: January 19, 2010
Rev 9

Study Plan – Preamble

The purpose of this document is to provide a consistent, comprehensive study methodology for the project sponsor(s) and/or study group to follow in establishing the planned rating (Phase 1) and accepted rating (Phase 2) for the Energy Gateway Projects. Section III (Page 7) outlines the methodology that was followed for the Phase 1 studies, while Section IV (Page 18) outlines the study process that will be followed for the Phase 2 studies.

A separate study plan which addresses the study methodology for the Gateway South Projects will be issued separately. While study schedule for both Gateway South and Gateway West are noted independently in each study plan, the study schedules have been coordinated between the projects.

I. INTRODUCTION

Idaho Power previously announced[3] its transmission expansion plan to build more than 1,400 miles of new 500 kV transmission lines originating in Wyoming and connecting into Idaho and the Pacific Northwest, with completion targeted in 2017. A First stage completion of this project is expected to be completed by 2016. This project has been identified as the Gateway West (GW) Project.

Regional Planning

The GW project was first presented to stakeholders on July 9, 2007 at a Northern Tier Transmission Group (NTTG) Regional Planning Process (RPP) kickoff meeting in Portland, Oregon. The Northern Tier Transmission Group is made up of a group of transmission providers and customers in the Northwest and Rocky Mountain states. The NTTG region covers Wyoming, Idaho, Utah, and parts of Oregon.

As the GW project facilities fall primarily within the NTTG footprint, the project was entered into the NTTG Regional Planning Process (RPP) in May 2007. The RPP for the Fast Track projects included engaging stakeholders to formulate and refine the transmission plan to meet the ten year requirements of the NTTG region. This process was completed during the first half of 2007 and incorporated: 1) the member utilities' Integrated Resource Plans (IRP), 2) past studies highlighting regional through-put and export needs and known congestion areas, and 3) existing regional projects.

The NTTG Planning Committee coordinates transmission planning within the NTTG footprint, with other sub-regional planning groups, and with WECC planning

[3] PacifiCorp has indicated that they have entered into a memorandum of understanding with Idaho Power Company to cooperate on a northernmost line, a double-circuit 500 kV transmission line from PacifiCorp's and Idaho Power's jointly owned Jim Bridger Power Plant in Wyoming to southeastern Idaho, with a connection south into Utah along an existing transmission path from southern Idaho into northern Utah. Another segment of this line will be built west across Idaho and into Oregon. This project has been identified as the Gateway West (GW) Project. Idaho Power Company is performing all the studies related to GW project (west of Populus).

committees. The planning group will biennially prepare a long-term (10 year) bulk transmission expansion plan, while taking into consideration up to a twenty year planning horizon. The plan will provide strategic transmission options for economic and reliability projects, and specific alternative plans for reinforcing the transmission system. The plan is intended to help coordinate the integration of new generation into the system and to reduce transmission congestion. This work is intended to be completed primarily by the transmission owners in the footprint utilities, with input from all interested stakeholders.

Path Rating

With the issuance of the Regional Planning Project Review report for the GW Project, regional planning has been completed and efforts to obtain a path rating[4] for the GW Project are now under way. This study plan outlines the GW technical studies that will be performed in support of the following:

- WECC Project Rating Review – Phase 1
- WECC Project Rating Review – Phase 2

The Phase 1 studies that are outlined as part of this Study Plan will focus on the non-simultaneous rating of the GW project. This includes all of the internal paths defined under the Gateway West project: TOT 4A, Aeolus West, Bridger West, Borah West and Midpoint West.

The Gateway West Comprehensive Progress Report, which summarized the results of the Phase 1 technical study findings, was issued on November 21, 2008. The Gateway West Project was granted Phase 2 status on February 6, 2009.

Phase 2 studies will address the Simultaneous Transfer Capability of the GW Project in conjunction with other major transmission paths in the Western Interconnection.

Due to the scope and nature of the GW project, the Phase 1 portion of this study plan is intended to establish non-simultaneous ratings for the expanded/modified transmission paths listed in Table 1.

Table 1. Proposed Gateway West Internal Paths

	Line Description	Transmission Path	Path Rating Direction
1	Anticline* – Populus 500 kV #1 & #2 (new) Bridger* – Three Mile Knoll 345 kV (modified)	Modified Bridger West	E → W

[4] A path rating can be related to an individual transmission line or a combination of parallel transmission lines. The transfer path may be composed of transmission lines between control areas or internal to a control area, or a combination of both.

	Bridger* – Populus 345 kV #1 & #2 (modified)		
2	Populus* – Cedar Hill 500 kV (new) Borah* – Midpoint #1 500 kV (conversion of Kinport – Midpoint 345 kV line) Borah* – Adelaide #2 345 kV Borah* – Adelaide – Midpoint #1 345 kV Borah* – Hunt 230 kV American Falls* – Minidoka 138 kV	Modified Borah West	E → W
3	Midpoint* - Hemingway 500 kV #1 (modified) Midpoint* – Hemingway 500 kV #2 (new) Cedar Hill* – Hemingway 500 kV (new) Midpoint* – Rattle Snake 230 kV Midpoint* – DRAM 230 kV Midpoint* – Boise Bench 230 kV #3 Upper Salmon* – Upper Salmon SR 138 kV Lower Malad *– Lower Malad SR 138 kV	Modified Midpoint West	Bidirectional
5	Aeolus* – Anticline #1 & #2 500 kV (new) Platte* - Latham 230 kV #1 Mustang* – Bridger 230 kV	Aeolus West	E → W
6	Windstar* – Aeolus 230 kV #1 & #2 (new) Riverton* – Wyopo 230 kV Dave Johnston* – Difficulty 230 kV Spence* – Mustang 230 kV	TOT 4A	NE → SW

Note: (*) indicates metering point

II. SCOPE OVERVIEW

The objective of the study plan is to outline steps necessary to determine the proposed path ratings for the GW Project. The GW Project includes the following transmission facilities:

- Windstar – Aeolus 230 kV #1 & #2 (73 & 88 miles, Bittern 2-1272 ACSR)
- Aeolus - Anticline 500 kV #1 & #2 (145 miles, 3- Athabaska/TW 1949.6)
- Aeolus 500/230 kV #1, #2 & #3 autotransformers (1500 MVA)
- Aeolus 230 kV SVC (-125/+450 MVAr)
- Anticline 500/345 kV #1 & #2 autotransformer (1500 MVA)
- Anticline 345 kV #1 & #2 PST (750MVA, ±20 Degrees)
- Anticline - Populus 500 kV #1 & #2 (204 miles, 3- Athabaska/TW 1949.6)
- Populus – Cedar Hill 500 kV #1 (118 miles, 3- Athabaska/TW 1949.6)
- Cedar Hill - Midpoint 500 kV #1 (33 miles, 3- Athabaska/TW 1949.6)

- Cedar Hill - Hemingway 500 kV #1 (158 miles, 3- Athabaska/TW 1949.6)
- Populus - Borah 500 kV #1 (53 miles, 3- Athabaska/TW 1949.6)
- Borah - Midpoint 500 kV #1 (88 miles, 3- 1272 MCM (36/1), conversion of Kinport-Midpoint 345 kV line)
- Midpoint - Hemingway 500 kV #2 (131 miles, 3- Athabaska/TW 1949.6)

Note that the Windstar – Aeolus 500 kV line and the Aeolus-Creston-Bridger 230 kV line have been eliminated from the Gateway West project since the original phase 1 report. An addendum report has been prepared for phase 1, stage 1 without these lines.

The preliminary configuration of the Gateway West Energy Project line and transformer impedances, line distances, shunt and series compensation and voltage support are provided in Appendix 3,

The non-simultaneous studies that will be performed as part of the Phase 1 studies include power flow and limited transient stability and post-transient stability analysis. The Phase 2 study efforts will perform simultaneous analysis to determine the Accepted Rating for the project.

Adding new transmission facilities to an existing path should increase the path rating. In following WECC policies, this increase should be attributable to the new project. This study plan only addresses the studies corresponding to maximum project loadings. Studies covering simultaneous interactions between paths, would ultimately be necessary to provide an Accepted Rating and/or nomogram(s) for the proposed project, and will be completed in Phase 2.

A. <u>Baseline Analysis – Non-simultaneous</u> (WECC Phase 1)

All aspects of this analysis, including assumptions, methodology, and contingencies are covered in Section III of this Study Plan.

B. <u>Simultaneous Analyses (WECC Phase 2)</u>

The Study Plan includes an assessment of the potential impact of GW on the following simultaneous paths to refine the GW Project definition. Further details of the simultaneous analysis are covered in Section IV of this Study Plan.

1. Gateway South paths
   - Aeolus South [New Path]
   - Mona South [New Path]
2. PacifiCorp Internal Paths

- Monument – Naughton 230 kV
- Rock Springs/Firehole West

3. Idaho – Northwest [Path 14] (including MP-SL [Path 75])
4. Path C [Path 20]
5. Idaho – Sierra [Path 16]
6. SWIP (Great Basin – North, EnTP)
7. MISTI
8. Montana - Idaho [Path 18]
9. Montana – Northwest [Path 8]
10. Montana Southeast [Path 80]
11. Yellowtail South
12. TOT 4B [Path 38]
13. TOT 3 [Path 36]
14. Bridger West [Path 19]
15. TOT 1A [Path 30]
16. Bonanza West [Path 33]
17. Others.

Further details of the simultaneous analysis are covered in Section IV of this Study Plan.

C. <u>Sensitivity Analyses</u>

The sensitivity analysis defined in this study plan was developed based on preliminary assessment that there could be an interaction between GW and projects that are planned to be developed in the same time frame as GW. The Study Plan includes the following projects and uncertainties as sensitivity cases.

1. Gateway South (GS) project will be modeled to determine its impact on Gateway West. The GS project will be constructed at least one year after GW is completed.

2. A generic version of a northern Nevada project will be modeled to include either the Ely Energy Center & 500 kV Line, or the Great Basin North & South 500 kV lines.

3. Southern portion GS: Mona – Red Butte, bi-directional rating

4. Mountain States Transmission (MSTI) Project

5. TOT 2C: Add a second Red Butte – Harry Allen/Crystal line, bi-directional rating

6. Different resource mix in Wyoming to evaluate higher concentrations of wind generation.

III. BASELINE ANALYSIS – NON-SIMULTANEOUS

To the fullest extent possible, the rating and sizing of new facilities shall be refined as part of this analysis.

A. Study Conditions

The process for performing the proposed Phase 1 studies that will establish the Preliminary Ratings are described below. Preliminary Ratings are identified for transmission lines that have not been through the WECC Phase 2 rating process, and are a general rating determined by simply evaluating the conductor ampacity required to handle the path flows between source and sink facilities. However, due to the scope of the GW Project, specific transfer levels have been proposed and facilities have been sized to accommodate these power transfers.

1. Base Case Description

Project Base Case 1a will be developed by starting with the WECC 2015HS1 power flow base case. This case was approved by WECC on April 6, 2007 and since has undergone a number of revisions. The added resources represented in this case are reflected under the "moderate wind generation" portion of Table 2. Stress in this case will reflect heavy Wyoming to Utah and west of Bridger transfers as well as heavy north to south flows South of Mona and on Path 2C (Red Butte – Harry Allen). Table 4a reflects the proposed transfer levels in Case 1a.

Project Base Case 1b will have a configuration (nearly) identical to Case 1a; however, its generation resource mix will be as noted under the "higher wind generation" portion of Table 2. As necessary, line series compensation will be adjusted to achieve (as close as possible) the flow conditions listed in Table 4a

Project Base Case 1c will have a configuration identical to Case 1a; however, schedules will be adjusted to reflect heavy south to north flows on the TOT 2C and the Mona South transmission paths. Table 4c reflects the proposed transfer levels.

The Project Base Case 1d will be developed by using the WECC 2010LA1 base case with facility adjustments to reconcile it as closely as possible to the configuration of a 2015 light load case. Table 4d reflects the proposed transfers for this case. Case 1c will not be utilized during the Phase 1 project definition studies, but will be developed for use in the Phase 2 studies.

2. Generation Assumptions

Planned future Generation projects will be modeled in the Case 1a, 1b and 1d base cases as identified in Table 2. Case 1c generation will reflect reduced

generation in Wyoming to allow transfers from southern Nevada thru central Utah (Crystal/Harry Allen – Red Butte – Mona) to the Utah – Wasatch Front[5].

Table 2. Future Planned Generation Projects*

	Case 1 a/d - Generation Projects (Moderate Wind Generation)			Case 1 b - Generation Projects (HighWind Generation)**		
	Generation Type		Zone	Generation Type		Zone
Location	Thermal	Wind	Total	Thermal	Wind	Total
Dave Johnston Area	275		2825	275		2825
Windstar	1500	1050		600	1950	
Creston			1050		500	1550
Aeolus		1050			1050	
Jim Bridger Area	1500		2000	500		1500
Upper Green River	500			500	500	
Subtotal	**3775**	**2100**		**1875**	**4000**	
Total	**5875**			**5875**		

* The generation assumptions will be responsive to energy policies currently under review by utilities, regulators and other stakeholders. Specific economic and technology evaluations and siting/permitting processes also need to run their course.

** Case 1b will be developed for the purpose of evaluating a wider range of Wyoming wind resources.

To stress the transmission paths, generation will be added in Wyoming and adjusted in Idaho, Utah, Arizona, Los Angeles, Las Vegas and the Northwest.

3. New Transmission Project Assumptions

All four of the base cases will be updated to reflect Energy Gateway Projects or projects that are currently within the WECC Phase 2 rating process. These projects are noted in Table 3.

[5] About 75 to 80% of all of the electricity use in the State of Utah is in the area known as the Wasatch Front (WF). This area includes the entire electrical load served out of the Spanish Fork substation in the south up to the electrical load served out of the Ben Lomond substation in the north. This includes parts of Juab and Sanpete Counties, and all of Utah, Salt Lake, Summit, Tooele, Wasatch, Davis, Morgan and Weber Counties.

Table 3. Planned Energy Gateway Projects or Projects in WECC Phase 2

1	Gateway West: Double circuit 500 kV lines
2	Gateway South: Double circuit 500 kV lines
3	Mona – Limber: Double circuit 500 kV line, Limber – Oquirrh and Limber – Terminal, Double circuit 345 kV lines
4	Populus – Terminal: Double circuit 345 kV line (Path C)
5	TOT 3 (230 kV upgrade)
6	Ely Energy Center and associated transmission* (Harry Allen – Robinson Summit Transmission Line)
7	Great Basin Transmission Project*
8	Mountain States Transmission (MISTI) Project
9	IPP DC line upgrade
10	Wyoming – Colorado Intertie Project
11	Navajo Transmission Project /Desert Rock Energy Project (this project is not likely to have any impact on the Idaho and PACE areas and may be omitted , depending upon group review)
12	Palo Verde – Devers 500 kV #2
13	Others

* A generic version of a northern Nevada project will be modeled that includes one of these projects, which cross through the SWIP corridor.

4. WECC Major Path Rating Assumptions

The updates to the WECC 2015HS base case for Case 1a and 1b includes revised load/generation adjustment to stress the major path flows to the proposed rating, shown in Table 4a/b.

Table 4a/b. Major Path Proposed Transfer Levels (Case 1a & 1b – GS N→S Flows)

	Path	Path Name	WECC Rating (MW)	Proposed Rating (MW)
1	37	TOT 4A: Northeast to Southwest	810	3500
2	19	Bridger West: (GW Path) East to West	2200	5200
3	New	Aeolus South		3000
4	New	Mona South: North to South		2335
5	35	Harry Allen – Red Butte (TOT 2C) North to South	300	2100
6	79	Sigurd – Glen Canyon (TOT 2B2) North to South	265	265

7	78	Pinto – Four Corners (TOT 2B1) North to South	530	560
8		Others		

Similarly, the updates to the WECC 2015HS base case for Case 1c includes revised load/generation adjustment to stress the major path flows to the proposed rating, shown in Table 4c

Table 4c. Major Path Proposed Transfer Levels (Case 1c – GS S→N Flows)

	Path	Path Name	WECC Rating (MW)	Proposed Rating (MW)
1	35	Harry Allen – Red Butte (TOT 2C) South to North	300	1700
2	79	Sigurd – Glen Canyon (TOT 2B2) South to North	300	300
3	78	Pinto – Four Corners (TOT 2B1) South to North	600	600
5		Others		

The base case for Case 1d will be developed from the WECC 2010LA1 and will reconcile as closely as possible to a 2015 light load base case configuration. Case 1d will be utilized during the Phase 1 project definition studies only if necessary to establish the proposed non-simultaneous ratings. This case will be analyzed in Phase 2 of the Rating Review.

Table 4d. Major Path Proposed Transfer Levels (Case 1d – GW E→W Flows)

	Path	Path Name	WECC Rating (MW)	Proposed Rating (MW)
1	37	TOT 4A: Northeast to Southwest	810	3400
2	19	Bridger West: East to West	2200	5200
3	17	Borah (Populus) West (GW Path)	2557	5557
4	New	Aeolus – Mona (GS Path): North to South		3000
5		Others		

B. <u>Study Methodology (Applicable for both WECC Phase 1 and 2 analysis).</u>

- The power flow base case(s) and dynamic stability data used for this study will be compatible with GE PSLF V16.3.

- For all areas outside Wyoming, Utah, Idaho and Southern Nevada, the network topology and loads will reflect information provided to WECC by each respective area.
- The study results will comply with NERC TPL-001-0 thru TPL-004-0 Standards as well as WECC TPL – (001 thru 004) – WECC – 1 – CR – System Performance Criteria. Additionally, PacifiCorp and Idaho Power planning criteria will also be applied.

1. <u>Power Flow Analysis (study criteria and contingency list)</u>

Power flow studies will be evaluated under steady-state and single/double contingency conditions to ensure the Project meets the system performance requirements defined in the planning standards.

Study Criteria:

a. Steady-State Conditions

   i. Under steady-state conditions, bus voltages must be maintained between 0.95 p.u. and 1.06 p.u., unless specific minimum operating voltage requirements exist.

   ii. All line and transformer loadings must be below normal continuous ratings.

b. Contingency Conditions

   1. Changes in bus voltages from pre- to post-contingency conditions must be less than 5% for single (N-1) contingencies, and 10% for double (N-2) contingencies, with exceptions noted in Appendix 1 in regards to the utilities involved.

   2. All line, series capacitors, and transformer loadings must be below their emergency rating (or normal rating if no emergency rating is given), for both N-1 and N-2 contingencies.

   3. In addition to the NERC TPL Standards and WECC system performance criteria, PacifiCorp has the following requirements: For steady-state conditions, Pinto load area 345 and 138 kV bus voltages as low as 0.93 pu are acceptable as long as load tap changing (LTC) transformers adjust the associated 69 kV bus voltages to 1.01 pu or higher. For post transient N-1 outages, Pinto load area voltages are acceptable if the 69 kV bus voltages are in the range of 0.90 to 1.10 p.u. The minimum 0.90 p.u. post-transient voltage criteria for this area are based on the original system design criteria.

Contingencies:

Tables 5a & 5b provides a list of contingencies to be simulated during the power flow analysis.

Table 5a - List of Single Contingencies for Power Flow Analysis

1	Anticline – Populus 500 kV Line
2	Anticline 500 / 345 kV Transformer
3	Bridger – Populus 345 kV Line
4	Bridger – 3Mileknoll 345 kV Line
5	Bridger 345 / 230 kV Transformer
6	3Mileknoll – Goshen 345 kV Line
7	Kinport – Goshen 345 kV Line
8	Kinport – Borah 345 kV Line
9	Populus – Borah 500 kV Line
10	Borah 500 / 345 kV Transformer
11	Borah 345 / 230 kV Transformer
12	Populus – Cedar Hill 500 kV Line
13	Cedar Hill – Midpoint 500 kV Line
14	Cedar Hill – Hemingway 500 kV Line
15	Midpoint – Hemingway 500 kV Line
15a	Hemingway – Summer Lake 500kV line
16	Borah – Midpoint 500 kV Line
17	Midpoint 500 / 345 kV Transformer
18	Midpoint 345 / 230 kV Transformer
19	Borah – Adelaide #2 345 kV Line
20	Adelaide – Midpoint #2 345 kV Line
21	Borah – Adelaide – Midpoint #1 345 kV Line
22	Borah – Hunt 230 kV Line
23	Midpoint – Boise Bench #3 230 kV Line
24	Midpoint – Rattle Snake 230 kV Line
25	Midpoint – Dram 230 kV Line
26	Rattle Snake – Boise Bench 230 kV Line
27	Dram – Boise Bench 230 kV Line
28	Hemingway 500/230 kV Transformer
29	Kinport – Goshen 345 kV Line
30	Populus – Borah #1 345 kV Line
31	Populus – Borah #2 345 kV Line
32	Populus – Kinport 345 kV Line
33	Populus – Ben Lomond #3 345 kV Line
34	Populus – Terminal 345 kV Line

35	Aeolus – Anticline 500 kV Line
36	Aeolus – Mona 500 kV Line
37	Aeolus 500 / 230 kV Transformer
38	Aeolus – Windstar 230 kV Line
39	Aeolus – Miners 230 kV Line
40	Bonanza –Mona 345kV Line

Table 5b - List of Double Contingencies for Power Flow Analysis

1	Anticline – Populus 500 kV Lines (two circuits) – with & w/o generator tripping
2	Bridger – Populus #1 & # 2 345 kV Lines – with & w/o generator tripping
3	Bridger – 3MileKnoll + Bridger – Populus #1 345 kV lines – with & w/o generator tripping
4	Bridger – 3MileKnoll + Bridger – Populus #2 345 kV lines – with & w/o generator tripping
5	Borah – Populus 345 kV DLO with / w/o generator tripping
6	Populus – Ben Lomond 345 kV DLO
7	Ben Lomond – Terminal 345 kV DLO
8	Populus – Kinport + Populus – Borah #2 345 kV Lines with/ w/o generator tripping
9	Populus – Borah #2 345 kV + Treasureton – Brady 230 kV Lines
10	Populus – Borah #1 345 kV + Treasureton – Brady 230 kV Lines
11	Populus – Ben Lomond #2 + Populus Terminal 345 kV Lines.
12	Populus – Terminal 345 kV + Treasureton – Brady 230 kV Lines
13	Borah – Adelaide #2 & Borah – Adelaide – Midpoint #1 345 kV lines (RA)
14	Borah – Adelaide #2 & Midpoint - Adelaide #2 345 kV lines (RA)
15	Borah – Adelaide #2 & Borah – Hunt 230 kV lines
16	Borah – Kinport & Borah – Adelaide – Midpoint #1 345 kV lines (RA?)
18	Borah – Kinport & Midpoint – Adelaide #2 345 kV lines (RA?)
19	Borah – Kinport 345 kV & Borah – Hunt 230 kV lines (RA?)
20	Borah – Adelaide – Midpoint #1 & Midpoint – Adelaide #2 345 kV lines
21	Borah – Adelaide – Midpoint #1 345 kV & Borah -Hunt 230 kV lines (RA)
23	Borah – Adel #2 345 kV + Borah – Midpoint 500 kV Lines

24	Bridger – Populus #1 & Goshen – Kinport 345 kV Lines -- with & w/o generator tripping.
25	Bridger – Populus #2 & Goshen – Kinport 345 kV lines with & w/o generator tripping.
26	Aeolus – Anticline 500 kV Lines (two circuits) – with & w/o generator tripping
27	Aeolus – Mona 500 kV Lines (two circuits) – with & w/o generator tripping
26	Palo Verde Generation – Trip Two Units

RA = Risk Assessment Outage - These are double line outages for lines that do not share a common element (structures, right of way, breaker) but are in the same general geographic location.

c. Voltage Stability Analysis:

The WECC Voltage Stability Guidelines and Reactive Power Reserve Monitoring Methodology will be utilized in evaluating study results.

i. For N-1 disturbances, the associated critical bus is required to have positive reactive margin for a 5% increase beyond the maximum allowable MW flow on the path. Idaho's 250 MVAr margin at the critical buses will also be observed.

ii. For N-2 disturbances, the associated critical bus is required to have positive margin for a 2.5% increase beyond the maximum allowable MW flow on the path. Idaho's 200 MVAr margin at the critical bus will also be observed.

iii. For simplicity, the N-1 and N-2 disturbances will all be evaluated with a 5% increase in flow. When necessary 2.5% increase in flow will be applied for N-2 disturbances.

2. Transient Stability Analysis (study criteria and contingency list)

Transient stability studies will be performed to assess the dynamic performance impact of heavily stressed lines under the projected system conditions for various contingencies. Limited transient stability analysis will be performed in Phase 1, with more extensive analysis in Phase 2.

The study will determine the most critical fault condition that would limit the non-simultaneous transfer capability.

Study Criteria for Phase 1:

a. All machines in the system shall remain in synchronism as demonstrated by their relative rotor angles.

b. System stability is evaluated based on the damping of the relative rotor angles and the damping of the voltage magnitude swings.

c. For central, northern and eastern Wyoming, the following dynamic stability guidelines have been established: Following a single contingency

disturbance with normal fault clearing, the bus voltage transient swing on all buses should not be lower than 0.70 p.u., and the system should exhibit positive damping. Additionally, the WECC off normal frequency criteria guidelines for N-1 (59.6 Hz) and N-1-1 or N-2 (59.0 Hz) will be followed.

d. Other transient voltage dips and duration requirements must meet the criteria of the TPL Standards and WECC System Performance Criteria. See Appendix 2.

e. The contingencies provided in Tables 6a & 6b will be simulated in the transient stability analysis.

Table 6a - List of Single Contingencies for Transient Stability

1	Anticline – Populus 500 kV Line
2	Populus – Borah 500 kV Line
3	Populus – Cedar Hill 500 kV Line
4	Borah – Midpoint 500 kV Line
5	Cedar Hill – Midpoint 500 kV Line
6	Cedar Hill – Hemingway 500 kV Line
7	Midpoint – Hemingway 500 kV Line
7a	Hemingway – Summer Lake 500 kV Line
8	Bridger – Populus 345 kV Line
9	Bridger – 3MileKnoll 345 kV Line
10	Populus – Borah #1 345 kV Line
11	Populus – Borah #2 345 kV Line
12	Populus – Kinport 345 kV Line
13	Borah – Kinport 345 kV Line
14	Borah – Adelaide – Midpoint #1 345 kV Line
15	Aeolus – Anticline 500 kV Line
16	Aeolus – Mona 500 kV Line

For all of the indicated outages, 3-phase faults with and w/o unit tripping as needed will be studied. If a 3-phase fault requires unit tripping to meet performance then SLG fault will be studied w/o unit tripping.

Table 6b - List of Double Contingencies for Transient Stability

1	Anticline – Populus 500 kV Lines (two circuits) – with & w/o generator tripping
2	Bridger – Populus #1 & # 2 345 kV Lines – with & w/o generator tripping
3	Bridger – 3MileKnoll + Bridger – Populus #1 345 kV lines – with & w/o generator tripping
4	Bridger – 3MileKnoll + Bridger – Populus #2 345 kV lines – with & w/o generator tripping

5	Borah – Populus 345 kV DLO with / w/o generator tripping)
6	Populus – Ben Lomond 345 kV DLO
7	Populus – Kinport + Populus – Borah #2 345 kV Lines with/ w/o generator tripping
8	Populus – Borah #2 345 kV + Treasureton – Brady 230 kV Lines
9	Borah – Adelaide #2 & Borah – Hunt 230 kV lines
10	Midpoint – Kinport & Borah – Adelaide – Midpoint #1 345 kV lines
11	Midpoint – Kinport 345 kV & Borah – Hunt 230 kV lines
12	Borah – Adelaide – Midpoint #1 & Midpoint – Adelaide #2 345 kV lines
13	Midpoint – Adelaide #2 345 kV & Borah – Hunt 230 kV lines
14	Palo Verde Generation – Trip Two Units

3. Post-Transient Stability Analysis (study assumptions)

A review of Power Flow and Transient Stability studies will be conducted to identify the post transient conditions to be evaluated. Specific post transient studies will be performed as part of the Phase 1 studies are noted below:

Study Assumptions:

a. All loads will be modeled as constant MVA during the first few minutes following an outage or disturbance.

b. All voltages at distribution substations will be restored to normal values by the transformer tap changers and other voltage control devices.

c. Generator MVAr limits will be modeled as a single value for each generator since the reactive power capability curve will not be modeled in the program output.

d. No manual operator intervention is allowed to increase the generator MVAr flow.

e. Under post-disturbance conditions in central, northern and eastern Wyoming, all bus voltages should be within 0.90-1.10 per unit.

f. The reactive margin will be measured at key locations identified during the studies.

g. Other Assumptions

- Area Interchange: Disabled

- Governor Blocking: Base load Flag will be used per WECC practices
- DC Line Transformer Tap Automatic Adjustment: Enabled
- Generator Voltage Control: Set to Local except for Palo Verde, and selected Northwest generation.
- Phase Shifter Control: Disabled
- Switched Shunt Devices: Disabled – except in Sierra Pacific Power system, and selected buses (Platte, Miners, Atlantic City, etc) in Wyoming.

IV. SIMULTANEOUS ANALYSES (WECC Phase 2)

To the fullest extent possible, the rating and sizing of new facilities shall be refined as part of this analysis.

Following the completion of the Project Definition studies for Phase 1, Facility Rating studies will be initiated for Phase 2. A two stage process will be adopted in establishing the Phase 2 ratings. Stage 1 will seek to establish a Phase 2 rating of 1500 MW in addition to the existing ratings of the underlying system while Stage 2 or the full-build stage will seek to achieve a Phase 2 rating of 3000 MW over the existing ratings of the associated paths. Due to the scope and nature of the Energy Gateway Project, not all facilities will be constructed during the same period. As such, facilities will be installed following a segmented approach – focusing on one leg of the project, than another leg, etc. (For example, Anticline-Populus #1 500 kV project will be in-service on 12/2014 and Anticline-Populus #2 500kV project will be in service in 12/2017.) Rather than initiate technical studies for each new transmission segment, it has been decided to group transmission segments into two logical project stages that would be evaluated by the WECC Phase 2 Study Group (or subgroup). Incremental system limitations for transmission segments that are added between stages, will be addressed via Operation Transfer Capability (OTC) studies. (This same process was followed by BPA and AVISTA for the West of Hatwai Expansion project.)
As technical studies progress and Accepted Ratings for a given transmission stage are determined, standalone WECC Phase 2 Study Group technical reports will be completed and submitted to TSS, OC and PCC for approval, following established WECC procedures.

A. Case Description

New base cases[6] will be developed for the Gateway West simultaneous evaluation with other paths. These base cases are summarized below:

- A new base case, 2a will be developed by starting with the WECC 2019HSa1 power flow case. This case was only recently approved by WECC on June 10, 2009. The added resources represented in this case are reflected under the "high wind generation" portion of Table 2. Stress in this case will reflect heavy Wyoming to Utah and west of Bridger transfers. . In this base case, the TOT 2C flows are projected to be 2100 MW for the Gateway South – Stage 2 configuration.

- The proposed transfer levels on the various Gateway West paths are noted in Table 4a.

[6] Depending on path to be evaluated and system conditions, other base cases or sensitivity cases may be required by the Phase 2 technical study review group.

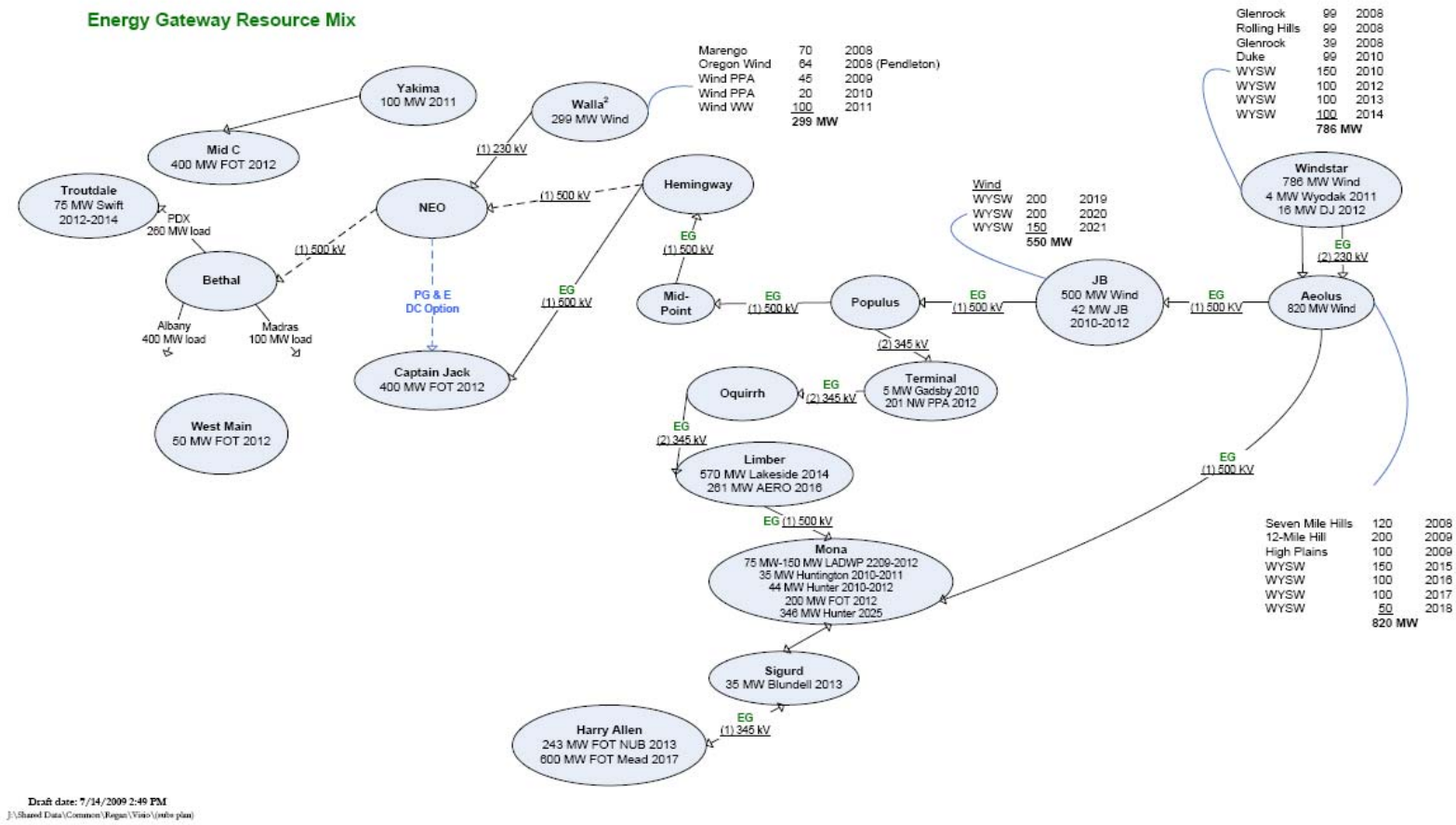
- A new base case, 2c will be developed utilizing the 2019HSa1 base case to evaluate increasing south-north TOT 2C transfers from 600 MW to 1700 MW transfers for the Stage 2 Gateway South configuration.
- A new base case, 2d will be developed by using the WECC 13LW1a1 base case with facility adjustments to reconcile it as closely as possible to the configuration of a 2019 light load case. Table 4d reflects the proposed transfers for this case.

Resources that will be utilized for both the Gateway West and Gateway South projects will be based on the latest PacifiCorp IRP (Integrated Resource Plan). A summary of the new resources that are available identified on the following table. (Updates to the table will be made as additional resource information is made available.)

Per discussions at the April 2009 TSS meeting, entities can utilize the best available resource information at the time a transmission path is rated. OTC studies will be used to evaluate operating transfer conditions if resources come on-line either staggered or different than what was initially projected. [Specific wording from TSS minutes will be inserted when available.]

PacifiCorp - Integrated Resource Plan and Plan Revisions

Based on the Revised 2008 IRP Preferred Portfolio (5/28/2009), the following resource plan projections were used to model resources in the Stage 1 – 1500 MW EGW simulation[7].



[7] **Additional resource projections, beyond 10-years, were utilized in developing the resource model for the Stage 2 – 3000 MW EGW simulation.**

B. Nomogram(s)

As part of the simultaneous GS simultaneous rating analysis, changes to existing nomograms will be determined or new nomograms will be defined. These changes may include:

- A Bridger West vs. Aeolus South Nomogram.
- Other nomogram changes as determined during technical studies.

C. Study Areas

To help manage the magnitude of the study effort associated with this project, it has been deemed necessary to divide it into multiple study areas with their associated review groups (see Figure 1):

1. Southern Idaho Study Area

This area will include all the planned and existing facilities between the Populus and the Hemingway substations. Both Midpoint West and Borah West paths will be studied and their corresponding ratings with the new proposed facilities determined under simultaneous interactions with other affected paths

In the first and second stage of the work these facilities are comprised of:

Facilities	Stage I	Stage II
Populus-Borah 500 kV #1	x	
Populus 500/345 kV Transformer	x	
Borah 500/345 kV Transformer	x	
Loop the Kinport-Midpoint 345 kV line into Borah to create the Kinport-Borah 345 kV and the Borah-Midpoint 500 kV lines.	x	
Upgrade series compensation on the Midpoint-Hemingway 500 kV #1	x	
Populus- Cedar Hill 500 kV #1	x	

(w/ series compensation)		
Cedar Hill – Hemingway 500 kV #1 (w/ series compensation)	x	
Populus 500/345 kV Transformer #2		x
Add series compensation on Populus-Borah #1 500 kV		x
Add series compensation on Borah – Midpoint 500 kV #1		x
Midpoint – Hemingway 500 kV #2 (w/ series compensation)		x
Cedar Hill – Midpoint 500 kV #1		x

2. <u>Bridger Study Area</u>

This area will include all the planned and existing facilities between the Aeolus substation and the area just West of Populus.

Bridger West, Aeolus West and Path C paths will be studied and their corresponding ratings with the new proposed facilities determined under simultaneous interactions with other affected paths.

In the first and second stage of this project these facilities are comprised of:

Facilities	Stage I	Stage II
Anticline-Populus 500 kV #1 (w/ series compensation)	x	
Aeolus – Anticline 500 kV #1	x	

(w/series compensation)		
Aeolus 500/230 kV #1, #2 & #3 TX	x	
Aeolus 230 kV SVC (-125/+450 MVAr), MSC's at 230 kV (3-100 MVAr, 1-50 MVAr) & 500 kV (4-200 MVAr)	x	
Anticline 500/345 kV #1 TX	x	
Anticline 345 kV PST #1 & #2	x	
Aeolus-Anticline #2 500 kV		x
Anticline-Populus 500 kV #2 (w/ series compensation)		x
Aeolus – Bridger #2 500 kV		x
Bridger 345/230 kV #4 & #5 TX (500/230 kV Optional)		x

3. <u>Windstar Study Area</u>

This area will include all the planned and existing facilities between the Windstar substation and the Aeolus substation.

As new facilities proposed parallel the TOT 4A [Path 37] transmission path, the TOT 4A path will be studied and the corresponding increased rating with the proposed facilities determined under simultaneous interactions with other affected paths.

In the first and second stage of this project these facilities are comprised of:

Facilities	Stage I	Stage II
Windstar – Aeolus 230 kV #1 & #2	x	

Dave Johnston – Difficulty – Aeolus 230 kV #1, rebuild to 2-1272 ACSR/phase		x

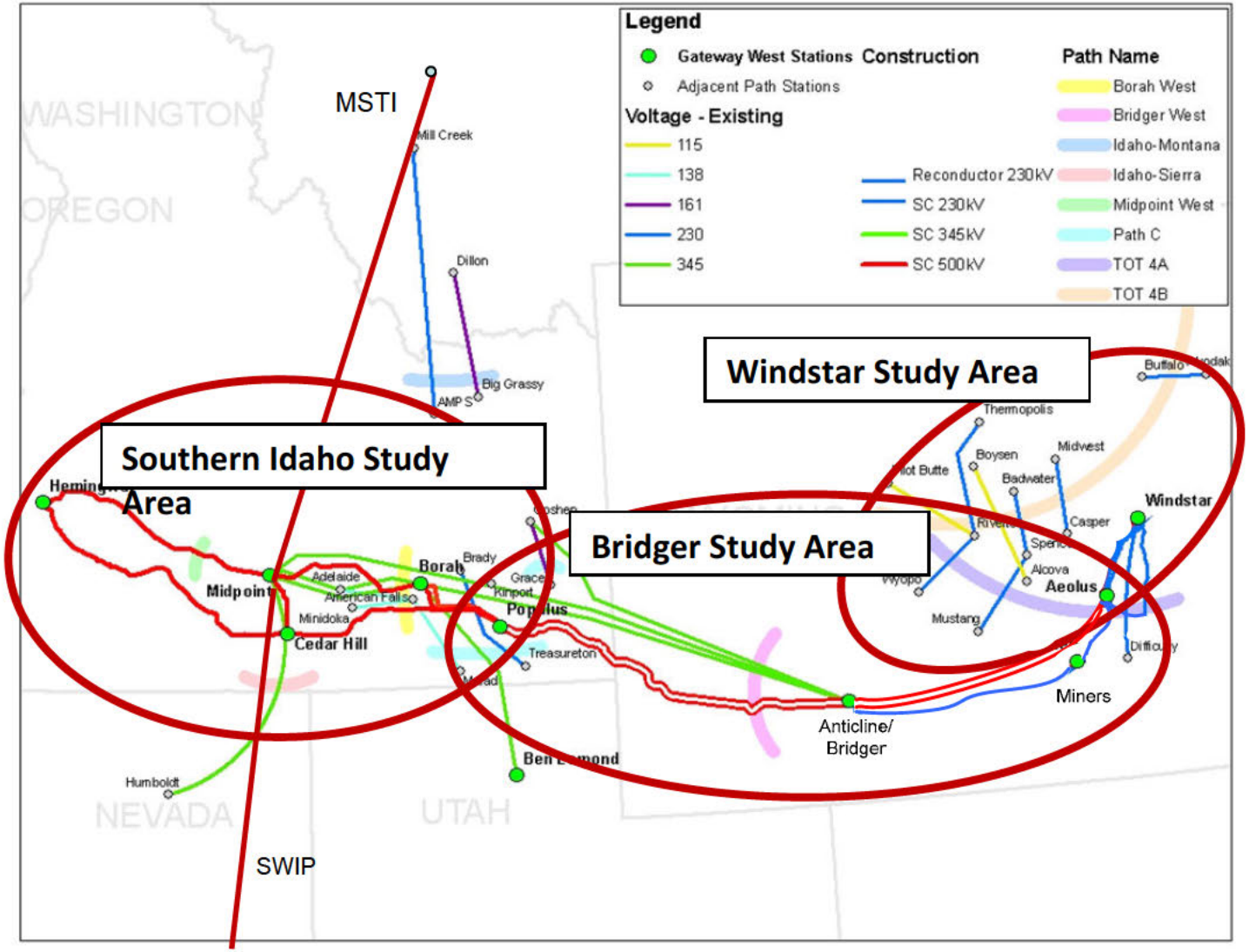


Figure 1

D. Path Ratings

Major path ratings for GW will require simultaneous studies that may include updating existing paths and identifying new paths related to the project. An initial listing of interacting paths has been included in the table below. In following WECC guidelines, a ten percent test (simulates the critical outage on the path that established the path's non-simultaneous transfer capability) will be performed to validate the legitimacy of each simultaneous interaction.

If no criteria violations (see Section III.B) exist for simultaneous operation with the main path and the proposed interactive path at their individual non-simultaneous transfer capability, under the critical outage, then simultaneous interaction will be deemed to be lacking.

If simultaneous interactions are verified, a simultaneous nomogram describing safe operation (meets NERC TPL Standards and WECC System Performance Criteria) of the affected paths will be developed.

New and existing paths with proposed new ratings that have been identified are:

Study Area	Path	Proposed Rating		Simultaneous Interaction
		Stage I	Stage II	
Windstar	TOT 4A (Path 37)	1935 MW	3435 MW	Montana SE
				Tot 3
				Tot 4B
				Yellowtail South
				Tot 1A
Bridger	Bridger West (Path 19)	3900 MW	5400 MW	Aeolus South
				Path C

				(Path 20)
				Montana - Idaho (Path 18)
				Bonanza West (Path 33)
				MISTI
				Monument-Naughton
				Rock Springs / Firehole West
Bridger	Path C (Path 20)	2250 MW	2250 MW	Montana - Idaho (Path 18)
				Bridger West (Path 19)
				Bonanza West (Path 33)
				MISTI
				Monument-Naughton
				Rock Springs / Firehole West

Bridger	Aeolus West	1500 MW	3000 MW	Aeolus South
				Tot 1A
				Bonanza West (Path 33)
Southern Idaho	Borah West (Path 17)	4057 MW	5557 MW	Path C
				Montana-Idaho (Path 18)
				MISTI
				SWIP (Great Basin – North, EnTP)
				Idaho – Sierra (Path 16)
Southern Idaho	Midpoint West	3987 MW	5487 MW	Idaho – Northwest (Path 14)
				Hemingway – Summer Lake (Path 75)
				Boardman -

				Hemingway
				Montana – Northwest (Path 8)

Along with the impact of GW on existing and proposed path ratings, simultaneous studies will be run assuming that the Gateway South project has previously been completed.

Other paths may be identified during the course of the study and would be added as appropriate.

IV. Operational Considerations

As part of this analysis, transmission options that will enhance operational flexibility will be evaluated. These options may include:

1. phase shifter utilization
2. varying levels of series compensation
3. others as identified

V. Mitigation Options

To the extent a need to mitigate criteria violations or interaction with Existing/Accepted path ratings is identified from the simultaneous path analyses, viable mitigation options will be identified in this Study Plan, including the following:

1. Added Facilities
2. Generation dropping
3. Shunt/Series capacitor switching.
4. Operating Procedures, RAS and/or Operating Nomograms

A detailed mitigation plan, if required, will be determined and/or negotiated during Phase 3 of the project, prior to facilities becoming commercial or as part of the OTC technical studies.

V. SENSITIVITY ANALYSES

The sensitivity analysis identified in this section is based on preliminary analysis to look at projects that are planned to be developed in the same time frame as GW. The Study Plan includes the projects and uncertainties noted in Table 7 as sensitivity cases.

Table 7. List of Study Sensitivities

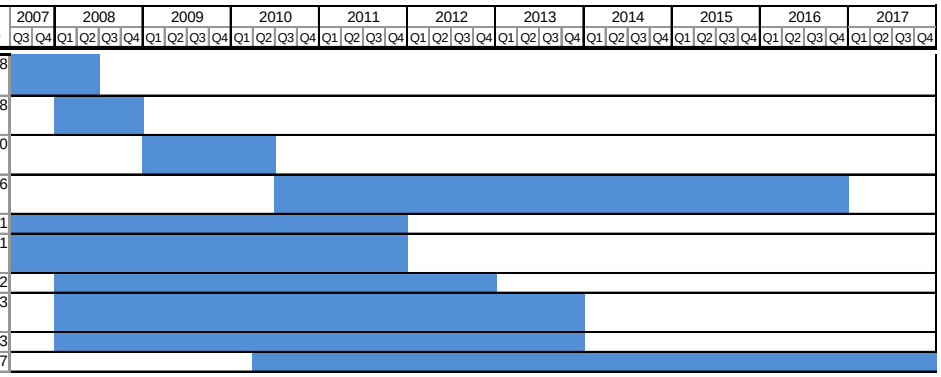
1	Generic Nevada 500 kV Line*
2	Gateway South 500 kV Line(s)
3	Other Transmission Sensitivities

* A generic version of a northern Nevada project will be modeled that includes either Ely Energy Center or the Great Basin North & South 500 kV lines that follow along the SWIP corridor.

VI. SCHEDULE

The study schedule for the Gateway West Project is noted below.

Task	Start Date	End Date
WECC Regional Planning Process	7/5/2007	5/30/2008
WECC Phase 1 Rating Process	2/1/2008	12/31/2008
WECC Phase 2 Rating Process	1/1/2009	6/1/2010
WECC Phase 3 Rating Process	6/2/2010	12/31/2016
NEPA Process	7/2/2007	12/31/2011
BLM Right of Way Grants	7/2/2007	12/31/2011
Permitting	1/1/2008	12/31/2012
Right of Way Acquisition	1/1/2008	12/31/2013
Engineering	1/1/2008	12/31/2013
Construction	2/2/2010	12/31/2017



Appendix 1

Minimum Voltage Limits

Minimum Idaho and Utah Bus Voltage Limits			
Bus	Pre-Outage Min. Volt (p.u.)	Post-Disturbance Min. Volt (p.u.)	Comments
PacifiCorp	0.95	5% Deviation	
Idaho Power	0.95	5% Deviation	(N-1)

Minimum Wyoming Bus Voltage Limits			
Bus	Pre-Outage Min. Volt (p.u.)	Post-Disturbance Min. Volt (p.u.)	Comments
Central, Northern and Eastern Wyoming	0.95	0.90	Automatic capacitor switching at Miners, Foote Creek, Platte and Atlantic City.

Appendix 2

Excerpt from WECC TPL-(001 thru 004)-WECC-1-CR System Performance Criteria

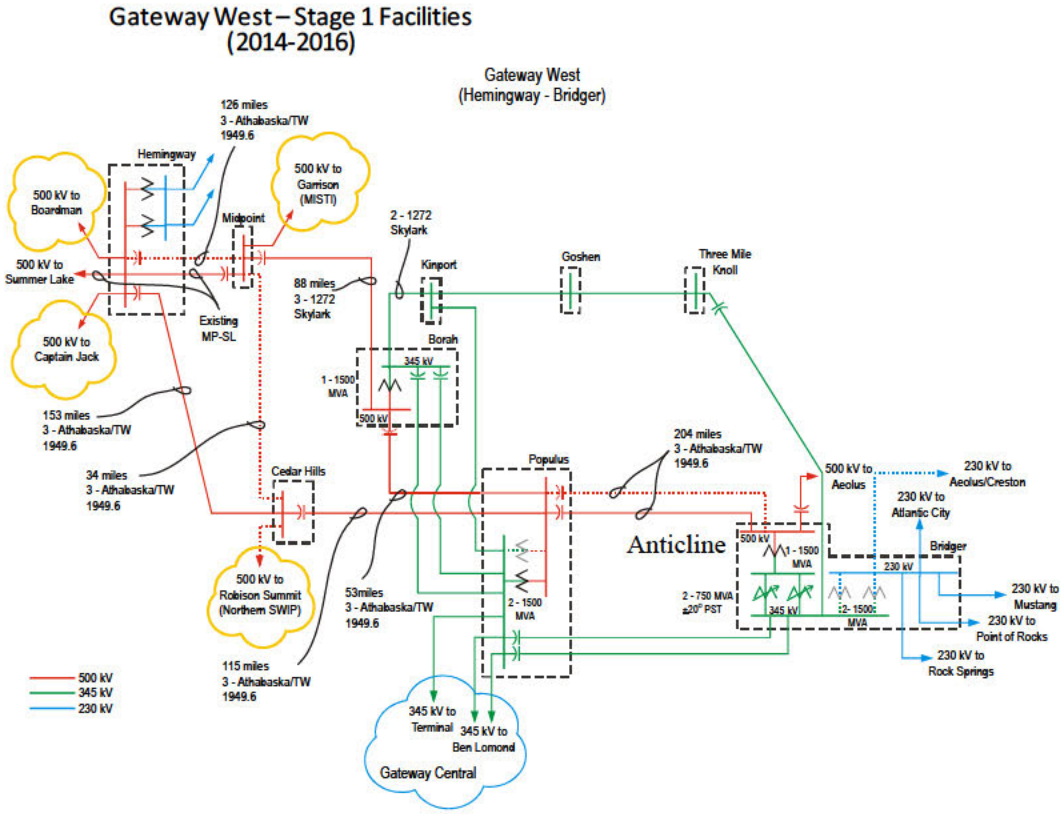
WECC DISTURBANCE-PERFORMANCE TABLE OF ALLOWABLE EFFECTS ON OTHER SYSTEMS

NERC and WECC Categories	Outage Frequency Associated with the Performance Category (outage/year)	Transient Voltage Dip Standard	Minimum Transient Frequency Standard	Post Transient Voltage Deviation Standard (See Note 3)
A	Not Applicable	Nothing in addition to NERC		
B	≥ 0.33	Not to exceed 25% at load buses or 30% at non-load buses. Not to exceed 20% for more than 20 cycles at load buses.	Not below 59.6 Hz for 6 cycles or more at a load bus.	Not to exceed 5% at any bus.
C	0.033 – 0.33	Not to exceed 30% at any bus. Not to exceed 20% for more than 40 cycles at load buses.	Not below 59.0 Hz for 6 cycles or more at a load bus.	Not to exceed 10% at any bus.
D	< 0.033	Nothing in addition to NERC		

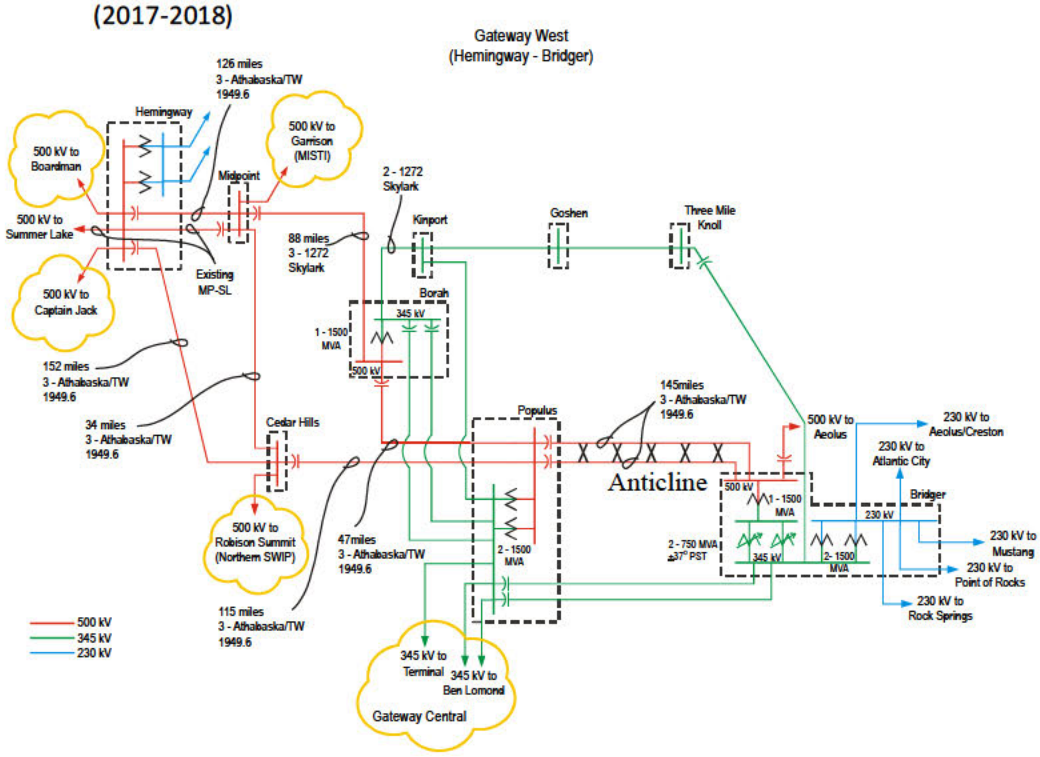
* PacifiCorp (Wyoming) buses allowed to deviate 10% for a level B disturbance.

Appendix 3

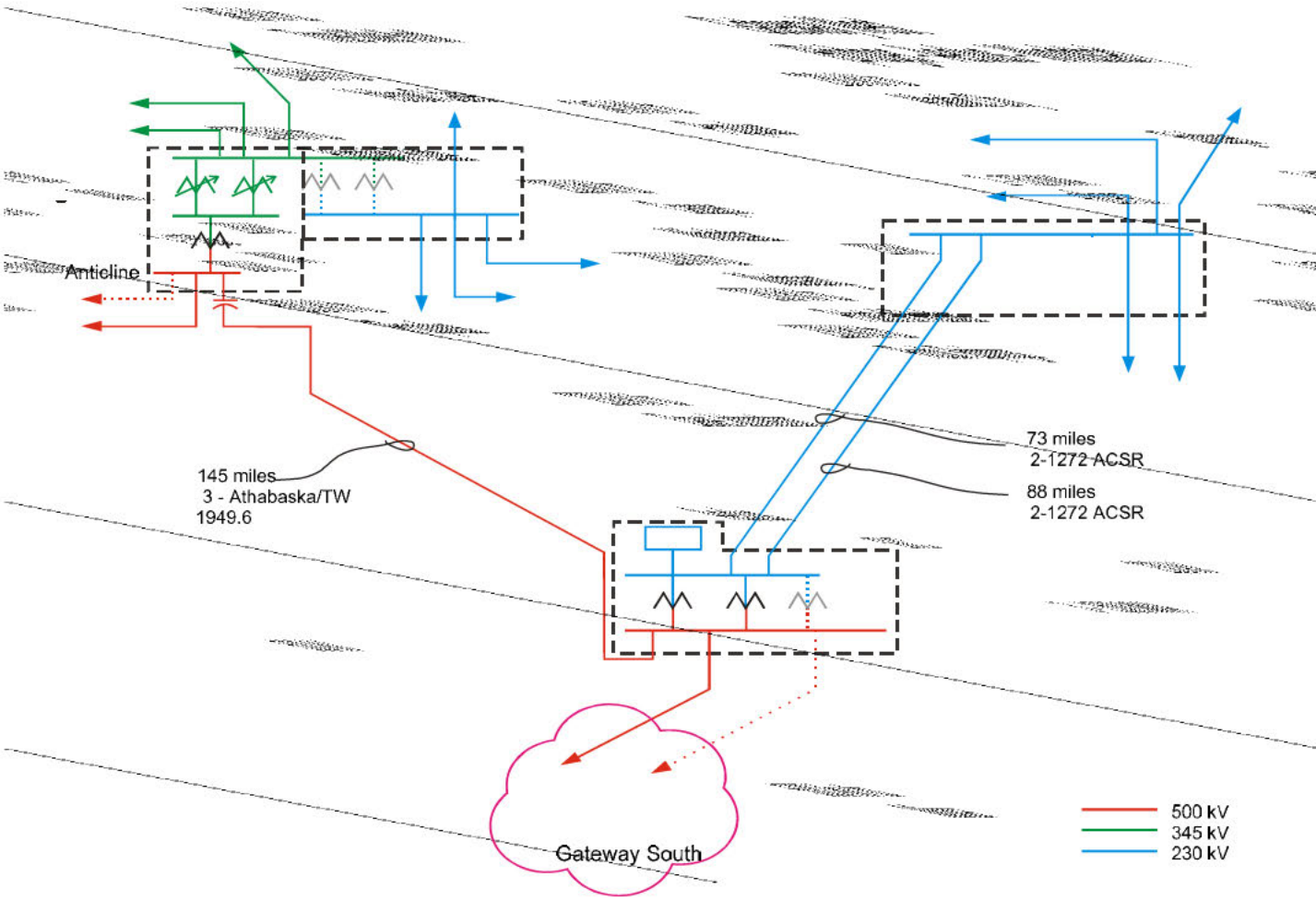
Energy Gateway Project Facilities



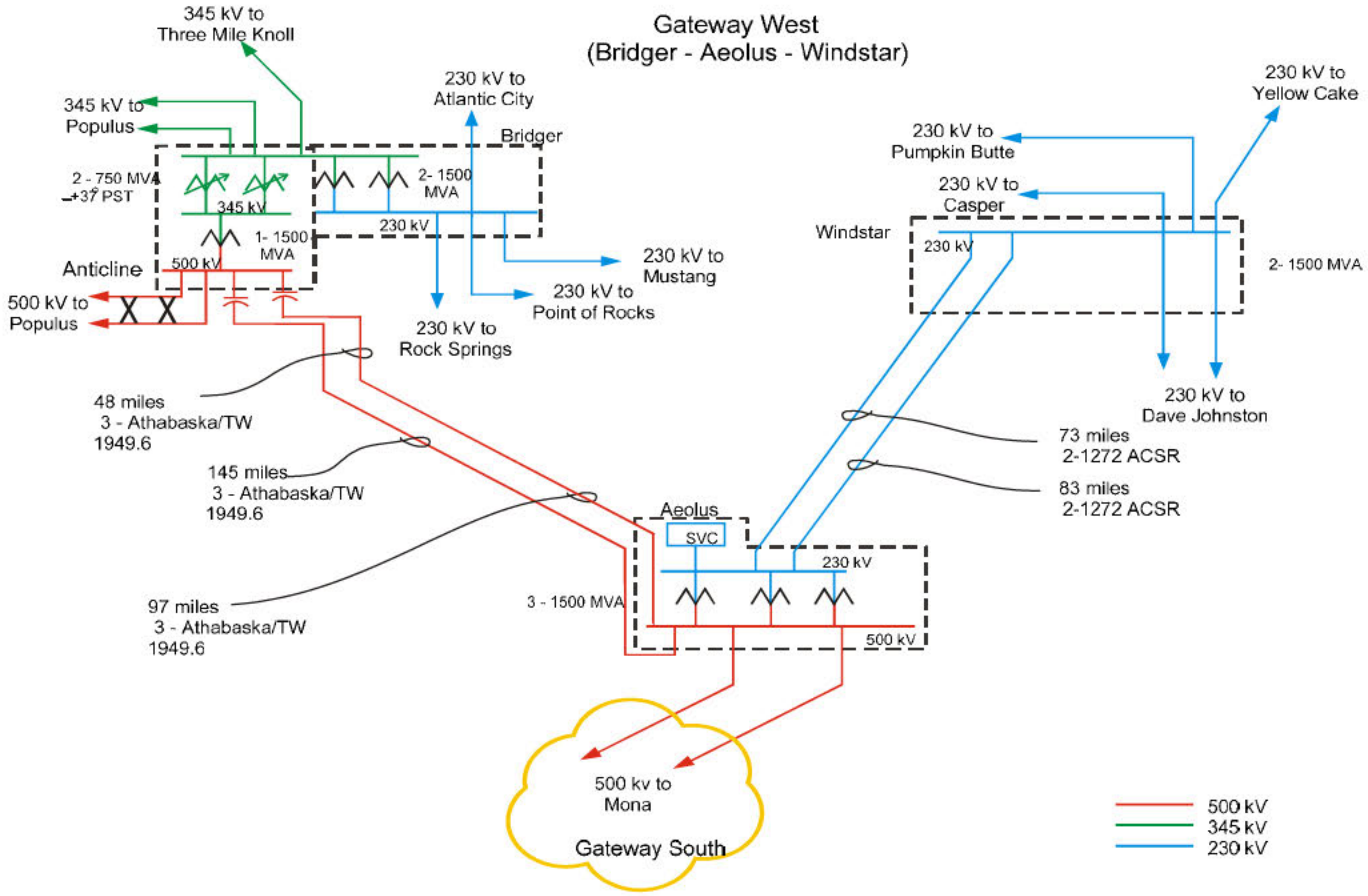
Gateway West – Stage 2 Facilities (2017-2018)



Gateway West – Stage 1 Facility
Bridger -Windstar (2014-2016)



Gateway West – Stage 2 Facility
Bridger -Windstar (2017-2018)



Appendix 4

Energy Gateway Project Facilities

As of 10-23-09, the facility impedances provided on the following pages were defined for the Energy Gateway Project facilities. As this project is a "work in progress", these impedances can and will change as the project matures.

Gateway West Project Facilities

Bus Numbers			M leage	R	X	B	Rating MVA) Normal	Rating MVA) Emergency	Conductor	New conductor	% of Line Charg ng Comp'ed by Reactors	argeted o al MVAR of Reactors	Quant ty S ze of Shunt Reac ors	Bus Numbers		% Series Comp	Impedanc e of eries Caps in PU	Rating (MVA) Normal Emergency	
F om	o	**Dave ohnston Aeolus**																	
		Dave ohnston - D ff cul y	45	0.00350	0 0 270	0. 60 0	888.0	86.0	2- 272 AC R	B tte n 272 ACSR									
6 460	67796	Di ficulty - Aeo us 230 k	26.9	0.002 0	0 03 0	0.095 0	888.0	86.0	2- 272 AC R	B tte n 272 ACSR									
677 6	65 7	Aeo us - M ne s 230 k	5 0	0.00237	0 023 2	0.04046	42 .9	2	- 272 AC R	Skyla k 272 ACSR									
F om	o	**Windstar 230 kV and 500 kV**																	
678 4	67796	W ndsta - Aeolus 2 0 k #	73 0	0.00 70	0 085 0	0.26070	888.0	86.0	2- 272 AC R	B tte n 272 ACSR									
678 4	67796	W ndsta - Aeolus 2 0 k #2	83 0	0.00650	0 0 6 0	0.2 660	888.0	86.0	2- 272 AC R	B tte n 272 ACSR									
67823	6779	W ndsta - Aeolus 500 k #	73 0	0.00054	0 0 509	.465 6	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	80	7	**2 x 60 MVAR**						
~~67823~~	~~678 4~~	~~W ndsta 500 2 0 k # ansfo me~~	~~—~~	~~—~~	~~—~~	~~—~~	~~**368 .5**~~	~~**4097.3**~~	~~ACSR WD~~		~~—~~	~~—~~	~~**3 x 60 MVAR**~~						
67823	678 4	W ndsta 500 2 0 k # ansfo me		0.000	0 008 6		00.0	680.0											
67823	678 4	W ndsta 500 2 0 k #2 ansfo me		0.000	0 008 6		00.0	680.0											
		Loop ellowcake-D 2 0 kV I ne in o Winds ar																	
66745	678 4	el owcake - Windsta 2 0 k #	8 0	0.00284	0 02580	0.05347	42 .9	2	- 272 AC R	Skyla k 272 ACSR									
678 4	65420	W ndsta 2 0 - D 230 k #	2.3	0.00036	0 003 0	0.00683	42 .9	2	- 272 AC R	Skyla k 272 ACSR									
		Loop Casper - D 2 0 kV # I ne into Windstar																	
65300	678 4	Caspe - Windsta 230 k #	9.63	0.00486	0 04506	0.0 4 6	68	8 4	- 272 ACCC										
678 4	65420	W ndsta - D 230 k #2	.6	0.00035	0 00324	0.00686	68	8 4	- 272 ACCC										
F om	o	**Aeolus Bridger**																	
67795	67796	Aeo us 00 230 k ansfo me #		0.000	0 008 6		500.0	680.0											
67795	67796	Aeo us 00 230 k ansfo me #2		0.000	0 008 6		500.0	680.0											
67795	67796	Aeo us 00 230 k ansfo me #3		0.000	0 008 6		500.0	680.0											
67795	67797	Aeo us - B dge 500 k #	4 .0	0.00 05	0.02966	2. 2782	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	80	2 4	**4 x 60 MVAR**	677 7	67800	.44	-0.0 355	2000	000
67800	6780	B dge 500 345 k ans o me #		0.000 2	0 0087		500.0	680.0											
60085	6780	B dge 345 k PS #		0.000	0 00889		00.0	680.0	- 45 Deg ee										
60085	65220	B dge 345 2 0 k #		0.00022	0 00778		00.0	680.0											
60085	65220	B dge 345 2 0 k #4		0.00022	0 00778		00.0	680.0											
677 6	67770	Aeo us - C eston 2 0 k	7.3	0.00 43	0 09543	0.4 269	693.5	884.7	3- 5 0 ACSR WD	A habaska W 949 6									
67770	65220	C es on - B idge 2 0 k	47 6	0.00 68	0 04669	0.20 89	693.5	884.7	3- 5 0 ACSR WD	A habaska W 949 6									
6 220	6755	B dge - Wind Rive 2 0 k #	0 0	0.00393	0 0 8 4	0. 7840	847.8	042	2- 272 AC R	B tte n 272 ACSR									
		Loop Platte - Point Of Rock 2 0 kV Line into Cres on																	
		Aeolus 500 kV Reactive upport		**2-200 MVAR Shunt Capac tors**															
		Bridger 500 kV Reactive Support		**2-200 MVAR Shunt Capac tors**															
F om	o	**Bridger West**																	
67800	678	B dge Populus 500k Ckt #	9	0.00 35	0.03865	.87766	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	85	3 0	4 x 80M AR	678	67794	0	-0.0 932	2000	000
67800	678 2	B dge Populus 500k Ckt #2	9	0.00 35	0.03865	.87766	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	85	3 0	4 x 80M AR	678 2	67794	0	-0.0 932	2000	000
F om	o	**Populus West**																	
677 4	60 28	Populus-Ceda Hi l 500k	5	0.00084	0.02 65	2.3 74	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	80	85	4 x 4 M AR	60 28	60 5	0	-0.0 82	2000	000
677 4	60057	Populus - Bo ah	47	0.00035	0.00 75	0. 4209	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	80	75	2x37. M AR	600 7	6006	0	-0.00488	2000	000
6006	6005	Bo ah - M dpoint	88	0.00085	0.0 667	.47600	**3 8**	**3 85**	Conve s on of K ngo 1 - M dpoint Line	.45 k	80	8	2x4 M AR	60059	60240	0	-0.00834		000
F om	o	**Cedar Hill West & North**																	
60 59	60240	Ceda Hi l M dpoint 00k	34	0.00025	0.00706	0.68 5	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	0	0				0	0 00000		
60 59	60 54	Ceda Hi l Hem ngway 00k	53	0.00	0.03 24	.09 94	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	80	247	4 x 60 M AR	60 55	60 54	0	-0.0 62	2000	000
F om	o	**Midpoint West**																	
60240	60 57	Midpoint-Hemingway 00k #2	26	0.000 2	0.02 86	2.53 60	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	80	203	4x 45M AR	60 7	60 5	0	-0.0 293	2000	000
F om	o	**Hemingway West**																	
60 55	60 32	Hem ngway-Sand Ho low 00k	29	0.00022	0.00602	0. 8 29	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	0	0				0	0 00000		
60 33	4072	Sand Hol ow McNa y (Boa dman) 500 k	202	0.00 42	0.04075	4. 0725	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	85	349	4 x 80M AR	60 33	60 32	0	-0.02037	2000	000
60 55	44 06	Halfway-Mid Cap 500k	60.5	0.00 6	0.03272	.246 8	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	80	260	4 x 60 M AR	44905	44 06	0	-0.0 636	2000	000
44905	44 04	Halfway-Captain ack 00k	60.5	0.00 6	0.03272	.246 8	**368 .5**	**4097.2**	3- 5 0 ACSR WD	A habaska W 949 6	80	260	4 x 60 M AR	44904	4503	0	-0.0 636	2000	000
F om	o	**Loop MP Burns into Hemingway**																	
60242	60 5	Midpoint-Hemingway 00k #	6	0.00 28	0.02 68	2.5854	3 7.7						- 0	60240	60242	5 .95	-0.0 34	772.7	239 2
60 55	4502	Hem ngway - Bu ns 500 k	34	0.00 6	0.0272	2 7 87	3 7.7												

IPCo 00 k lines assumes t iple B t e n 272 conduc o , on 8 Eq. t iangle w th n bundle, and 3 x3 x62 89 phase spacing.
Pac f co p 500 k l nes assume t p e B tte n 272 conducto , on 7.28 Eq. t iangle w thin bund e, and 37.5 3 phase spac ng.

Gateway South Project Facilities

cq	Bus Numbers F om	Bus Numbers To		Mileage	R	X	B	Rating (MVA) Normal	Rating (MVA) Emergency	Conductor	Conductor Name	% of L ne Charging Comp'ed by Reactors	arged otal MVAR of Reactors	Quant ty / Size of Shunt Reactors	Bus Numbers From	Bus Numbers To	% Series Comp	mpedance of Series Caps in PU	Rating (MVA) Normal	Rating (MVA) Emergency
	Aeolus Mona																			
•	67795	67798	Aeolus - Series Cap Stat on 1A 500 kV #1	133.3	0 0009	0 02690	2.70960	**3681 5**	**4097 2**	3-1590 ACSR/TWD	Athabaska/TW 19 9 6	80	217	**4 x 50 MVAR**	67798	67799	58	0.0153	2000	3000
•	67795	67802	Aeolus - Series Cap Stat on 2A 500 kV #2	133.3	0 0009	0 02690	2.70960	**3681 5**	**4097 2**	3-1590 ACSR/TWD	Athabaska/TW 19 9 6	80	217	**4 x 50 MVAR**	67802	67803	58	0.0153	2000	3000
	67799	6780	Series Cap Stat on 1B - Series Cap Sta ion 1C	133.3	0 0009	0 02690	2.70960	**3681 5**	**4097 2**	3-1590 ACSR/TWD	Athabaska/TW 19 9 6	80	217	**4 x 50 MVAR**	6780	6790	58	0.0153	2000	3000
	67803	67806	Series Cap Stat on 2B - Series Cap station 2C	133.3	0 0009	0 02690	2.70960	**3681 5**	**4097 2**	3-1590 ACSR/TWD	Athabaska/TW 19 9 6	80	217	**4 x 50 MVAR**	67806	67905	58	0.0153	2000	3000
•	6790	67805	Series Cap Stat on 1D - Mona 500 kV #1	133.3	0 0009	0 02690	2 7096	3681.5	097 2			80	217	**4 x 50 MVAR**						
	67905	67805	Series Cap Stat on 2D - Mona 500 kV #2	133.3	0 0009	0 02690	2 7096	3681.5	3681 5			80	217	**4 x 50 MVAR**						
	65995	67805	Mona 500/3 5 kV Transformer #1		0 00012	0.00871		1500.0	1680 0											
	65995	67805	Mona 500/3 5 kV Transformer #2		0 00012	0.00871		1500.0	1680 0											
	F om	**To**	**Mona Sigurd Crystal**												**From**	**To**				
•	67805	67899	Mona - Sigurd 500 kV #1	7 2	0 00055	0 015 0	1. 8730	**3681 5**	**4097 2**	3-1590 ACSR/TWD	Athabaska/TW 19 9 6	80	119	**4 x 25 MVAR**						
	67899	663 0	S gurd 500/3 5 kV Transformer #1		0 00036	0.01296		**1500**	**1680**											
	67896	66280	Red Butte 500/3 5 kV Transformer #1		0 00012	0 00871		1500.0	1680 0											
	663 0	66280	S gurd - Red But e 3 5 kV #2	187	0 00860	0 09335	1.5 972	1162.9	1 32 0	2-95 ACSR	Cardinal	80	12	**2 x 55 MVAR**	66280	6783	6	0.0 275	1076	1076
•	67896	67897	Red Butte - Crys al 500 kV #1	95	0 00070	0 01959	1.91021	**3681 5**	**4097 2**	3-1590 ACSR/TWD	Athabaska/TW 19 9 6	80	153	**2 x 75 MVAR**	67897	67898	50	0.00980	2000	3000
•	18 52	67898	Crys al 500 kV PST #1		0 00036	0 01296		900.0	1008 0	-/- 50 Degree										
•	18 52	67898	Crys al 500 kV PST #2		0 00019	0 01373		900.0	1008 0	-/- 50 Degree										
	From	**o**																		
	18 50	18 52	**Crystal Harry Allen**	7.2	0 00007	0 00172	0.15791	2787.7	3886.7						**From**	**To**				
			Har y Allen 3 5/230 kV Trans ormer #2		0 00033	0 02683		357.1	65.3											
	18 52	18 50	Crys al N - Harry Al en 500 KV #1	7 2	0 00007	0 00172	0.15791	2787.7	3886.7	3-1590 ACSR	Lapwing				18 52	18 50				
•	18 52	18 50	Crys al N - Harry Al en 500 KV #2	7 2	0 00007	0 00172	0.15791	2787.7	3886.7	3-1590 ACSR	Lapwing				18 52	18 50				

IPCo 500 kV lines assumes trip e B ttern 1272 conductor, on 18 Eq. tr ang e w thin bund e, and 33x33x62.89 phase spacing.
Pac ficorp 500 kV ines assume triple Athabaska TW 19 9 6 conductor, on 25. 5 18/18 inch tr ang e w thin bund e, and 37 5 foot phase spacing.

Gateway Central Project Facilities

Bus Numbers From	Bus Numbers To	Populus - Terminal	Mileage	R	X	B	Rating (MVA) Normal	Rating (MVA) Emergency	Conductor	Conductor Name	% of Line Charging Comp'ed by Reactors	Targeted Total MVAR of Reactors	Quantity / Size of Shunt Reactors	Bus Numbers From	Bus Numbers To	% Series Comp
		Loop Borah Ben Lomond 345 kV into Populus (@BI, BL POP #1 connected to BL BM #1)														
60093	67790	Borah - Populus 345 kV #2	48.0018	0.00221	0.02414	0.40025	1183	1482	2-954 ACSR 54/7 (part of BL-BR)	Cardinal				60060	60093	56.55
67790	67793	Populus - Treasureton 345 kV #1	20.052	0.00092	0.01008	0.16827	1165	1482	2-954 ACSR 54/7 (part of BL-BR)	Cardinal						
67793	66510	Treasureton - Terminal 345 kV #1	112.358	0.00436	0.05672	0.93501	1165	1482	2-954 ACSR 54/7 (part of BL-BR)	Cardinal						
67790	65135	Populus - Ben Lomond 345 kV #2	86.1	0.00301	0.04477	0.69124	1332	1478	2-1272 ACSR	Bittern						
67790	65135	Populus - Ben Lomond 345 kV #3	81.63	0.00308	0.04209	0.66181	1332	1478	2-1272 ACSR	Bittern						
65135	66510	Ben Lomond - Terminal 345 kV #3	46.6	0.00164	0.02322	0.39237	1332	1478	2-1272 ACSR	Bittern						
65135	66510	Ben Lomond - Terminal 345 kV #4	46.6	0.00164	0.02322	0.39237	1332	1478	2-1272 ACSR	Bittern						
		Loop Bridger Borah 345 kV into Populus														
60090	67790	Borah - Populus 345 kV #1	47.94	0.00169	0.02260	0.42876	1127	1553.6	2-1272 ACSR (part of Borah-Bridger)	Skylark				60060	60090	59
67791	60085	Populus - Bridger 345 kV #1	192.0	0.00631	0.09016	1.69402	**1127**	**1553.6**	1-2167 ACSR upgrade to 2-1272 ACSR (part of Borah-Bridger)	Skylark				67790	67791	43.18
		Loop Bridger Kinport 345 kV into Populus														
60191	67790	Kinport - Populus 345 kV #1	41.81	0.00147	0.02027	0.36371	1127	1553.6	2-1272 ACSR (part of Kinport-Bridger)	Skylark				60091	60190	65.78
67792	60085	Populus - Bridger 345 kV #2	192.0		0.09038	1.69167	**1127**	**1553.6**	upgrade to 2-1272 ACSR (part of Borah-Bridger)	Skylark				67790	67792	43.07
		Populus 345 kV Reactive Support		**1 200 MVAR Shunt Capacitor, 2 90 MVAR Shunt Reactor**												

From	To	Bridger - 3MK - Goshen Rep														
65665	60084	**Goshen 3MK 345 kV**	**56.5**	**0.00169**	**0.0263**	**0.50072**	**1386**	**1593.9**								
		3MK Series Capacitor			-0.04790		986	**1331.1**	41.2 Ohms					60084	60092	60.63
60092	60085	**3MK Bridger 345 kV**	169.5	0.00507	0.07900	1.50217	**1386**	**1593.9**	1-2167 ACSR upgrade to 2-1272 ACSR (part of Goshen-Bridger)	Skylark	50 MVAR					

From	To	Mona - Limber - Terminal												From	To
67805	67807	Mona - Limber 500 kV #1	65	0.00048	0.01345	1.30480	**3681.5**	**4097.2**	3-1590 ACSR/TWD	Athabaska/TW 1949.6	80	104	**2 x 50 MVAR**		
67805	67807	Mona - Limber 500 kV #2	65	0.00048	0.01345	1.30480	**3681.5**	**4097.2**	3-1590 ACSR/TWD	Athabaska/TW 1949.6	80	104	**2 x 50 MVAR**		
67807	67808	Limber 500/345 kV Transformer #1		0.00012	0.00871		1500.0	1680.0							
67807	67808	Limber 500/345 kV Transformer #2		0.00012	0.00871		1500.0	1680.0							
67808	66133	Limber - Oquirrh 345 kV #1	21	0.00074	0.01095	0.16844	1332	1478	2-1272 ACSR	Bittern 1272 ACSR					
67808	66133	Limber - Oquirrh 345 kV #2	21	0.00074	0.01095	0.16844	1332	1478	2-1272 ACSR	Bittern 1272 ACSR					
67808	66510	Limber - Terminal 345 kV #1	40	0.00140	0.02085	0.32084	1332	1478	2-1272 ACSR	Bittern 1272 ACSR					
67808	66510	Limber - Terminal 345 kV #2	40	0.00140	0.02085	0.32084	1332	1478	2-1272 ACSR	Bittern 1272 ACSR					
66133	66510	Oquirrh - Terminal 345 kV #1	14.4	0.00050	0.00673	0.12907	1332	1478	2-1272 ACSR	Bittern 1272 ACSR					
66133	66510	Oquirrh - Terminal 345 kV #2	14.4	0.00050	0.00673	0.12907	1332	1478	2-1272 ACSR	Bittern 1272 ACSR					
66133	66510	Oquirrh - Terminal 345 kV #3	14.4	0.00050	0.00673	0.12907	1332	1478	2-1272 ACSR	Bittern 1272 ACSR					
66133	66510	Oquirrh - Terminal 345 kV #4	14.4	0.00050	0.00673	0.12907	1332	1478	2-1272 ACSR	Bittern 1272 ACSR					
65260	66080	Camp Will - 90th 345 kV #3	10.65	0.00030	0.00440	0.08140	1395.9	1724.0	2-1272 ACSR/TWD	Potomac/TW 1557.4					
65260	66080	Camp Will - 90th 345 kV #4	10.65	0.00030	0.00440	0.08140	1395.9	1724.0	2-1272 ACSR/TWD	Potomac/TW 1557.4					
		Mona 500 kV Reactive Support		**2 200 MVAR Shunt Capacitors**											

Appendix 21

TSS Approved Exceptions to the NERC/WECC Standards

Accepted Voltage and Frequency Exceptions
To the WECC Reliability Criteria for Transmission System Planning

Bus Name/Location	Company	Acceptable Voltage/Frequency Dip	Level of WECC Reliability Criteria	Reference
Northern New Mexico	PNM	6% Post-Transient Voltage Deviation	A*	1997 Path Rating Catalog, Path 48 Northern New Mexico (NM2) Study Criteria
Southern New Mexico	PNM	7% Post-Transient Voltage Deviation	A*	1997 Path Rating Catalog, Path 48 Northern New Mexico (NM2) Study Criteria
BIGCREEK13.8	SCE	59.47 Hz 23 cycles below 59.6	A*	1992 Study Program, Case NT08
BIGCREEK230.	SCE	59.5 Hz 21 cycles below 59.6	A*	1992 Study Program, Case NT08
EASTWOOD230.	SCE	59.5 Hz 21 cycles below 59.6	A*	1992 Study Program, Case NT08
RECTOR 230.	SCE	59.56 Hz 15 cycles below 59.6	A*	1992 Study Program, Case NT08
SPRINGVL230.	SCE	59.57 Hz 13 cycles below 59.6	A*	1992 Study Program, Case NT08
OMAR G13.8	SCE	59.57 Hz 13 cycles below 59.6	A*	1992 Study Program, Case NT08
SYC CYNG13.8	SCE	59.58 Hz 11 cycles below 59.6	A*	1992 Study Program, Case NT08
VESTAL 230.	SCE	59.59 Hz 9 cycles below 59.6	A*	1992 Study Program, Case NT08
BLNDL G112.5	PACE	59.43 Hz 15 cycles below 59.6	A*	1993 Study Program, Case NT12
BLUNDELL46.0	PACE	59.53 Hz 10 cycles below 59.6	A*	1993 Study Program, Case NT12
MONTANA113.8	MPC	58.66 Hz 14 cycles below 59.4	B*	1992 Study Program, Case NT38B
COLSTP 222.0	MPC	58.86 Hz 14 cycles below 59.4	B*	1992 Study Program, Case NT38B
COLSTP 115	MPC	59.13 Hz 10 cycles below 59.4	B*	1992 Study Program, Case NT38B
COLSTP 122.0	MPC	59.14 Hz 9 cycles below 59.4	B*	1992 Study Program, Case NT38B
HARDIN 115	MPC	59.27 Hz 7 cycles below 59.4	B*	1992 Study Program, Case NT38B
COLSTRP 230.	MPC	59.13 Hz 9 cycles below 59.4	B*	1992 Study Program, Case NT38B
CORETTE 18.0	MPC	59.29 Hz 9 cycles below 59.4	B*	1992 Study Program, Case NT38B

Accepted Voltage and Frequency Exceptions
To the WECC Reliability Criteria for Transmission System Planning

Bus Name/Location	Company	Acceptable Voltage/Frequency Dip	Level of WECC Reliability Criteria	Reference
HARDIN 230.	MPC	59.31 Hz 6 cycles below 59.4	B*	1992 Study Program, Case NT38B
MILCTYDC230.	WAPA UM	59.27 Hz 8 cycles below 59.4	B*	1992 Study Program, Case NT38B
ROSEBUD 230.	WAPA UM	59.30 Hz 7 cycles below 59.4	B*	1992 Study Program, Case NT38B
DIABLO 500.	PG&E	31.8% Transient Voltage Dip	C*	1993 Study Program, Case FT09
Ft. CREEK 34.5	PACE	36.1% Transient Voltage Dip	C*	1997 Study Program, Case 9709
Ft. CREEK 230	PACE	35.6% Transient Voltage Dip	C*	1997 Study Program, Case 9709
MINERS 230	PACE	35.4% Transient Voltage Dip	C*	1997 Study Program, Case 9709
PLATTE 230	PACE	32.4% Transient Voltage Dip	C*	1997 Study Program, Case 9709
NTL 138	BCHA	53.2% Transient Voltage Dip	C*	1994 Study Program, Case FT14
Southern Nevada Area	SPP	46.6% Transient Voltage Dip	C*	1998 Study Program, Case 9813
WAPA L.M. Area EC Zone	WAPA LM	30.7% Transient Voltage Dip	C*	Response to Performance Log Item 95-02
Between Alberta and BCHA	BCHA	Separation and associated low voltages	A-D*	1988 Study Program, Case NT04
ROSEBUD 115.	TSG&T	59.2 Hz 15 cycles below 59.6	B	2003 Study Program, Case D0310, D0329
ROSEBUD 13.8	TSG&T	59.2 Hz 15 cycles below 59.6	B	2003 Study Program, Case D0310, D0329
CARLIN TREND AREA	SPPR	7% Post-Transient Voltage Deviation	B	2007 Study Program, Case D0707

Accepted Voltage and Frequency Exceptions
To the WECC Reliability Criteria for Transmission System Planning

Bus Name/Location	Company	Acceptable Voltage/Frequency Dip	Level of WECC Reliability Criteria	Reference
NORTHEASTERN NEW MEXICO AREA	TSG&T	7% Post-Transient Voltage Deviation	B	2003 Study Program, Case D0309 2004 Study Program, Case D0421
SOUTHERN NEW MEXICO AREA	TSG&T	7% Post-Transient Voltage Deviation	B	2005 Study Program, Case D0509
OTHER BUSES IN PNM AREA	TSG&T	6% Post-Transient Voltage Deviation	B	2003 Study Program, Case D0333
WESTERN COLORADO AREA	TSG&T	7% Post-Transient Voltage Deviation	B	2004 Study Program, Case D0424
SOUTHERN COLORADO AREA	TSG&T	7% Post-Transient Voltage Deviation	B	2003 Study Program, Case D0309 2004 Study Program, Case D0421, D0424
OTHER TRI-STATE AREAS	TSG&T	6% Post-Transient Voltage Deviation	B	
BRIDGER1-5 22.0	PACE & IPC	59.42 Hz 6 cycles below 59.6	B	2007 Study Program, Case D0710, D0727
BRIDGER 34.5	PACE & IPC	59.55 Hz 6 cycles below 59.6	B	2007 Study Program, Case D0710, D0727
WALSENBURG 69, 115, 230	TSG&T	8% Post-Transient Voltage Deviation	B	
PTRSNFLT 230	PACE & IPC	14% Post-Transient Voltage Deviation	C	2007 Study Program, Case D0709
PTRSNFUR 69	PACE & IPC	13% Post-Transient Voltage Deviation	C	2007 Study Program, Case D0709
PTRSNFRG 69	PACE & IPC	12% Post-Transient Voltage Deviation	C	2007 Study Program, Case D0709
AMPS 69	PACE & IPC	13% Post-Transient Voltage Deviation	C	2007 Study Program, Case D0709
AMPS 230	PACE & IPC	12% Post-Transient Voltage Deviation	C	2007 Study Program, Case D0709

Accepted Voltage and Frequency Exceptions
To the WECC Reliability Criteria for Transmission System Planning

Bus Name/Location	Company	Acceptable Voltage/Frequency Dip	Level of WECC Reliability Criteria	Reference
BIGGRASS 69	PACE & IPC	11.5% Post-Transient Voltage Deviation	C	2007 Study Program, Case D0709
BIGGRASS 161	PACE & IPC	11% Post-Transient Voltage Deviation	C	2007 Study Program, Case D0709

* Refers to old WSCC Disturbance Performance Table.

PUBLIC UTILITY COMMISSION OF OREGON

UE 374

SIERRA CLUB EXHIBIT 724

Cross-Examination Exhibit

Aeolus West Transmission Path Transfer Capability Assessment

Updated Study Report
Revision 2.1

March 30, 2018

Prepared by
PacifiCorp – Transmission Planning

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Updated
Aeolus West Transmission Path
Transfer Capability Assessment

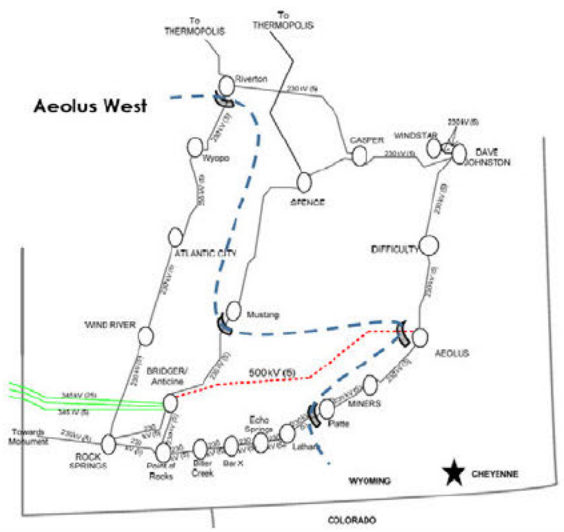
Executive Summary

This assessment was conducted to document the Transfer Capability of the Aeolus West[1] transmission path once the Gateway West – Subsegment D.2[2] (Bridger/Anticline – Aeolus) transmission facilities (D.2 Project) are added to the Wyoming transmission system and assumed resources identified in the PacifiCorp 2017R RFP[3] Shortlist were added.

The Aeolus West transmission path (see Figure 1) is a new path that will be formed by adding the D.2 Project in parallel with the TOT 4A[4] (Path 37) transmission path facilities. The anticipated in-service date for the D.2 Project is October 31, 2020. The D.2 Project is part of PacifiCorp's Energy Vision 2020 (EV2020) initiative which includes the following major transmission facilities and network upgrades to support new wind generation resources:

- Aeolus 500/230 kV substation,
- Shirley Basin – Freezeout 230 kV line loop-in to Aeolus,
- Anticline 500/345 kV substation,
- Aeolus – Anticline 500 kV new line,
- Bridger – Anticline 345 kV new line,
- Shirley Basin – Aeolus 230 kV #1 line rebuild,
- Shirley Basin – Aeolus 230 kV #2 new line,

Figure 1: Aeolus West Transmission Path



[1] The Aeolus West transmission path will include the following major transmission elements: Aeolus* – Anticline 500 kV, Platte* – Latham 230 kV, Mustang* – Bridger 230 kV and Riverton* – Wyopo 230 kV transmission lines. (*meter location)

[2] Gateway West – Subsegment D.2 is a key component of the Energy Vision 2020 (EV2020) initiative that was announced by PacifiCorp on April 4, 2017. Other components of the EV2020 initiative include repowering PacifiCorp's existing wind fleet in southeast Wyoming and adding approximately 1,100 MW of new wind generation east of the Aeolus West transmission path. [Subsequent to the initial announcement, technical studies have demonstrated that as high as 1,510 MW can be integrated east of the Aeolus West transmission path.]

[3] The PacifiCorp 2017R Request for Proposals for renewable resources (2017R RFP) solicited cost-competitive bids for up to 1,270 MW of new or repowered wind energy interconnecting with or delivering to PacifiCorp's Wyoming system with the use of third-party firm transmission service and any additional wind energy located outside of Wyoming capable of delivering energy to PacifiCorp's transmission system that will reduce system costs and provide net benefits for customers.

[4] The existing TOT 4A (Path 37) transmission path is comprised of the Riverton* – Wyopo 230 kV, Platte – Standpipe* 230 kV and Spence* – Mustang 230 kV transmission lines. (*meter location)

- Aeolus – Freezeout 230 kV line reconductor,
- Freezeout – Standpipe 230 kV line reconductor,
- Latham dynamic voltage control device,
- Separate the double-circuit portion of the Ben Lomond - Naughton 230 kV #1 and Ben Lomond - Birch Creek 230 kV #2 lines to create two single-circuit lines,
- Railroad – Croydon 138 kV partial line reconductor,
- Aeolus 230 kV shunt reactor,
- Shirley Basin 230 kV shunt reactor,

The WECC 2021-22 HW power flow base case was utilized for the Aeolus West transfer capability assessment studies. In support of the EV2020 initiative, which calls for the addition of new and repowered wind resources in Wyoming, the base case was modified to achieve the transfer levels evaluated by utilizing PacifiCorp 2017R RFP Shortlist resources as evaluated in the Large Generation Interconnection (LGI) queue, which added 1510 MW east of the Aeolus West "cut plane" and 221 MW in southwest Wyoming. For different Aeolus West transfer levels (heavy and light) and 2400 MW flow across the Jim Bridger West path, resource levels in eastern Wyoming were varied relative to the Jim Bridger Generation in central Wyoming and the Emery/Hunter and Huntington generation in central Utah.

Contingencies that were considered in this analysis include:

- N-1 of D.2 Project facilities
- N-1, N-2 Bridger contingencies
- All eastern, central and northern Wyoming transmission system contingencies performed as part of the TPL-001-4 annual assessment.

For this transfer capability assessment, simultaneous interaction between the Aeolus West path and the TOT 4B path was evaluated; however, the interactions with other transmission paths (Yellowtail South, Jim Bridger West, TOT 1A and TOT 3) were monitored throughout the study. Subsequent transfer capability assessments will evaluate interaction with TOT 3 (Path 36), Bonanza West (Path 33) and TOT 1A (Path 30) transmission paths. (See Appendix A.)

In this revision of the report, the power flow analysis was re-evaluated to identify maximum transfer capability by stressing both the Aeolus West and the TOT 4B paths simultaneously. If required, additional power from Western Area Power Administration (WAPA) was imported into the PacifiCorp East (PACE) balancing authority area.

Conclusions

Technical studies have demonstrated that the interconnected Bulk Electric System (BES) in Wyoming with the D.2 Project added can support the PacifiCorp 2017R RFP Shortlist resources, and that system performance will meet all North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) performance criteria.

Preliminary power flow studies demonstrate that by utilizing existing and planned southeast Wyoming resources[5], the Aeolus West transmission path can transfer up to 1829 MW under simultaneous transfer conditions with the TOT 4B transmission path, effectively[6] increasing the east to west transfer levels across Wyoming by 951 MW. Power flow findings also indicated:

- Dynamic voltage control is necessary at the Latham 230 kV substation to mitigate low voltage conditions resulting from loss of Bridger/Anticline – Aeolus transmission facilities.
- Under certain operating conditions, one Remedial Action Scheme (RAS) will need to be implemented to trip generation following outage of specific transmission facilities in southeast Wyoming.
- The location (and output level) of new and repowered wind resources can influence the transfer capability level across the Aeolus West transmission path and the Aeolus West vs. TOT 4B nomogram curve.

Dynamic stability studies evaluated a wide range of critical system disturbances in eastern Wyoming. The analyses identified two outages with poor voltage performance, and another outage identified a wind turbine modeling problem. These issues are all attributed to the wind turbine models at the Q0706, Q0707 and Q0708 projects. PacifiCorp is working with the wind turbine manufacture to resolve these issues. Aside from these issues, the studied outages evaluated meet the dynamic performance criteria with the system being stable and damped.

[5] Eastern Wyoming Resources: Existing Wind: 1124 MW, Dave Johnston (net) 717 MW; Wyodak (PacifiCorp – net) 268 MW, New Wind – behind the Aeolus West "cut plane": 1510 MW; east Wyoming: 1270 MW, north Wyoming: 240 MW.

[6] Effective transfers were determined by subtracting the existing TOT 4A path maximum[13] transfer level (960 MW) from the Aeolus West transfer level (1829 MW) and adding the Platte area loads (82 MW) that are up-stream of the Aeolus West metering point.

1 Introduction

1.1 Purpose

The purpose of the study is to demonstrate that the interconnected transmission Bulk Electric System (BES) in Wyoming with the D.2 Project added can support the PacifiCorp 2017R RFP Shortlist resources and can be operated reliably during normal and contingency operations throughout the planning horizon. To achieve this purpose, the study will: (1) identify the new Aeolus West transmission path limitations, (2) evaluate the interactions between the Aeolus West and the TOT 4B transmission paths and develop a nomogram that depicts system limitations, and (3) identify any necessary Remedial Action Schemes (RAS).

This report will summarize the results of the power flow and dynamic stability analysis of the Aeolus West transmission path and will demonstrate that Wyoming transmission system performance with the D.2 project added meets all NERC and WECC performance criteria.

1.2 Plan of Service

The D.2 Project, and supporting network upgrades consists of the following system improvements:

1. Add Aeolus 500/230 kV substation
2. Add Aeolus 500/230 kV, 1600 MVA transformer
3. Loop the Shirley Basin – Freezeout 230 kV line into Aeolus,
4. Add Anticline 500/345 kV substation
5. Add Anticline 500/345 kV, 1600 MVA transformer
6. Add the Aeolus – Anticline 500 kV transmission line, 137.8-miles, 3x1272 ACSR (Bittern) conductor
7. Add the Anticline – Bridger 345 kV line, 5.1-miles, 3x1272 ACSR (Bittern) conductor
8. Add the Aeolus 230 kV, 60 MVAr shunt reactor
9. Add the Shirley Basin 230 kV, 60 MVAr shunt reactor
10. Add Aeolus 500 kV, 200 MVAr shunt capacitor
11. Add Anticline 500 kV, 200 MVAr shunt capacitor
12. Rebuilding of the Aeolus – Shirley Basin 230 kV #1 line, 2x1557 ACSS/TW (Hudson/TW) conductor
13. Add the Aeolus – Shirley Basin 230 kV #2 line, 2x1557 ACSS/TW (Hudson/TW) conductor
14. Reconductor the Aeolus – Freezeout 230 kV line, 2x1272 ACSR (Bittern) conductor

15. Reconductor the Freezeout – Standpipe 230 kV line, 2x1272 ACSR (Bittern) conductor
16. Add dynamic reactive device at Latham 230 kV substation.
17. Separate eight miles of the double-circuit Ben Lomond - Naughton 230 kV #1 and Ben Lomond - Birch Creek 230 kV #2 lines to create two single-circuit lines, and
18. Reconductor 2.35 miles of the Railroad - Croydon 138 kV line, 1222 ACCC high temperature conductor,

1.3 Planned Operating Date

The in-service date for all facilities associated with the D.2 Project is October 31, 2020.

1.4 Scope

The Aeolus West transfer capability assessment assumes the addition of new wind generation facilities as noted in Table 1, which includes the PacifiCorp 2017R RFP Shortlist resources as evaluated in LGI queue studies. While the new technology and model information of the repowered units was used in the steady-state and dynamic stability analysis, no incremental MW output was considered; i.e., each repowered facility was limited to its current LGI agreement generation capacity levels. The study was performed using a 2021-22 heavy winter WECC approved case which was modified to include the D.2 Project facilities. The system model assumed summer line ratings to assess the thermal limitation of the Wyoming system. Load served from Platte is normally represented as an open point between Platte – Whiskey Peak 115 kV. The system configuration with Platte 115 kV normally open is presently the most limiting scenario for the existing TOT 4A/4B nomogram.

2 Study Criteria

2.1 Thermal Loading

For system normal conditions described by the P0[7] event, thermal loading on BES transmission lines and transformers is required to be within continuous ratings.

For contingency conditions described by P1-P7 category planning events, thermal loading on transmission lines and transformers should remain within 30-minute emergency ratings.

[7] Facility outage events that are identified with “P” designations are referenced to the TPL-001-4 NERC standard.

The thermal ratings of PacifiCorp's BES transmission lines and transformers are based on the most recent PacifiCorp's Weak Link Transmission Database and Weak Link Transformer Database.

Table 1: Generating Resources Studied

Existing Wyoming Thermal Generation	Existing East Wyoming Wind Generation	New Wyoming Wind Generation
2396 MW • Dave Johnston (DJ): 717 MW • Wyodak (PacifiCorp): 268 MW • Jim Bridger (PacifiCorp): 1411 MW	1124 MW (Foote Creek, Rock River, High Plains, Seven Mile Hill, Dunlap, Root Creek, Top of the World, Glenrock, Three Buttes, Chevron)	1731 MW • Eastern Wyoming (Aeolus, Shirley Basin, Windstar): 1270 MW • Northern Wyoming (Bighorn Basin): 240 MW • Southwest Wyoming (Uinta County) : 221 MW See Table 4.

2.2 Steady State Voltage Range

The steady state voltage ranges at all PacifiCorp BES buses shall be within acceptable limits as established in PacifiCorp's Engineering Handbook section 1B.3 "Planning Standards for Transmission Voltage[8]" as shown below.

Table 2: Voltage Criteria

Operating System Configuration	Normal Conditions (P0)		Contingency Conditions (P1-P7)	
	Vmin (pu)	Vmax (pu)	Vmin (pu)	Vmax (pu)
Looped	0.95	1.06[9]	0.90	1.10
Radial	0.90	1.06[9]	0.85	1.10

[8] PacifiCorp Engineering Handbook "Planning Standards for Transmission Voltage," April 8, 2013.

[9] In some situations, voltages may go as high as 1.08 pu at non-load buses, contingent upon equipment rating review.

Steady state voltage ranges at all applicable BES buses on adjacent systems were screened based on the limits established by WECC regional criterion as follows:

- 95% to 105% of nominal for P0 event (system normal),
- 90% to 110% of nominal for P1-P7 events (contingency).

2.3 Post-Transient Voltage Deviation

Post-contingency steady state voltage deviation at each applicable BES load serving bus (having no intermediate connection) shall not exceed 8% for P1 events.

2.4 Dynamic Stability Analysis Criteria

All voltages, frequencies and relative rotor angles are required to be stable and damped. Cascading or uncontrolled separation shall not occur and dynamic voltage response shall be within established limits.

2.5 Dynamic Voltage Response

Dynamic stability voltage response criteria are based on WECC Regional Performance Criteria WR1.3 through WR1.5 as follows:

- Dynamic stability voltage response at the applicable BES buses serving load (having no intermediate connection) shall recover to at least 80% of pre-contingency voltage within 20 seconds of the initiating event for all P1-P7 category events, for each applicable bus serving load.
- For voltage swings following fault clearing and voltage recovery above 80%, voltage dips at each applicable BES bus serving load (having no intermediate buses) shall not dip below 70% of pre-contingency voltage for more than 30 cycles or remain below 80% of pre-contingency voltage for more than two seconds for all P1-P7 category events.
- For contingencies without a fault (P2-1 category event), voltage dips at each applicable BES bus serving load (having no intermediate buses) shall not dip below 70% of pre-contingency voltage for more than 30 cycles or remain below 80% of pre-contingency voltage for more than two seconds.

The following criteria were used to investigate the potential for cascading and uncontrolled islanding:

- Load interruption due to successive line tripping for thermal violations shall be confined to the immediate impacted areas and shall not propagate to other areas. The highest available emergency rating is used to determine the tripping threshold for lines or transformers when evaluating a scenario that may lead to cascading.
- Voltage deficiencies caused by either the initiating event or successive line tripping shall be confined to the immediate impacted areas, and shall not propagate to other areas.

Positive damping in stability analysis is demonstrated by showing that the amplitude of power angle or voltage magnitude oscillations after a minimum of 10 seconds is less than the initial post-contingency amplitude. Oscillations that do not show positive damping within a 30-second time frame shall be deemed unacceptable.

Stability studies shall be performed for planning events to determine whether the BES meets the performance requirements.

- Single contingencies (P1 category events): No generating unit shall pull out of synchronism (excludes generators being disconnected from the system by fault clearing action or by a special protection system).
- Multiple contingencies (P2-P7 category events): When a generator pulls out of synchronism in the simulations, the resulting apparent impedance swings shall not result in the tripping of any transmission system elements other than the generating unit and its directly connected facilities.
- Power oscillations are evaluated by exhibiting acceptable damping. The absence of positive damping within a 30-second time frame is considered un-damped.

3 Base Case Development

3.1 Base Case Selection

The base case development process involves selecting an approved WECC base case, updating the models to represent planned transmission facilities (D.2 Project) and existing and new wind generation (see Table 1) facilities, and then tuning the cases to maximum transfer levels on the WECC transmission path(s) being studied. For this study, the WECC approved base case 2021-22 HW (created on August 19, 2016) was selected. This case meets key criteria in that it is close to the Projects' in-service date of October 31, 2020, includes average load conditions based on 2021 load projections and has an accompanying dynamic stability base case available. This study focused on simultaneous transmission path interaction in the Wyoming area

between the Aeolus West and the TOT 4B transmission paths; however, other transmission paths such as Yellowtail South (non-WECC path), Jim Bridger West, TOT 1A and TOT 3 (See Appendix A for path definitions) were monitored throughout the study.

The various critical components for this study purpose selected from the 2021-22 HW base case are listed below:

Table 3: Wyoming Load, Generation and Platte Normal Open Configuration in Base Case

Load or Generation	**Amount (MW)**
North Wyoming PAC Load (including Wyodak load of 42 MW)	391 MW
North Wyoming - WAPA Load	211 MW
Eastern Wyoming PAC Load (including DJ load of 56 MW)	474 MW
Eastern Wyoming PAC Loads on WAPA System	95 MW
Central Wyoming Load (including JB load of 130 MW)	434 MW
Yellowtail South Flow	192 MW
Yellowtail Generation	140/260 MW (Online/Max)
WAPA's Existing Small Generation[10] in North Wyoming	26/50 MW(Online/Max)
WAPA's Existing Small Generation[11] in Eastern Wyoming	484/584 MW(Online/Max)
Wyodak Generation (PacifiCorp/Black Hills)	350/380 MW (Online/Max)
Dry Fork Generation (Basin Electric)	420/440 MW (Online/Max)
Gross Laramie River Generation I (WAPA's swing machine)	605 MW(Max)

[10] WAPA's small generation in north Wyoming includes; Boysen, Buffalo Bill, Heart Mountain, Shoshone, Spring Mountain

[11] WAPA's small generation in eastern Wyoming includes; Alcova, Fremont, Glendo, Guernsy, Kortes, Seminoe, CLR_1, SS_Gen1 AND CPGSTN

Load or Generation	**Amount (MW)**
Gross Laramie River Generation II	590/605 MW(Online/Max)
Gross Dave Johnston (DJ) Generation	700/774 MW(Online/Max)
Total Existing PAC East Wyoming Wind[12] Generation	885.7/1124 MW (Online/Max)
Rapid City DC W Tie	130 w2e (200 MW-bidirectional)
Stegall DC Tie	100 e2w (110 MW-bidirectional)
Sydney DC Tie	196 e2w (200 MW-bidirectional)
TOT 4A Flow	627 MW
TOT 4B Flow	469 MW
Jim Bridger (JB) Generation	2200 MW
Jim Bridger West Flow	2027 MW
TOT 3 Flow	1259.1 MW
TOT 1A Flow	195 MW
Platte – Mustang 115 kV Normal Open Point	Platte – Normal Open

3.2 Generating Facility Additions

The transmission path assessment studies outlined in Section 4 were performed by utilizing the resources identified in Table 4 to evaluate the performance of the Aeolus West transmission path. Transmission and generation projects with an in-service date beyond 2020 were excluded from the analysis. While Table 4 provides the general location of the resources included in the study, Figure 2 provides an overview of PacifiCorp's Wyoming transmission system and provides a visual illustration of the location of each of the existing and new generation (noted in red) resources, and identifies the location of the Aeolus West and TOT 4B transmission path constraints.

[12] PAC eastern Wyoming wind generation includes; Root Creek, Three Buttes, Top of The World, Glenrock, Rolling Hills, Dunlap. Seven Mile Hill, Foote Creek and High Plains wind generation

Table 4: New Wyoming Wind Resources

Proposed New Wind Facilities	LGI Queue Number	Project Size	Point of Interconnection
Northern Wyoming (Bighorn Basin)	Q542	240 MW	Frannie - Yellowtail 230 kV line
Eastern Wyoming (Aeolus/Shirley Basin/Windstar Area)	Q706	250 MW	Aeolus 230 kV
	Q707	250 MW	Shirley Basin 230 kV
	Q708	250 MW	Shirley Basin 230 kV
	Q712	520 MW	Windstar 230 kV
Southwest Wyoming (Uinta County)	Q715	120 MW	Canyon Compression – Railroad 138 kV line
	Q810	101 MW	Canyon Compression – Railroad 138 kV line
TOTAL		**1731 MW**	

3.3 Base Case Modification and Tuning

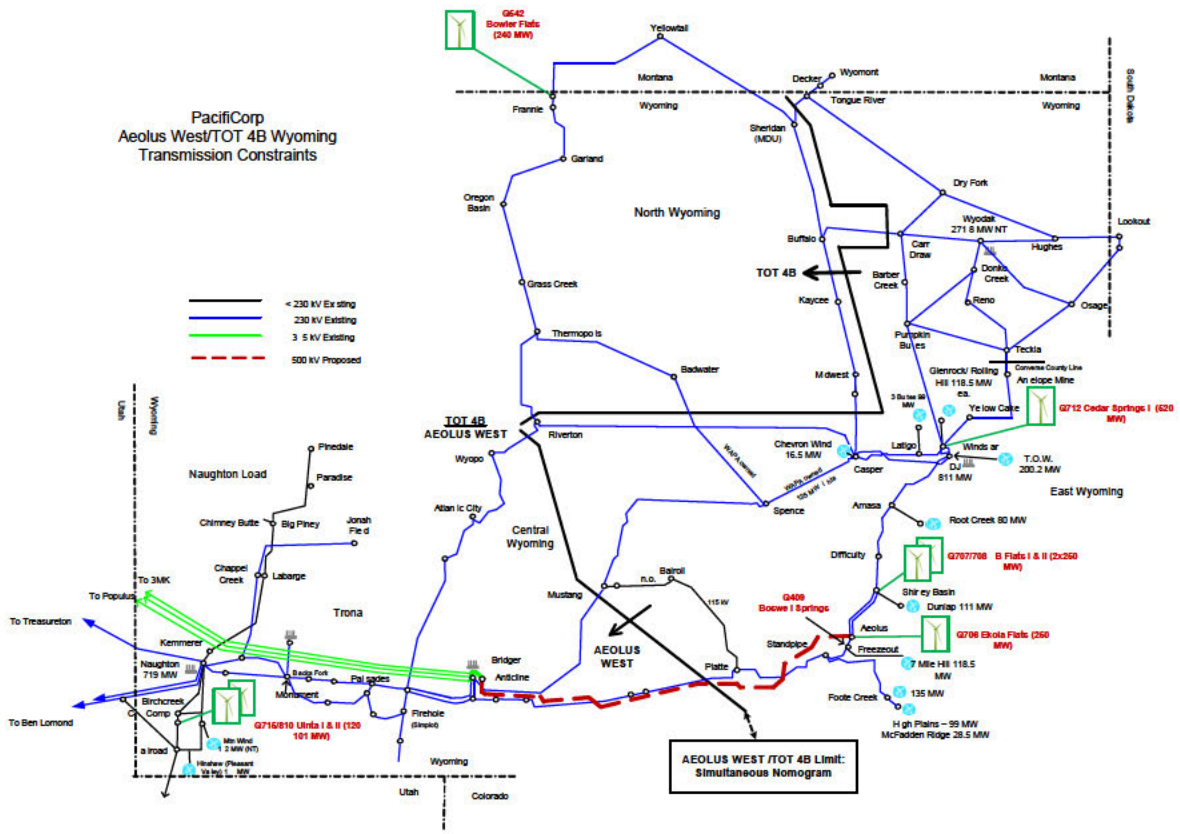
The 2021-22HW base case was modified to reflect the most recent Foote Creek, High Plains, Top of the World and Three Buttes wind generation modeling as per the recent MOD-032 data submitted by each generator owner (GO). Transmission line impedances between Dave Johnston and Standpipe were verified and updated and the transmission line ratings in the 2021-22 heavy winter case were modified to summer ratings, which represent the most conservative thermal limitations. The Platte – Standpipe 230 kV dynamic line rating of 608/666/680 MVA was assumed during the analysis.

The generation resources listed in Table 4 were added to the base case and the existing repowered wind farm generator models and collector system data were updated. The Aeolus West path was stressed by maximizing the output on all of the existing and new wind generation facilities. Output for the repowered wind generation facilities was limited to the existing LGI agreement generation capacity levels. The additional generation in southeast Wyoming was displaced with Jim Bridger, central and southern Utah generation. The Jim Bridger generation output was maintained such that Jim Bridger West path flows were maintained near 2400 MW.

As per the available data obtained for the various wind generation facilities at the time of this study analysis, the base cases were reviewed and adjusted to ensure voltages in the collector system of wind generation facilities were below 1.05 p.u. and that there was no reactive power

GSU loop flow conditions for wind generation facilities that have multiple main generator step-up GSU transformers.

Figure 2
Existing/Proposed Wyoming Generation Resources, and Transmission Constraints



This process involved tuning transformer and generator parameters such that generators were producing appropriate reactive power output. Additionally, within the 230 kV transmission system it was verified that the shunt reactive devices were accurately represented, voltage profiles were normal, reactive power flows were within normal operating ranges and transmission system voltage was maintained to match acceptable PacifiCorp Transmission Voltage Schedules.

4 Path Studies

4.1 Aeolus West vs. TOT 4B

Based on the assumptions outlined above, the study demonstrated that the Aeolus West maximum transfer capability limit is 1829 MW, while meeting all NERC and WECC performance criteria. While this transfer level is 869 MW above the present TOT 4A (960

MW[13]) path limit for similar conditions, east to west transfers have effectively increased by 951 MW due to shifting the Platte area load (82 MW) east of the Aeolus West cut plane. The Aeolus West path was stressed by using 3351 MW of total generation resources, which includes thermal (Dave Johnston, 717 MW - net), existing wind (1124 MW), and new wind (1510 MW) resources. The 240 MW of new wind resource in Big Horn Basin was varied with Wyodak generation as necessary. It was assumed that only the thermal generation at Dave Johnston and Wyodak generating plants in eastern Wyoming would be adjusted to maintain transfers on the Aeolus West and the TOT 4B transmission paths.

Table 5: Aeolus West and TOT 4B Corner Point Cases (See Figure 3)

Case	Aeolus West (MW)	TOT 4B (MW)	Limiting Element	Outage
1	1829	100	Platte- Latham 230 kV line	Anticline – Aeolus 500 kV line outage with RAS
2	1803	300	Platte- Latham 230 kV line	Anticline – Aeolus 500 kV line outage with RAS
3	1777	500	Platte- Latham 230 kV line	Anticline – Aeolus 500 kV line outage with RAS
4	1763	607	Platte- Latham 230 kV line	Anticline – Aeolus 500 kV line outage with RAS
			Dave Johnston South Tap – Refinery Tap – Casper 115 kV line	Casper 230 kV CB 1H4001 failure causing Casper – Dave Johnston 230 kV and Casper 230/115 kV transformer outage or Casper – Dave Johnston 230 kV line outage
5	1628	699	Platte- Latham 230 kV line	Anticline – Aeolus 500 kV line outage with RAS

[13] Maximum nomogram point with normal open point at Platte utilizing the dynamic line rating on Platte – Standpipe 230 kV line.

Case	Aeolus West (MW)	TOT 4B (MW)	Limiting Element	Outage
			Dave Johnston South Tap – Refinery Tap – Casper 115 kV line	Casper 230 kV CB 1H4001 failure causing Casper – Dave Johnston 230 kV and Casper 230/115 kV transformer outage or Casper – Dave Johnston 230 kV line outage
6	1125	880	Yellowtail – Sheridan 230 kV line	N-0

See Appendix B for power flow plots.

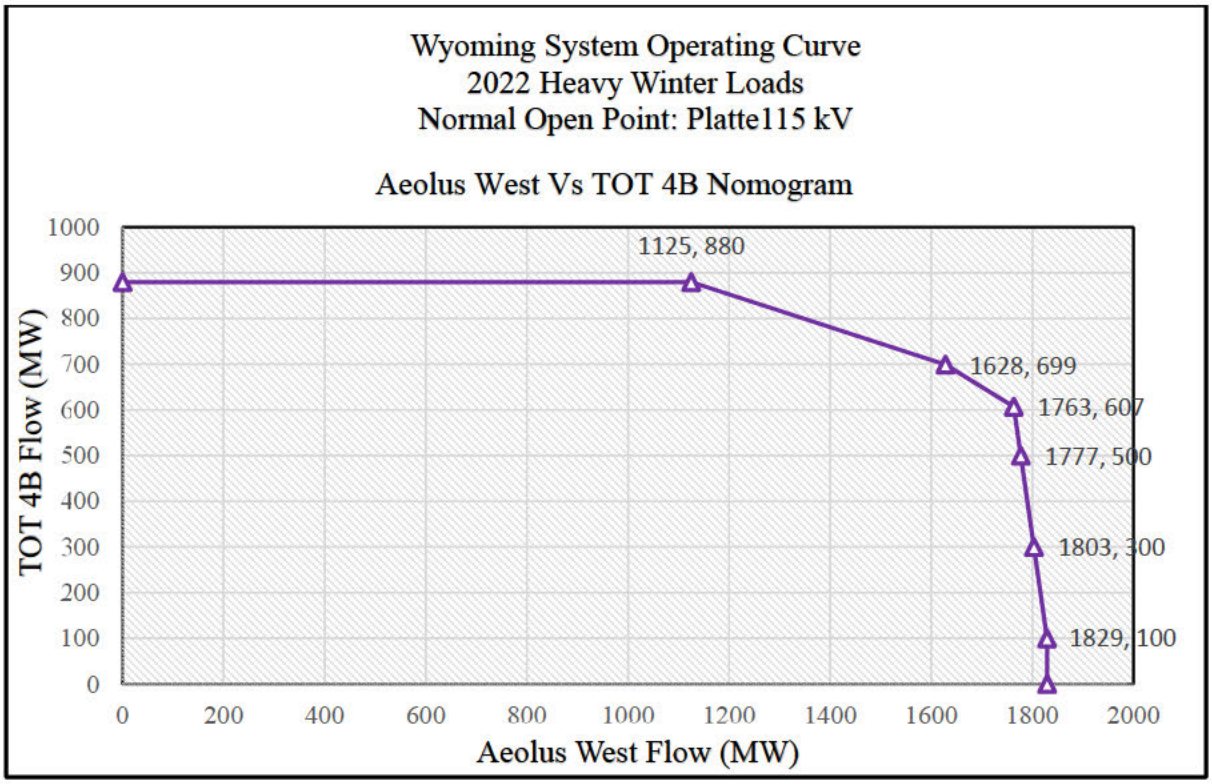
The low voltage issue in the Big Horn Wyoming area is an existing issue for the Yellowtail – Frannie 230 kV line outage or future Q0542 POI – Frannie 230 kV outage. This issue is resolved by adding capacitor banks at various locations in north Wyoming. A project to install a new 30 MVAr shunt capacitor bank at Grass Creek 230 kV, two new 20 MVAr shunt capacitor banks at Frannie and a new 7.5 MVAr capacitor bank at Hilltop 115 kV are proposed.

In the study, one RAS scheme was identified for N-1 outages:

i. Aeolus RAS to trip approximately 630 MW of wind generation depending on pre-outage flow conditions for any of the new transmission element outages between Aeolus – Jim Bridger.

Study results are summarized in Table 5 and illustrated in Figure 3. In reviewing Figure 3, it is evident that the Aeolus West and TOT 4B path interaction are minimized with the addition of the D.2 Project, as indicated by the straight horizontal line (implying no path interaction) when Aeolus West flows are below 1125 MW. The Aeolus West vs TOT 4B nomogram “knee point” is at Aeolus West flows of 1763 MW (TOT 4B, 607 MW). As TOT 4B flows increase from that point, Aeolus West flows reduce; likewise, from the knee point as TOT 4B flows decrease, Aeolus West flows increase.

Figure 3: Aeolus West Vs TOT 4B Nomogram



4.2 Base Case Development

The 2021-22 HW WECC case was modified to simultaneously stress the Aeolus West and the TOT 4B path flows. The Aeolus West path was stressed using all of eastern and north Wyoming resources fora total of 3619 MW (existing and future) wind and net coal resources. These resources were displaced with Jim Bridger and resources in central and southern Utah such that the Jim Bridger West flows were maintained near 2400 MW.

The TOT 4B path flows were adjusted between a minimum of 100 MW and a maximum of 880 MW. Additional resources were exported from PACE to Montana and WAPA to Montana to adjust flows across the TOT 4B path between 300 MW and 880 MW using Crossover, Rimrock and Steam Plant phase shifting transformers in Montana.

The Shiprock, San Juan and Gladstone phase shifting transformers were locked to regulate flow across the TOT 3 path between Colorado and Wyoming.

4.3 Dynamic Stability Analysis

The dynamic stability analysis was performed using PSS/E models provided by both General Electric (GE) and Vestas's for the repowered and new wind generation. The generic model for the Root Creek wind model was updated to the GE0501 model (GE 1.85 units). Top of the World and Three Buttes wind farms in eastern Wyoming were updated to the GE 1.5 wind turbine model provided by GE for PTI V33. A generic WECC model was used for the Latham dynamic reactive device.

The stability study was focused in the eastern Wyoming region to demonstrate the acceptable performance from various new wind farms in the region. The real power, reactive power and voltage output from the new and the existing wind farm generators were reviewed to evaluate their ability to support the transmission grid voltage and system stability during various outage scenarios. Due to the combination of different wind turbine models, dynamic analysis also ensured that no interaction issues were being observed.

The dynamic stability study was performed for one (worst case) nomogram point on the Aeolus West vs. the TOT 4B nomogram curve, which reflected the heaviest Aeolus West flow conditions.

Dynamic stability analysis was performed on selective critical outages based on anticipated post fault impacts on the wind generation performance, especially for the portion of the system with a calculated short circuit ratio of approximately 2.3. See Appendix C for the dynamic stability analysis summary and dynamic plots.

5 Sensitivity Analysis

The sensitivity analysis focused on the evaluation of two different RAS generation tripping scenarios to ascertain which scheme would be the most effective at tripping generation following outage of the D.2 Project facilities between Bridger and Aeolus.

A dynamic stability sensitivity analysis was performed to evaluate the system impact and generator performance for a single element outage on the D.2 segment between Aeolus 230 kV and Bridger 345 kV buses which requires a RAS for generator tripping. Two different sets of generator tripping locations and tripping levels (approximately 630 MW) were selected. The generation tripping of 607 MW, which includes High Plains, Seven Mile Hill, Q706 and Dunlap wind generation was compared with generation tripping of 628 MW, which includes High Plains, Q0706 and Q0707 wind generation. For summary results and plots, please see dynamic simulation cases 1a – 1f2 in Appendix C.

6 Study Conclusions

Technical studies demonstrated that with the addition of the planned D.2 Project facilities to the Wyoming transmission system, system performance will meet all NERC and WECC performance criteria.

Updated power flow studies demonstrate that by utilizing existing and planned southeast Wyoming resources[5], the Aeolus West transmission path can transfer up to 1829 MW under simultaneous transfer conditions with the TOT 4B transmission path, effectively[6] increasing the east to west transfer levels across Wyoming by 951 MW. Power flow findings also indicated:

- Dynamic voltage control is necessary at the Latham 230 kV substation to mitigate low voltage conditions resulting from loss of Bridger/Anticline – Aeolus transmission facilities.
- Under certain operating conditions, one RAS scheme will need to be implemented to trip generation following the outage of specific transmission facilities.
- The location (and output level) of new and repowered wind resources can influence the transfer capability level across the Aeolus West transmission path, the Aeolus West and TOT 4B nomogram curve and the area under the nomogram curve.

Dynamic stability studies evaluated a wide range of critical system disturbances in eastern Wyoming. The analyses identified two outages with poor voltage performance, and another outage identified a wind turbine modeling problem. These issues are all attributed to the wind turbine models at the Q0706, Q0707 and Q0708 projects. PacifiCorp is working with the wind turbine manufacture to resolve these issues. Aside from these issues, the studied outages evaluated meet the dynamic performance criteria with the system being stable and damped.

Report Appendices

Appendix A – Path Definitions

Appendix B – Power Flow Plots

Appendix C – Dynamic Stability Results (Case C7)

			COBHLH	COBLLH	Palo VerdeHL	Palo VerdeLL	Mid-Columbia	Mid-Columbia	NP 15HLH	NP 15LLH	SP 15HLH	SP 15LLH	Henry Hub Ga	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Cree	Lakeside	Z_CHEBRN*
Quote Date		**Data Type:**	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
12/30/2016		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN ***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/17	01/31/17	Jan 2017	43.20	30.45	32.75	27.25	39.00	27.75	42.25	34.00	39.50	33.75	3.93	3.75	3.56	3.66	3.79	3.75	4.81	2.68	4.17	3.92	3.96	5.83
02/01/17	02/28/17	Feb 2017	34.00	26.05	29.50	26.40	31.00	23.50	39.25	32.50	36.75	31.75	3.72	3.76	3.63	3.66	3.68	3.65	3.88	2.68	3.96	3.77	3.74	4.16
03/01/17	03/31/17	Mar 2017	29.25	22.50	27.50	24.00	25.50	20.25	36.00	28.75	32.75	28.25	3.68	3.53	3.42	3.45	3.45	3.42	3.19	2.64	3.74	3.55	3.53	3.43
04/01/17	04/30/17	Apr 2017	28.54	20.31	27.16	22.00	23.54	17.13	32.88	27.09	29.59	25.82	3.57	3.38	3.27	3.26	3.29	3.26	2.74	2.49	3.55	3.36	3.34	2.92
05/01/17	05/31/17	May 2017	25.18	14.01	26.21	21.12	21.80	11.50	33.91	24.88	29.60	23.72	3.54	3.29	3.19	3.22	3.25	3.22	2.65	2.46	3.50	3.32	3.30	2.83
06/01/17	06/30/17	Jun 2017	25.44	12.48	29.68	23.10	20.46	8.88	35.96	25.83	31.72	24.72	3.56	3.35	3.18	3.24	3.29	3.26	2.70	2.45	3.52	3.34	3.31	2.88
07/01/17	07/31/17	Jul 2017	36.86	24.38	42.18	28.34	33.22	22.05	43.25	32.74	43.10	32.01	3.59	3.52	3.35	3.30	3.39	3.36	2.94	2.46	3.58	3.40	3.38	3.13
08/01/17	08/31/17	Aug 2017	39.52	29.70	38.76	27.80	36.31	24.99	44.55	35.44	43.52	33.99	3.58	3.53	3.35	3.29	3.39	3.36	3.04	2.48	3.57	3.39	3.37	3.24
09/01/17	09/30/17	Sep 2017	37.62	29.97	33.06	25.07	33.22	26.16	41.95	33.08	40.14	33.00	3.55	3.44	3.27	3.26	3.38	3.35	3.02	2.50	3.54	3.36	3.33	3.22
10/01/17	10/31/17	Oct 2017	32.32	27.12	29.89	25.73	28.35	23.63	41.83	32.54	37.29	31.59	3.57	3.38	3.26	3.29	3.33	3.30	3.09	2.54	3.57	3.39	3.37	3.30
11/01/17	11/30/17	Nov 2017	34.40	27.69	29.59	24.94	31.19	26.75	41.83	33.57	39.25	32.25	3.60	3.58	3.36	3.42	3.47	3.44	3.44	2.69	3.70	3.52	3.50	3.69
12/01/17	12/31/17	Dec 2017	37.53	30.25	32.03	28.09	34.65	27.83	43.10	36.65	41.21	35.91	3.70	3.87	3.54	3.59	3.58	3.54	3.76	2.77	3.88	3.70	3.67	4.03
01/01/18	01/31/18	Jan 2018	37.43	31.61	32.55	27.04	32.82	28.33	42.53	33.74	39.00	32.70	3.78	3.84	3.60	3.66	3.62	3.59	3.64	2.85	3.95	3.77	3.74	3.90
02/01/18	02/28/18	Feb 2018	32.04	27.25	30.38	26.26	30.76	25.67	41.31	32.57	37.90	31.75	3.73	3.77	3.55	3.60	3.58	3.55	3.46	2.80	3.88	3.71	3.68	3.71
03/01/18	03/31/18	Mar 2018	29.18	25.19	30.07	24.45	27.28	22.40	37.67	30.64	35.25	30.80	3.62	3.50	3.39	3.38	3.46	3.43	3.34	2.68	3.65	3.48	3.45	3.58
04/01/18	04/30/18	Apr 2018	24.44	19.26	21.09	16.90	20.43	13.80	27.92	23.45	24.25	22.75	2.98	2.68	2.57	2.65	2.63	2.61	2.10	2.12	2.90	2.74	2.72	2.25
05/01/18	05/31/18	May 2018	24.33	13.81	22.79	16.60	18.57	10.69	26.81	21.16	24.75	20.23	2.91	2.61	2.51	2.50	2.56	2.54	2.04	2.04	2.75	2.59	2.57	2.18
06/01/18	06/30/18	Jun 2018	25.44	14.63	25.48	18.90	19.91	10.01	29.88	22.99	26.00	21.68	2.92	2.64	2.51	2.52	2.58	2.56	2.03	2.04	2.77	2.61	2.59	2.17
07/01/18	07/31/18	Jul 2018	35.36	21.33	36.23	24.83	30.24	18.50	39.00	29.59	37.90	28.62	2.94	2.91	2.62	2.60	2.66	2.63	2.23	2.02	2.85	2.69	2.67	2.38
08/01/18	08/31/18	Aug 2018	39.27	29.70	35.35	24.93	34.02	23.15	40.17	32.03	38.37	30.39	2.93	2.91	2.65	2.59	2.66	2.64	2.21	2.01	2.85	2.68	2.67	2.37
09/01/18	09/30/18	Sep 2018	36.17	29.97	30.83	23.40	30.24	24.75	38.03	29.89	35.59	29.50	2.91	2.69	2.57	2.57	2.64	2.61	2.23	2.02	2.82	2.66	2.64	2.38
10/01/18	10/31/18	Oct 2018	30.62	27.02	26.22	22.79	26.19	20.93	36.88	29.93	33.01	28.31	2.93	2.59	2.54	2.59	2.65	2.62	2.27	2.06	2.84	2.68	2.66	2.42
11/01/18	11/30/18	Nov 2018	34.40	27.69	25.95	22.09	28.46	24.18	36.88	30.87	34.75	28.86	2.97	2.91	2.76	2.82	2.82	2.80	2.87	2.16	3.08	2.91	2.89	3.09
12/01/18	12/31/18	Dec 2018	37.53	29.95	28.09	24.88	31.05	24.65	38.00	33.71	36.49	32.13	3.09	3.23	2.92	3.00	2.96	2.93	3.26	2.25	3.26	3.09	3.07	3.50
01/01/19	01/31/19	Jan 2019	34.95	32.83	32.51	28.08	32.81	27.77	42.63	34.27	38.25	33.37	3.20	3.22	3.02	3.05	3.04	3.01	3.03	2.33	3.32	3.15	3.13	3.26
02/01/19	02/28/19	Feb 2019	34.33	31.50	31.88	27.27	31.88	26.97	41.41	33.28	37.50	32.40	3.16	3.15	2.99	3.01	3.00	2.98	2.82	2.29	3.27	3.10	3.08	3.03
03/01/19	03/31/19	Mar 2019	31.83	30.17	29.35	25.65	29.06	25.37	37.76	31.30	34.50	31.43	3.09	3.10	2.92	2.90	2.94	2.91	2.76	2.24	3.16	2.99	2.97	2.97
04/01/19	04/30/19	Apr 2019	29.89	21.46	22.69	15.15	22.93	15.45	26.22	24.25	24.25	21.75	2.72	2.46	2.35	2.42	2.37	2.35	1.90	1.95	2.66	2.50	2.49	2.03
05/01/19	05/31/19	May 2019	26.18	14.96	23.39	14.25	19.97	12.69	27.11	20.16	24.75	17.18	2.69	2.44	2.32	2.32	2.34	2.32	1.83	1.87	2.56	2.40	2.39	1.96
06/01/19	06/30/19	Jun 2019	26.44	15.78	25.48	16.05	20.16	11.31	28.88	20.84	26.00	17.18	2.72	2.48	2.35	2.35	2.37	2.35	1.83	1.87	2.59	2.43	2.41	1.96
07/01/19	07/31/19	Jul 2019	36.81	18.13	36.68	27.23	31.24	17.95	39.10	30.29	38.00	29.27	2.75	2.71	2.38	2.40	2.46	2.44	2.00	1.86	2.65	2.48	2.47	2.14
08/01/19	08/31/19	Aug 2019	39.47	26.50	35.30	26.98	35.02	20.20	40.27	32.73	38.37	31.04	2.76	2.72	2.42	2.41	2.48	2.46	2.02	1.88	2.66	2.50	2.48	2.16
09/01/19	09/30/19	Sep 2019	37.57	26.77	32.88	23.80	31.24	22.45	37.93	30.59	35.39	30.15	2.76	2.55	2.40	2.41	2.49	2.46	2.07	1.92	2.65	2.49	2.48	2.21
10/01/19	10/31/19	Oct 2019	33.32	28.72	28.87	26.49	27.74	23.28	38.13	31.83	33.01	29.96	2.79	2.47	2.41	2.44	2.51	2.48	2.07	1.93	2.68	2.52	2.51	2.22
11/01/19	11/30/19	Nov 2019	35.40	29.29	28.60	25.79	29.46	26.53	38.13	32.77	34.75	30.56	2.85	2.87	2.63	2.68	2.72	2.70	2.64	2.06	2.94	2.77	2.75	2.84
12/01/19	12/31/19	Dec 2019	38.53	31.55	30.74	28.58	32.05	27.00	39.25	35.61	36.49	33.83	2.99	3.05	2.80	2.87	2.87	2.84	3.01	2.19	3.13	2.96	2.94	3.23
01/01/20	01/31/20	Jan 2020	35.90	34.53	34.56	29.23	34.06	29.22	44.08	35.52	39.25	34.42	3.10	3.14	2.91	2.98	2.95	2.93	3.11	2.25	3.24	3.08	3.06	3.34
02/01/20	02/29/20	Feb 2020	35.28	33.20	33.93	28.42	33.13	28.42	42.86	34.53	38.50	33.45	3.07	3.09	2.87	2.95	2.92	2.90	2.87	2.23	3.21	3.04	3.02	3.08
03/01/20	03/31/20	Mar 2020	32.78	31.87	31.40	26.80	30.31	26.82	39.21	32.55	35.50	32.48	3.00	3.07	2.81	2.85	2.86	2.83	2.82	2.20	3.10	2.94	2.92	3.03
04/01/20	04/30/20	Apr 2020	31.39	22.21	24.44	18.50	25.43	16.00	29.77	26.65	26.40	25.65	2.72	2.45	2.38	2.43	2.40	2.38	1.99	1.96	2.68	2.51	2.50	2.15
05/01/20	05/31/20	May 2020	27.68	15.71	25.14	17.60	22.47	13.24	30.66	22.56	26.90	21.08	2.71	2.54	2.36	2.35	2.38	2.36	1.93	1.89	2.60	2.44	2.42	2.08
06/01/20	06/30/20	Jun 2020	27.94	16.53	27.23	19.40	22.66	11.86	32.43	23.24	28.15	21.08	2.74	2.58	2.40	2.38	2.42	2.40	1.95	1.90	2.63	2.47	2.45	2.11
07/01/20	07/31/20	Jul 2020	39.36	22.08	38.53	27.48	32.74	21.20	40.65	31.54	39.45	30.32	2.78	2.77	2.44	2.44	2.50	2.48	2.13	1.91	2.69	2.53	2.51	2.30
08/01/20	08/31/20	Aug 2020	42.02	30.45	37.15	27.23	36.52	23.45	41.82	33.98	39.82	32.09	2.80	2.78	2.49	2.47	2.55	2.53	2.13	1.91	2.72	2.55	2.54	2.30
09/01/20	09/30/20	Sep 2020	40.12	30.72	34.73	24.05	32.74	25.70	39.48	31.84	36.84	31.20	2.81	2.60	2.48	2.47	2.56	2.54	2.22	2.00	2.72	2.56	2.54	2.39
10/01/20	10/31/20	Oct 2020	34.82	30.17	31.33	27.29	29.29	24.48	40.08	32.38	34.46	32.31	2.84	2.55	2.49	2.51	2.59	2.56	2.14	2.01	2.76	2.59	2.58	2.31
11/01/20	11/30/20	Nov 2020	36.90	30.74	31.06	26.59	31.01	27.73	40.08	33.32	36.20	32.91	2.91	2.95	2.69	2.75	2.79	2.77	2.82	2.09	3.01	2.84	2.82	3.04
12/01/20	12/31/20	Dec 2020	40.03	33.00	33.20	29.38	33.60	28.20	41.20	36.16	37.94	36.18	3.06	3.13	2.87	2.96	2.94	2.92	3.25	2.21	3.22	3.05	3.03	3.48
01/01/21	01/31/21	Jan 2021	37.50	33.43	35.81	30.43	35.16	29.82	45.38	36.52	40.95	35.42	3.19	3.29	3.02	3.09	3.05	3.02	3.21	2.35	3.36	3.19	3.17	3.44
02/01/21	02/28/21	Feb 2021	36.88	32.10	35.18	29.62	34.23	29.02	44.16	35.53	40.20	34.45	3.15	3.24	2.97	3.06	3.03	3.00	3.00	2.33	3.32	3.15	3.13	3.22
03/01/21	03/31/21	Mar 2021	34.38	30.77	32.65	28.00	31.41	27.42	40.51	33.55	37.20	33.48	3.08	3.17	2.91	2.98	2.95	2.92	2.94	2.28	3.25	3.08	3.06	3.16
04/01/21	04/30/21	Apr 2021	32.74	24.41	25.64	19.95	27.13	17.70	30.87	28.20	27.60	26.80	2.73	2.51	2.40	2.48	2.41	2.39	2.27	1.94	2.73	2.57	2.55	2.45
05/01/21	05/31/21	May 2021	29.03	17.91	26.34	19.05	24.17	14.94	31.76	24.11	28.10	22.23	2.72	2.55	2.39	2.40	2.39	2.37	2.22	1.87	2.65	2.49	2.47	2.40
06/01/21	06/30/21	Jun 2021	29.29	18.73	28.43	20.85	24.36	13.56	33.53	24.79	29.35	22.23	2.75	2.58	2.42	2.44	2.43	2.41	2.23	1.88	2.69	2.53	2.51	2.40
07/01/21	07/31/21	Jul 2021	40.71	26.23	39.78	28.93	34.29	24.80	42.50	32.54	40.70	31.32	2.78	2.83	2.46	2.49	2.51	2.49	2.42	1.90	2.74	2.57	2.56	2.61
08/01/21	08/31/21	Aug 2021	43.37	34.60	38.40	28.68	38.07	27.05	43.67	34.98	41.07	33.09	2.81	2.85	2.52	2.52	2.56	2.53	2.42	1.89	2.77	2.60	2.59	2.60
09/01/21	09/30/21	Sep 2021	41.47	34.87	35.98	25.50	34.29	29.30	41.33	32.84	38.09	32.20	2.82	2.67	2.51	2.53	2.57	2.55	2.48	1.96	2.78	2.62	2.60	2.67
10/01/21	10/31/21	Oct 2021	36.17	35.12	32.22	30.39	31.34	28.73	41.93	33.58	35.71	33.86	2.85	2.60	2.52	2.56	2.59	2.57	2.47	1.98	2.81	2.64	2.63	2.66
11/01/21	11/30/21	Nov 2021	38.25	35.69	31.95	29.69	33.06	31.98	41.93	34.52	37.45	34.46	2.92	3.00	2.80	2.80	2.80	2.78	2.89	2.07	3.06	2.89	2.87	3.11
12/01/21	12/31/21	Dec 2021	41.38	37.95	34.09	32.48	35.65	32.45	43.05	37.36	39.19	37.73	3.08	3.18	2.99	3.01	2.96	2.94	3.29	2.20	3.27	3.10	3.08	3.53
01/01/22	01/31/22	Jan 2022	39.35	31.23	37.11	32.83	37.11	28.27	46.73	37.47	42.50	36.37	3.22	3.38	3.12	3.15	3.08	3.05	3.20	2.34	3.42	3.25	3.23	3.44
02/01/22	02/28/22	Feb 2022	38.73	29.90	36.48	32.02	36.18	27.47	45.51	36.48	41.75	35.40	3.18	3.32	3.07	3.11	3.06	3.03	3.01	2.32	3.37	3.21	3.18	3.23
03/01/22	03/31/22	Mar 2022	36.23	28.57	33.95	30.40	33.36	25.87	41.86	34.50	38.75	34.43	3.11	3.25	3.01	3.04	2.98	2.95	2.96	2.27	3.30	3.13	3.11	3.18

04/01/22	04/30/22	Apr 2022	35.09	25.21	27.04	21.85	29.13	18.30	31.62	29.15	28.70	27.70	2.75	2.60	2.44	2.53	2.43	2.40	2.19	1.94	2.78	2.62	2.60	2.37	
05/01/22	05/31/22	May 2022	31.38	18.71	27.74	20.95	26.17	15.54	32.51	25.06	29.20	23.13	2.74	2.60	2.43	2.45	2.41	2.39	2.14	1.88	2.70	2.53	2.52	2.31	
06/01/22	06/30/22	Jun 2022	31.64	19.53	29.83	22.75	26.36	14.16	34.28	25.74	30.45	23.13	2.77	2.64	2.47	2.49	2.45	2.43	2.16	1.89	2.73	2.57	2.56	2.33	
07/01/22	07/31/22	Jul 2022	42.16	30.53	41.08	30.28	36.74	28.45	43.20	33.49	41.95	32.27	2.81	2.89	2.51	2.54	2.53	2.51	2.35	1.91	2.79	2.62	2.61	2.53	
08/01/22	08/31/22	Aug 2022	44.82	38.90	39.70	30.03	40.52	30.70	44.37	35.93	42.32	34.04	2.84	2.92	2.57	2.57	2.59	2.56	2.35	1.90	2.82	2.66	2.64	2.53	
09/01/22	09/30/22	Sep 2022	42.92	39.17	37.28	26.85	36.74	32.95	42.03	33.79	39.34	33.15	2.85	2.74	2.56	2.58	2.60	2.58	2.42	1.98	2.83	2.67	2.65	2.60	
10/01/22	10/31/22	Oct 2022	38.52	36.82	33.57	32.84	33.79	30.18	42.63	34.83	36.96	35.06	2.88	2.68	2.57	2.62	2.63	2.60	2.44	2.00	2.87	2.70	2.69	2.63	
11/01/22	11/30/22	Nov 2022	40.60	37.39	33.30	32.14	35.51	33.43	42.63	35.77	38.70	35.66	2.96	3.05	2.84	2.87	2.84	2.82	3.02	2.13	3.12	2.96	2.94	3.24	
12/01/22	12/31/22	Dec 2022	43.73	39.65	35.44	34.93	38.10	33.90	43.75	38.61	40.44	38.93	3.12	3.24	3.03	3.07	3.01	2.98	3.41	2.27	3.33	3.16	3.14	3.66	
01/01/23	01/31/23	Jan 2023	38.05	32.23	38.36	32.13	38.36	31.97	47.93	38.47	44.15	37.37	3.28	3.44	3.18	3.22	3.14	3.11	3.31	2.44	3.49	3.31	3.29	3.56	
02/01/23	02/28/23	Feb 2023	39.92	33.75	39.37	35.22	39.36	32.99	46.19	40.08	44.21	39.58	3.86	4.01	3.75	3.76	3.78	3.70	3.64	3.12	4.03	3.86	3.84	3.88	
03/01/23	03/31/23	Mar 2023	37.14	32.66	35.29	32.61	35.23	30.32	41.80	37.59	39.74	37.28	3.68	3.80	3.56	3.56	3.57	3.52	3.49	2.95	3.83	3.66	3.64	3.72	
04/01/23	04/30/23	Apr 2023	35.64	30.12	30.73	27.60	31.83	25.55	35.08	33.58	33.00	32.61	3.36	3.33	3.12	3.16	3.15	3.11	2.93	2.52	3.42	3.25	3.24	3.11	
05/01/23	05/31/23	May 2023	32.51	24.83	31.05	27.11	28.63	21.89	35.22	30.74	33.33	29.96	3.37	3.34	3.13	3.12	3.14	3.10	2.84	2.50	3.37	3.20	3.19	3.02	
06/01/23	06/30/23	Jun 2023	33.43	25.82	32.40	27.99	29.48	21.78	36.58	31.48	34.30	30.34	3.40	3.37	3.18	3.13	3.16	3.11	2.86	2.51	3.38	3.22	3.20	3.04	
07/01/23	07/31/23	Jul 2023	45.48	34.86	44.95	34.43	41.68	32.52	45.90	37.42	45.15	36.76	3.44	3.51	3.20	3.17	3.21	3.15	2.96	2.58	3.42	3.26	3.24	3.14	
08/01/23	08/31/23	Aug 2023	47.63	39.63	45.29	35.06	45.26	34.83	48.10	39.61	46.97	38.65	3.47	3.56	3.25	3.25	3.29	3.23	3.05	2.59	3.50	3.34	3.32	3.23	
09/01/23	09/30/23	Sep 2023	45.00	40.15	42.18	33.12	42.77	36.44	45.96	38.75	44.57	38.40	3.49	3.50	3.28	3.29	3.33	3.26	3.14	2.73	3.54	3.38	3.36	3.33	
10/01/23	10/31/23	Oct 2023	42.14	38.56	37.81	35.18	38.42	33.90	44.84	39.19	41.79	39.29	3.60	3.57	3.37	3.41	3.44	3.39	3.25	2.82	3.67	3.50	3.48	3.44	
11/01/23	11/30/23	Nov 2023	43.78	39.76	38.63	35.87	39.86	36.44	46.33	41.00	44.08	40.92	3.79	3.92	3.65	3.71	3.71	3.66	3.69	3.14	3.97	3.80	3.78	3.89	
12/01/23	12/31/23	Dec 2023	44.66	40.24	38.88	36.79	40.48	36.02	45.65	41.58	44.00	41.83	3.89	4.00	3.79	3.78	3.79	3.73	3.84	3.17	4.05	3.88	3.86	4.06	
01/01/24	01/31/24	Jan 2024	42.97	37.32	41.37	36.13	41.73	35.81	48.85	42.00	46.85	41.61	4.02	4.17	3.95	3.94	3.93	3.87	3.90	3.30	4.21	4.04	4.02	4.15	
02/01/24	02/29/24	Feb 2024	41.11	37.59	42.26	38.42	42.54	38.51	46.87	43.69	46.68	43.75	4.55	4.70	4.43	4.42	4.50	4.37	4.28	3.92	4.69	4.52	4.50	4.51	
03/01/24	03/31/24	Mar 2024	38.06	36.75	36.62	34.81	37.10	34.77	41.74	40.68	40.73	40.14	4.26	4.35	4.12	4.09	4.17	4.09	4.01	3.62	4.36	4.19	4.17	4.24	
04/01/24	04/30/24	Apr 2024	36.20	35.03	34.42	33.35	34.53	32.81	38.55	38.01	37.30	37.52	3.98	4.06	3.80	3.80	3.87	3.82	3.67	3.11	4.05	3.89	3.87	3.85	
05/01/24	05/31/24	May 2024	33.64	30.95	34.37	33.27	31.10	28.23	37.93	36.43	37.47	36.80	4.00	4.08	3.82	3.78	3.87	3.81	3.54	3.12	4.04	3.87	3.86	3.72	
06/01/24	06/30/24	Jun 2024	35.22	32.11	34.98	33.22	32.60	29.40	38.89	37.23	38.16	37.54	4.04	4.10	3.89	3.77	3.87	3.78	3.57	3.13	4.02	3.86	3.84	3.74	
07/01/24	07/31/24	Jul 2024	48.80	39.19	48.82	38.59	46.63	36.59	48.61	41.35	48.35	41.25	4.08	4.13	3.90	3.80	3.89	3.80	3.57	3.25	4.05	3.89	3.87	3.75	
08/01/24	08/31/24	Aug 2024	50.45	40.37	50.89	40.08	50.00	38.97	51.82	43.29	51.62	43.26	4.10	4.20	3.92	3.92	4.00	3.90	3.75	3.29	4.18	4.01	4.00	3.93	
09/01/24	09/30/24	Sep 2024	47.08	41.13	47.09	39.39	48.79	39.94	49.89	43.72	49.80	43.66	4.13	4.27	3.99	3.99	4.05	3.95	3.86	3.48	4.24	4.08	4.06	4.05	
10/01/24	10/31/24	Oct 2024	45.77	40.29	42.05	37.53	43.04	37.62	47.06	43.56	46.62	43.52	4.32	4.47	4.17	4.20	4.26	4.18	4.05	3.64	4.46	4.30	4.28	4.24	
11/01/24	11/30/24	Nov 2024	46.95	42.14	43.95	39.61	44.22	39.45	50.03	46.23	49.46	46.18	4.63	4.79	4.46	4.55	4.59	4.51	4.37	4.14	4.81	4.64	4.62	4.57	
12/01/24	12/31/24	Dec 2024	45.59	40.83	42.32	38.65	42.87	38.15	47.55	44.56	47.56	44.72	4.65	4.75	4.55	4.50	4.56	4.49	4.27	4.06	4.77	4.60	4.57	4.49	
01/01/25	01/31/25	Jan 2025	47.89	42.41	44.38	40.14	45.09	39.66	49.77	45.53	49.55	45.84	4.75	4.90	4.71	4.66	4.71	4.62	4.49	4.17	4.93	4.76	4.74	4.74	
02/01/25	02/28/25	Feb 2025	43.20	39.64	44.58	40.98	44.86	40.96	49.19	45.62	49.15	46.73	4.79	4.92	4.68	4.66	4.73	4.64	4.56	4.18	4.93	4.76	4.74	4.79	
03/01/25	03/31/25	Mar 2025	41.37	39.89	40.40	38.31	40.61	38.04	44.65	43.42	44.53	44.55	4.62	4.71	4.52	4.45	4.53	4.45	4.39	3.97	4.72	4.55	4.53	4.62	
04/01/25	04/30/25	Apr 2025	40.59	39.55	39.65	38.46	39.41	37.60	42.62	41.67	42.55	43.78	4.48	4.57	4.30	4.30	4.38	4.31	4.15	3.54	4.55	4.39	4.37	4.33	
05/01/25	05/31/25	May 2025	36.44	33.48	36.49	35.22	33.83	30.79	40.68	38.71	39.78	40.40	4.30	4.35	4.11	4.05	4.14	4.07	3.81	3.55	4.30	4.14	4.12	3.99	
06/01/25	06/30/25	Jun 2025	38.09	33.81	37.82	35.08	35.57	31.09	42.15	38.88	41.08	39.74	4.31	4.38	4.18	4.05	4.13	4.06	3.77	3.54	4.30	4.14	4.12	3.95	
07/01/25	07/31/25	Jul 2025	52.14	41.89	52.12	41.15	50.18	39.22	52.89	44.43	52.07	44.15	4.36	4.41	4.21	4.07	4.18	4.09	3.84	3.62	4.33	4.16	4.15	4.02	
08/01/25	08/31/25	Aug 2025	54.94	44.42	55.73	44.07	54.50	43.26	57.64	48.06	56.82	47.99	4.39	4.51	4.22	4.17	4.24	4.18	4.00	3.60	4.42	4.26	4.24	4.18	
09/01/25	09/30/25	Sep 2025	50.07	42.94	50.51	41.53	51.75	41.76	54.50	46.99	53.95	46.94	4.28	4.45	4.14	4.07	4.17	4.07	3.96	3.63	4.33	4.16	4.15	4.15	
10/01/25	10/31/25	Oct 2025	46.41	40.91	42.63	38.30	43.62	38.17	48.60	44.12	47.72	44.74	4.30	4.52	4.14	4.13	4.19	4.11	3.97	3.62	4.38	4.22	4.20	4.16	
11/01/25	11/30/25	Nov 2025	46.14	41.09	43.18	38.65	43.35	38.35	49.23	44.54	48.48	45.24	4.35	4.53	4.19	4.24	4.31	4.24	4.02	3.87	4.51	4.34	4.32	4.22	
12/01/25	12/31/25	Dec 2025	46.57	41.23	43.70	39.75	43.78	38.49	48.38	45.26	49.23	46.39	4.62	4.75	4.53	4.47	4.55	4.47	4.23	3.98	4.73	4.56	4.54	4.45	
01/01/26	01/31/26	Jan 2026	49.18	43.71	45.74	41.11	46.31	40.89	51.29	46.40	51.24	47.86	4.86	4.99	4.82	4.71	4.79	4.70	4.48	4.16	4.98	4.81	4.79	4.73	
02/01/26	02/28/26	Feb 2026	43.46	40.69	46.08	42.28	46.29	42.30	49.81	45.82	50.77	48.44	4.90	5.05	4.83	4.77	4.83	4.75	4.52	4.18	5.04	4.87	4.84	4.76	
03/01/26	03/31/26	Mar 2026	42.35	41.56	41.31	39.57	41.53	39.41	44.57	44.08	45.64	46.04	4.73	4.82	4.61	4.54	4.63	4.57	4.42	3.88	4.81	4.64	4.61	4.65	
04/01/26	04/30/26	Apr 2026	41.28	40.20	40.22	39.35	39.62	37.78	42.81	42.77	42.73	45.11	4.55	4.65	4.38	4.35	4.43	4.36	4.20	3.61	4.60	4.44	4.42	4.38	
05/01/26	05/31/26	May 2026	36.47	33.07	37.63	36.55	33.71	30.24	40.69	38.36	40.93	41.62	4.43	4.48	4.26	4.15	4.24	4.18	3.90	3.67	4.40	4.24	4.22	4.07	
06/01/26	06/30/26	Jun 2026	40.08	34.76	39.18	36.71	37.15	31.90	44.07	40.11	42.48	42.59	4.46	4.50	4.32	4.16	4.24	4.18	3.86	3.64	4.42	4.25	4.23	4.03	
07/01/26	07/31/26	Jul 2026	53.85	44.20	54.02	42.85	52.13	41.40	55.74	46.73	54.34	46.88	4.50	4.55	4.34	4.19	4.28	4.20	3.95	3.75	4.44	4.28	4.26	4.13	
08/01/26	08/31/26	Aug 2026	54.47	45.26	56.09	44.62	55.17	43.83	58.75	49.59	57.41	49.16	4.52	4.69	4.36	4.30	4.38	4.31	4.11	3.80	4.55	4.39	4.37	4.29	
09/01/26	09/30/26	Sep 2026	50.15	44.19	50.76	42.80	52.30	43.27	54.71	48.25	54.29	48.28	4.42	4.61	4.26	4.20	4.28	4.22	4.03	3.76	4.46	4.29	4.28	4.22	
10/01/26	10/31/26	Oct 2026	48.35	42.74	44.41	39.94	45.48	39.93	49.46	45.74	49.05	46.52	4.44	4.66	4.27	4.26	4.32	4.26	4.06	3.74	4.51	4.35	4.33	4.25	
11/01/26	11/30/26	Nov 2026	47.68	42.73	43.87	39.76	44.82	39.92	50.14	46.04	49.48	46.75	4.50	4.77	4.34	4.38	4.44	4.38	4.16	4.04	4.64	4.47	4.45	4.36	
12/01/26	12/31/26	Dec 2026	47.68	42.40	44.22	40.66	44.82	39.59	48.84	46.01	49.91	47.04	4.78	4.91	4.71	4.62	4.70	4.62	4.38	3.98	4.89	4.72	4.69	4.60	
01/01/27	01/31/27	Jan 2027	51.29	46.18	47.42	43.50	48.34	43.28	53.66	48.83	53.19	50.23	5.09	5.25	5.12	4.97	5.04	4.96	4.72	4.46	5.24	5.07	5.05	4.97	
02/01/27	02/28/27	Feb 2027	45.24	42.30	47.61	43.89	48.01	44.05	51.80	47.77	52.63	50.25	5.14	5.27	5.08	5.00	5.07	4.99	4.75	4.48	5.27	5.10	5.08	4.98	
03/01/27	03/31/27	Mar 2027	43.59	43.32	42.65	41.49	43.16	41.20	46.27	45.80	46.77	48.33	4.94	5.04	4.82	4.75	4.85	4.78	4.64	4.27	5.02	4.85	4.83	4.87	
04/01/27	04/30/27	Apr 2027	42.61	41.65	40.88	40.18	40.98	39.14	44.37	43.98	43.53	46.26	4.75	4.83	4.57	4.53	4.62	4.57	4.38	4.00	4.79	4.62	4.60	4.56	
05/01/27	05/31/27	May 2027	38.37	34.58	39.28	38.31	35.51	31.68	42.35	40.00	42.14	43.34	4.60	4.66	4.44	4.34	4.44	4.38	4.16	3.92	4.59	4.43	4.41	4.34	
06/01/27	06/30/27	Jun 2027	42.13	36.68	40.67	38.20	39.20	33.78	46.20	42.20	43.81	44.44	4.64	4.67	4.52	4.33	4.44	4.38	4.11	3.92	4.58	4.42	4.40	4.28	
07/01/27	07/31/27	Jul 2027	55.89	46.02	56.02	44.59	54.26	43.13	57.97	48.88	56.02	48.71	4.68	4.74	4.52	4.37	4.46	4.42	4.18	4.01	4.62	4.46	4.44	4.36	
08/01/27	08/31/27	Aug 2027	56.85	46.76	58.23	45.94	57.54	45.25	61.31	51.28	59.51	50.65	4.72	4.83	4.55	4.44	4.55	4.49	4.27	4.01	4.69	4.53	4.51	4.46	
09/01/27	09/30/27	Sep 2027	52.21	46.08	52.54	44.53	54.35	45.09	56.82	50.45	56.14	50.44	4.68	4.86	4.55	4.44	4.53	4.48	4.33	4.09	4.69	4.53	4.51	4.52	
10/01/27	10/31/27	Oct 2027	51.11	45.49	46.83	42.37	48.16	42.61	52.38	48.42	51.71	49.02	4.72	4.97	4.56	4.56	4.63	4.56	4.49	4.15	4.82	4.65	4.63	4.68	
11/01/27	11/30/27	Nov 2027	51.25	45.86	47.67	43.14	48.30	42.96	54.16	49.52	53.25	49.98	4.88	5.15	4.70	4.75	4.86	4.79	4.67	4.48	5.01	4.85	4.83	4.87	
12/01/27	12/31/27	Dec 2027	51.68	46.43	47.66	44.28	48.73	43.53	52.86	50.18	53.80	51.06	5.18	5.34	5.14	5.05	5.14	5.05	5.01	4.55	5.32	5.15	5.13	5.23	
01/01/28	01/31/28	Jan 2028	52.15	46.76	47.42	43.59	49.14	43.80	53.70	48.84	53.38	50.33	5.04	5.19	5.08	4.93	5.00	4.90	4.91	4.48	5.20	5.03	5.00	5.16	
02/01/28	02/29/28	Feb 2028	45.33	43.34	47.29	44.14	48.40	44.80	51.63	48.34	52.29	50.84	5.08	5.22	5.04	4.95	5.02	4.94	4.94	4.48	5.22	5.05	5.03	5.17	
03/01/28	03/31/28	Mar 2028	44.48	43.72	42.56	41.42	43.23	41.26	46.14	45.52	46.40	48.32	4.94	5.01	4.79	4.76	4.84	4.76	4.67	4.23	5.03	4.86	4.83	4.90	
04/01/28	04/30/28	Apr 2028	43.89	42.97	41.87	41.27	42.16	40.43	44.51	44.33	43.51	46.44	4.79	4.86	4.59	4.58	4.66	4.62	4.52	4.13	4.83	4.67	4.65	4.70	

05/01/28	05/31/28	May 2028	41.02	36.94	40.46	39.71	38.23	34.04	44.47	42.09	43.33	45.32	4.79	4.81	4.63	4.51	4.62	4.56	4.34	4.16	4.76	4.59	4.58	4.51	
06/01/28	06/30/28	Jun 2028	44.09	37.93	42.03	39.47	40.92	34.95	48.21	43.52	44.91	45.38	4.83	4.84	4.70	4.49	4.60	4.53	4.37	4.18	4.75	4.58	4.56	4.54	
07/01/28	07/31/28	Jul 2028	58.62	48.19	58.25	46.53	56.52	45.28	60.46	50.50	57.90	50.45	4.90	4.91	4.76	4.55	4.67	4.60	4.44	4.31	4.80	4.64	4.62	4.62	
08/01/28	08/31/28	Aug 2028	59.05	48.74	60.39	47.69	59.61	46.99	63.76	53.07	61.57	52.65	4.93	5.04	4.76	4.66	4.76	4.67	4.62	4.34	4.92	4.75	4.73	4.80	
09/01/28	09/30/28	Sep 2028	53.34	47.88	53.27	46.22	55.23	46.83	57.72	51.70	56.80	52.21	4.88	5.02	4.77	4.66	4.74	4.65	4.62	4.51	4.92	4.75	4.73	4.81	
10/01/28	10/31/28	Oct 2028	53.18	46.87	47.45	43.09	50.15	43.92	54.21	49.50	53.42	50.49	4.91	5.09	4.81	4.76	4.83	4.73	4.70	4.56	5.02	4.85	4.83	4.89	
11/01/28	11/30/28	Nov 2028	54.21	48.25	50.04	45.10	51.18	45.28	56.64	51.81	55.68	52.39	5.04	5.25	4.93	4.93	5.02	4.95	4.95	4.76	5.19	5.02	5.00	5.15	
12/01/28	12/31/28	Dec 2028	53.54	48.33	48.75	45.85	50.52	45.36	54.52	51.91	55.37	53.05	5.33	5.50	5.30	5.22	5.28	5.18	5.19	4.86	5.49	5.32	5.30	5.41	
01/01/29	01/31/29	Jan 2029	54.99	48.93	50.29	46.06	51.89	45.90	55.52	51.02	55.67	52.64	5.35	5.52	5.32	5.29	5.36	5.25	5.28	4.86	5.56	5.39	5.37	5.53	
02/01/29	02/28/29	Feb 2029	47.88	45.04	50.58	47.01	51.34	47.41	54.02	50.35	54.77	53.54	5.39	5.55	5.31	5.32	5.38	5.29	5.31	4.88	5.59	5.42	5.40	5.54	
03/01/29	03/31/29	Mar 2029	46.39	46.50	44.91	43.97	45.84	44.17	48.09	48.20	47.73	50.85	5.21	5.31	5.08	5.11	5.18	5.08	5.08	4.59	5.37	5.20	5.18	5.31	
04/01/29	04/30/29	Apr 2029	45.50	44.42	43.06	42.26	43.50	41.81	45.20	45.70	43.92	47.55	5.04	5.11	4.89	4.82	4.92	4.86	4.79	4.29	5.07	4.91	4.89	4.97	
05/01/29	05/31/29	May 2029	40.90	36.77	41.39	40.77	38.02	33.80	44.06	41.97	43.12	45.76	4.88	4.91	4.73	4.61	4.72	4.66	4.46	4.22	4.86	4.69	4.68	4.64	
06/01/29	06/30/29	Jun 2029	43.20	37.93	41.57	40.14	40.17	34.90	46.44	42.87	43.96	45.73	4.92	4.94	4.78	4.59	4.71	4.66	4.48	4.22	4.84	4.68	4.66	4.65	
07/01/29	07/31/29	Jul 2029	58.91	48.72	58.87	47.66	56.98	45.72	59.70	49.05	57.25	50.78	4.96	4.99	4.81	4.61	4.73	4.63	4.49	4.28	4.86	4.70	4.68	4.68	
08/01/29	08/31/29	Aug 2029	60.48	49.43	61.81	48.92	61.33	48.11	64.30	52.80	61.61	52.84	5.01	5.08	4.82	4.72	4.82	4.75	4.69	4.32	4.98	4.81	4.79	4.88	
09/01/29	09/30/29	Sep 2029	55.29	48.64	56.03	47.98	57.68	48.21	59.44	52.08	58.62	52.78	4.89	5.08	4.76	4.66	4.76	4.65	4.62	4.43	4.92	4.75	4.74	4.81	
10/01/29	10/31/29	Oct 2029	53.96	47.37	48.93	44.21	50.88	44.35	54.26	49.53	53.31	50.85	4.92	5.14	4.79	4.76	4.85	4.75	4.71	4.48	5.02	4.85	4.84	4.90	
11/01/29	11/30/29	Nov 2029	53.41	47.93	48.85	44.51	50.33	44.90	55.39	51.22	54.78	51.99	5.04	5.31	4.95	4.99	5.05	4.96	4.98	4.71	5.25	5.09	5.07	5.17	
12/01/29	12/31/29	Dec 2029	53.35	48.42	48.65	45.57	50.27	45.39	53.75	50.90	54.96	52.96	5.31	5.46	5.29	5.24	5.31	5.21	5.22	4.82	5.50	5.33	5.31	5.44	
01/01/30	01/31/30	Jan 2030	54.79	49.60	50.14	46.52	51.64	46.50	56.44	51.89	55.99	53.52	5.42	5.58	5.45	5.37	5.44	5.35	5.35	4.96	5.64	5.46	5.44	5.60	
02/01/30	02/28/30	Feb 2030	49.42	47.43	50.71	47.42	51.86	48.12	55.09	51.71	55.37	54.49	5.47	5.61	5.45	5.39	5.47	5.38	5.39	5.01	5.66	5.49	5.47	5.63	
03/01/30	03/31/30	Mar 2030	48.23	47.87	45.22	44.48	46.40	44.88	48.85	49.34	48.55	51.17	5.32	5.42	5.18	5.23	5.32	5.22	5.23	4.72	5.50	5.33	5.31	5.46	
04/01/30	04/30/30	Apr 2030	47.29	45.93	43.61	42.75	44.41	42.96	46.41	47.09	44.67	48.92	5.18	5.26	5.00	4.99	5.07	5.03	4.96	4.58	5.24	5.07	5.06	5.13	
05/01/30	05/31/30	May 2030	43.35	38.83	43.94	43.31	40.29	35.72	46.40	44.34	45.06	48.23	5.16	5.22	4.99	4.93	5.03	4.97	4.84	4.56	5.18	5.01	5.00	5.01	
06/01/30	06/30/30	Jun 2030	45.37	40.26	43.58	42.45	42.19	37.05	48.72	45.44	45.50	47.76	5.20	5.23	5.06	4.91	5.03	4.97	4.85	4.62	5.16	5.00	4.98	5.03	
07/01/30	07/31/30	Jul 2030	62.94	51.15	61.91	49.62	60.55	48.04	63.38	51.60	60.39	53.37	5.28	5.31	5.09	4.93	5.06	5.00	4.84	4.74	5.18	5.02	5.00	5.02	
08/01/30	08/31/30	Aug 2030	63.62	52.75	64.50	51.48	64.14	50.88	67.72	55.95	64.61	55.82	5.31	5.41	5.13	5.06	5.16	5.07	5.03	4.77	5.31	5.15	5.13	5.21	
09/01/30	09/30/30	Sep 2030	59.37	52.18	58.93	50.36	60.71	50.81	63.65	55.84	62.00	55.92	5.26	5.44	5.09	5.13	5.20	5.13	5.13	4.94	5.39	5.22	5.20	5.32	
10/01/30	10/31/30	Oct 2030	56.59	49.72	51.12	46.33	53.43	46.62	57.73	52.69	56.12	53.62	5.29	5.48	5.12	5.20	5.26	5.16	5.20	4.99	5.46	5.30	5.28	5.40	
11/01/30	11/30/30	Nov 2030	55.25	50.03	50.75	46.82	52.09	46.92	57.92	53.85	56.70	54.23	5.41	5.66	5.26	5.41	5.47	5.35	5.41	5.13	5.67	5.50	5.48	5.61	
12/01/30	12/31/30	Dec 2030	55.71	51.36	51.40	48.42	52.55	48.24	56.91	54.08	57.80	55.76	5.70	5.85	5.66	5.64	5.70	5.61	5.63	5.31	5.91	5.74	5.72	5.85	
01/01/31	01/31/31	Jan 2031	57.09	51.49	52.12	48.38	53.86	48.31	58.83	53.94	58.32	55.40	5.59	5.77	5.58	5.56	5.62	5.53	5.55	5.20	5.83	5.66	5.64	5.80	
02/01/31	02/28/31	Feb 2031	51.22	48.96	52.51	48.68	53.85	49.45	57.22	53.57	57.49	55.95	5.64	5.82	5.53	5.61	5.67	5.58	5.59	5.26	5.88	5.71	5.68	5.83	
03/01/31	03/31/31	Mar 2031	50.32	49.51	47.12	46.07	48.51	46.56	51.12	50.88	50.82	53.22	5.49	5.62	5.34	5.46	5.52	5.44	5.44	4.92	5.73	5.56	5.53	5.67	
04/01/31	04/30/31	Apr 2031	49.52	48.22	46.43	45.36	46.88	45.27	48.24	49.22	46.91	51.36	5.34	5.44	5.17	5.17	5.26	5.20	5.14	4.74	5.43	5.26	5.25	5.32	
05/01/31	05/31/31	May 2031	45.13	41.29	44.78	44.35	42.13	38.18	47.83	46.08	46.27	49.63	5.29	5.34	5.13	5.05	5.16	5.10	4.98	4.70	5.31	5.14	5.13	5.15	
06/01/31	06/30/31	Jun 2031	47.52	41.88	45.34	43.90	44.30	38.71	51.00	47.02	47.69	49.30	5.34	5.37	5.17	5.05	5.16	5.10	5.00	4.73	5.31	5.14	5.13	5.17	
07/01/31	07/31/31	Jul 2031	65.53	53.15	64.41	51.53	63.12	49.95	66.16	53.83	63.04	55.50	5.43	5.47	5.26	5.10	5.22	5.17	5.01	4.82	5.35	5.19	5.17	5.19	
08/01/31	08/31/31	Aug 2031	65.94	54.93	66.76	53.72	66.50	53.24	70.34	58.28	67.09	58.13	5.47	5.58	5.26	5.22	5.32	5.25	5.19	4.85	5.47	5.31	5.29	5.37	
09/01/31	09/30/31	Sep 2031	61.22	53.16	60.72	51.36	62.81	51.91	65.61	57.44	64.10	57.73	5.35	5.56	5.19	5.23	5.31	5.23	5.23	4.98	5.49	5.32	5.31	5.42	
10/01/31	10/31/31	Oct 2031	57.79	50.83	51.50	46.99	54.53	47.66	59.28	54.14	57.27	54.46	5.40	5.61	5.22	5.32	5.38	5.28	5.32	5.04	5.58	5.41	5.40	5.52	
11/01/31	11/30/31	Nov 2031	56.98	51.36	52.13	47.95	53.75	48.19	59.53	54.87	57.92	55.32	5.47	5.73	5.34	5.49	5.55	5.46	5.47	5.13	5.75	5.58	5.56	5.67	
12/01/31	12/31/31	Dec 2031	57.27	52.18	52.20	49.28	54.03	49.00	58.12	55.11	58.86	56.99	5.77	5.97	5.73	5.71	5.77	5.68	5.70	5.50	5.98	5.81	5.79	5.92	
01/01/32	01/31/32	Jan 2032	59.75	53.90	54.71	50.69	56.42	50.64	62.03	56.73	61.36	58.36	5.91	6.07	5.87	5.86	5.94	5.81	5.86	5.60	6.13	5.96	5.94	6.11	
02/01/32	02/29/32	Feb 2032	53.87	52.25	54.86	51.24	56.09	52.09	60.18	56.53	59.74	58.35	5.94	6.14	5.86	5.91	5.97	5.87	5.91	5.65	6.17	6.00	5.98	6.14	
03/01/32	03/31/32	Mar 2032	52.43	51.60	48.80	47.96	50.31	48.41	53.18	52.92	52.54	55.80	5.71	5.87	5.55	5.66	5.74	5.63	5.66	5.37	5.93	5.76	5.74	5.89	
04/01/32	04/30/32	Apr 2032	51.19	49.71	47.76	46.76	48.00	46.58	50.20	51.22	48.31	53.21	5.49	5.65	5.28	5.39	5.46	5.40	5.34	5.05	5.64	5.47	5.46	5.52	
05/01/32	05/31/32	May 2032	45.39	40.76	45.64	44.95	42.18	37.49	48.37	46.32	46.69	49.99	5.37	5.42	5.20	5.11	5.22	5.14	5.08	4.93	5.36	5.20	5.18	5.25	
06/01/32	06/30/32	Jun 2032	49.61	43.09	46.82	44.96	46.30	39.84	52.89	48.68	48.90	50.93	5.42	5.45	5.25	5.11	5.22	5.16	5.08	4.96	5.36	5.20	5.18	5.25	
07/01/32	07/31/32	Jul 2032	66.43	53.88	65.10	52.44	63.74	50.62	67.34	55.05	63.78	56.66	5.51	5.54	5.32	5.16	5.28	5.22	5.05	4.94	5.41	5.24	5.23	5.23	
08/01/32	08/31/32	Aug 2032	67.46	56.53	68.43	55.26	67.82	54.46	72.15	59.76	68.78	59.59	5.55	5.72	5.34	5.34	5.43	5.37	5.31	5.02	5.59	5.43	5.41	5.49	
09/01/32	09/30/32	Sep 2032	62.08	54.71	61.73	52.90	63.25	53.37	66.66	58.93	64.90	59.63	5.43	5.68	5.25	5.34	5.42	5.34	5.32	5.05	5.59	5.43	5.41	5.51	
10/01/32	10/31/32	Oct 2032	59.58	52.53	53.84	48.74	56.26	49.29	60.89	55.69	59.27	56.35	5.46	5.72	5.28	5.45	5.51	5.42	5.42	5.11	5.70	5.54	5.52	5.61	
11/01/32	11/30/32	Nov 2032	58.94	52.93	53.47	49.13	55.63	49.67	61.91	56.97	60.00	57.23	5.58	5.87	5.45	5.63	5.72	5.63	5.63	5.25	5.89	5.72	5.70	5.83	
12/01/32	12/31/32	Dec 2032	58.65	53.81	53.80	50.53	55.33	50.54	59.59	56.95	60.45	58.57	5.87	6.09	5.83	5.87	5.94	5.83	5.84	5.66	6.14	5.97	5.95	6.06	
01/01/33	01/31/33	Jan 2033	60.71	55.31	55.21	51.67	57.32	51.97	62.17	57.54	61.87	59.21	5.99	6.20	5.98	6.01	6.06	5.95	5.98	5.74	6.28	6.11	6.09	6.23	
02/01/33	02/28/33	Feb 2033	54.82	53.48	55.48	52.05	57.02	52.99	60.48	57.78	60.31	59.75	6.04	6.24	5.96	6.04	6.10	5.99	6.01	5.81	6.31	6.14	6.12	6.24	
03/01/33	03/31/33	Mar 2033	53.64	52.64	49.31	48.82	51.14	49.33	53.88	54.27	53.39	56.81	5.81	5.98	5.62	5.82	5.90	5.79	5.81	5.40	6.09	5.92	5.90	6.04	
04/01/33	04/30/33	Apr 2033	51.99	50.78	48.07	47.44	48.70	47.50	50.70	52.67	48.41	54.37	5.56	5.78	5.34	5.54	5.60	5.54	5.46	5.13	5.79	5.63	5.61	5.64	
05/01/33	05/31/33	May 2033	47.18	42.76	47.69	46.87	43.90	39.48	49.90	48.58	48.46	51.97	5.51	5.60	5.32	5.31	5.42	5.35	5.21	5.06	5.56	5.39	5.38	5.38	
06/01/33	06/30/33	Jun 2033	51.02	44.72	48.09	46.01	47.61	41.42	54.02	50.14	49.99	51.87	5.56	5.60	5.38	5.29	5.42	5.35	5.21	5.10	5.54	5.38	5.36	5.38	
07/01/33	07/31/33	Jul 2033	68.93	56.13	66.92	54.36	66.16	52.81	68.81	57.29	65.10	58.37	5.67	5.76	5.48	5.40	5.59	5.51	5.27	5.18	5.65	5.49	5.47	5.46	
08/01/33	08/31/33	Aug 2033	69.73	58.28	70.21	56.56	69.74	55.93	73.75	61.76	70.16	61.81	5.71	5.90	5.48	5.60	5.70	5.62	5.52	5.23	5.86	5.69	5.68	5.71	
09/01/33	09/30/33	Sep 2033	63.56	56.65	62.65	54.19	64.29	54.88	67.09	60.12	65.89	60.89	5.60	5.88	5.43	5.59	5.63	5.52	5.52	5.26	5.84	5.68	5.66	5.71	
10/01/33	10/31/33	Oct 2033	60.28	53.86	54.28	49.76	56.89	50.53	61.20	57.08	59.90	57.83	5.65	5.92	5.45	5.65	5.71	5.62	5.65	5.29	5.91	5.74	5.72	5.84	
11/01/33	11/30/33	Nov 2033	60.40	54.34	54.87	50.39	57.01	50.98	62.79	58.42	61.21	58.81	5.76	6.06	5.60	5.82	5.92	5.81	5.88	5.42	6.08	5.92	5.90	6.08	
12/01/33	12/31/33	Dec 2033	60.40	55.64	54.82	52.03	57.00	52.30	61.08	59.22	61.94	60.55	6.09	6.31	6.04	6.09	6.24	6.14	6.24	5.76	6.36	6.19	6.16	6.46	
01/01/34	01/31/34	Jan 2034	63.17	57.43	57.33	53.55	59.69	54.01	64.90	59.84	64.28	61.69	6.18	6.44	6.15	6.23	6.37	6.26	6.39	5.83	6.50	6.33	6.30	6.64	
02/01/34	02/28/34	Feb 2034	57.39	55.85	56.95	53.76	58.86	54.84	63.23	60.23	62.48	62.16	6.23	6.47	6.10	6.26	6.40	6.29	6.40	5.88	6.53	6.36	6.34	6.64	
03/01/34	03/31/34	Mar 2034	55.83	54.49	51.10	50.48	53.11	51.10	55.58	56.11	55.49	58.47	6.00	6.20	5.80	6.04	6.08	5.99	6.04	5.41	6.30	6.13	6.11	6.27	
04/01/34	04/30/34	Apr 2034	54.51	52.92	50.26	49.43	51.12	49.57	52.71	54.16	50.61	55.64	5.76	5.96	5.54	5.75	5.78	5.72	5.67	5.14	6.00	5.84	5.82	5.84	
05/01/34	05/31/34	May 2034	50.42	46.27	49.61	48.76	47.06	42.96	52.59	51.42	50.73	54.82	5.72	5.86	5.51	5.57	5.68	5.64	5.48	5.11	5.82	5.66	5.64	5.65	

06/01/34	06/30/34	Jun 2034	53.48	46.83	50.31	48.24	49.98	43.50	56.54	52.09	52.25	54.14	5.76	5.84	5.60	5.52	5.68	5.62	5.44	5.12	5.78	5.61	5.60	5.62	
07/01/34	07/31/34	Jul 2034	71.74	58.11	69.57	56.25	68.68	54.71	71.76	58.77	67.99	60.76	5.83	5.96	5.64	5.59	5.75	5.67	5.46	5.22	5.84	5.68	5.66	5.64	
08/01/34	08/31/34	Aug 2034	72.14	60.35	72.38	58.31	71.66	57.81	75.86	63.34	72.26	63.95	5.88	6.10	5.62	5.78	5.86	5.76	5.70	5.27	6.04	5.87	5.85	5.88	
09/01/34	09/30/34	Sep 2034	64.48	58.07	63.23	55.14	64.90	55.96	67.77	60.93	66.50	62.31	5.67	5.94	5.51	5.67	5.72	5.59	5.62	5.30	5.92	5.76	5.74	5.81	
10/01/34	10/31/34	Oct 2034	61.56	54.71	54.17	50.05	58.10	51.32	62.14	57.52	60.73	58.40	5.70	5.99	5.52	5.72	5.78	5.68	5.72	5.35	5.97	5.81	5.79	5.91	
11/01/34	11/30/34	Nov 2034	61.70	55.11	55.25	51.06	58.23	51.71	63.60	58.92	61.89	59.32	5.76	6.05	5.62	5.81	5.92	5.81	5.92	5.38	6.07	5.91	5.89	6.12	
12/01/34	12/31/34	Dec 2034	61.37	56.77	55.15	52.77	57.90	53.36	61.96	59.85	62.75	61.58	6.10	6.37	6.05	6.12	6.31	6.20	6.32	5.76	6.38	6.21	6.19	6.54	
01/01/35	01/31/35	Jan 2035	63.26	57.74	57.04	53.76	59.70	54.24	65.41	60.52	64.33	62.01	6.21	6.44	6.19	6.26	6.44	6.29	6.47	5.88	6.53	6.36	6.33	6.72	
02/01/35	02/28/35	Feb 2035	58.61	56.90	57.52	53.91	59.60	55.49	64.11	60.51	63.42	62.29	6.26	6.49	6.18	6.27	6.47	6.34	6.49	5.90	6.54	6.37	6.35	6.72	
03/01/35	03/31/35	Mar 2035	57.10	55.92	52.02	51.44	54.36	52.45	56.46	56.86	55.81	59.65	6.06	6.29	5.88	6.09	6.18	6.06	6.14	5.75	6.36	6.19	6.17	6.37	
04/01/35	04/30/35	Apr 2035	55.62	53.67	51.05	49.82	52.16	50.22	53.34	54.86	51.23	56.52	5.86	6.08	5.63	5.86	5.90	5.80	5.83	5.45	6.12	5.95	5.94	6.01	
05/01/35	05/31/35	May 2035	51.25	45.85	51.05	50.00	47.81	42.39	53.52	51.83	51.64	55.98	5.88	6.06	5.72	5.83	5.90	5.81	5.75	5.41	6.08	5.92	5.90	5.92	
06/01/35	06/30/35	Jun 2035	53.26	47.15	50.74	49.51	49.75	43.67	56.09	52.63	52.26	55.40	5.91	6.03	5.78	5.73	5.86	5.78	5.65	5.21	5.99	5.82	5.80	5.82	
07/01/35	07/31/35	Jul 2035	73.97	59.75	71.77	57.89	70.68	56.25	74.01	60.84	69.84	62.39	6.01	6.14	5.85	5.85	5.98	5.86	5.75	5.29	6.10	5.94	5.92	5.93	
08/01/35	08/31/35	Aug 2035	75.41	62.20	75.29	60.03	74.48	59.68	79.51	65.99	75.08	65.99	6.06	6.26	5.85	5.98	6.06	5.93	5.91	5.47	6.23	6.07	6.05	6.10	
09/01/35	09/30/35	Sep 2035	68.27	60.65	67.58	57.90	67.95	58.11	73.21	64.65	71.03	64.93	5.88	6.11	5.72	5.90	5.93	5.80	5.85	5.49	6.15	5.99	5.97	6.04	
10/01/35	10/31/35	Oct 2035	63.23	56.00	56.99	51.87	59.67	52.52	65.25	59.68	62.92	60.15	5.90	6.14	5.72	5.91	5.98	5.88	5.91	5.49	6.17	6.00	5.99	6.10	
11/01/35	11/30/35	Nov 2035	62.03	56.12	56.15	51.83	58.49	52.62	65.30	60.56	63.07	60.69	5.96	6.27	5.86	6.01	6.19	6.06	6.19	5.59	6.27	6.11	6.09	6.39	
12/01/35	12/31/35	Dec 2035	61.76	57.92	56.00	53.92	58.20	54.43	63.55	61.53	63.85	62.90	6.29	6.54	6.24	6.29	6.49	6.37	6.49	5.83	6.56	6.39	6.37	6.70	
01/01/36	01/31/36	Jan 2036	66.12	60.44	59.88	56.29	62.47	56.85	68.47	63.57	67.00	64.83	6.47	6.80	6.43	6.55	6.80	6.67	6.80	5.85	6.82	6.65	6.63	7.05	
02/01/36	02/29/36	Feb 2036	60.63	58.62	59.12	55.79	61.55	57.24	66.01	62.62	65.07	64.30	6.52	6.72	6.43	6.52	6.65	6.55	6.65	6.15	6.79	6.62	6.59	6.88	
03/01/36	03/31/36	Mar 2036	59.44	57.95	53.91	53.31	56.43	54.39	59.42	58.94	58.04	61.60	6.32	6.52	6.15	6.33	6.42	6.30	6.40	6.03	6.60	6.43	6.41	6.63	
04/01/36	04/30/36	Apr 2036	57.44	55.36	52.69	51.08	53.89	51.86	55.31	57.38	53.03	58.70	6.12	6.28	5.91	6.10	6.13	6.05	6.03	5.68	6.35	6.19	6.17	6.21	
05/01/36	05/31/36	May 2036	52.80	47.60	53.18	51.82	49.22	44.07	55.55	53.63	53.40	57.73	6.13	6.28	5.97	6.05	6.12	6.03	5.97	5.65	6.30	6.14	6.12	6.14	
06/01/36	06/30/36	Jun 2036	56.78	49.81	55.62	52.02	53.14	46.27	59.64	55.20	56.05	57.48	6.17	6.25	6.05	5.93	6.10	6.00	5.85	5.40	6.18	6.02	6.00	6.02	
07/01/36	07/31/36	Jul 2036	76.89	61.93	74.55	59.65	73.79	58.33	76.62	62.96	72.54	64.87	6.27	6.35	6.12	6.03	6.20	6.05	5.91	5.43	6.29	6.12	6.10	6.10	
08/01/36	08/31/36	Aug 2036	77.89	65.07	77.75	62.80	76.92	62.54	81.53	68.67	77.28	68.28	6.32	6.52	6.12	6.25	6.32	6.20	6.17	5.73	6.51	6.34	6.32	6.35	
09/01/36	09/30/36	Sep 2036	70.72	62.29	69.96	59.27	70.83	59.82	75.75	66.70	73.48	67.18	6.12	6.35	5.97	6.12	6.17	6.03	6.08	5.73	6.37	6.21	6.19	6.27	
10/01/36	10/31/36	Oct 2036	65.25	57.71	58.91	53.56	61.61	54.15	67.68	62.21	65.32	62.17	6.15	6.42	5.98	6.15	6.25	6.13	6.18	5.75	6.41	6.24	6.22	6.37	
11/01/36	11/30/36	Nov 2036	64.18	58.22	57.95	54.08	60.55	54.65	67.62	62.73	65.23	63.01	6.22	6.52	6.10	6.25	6.45	6.32	6.43	5.85	6.51	6.34	6.32	6.63	
12/01/36	12/31/36	Dec 2036	64.14	59.60	58.18	55.59	60.50	56.02	66.02	63.41	66.32	64.62	6.55	6.75	6.52	6.52	6.74	6.60	6.74	6.02	6.79	6.62	6.59	6.95	
01/01/37	01/31/37	Jan 2037	67.87	62.15	61.36	57.87	64.14	58.48	69.32	65.28	68.71	67.04	6.62	6.98	6.58	6.69	6.96	6.82	6.98	6.02	6.96	6.78	6.76	7.23	
02/01/37	02/28/37	Feb 2037	64.40	62.15	60.88	57.57	63.93	59.69	68.30	65.31	67.33	66.74	6.67	6.93	6.60	6.65	6.96	6.84	6.96	6.14	6.92	6.75	6.73	7.19	
03/01/37	03/31/37	Mar 2037	62.06	60.04	55.54	54.51	58.71	56.39	60.89	61.02	60.21	63.11	6.46	6.67	6.31	6.48	6.58	6.46	6.57	6.19	6.75	6.58	6.56	6.79	
04/01/37	04/30/37	Apr 2037	59.94	58.10	54.71	53.61	56.36	54.48	56.73	59.63	54.82	61.65	6.26	6.45	6.07	6.26	6.29	6.15	6.21	5.85	6.51	6.35	6.33	6.38	
05/01/37	05/31/37	May 2037	56.27	52.25	54.54	53.29	52.68	48.68	57.40	57.30	54.99	59.62	6.27	6.45	6.12	6.24	6.29	6.15	6.14	5.85	6.49	6.33	6.31	6.31	
06/01/37	06/30/37	Jun 2037	60.15	52.18	57.68	53.65	56.45	48.61	61.27	57.56	57.53	59.80	6.31	6.43	6.24	6.14	6.26	6.17	6.02	5.59	6.39	6.22	6.21	6.19	
07/01/37	07/31/37	Jul 2037	78.84	63.75	76.21	61.17	75.63	60.05	77.81	64.25	73.85	66.72	6.43	6.53	6.29	6.22	6.36	6.21	6.09	5.55	6.48	6.31	6.29	6.27	
08/01/37	08/31/37	Aug 2037	81.39	67.51	79.85	64.71	79.26	64.45	83.05	70.14	78.99	70.42	6.46	6.70	6.27	6.43	6.50	6.38	6.36	5.98	6.68	6.52	6.50	6.54	
09/01/37	09/30/37	Sep 2037	73.57	64.67	71.87	60.88	72.62	61.81	76.92	67.85	75.37	68.99	6.27	6.55	6.14	6.26	6.33	6.21	6.26	5.86	6.51	6.35	6.33	6.45	
10/01/37	10/31/37	Oct 2037	66.12	59.02	59.35	54.57	62.41	55.37	67.48	63.20	65.52	63.21	6.29	6.57	6.12	6.29	6.38	6.26	6.33	5.88	6.55	6.38	6.36	6.52	
11/01/37	11/30/37	Nov 2037	66.39	60.37	59.83	55.63	62.67	56.71	68.82	64.86	66.72	64.94	6.36	6.67	6.26	6.39	6.63	6.51	6.65	6.03	6.66	6.49	6.47	6.85	
12/01/37	12/31/37	Dec 2037	65.77	61.62	59.53	57.31	62.04	57.96	66.92	65.64	67.51	67.11	6.70	6.96	6.67	6.70	6.96	6.84	7.01	6.22	6.97	6.80	6.78	7.23	
01/01/38	01/31/38	Jan 2038	71.44	65.46	64.26	60.74	67.60	61.69	73.01	68.78	71.64	69.95	6.93	7.33	6.91	6.98	7.35	7.17	7.37	6.31	7.25	7.08	7.06	7.61	
02/01/38	02/28/38	Feb 2038	68.36	65.66	63.66	60.16	67.83	62.68	71.04	68.22	70.15	69.67	6.98	7.24	6.93	6.98	7.31	7.15	7.37	6.47	7.25	7.08	7.06	7.60	
03/01/38	03/31/38	Mar 2038	65.20	62.79	58.06	57.22	61.69	59.04	63.47	64.55	62.40	66.74	6.77	6.98	6.61	6.79	6.89	6.77	6.86	6.49	7.05	6.88	6.86	7.09	
04/01/38	04/30/38	Apr 2038	62.82	60.42	57.21	55.53	59.09	56.72	59.48	62.06	57.26	63.61	6.56	6.75	6.31	6.54	6.59	6.49	6.54	6.17	6.79	6.63	6.61	6.72	
05/01/38	05/31/38	May 2038	57.80	52.50	57.36	55.60	54.05	48.85	59.25	58.65	56.83	61.98	6.58	6.75	6.42	6.51	6.58	6.44	6.40	6.07	6.76	6.59	6.58	6.57	
06/01/38	06/30/38	Jun 2038	63.07	54.74	59.24	55.74	59.29	51.07	63.88	60.35	59.27	61.86	6.61	6.75	6.52	6.44	6.56	6.44	6.33	5.89	6.69	6.52	6.51	6.50	
07/01/38	07/31/38	Jul 2038	83.06	67.51	79.72	64.52	79.82	63.73	81.62	68.16	77.23	70.45	6.72	6.86	6.58	6.54	6.66	6.54	6.42	5.87	6.79	6.63	6.61	6.60	
08/01/38	08/31/38	Aug 2038	85.40	71.01	83.22	67.71	83.18	67.84	86.59	73.62	82.47	74.30	6.77	7.07	6.58	6.73	6.79	6.66	6.68	6.26	6.99	6.82	6.81	6.87	
09/01/38	09/30/38	Sep 2038	76.18	67.11	73.74	63.39	74.87	64.05	79.03	70.71	77.32	71.99	6.56	6.87	6.40	6.56	6.63	6.51	6.56	6.16	6.81	6.65	6.63	6.75	
10/01/38	10/31/38	Oct 2038	69.63	62.13	62.29	57.35	65.82	58.38	70.94	66.25	68.49	66.34	6.59	6.91	6.42	6.58	6.75	6.63	6.73	6.17	6.83	6.67	6.65	6.92	
11/01/38	11/30/38	Nov 2038	71.10	63.60	62.93	58.37	67.27	59.84	72.74	68.10	70.35	68.05	6.66	7.03	6.56	6.68	7.03	6.89	7.08	6.30	6.94	6.78	6.76	7.28	
12/01/38	12/31/38	Dec 2038	69.19	64.60	62.33	60.04	65.37	60.84	70.18	69.32	70.40	70.42	7.01	7.33	7.01	7.00	7.35	7.21	7.42	6.58	7.26	7.09	7.07	7.64	
01/01/39	01/31/39	Jan 2039	74.49	67.71	67.29	62.88	70.55	63.84	76.14	70.71	74.68	72.15	7.14	7.61	7.16	7.19	7.57	7.41	7.44	6.49	7.46	7.29	7.27	7.69	
02/01/39	02/28/39	Feb 2039	70.88	67.68	66.49	62.50	70.53	64.82	74.00	71.02	72.75	72.39	7.19	7.52	7.14	7.21	7.61	7.43	7.64	6.71	7.48	7.31	7.29	7.87	
03/01/39	03/31/39	Mar 2039	67.00	64.79	60.54	59.37	63.57	60.95	65.30	66.36	64.55	68.79	6.98	7.19	6.82	7.00	7.10	6.98	7.07	6.69	7.26	7.09	7.07	7.30	
04/01/39	04/30/39	Apr 2039	64.34	62.24	58.70	57.77	60.52	58.43	60.92	64.37	58.07	66.02	6.76	6.96	6.48	6.76	6.80	6.67	6.76	6.40	7.02	6.85	6.83	6.94	
05/01/39	05/31/39	May 2039	60.80	54.82	59.72	57.85	56.99	51.07	61.66	60.59	58.96	64.09	6.78	6.98	6.60	6.76	6.80	6.67	6.67	6.37	7.01	6.85	6.83	6.85	
06/01/39	06/30/39	Jun 2039	65.70	56.90	61.86	57.65	61.84	53.17	66.65	62.66	62.00	63.99	6.82	6.98	6.75	6.64	6.78	6.64	6.55	6.08	6.89	6.73	6.71	6.72	
07/01/39	07/31/39	Jul 2039	85.95	70.39	82.64	67.39	82.60	66.54	84.84	71.26	80.04	73.04	6.94	7.10	6.83	6.76	6.89	6.73	6.64	6.06	7.02	6.85	6.83	6.82	
08/01/39	08/31/39	Aug 2039	87.95	73.59	85.73	70.27	85.84	70.29	89.21	76.73	84.98	78.14	7.00	7.28	6.78	6.96	7.03	6.87	6.91	6.49	7.22	7.05	7.03	7.09	
09/01/39	09/30/39	Sep 2039	78.16	69.18	75.25	65.36	76.89	66.05	80.99	72.85	79.13	74.11	6.78	7.16	6.62	6.75	6.83	6.71	6.76	6.35	7.00	6.84	6.82	6.95	
10/01/39	10/31/39	Oct 2039	72.07	64.21	64.69	59.55	68.16	60.38	73.47	68.74	71.10	68.76	6.80	7.16	6.66	6.78	7.03	6.89	7.00	6.39	7.04	6.87	6.85	7.19	
11/01/39	11/30/39	Nov 2039	73.92	65.88	66.05	60.80	69.99	62.03	76.31	70.81	73.58	70.64	6.87	7.32	6.80	6.91	7.28	7.14	7.30	6.49	7.17	7.00	6.98	7.50	
12/01/39	12/31/39	Dec 2039	72.23	66.92	65.35	62.20	68.30	63.06	73.11	71.54	73.19	72.34	7.25	7.57	7.34	7.23	7.59	7.44	7.66	6.82	7.50	7.33	7.31	7.88	
01/01/40	01/31/40	Jan 2040	77.00	70.22	69.94	65.14	72.96	66.25	79.22	73.71	77.76	75.04	7.43	7.91	7.52	7.52	7.87	7.73	7.67	6.81	7.79	7.62	7.60	7.92	
02/01/40	02/29/40	Feb 2040	75.21	71.57	68.47	65.05	73.02	67.63	76.64	74.17	75.07	75.19	7.51	7.84	7.49	7.54	7.95	7.80	8.06	7.14	7.81	7.64	7.62	8.29	
03/01/40	03/31/40	Mar 2040	70.20	67.76	62.89	61.82	66.23	63.81	67.96	69.56	66.51	71.92	7.27	7.52	7.14	7.30	7.47	7.34	7.49	6.97	7.57	7.40	7.38	7.72	
04/01/40	04/30/40	Apr 2040	67.53	65.09	61.51	59.96	63.61	61.18	63.93	66.81	61.22	67.72	7.05	7.25	6.88	7.03	7.08	6.96	7.03	6.68	7.28	7.12	7.10	7.20	
05/01/40	05/31/40	May 2040	65.77	59.35	63.01	60.20	61.83	55.49	65.27	64.16	62.41	67.38	7.07	7.27	6.94	7.03	7.07	6.96	6.96	6.64	7.28	7.12	7.10	7.13	
06/01/40	06/30/40	Jun 2040	69.32	58.95	66.41	60.54	65.36	55.12	69.98	65.35	65.64	67.11	7.10	7.29	7.05	6.90	7.05	6.90	6.83	6.29	7.15	6.99	6.97	7.00	

	07/01/40	07/31/40	Jul 2040	88.94	72.77	85.28	69.46	85.09	68.83	87.70	73.91	82.62	75.39	7.21	7.40	7.10	7.01	7.18	6.99	6.90	6.31	7.26	7.10	7.08	7.08
	08/01/40	08/31/40	Aug 2040	91.39	76.03	89.42	72.61	87.79	72.31	92.62	79.81	88.73	80.81	7.27	7.62	7.12	7.25	7.32	7.16	7.19	6.75	7.50	7.34	7.32	7.38
	09/01/40	09/30/40	Sep 2040	80.23	71.75	76.72	67.41	77.82	68.14	81.99	75.36	79.79	76.08	7.05	7.40	6.92	7.01	7.12	6.97	7.01	6.57	7.27	7.10	7.08	7.20
	10/01/40	10/31/40	Oct 2040	75.07	66.49	67.27	61.64	71.06	62.56	76.35	71.34	74.13	71.14	7.08	7.49	6.94	7.07	7.36	7.19	7.34	6.64	7.32	7.16	7.14	7.53
	11/01/40	11/30/40	Nov 2040	76.73	68.64	68.77	63.30	72.70	64.68	79.11	74.23	76.63	73.79	7.16	7.60	7.18	7.16	7.62	7.47	7.67	6.75	7.42	7.25	7.23	7.87
	12/01/40	12/31/40	Dec 2040	74.98	70.39	68.08	65.32	70.95	66.42	76.62	75.08	76.33	76.05	7.54	7.95	7.65	7.52	7.98	7.84	8.04	7.14	7.79	7.62	7.60	8.26
	01/01/41	01/31/41	Jan 2041	78.99	71.85	71.70	66.65	74.86	67.79	80.77	75.96	79.40	76.96	7.60	8.09	7.70	7.70	8.05	7.90	7.85	6.97	7.97	7.80	7.77	8.10
	02/01/41	02/28/41	Feb 2041	76.43	73.65	71.04	66.64	75.34	69.93	79.34	76.60	77.30	77.48	7.68	8.02	7.66	7.72	8.13	7.98	8.24	7.30	7.99	7.82	7.79	8.47
	03/01/41	03/31/41	Mar 2041	72.34	69.97	64.65	63.32	68.42	65.97	69.27	70.24	68.16	72.83	7.43	7.70	7.30	7.47	7.64	7.51	7.66	7.13	7.74	7.57	7.55	7.89
	04/01/41	04/30/41	Apr 2041	69.39	66.48	62.90	61.02	65.38	62.50	65.09	68.12	62.51	69.46	7.21	7.42	7.04	7.19	7.25	7.12	7.19	6.83	7.44	7.28	7.26	7.37
	05/01/41	05/31/41	May 2041	65.28	59.02	63.09	61.29	61.23	55.09	65.46	64.65	62.49	68.66	7.23	7.43	7.10	7.19	7.23	7.12	7.12	6.80	7.44	7.28	7.26	7.29
	06/01/41	06/30/41	Jun 2041	68.15	60.62	65.57	61.59	64.27	56.69	68.65	66.30	64.14	67.83	7.27	7.45	7.21	7.06	7.21	7.06	6.98	6.44	7.31	7.15	7.13	7.16
	07/01/41	07/31/41	Jul 2041	91.71	74.54	88.33	71.30	87.84	70.49	90.70	75.62	85.62	77.70	7.38	7.57	7.27	7.17	7.34	7.15	7.06	6.46	7.43	7.26	7.24	7.24
	08/01/41	08/31/41	Aug 2041	94.17	78.11	92.01	74.80	90.87	74.53	95.69	82.49	91.36	82.88	7.43	7.79	7.28	7.42	7.49	7.32	7.36	6.91	7.67	7.51	7.49	7.54
	09/01/41	09/30/41	Sep 2041	84.86	74.40	83.11	70.67	82.72	70.74	88.99	79.01	86.83	79.30	7.21	7.57	7.08	7.17	7.28	7.13	7.17	6.72	7.43	7.26	7.24	7.36
	10/01/41	10/31/41	Oct 2041	77.36	68.37	69.92	63.59	73.25	64.34	79.58	74.22	76.50	73.47	7.25	7.66	7.10	7.23	7.53	7.36	7.51	6.80	7.48	7.32	7.30	7.70
	11/01/41	11/30/41	Nov 2041	77.79	69.82	70.06	64.15	73.67	65.78	80.73	75.76	78.19	75.38	7.32	7.77	7.34	7.32	7.79	7.64	7.85	6.91	7.58	7.42	7.40	8.04
	12/01/41	12/31/41	Dec 2041	77.30	72.14	70.23	66.79	73.19	68.07	79.10	77.16	78.65	77.82	7.72	8.13	7.83	7.70	8.17	8.02	8.22	7.30	7.96	7.80	7.77	8.44
	01/01/42	01/31/42	Jan 2042	81.33	73.89	73.65	68.43	77.09	69.73	83.21	78.15	81.66	78.91	7.78	8.28	7.87	7.87	8.24	8.09	8.03	7.13	8.14	7.97	7.95	8.28
	02/01/42	02/28/42	Feb 2042	79.29	75.38	72.42	68.02	77.48	71.27	80.90	78.15	78.62	78.43	7.86	8.20	7.84	7.89	8.32	8.16	8.43	7.47	8.16	7.99	7.97	8.66
	03/01/42	03/31/42	Mar 2042	74.80	71.51	66.13	64.68	70.66	67.37	70.86	71.98	69.49	74.52	7.61	7.87	7.47	7.64	7.82	7.68	7.84	7.30	7.91	7.74	7.72	8.07
	04/01/42	04/30/42	Apr 2042	70.92	68.19	64.55	62.06	66.84	64.11	66.54	69.87	63.87	71.00	7.37	7.59	7.20	7.36	7.41	7.28	7.36	6.99	7.61	7.44	7.43	7.53
	05/01/42	05/31/42	May 2042	67.33	60.38	64.83	62.65	63.19	56.37	66.93	66.00	63.53	69.38	7.39	7.61	7.26	7.36	7.39	7.28	7.28	6.95	7.61	7.44	7.43	7.45
	06/01/42	06/30/42	Jun 2042	71.50	62.78	68.00	63.37	67.37	58.74	71.32	68.54	66.68	69.43	7.43	7.62	7.37	7.22	7.37	7.22	7.14	6.59	7.47	7.31	7.29	7.32
	07/01/42	07/31/42	Jul 2042	93.48	76.43	90.15	72.95	89.60	72.24	92.69	78.16	87.46	79.78	7.55	7.74	7.43	7.34	7.51	7.32	7.22	6.61	7.59	7.43	7.41	7.41
	08/01/42	08/31/42	Aug 2042	96.85	80.67	94.90	77.55	92.46	76.90	98.37	85.22	94.06	85.14	7.61	7.97	7.45	7.59	7.66	7.49	7.53	7.07	7.84	7.68	7.66	7.71
	09/01/42	09/30/42	Sep 2042	87.44	76.23	84.61	71.99	84.58	72.41	91.49	81.43	89.18	81.90	7.37	7.74	7.24	7.34	7.45	7.30	7.34	6.88	7.59	7.43	7.41	7.53
	10/01/42	10/31/42	Oct 2042	79.00	69.88	71.71	64.99	74.79	65.76	81.94	76.17	78.71	74.84	7.41	7.84	7.26	7.39	7.70	7.53	7.68	6.95	7.65	7.48	7.47	7.87
	11/01/42	11/30/42	Nov 2042	79.09	71.79	71.36	65.86	74.88	67.63	82.53	77.65	79.33	77.25	7.49	7.95	7.51	7.49	7.97	7.82	8.03	7.07	7.75	7.58	7.56	8.22
	12/01/42	12/31/42	Dec 2042	79.71	73.76	72.22	68.25	75.50	69.60	81.30	79.43	81.00	79.94	7.89	8.32	8.01	7.87	8.35	8.20	8.41	7.47	8.14	7.97	7.95	8.63
	01/01/43	01/31/43	Jan 2043	83.20	75.59	75.35	70.01	78.87	71.33	85.13	79.95	83.53	80.72	7.96	8.47	8.06	8.06	8.43	8.27	8.21	7.29	8.33	8.15	8.13	8.46
	02/01/43	02/28/43	Feb 2043	81.12	77.12	74.08	69.59	79.26	72.91	82.76	79.95	80.43	80.24	8.04	8.39	8.02	8.08	8.51	8.35	8.63	7.64	8.34	8.17	8.15	8.86
	03/01/43	03/31/43	Mar 2043	76.52	73.15	67.66	66.17	72.28	68.92	72.49	73.63	71.08	76.24	7.78	8.06	7.64	7.82	8.00	7.86	8.02	7.47	8.09	7.92	7.90	8.25
	04/01/43	04/30/43	Apr 2043	72.55	69.75	66.03	63.48	68.37	65.58	68.07	71.47	65.34	72.63	7.54	7.76	7.37	7.52	7.58	7.45	7.52	7.15	7.78	7.61	7.60	7.70
	05/01/43	05/31/43	May 2043	68.88	61.77	66.32	64.09	64.64	57.66	68.47	67.52	64.99	70.97	7.56	7.78	7.43	7.52	7.56	7.45	7.45	7.11	7.78	7.61	7.60	7.62
	06/01/43	06/30/43	Jun 2043	73.15	64.23	69.56	64.83	68.92	60.10	72.96	70.12	68.21	71.03	7.60	7.80	7.54	7.39	7.54	7.39	7.31	6.74	7.64	7.48	7.46	7.48
	07/01/43	07/31/43	Jul 2043	95.63	78.19	92.23	74.62	91.66	73.90	94.82	79.96	89.47	81.61	7.72	7.92	7.60	7.51	7.68	7.49	7.39	6.76	7.76	7.59	7.58	7.57
	08/01/43	08/31/43	Aug 2043	99.08	82.53	97.08	79.33	94.59	78.67	100.63	87.18	96.23	87.09	7.78	8.15	7.62	7.76	7.84	7.66	7.70	7.23	8.02	7.85	7.83	7.89
	09/01/43	09/30/43	Sep 2043	89.45	77.99	86.55	73.65	86.53	74.07	93.60	83.30	91.23	83.78	7.54	7.92	7.41	7.51	7.62	7.47	7.51	7.03	7.76	7.60	7.58	7.69
	10/01/43	10/31/43	Oct 2043	80.82	71.49	73.36	66.49	76.51	67.28	83.82	77.92	80.52	76.57	7.58	8.02	7.43	7.56	7.88	7.70	7.86	7.11	7.82	7.65	7.64	8.05
	11/01/43	11/30/43	Nov 2043	80.91	73.44	73.01	67.37	76.61	69.19	84.43	79.44	81.15	79.03	7.66	8.13	7.68	7.66	8.15	8.00	8.21	7.23	7.92	7.76	7.74	8.41
	12/01/43	12/31/43	Dec 2043	81.55	75.46	73.88	69.82	77.23	71.21	83.17	81.25	82.87	81.78	8.08	8.51	8.19	8.06	8.55	8.39	8.61	7.64	8.32	8.15	8.13	8.82
	01/01/44	01/31/44	Jan 2044	85.11	77.32	77.08	71.62	80.68	72.97	87.08	81.79	85.46	82.58	8.14	8.66	8.24	8.24	8.62	8.46	8.40	7.46	8.51	8.34	8.32	8.65
	02/01/44	02/29/44	Feb 2044	82.98	78.89	75.79	71.19	81.09	74.59	84.66	81.79	82.28	82.08	8.22	8.58	8.20	8.26	8.70	8.54	8.82	7.82	8.53	8.36	8.34	9.06
	03/01/44	03/31/44	Mar 2044	78.28	74.83	69.21	67.69	73.95	70.51	74.16	75.33	72.72	77.99	7.96	8.24	7.82	8.00	8.18	8.04	8.20	7.64	8.27	8.10	8.08	8.43
	04/01/44	04/30/44	Apr 2044	74.22	71.36	67.55	64.94	69.95	67.09	69.63	73.12	66.84	74.30	7.72	7.94	7.54	7.70	7.76	7.62	7.70	7.32	7.95	7.79	7.77	7.87
	05/01/44	05/31/44	May 2044	70.47	63.19	67.84	65.57	66.13	58.99	70.04	69.07	66.48	72.60	7.74	7.96	7.60	7.70	7.74	7.62	7.62	7.28	7.95	7.79	7.77	7.79
	06/01/44	06/30/44	Jun 2044	74.83	65.70	71.16	66.32	70.50	61.48	74.63	71.73	69.78	72.66	7.78	7.98	7.72	7.56	7.72	7.56	7.48	6.89	7.81	7.65	7.63	7.65
	07/01/44	07/31/44	Jul 2044	97.83	79.99	94.35	76.34	93.77	75.60	97.00	81.80	91.53	83.49	7.90	8.10	7.78	7.68	7.86	7.66	7.56	6.91	7.93	7.77	7.75	7.74
	08/01/44	08/31/44	Aug 2044	101.36	84.43	99.31	81.16	96.77	80.48	102.95	89.18	98.44	89.10	7.96	8.34	7.80	7.94	8.02	7.84	7.88	7.40	8.19	8.03	8.01	8.06
	09/01/44	09/30/44	Sep 2044	91.51	79.78	88.55	75.34	88.52	75.77	95.75	85.22	93.33	85.71	7.72	8.10	7.58	7.68	7.80	7.64	7.68	7.20	7.93	7.77	7.75	7.87
	10/01/44	10/31/44	Oct 2044	82.67	73.13	75.05	68.01	78.27	68.82	85.75	79.72	82.37	78.33	7.76	8.20	7.60	7.74	8.06	7.88	8.04	7.28	7.99	7.83	7.81	8.23
	11/01/44	11/30/44	Nov 2044	82.77	75.13	74.68	68.92	78.37	70.78	86.37	81.26	83.02	80.84	7.84	8.32	7.86	7.84	8.34	8.18	8.40	7.40	8.10	7.93	7.91	8.60
	12/01/44	12/31/44	Dec 2044	83.42	77.19	75.58	71.42	79.01	72.84	85.08	83.12	84.77	83.66	8.26	8.70	8.38	8.24	8.74	8.58	8.80	7.82	8.51	8.34	8.32	9.02
	01/01/45	01/31/45	Jan 2045	87.07	79.10	78.85	73.27	82.54	74.65	89.09	83.67	87.42	84.48	8.33	8.86	8.43	8.43	8.82	8.66	8.59	7.63	8.70	8.53	8.51	8.84
	02/01/45	02/28/45	Feb 2045	84.89	80.70	77.53	72.82	82.95	76.30	86.61	83.67	84.17	83.97	8.41	8.78	8.39	8.45	8.90	8.74	9.03	8.00	8.72	8.55	8.53	9.26
	03/01/45	03/31/45	Mar 2045	80.08	76.56	70.80	69.25	75.65	72.13	75.87	77.06	74.39	79.78	8.14	8.43	8.00	8.18	8.37	8.22	8.39	7.81	8.45	8.28	8.26	8.62
	04/01/45	04/30/45	Apr 2045	75.93	73.00	69.11	66.44	71.56	68.64	71.24	74.80	68.38	76.01	7.90	8.12	7.71	7.88	7.94	7.79	7.88	7.48	8.13	7.96	7.95	8.05
	05/01/45	05/31/45	May 2045	72.09	64.64	69.40	67.07	67.65	60.35	71.66	70.66	68.01	74.27	7.92	8.14	7.77	7.88	7.92	7.79	7.79	7.44	8.13	7.96	7.95	7.97
	06/01/45	06/30/45	Jun 2045	76.55	67.21	72.80	67.85	72.12	62.89	76.35	73.38	71.39	74.33	7.96	8.16	7.90	7.73	7.90	7.73	7.65	7.05	7.98	7.82	7.80	7.82
	07/01/45	07/31/45	Jul 2045	100.08	81.83	96.52	78.10	95.92	77.34	99.23	83.68	93.63	85.41	8.08	8.29	7.96	7.85	8.04	7.83	7.73	7.07	8.11	7.94	7.93	7.92
	08/01/45	08/31/45	Aug 2045	103.69	86.37	101.60	83.03	98.99	82.33	105.31	91.23	100.70	91.15	8.14	8.53	7.98	8.12	8.20	8.02	8.06	7.57	8.38	8.21	8.19	8.24
	09/01/45	09/30/45	Sep 2045	93.62	81.62	90.58	77.07	90.56	77.52	97.95	87.18	95.48	87.68	7.90	8.29	7.75	7.85	7.98	7.81	7.85	7.36	8.11	7.94	7.93	8.04
	10/01/45	10/31/45	Oct 2045	84.58	74.82	76.77	69.58	80.07	70.41	87.72	81.55	84.27	80.13	7.94	8.39	7.77	7.92	8.25	8.06	8.22	7.44	8.17	8.01	7.99	8.42
	11/01/45	11/30/45	Nov 2045	84.68	76.86	76.40	70.51	80.17	72.41	88.35	83.13	84.93	82.70	8.02	8.51	8.04	8.02	8.53	8.37	8.59	7.57	8.28	8.11	8.09	8.79
	12/01/45	12/31/45	Dec 2045	85.34	78.97	77.31	73.07	80.82	74.52	87.04	85.03	86.72	85.58	8.45	8.90	8.57	8.43	8.94	8.78	9.01	8.00	8.70	8.53	8.51	9.22
	01/01/46	01/31/46	Jan 2046	89.07	80.92	80.66	74.95	84.43	76.37	91.14	85.60	89.43	86.42	8.52	9.07	8.62	8.62	9.02	8.86	8.79	7.80	8.89	8.72	8.70	9.04
	02/01/46	02/28/46	Feb 2046	86.84	82.56	79.31	74.50	84.86	78.06	88.60	85.59	86.11	85.90	8.60	8.98	8.58	8.65	9.11	8.94	9.23	8.18	8.91	8.74	8.72	9.47
	03/01/46	03/31/46	Mar 2046	81.92	78.32	72.43	70.84	77.39	73.79	77.61	78.83	76.10	81.62	8.33	8.62	8.18	8.37	8.56	8.41	8.58	7.99	8.64	8.47	8.45	8.81
	04/01/46	04/30/46	Apr 2046	77.67	74.68	70.70	67.97	73.20	70.21	72.87	76.52	69.95	77.76	8.08	8.31	7.89	8.06	8.12	7.97	8.06	7.66	8.31	8.14	8.13	8.23
	05/01/46	05/31/46	May 2046	73.74	66.13	71.00	68.62	69.20	61.74	73.30	72.29	69.58	75.98	8.10	8.33	7.95	8.06	8.10	7.97	7.97	7.61	8.31	8.14	8.13	8.14
	06/01/46	06/30/46	Jun 2046	78.31	68.76	74.48	69.41	73.78	64.34	78.11	75.07	73.03	76.04	8.14	8.35	8.08	7.91	8.08	7.91	7.82	7.21	8.16	8.00	7.98	8.00
	07/01/46	07/31/46	Jul 2046	102.38	83.71	98.74	79.89	98.13	79.12	101.51	85.61	95.78	87.37	8.27	8.48	8.14	8.04	8.22	8.01	7.91	7.24	8.29	8.12	8.11	8.09

	08/01/46	08/31/46	Aug 2046	106.08	88.35	103.93	84.94	101.27	84.22	107.74	93.33	103.02	93.24	8.33	8.73	8.16	8.31	8.39	8.20	8.25	7.74	8.56	8.40	8.38	8.43	
	09/01/46	09/30/46	Sep 2046	95.77	83.49	92.67	78.85	92.64	79.30	100.20	89.18	97.67	89.69	8.08	8.48	7.93	8.04	8.16	7.99	8.04	7.53	8.29	8.13	8.11	8.22	
	10/01/46	10/31/46	Oct 2046	86.52	76.54	78.54	71.18	81.91	72.03	89.74	83.42	86.20	81.97	8.12	8.58	7.95	8.10	8.43	8.25	8.41	7.61	8.35	8.19	8.17	8.60	
	11/01/46	11/30/46	Nov 2046	86.62	78.63	78.16	72.13	82.01	74.07	90.39	85.05	86.88	84.61	8.20	8.71	8.22	8.20	8.73	8.56	8.79	7.74	8.46	8.30	8.28	8.99	
	12/01/46	12/31/46	Dec 2046																							

			COBHLH	COBLLH	Palo VerdeHL	Palo VerdeLL	Mid-Columbia	Mid-Columbia	NP 15HLH	NP 15LLH	SP 15HLH	SP 15LLH	Henry Hub Ga	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Cree	Lakeside	Z_CHEBRN*
		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
11/8/2016		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
		Tue, 5/31/2005																						
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN**
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/17	01/31/17	Jan 2017	29.38	24.96	28.62	23.66	27.52	22.40	37.01	30.68	35.10	29.61	2.81	3.00	2.73	2.72	2.73	2.71	2.75	1.90	2.99	2.81	2.79	2.96
02/01/17	02/28/17	Feb 2017	28.82	23.25	28.08	23.43	25.74	20.80	35.96	29.80	34.43	28.75	2.85	3.00	2.74	2.76	2.76	2.74	2.69	1.91	3.03	2.85	2.83	2.90
03/01/17	03/31/17	Mar 2017	23.01	20.14	24.30	21.16	19.80	16.25	32.78	27.33	30.33	26.54	2.85	2.72	2.56	2.58	2.61	2.59	2.23	1.90	2.85	2.67	2.66	2.41
04/01/17	04/30/17	Apr 2017	23.10	16.40	24.19	18.86	19.25	11.99	30.96	24.62	27.01	22.52	2.82	2.63	2.50	2.48	2.52	2.50	2.11	1.85	2.74	2.57	2.55	2.26
05/01/17	05/31/17	May 2017	21.61	12.15	24.54	18.29	18.56	9.45	31.93	23.17	27.72	21.39	2.83	2.62	2.49	2.49	2.52	2.49	1.99	1.85	2.75	2.57	2.56	2.13
06/01/17	06/30/17	Jun 2017	21.84	11.30	27.03	20.41	18.19	7.56	33.76	24.96	29.12	22.84	2.86	2.67	2.55	2.52	2.57	2.54	2.02	1.86	2.78	2.61	2.59	2.16
07/01/17	07/31/17	Jul 2017	34.68	21.70	36.21	25.76	30.59	19.47	39.75	29.59	39.02	29.34	2.90	2.87	2.70	2.63	2.68	2.66	2.30	1.89	2.89	2.71	2.70	2.45
08/01/17	08/31/17	Aug 2017	37.18	27.78	35.86	25.76	33.32	22.98	40.94	32.03	39.40	31.16	2.91	2.90	2.71	2.64	2.70	2.68	2.36	1.88	2.90	2.73	2.71	2.53
09/01/17	09/30/17	Sep 2017	35.39	27.08	31.14	23.23	30.69	24.15	38.56	29.89	36.34	30.25	2.90	2.82	2.65	2.62	2.70	2.68	2.37	1.92	2.88	2.71	2.69	2.53
10/01/17	10/31/17	Oct 2017	31.39	25.92	27.69	24.01	27.35	22.50	38.36	30.64	34.91	29.69	2.92	2.75	2.60	2.67	2.71	2.68	2.44	1.98	2.93	2.76	2.74	2.61
11/01/17	11/30/17	Nov 2017	33.41	26.46	27.40	23.28	29.75	24.55	38.36	31.61	36.75	30.31	2.97	3.01	2.79	2.83	2.88	2.86	2.85	2.12	3.10	2.92	2.90	3.06
12/01/17	12/31/17	Dec 2017	36.45	28.62	29.66	26.22	33.55	26.50	39.53	34.51	38.59	33.65	3.13	3.32	3.06	3.06	3.04	3.02	3.20	2.26	3.33	3.15	3.13	3.43
01/01/18	01/31/18	Jan 2018	34.43	29.16	29.37	24.41	32.22	25.30	39.46	31.53	35.75	30.11	3.22	3.36	3.12	3.14	3.11	3.08	3.07	2.33	3.41	3.24	3.21	3.30
02/01/18	02/28/18	Feb 2018	32.12	27.60	28.83	24.18	30.24	23.70	39.46	31.25	35.43	30.10	3.20	3.32	3.09	3.11	3.09	3.07	2.98	2.32	3.38	3.21	3.18	3.21
03/01/18	03/31/18	Mar 2018	29.16	25.39	26.55	21.91	24.95	21.05	38.33	29.63	34.68	29.04	3.14	3.09	3.00	2.97	3.03	3.00	2.92	2.26	3.23	3.07	3.05	3.14
04/01/18	04/30/18	Apr 2018	23.95	17.50	22.39	18.56	20.15	13.24	30.76	25.37	27.16	25.12	2.76	2.53	2.42	2.49	2.43	2.41	1.98	1.94	2.74	2.58	2.56	2.12
05/01/18	05/31/18	May 2018	21.86	12.35	25.04	18.19	19.56	10.15	29.58	23.02	27.32	21.99	2.74	2.51	2.42	2.41	2.42	2.40	1.97	1.92	2.65	2.49	2.48	2.11
06/01/18	06/30/18	Jun 2018	23.54	13.50	27.53	20.66	20.19	9.76	32.91	25.06	29.12	24.59	2.76	2.55	2.44	2.43	2.44	2.42	1.96	1.92	2.67	2.51	2.50	2.10
07/01/18	07/31/18	Jul 2018	35.18	22.30	36.16	23.81	32.04	19.77	41.00	29.64	37.97	29.34	2.79	2.79	2.53	2.47	2.52	2.50	2.17	1.91	2.72	2.56	2.54	2.32
08/01/18	08/31/18	Aug 2018	37.68	28.58	35.81	23.86	36.02	24.73	42.39	31.53	38.65	31.16	2.79	2.80	2.57	2.47	2.54	2.51	2.17	1.91	2.72	2.56	2.54	2.32
09/01/18	09/30/18	Sep 2018	35.89	28.13	34.39	23.73	34.39	27.00	40.31	30.39	35.59	30.25	2.78	2.59	2.51	2.46	2.52	2.50	2.20	1.94	2.71	2.55	2.53	2.36
10/01/18	10/31/18	Oct 2018	31.89	27.47	28.69	24.16	28.45	24.49	39.86	31.79	35.16	30.44	2.80	2.53	2.49	2.49	2.54	2.52	2.23	1.97	2.74	2.57	2.56	2.38
11/01/18	11/30/18	Nov 2018	33.91	28.01	28.40	23.43	31.20	27.99	39.86	32.76	37.00	31.06	2.86	2.91	2.80	2.74	2.77	2.75	2.85	2.12	2.99	2.83	2.81	3.06
12/01/18	12/31/18	Dec 2018	36.95	30.17	30.66	26.37	34.55	28.49	41.03	35.66	38.84	34.50	3.00	3.19	2.95	2.92	2.92	2.89	3.23	2.21	3.18	3.02	3.00	3.47
01/01/19	01/31/19	Jan 2019	35.18	31.31	31.47	27.51	33.22	28.00	42.26	34.68	36.95	34.21	3.10	3.20	3.00	3.01	3.01	2.98	3.01	2.29	3.27	3.10	3.08	3.24
02/01/19	02/28/19	Feb 2019	34.62	30.20	30.93	27.28	31.24	26.40	41.21	33.80	36.28	33.35	3.08	3.15	2.99	2.99	2.98	2.96	2.81	2.27	3.25	3.08	3.06	3.02
03/01/19	03/31/19	Mar 2019	32.36	29.09	27.15	25.01	24.80	22.40	38.03	32.03	33.58	32.49	3.02	3.11	2.93	2.93	2.93	2.91	2.76	2.23	3.19	3.03	3.01	2.97
04/01/19	04/30/19	Apr 2019	29.45	22.55	25.84	17.31	23.60	16.14	30.21	28.02	27.16	25.32	2.73	2.55	2.47	2.46	2.38	2.36	2.06	2.01	2.71	2.55	2.53	2.21
05/01/19	05/31/19	May 2019	26.26	16.95	25.84	16.54	22.66	14.40	31.18	23.57	27.72	20.49	2.72	2.56	2.45	2.38	2.37	2.35	2.01	1.95	2.63	2.47	2.45	2.15
06/01/19	06/30/19	Jun 2019	26.49	17.65	28.13	18.66	22.29	12.66	33.11	24.31	29.12	20.49	2.76	2.60	2.49	2.42	2.41	2.39	2.02	1.96	2.67	2.50	2.49	2.16
07/01/19	07/31/19	Jul 2019	36.33	20.60	36.71	27.66	35.44	19.67	41.60	31.19	38.27	30.19	2.79	2.84	2.53	2.48	2.51	2.48	2.19	1.96	2.72	2.56	2.55	2.34
08/01/19	08/31/19	Aug 2019	38.83	28.43	36.36	27.16	38.32	22.63	42.79	33.63	38.65	32.01	2.81	2.86	2.57	2.49	2.53	2.51	2.22	1.98	2.74	2.58	2.56	2.37
09/01/19	09/30/19	Sep 2019	37.04	28.68	34.94	24.63	35.44	24.90	40.41	31.49	35.59	31.10	2.81	2.68	2.55	2.49	2.53	2.51	2.26	2.02	2.74	2.57	2.56	2.42
10/01/19	10/31/19	Oct 2019	33.09	29.92	30.04	26.91	29.45	26.40	41.06	34.29	35.16	32.24	2.84	2.61	2.57	2.52	2.56	2.54	2.28	2.04	2.77	2.61	2.59	2.43
11/01/19	11/30/19	Nov 2019	35.11	30.46	29.75	26.18	32.20	29.90	41.06	35.26	37.00	32.86	2.90	2.97	2.79	2.76	2.83	2.80	2.87	2.15	3.02	2.86	2.84	3.09
12/01/19	12/31/19	Dec 2019	38.15	32.62	32.01	29.12	35.55	30.40	42.23	38.16	38.84	36.30	3.04	3.16	2.97	2.96	2.98	2.95	3.26	2.27	3.22	3.05	3.03	3.49
01/01/20	01/31/20	Jan 2020	36.28	35.16	32.52	28.41	34.22	31.25	42.81	34.63	37.55	35.91	3.14	3.23	3.11	3.06	3.06	3.03	3.24	2.32	3.33	3.16	3.13	3.48
02/01/20	02/29/20	Feb 2020	35.72	34.05	31.98	28.18	32.24	29.65	41.76	33.75	36.88	35.05	3.10	3.18	3.07	3.02	3.03	3.00	2.99	2.30	3.29	3.12	3.10	3.21
03/01/20	03/31/20	Mar 2020	33.46	32.94	28.20	25.91	25.80	25.65	38.58	31.98	34.18	34.19	3.04	3.15	3.01	2.95	2.96	2.93	2.94	2.26	3.22	3.05	3.03	3.16
04/01/20	04/30/20	Apr 2020	30.75	22.75	26.84	18.71	24.60	16.29	31.16	28.32	27.91	27.17	2.74	2.54	2.48	2.47	2.46	2.43	2.11	2.02	2.72	2.56	2.54	2.28
05/01/20	05/31/20	May 2020	27.56	17.15	26.84	17.94	23.66	14.55	32.13	23.87	28.47	22.34	2.73	2.63	2.46	2.40	2.44	2.42	2.05	1.95	2.64	2.48	2.47	2.22
06/01/20	06/30/20	Jun 2020	27.79	17.85	29.13	20.06	23.29	12.81	34.06	24.61	29.87	22.34	2.76	2.67	2.50	2.43	2.48	2.46	2.07	1.97	2.68	2.51	2.50	2.24
07/01/20	07/31/20	Jul 2020	37.43	21.95	39.05	28.01	36.49	22.47	42.85	32.29	39.02	31.09	2.80	2.86	2.54	2.49	2.57	2.54	2.26	1.97	2.74	2.57	2.56	2.43
08/01/20	08/31/20	Aug 2020	39.93	29.78	38.70	27.51	39.37	25.43	44.04	34.73	39.40	32.91	2.83	2.88	2.60	2.52	2.61	2.59	2.26	1.97	2.77	2.60	2.59	2.44
09/01/20	09/30/20	Sep 2020	38.14	30.03	37.28	24.98	36.49	27.70	41.66	32.59	36.34	32.00	2.83	2.70	2.59	2.52	2.63	2.60	2.35	2.07	2.77	2.61	2.59	2.53
10/01/20	10/31/20	Oct 2020	34.09	31.67	31.14	27.66	30.45	27.75	42.36	34.84	35.91	34.69	2.87	2.65	2.60	2.56	2.65	2.63	2.35	2.07	2.81	2.64	2.63	2.54
11/01/20	11/30/20	Nov 2020	36.11	32.21	30.85	26.93	33.20	31.25	42.36	35.81	37.75	35.31	2.94	3.02	2.86	2.83	2.89	2.87	2.97	2.14	3.08	2.92	2.90	3.19
12/01/20	12/31/20	Dec 2020	39.15	34.37	33.11	29.87	36.55	31.75	43.53	38.71	39.59	38.75	3.09	3.21	3.04	3.04	3.05	3.03	3.39	2.27	3.30	3.13	3.11	3.64
01/01/21	01/31/21	Jan 2021	36.33	34.16	32.97	30.56	35.47	29.30	44.31	34.83	39.05	36.11	3.23	3.37	3.19	3.18	3.16	3.13	3.37	2.44	3.44	3.27	3.25	3.61
02/01/21	02/28/21	Feb 2021	35.77	33.05	32.43	30.33	33.49	27.70	43.26	33.95	38.38	35.25	3.19	3.32	3.15	3.14	3.13	3.10	3.15	2.43	3.41	3.24	3.21	3.38
03/01/21	03/31/21	Mar 2021	33.51	31.94	28.65	28.06	27.05	23.70	40.08	32.18	35.68	34.39	3.13	3.25	3.09	3.07	3.06	3.04	3.11	2.39	3.34	3.17	3.15	3.34
04/01/21	04/30/21	Apr 2021	31.40	24.55	27.94	20.06	25.20	16.69	32.56	28.62	29.11	27.62	2.83	2.76	2.71	2.61	2.55	2.52	2.43	2.09	2.87	2.70	2.68	2.62
05/01/21	05/31/21	May 2021	28.21	18.95	27.94	19.29	24.26	14.95	33.53	24.17	29.67	22.79	2.82	2.79	2.69	2.54	2.53	2.51	2.38	2.03	2.79	2.63	2.61	2.57
06/01/21	06/30/21	Jun 2021	28.44	19.65	30.23	21.41	23.89	13.21	35.46	24.91	31.07	22.79	2.85	2.83	2.73	2.57	2.57	2.55	2.39	2.04	2.82	2.66	2.64	2.57
07/01/21	07/31/21	Jul 2021	38.43	27.05	39.46	29.26	37.24	25.02	44.65	33.04	40.22	32.09	2.89	3.08	2.77	2.63	2.65	2.63	2.59	2.06	2.89	2.72	2.70	2.79
08/01/21	08/31/21	Aug 2021	40.93	34.88	39.11	28.76	40.12	27.98	45.84	35.48	40.60	33.91	2.92	3.11	2.84	2.66	2.71	2.68	2.59	2.06	2.92	2.75	2.73	2.78
09/01/21	09/30/21	Sep 2021	39.14	35.13	37.69	26.23	37.24	30.25	43.46	33.34	37.54	33.00	2.92	2.93	2.83	2.67	2.72	2.69	2.64	2.12	2.92	2.76	2.74	2.85
10/01/21	10/31/21	Oct 2021	35.14	30.22	31.54	27.81	31.70	28.75	41.91	35.09	37.11	33.19	2.96	2.86	2.83	2.70	2.74	2.72	2.81	2.15	2.96	2.79	2.78	3.02
11/01/21	11/30/21	Nov 2021	37.16	30.76	31.25	27.08	34.45	32.25	41.91	36.06	38.95	33.81	3.04	3.16	3.03	2.96	2.99	2.96	3.12	2.26	3.22	3.06	3.04	3.35
12/01/21	12/31/21	Dec 2021	40.20	32.92	33.51	30.02	37.80	32.75	43.08	38.96	40.79	37.25	3.20	3.35	3.22	3.17	3.16	3.13	3.52	2.40	3.44	3.27	3.25	3.77
01/01/22	01/31/22	Jan 2022	34.38	27.36	33.47	28.71	36.72	28.90	41.26	35.13	38.25	33.86	3.34	3.56	3.36	3.32	3.28	3.25	3.46	2.56	3.59	3.42	3.40	3.71
02/01/22	02/28/22	Feb 2022	33.82	26.25	32.93	28.48	34.74	27.30	40.21	34.25	37.58	33.00	3.31	3.50	3.32	3.28	3.25	3.22	3.27	2.54	3.55	3.38	3.35	3.51
03/01/22	03/31/22	Mar 2022	31.56	25.14	29.15	26.21	28.30	23.30	37.03	32.48	34.88	32.14	3.24	3.43	3.26	3.21	3.18	3.15	3.23	2.50	3.48	3.31	3.29	3.46
04/01/22	04/30/22	Apr 2022	29.55	21.75	29.34	23.61	26.00	17.49	34.46	31.42	30.31	29.97	2.94	2.91	2.83	2.76	2.66	2.64	2.45	2.20	3.02	2.85	2.83	2.64

05/01/22	05/31/22	May 2022	26.36	16.15	29.34	22.84	25.06	15.75	35.43	26.97	30.87	25.14	2.94	2.92	2.82	2.68	2.65	2.62	2.41	2.15	2.94	2.77	2.76	2.60	
06/01/22	06/30/22	Jun 2022	26.59	16.85	31.63	24.96	24.69	14.01	37.36	27.71	32.27	25.14	2.97	2.96	2.86	2.72	2.69	2.66	2.42	2.15	2.97	2.81	2.79	2.61	
07/01/22	07/31/22	Jul 2022	39.68	23.95	41.56	31.06	39.54	26.02	44.75	34.04	41.42	33.09	3.01	3.21	2.90	2.78	2.77	2.75	2.62	2.18	3.03	2.87	2.85	2.82	
08/01/22	08/31/22	Aug 2022	42.18	31.78	41.21	30.56	42.42	28.98	45.94	36.48	41.80	34.91	3.04	3.24	2.97	2.81	2.83	2.80	2.62	2.18	3.07	2.90	2.89	2.82	
09/01/22	09/30/22	Sep 2022	40.39	32.03	39.79	28.03	39.54	31.25	43.56	34.34	38.74	34.00	3.05	3.06	2.96	2.82	2.84	2.81	2.69	2.25	3.08	2.91	2.89	2.89	
10/01/22	10/31/22	Oct 2022	36.39	29.92	32.79	28.81	32.95	29.75	43.11	36.09	38.31	34.19	3.09	3.00	2.97	2.86	2.87	2.84	2.72	2.28	3.11	2.95	2.93	2.92	
11/01/22	11/30/22	Nov 2022	38.41	30.46	32.50	28.08	35.70	33.25	43.11	37.06	40.15	34.81	3.17	3.32	3.17	3.12	3.12	3.09	3.34	2.42	3.38	3.21	3.19	3.58	
12/01/22	12/31/22	Dec 2022	40.82	35.53	37.23	33.55	40.63	35.00	44.75	41.06	43.40	40.15	3.71	3.86	3.67	3.65	3.67	3.60	3.77	3.01	3.92	3.75	3.73	4.04	
01/01/23	01/31/23	Jan 2023	42.09	34.72	38.56	33.88	42.02	34.30	45.45	40.22	43.65	39.50	3.91	4.10	3.89	3.84	3.87	3.82	3.85	3.21	4.12	3.95	3.92	4.12	
02/01/23	02/28/23	Feb 2023	39.45	33.69	38.00	33.91	39.40	33.45	44.34	39.82	42.58	39.05	3.89	4.06	3.85	3.81	3.84	3.76	3.74	3.20	4.09	3.92	3.89	4.00	
03/01/23	03/31/23	Mar 2023	35.94	31.58	33.39	30.92	33.20	29.42	40.11	37.06	38.45	36.59	3.72	3.86	3.66	3.62	3.64	3.58	3.58	3.03	3.89	3.72	3.69	3.84	
04/01/23	04/30/23	Apr 2023	32.88	26.45	31.23	27.14	29.91	23.30	34.97	31.83	31.68	29.20	3.43	3.46	3.29	3.25	3.24	3.20	3.04	2.62	3.51	3.35	3.33	3.23	
05/01/23	05/31/23	May 2023	30.09	21.66	31.69	26.73	28.14	20.19	36.50	29.36	32.75	26.39	3.44	3.47	3.29	3.20	3.23	3.18	2.95	2.61	3.46	3.29	3.27	3.15	
06/01/23	06/30/23	Jun 2023	32.19	23.46	35.83	29.18	30.02	20.79	39.42	31.20	35.93	28.23	3.47	3.50	3.34	3.22	3.25	3.20	2.96	2.62	3.48	3.31	3.29	3.16	
07/01/23	07/31/23	Jul 2023	42.77	31.81	44.04	35.46	42.02	31.77	45.32	37.92	43.67	37.53	3.51	3.63	3.37	3.26	3.30	3.25	3.07	2.68	3.52	3.35	3.33	3.27	
08/01/23	08/31/23	Aug 2023	43.78	35.32	44.09	35.38	44.61	33.96	47.12	39.70	45.08	38.93	3.54	3.69	3.42	3.34	3.38	3.32	3.16	2.70	3.60	3.44	3.41	3.36	
09/01/23	09/30/23	Sep 2023	42.83	35.33	42.86	33.99	43.58	35.62	46.92	39.25	44.28	38.99	3.55	3.63	3.44	3.37	3.41	3.35	3.25	2.83	3.63	3.46	3.44	3.46	
10/01/23	10/31/23	Oct 2023	39.21	33.76	37.64	33.40	38.88	34.11	45.36	39.92	42.84	39.00	3.67	3.69	3.54	3.49	3.53	3.48	3.36	2.93	3.76	3.59	3.57	3.57	
11/01/23	11/30/23	Nov 2023	42.01	35.73	38.52	34.01	41.07	36.76	47.24	41.96	45.30	40.78	3.86	4.01	3.78	3.79	3.81	3.77	3.82	3.24	4.06	3.89	3.87	4.04	
12/01/23	12/31/23	Dec 2023	41.45	38.14	40.96	37.09	43.46	37.25	46.42	43.16	46.01	43.06	4.23	4.36	4.13	4.13	4.19	4.08	4.02	3.62	4.40	4.23	4.21	4.29	
01/01/24	01/31/24	Jan 2024	49.81	42.08	43.65	39.06	47.33	39.70	49.63	45.30	49.06	45.14	4.47	4.65	4.43	4.37	4.46	4.38	4.24	3.85	4.65	4.47	4.45	4.51	
02/01/24	02/29/24	Feb 2024	45.08	41.13	43.08	39.35	44.06	39.60	48.48	45.40	47.59	45.10	4.48	4.62	4.37	4.34	4.43	4.29	4.22	3.87	4.62	4.45	4.42	4.47	
03/01/24	03/31/24	Mar 2024	40.33	38.03	37.64	35.64	38.11	35.54	43.18	41.64	42.03	41.04	4.19	4.28	4.06	4.02	4.09	4.02	3.94	3.55	4.29	4.12	4.10	4.19	
04/01/24	04/30/24	Apr 2024	36.22	31.15	33.12	30.68	33.83	29.10	35.47	32.24	33.05	28.42	3.92	4.01	3.74	3.74	3.82	3.75	3.62	3.05	4.01	3.84	3.82	3.81	
05/01/24	05/31/24	May 2024	33.81	27.16	34.04	30.63	31.22	24.63	37.58	31.75	34.63	27.64	3.94	4.02	3.77	3.72	3.80	3.74	3.49	3.08	3.98	3.81	3.79	3.69	
06/01/24	06/30/24	Jun 2024	37.78	30.08	40.02	33.40	35.35	27.57	41.47	34.70	39.59	31.32	3.98	4.04	3.83	3.72	3.80	3.73	3.50	3.09	3.98	3.81	3.79	3.70	
07/01/24	07/31/24	Jul 2024	45.87	39.68	46.51	39.85	44.51	37.52	45.89	41.81	45.92	41.98	4.01	4.06	3.84	3.74	3.83	3.74	3.52	3.19	4.01	3.84	3.82	3.72	
08/01/24	08/31/24	Aug 2024	45.38	38.87	46.98	40.20	46.79	38.94	48.30	42.93	48.37	42.96	4.03	4.14	3.87	3.87	3.93	3.84	3.69	3.23	4.13	3.96	3.94	3.90	
09/01/24	09/30/24	Sep 2024	45.26	38.63	45.93	39.95	47.61	39.98	50.28	44.16	49.82	43.97	4.06	4.19	3.92	3.92	3.98	3.89	3.80	3.42	4.18	4.01	3.99	4.02	
10/01/24	10/31/24	Oct 2024	42.03	37.61	42.50	37.99	44.82	38.46	47.61	43.76	47.36	43.81	4.26	4.39	4.11	4.13	4.18	4.12	3.99	3.59	4.40	4.23	4.21	4.21	
11/01/24	11/30/24	Nov 2024	45.62	41.00	44.53	39.94	46.44	40.27	51.37	46.87	50.45	46.74	4.55	4.71	4.38	4.47	4.51	4.45	4.29	4.07	4.74	4.57	4.55	4.51	
12/01/24	12/31/24	Dec 2024	45.25	40.84	44.10	39.68	47.32	40.12	49.81	46.07	49.34	45.88	4.57	4.67	4.48	4.42	4.48	4.42	4.19	4.01	4.69	4.52	4.50	4.46	
01/01/25	01/31/25	Jan 2025	51.96	44.43	46.51	41.40	50.17	42.05	52.23	47.74	51.22	47.45	4.66	4.80	4.62	4.57	4.62	4.53	4.41	4.09	4.85	4.67	4.65	4.68	
02/01/25	02/28/25	Feb 2025	47.53	43.27	45.54	41.54	46.63	41.61	51.47	47.86	49.69	47.19	4.70	4.83	4.59	4.58	4.63	4.56	4.47	4.11	4.86	4.69	4.66	4.72	
03/01/25	03/31/25	Mar 2025	43.56	41.29	41.01	39.16	41.39	38.88	46.95	44.94	45.47	44.95	4.54	4.62	4.44	4.36	4.44	4.38	4.30	3.90	4.64	4.47	4.44	4.55	
04/01/25	04/30/25	Apr 2025	41.41	36.49	38.41	35.26	39.04	34.24	40.11	37.82	38.33	33.74	4.39	4.49	4.22	4.22	4.29	4.23	4.08	3.46	4.49	4.32	4.30	4.28	
05/01/25	05/31/25	May 2025	37.11	31.07	36.52	33.52	34.47	28.48	40.65	35.68	37.54	31.28	4.21	4.27	4.04	3.98	4.06	4.00	3.75	3.49	4.24	4.07	4.05	3.94	
06/01/25	06/30/25	Jun 2025	41.57	33.46	43.41	36.26	39.20	30.82	45.48	38.14	43.24	34.58	4.23	4.29	4.09	3.97	4.04	3.99	3.70	3.46	4.23	4.06	4.04	3.89	
07/01/25	07/31/25	Jul 2025	48.52	42.40	50.10	43.49	48.59	41.54	50.00	45.44	50.03	46.04	4.27	4.32	4.13	4.00	4.09	4.00	3.76	3.55	4.27	4.10	4.08	3.97	
08/01/25	08/31/25	Aug 2025	49.44	41.31	51.58	44.03	51.02	43.69	53.50	46.77	53.71	48.06	4.31	4.43	4.13	4.08	4.17	4.09	3.91	3.53	4.35	4.18	4.16	4.12	
09/01/25	09/30/25	Sep 2025	49.68	41.96	49.50	43.21	50.91	43.63	56.07	48.39	53.58	48.12	4.20	4.36	4.06	4.00	4.08	3.99	3.88	3.55	4.27	4.10	4.08	4.09	
10/01/25	10/31/25	Oct 2025	44.87	38.95	44.26	39.90	46.74	40.33	51.13	45.19	49.46	46.14	4.22	4.43	4.07	4.04	4.12	4.03	3.90	3.55	4.31	4.14	4.12	4.12	
11/01/25	11/30/25	Nov 2025	45.32	39.70	45.42	40.24	46.82	40.63	51.59	46.02	50.43	46.50	4.27	4.45	4.12	4.16	4.22	4.16	3.94	3.79	4.43	4.26	4.23	4.16	
12/01/25	12/31/25	Dec 2025	46.87	42.06	46.54	41.22	49.24	41.41	52.44	47.76	51.61	47.53	4.53	4.67	4.45	4.39	4.45	4.39	4.16	3.90	4.66	4.49	4.47	4.43	
01/01/26	01/31/26	Jan 2026	51.16	45.04	47.62	42.32	50.84	43.00	55.53	49.96	52.98	48.96	4.75	4.89	4.72	4.62	4.68	4.60	4.38	4.07	4.89	4.72	4.70	4.65	
02/01/26	02/28/26	Feb 2026	47.97	44.00	47.08	42.72	48.42	43.20	54.08	49.71	51.64	49.09	4.79	4.93	4.72	4.66	4.73	4.66	4.43	4.08	4.93	4.76	4.73	4.69	
03/01/26	03/31/26	Mar 2026	44.34	42.29	42.06	39.97	42.56	39.91	48.26	45.88	46.77	46.30	4.63	4.71	4.50	4.45	4.52	4.46	4.31	3.80	4.72	4.55	4.52	4.57	
04/01/26	04/30/26	Apr 2026	41.31	36.33	38.76	35.99	39.10	33.98	40.67	38.31	38.90	34.30	4.46	4.54	4.28	4.25	4.33	4.26	4.12	3.53	4.51	4.34	4.32	4.32	
05/01/26	05/31/26	May 2026	37.39	31.44	37.77	34.76	34.58	28.67	41.78	36.58	38.68	32.19	4.33	4.38	4.16	4.05	4.14	4.08	3.82	3.58	4.31	4.15	4.13	4.01	
06/01/26	06/30/26	Jun 2026	44.19	35.40	45.28	37.76	41.47	32.59	48.83	40.72	45.69	37.04	4.35	4.39	4.22	4.07	4.14	4.08	3.76	3.57	4.33	4.16	4.14	3.96	
07/01/26	07/31/26	Jul 2026	49.78	45.76	51.69	45.16	49.94	44.04	52.83	46.95	52.34	48.85	4.39	4.45	4.25	4.09	4.20	4.11	3.86	3.66	4.36	4.19	4.17	4.06	
08/01/26	08/31/26	Aug 2026	49.60	42.47	52.19	44.95	51.93	44.69	55.12	47.87	54.89	49.70	4.42	4.58	4.28	4.20	4.28	4.21	4.03	3.72	4.46	4.29	4.27	4.23	
09/01/26	09/30/26	Sep 2026	49.90	42.35	49.68	43.60	51.17	43.78	56.55	48.83	54.00	48.41	4.31	4.51	4.16	4.11	4.20	4.12	3.93	3.67	4.37	4.20	4.18	4.15	
10/01/26	10/31/26	Oct 2026	44.97	39.52	44.75	40.62	47.49	41.09	51.28	45.87	49.37	46.79	4.34	4.55	4.17	4.16	4.22	4.16	3.96	3.66	4.42	4.25	4.23	4.18	
11/01/26	11/30/26	Nov 2026	45.83	40.96	45.41	40.76	48.29	41.49	52.67	47.20	51.34	47.66	4.41	4.66	4.24	4.28	4.35	4.28	4.07	3.96	4.55	4.38	4.35	4.29	
12/01/26	12/31/26	Dec 2026	46.24	42.92	46.08	41.50	48.95	41.62	52.60	48.66	51.52	48.17	4.67	4.80	4.60	4.51	4.59	4.51	4.29	3.90	4.79	4.61	4.59	4.56	

			COBHLH	COBLLH	Palo VerdeHL	Palo VerdeLL	Mid-Columbia	Mid-Columbia	NP 15HLH	NP 15LLH	SP 15HLH	SP 15LLH	Henry Hub Ga	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Cree	Lakeside	Z_CHEBRN*
		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
10/31/2016		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
		Tue, 5/31/2005																						
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN**
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/17	01/31/17	Jan 2017	32.01	27.13	30.74	26.48	29.69	26.04	39.38	33.54	37.70	32.45	3.20	3.41	3.15	3.15	3.15	3.12	3.17	2.21	3.43	3.25	3.23	3.40
02/01/17	02/28/17	Feb 2017	30.86	25.50	29.58	25.00	27.55	23.83	38.25	32.57	36.98	31.50	3.22	3.40	3.14	3.15	3.15	3.13	3.07	2.23	3.43	3.25	3.23	3.30
03/01/17	03/31/17	Mar 2017	26.64	22.23	26.68	22.77	22.61	18.58	34.73	29.44	32.28	29.21	3.20	3.05	2.91	2.91	2.94	2.92	2.60	2.20	3.19	3.01	2.99	2.80
04/01/17	04/30/17	Apr 2017	24.27	16.39	25.80	20.34	19.70	11.70	32.16	25.53	28.12	24.32	3.07	2.88	2.76	2.73	2.79	2.77	2.38	2.09	3.00	2.82	2.81	2.55
05/01/17	05/31/17	May 2017	22.93	12.29	25.95	19.71	18.72	10.00	33.17	23.97	29.01	23.02	3.06	2.85	2.70	2.72	2.77	2.75	2.20	2.07	2.98	2.81	2.79	2.35
06/01/17	06/30/17	Jun 2017	22.61	11.53	28.36	22.00	18.92	7.90	34.43	25.57	30.68	24.12	3.10	2.89	2.74	2.75	2.82	2.79	2.22	2.08	3.01	2.84	2.82	2.37
07/01/17	07/31/17	Jul 2017	34.68	23.00	36.72	26.78	31.04	20.02	40.00	30.31	39.78	30.07	3.13	3.10	2.92	2.84	2.90	2.87	2.50	2.09	3.11	2.94	2.92	2.67
08/01/17	08/31/17	Aug 2017	37.18	27.78	36.36	26.27	33.92	23.13	41.20	32.81	40.17	31.93	3.13	3.12	2.94	2.85	2.91	2.88	2.59	2.10	3.12	2.94	2.92	2.76
09/01/17	09/30/17	Sep 2017	35.39	28.03	32.02	23.69	31.04	24.85	38.80	30.63	37.05	31.00	3.11	3.04	2.87	2.82	2.91	2.88	2.60	2.14	3.09	2.91	2.90	2.77
10/01/17	10/31/17	Oct 2017	31.16	26.40	28.67	24.99	27.23	22.95	38.61	31.35	35.39	30.40	3.13	2.97	2.80	2.87	2.91	2.88	2.68	2.20	3.14	2.97	2.95	2.86
11/01/17	11/30/17	Nov 2017	33.17	26.95	28.37	24.23	29.95	25.52	38.61	32.34	37.25	31.04	3.17	3.21	2.99	3.03	3.09	3.06	3.07	2.32	3.30	3.12	3.10	3.30
12/01/17	12/31/17	Dec 2017	36.18	30.05	30.71	27.29	33.28	27.03	39.78	35.31	39.11	34.41	3.32	3.57	3.25	3.25	3.24	3.22	3.41	2.45	3.53	3.35	3.33	3.66
01/01/18	01/31/18	Jan 2018	35.81	31.30	29.24	25.73	31.74	26.34	38.13	32.29	35.20	30.95	3.41	3.55	3.31	3.33	3.31	3.28	3.32	2.55	3.60	3.43	3.41	3.56
02/01/18	02/28/18	Feb 2018	33.36	29.60	28.28	25.60	29.30	24.68	37.65	31.82	34.78	30.90	3.38	3.49	3.27	3.29	3.28	3.25	3.20	2.52	3.56	3.39	3.36	3.44
03/01/18	03/31/18	Mar 2018	30.39	27.48	28.13	23.77	26.11	21.98	36.43	30.09	33.83	29.76	3.31	3.26	3.17	3.14	3.20	3.18	3.14	2.46	3.41	3.24	3.22	3.37
04/01/18	04/30/18	Apr 2018	24.32	19.74	23.25	20.04	19.20	14.85	29.11	26.28	26.62	26.02	2.88	2.66	2.56	2.62	2.58	2.56	2.12	2.10	2.87	2.70	2.69	2.27
05/01/18	05/31/18	May 2018	22.58	14.74	24.95	19.21	18.22	10.85	28.02	23.20	26.81	22.52	2.85	2.63	2.54	2.51	2.55	2.53	2.07	2.04	2.76	2.60	2.58	2.21
06/01/18	06/30/18	Jun 2018	22.81	14.53	27.36	21.50	19.07	10.05	29.93	24.77	28.68	24.02	2.87	2.66	2.56	2.53	2.57	2.55	2.06	2.04	2.78	2.62	2.60	2.20
07/01/18	07/31/18	Jul 2018	34.73	20.80	35.97	25.23	30.79	18.47	38.55	29.31	36.63	28.82	2.89	2.91	2.64	2.57	2.65	2.62	2.27	2.02	2.82	2.66	2.64	2.42
08/01/18	08/31/18	Aug 2018	37.68	27.78	35.61	25.32	33.92	22.83	39.90	31.66	37.77	30.68	2.89	2.91	2.68	2.57	2.66	2.64	2.26	2.02	2.82	2.66	2.64	2.41
09/01/18	09/30/18	Sep 2018	35.89	28.03	34.17	22.94	30.79	25.00	37.80	29.63	35.80	29.75	2.88	2.71	2.63	2.56	2.65	2.63	2.30	2.05	2.81	2.65	2.63	2.46
10/01/18	10/31/18	Oct 2018	31.66	26.15	27.42	23.84	27.23	21.70	37.61	29.85	33.39	28.90	2.91	2.65	2.61	2.59	2.68	2.65	2.32	2.08	2.85	2.68	2.67	2.48
11/01/18	11/30/18	Nov 2018	33.67	26.70	27.12	23.08	29.95	25.27	37.61	30.84	35.25	29.54	2.96	3.03	2.90	2.84	2.88	2.85	2.95	2.23	3.10	2.93	2.91	3.17
12/01/18	12/31/18	Dec 2018	36.68	28.90	29.46	26.14	33.28	25.78	38.78	33.81	37.11	33.06	3.10	3.30	3.05	3.02	3.03	3.00	3.35	2.33	3.29	3.12	3.10	3.59
01/01/19	01/31/19	Jan 2019	32.96	32.33	31.44	28.68	30.34	27.74	38.23	32.99	35.20	32.00	3.20	3.32	3.10	3.11	3.11	3.08	3.13	2.41	3.38	3.21	3.19	3.36
02/01/19	02/28/19	Feb 2019	32.36	31.05	30.28	27.20	28.20	25.88	37.10	32.02	34.48	31.05	3.17	3.26	3.08	3.08	3.08	3.05	2.91	2.39	3.35	3.18	3.16	3.13
03/01/19	03/31/19	Mar 2019	29.94	29.78	27.38	24.97	23.66	21.23	33.73	30.09	31.58	30.11	3.11	3.21	3.01	3.02	3.02	2.99	2.86	2.34	3.28	3.11	3.09	3.08
04/01/19	04/30/19	Apr 2019	27.57	22.49	25.55	17.49	21.75	15.10	26.86	26.58	26.62	24.32	2.79	2.62	2.53	2.51	2.44	2.42	2.13	2.07	2.76	2.60	2.58	2.27
05/01/19	05/31/19	May 2019	24.28	16.99	25.55	16.66	20.77	13.40	27.87	21.95	27.21	19.12	2.78	2.63	2.51	2.43	2.43	2.41	2.08	2.01	2.68	2.52	2.50	2.22
06/01/19	06/30/19	Jun 2019	24.51	17.68	27.96	18.95	20.97	11.70	29.88	22.72	28.68	19.12	2.81	2.66	2.55	2.46	2.47	2.44	2.08	2.02	2.71	2.55	2.53	2.22
07/01/19	07/31/19	Jul 2019	36.18	20.60	36.52	26.93	32.04	18.42	39.10	30.01	38.08	29.47	2.84	2.90	2.58	2.52	2.56	2.53	2.25	2.01	2.77	2.60	2.59	2.40
08/01/19	08/31/19	Aug 2019	38.68	28.43	36.16	26.42	34.92	21.38	40.30	32.51	38.47	31.33	2.86	2.91	2.62	2.53	2.58	2.56	2.27	2.03	2.78	2.62	2.60	2.43
09/01/19	09/30/19	Sep 2019	36.89	28.68	34.72	23.84	32.04	23.65	37.90	30.33	35.35	30.40	2.85	2.73	2.60	2.52	2.58	2.56	2.31	2.07	2.77	2.61	2.59	2.47
10/01/19	10/31/19	Oct 2019	32.66	30.70	29.82	27.24	28.23	23.85	37.71	31.65	33.39	29.85	2.88	2.66	2.61	2.55	2.60	2.58	2.32	2.08	2.80	2.64	2.62	2.48
11/01/19	11/30/19	Nov 2019	34.67	31.25	29.52	26.48	30.95	27.42	37.71	32.64	35.25	30.49	2.94	3.02	2.83	2.81	2.87	2.85	2.93	2.21	3.06	2.90	2.88	3.14
12/01/19	12/31/19	Dec 2019	37.68	33.45	31.86	29.54	34.28	27.93	38.88	35.61	37.11	34.01	3.08	3.20	3.01	3.00	3.03	3.00	3.31	2.33	3.26	3.10	3.08	3.55
01/01/20	01/31/20	Jan 2020	34.46	33.93	31.99	29.18	31.69	28.94	39.13	33.99	36.10	33.15	3.19	3.28	3.16	3.11	3.11	3.08	3.30	2.38	3.37	3.20	3.18	3.54
02/01/20	02/29/20	Feb 2020	33.86	32.65	30.83	27.70	29.55	27.08	38.00	33.02	35.38	32.20	3.15	3.23	3.12	3.07	3.07	3.05	3.05	2.36	3.33	3.17	3.14	3.28
03/01/20	03/31/20	Mar 2020	31.44	31.38	27.93	25.47	25.01	22.43	34.63	31.09	32.48	31.26	3.08	3.20	3.05	3.00	3.01	2.98	3.00	2.32	3.26	3.09	3.07	3.22
04/01/20	04/30/20	Apr 2020	29.07	21.09	26.55	18.59	23.00	14.20	27.11	26.48	27.52	25.67	2.79	2.62	2.55	2.53	2.53	2.50	2.21	2.08	2.78	2.61	2.60	2.38
05/01/20	05/31/20	May 2020	25.78	15.59	26.55	17.76	22.02	12.50	28.12	21.85	28.11	20.47	2.79	2.71	2.54	2.45	2.51	2.49	2.15	2.02	2.70	2.54	2.52	2.32
06/01/20	06/30/20	Jun 2020	26.01	16.28	28.96	20.05	22.22	10.80	30.13	22.62	29.58	20.47	2.82	2.75	2.58	2.48	2.55	2.53	2.17	2.03	2.73	2.57	2.55	2.34
07/01/20	07/31/20	Jul 2020	37.68	22.00	38.07	27.88	33.54	19.57	40.00	31.01	39.13	30.47	2.86	2.94	2.62	2.54	2.64	2.61	2.35	2.04	2.79	2.63	2.61	2.54
08/01/20	08/31/20	Aug 2020	40.18	29.83	37.71	27.37	36.42	22.53	41.20	33.51	39.52	32.33	2.89	2.96	2.68	2.57	2.69	2.66	2.36	2.04	2.82	2.66	2.64	2.54
09/01/20	09/30/20	Sep 2020	38.39	30.08	36.27	24.79	33.54	24.80	38.80	31.33	36.40	31.40	2.89	2.78	2.67	2.58	2.70	2.67	2.45	2.13	2.83	2.67	2.65	2.63
10/01/20	10/31/20	Oct 2020	34.16	29.95	30.37	27.54	29.73	25.25	38.61	31.70	34.29	31.60	2.93	2.73	2.68	2.61	2.73	2.70	2.45	2.14	2.87	2.70	2.68	2.64
11/01/20	11/30/20	Nov 2020	36.17	30.50	30.07	26.78	32.45	28.82	38.61	32.69	36.15	32.24	3.00	3.09	2.92	2.88	2.95	2.92	3.02	2.19	3.14	2.98	2.96	3.24
12/01/20	12/31/20	Dec 2020	39.18	32.70	32.41	29.84	35.78	29.33	39.78	35.66	38.01	35.76	3.15	3.28	3.11	3.10	3.11	3.08	3.44	2.32	3.36	3.19	3.17	3.69
01/01/21	01/31/21	Jan 2021	35.71	33.58	32.79	31.23	32.94	28.84	40.33	34.99	37.30	33.60	3.28	3.44	3.25	3.23	3.22	3.19	3.42	2.50	3.50	3.33	3.31	3.67
02/01/21	02/28/21	Feb 2021	35.11	32.30	31.63	29.75	30.80	26.98	39.20	34.02	36.58	32.65	3.24	3.39	3.21	3.19	3.19	3.16	3.20	2.48	3.46	3.29	3.27	3.44
03/01/21	03/31/21	Mar 2021	32.69	31.03	28.73	27.52	26.26	22.33	35.83	32.09	33.68	31.71	3.18	3.32	3.15	3.13	3.12	3.09	3.16	2.44	3.39	3.22	3.20	3.40
04/01/21	04/30/21	Apr 2021	30.52	23.64	27.65	19.84	24.25	15.30	28.16	26.63	28.72	26.02	2.88	2.84	2.77	2.68	2.61	2.59	2.49	2.15	2.93	2.76	2.75	2.68
05/01/21	05/31/21	May 2021	27.23	18.14	27.65	19.01	23.27	13.60	29.17	22.00	29.31	20.82	2.87	2.87	2.76	2.60	2.60	2.58	2.44	2.10	2.86	2.69	2.68	2.63
06/01/21	06/30/21	Jun 2021	27.46	18.83	30.06	21.30	23.47	11.90	31.18	22.77	30.78	20.82	2.90	2.91	2.79	2.64	2.64	2.61	2.45	2.10	2.89	2.72	2.71	2.64
07/01/21	07/31/21	Jul 2021	38.93	26.10	39.07	29.08	34.79	23.07	41.20	32.01	40.61	30.57	2.94	3.16	2.84	2.70	2.72	2.70	2.65	2.13	2.95	2.78	2.77	2.85
08/01/21	08/31/21	Aug 2021	41.43	33.93	38.71	28.57	37.67	26.03	42.40	34.51	41.00	32.43	2.97	3.18	2.90	2.73	2.77	2.75	2.65	2.12	2.98	2.82	2.80	2.85
09/01/21	09/30/21	Sep 2021	39.64	34.18	37.27	25.99	34.79	28.30	40.00	32.33	37.88	31.50	2.98	3.00	2.89	2.73	2.78	2.76	2.71	2.18	2.99	2.82	2.80	2.91
10/01/21	10/31/21	Oct 2021	35.41	30.45	30.77	27.04	30.98	26.25	39.81	32.55	35.49	31.55	3.01	2.94	2.90	2.77	2.81	2.79	2.86	2.21	3.02	2.86	2.84	3.08
11/01/21	11/30/21	Nov 2021	37.42	32.00	30.47	26.28	33.70	29.82	39.81	33.54	37.35	32.19	3.09	3.24	3.08	3.02	3.04	3.02	3.17	2.31	3.28	3.11	3.09	3.40
12/01/21	12/31/21	Dec 2021	40.43	33.20	32.81	29.34	37.03	30.33	40.98	36.51	39.21	35.71	3.25	3.43	3.28	3.23	3.22	3.19	3.57	2.45	3.50	3.33	3.31	3.83
01/01/22	01/31/22	Jan 2022	36.96	30.83	33.84	30.03	34.19	29.84	41.53	35.99	38.50	34.60	3.40	3.63	3.41	3.37	3.33	3.30	3.51	2.61	3.65	3.48	3.45	3.77
02/01/22	02/28/22	Feb 2022	36.36	29.55	32.68	28.55	32.05	27.98	40.40	35.02	37.78	33.65	3.36	3.57	3.37	3.33	3.30	3.28	3.32	2.59	3.60	3.43	3.41	3.56
03/01/22	03/31/22	Mar 2022	33.94	28.28	29.78	26.32	27.51	23.33	37.03	33.09	34.88	32.71	3.29	3.50	3.31	3.26	3.23	3.21	3.28	2.55	3.54	3.36	3.34	3.52
04/01/22	04/30/22	Apr 2022	30.87	21.49	29.55	24.34	24.20	15.50	34.56	31.28	29.92	30.87	2.98	2.97	2.88	2.81	2.72	2.69	2.51	2.25	3.07	2.90	2.88	2.70

	05/01/22	05/31/22	May 2022	27.58	15.99	29.55	23.51	23.22	13.80	35.57	26.65	30.51	25.67	2.98	2.98	2.87	2.74	2.71	2.68	2.47	2.20	2.99	2.83	2.81	2.66
	06/01/22	06/30/22	Jun 2022	27.81	16.68	31.96	25.80	23.42	12.10	37.58	27.42	31.98	25.67	3.01	3.02	2.91	2.77	2.75	2.72	2.48	2.21	3.02	2.86	2.84	2.67
	07/01/22	07/31/22	Jul 2022	40.18	24.00	40.57	30.33	36.04	24.07	42.40	33.01	41.81	32.47	3.05	3.28	2.95	2.83	2.83	2.80	2.67	2.23	3.09	2.92	2.90	2.88
	08/01/22	08/31/22	Aug 2022	42.68	31.83	40.21	29.82	38.92	27.03	43.60	35.51	42.20	34.33	3.08	3.30	3.02	2.86	2.89	2.86	2.68	2.23	3.12	2.96	2.94	2.88
	09/01/22	09/30/22	Sep 2022	40.89	32.08	38.77	27.24	36.04	29.30	41.20	33.33	39.08	33.40	3.09	3.13	3.01	2.87	2.90	2.87	2.74	2.30	3.13	2.96	2.94	2.95
	10/01/22	10/31/22	Oct 2022	36.66	30.45	32.02	28.04	32.23	27.25	41.01	33.55	36.69	32.55	3.13	3.06	3.02	2.91	2.93	2.90	2.77	2.33	3.17	3.00	2.98	2.98
	11/01/22	11/30/22	Nov 2022	38.67	31.00	31.72	27.28	34.95	30.82	41.01	34.54	38.55	33.19	3.21	3.38	3.21	3.16	3.16	3.13	3.38	2.46	3.43	3.26	3.24	3.62
	12/01/22	12/31/22	Dec 2022	40.94	35.67	36.88	33.21	40.24	33.79	43.70	39.83	42.61	39.38	3.74	3.89	3.70	3.68	3.70	3.63	3.80	3.04	3.95	3.78	3.76	4.07
	01/01/23	01/31/23	Jan 2023	43.38	36.45	38.74	34.54	40.76	34.77	45.58	40.65	43.78	39.87	3.93	4.14	3.92	3.87	3.90	3.84	3.88	3.23	4.15	3.98	3.95	4.15
	02/01/23	02/28/23	Feb 2023	40.72	35.34	37.88	33.95	38.06	33.79	44.44	40.21	42.68	39.38	3.92	4.10	3.87	3.84	3.87	3.78	3.77	3.23	4.11	3.94	3.92	4.02
	03/01/23	03/31/23	Mar 2023	37.13	33.15	33.71	30.98	32.81	29.43	40.10	37.36	38.45	36.87	3.74	3.89	3.68	3.64	3.66	3.61	3.61	3.05	3.92	3.75	3.72	3.86
	04/01/23	04/30/23	Apr 2023	33.54	26.32	31.33	27.51	29.01	22.30	35.02	31.76	31.48	29.64	3.45	3.49	3.31	3.28	3.27	3.22	3.06	2.65	3.54	3.37	3.35	3.26
	05/01/23	05/31/23	May 2023	30.69	21.57	31.79	27.07	27.22	19.22	36.57	29.20	32.57	26.65	3.46	3.50	3.32	3.23	3.26	3.21	2.98	2.64	3.49	3.32	3.30	3.18
	06/01/23	06/30/23	Jun 2023	32.80	23.38	35.99	29.60	29.38	19.83	39.52	31.06	35.78	28.49	3.50	3.53	3.37	3.24	3.27	3.22	2.99	2.65	3.51	3.34	3.32	3.19
	07/01/23	07/31/23	Jul 2023	43.02	31.84	43.54	35.09	40.27	30.80	44.15	37.41	43.87	37.22	3.53	3.67	3.40	3.28	3.33	3.27	3.09	2.71	3.55	3.38	3.36	3.30
	08/01/23	08/31/23	Aug 2023	44.03	35.35	43.59	35.01	42.86	32.98	45.95	39.22	45.29	38.64	3.56	3.72	3.44	3.37	3.41	3.35	3.18	2.73	3.63	3.46	3.44	3.39
	09/01/23	09/30/23	Sep 2023	43.08	35.36	42.35	33.59	41.83	34.64	45.74	38.74	44.45	38.69	3.57	3.66	3.46	3.39	3.44	3.38	3.27	2.86	3.66	3.49	3.47	3.49
	10/01/23	10/31/23	Oct 2023	39.34	34.03	37.26	33.01	38.52	32.86	44.31	38.66	42.02	38.18	3.69	3.73	3.56	3.52	3.55	3.51	3.38	2.96	3.79	3.62	3.59	3.60
	11/01/23	11/30/23	Nov 2023	42.14	36.00	38.13	33.61	40.69	35.55	46.19	40.71	44.50	39.97	3.88	4.04	3.80	3.81	3.83	3.79	3.84	3.26	4.09	3.92	3.89	4.06
	12/01/23	12/31/23	Dec 2023	41.45	38.14	40.96	37.09	43.46	37.25	46.42	43.16	46.01	43.06	4.23	4.36	4.13	4.13	4.19	4.08	4.02	3.62	4.40	4.23	4.21	4.29
	01/01/24	01/31/24	Jan 2024	49.81	42.08	43.65	39.06	47.33	39.70	49.63	45.30	49.06	45.14	4.47	4.65	4.43	4.37	4.46	4.38	4.24	3.85	4.65	4.48	4.45	4.51
	02/01/24	02/29/24	Feb 2024	45.08	41.13	43.08	39.35	44.06	39.60	48.48	45.40	47.59	45.10	4.48	4.62	4.37	4.34	4.43	4.29	4.22	3.87	4.62	4.45	4.42	4.48
	03/01/24	03/31/24	Mar 2024	40.33	38.03	37.64	35.64	38.11	35.54	43.18	41.64	42.03	41.04	4.19	4.28	4.06	4.02	4.09	4.02	3.94	3.55	4.29	4.12	4.10	4.20
	04/01/24	04/30/24	Apr 2024	36.22	31.15	33.12	30.68	33.83	29.10	35.47	32.24	33.05	28.42	3.92	4.01	3.74	3.74	3.82	3.75	3.62	3.05	4.01	3.84	3.82	3.82
	05/01/24	05/31/24	May 2024	33.81	27.16	34.04	30.63	31.22	24.63	37.58	31.75	34.63	27.64	3.94	4.02	3.77	3.72	3.80	3.74	3.49	3.08	3.98	3.81	3.79	3.69
	06/01/24	06/30/24	Jun 2024	37.78	30.08	40.02	33.40	35.35	27.57	41.47	34.70	39.59	31.32	3.98	4.04	3.83	3.72	3.80	3.73	3.50	3.09	3.98	3.81	3.79	3.70
	07/01/24	07/31/24	Jul 2024	45.87	39.68	46.51	39.85	44.51	37.52	45.89	41.81	45.92	41.98	4.01	4.06	3.84	3.74	3.83	3.74	3.52	3.19	4.01	3.84	3.82	3.73
	08/01/24	08/31/24	Aug 2024	45.38	38.87	46.98	40.20	46.79	38.94	48.30	42.93	48.37	42.96	4.03	4.14	3.87	3.87	3.93	3.84	3.69	3.23	4.13	3.96	3.94	3.90
	09/01/24	09/30/24	Sep 2024	45.26	38.63	45.93	39.95	47.61	39.98	50.28	44.16	49.82	43.97	4.06	4.19	3.92	3.92	3.98	3.89	3.80	3.42	4.18	4.01	3.99	4.02
	10/01/24	10/31/24	Oct 2024	42.03	37.61	42.50	37.99	44.82	38.46	47.61	43.76	47.36	43.81	4.26	4.39	4.11	4.13	4.18	4.12	3.99	3.59	4.40	4.23	4.21	4.21
	11/01/24	11/30/24	Nov 2024	45.62	41.00	44.53	39.94	46.44	40.27	51.37	46.87	50.45	46.74	4.55	4.71	4.38	4.47	4.51	4.45	4.29	4.07	4.74	4.57	4.55	4.52
	12/01/24	12/31/24	Dec 2024	45.25	40.84	44.10	39.68	47.32	40.12	49.81	46.07	49.34	45.88	4.57	4.67	4.48	4.42	4.48	4.42	4.19	4.01	4.69	4.52	4.50	4.47
	01/01/25	01/31/25	Jan 2025	51.96	44.43	46.51	41.40	50.17	42.05	52.23	47.74	51.22	47.45	4.66	4.80	4.62	4.57	4.62	4.53	4.41	4.09	4.85	4.67	4.65	4.68
	02/01/25	02/28/25	Feb 2025	47.53	43.27	45.54	41.54	46.63	41.61	51.47	47.86	49.69	47.19	4.70	4.83	4.59	4.58	4.63	4.56	4.47	4.11	4.86	4.69	4.66	4.72
	03/01/25	03/31/25	Mar 2025	43.56	41.29	41.01	39.16	41.39	38.88	46.95	44.94	45.47	44.95	4.54	4.62	4.44	4.36	4.44	4.38	4.30	3.90	4.64	4.47	4.44	4.55
	04/01/25	04/30/25	Apr 2025	41.41	36.49	38.41	35.26	39.04	34.24	40.11	37.82	38.33	33.74	4.39	4.49	4.22	4.22	4.29	4.23	4.08	3.46	4.49	4.32	4.30	4.28
	05/01/25	05/31/25	May 2025	37.11	31.07	36.52	33.52	34.47	28.48	40.65	35.68	37.54	31.28	4.21	4.27	4.04	3.98	4.06	4.00	3.75	3.49	4.24	4.07	4.05	3.95
	06/01/25	06/30/25	Jun 2025	41.57	33.46	43.41	36.26	39.20	30.82	45.48	38.14	43.24	34.58	4.23	4.29	4.09	3.97	4.04	3.99	3.70	3.46	4.23	4.06	4.04	3.89
	07/01/25	07/31/25	Jul 2025	48.52	42.40	50.10	43.49	48.59	41.54	50.00	45.44	50.03	46.04	4.27	4.32	4.13	4.00	4.09	4.00	3.76	3.55	4.27	4.10	4.08	3.97
	08/01/25	08/31/25	Aug 2025	49.44	41.31	51.58	44.03	51.02	43.69	53.50	46.77	53.71	48.06	4.31	4.43	4.13	4.08	4.17	4.09	3.91	3.53	4.35	4.18	4.16	4.12
	09/01/25	09/30/25	Sep 2025	49.68	41.96	49.50	43.21	50.91	43.63	56.07	48.39	53.58	48.12	4.20	4.36	4.06	4.00	4.08	3.99	3.88	3.55	4.27	4.10	4.08	4.09
	10/01/25	10/31/25	Oct 2025	44.87	38.95	44.26	39.90	46.74	40.33	51.13	45.19	49.46	46.14	4.22	4.43	4.07	4.04	4.12	4.03	3.90	3.55	4.31	4.14	4.12	4.12
	11/01/25	11/30/25	Nov 2025	45.32	39.70	45.42	40.24	46.82	40.63	51.59	46.02	50.43	46.50	4.27	4.45	4.12	4.16	4.22	4.16	3.94	3.79	4.43	4.26	4.23	4.16
	12/01/25	12/31/25	Dec 2025	46.87	42.06	46.54	41.22	49.24	41.41	52.44	47.76	51.61	47.53	4.53	4.67	4.45	4.39	4.45	4.39	4.16	3.90	4.66	4.49	4.47	4.43
	01/01/26	01/31/26	Jan 2026	51.16	45.04	47.62	42.32	50.84	43.00	55.53	49.96	52.98	48.96	4.75	4.89	4.72	4.62	4.68	4.60	4.38	4.07	4.90	4.72	4.70	4.65
	02/01/26	02/28/26	Feb 2026	47.97	44.00	47.08	42.72	48.42	43.20	54.08	49.71	51.64	49.09	4.79	4.93	4.72	4.66	4.73	4.66	4.43	4.08	4.93	4.76	4.73	4.69
	03/01/26	03/31/26	Mar 2026	44.34	42.29	42.06	39.97	42.56	39.91	48.26	45.88	46.77	46.30	4.63	4.71	4.50	4.45	4.52	4.46	4.31	3.80	4.72	4.55	4.52	4.57
	04/01/26	04/30/26	Apr 2026	41.31	36.33	38.76	35.99	39.10	33.98	40.67	38.31	38.90	34.30	4.46	4.54	4.28	4.25	4.33	4.26	4.12	3.53	4.51	4.35	4.32	4.32
	05/01/26	05/31/26	May 2026	37.39	31.44	37.77	34.76	34.58	28.67	41.78	36.58	38.68	32.19	4.33	4.38	4.16	4.05	4.14	4.08	3.82	3.58	4.31	4.15	4.13	4.02
	06/01/26	06/30/26	Jun 2026	44.19	35.40	45.28	37.76	41.47	32.59	48.83	40.72	45.69	37.04	4.35	4.39	4.22	4.07	4.14	4.08	3.76	3.57	4.33	4.16	4.14	3.96
	07/01/26	07/31/26	Jul 2026	49.78	45.76	51.69	45.16	49.94	44.04	52.83	46.95	52.34	48.85	4.39	4.45	4.25	4.09	4.20	4.11	3.86	3.66	4.36	4.19	4.17	4.07
	08/01/26	08/31/26	Aug 2026	49.60	42.47	52.19	44.95	51.93	44.69	55.12	47.87	54.89	49.70	4.42	4.58	4.28	4.20	4.28	4.21	4.03	3.72	4.46	4.29	4.27	4.24
	09/01/26	09/30/26	Sep 2026	49.90	42.35	49.68	43.60	51.17	43.78	56.55	48.83	54.00	48.41	4.31	4.51	4.16	4.11	4.20	4.12	3.93	3.67	4.37	4.20	4.18	4.15
	10/01/26	10/31/26	Oct 2026	44.97	39.52	44.75	40.62	47.49	41.09	51.28	45.87	49.37	46.79	4.34	4.55	4.17	4.16	4.22	4.16	3.96	3.66	4.42	4.26	4.23	4.18
	11/01/26	11/30/26	Nov 2026	45.83	40.96	45.41	40.76	48.29	41.49	52.67	47.20	51.34	47.66	4.41	4.66	4.24	4.28	4.35	4.28	4.07	3.96	4.55	4.38	4.35	4.29
	12/01/26	12/31/26	Dec 2026	46.24	42.92	46.08	41.50	48.95	41.62	52.60	48.66	51.52	48.17	4.67	4.80	4.60	4.51	4.59	4.51	4.29	3.90	4.79	4.61	4.59	4.56

			COBHLH	COBLLH	Palo VerdeHL	Palo VerdeLL	Mid-Columbia	Mid-Columbia	NP 15HLH	NP 15LLH	SP 15HLH	SP 15LLH	Henry Hub Ga	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Cree	Lakeside	Z_CHEBRN*
Quote Date		**Data Type:**	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
10/12/2016		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
		Tue, 5/31/2005																						
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
10/13/16	10/31/16	Oct 2016	26.25	22.05	27.50	23.00	21.50	19.15	36.25	29.00	34.75	29.00	2.95	2.86	2.74	2.71	2.80	2.68	2.65	2.00	3.07	2.85	2.88	2.83
11/01/16	11/30/16	Nov 2016	30.25	25.60	27.25	23.25	27.00	23.50	36.25	32.00	35.00	30.75	3.21	3.12	2.98	2.98	3.06	3.03	3.07	2.37	3.26	3.07	3.05	3.30
12/01/16	12/31/16	Dec 2016	36.00	30.40	33.00	27.25	33.50	28.75	41.75	36.00	41.50	35.50	3.41	3.73	3.36	3.43	3.48	3.45	3.65	2.45	3.72	3.53	3.51	3.91
01/01/17	01/31/17	Jan 2017	34.15	30.08	33.13	27.56	32.19	28.28	41.48	35.36	39.83	34.25	3.54	3.82	3.48	3.53	3.54	3.50	3.57	2.54	3.82	3.64	3.61	3.83
02/01/17	02/28/17	Feb 2017	33.15	27.50	32.19	26.25	29.87	26.26	40.29	34.34	39.02	33.25	3.54	3.78	3.51	3.51	3.53	3.50	3.45	2.55	3.80	3.61	3.59	3.70
03/01/17	03/31/17	Mar 2017	29.40	24.83	28.44	24.94	24.94	21.21	36.74	31.30	34.86	31.05	3.50	3.37	3.22	3.22	3.27	3.24	3.03	2.52	3.50	3.32	3.30	3.25
04/01/17	04/30/17	Apr 2017	25.76	17.78	26.92	21.43	20.71	13.75	32.64	27.04	29.34	26.27	3.23	3.07	2.94	2.90	2.99	2.96	2.58	2.28	3.17	3.00	2.98	2.76
05/01/17	05/31/17	May 2017	23.53	14.48	26.92	20.66	19.68	11.75	33.66	24.88	29.95	23.72	3.18	3.01	2.86	2.87	2.93	2.91	2.37	2.23	3.14	2.97	2.95	2.54
06/01/17	06/30/17	Jun 2017	24.17	13.95	29.92	23.06	20.09	9.75	35.70	26.88	31.66	25.92	3.21	3.03	2.91	2.90	2.97	2.95	2.38	2.23	3.17	2.99	2.97	2.54
07/01/17	07/31/17	Jul 2017	33.47	22.75	36.92	27.04	29.83	20.02	39.50	30.80	39.53	30.56	3.24	3.25	3.06	2.98	3.05	3.02	2.66	2.24	3.25	3.07	3.05	2.84
08/01/17	08/31/17	Aug 2017	35.88	27.78	36.46	26.52	32.60	22.98	40.69	33.34	39.91	32.45	3.24	3.27	3.08	2.98	3.06	3.03	2.74	2.25	3.25	3.08	3.06	2.93
09/01/17	09/30/17	Sep 2017	34.16	28.03	32.27	24.22	29.83	24.95	38.32	31.12	36.81	31.50	3.22	3.18	3.00	2.95	3.05	3.02	2.74	2.27	3.22	3.05	3.03	2.92
10/01/17	10/31/17	Oct 2017	30.92	26.64	28.91	24.99	27.00	23.18	39.11	31.59	35.86	30.64	3.23	3.13	2.94	3.01	3.05	3.03	2.82	2.33	3.28	3.10	3.08	3.01
11/01/17	11/30/17	Nov 2017	32.92	27.30	28.62	24.23	29.70	25.63	39.11	32.59	37.75	31.28	3.28	3.35	3.11	3.14	3.21	3.18	3.22	2.47	3.42	3.24	3.22	3.45
12/01/17	12/31/17	Dec 2017	37.46	32.27	30.98	27.29	33.15	27.95	40.29	35.58	39.64	34.83	3.41	3.65	3.35	3.35	3.36	3.33	3.54	2.59	3.64	3.46	3.43	3.79
01/01/18	01/31/18	Jan 2018	35.10	30.13	31.43	27.56	31.69	28.03	40.98	34.61	38.28	33.50	3.51	3.62	3.41	3.44	3.42	3.39	3.42	2.66	3.71	3.54	3.51	3.67
02/01/18	02/28/18	Feb 2018	33.65	28.35	31.39	26.25	29.37	26.01	39.79	33.59	37.52	32.50	3.47	3.56	3.37	3.39	3.38	3.35	3.31	2.64	3.66	3.49	3.46	3.55
03/01/18	03/31/18	Mar 2018	31.05	26.63	28.29	24.94	25.14	21.71	36.89	31.55	34.46	31.50	3.39	3.41	3.28	3.23	3.30	3.27	3.23	2.55	3.50	3.33	3.31	3.46
04/01/18	04/30/18	Apr 2018	23.76	19.63	23.32	20.83	19.86	14.85	29.84	26.19	27.69	25.92	2.89	2.70	2.60	2.65	2.61	2.58	2.15	2.12	2.91	2.74	2.73	2.30
05/01/18	05/31/18	May 2018	23.43	13.98	26.02	20.41	19.18	11.50	28.71	24.63	27.10	23.22	2.84	2.66	2.56	2.53	2.56	2.54	2.06	2.02	2.78	2.62	2.61	2.21
06/01/18	06/30/18	Jun 2018	23.77	14.20	29.17	22.91	19.64	9.65	30.70	25.43	29.56	23.97	2.85	2.70	2.58	2.55	2.58	2.56	2.05	2.02	2.80	2.64	2.62	2.19
07/01/18	07/31/18	Jul 2018	33.87	20.45	36.22	25.44	29.68	17.77	39.00	29.55	37.03	30.01	2.88	2.94	2.65	2.59	2.66	2.64	2.26	2.00	2.85	2.68	2.67	2.42
08/01/18	08/31/18	Aug 2018	36.38	28.28	35.86	26.52	32.60	22.98	40.44	32.56	38.66	32.20	2.88	2.95	2.68	2.60	2.67	2.65	2.25	2.01	2.85	2.68	2.67	2.41
09/01/18	09/30/18	Sep 2018	34.66	28.53	34.42	23.92	29.83	25.25	38.07	30.34	35.56	31.25	2.88	2.75	2.66	2.59	2.67	2.65	2.30	2.04	2.84	2.68	2.66	2.46
10/01/18	10/31/18	Oct 2018	31.42	27.39	28.41	24.99	26.50	22.68	38.61	31.09	34.36	30.14	2.91	2.70	2.64	2.63	2.70	2.67	2.33	2.07	2.88	2.72	2.70	2.49
11/01/18	11/30/18	Nov 2018	33.42	27.95	28.12	24.23	29.20	26.28	38.61	32.09	36.25	30.78	2.96	3.01	2.87	2.85	2.89	2.86	2.97	2.22	3.11	2.94	2.92	3.19
12/01/18	12/31/18	Dec 2018	36.41	30.17	30.48	27.29	32.50	26.80	39.79	35.08	38.14	34.33	3.10	3.27	3.03	3.04	3.04	3.02	3.36	2.32	3.30	3.13	3.11	3.61
01/01/19	01/31/19	Jan 2019	35.30	31.08	33.48	28.46	32.69	28.93	41.08	35.31	38.28	34.15	3.21	3.32	3.14	3.12	3.13	3.10	3.15	2.41	3.39	3.22	3.20	3.39
02/01/19	02/28/19	Feb 2019	34.65	29.70	32.54	27.15	30.37	26.91	39.89	34.29	37.52	33.15	3.17	3.25	3.11	3.09	3.09	3.07	2.93	2.38	3.36	3.19	3.16	3.15
03/01/19	03/31/19	Mar 2019	32.05	28.33	28.79	25.84	25.44	21.86	36.34	32.25	34.46	32.15	3.10	3.20	3.04	3.02	3.03	3.00	2.88	2.32	3.28	3.12	3.09	3.09
04/01/19	04/30/19	Apr 2019	27.96	21.53	25.42	17.58	21.46	15.35	27.49	27.19	27.94	24.82	2.74	2.62	2.53	2.50	2.43	2.41	2.11	2.02	2.75	2.59	2.57	2.25
05/01/19	05/31/19	May 2019	24.53	15.33	26.52	16.71	20.43	13.35	28.51	22.38	28.55	19.47	2.74	2.63	2.52	2.43	2.42	2.39	2.06	1.96	2.67	2.51	2.49	2.20
06/01/19	06/30/19	Jun 2019	24.77	16.10	29.02	19.11	20.64	11.35	30.55	23.18	30.06	19.47	2.77	2.67	2.55	2.46	2.45	2.43	2.06	1.96	2.70	2.54	2.52	2.20
07/01/19	07/31/19	Jul 2019	34.97	18.65	36.80	27.94	30.83	17.57	39.35	31.00	38.28	30.96	2.80	2.90	2.59	2.51	2.54	2.52	2.22	1.95	2.76	2.59	2.58	2.38
08/01/19	08/31/19	Aug 2019	37.38	26.48	36.44	27.42	33.60	20.53	40.54	33.54	38.66	32.85	2.81	2.92	2.63	2.52	2.57	2.55	2.25	1.97	2.77	2.61	2.59	2.40
09/01/19	09/30/19	Sep 2019	35.66	26.73	35.00	24.82	30.83	22.80	38.17	31.32	35.56	31.90	2.81	2.73	2.60	2.52	2.57	2.54	2.29	2.01	2.77	2.60	2.59	2.45
10/01/19	10/31/19	Oct 2019	32.42	28.99	30.06	27.44	27.50	23.58	38.71	32.44	34.36	30.79	2.84	2.66	2.62	2.55	2.59	2.57	2.30	2.02	2.80	2.63	2.62	2.46
11/01/19	11/30/19	Nov 2019	34.42	29.55	29.77	26.68	30.20	27.18	38.71	33.44	36.25	31.43	2.90	2.96	2.85	2.78	2.85	2.82	2.89	2.17	3.03	2.87	2.85	3.11
12/01/19	12/31/19	Dec 2019	37.41	31.77	32.13	29.74	33.50	27.70	39.89	36.43	38.14	34.98	3.04	3.16	3.02	2.98	3.00	2.98	3.28	2.29	3.24	3.07	3.05	3.52
01/01/20	01/31/20	Jan 2020	36.65	32.28	34.88	29.71	33.84	30.13	42.08	36.16	39.27	35.15	3.17	3.26	3.16	3.11	3.10	3.07	3.27	2.35	3.38	3.21	3.19	3.51
02/01/20	02/29/20	Feb 2020	36.00	30.90	33.94	28.40	31.52	28.11	40.89	35.14	38.51	34.15	3.13	3.21	3.12	3.07	3.07	3.04	3.02	2.33	3.34	3.17	3.15	3.24
03/01/20	03/31/20	Mar 2020	33.40	29.53	30.19	27.09	26.59	23.06	37.34	33.10	35.45	33.15	3.06	3.19	3.05	3.01	3.00	2.98	2.97	2.29	3.27	3.10	3.08	3.19
04/01/20	04/30/20	Apr 2020	29.71	21.53	26.42	18.53	23.21	15.35	27.54	27.04	28.59	26.12	2.75	2.64	2.58	2.54	2.53	2.51	2.15	2.04	2.79	2.63	2.61	2.32
05/01/20	05/31/20	May 2020	26.28	15.33	26.42	17.66	22.18	13.35	28.56	22.23	29.20	20.77	2.75	2.72	2.57	2.47	2.52	2.50	2.09	1.97	2.71	2.55	2.54	2.25
06/01/20	06/30/20	Jun 2020	26.52	16.10	28.92	20.06	22.39	11.35	30.60	23.03	30.71	20.77	2.78	2.77	2.61	2.50	2.56	2.53	2.11	1.99	2.75	2.58	2.57	2.27
07/01/20	07/31/20	Jul 2020	36.72	19.80	38.07	27.84	32.58	18.57	40.35	32.00	39.28	31.31	2.82	2.96	2.65	2.56	2.64	2.62	2.29	1.99	2.81	2.64	2.63	2.47
08/01/20	08/31/20	Aug 2020	39.13	27.63	37.71	27.32	35.35	21.53	41.54	34.54	39.66	33.20	2.84	2.97	2.71	2.59	2.69	2.67	2.29	1.99	2.84	2.67	2.66	2.47
09/01/20	09/30/20	Sep 2020	37.41	27.88	36.27	24.72	32.58	23.80	39.17	32.32	36.56	32.25	2.85	2.80	2.69	2.59	2.70	2.67	2.38	2.08	2.84	2.68	2.66	2.57
10/01/20	10/31/20	Oct 2020	34.07	29.49	30.41	27.49	28.90	24.78	39.71	32.79	35.36	32.29	2.88	2.74	2.70	2.62	2.73	2.70	2.39	2.09	2.88	2.71	2.70	2.57
11/01/20	11/30/20	Nov 2020	36.07	30.05	30.12	26.73	31.60	28.38	39.71	33.79	37.25	32.93	2.96	3.06	2.92	2.87	2.93	2.90	3.02	2.20	3.13	2.96	2.94	3.25
12/01/20	12/31/20	Dec 2020	39.06	32.27	32.48	29.79	34.90	28.90	40.89	36.78	39.14	36.48	3.12	3.25	3.11	3.09	3.10	3.07	3.45	2.33	3.35	3.18	3.16	3.70
01/01/21	01/31/21	Jan 2021	37.80	32.58	36.08	30.73	34.84	30.58	43.08	36.16	40.28	36.15	3.26	3.41	3.24	3.22	3.21	3.19	3.39	2.46	3.49	3.32	3.30	3.64
02/01/21	02/28/21	Feb 2021	37.15	31.20	35.14	29.42	32.52	28.56	41.89	35.14	39.52	35.15	3.22	3.36	3.21	3.19	3.18	3.15	3.16	2.44	3.46	3.29	3.26	3.40
03/01/21	03/31/21	Mar 2021	34.55	29.83	31.39	28.11	27.59	23.51	38.34	33.10	36.46	34.15	3.16	3.29	3.14	3.12	3.12	3.09	3.13	2.41	3.39	3.22	3.20	3.36
04/01/21	04/30/21	Apr 2021	30.96	22.83	27.52	19.78	24.46	16.60	28.69	27.24	29.69	26.52	2.86	2.85	2.78	2.70	2.64	2.61	2.47	2.13	2.95	2.79	2.77	2.66
05/01/21	05/31/21	May 2021	27.53	16.63	27.52	18.91	23.43	14.60	29.71	22.43	30.30	21.17	2.85	2.89	2.77	2.62	2.62	2.60	2.42	2.07	2.88	2.71	2.70	2.60
06/01/21	06/30/21	Jun 2021	27.77	17.40	30.02	21.31	23.64	12.60	31.75	23.23	31.81	21.17	2.88	2.92	2.81	2.66	2.66	2.64	2.42	2.08	2.91	2.75	2.73	2.61
07/01/21	07/31/21	Jul 2021	37.97	23.65	38.97	29.04	33.83	23.22	41.35	33.00	40.28	31.16	2.92	3.18	2.85	2.72	2.75	2.72	2.63	2.10	2.97	2.80	2.79	2.83
08/01/21	08/31/21	Aug 2021	40.38	31.48	38.61	28.52	36.60	26.18	42.54	35.54	40.66	33.05	2.95	3.20	2.92	2.75	2.80	2.77	2.62	2.09	3.00	2.84	2.82	2.82
09/01/21	09/30/21	Sep 2021	38.66	31.73	37.17	25.92	33.83	28.45	40.17	33.32	37.56	32.10	2.96	3.02	2.90	2.75	2.81	2.78	2.68	2.16	3.01	2.84	2.82	2.88
10/01/21	10/31/21	Oct 2021	35.42	30.59	31.81	28.14	30.50	25.88	40.71	33.79	36.36	32.79	2.99	2.95	2.91	2.78	2.83	2.81	2.84	2.18	3.04	2.88	2.86	3.05
11/01/21	11/30/21	Nov 2021	37.42	31.15	31.52	27.38	33.20	29.48	40.71	34.79	38.25	33.43	3.07	3.22	3.07	3.01	3.04	3.01	3.16	2.30	3.28	3.11	3.09	3.39
12/01/21	12/31/21	Dec 2021	40.41	33.37	33.88	30.44	36.50	30.00	41.89	37.78	40.14	36.98	3.24	3.42	3.27	3.23	3.22	3.19	3.57	2.45	3.50	3.33	3.31	3.83
01/01/22	01/31/22	Jan 2022	39.55	33.68	37.68	31.71	36.94	32.33	44.08	38.31	41.28	37.15	3.38	3.62	3.40	3.36	3.33	3.30	3.51	2.61	3.64	3.47	3.44	3.76
02/01/22	02/28/22	Feb 2022	38.90	32.30	36.74	30.40	34.62	30.31	42.89	37.29	40.52	36.15	3.34	3.56	3.36	3.32	3.30	3.27	3.31	2.59	3.59	3.42	3.40	3.56

03/01/22	03/31/22	Mar 2022	36.30	30.93	32.99	29.09	29.69	25.26	39.34	35.25	37.46	35.15	3.28	3.49	3.30	3.26	3.24	3.21	3.27	2.55	3.53	3.36	3.33	3.51	
04/01/22	04/30/22	Apr 2022	32.21	23.93	31.47	25.68	25.71	17.80	35.49	33.14	31.59	32.22	2.98	3.01	2.92	2.84	2.76	2.74	2.50	2.24	3.10	2.94	2.92	2.69	
05/01/22	05/31/22	May 2022	28.78	17.73	31.47	24.81	24.68	15.80	36.51	28.33	32.20	26.87	2.98	3.02	2.90	2.77	2.75	2.72	2.45	2.19	3.02	2.86	2.84	2.64	
06/01/22	06/30/22	Jun 2022	29.02	18.50	33.97	27.21	24.89	13.80	38.55	29.13	33.71	26.87	3.01	3.06	2.94	2.80	2.79	2.76	2.46	2.19	3.06	2.89	2.87	2.65	
07/01/22	07/31/22	Jul 2022	39.22	24.75	41.02	31.19	35.08	24.32	42.35	34.00	41.28	33.96	3.05	3.31	2.98	2.86	2.87	2.85	2.66	2.22	3.12	2.95	2.93	2.86	
08/01/22	08/31/22	Aug 2022	41.63	32.58	40.66	30.67	37.85	27.28	43.54	36.54	41.66	35.85	3.08	3.34	3.05	2.89	2.93	2.90	2.66	2.22	3.16	2.99	2.97	2.86	
09/01/22	09/30/22	Sep 2022	39.91	32.83	39.22	28.07	35.08	29.55	41.17	34.32	38.56	34.90	3.09	3.16	3.04	2.90	2.94	2.91	2.72	2.28	3.16	2.99	2.97	2.93	
10/01/22	10/31/22	Oct 2022	36.67	31.69	33.21	29.14	31.75	26.98	41.71	34.79	37.36	33.79	3.12	3.09	3.05	2.94	2.97	2.94	2.76	2.32	3.20	3.03	3.01	2.96	
11/01/22	11/30/22	Nov 2022	39.45	33.65	35.71	31.54	38.10	33.04	43.16	38.28	41.84	37.57	3.53	3.69	3.44	3.46	3.51	3.44	3.46	2.86	3.73	3.56	3.54	3.71	
12/01/22	12/31/22	Dec 2022	40.93	35.75	37.42	33.76	39.98	33.62	44.16	40.47	43.07	40.02	3.73	3.89	3.70	3.68	3.70	3.63	3.79	3.04	3.95	3.78	3.76	4.05	
01/01/23	01/31/23	Jan 2023	44.68	37.88	40.66	35.38	42.13	36.01	46.85	41.81	45.17	41.15	3.92	4.13	3.92	3.87	3.90	3.84	3.88	3.23	4.14	3.97	3.95	4.14	
02/01/23	02/28/23	Feb 2023	41.99	36.72	39.91	34.87	39.34	34.96	45.69	41.34	44.05	40.63	3.91	4.09	3.87	3.83	3.87	3.78	3.77	3.23	4.11	3.94	3.91	4.03	
03/01/23	03/31/23	Mar 2023	38.31	34.48	35.31	32.36	33.90	30.40	41.26	38.44	39.74	38.10	3.74	3.89	3.68	3.64	3.66	3.61	3.61	3.05	3.91	3.74	3.72	3.87	
04/01/23	04/30/23	Apr 2023	34.21	27.54	32.29	28.18	29.77	23.45	35.48	32.69	32.32	30.32	3.45	3.51	3.33	3.29	3.29	3.24	3.06	2.64	3.56	3.39	3.37	3.26	
05/01/23	05/31/23	May 2023	31.29	22.44	32.75	27.72	27.95	20.22	37.04	30.04	33.42	27.25	3.46	3.52	3.34	3.24	3.28	3.23	2.97	2.63	3.51	3.34	3.32	3.17	
06/01/23	06/30/23	Jun 2023	33.40	24.29	36.99	30.30	30.12	20.68	40.01	31.91	36.65	29.09	3.49	3.55	3.39	3.26	3.30	3.24	2.98	2.64	3.52	3.35	3.33	3.18	
07/01/23	07/31/23	Jul 2023	42.54	32.21	43.77	35.52	39.79	30.92	44.12	37.90	43.60	37.97	3.53	3.68	3.41	3.30	3.35	3.29	3.09	2.70	3.57	3.40	3.38	3.29	
08/01/23	08/31/23	Aug 2023	43.50	35.72	43.82	35.43	42.32	33.11	45.92	39.73	45.02	39.40	3.56	3.74	3.46	3.38	3.43	3.37	3.18	2.72	3.65	3.48	3.46	3.38	
09/01/23	09/30/23	Sep 2023	42.58	35.73	42.58	34.01	41.35	34.77	45.72	39.24	44.19	39.44	3.57	3.68	3.48	3.41	3.46	3.40	3.26	2.85	3.68	3.51	3.48	3.47	
10/01/23	10/31/23	Oct 2023	39.35	34.65	37.86	33.56	38.28	32.72	44.66	39.27	42.36	38.80	3.69	3.74	3.58	3.53	3.58	3.53	3.37	2.95	3.80	3.63	3.61	3.58	
11/01/23	11/30/23	Nov 2023	41.48	36.15	39.90	35.71	43.00	36.59	45.61	41.77	45.43	41.71	3.98	4.15	3.82	3.91	3.98	3.87	3.76	3.43	4.18	4.01	3.98	4.01	
12/01/23	12/31/23	Dec 2023	41.45	38.14	40.96	37.09	43.46	37.25	46.42	43.16	46.01	43.06	4.23	4.36	4.13	4.13	4.19	4.08	4.02	3.62	4.40	4.23	4.21	4.28	
01/01/24	01/31/24	Jan 2024	49.81	42.08	43.65	39.06	47.33	39.70	49.63	45.30	49.06	45.14	4.47	4.65	4.43	4.37	4.46	4.38	4.24	3.85	4.65	4.48	4.45	4.51	
02/01/24	02/29/24	Feb 2024	45.08	41.13	43.08	39.35	44.06	39.60	48.48	45.40	47.59	45.10	4.48	4.62	4.37	4.34	4.43	4.29	4.22	3.87	4.62	4.45	4.42	4.48	
03/01/24	03/31/24	Mar 2024	40.33	38.03	37.64	35.64	38.11	35.54	43.18	41.64	42.03	41.04	4.19	4.28	4.06	4.02	4.09	4.02	3.94	3.55	4.29	4.12	4.10	4.20	
04/01/24	04/30/24	Apr 2024	36.22	31.15	33.12	30.68	33.83	29.10	35.47	32.24	33.05	28.42	3.92	4.01	3.74	3.74	3.82	3.75	3.62	3.05	4.01	3.84	3.82	3.82	
05/01/24	05/31/24	May 2024	33.81	27.16	34.04	30.63	31.22	24.63	37.58	31.75	34.63	27.64	3.94	4.02	3.77	3.72	3.80	3.74	3.49	3.08	3.98	3.81	3.79	3.69	
06/01/24	06/30/24	Jun 2024	37.78	30.08	40.02	33.40	35.35	27.57	41.47	34.70	39.59	31.32	3.98	4.04	3.83	3.72	3.80	3.73	3.50	3.09	3.98	3.81	3.79	3.70	
07/01/24	07/31/24	Jul 2024	45.87	39.68	46.51	39.85	44.51	37.52	45.89	41.81	45.92	41.98	4.01	4.06	3.84	3.74	3.83	3.74	3.52	3.19	4.01	3.84	3.82	3.72	
08/01/24	08/31/24	Aug 2024	45.38	38.87	46.98	40.20	46.79	38.94	48.30	42.93	48.37	42.96	4.03	4.14	3.87	3.87	3.93	3.84	3.69	3.23	4.13	3.97	3.94	3.90	
09/01/24	09/30/24	Sep 2024	45.26	38.63	45.93	39.95	47.61	39.98	50.28	44.16	49.82	43.97	4.06	4.19	3.92	3.92	3.98	3.89	3.80	3.42	4.19	4.02	3.99	4.01	
10/01/24	10/31/24	Oct 2024	42.03	37.61	42.50	37.99	44.82	38.46	47.61	43.76	47.36	43.81	4.26	4.39	4.11	4.13	4.18	4.12	3.99	3.59	4.40	4.23	4.21	4.20	
11/01/24	11/30/24	Nov 2024	45.62	41.00	44.53	39.94	46.44	40.27	51.37	46.87	50.45	46.74	4.55	4.71	4.38	4.47	4.51	4.45	4.29	4.07	4.74	4.57	4.55	4.54	
12/01/24	12/31/24	Dec 2024	45.25	40.84	44.10	39.68	47.32	40.12	49.81	46.07	49.34	45.88	4.57	4.67	4.48	4.42	4.48	4.42	4.19	4.01	4.69	4.52	4.50	4.45	
01/01/25	01/31/25	Jan 2025	51.96	44.43	46.51	41.40	50.17	42.05	52.23	47.74	51.22	47.45	4.66	4.80	4.62	4.57	4.62	4.53	4.41	4.09	4.85	4.67	4.65	4.68	
02/01/25	02/28/25	Feb 2025	47.53	43.27	45.54	41.54	46.63	41.61	51.47	47.86	49.69	47.19	4.70	4.83	4.59	4.58	4.63	4.56	4.47	4.11	4.86	4.69	4.66	4.73	
03/01/25	03/31/25	Mar 2025	43.56	41.29	41.01	39.16	41.39	38.88	46.95	44.94	45.47	44.95	4.54	4.62	4.44	4.36	4.44	4.38	4.30	3.90	4.64	4.47	4.44	4.56	
04/01/25	04/30/25	Apr 2025	41.41	36.49	38.41	35.26	39.04	34.24	40.11	37.82	38.33	33.74	4.39	4.49	4.22	4.22	4.29	4.23	4.08	3.46	4.49	4.32	4.30	4.28	
05/01/25	05/31/25	May 2025	37.11	31.07	36.52	33.52	34.47	28.48	40.65	35.68	37.54	31.28	4.21	4.27	4.04	3.98	4.06	4.00	3.75	3.49	4.24	4.07	4.05	3.95	
06/01/25	06/30/25	Jun 2025	41.57	33.46	43.41	36.26	39.20	30.82	45.48	38.14	43.24	34.58	4.23	4.29	4.09	3.97	4.04	3.99	3.70	3.46	4.23	4.06	4.04	3.90	
07/01/25	07/31/25	Jul 2025	48.52	42.40	50.10	43.49	48.59	41.54	50.00	45.44	50.03	46.04	4.27	4.32	4.13	4.00	4.09	4.00	3.76	3.55	4.27	4.10	4.08	3.96	
08/01/25	08/31/25	Aug 2025	49.44	41.31	51.58	44.03	51.02	43.69	53.50	46.77	53.71	48.06	4.31	4.43	4.13	4.08	4.17	4.09	3.91	3.53	4.35	4.18	4.16	4.12	
09/01/25	09/30/25	Sep 2025	49.68	41.96	49.50	43.21	50.91	43.63	56.07	48.39	53.58	48.12	4.20	4.36	4.06	4.00	4.08	3.99	3.88	3.55	4.27	4.10	4.08	4.08	
10/01/25	10/31/25	Oct 2025	44.87	38.95	44.26	39.90	46.74	40.33	51.13	45.19	49.46	46.14	4.22	4.43	4.07	4.04	4.12	4.03	3.90	3.55	4.31	4.14	4.12	4.11	
11/01/25	11/30/25	Nov 2025	45.32	39.70	45.42	40.24	46.82	40.63	51.59	46.02	50.43	46.50	4.27	4.45	4.12	4.16	4.22	4.16	3.94	3.79	4.43	4.26	4.23	4.19	
12/01/25	12/31/25	Dec 2025	46.87	42.06	46.54	41.22	49.24	41.41	52.44	47.76	51.61	47.53	4.53	4.67	4.45	4.39	4.45	4.39	4.16	3.90	4.66	4.49	4.47	4.42	
01/01/26	01/31/26	Jan 2026	51.16	45.04	47.62	42.32	50.84	43.00	55.53	49.96	52.98	48.96	4.75	4.89	4.72	4.62	4.68	4.60	4.38	4.07	4.89	4.72	4.70	4.65	
02/01/26	02/28/26	Feb 2026	47.97	44.00	47.08	42.72	48.42	43.20	54.08	49.71	51.64	49.09	4.79	4.93	4.72	4.66	4.73	4.66	4.43	4.08	4.93	4.76	4.73	4.70	
03/01/26	03/31/26	Mar 2026	44.34	42.29	42.06	39.97	42.56	39.91	48.26	45.88	46.77	46.30	4.63	4.71	4.50	4.45	4.52	4.46	4.31	3.80	4.72	4.55	4.52	4.58	
04/01/26	04/30/26	Apr 2026	41.31	36.33	38.76	35.99	39.10	33.98	40.67	38.31	38.90	34.30	4.46	4.54	4.28	4.25	4.33	4.26	4.12	3.53	4.51	4.35	4.32	4.32	
05/01/26	05/31/26	May 2026	37.39	31.44	37.77	34.76	34.58	28.67	41.78	36.58	38.68	32.19	4.33	4.38	4.16	4.05	4.14	4.08	3.82	3.58	4.32	4.15	4.13	4.02	
06/01/26	06/30/26	Jun 2026	44.19	35.40	45.28	37.76	41.47	32.59	48.83	40.72	45.69	37.04	4.35	4.39	4.22	4.07	4.14	4.08	3.76	3.57	4.33	4.16	4.14	3.96	
07/01/26	07/31/26	Jul 2026	49.78	45.76	51.69	45.16	49.94	44.04	52.83	46.95	52.34	48.85	4.39	4.45	4.25	4.09	4.20	4.11	3.86	3.66	4.36	4.19	4.17	4.06	
08/01/26	08/31/26	Aug 2026	49.60	42.47	52.19	44.95	51.93	44.69	55.12	47.87	54.89	49.70	4.42	4.58	4.28	4.20	4.28	4.21	4.03	3.72	4.46	4.29	4.27	4.23	
09/01/26	09/30/26	Sep 2026	49.90	42.35	49.68	43.60	51.17	43.78	56.55	48.83	54.00	48.41	4.31	4.51	4.16	4.11	4.20	4.12	3.93	3.67	4.37	4.20	4.18	4.14	
10/01/26	10/31/26	Oct 2026	44.97	39.52	44.75	40.62	47.49	41.09	51.28	45.87	49.37	46.79	4.34	4.55	4.17	4.16	4.22	4.16	3.96	3.66	4.43	4.26	4.23	4.17	
11/01/26	11/30/26	Nov 2026	45.83	40.96	45.41	40.76	48.29	41.49	52.67	47.20	51.34	47.66	4.41	4.66	4.24	4.28	4.35	4.28	4.07	3.96	4.54	4.37	4.35	4.31	
12/01/26	12/31/26	Dec 2026	46.24	42.92	46.08	41.50	48.95	41.62	52.60	48.66	51.52	48.17	4.67	4.80	4.60	4.51	4.59	4.51	4.29	3.90	4.79	4.61	4.59	4.55	
01/01/27	01/31/27	Jan 2027	53.05	47.10	48.85	44.17	52.86	45.39	56.72	51.45	54.62	51.19	4.97	5.12	5.00	4.85	4.92	4.84	4.61	4.36	5.13	4.96	4.93	4.88	
02/01/27	02/28/27	Feb 2027	49.42	45.50	48.12	44.17	50.05	45.01	55.39	51.13	53.46	50.95	5.01	5.15	4.96	4.88	4.95	4.87	4.64	4.37	5.16	4.98	4.96	4.90	
03/01/27	03/31/27	Mar 2027	45.70	43.80	43.08	41.60	44.09	41.40	48.90	47.13	47.74	48.39	4.83	4.92	4.72	4.65	4.73	4.66	4.53	4.17	4.93	4.75	4.73	4.79	
04/01/27	04/30/27	Apr 2027	42.83	37.98	39.86	37.21	40.54	35.60	41.86	39.68	39.90	35.88	4.64	4.72	4.46	4.42	4.50	4.46	4.28	3.91	4.69	4.52	4.50	4.48	
05/01/27	05/31/27	May 2027	38.87	32.89	39.36	36.37	36.06	30.10	42.87	38.06	40.02	33.71	4.50	4.54	4.34	4.24	4.33	4.29	4.06	3.82	4.50	4.33	4.31	4.26	
06/01/27	06/30/27	Jun 2027	46.13	36.94	47.09	39.17	43.46	34.08	50.40	42.38	47.20	38.67	4.53	4.56	4.41	4.22	4.33	4.29	4.01	3.82	4.49	4.32	4.30	4.21	
07/01/27	07/31/27	Jul 2027	51.17	47.37	53.01	46.52	51.46	45.57	53.81	48.19	53.49	50.59	4.57	4.64	4.41	4.26	4.36	4.32	4.07	3.91	4.53	4.36	4.34	4.28	
08/01/27	08/31/27	Aug 2027	51.01	43.52	53.44	46.00	53.55	45.90	56.32	48.80	56.16	50.90	4.61	4.72	4.44	4.33	4.44	4.38	4.17	3.91	4.60	4.43	4.41	4.37	
09/01/27	09/30/27	Sep 2027	51.48	43.76	51.09	44.96	53.08	45.42	58.14	50.35	55.49	50.36	4.57	4.74	4.44	4.33	4.42	4.37	4.22	4.01	4.60	4.43	4.41	4.43	
10/01/27	10/31/27	Oct 2027	46.79	41.78	46.58	42.55	49.58	43.13	53.19	47.96	51.66	48.86	4.61	4.85	4.45	4.45	4.52	4.45	4.38	4.05	4.72	4.55	4.53	4.59	
11/01/27	11/30/27	Nov 2027	49.00	43.93	48.08	43.50	51.59	44.18	55.79	50.42	54.67	50.78	4.76	5.03	4.58	4.64	4.74	4.69	4.56	4.37	4.91	4.74	4.71	4.81	
12/01/27	12/31/27	Dec 2027	49.66	45.96	48.63	44.37	52.91	44.97	55.47	51.55	55.20	51.61	5.05	5.21	5.01	4.93	5.01	4.93	4.89	4.44	5.21	5.03	5.01	5.15	
46753	46783	46753	53.62157	47.41025	48.66011	44.22714	53.76167	45.84451	57.10646	51.55694	54.79902	51.23956	4.9178	5.0822	4.9589	4.8082	4.8767	4.7808	4.7945	4.3699	5.0866	4.9137	4.8874	5.0623	
46784	46812	46784	49.29933	45.70711	47.63989	44.15713	50.4538	45.30156	54.89824	51.11092	52.77855	50.96275	4.9589	5.0959	4.9178	4.8356	4.9041	4.8219	4.8219	4.3836	5.1129	4.9404	4.9145	5.0875	
46813	46843	46813	46.3115	44.27618	43.31179	41.77023	44.34589	41.70078	48.88602	46.74614	47.58997	48.27832	4.8219	4.8904	4.6849	4.6438	4.726	4.6575	4.5617	4.137	4.9193	4.7473	4.7221	4.8232	
46844	46873	46844	44.36021	39.46004	41.17332	38.35313	42.47093	37.16448	42.46689	40.24873	40.77805	36.74061	4.6712	4.7397	4.4795	4.4658	4.548	4.5069	4.411	4.0411	4.7303	4.5618	4.5407	4.6102	

46874	46904	46874	41.957	35.3119	40.52275	37.53541	39.13383	32.48948	45.31499	40.41272	41.79734	35.67508	4.6712	4.6986	4.5206	4.3973	4.5069	4.4521	4.2466	4.0548	4.6616	4.4932	4.4721	4.4453		
46905	46934	46905	48.66965	38.7579	48.78303	40.65685	45.80172	35.86685	52.69165	44.18613	48.97569	40.39397	4.7123	4.726	4.5891	4.3836	4.5069	4.4384	4.274	4.0822	4.6488	4.4801	4.4587	4.4747		
46935	46965	46935	53.60385	50.05066	54.8414	48.35958	53.71466	47.96481	55.82287	49.93904	55.16341	52.41426	4.7808	4.7945	4.6438	4.4521	4.5617	4.4932	4.3288	4.2055	4.7185	4.5494	4.5275	4.5319		
46966	46996	46966	53.1897	45.98606	55.28506	47.64448	55.58846	47.74992	58.48312	50.68496	57.98394	52.91246	4.8219	4.9178	4.6438	4.548	4.6438	4.5617	4.5069	4.2329	4.8154	4.646	4.6238	4.7122		
46997	47026	46997	52.53377	45.54515	51.74054	46.37871	54.34256	47.04387	59.10674	52.15807	56.20866	52.0766	4.7671	4.9041	4.6575	4.548	4.6301	4.548	4.5206	4.3973	4.8156	4.6461	4.6238	4.7264		
47027	47057	47027	49.09339	43.51264	47.05648	43.65185	52.18463	45.16978	55.08423	49.51244	53.38468	50.73085	4.8082	4.9863	4.6986	4.6438	4.7123	4.6164	4.5891	4.4521	4.9128	4.7429	4.7201	4.7976		
47058	47087	47058	51.48529	45.86753	49.76627	45.08644	54.50844	46.42111	57.95094	51.98861	56.5147	52.61279	4.9178	5.1233	4.8082	4.8082	4.9178	4.8356	4.8356	4.6438	5.0772	4.9073	4.8845	5.0834		
47088	47118	47088	52.07705	48.47046	50.14183	46.1241	55.42999	47.52393	57.2858	53.60482	56.6693	53.59591	5.2055	5.3699	5.1781	5.0959	5.1507	5.0548	5.0685	4.7397	5.3696	5.1982	5.1736	5.3264		
47119	47149	47119	56.24429	49.64114	51.53102	46.49169	56.62361	47.78579	59.99486	54.06123	57.89392	53.60336	5.222	5.39	5.194	5.166	5.236	5.124	5.152	4.746	5.4444	5.2714	5.2452	5.4198		
47150	47177	47150	52.72486	48.14145	50.58743	46.87935	53.98272	47.92002	58.69775	53.76245	56.23289	53.92925	5.264	5.418	5.18	5.194	5.25	5.166	5.18	4.76	5.4713	5.2987	5.2728	5.4456		
47178	47208	47178	48.6797	46.77671	45.32321	44.00143	46.92987	44.23191	51.02962	49.21805	49.14469	50.6114	5.096	5.18	4.97	4.984	5.054	4.956	4.956	4.48	5.2594	5.0874	5.0623	5.2175		
47209	47238	47209	46.05749	40.5957	42.46083	39.01702	43.94025	38.21484	43.41804	41.25394	41.43803	36.9708	4.914	4.984	4.774	4.704	4.802	4.746	4.676	4.186	4.9686	4.8001	4.7789	4.8753		
47239	47269	47239	41.70009	34.64994	41.27454	38.12559	38.82682	31.80395	44.99829	39.72877	41.66136	35.33255	4.76	4.788	4.62	4.508	4.606	4.55	4.354	4.116	4.7723	4.6039	4.5829	4.5528		
47270	47299	47270	47.68262	37.99639	48.42083	40.67677	44.72121	35.08971	51.52913	43.28931	47.67683	39.13825	4.802	4.816	4.676	4.494	4.592	4.55	4.382	4.13	4.7593	4.5906	4.5692	4.5828		
47300	47330	47300	54.12915	50.35065	55.65569	49.37964	54.19645	48.4465	56.21031	49.99821	54.97412	52.73262	4.844	4.872	4.69	4.508	4.62	4.522	4.396	4.172	4.7744	4.6053	4.5835	4.5991		
47331	47361	47331	54.19891	46.07411	56.25394	48.63196	56.73375	48.65327	59.49723	50.85115	58.0791	53.17978	4.886	4.97	4.704	4.606	4.718	4.634	4.578	4.214	4.8735	4.704	4.6818	4.7834		
47362	47391	47362	54.3832	46.69706	53.97506	48.19469	55.81084	48.48459	61.25755	53.49103	58.02806	53.08709	4.774	4.956	4.648	4.564	4.648	4.55	4.508	4.326	4.8317	4.6622	4.6399	4.7139		
47392	47422	47392	50.01402	43.57189	49.58953	44.95266	52.94905	45.58769	56.26839	49.83345	54.14437	51.36609	4.802	5.012	4.676	4.648	4.732	4.634	4.606	4.368	4.9169	4.747	4.7243	4.8145		
47423	47452	47423	51.00859	45.99494	49.91849	45.38407	53.76493	46.22612	58.06379	52.19535	56.35264	52.72758	4.914	5.18	4.844	4.872	4.928	4.844	4.858	4.592	5.141	4.9711	4.9483	5.1058		
47453	47483	47453	51.93267	48.36463	50.22109	46.22687	55.2762	47.55856	57.62814	53.27364	56.79752	53.26976	5.18	5.334	5.166	5.11	5.18	5.082	5.096	4.704	5.3837	5.2123	5.1877	5.3539		
47484	47514	47484	57.44552	50.87549	51.89603	47.20016	57.09863	48.78872	61.25773	55.41904	58.86332	54.97952	5.3083	5.4514	5.3226	5.2367	5.3083	5.2224	5.2367	4.8361	5.5151	5.3422	5.3159	5.5045		
47515	47542	47515	53.69151	49.74377	50.81739	47.09428	54.19338	48.79391	59.5337	54.99794	56.99894	54.85552	5.3369	5.48	5.3226	5.2654	5.3369	5.251	5.2654	4.8933	5.5427	5.3701	5.3442	5.5309		
47543	47573	47543	49.75926	47.98238	45.91753	44.84579	47.34119	45.08473	51.57738	50.13889	49.72907	51.19913	5.1938	5.294	5.0507	5.1223	5.1938	5.108	5.1223	4.6072	5.3977	5.2257	5.2005	5.3838		
47574	47603	47574	47.31226	41.98315	43.39326	40.234	44.77546	39.33426	44.86724	42.73035	42.49644	38.71152	5.065	5.1366	4.879	4.8647	4.9649	4.9077	4.8361	4.4641	5.1293	4.9608	4.9397	5.0354		
47604	47634	47604	44.12047	36.88901	43.82417	40.67707	41.10804	33.93753	47.5957	42.34969	44.33086	37.88718	5.0364	5.0937	4.8647	4.8075	4.9077	4.8504	4.7217	4.4498	5.0718	4.9034	4.8824	4.9204		
47635	47664	47635	50.15399	40.8246	50.51614	43.34513	47.10493	37.77963	53.815	46.18115	49.79324	42.12843	5.0794	5.108	4.9363	4.7932	4.9077	4.8504	4.7503	4.507	5.0585	4.8898	4.8683	4.951		
47665	47695	47665	58.12598	53.82427	58.14444	51.5671	57.06098	51.06469	59.61921	52.89807	57.75742	55.70086	5.1509	5.1795	4.9649	4.8075	4.9363	4.879	4.736	4.6358	5.0739	4.9048	4.883	4.9391		
47696	47726	47696	57.2225	52.27809	58.51469	51.08887	58.90984	51.26323	62.69301	54.28276	60.71776	55.74383	5.1795	5.2797	5.0078	4.9363	5.0507	4.9649	4.9077	4.6644	5.2037	5.0343	5.0121	5.113		
47727	47756	47727	58.17986	51.33454	56.76413	50.69588	58.90641	51.04342	65.2177	57.56377	61.49693	56.54396	5.1366	5.3083	4.9792	5.0078	5.0794	5.0221	5.0078	4.8218	5.2755	5.106	5.0837	5.2137		
47757	47787	47757	53.21693	47.48705	52.09629	47.62895	55.6744	48.24429	59.83936	53.87277	57.11269	54.64012	5.1795	5.3512	4.9935	5.0794	5.1366	5.0364	5.0794	4.8647	5.3483	5.1784	5.1556	5.2879		
47788	47817	47788	54.22413	50.84267	52.56931	48.19725	56.07857	49.08387	61.24258	56.25718	59.36646	56.10522	5.294	5.5229	5.1366	5.294	5.3369	5.2367	5.2797	5.0221	5.5629	5.393	5.3702	5.5274		
47818	47848	47818	55.66975	52.44709	52.62946	49.34383	58.42885	50.99734	61.43273	57.31722	60.57933	57.39756	5.5801	5.7089	5.5229	5.5086	5.5801	5.48	5.5086	5.1795	5.7823	5.6109	5.5863	5.7665		
47849	47879	47849	59.16827	52.30113	52.89101	48.4723	59.09133	50.30567	62.61859	56.37625	60.84391	56.92829	5.4689	5.6298	5.4397	5.4251	5.4982	5.3958	5.4104	5.0741	5.7034	5.5305	5.5042	5.6782		
47880	47907	47880	55.02939	51.09288	52.62269	48.81666	55.86266	50.26885	60.64288	55.969	58.68935	56.13982	5.5128	5.6737	5.3958	5.4689	5.542	5.4397	5.4543	5.1472	5.7462	5.5737	5.5478	5.7199		
47908	47938	47908	51.30336	49.30501	47.2097	46.12175	48.85272	46.42519	52.86287	51.33636	51.32963	52.89533	5.3666	5.4982	5.2057	5.3227	5.3812	5.3227	5.3081	4.7963	5.5981	5.4261	5.4009	5.5696		
47939	47968	47939	49.53538	44.51331	45.63664	42.67148	47.13203	41.86665	46.5729	44.66204	44.64708	41.59609	5.2057	5.3081	5.0449	5.0449	5.1326	5.0887	5.0156	4.6208	5.3094	5.141	5.1198	5.2149		
47969	47999	47969	46.09616	39.49327	44.69273	42.06973	43.12775	36.48637	49.00629	44.24702	45.52328	40.18198	5.1619	5.2203	5.001	4.9279	5.0302	4.9718	4.8548	4.5769	5.1922	5.0238	5.0027	5.0535		
48000	48029	48000	52.46029	42.13524	52.33939	44.53437	49.35802	39.05986	55.48205	47.36177	51.86009	43.64217	5.2057	5.235	5.0449	4.9279	5.0302	4.9718	4.8694	4.6062	5.1932	5.0244	5.003	5.0701		
48030	48060	48030	59.7868	55.41381	59.72007	52.95642	58.82782	52.70047	60.66467	53.92317	59.18634	57.29017	5.3081	5.3373	5.1326	4.9718	5.1034	5.0449	4.884	4.6939	5.2381	5.0691	5.0472	5.0871		
48061	48091	48061	58.66562	53.87239	60.07182	52.77315	60.57384	53.11817	63.90736	55.72689	62.50474	57.7192	5.3373	5.4397	5.1472	5.0887	5.1911	5.1326	5.0741	4.7378	5.3562	5.1868	5.1645	5.2795		
48092	48121	48092	58.92869	51.7523	57.85386	51.39674	60.17697	51.89186	65.99397	58.22034	62.85754	57.92527	5.235	5.4251	5.0741	5.1034	5.1765	5.1034	5.1034	4.8548	5.371	5.2016	5.1792	5.3092		
48122	48152	48122	54.02772	48.09037	51.8376	47.73998	56.56504	49.0048	60.34219	54.46826	57.91478	55.23385	5.2642	5.4836	5.1034	5.1911	5.2642	5.1472	5.1911	4.9279	5.46	5.2901	5.2674	5.3996		
48153	48182	48153	54.72	51.69847	53.81838	49.4644	57.28781	50.53391	61.64595	56.95781	60.19245	57.39466	5.3373	5.5859	5.2057	5.3666	5.4104	5.3227	5.3373	5.001	5.6355	5.4656	5.4428	5.5851		
48183	48213	48183	57.03426	53.36917	53.41269	49.86292	60.42588	51.66972	61.71222	57.87255	62.14641	58.70752	5.6444	5.8199	5.5859	5.5713	5.6444	5.542	5.5713	5.3812	5.845	5.6736	5.649	5.8292		
48214	48244	48214	61.8375	54.76988	55.20182	50.65267	61.54898	52.56273	65.24767	59.06532	63.29362	59.34388	5.7536	5.933	5.7237	5.7237	5.7835	5.6789	5.7088	5.4697	6.0021	5.8292	5.8029	5.9766		
48245	48273	48245	57.61111	53.86344	54.85605	50.93368	58.13518	52.67284	63.24664	58.52137	60.83347	58.44064	5.7985	5.9778	5.7088	5.7686	5.8284	5.7237	5.7536	5.5145	6.0459	5.8733	5.8474	6.0192		
48274	48304	48274	53.18681	51.05398	48.91991	47.81183	50.64075	47.97742	54.62833	53.39315	53.12069	55.01731	5.5594	5.7237	5.4099	5.5295	5.5892	5.4996	5.5145	5.2306	5.8049	5.6329	5.6077	5.776		
48305	48334	48305	50.83511	45.8654	47.02506	44.0146	48.02757	42.97354	48.68234	46.37447	46.35305	43.39835	5.3501	5.5145	5.1409	5.2605	5.3202	5.2754	5.2007	4.9167	5.525	5.3566	5.3354	5.3999		
48335	48365	48335	46.08932	39.24627	45.34523	42.80496	42.94605	36.12422	49.40402	44.54957	46.03758	40.83991	5.2455	5.2754	5.0662	4.9765	5.0961	5.0064	4.9466	4.8121	5.2409	5.0724	5.0514	5.1454		
48366	48395	48366	54.68172	43.90032	54.00626	45.97206	51.54405	40.73163	57.62724	49.46706	53.73654	46.12574	5.2754	5.3202	5.126	4.9765	5.0961	5.0363	4.9466	4.842	5.2418	5.0731	5.0517	5.1474		
48396	48426	48396	61.04368	56.55006	60.50545	53.77874	59.55078	53.56091	61.67231	55.03215	59.71522	58.27231	5.3651	5.4099	5.1857	5.0214	5.1559	5.0811	4.9317	4.8121	5.2877	5.1187	5.0968	5.1348		
48427	48457	48427	59.94233	54.4542	61.56729	53.73848	61.61271	53.89342	65.5183	56.9084	64.04676	58.91581	5.4099	5.5743	5.2007	5.2156	5.3053	5.2306	5.1708	4.8869	5.4831	5.3137	5.2914	5.3762		
48458	48487	48458	59.01266	52.25364	58.4189	52.10503	60.3878	52.33482	66.39497	59.01614	63.11986	58.62885	5.2904	5.5295	5.126	5.2156	5.2754	5.2007	5.1857	4.9317	5.4833	5.3138	5.2915	5.3916		
48488	48518	48488	55.10106	49.35419	53.90416	49.33877	57.9081	50.459	61.32351	55.49555	59.04785	56.37463	5.3352	5.5743	5.1409	5.3053	5.3651	5.2754	5.2754	4.9915	5.5742	5.4043	5.3816	5.4839		
48519	48548	48519	56.99067	52.14503	53.81889	49.9654	60.01148	51.95173	64.00138	58.37708	61.98985	58.66427	5.4547	5.7387	5.3202	5.4846	5.5743	5.4846	5.4846	5.111	5.7536	5.5837	5.5609	5.7324		
48549	48579	48549	58.60703	54.91209	54.32961	50.87388	61.70004	53.03276	63.23344	59.54469	62.97134	59.84424	5.7237	5.933	5.6789	5.7237	5.7835	5.6789	5.6939	5.5295	5.9975	5.826	5.8015	5.9517		
48580	48610	48580	63.56848	56.23767	56.21464	51.74547	62.93377	54.16093	66.73563	60.36607	64.50261	60.55894	5.8344	6.0329	5.8344	5.8497	5.9108	5.7886	5.8191	5.6053	6.128	5.9551	5.9288	6.0869		
48611	48638	48611	59.09261	55.036	55.88757	51.83845	59.36697	53.59544	64.86178	59.83536	62.01184	59.76603	5.8802	6.0788	5.8191	5.8802	5.9413	5.8497	5.8497	5.6511	6.1575	5.9849	5.959	6.1153		
48639	48669	48639	54.49696	52.17146	49.89548	48.63305	51.65553	48.9478	56.18663	54.78216	54.36226	56.04493	5.6511	5.8191	5.4678	5.6664	5.7428	5.6511	5.6511	5.254	5.9418	5.7698	5.7446	5.9126		
48670	48699	48670	51.80444	47.10167	47.90103	45.18479	48.89833	44.11146	49.63087	47.83723	46.91488	45.16479	5.4067	5.6358	5.1929	5.4067	5.4526	5.3915	5.3151	4.9944	5.6713	5.5028	5.4817	5.5143		
48700	48730	48700	48.09576	41.11844	47.47326	44.64305	44.87592	37.95073	51.21543	46.51385	48.00496	43.03213	5.3762	5.4678	5.1776	5.1624	5.2693	5.2082	5.0707	4.918	5.4267	5.2583	5.2372	5.2695		
48731	48760	48731	56.54815	45.70387	55.71179	47.5135	53.2662	42.52526	59.5151	51.2825	55.26065	48.02529	5.4067	5.4678	5.2387	5.1624	5.2693	5.2082	5.0707	4.9638	5.4276	5.2589	5.2375	5.2715		
48761	48791	48761	63.63174	58.33436	62.42266	55.56876	61.85093	55.45602	64.17266	57.07738	61.65361	59.81417	5.5137	5.6053	5.3457	5.2693	5.4373	5.3762	5.1471	5.0555	5.5357	5.3666	5.3448	5.3502		
48792	48822	48792	62.48674	57.34791	63.56366	55.44485	63.62039	55.55015	67.62794	58.94027	65.62778	60.6715	5.5595	5.7428	5.3304	5.4526	5.5442	5.4678	5.3762	5.1013	5.72	5.5506	5.5284	5.5816		
48823	48852	48823	61.21326	54.83304	59.93481	53.61988	61.78459	53.86825	68.05857	61.14869	64.50166	60.16678	5.4678	5.7275	5.2846	5.4373	5.4984	5.3915	5.3762	5.1166	5.705	5.5355	5.5132	5.5821		
48853	48883	48853	56.78381	51.20351	55.33773	50.47857	59.408	51.64123	63.2705	57.51596	60.67417	58.01674	5.4984	5.7733	5.2998	5.4984	5.5595	5.4678	5.4984	5.1624	5.7673	5.5974	5.5746	5.7069		
48884	48913	48884	58.45275	54.45202	55.68708	51.68502	61.40296	53.43338	65.52798	60.36915	63.42418	60.41626	5.6053	5.8955	5.4678	5.6664	5.758	5.6511	5.7275	5.2693	5.9353	5.7654	5.7427	5.9752		
48914	48944	48914	61.06325	57.2598	56.25448	52.66065	63.94394	55.30418	65.515	61.75876	64.8972	61.89358	5.926	6.1551	5.8802	5.9413	6.094	5.9719	6.0788	5.6053	6.215	6.0436	6.019	6.3367		
48945	48975	48945	65.78053	58.19349	57.78672	53.36813	65.09157	55.98427	67.75894	61.39062	66.29978	62.61568	6.0096	6.2593	5.9784	6.0564	6.1969	6.0876	6.2125	5.6662	6.3347	6.1618	6.1356	6.4803		
48976	49003	48976	60.30568	56.48917	56.9588	52.97783	60.90062	55.00974	65.31633	61.03985	63.24794	61.56754	6.0564	6.2905	5.9471	6.0876	6.2281	6.1188	6.2281	5.7286	6.3649	6.1924	6.1665	6.4937		
49004	49034	49004	56.2257	53.81001	51.19438	50.02899	53.31834	50.52378	57.41508	56.1097	55.94833	57.90567	5.8379	6.0252	5.635	5.8691	5.9159	5.8223	5.8691	5.2759	6.1445	5.9725	5.9473	6.1306		
49035	49064	49035	53.8848	49.48964	49.54488	46.63592	50.84884	46.35714	50.49835	48.82728	48.35783	46.61268	5.6037	5.8067	5.3852	5.5881	5.635	5.5569	5.5101	5.0106	5.8527	5.6842	5.6631	5.7093		
49065	49095	49065	51.63173	44.69799	49.39171	46.64217	48.33555	41.45862	53.61364	49.26817	50.26485	46.24294	5.5725	5.6974	5.354	5.432	5.5413	5.4789	5.3228	4.9638	5.6964	5.528	5.5069	5.5215		
49096	49125	49096	58.81812	47.4585	57.43287	49.25497	55.45576	44.2034	60.68584	52.46169	56.56487	50.15522	5.6037	5.6974	5.4633	5.3852	5.5257	5.4789	5.2916	4.995	5.6505	5.4818	5.4604	5.4923		

49126	49156	49126	65.46466	60.17657	64.02905	56.99479	63.41518	57.0703	64.87936	58.19578	62.81056	61.49372	5.6818	5.7911	5.4945	5.4476	5.5881	5.5101	5.3072	5.073	5.714	5.545	5.5231	5.5103
49157	49187	49157	64.25231	58.76803	64.96409	56.66295	64.87915	56.67751	68.67506	59.72969	67.11184	62.33757	5.713	5.9315	5.4633	5.6193	5.6974	5.6037	5.5413	5.1199	5.8868	5.7174	5.6952	5.7467
49188	49217	49188	60.78207	55.05301	59.90585	54.19548	62.11829	54.52728	67.53344	60.75451	64.50499	60.92613	5.5101	5.7911	5.354	5.5101	5.5569	5.4476	5.4633	5.1511	5.7778	5.6083	5.586	5.6691
49218	49248	49218	57.1228	51.66448	54.4911	50.38794	60.22639	52.44214	63.02554	57.57819	60.84774	58.66147	5.5569	5.8223	5.3852	5.5569	5.6193	5.5257	5.5569	5.1979	5.8258	5.6559	5.6332	5.7654
49249	49278	49249	59.03944	54.94207	57.01078	52.0584	62.26558	54.24583	65.57779	60.47089	63.71362	60.82669	5.6037	5.8847	5.4633	5.6506	5.7598	5.6506	5.7598	5.2291	5.9195	5.7496	5.7268	6.0076
49279	49309	49279	61.8094	58.65321	56.73424	53.78438	65.01499	56.95903	64.91064	62.06169	65.27451	63.39686	5.9315	6.1969	5.8847	5.9471	6.1345	6.0252	6.1501	5.6193	6.2208	6.0494	6.0249	6.408
49310	49340	49310	66.43557	58.82576	57.89792	53.6021	65.20831	56.1636	68.23559	62.49907	66.34824	62.84731	6.0301	6.2535	6.0142	6.078	6.2535	6.1099	6.2854	5.727	6.3563	6.1834	6.1571	6.5531
49341	49368	49341	61.49917	57.41961	57.56237	53.33296	61.91832	55.62053	66.89483	62.17581	64.07899	61.98515	6.078	6.3013	5.9982	6.1099	6.2854	6.1577	6.3013	5.743	6.3872	6.2146	6.1887	6.5669
49369	49399	49369	57.35144	55.00242	51.81867	50.73048	54.41909	51.62758	58.43636	57.47857	56.34644	58.97337	5.8865	6.1099	5.7111	5.9185	5.9982	5.8865	5.9663	5.5834	6.1939	6.0219	5.9967	6.2278
49400	49429	49400	54.80805	50.08839	50.01782	46.90828	51.68702	46.937	50.93063	49.36018	48.86724	47.04203	5.6951	5.9025	5.4718	5.6951	5.727	5.6313	5.6792	5.2963	5.9597	5.7912	5.77	5.8784
49430	49460	49430	51.83029	44.00727	50.55813	47.72226	48.46421	40.68923	54.19146	49.30184	51.12062	46.85653	5.7111	5.8865	5.5515	5.6632	5.727	5.6632	5.5834	5.2484	5.9275	5.7591	5.7381	5.7822
49461	49490	49461	58.40736	47.31425	57.23495	49.84314	54.98547	43.91058	60.23924	52.41921	56.15042	50.021	5.743	5.8546	5.6154	5.5675	5.6951	5.6154	5.4877	5.073	5.8328	5.6641	5.6426	5.6885
49491	49521	49491	67.8727	61.59134	65.89167	58.40937	65.32388	58.36196	67.19936	59.74693	64.74497	62.83379	5.8387	5.9663	5.6951	5.6792	5.8068	5.6951	5.5834	5.1368	5.9456	5.7765	5.7546	5.7866
49522	49552	49522	66.56094	60.60912	66.62124	58.11509	66.80701	58.32404	71.39977	62.14001	68.83439	63.89606	5.8865	6.078	5.6792	5.8068	5.8865	5.7589	5.743	5.3123	6.0742	5.9048	5.8826	5.9484
49553	49582	49553	64.55505	58.02354	63.11218	56.29495	64.94671	56.73196	71.82327	64.62474	68.77229	63.34849	5.7111	5.9344	5.5515	5.727	5.7589	5.6313	5.6792	5.3282	5.9947	5.8252	5.8029	5.885
49583	49613	49583	59.91716	53.38675	57.38971	52.2585	62.01975	53.52851	66.12686	59.94005	63.13158	60.19437	5.727	5.9663	5.5675	5.743	5.8227	5.7111	5.743	5.3442	6.0119	5.842	5.8192	5.9515
49614	49643	49614	60.35952	56.53087	56.70445	52.06987	62.45985	54.72076	67.23695	62.22609	64.66499	62.00321	5.7908	6.0939	5.6951	5.8387	6.0142	5.8865	6.0142	5.4239	6.1076	5.9377	5.915	6.2619
49644	49674	49644	64.50568	59.94291	58.14291	54.4221	66.28584	57.84792	67.3584	63.68055	67.23589	64.50762	6.1099	6.3492	6.062	6.1099	6.3013	6.1897	6.3013	5.6632	6.3836	6.2122	6.1876	6.5592
49675	49705	49675	69.20329	61.41862	60.53316	56.01699	67.89931	58.64371	71.67341	65.74503	69.38367	65.68068	6.2769	6.603	6.2443	6.3584	6.603	6.4726	6.603	5.6737	6.6368	6.4639	6.4376	6.8708
49706	49734	49706	63.47897	59.24517	58.94159	54.86906	63.48167	57.25581	68.50135	63.76487	65.83945	63.92811	6.3258	6.5215	6.2443	6.3258	6.4563	6.3584	6.4563	5.9671	6.6031	6.4306	6.4047	6.7218
49735	49765	49735	59.47783	56.90092	53.45138	52.25825	56.37756	53.44948	60.90528	59.13369	58.45424	60.43064	6.1302	6.3258	5.9671	6.1465	6.228	6.1139	6.2117	5.853	6.4219	6.2499	6.2247	6.4732
49766	49795	49766	56.46708	51.70649	51.56767	48.37962	53.36118	48.49372	52.81326	51.28473	50.68555	48.95848	5.9345	6.0976	5.7389	5.9182	5.9508	5.8693	5.853	5.5106	6.1828	6.0143	5.9932	6.0523
49796	49826	49796	53.64605	46.12714	52.37022	49.60653	50.18869	42.70718	56.25918	51.34539	52.86702	49.01272	5.9508	6.0976	5.7878	5.8856	5.9345	5.853	5.8041	5.478	6.15	5.9815	5.9605	6.0028
49827	49856	49827	61.31516	50.40324	60.04984	52.34968	57.79269	46.93548	62.95184	55.2044	58.7835	52.87561	5.9834	6.0813	5.8693	5.7552	5.9182	5.8204	5.6737	5.2335	6.0205	5.8518	5.8303	5.8744
49857	49887	49857	69.77823	63.3374	67.86794	60.03265	67.23499	60.00049	69.15156	61.48063	66.73236	64.97174	6.0813	6.1628	5.9345	5.853	6.0161	5.8693	5.7389	5.2661	6.1194	5.9503	5.9285	5.942
49888	49918	49888	68.34226	62.82074	68.73923	60.31479	68.2767	60.5922	73.19513	64.33283	71.02498	65.84666	6.1302	6.3258	5.9345	6.065	6.1302	6.0161	5.9834	5.5596	6.3324	6.163	6.1408	6.1888
49919	49948	49919	66.41863	59.6185	65.24021	57.8673	67.00121	58.50529	74.11552	66.5685	70.94698	65.55373	5.9345	6.1628	5.7878	5.9345	5.9834	5.853	5.9019	5.5596	6.2022	6.0327	6.0104	6.1078
49949	49979	49949	61.92791	55.69437	58.65403	53.55107	63.78862	54.95077	68.40946	62.40647	65.03049	61.9657	5.9671	6.228	5.8041	5.9671	6.065	5.9508	5.9997	5.5759	6.2361	6.0662	6.0434	6.2083
49980	50009	49980	62.99207	59.25116	58.45719	54.31256	64.44478	56.96503	69.62865	64.48726	66.9427	64.37029	6.0324	6.3258	5.9345	6.065	6.2606	6.1302	6.2443	5.6737	6.3339	6.164	6.1412	6.492
50010	50040	50010	66.55893	61.84574	59.79703	56.04055	69.02423	59.52012	69.52286	65.73964	69.25237	66.44179	6.3584	6.5541	6.3258	6.3258	6.5378	6.4073	6.5378	5.8367	6.5995	6.4281	6.4035	6.7957
50041	50071	50041	69.91975	63.47165	61.85007	57.6535	69.69156	60.67555	73.67155	67.88137	71.21848	67.94298	6.415	6.7483	6.3817	6.4817	6.7483	6.615	6.7649	5.8318	6.76	6.5871	6.5608	7.0327
50072	50099	50072	65.4977	61.41295	60.44557	56.66619	66.00702	59.49405	71.3715	66.42918	67.96806	66.07864	6.465	6.7149	6.3983	6.4483	6.7316	6.615	6.7483	5.9485	6.7256	6.5531	6.5272	7.0138
50100	50130	50100	61.46461	58.64487	54.71944	53.44372	58.22163	55.12271	61.61384	60.44167	59.8886	61.80632	6.265	6.465	6.1151	6.2817	6.3817	6.265	6.3484	5.9984	6.5571	6.3851	6.3599	6.6099
50131	50160	50131	59.24396	54.41847	53.71431	50.61815	55.99417	51.0043	54.56116	53.39164	52.34838	51.66793	6.0651	6.2484	5.8818	6.0651	6.0984	5.9651	6.0151	5.6819	6.3297	6.1612	6.14	6.2144
50161	50191	50161	57.83534	50.67509	53.82998	51.10087	54.27312	47.19532	58.4696	54.2067	54.51147	51.42054	6.0818	6.2484	5.9318	6.0484	6.0984	5.9651	5.9485	5.6652	6.3128	6.1444	6.1233	6.1472
50192	50221	50192	65.25905	53.37462	62.272	54.19003	61.64282	49.86877	65.50777	57.65863	61.01794	55.52757	6.1151	6.2317	6.0484	5.9485	6.0651	5.9818	5.8318	5.4153	6.2137	6.045	6.0236	6.0326
50222	50252	50222	72.48485	65.48596	69.97362	61.98906	69.43893	62.01335	71.62461	63.61118	68.8726	67.18538	6.2151	6.3317	6.0984	6.0318	6.1651	6.0151	5.8985	5.3819	6.2982	6.1291	6.1073	6.1016
50253	50283	50253	70.87042	64.79931	70.34595	61.93401	69.90887	62.04169	74.99809	66.30211	72.60597	68.00127	6.265	6.4983	6.0818	6.2317	6.2817	6.1817	6.1651	5.7985	6.4992	6.3298	6.3075	6.3704
50284	50313	50284	68.74854	61.96682	66.74767	59.56498	68.82168	60.235	76.13823	68.85593	72.92425	67.48087	6.0818	6.3484	5.9485	6.0651	6.1317	6.0151	6.0651	5.6819	6.3328	6.1633	6.141	6.271
50314	50344	50314	63.63064	57.90898	59.13301	54.15826	64.71806	56.20525	69.50919	63.84476	66.06925	63.31383	6.0984	6.365	5.9318	6.0984	6.1817	6.0651	6.1151	5.6985	6.3673	6.1974	6.1747	6.3236
50345	50374	50345	64.70838	61.341	60.56861	55.9622	66.75207	58.99448	71.33112	66.41298	68.73326	65.88716	6.1651	6.465	6.0651	6.1984	6.4317	6.315	6.4483	5.8485	6.4673	6.2975	6.2747	6.6961
50375	50405	50375	69.75242	64.39718	61.18689	57.52065	71.15933	61.71222	71.47134	67.71187	70.62055	67.99444	6.4983	6.7483	6.465	6.4983	6.7483	6.615	6.7982	6.0318	6.772	6.6006	6.576	7.0561
50406	50436	50406	72.65905	65.90645	64.05862	59.82808	71.39805	63.13504	75.75537	70.02467	73.11281	70.41854	6.7094	7.1011	6.6924	6.7605	7.1181	6.9478	7.1181	6.0964	7.0388	6.8659	6.8396	7.3859
50437	50464	50437	67.41333	63.80902	61.97929	58.38391	67.47472	61.3982	72.72913	68.61805	69.55611	68.18408	6.7605	7.0159	6.7094	6.7435	7.084	6.9137	7.1351	6.2666	7.0208	6.8482	6.8223	7.4007
50465	50495	50465	64.09041	60.94728	56.96604	55.67056	60.51304	57.32253	64.28125	64.16657	62.17864	65.46564	6.5561	6.7605	6.4029	6.5732	6.6583	6.5561	6.6413	6.2837	6.8486	6.6766	6.6514	6.9028
50496	50525	50496	60.53998	56.18675	55.37778	52.26554	57.07281	52.63665	56.61465	55.81678	53.91135	53.55281	6.3518	6.5391	6.1134	6.3348	6.3858	6.2837	6.3348	5.9772	6.5993	6.4308	6.4097	6.534
50526	50556	50526	57.90503	50.59359	55.52221	53.0102	54.28024	47.04739	59.74184	55.5765	55.99213	53.38906	6.3688	6.5391	6.1985	6.3007	6.3688	6.2326	6.1985	5.875	6.565	6.3966	6.3756	6.3973
50557	50586	50557	67.63377	56.02254	64.4725	56.82242	63.92883	52.43276	66.9649	60.08841	62.68164	58.73353	6.4029	6.5221	6.3007	6.2326	6.3518	6.2326	6.1304	5.7047	6.4979	6.3291	6.3077	6.3312
50587	50617	50587	75.7271	67.73886	72.30118	64.09931	72.51488	64.11366	73.40826	65.74918	70.6988	69.45931	6.505	6.6413	6.3688	6.3177	6.454	6.3348	6.2156	5.6877	6.5841	6.415	6.3932	6.4187
50618	50648	50618	75.16969	67.55076	73.40179	64.31739	72.92173	64.47894	77.9865	68.77308	75.83062	70.89369	6.5561	6.8456	6.3688	6.5221	6.5732	6.454	6.471	6.0623	6.7895	6.6201	6.5979	6.6764
50649	50678	50649	70.56152	63.92506	68.37408	61.49535	70.21451	61.82403	77.76035	71.18625	74.5122	70.15511	6.3518	6.6583	6.1985	6.3518	6.4199	6.3007	6.3518	5.9601	6.6195	6.45	6.4277	6.5577
50679	50709	50679	65.42495	60.14604	61.41877	56.60698	66.70002	58.60115	71.02345	66.15321	67.67368	65.60338	6.3858	6.6924	6.2156	6.3688	6.5391	6.4029	6.5221	5.9772	6.6377	6.4678	6.4451	6.7306
50710	50739	50710	66.23425	63.15675	61.87684	57.68127	69.67652	61.79844	73.61022	68.96413	71.16692	68.66696	6.454	6.8116	6.3518	6.471	6.7945	6.6583	6.8627	6.0964	6.7399	6.57	6.5473	7.1104
50740	50770	50740	72.21371	67.05241	63.43639	59.97214	73.29302	64.05379	73.41042	70.70547	73.23379	71.63612	6.7945	7.084	6.7945	6.7775	7.1181	6.9819	7.1692	6.3688	7.0512	6.8798	6.8552	7.4271
50771	50801	50771	76.13404	68.91055	66.2768	61.81248	73.97735	65.36743	78.20308	72.53933	75.17699	72.56586	6.916	7.3515	6.9334	6.9508	7.3166	7.1773	7.1947	6.2888	7.2292	7.0562	7.03	7.4625
50802	50829	50802	69.9896	65.70428	64.5297	60.54207	70.07171	63.23972	75.22288	71.34177	71.89861	70.42037	6.9682	7.2818	6.916	6.9857	7.3515	7.1947	7.4037	6.4979	7.263	7.0904	7.0645	7.6693
50830	50860	50830	65.82746	62.38429	59.11855	57.275	62.36377	58.69022	65.79615	64.86377	64.00877	66.36788	6.7592	6.9508	6.585	6.7766	6.8637	6.7592	6.8463	6.4805	7.052	6.88	6.8549	7.1078
50861	50890	50861	62.38719	57.89091	56.74112	54.18835	58.81859	54.30646	57.81664	57.65922	54.89259	55.7714	6.5501	6.7418	6.254	6.5327	6.585	6.4456	6.5327	6.1843	6.7973	6.6288	6.6076	6.732
50891	50921	50891	61.11048	53.2772	58.21776	55.40826	57.38707	49.64924	61.96852	58.10553	58.17331	56.07845	6.5676	6.7592	6.3934	6.5501	6.5676	6.4456	6.4456	6.1669	6.8145	6.6461	6.625	6.6444
50922	50951	50922	70.17558	58.64011	66.42161	58.6932	66.44317	54.9761	69.33566	62.45356	64.54022	60.68711	6.6024	6.7592	6.5327	6.4282	6.5676	6.4282	6.3411	5.8882	6.6935	6.5248	6.5033	6.5418
50952	50982	50952	77.98351	69.92716	74.25608	66.29431	74.60482	66.25475	76.05512	68.22225	72.76342	71.17772	6.7069	6.8637	6.6024	6.5327	6.6721	6.5153	6.4282	5.8707	6.7991	6.63	6.6082	6.6313
50983	51013	50983	77.34441	68.994	75.79824	66.16375	75.05643	65.78013	80.61421	71.02364	77.95937	72.59509	6.7592	7.0553	6.5676	6.7418	6.8114	6.6372	6.6721	6.2888	7.0092	6.8398	6.8176	6.8775
51014	51043	51014	72.26266	65.78403	70.08126	63.36498	71.86454	63.63712	79.534	73.09762	76.21045	72.05735	6.5501	6.9334	6.4108	6.5327	6.6198	6.4805	6.5501	6.1495	6.8004	6.6309	6.6086	6.756
51044	51074	51044	67.98759	62.46325	63.60651	58.11963	69.02736	60.40215	73.59879	68.53774	70.04911	67.74715	6.585	6.9334	6.4282	6.5676	6.794	6.6721	6.7592	6.1669	6.8365	6.6666	6.6438	6.9677
51075	51104	51075	68.92762	66.08133	64.74644	59.91521	71.97643	63.81364	76.66019	71.72865	73.70716	71.04472	6.6547	7.0902	6.585	6.6895	7.0553	6.916	7.0553	6.2714	6.9585	6.7886	6.7658	7.3031
51105	51135	51105	74.09344	69.22853	65.73635	61.90041	75.85128	66.4233	76.00407	72.90392	75.22624	73.40752	7.0031	7.3166	7.0902	6.9857	7.3515	7.2121	7.4212	6.6024	7.2594	7.0879	7.0634	7.6791
51136	51166	51136	79.88004	71.76662	68.83988	63.95238	76.7784	67.87678	81.55391	75.39405	78.40491	75.0699	7.1998	7.6453	7.2711	7.2711	7.6097	7.4671	7.4315	6.5939	7.5494	7.3765	7.3502	7.6992
51167	51195	51167	74.13901	69.20855	66.6955	63.02747	72.53538	65.92181	78.53996	74.88963	74.20197	73.53696	7.2533	7.574	7.2354	7.2889	7.6988	7.5384	7.7879	6.8968	7.5662	7.3936	7.3677	8.0535
51196	51226	51196	68.424	65.27082	61.51867	59.73439	64.78132	61.45283	68.20467	68.38326	65.90231	69.52337	7.0394	7.2711	6.9146	7.0572	7.2354	7.1107	7.2354	6.7364	7.3326	7.1607	7.1355	7.497
51227	51256	51227	65.46284	60.3255	59.64579	56.0439	61.71215	56.61347	60.96975	59.94624	58.20171	57.57896	6.8077	7.0038	6.6473	6.7899	6.8612	6.7364	6.8077	6.4513	7.0545	6.886	6.8648	7.007
51257	51287	51257	65.6478	58.1834	61.02902	57.80493	61.81998	54.44572	65.27117	61.67708	61.05927	59.67793	6.8255	7.0216	6.7186	6.8077	6.8434	6.7186	6.7364	6.4335	7.0721	6.9036	6.8826	6.9352
51288	51317	51288	73.05377	60.9886	69.52383	61.40854	69.15105	57.20307	72.78915	65.27408	67.74022	63.72267	6.879	7.0394	6.8077	6.6652	6.8255	6.683	6.6117	6.077	6.9304	6.7617	6.7403	6.8124
51318	51348	51318	81.45955	72.74546	77.70039	68.92485	77.69984	68.94174	79.83849	71.47983	76.21719	74.26041	6.9859	7.1463	6.879	6.7721	6.9325	6.7721	6.683	6.1127	7.0385	6.8694	6.8476	6.8861
51349	51379	51349	81.64941	72.50059	80.59697	69.31866	78.08726	68.87164	84.65421	74.41508	82.55127	76.24291	7.0394	7.3602	6.879	7.0216	7.0929	6.9146	6.9681	6.5226	7.289	7.1196	7.0974	7.1735

51380	51409	51380	74.1759	68.31951	71.49143	65.09396	72.77444	65.37159	80.94099	75.18007	77.40614	74.01939	6.8255	7.1463	6.7008	6.7721	6.879	6.7543	6.7899	6.3622	7.0398	6.8703	6.848	6.9958	
51410	51440	51410	71.92664	65.63166	65.30908	60.08911	71.89691	62.5852	76.78438	71.39262	72.95418	70.4343	6.8434	7.2354	6.7186	6.8255	7.1107	6.9681	7.1107	6.4157	7.0945	6.9246	6.9018	7.3192	
51441	51470	51441	73.30948	69.43267	67.29539	62.44424	74.89918	66.57243	79.58002	75.1678	76.32986	74.02453	6.9325	7.3424	6.9325	6.9325	7.3602	7.2176	7.4136	6.5404	7.2014	7.0315	7.0087	7.6614	
51471	51501	51471	80.8604	73.34496	68.76379	65.00233	79.8821	70.12807	80.16693	76.74396	78.84391	76.7412	7.2889	7.6988	7.3958	7.2889	7.7166	7.574	7.7879	6.8968	7.5626	7.3912	7.3666	8.0458	
51502	51532	51502	81.71728	73.41725	70.42319	65.42329	78.5443	69.43794	83.42965	77.12811	80.20822	76.79651	7.3654	7.8212	7.4383	7.4383	7.7847	7.6389	7.6024	6.7455	7.7166	7.5437	7.5174	7.8702	
51533	51560	51533	75.84421	70.80035	68.2295	64.4771	74.2037	67.43801	80.34638	76.61209	75.90862	75.22831	7.4201	7.7482	7.4018	7.4565	7.8759	7.7118	7.967	7.0555	7.7339	7.5613	7.5354	8.2326	
51561	51591	51561	69.99775	66.77205	62.9336	61.10828	66.27129	62.86625	69.77338	69.95608	67.41806	71.12241	7.2013	7.4383	7.0737	7.2195	7.4018	7.2742	7.4018	6.8914	7.4949	7.323	7.2978	7.6634	
51592	51621	51592	66.96848	61.71299	61.01764	57.33291	63.13153	57.91558	62.37206	61.325	59.54035	58.90327	6.9643	7.1648	6.8002	6.9461	7.019	6.8914	6.9643	6.5997	7.2106	7.0422	7.021	7.1635	
51622	51652	51622	67.1577	59.52162	62.43269	59.13445	63.24184	55.69797	66.77241	63.09565	62.46363	61.05052	6.9825	7.1831	6.8731	6.9643	7.0008	6.8731	6.8914	6.5814	7.2286	7.0602	7.0392	7.0901	
51653	51682	51653	74.73401	62.39134	71.12288	62.82094	70.74152	58.51874	74.4633	66.77538	69.29825	65.18829	7.0372	7.2013	6.9643	6.8184	6.9825	6.8367	6.7638	6.2168	7.0837	6.915	6.8936	6.9645	
51683	51713	51683	83.33312	74.4186	79.4875	70.51012	79.48694	70.5274	81.67477	73.12386	77.97018	75.9684	7.1466	7.3107	7.0372	6.9278	7.0919	6.9278	6.8367	6.2533	7.1942	7.0252	7.0033	7.0398	
51714	51744	51714	83.52734	74.16811	82.4507	70.91299	79.88327	70.45569	86.60126	76.12663	84.44995	77.9965	7.2013	7.5295	7.0372	7.1831	7.256	7.0737	7.1284	6.6726	7.4505	7.2811	7.2589	7.3338	
51745	51774	51745	75.88194	69.89086	73.13573	66.59112	74.44825	66.87514	82.80264	76.90921	79.18648	75.72183	6.9825	7.3107	6.8549	6.9278	7.0372	6.9096	6.9461	6.5085	7.1955	7.026	7.0037	7.1519	
51775	51805	51775	73.58096	67.14119	66.81119	61.47116	73.55054	64.02466	78.55042	73.03465	74.63213	72.05429	7.0008	7.4018	6.8731	6.9825	7.2742	7.1284	7.2742	6.5632	7.2514	7.0816	7.0588	7.4827	
51806	51835	51806	74.9956	71.02962	68.84319	63.88046	76.62186	68.1036	81.41036	76.89666	78.08545	75.7271	7.0919	7.5112	7.0919	7.0919	7.5295	7.3836	7.5842	6.6908	7.3609	7.191	7.1682	7.8319	
51836	51866	51836	82.72019	75.03189	70.34536	66.49738	81.71939	71.74101	82.01077	78.50907	80.65732	78.50625	7.4565	7.8759	7.5659	7.4565	7.8941	7.7482	7.967	7.0555	7.7302	7.5588	7.5343	8.2249	
51867	51897	51867	83.59678	75.10585	72.04293	66.92802	80.35082	71.03502	85.34853	78.90206	82.05301	78.56283	7.5348	8.001	7.6094	7.6094	7.9637	7.8145	7.7772	6.9007	7.8877	7.7148	7.6885	8.045	
51898	51925	51898	77.58862	72.42876	69.79877	65.96008	75.91038	68.98908	82.19434	78.37417	77.65451	76.95856	7.5907	7.9264	7.5721	7.628	8.057	7.8891	8.1503	7.2177	7.9054	7.7328	7.7069	8.4158	
51926	51956	51926	71.6077	68.30781	64.38107	62.51377	67.79553	64.31217	71.37817	71.56506	68.96868	72.75822	7.3669	7.6094	7.2364	7.3856	7.5721	7.4415	7.5721	7.0499	7.661	7.489	7.4638	7.8336	
51957	51986	51957	68.50876	63.13239	62.42105	58.65157	64.58356	59.24764	63.80661	62.73548	60.90978	60.25805	7.1245	7.3296	6.9566	7.1058	7.1804	7.0499	7.1245	6.7515	7.3704	7.2019	7.1808	7.3237	
51987	52017	51987	68.70232	60.89061	63.86864	60.49454	64.6964	56.97903	68.30817	64.54685	63.9003	62.45469	7.1431	7.3483	7.0312	7.1245	7.1618	7.0312	7.0499	6.7328	7.3888	7.2204	7.1993	7.2486	
52018	52047	52018	76.45289	63.82634	72.75871	64.26582	72.36858	59.86467	76.17596	68.31122	70.89211	66.68762	7.1991	7.3669	7.1245	6.9753	7.1431	6.9939	6.9193	6.3598	7.2405	7.0718	7.0504	7.1201	
52048	52078	52048	85.24978	76.13023	81.31571	72.13185	81.31513	72.14953	83.55329	74.80572	79.7635	77.71568	7.311	7.4788	7.1991	7.0872	7.255	7.0872	6.9939	6.3971	7.3536	7.1845	7.1627	7.1971	
52079	52109	52079	85.44848	75.87397	84.34707	72.54399	81.72058	72.07617	88.59309	77.87754	86.3923	79.79041	7.3669	7.7026	7.1991	7.3483	7.4229	7.2364	7.2923	6.8261	7.6157	7.4463	7.4241	7.4977	
52110	52139	52110	77.62723	71.49835	74.81786	68.12272	76.16056	68.41326	84.70709	78.67812	81.00777	77.46344	7.1431	7.4788	7.0126	7.0872	7.1991	7.0685	7.1058	6.6582	7.3549	7.1854	7.1631	7.3117	
52140	52170	52140	75.27332	68.68543	68.34785	62.88499	75.2422	65.49723	80.35708	74.71445	76.34866	73.71154	7.1618	7.5721	7.0312	7.1431	7.4415	7.2923	7.4415	6.7142	7.412	7.2422	7.2194	7.65	
52171	52200	52171	76.7205	72.6633	70.42657	65.34971	78.38416	69.66998	83.2828	78.66528	79.88141	77.46882	7.255	7.684	7.255	7.255	7.7026	7.5534	7.7586	6.8447	7.524	7.3541	7.3313	8.0063	
52201	52231	52201	84.62276	76.75763	71.9633	68.02682	83.59894	73.39106	83.89702	80.31478	82.51244	80.31189	7.628	8.057	7.7399	7.628	8.0757	7.9264	8.1503	7.2177	7.9017	7.7303	7.7058	8.4081	
52232	52262	52232	85.5195	76.83328	73.69992	68.46736	82.19889	72.66882	87.31155	80.7168	83.94023	80.36977	7.7081	8.1851	7.7844	7.7844	8.1469	7.9943	7.9561	7.0594	8.0627	7.8898	7.8635	8.2239	
52263	52290	52263	79.37316	74.09462	71.40414	67.47716	77.65632	70.57584	84.08482	80.17677	79.44057	78.72861	7.7653	8.1088	7.7462	7.8035	8.2423	8.0706	8.3377	7.3837	8.0808	7.9082	7.8823	8.6033	
52291	52321	52291	73.25468	69.87888	65.86184	63.95159	69.35483	65.79135	73.01986	73.21106	70.55495	74.43166	7.5364	7.7844	7.4028	7.5555	7.7462	7.6127	7.7462	7.212	7.8309	7.6589	7.6337	8.0078	
52322	52351	52322	70.08447	64.58443	63.85673	60.00055	66.06898	60.61033	65.27416	64.1784	62.3107	61.64399	7.2883	7.4982	7.1166	7.2693	7.3456	7.212	7.2883	6.9068	7.5338	7.3653	7.3442	7.4876	
52352	52382	52352	70.28248	62.2911	65.33762	61.88591	66.18442	58.28954	69.87926	66.03143	65.37	63.89114	7.3074	7.5173	7.1929	7.2883	7.3265	7.1929	7.212	6.8877	7.5527	7.3843	7.3632	7.4108	
52383	52412	52383	78.2113	65.29434	74.43215	65.74393	74.03306	61.24156	77.928	69.88238	72.52262	68.22144	7.3647	7.5364	7.2883	7.1357	7.3074	7.1548	7.0785	6.5061	7.401	7.2323	7.2108	7.2792	
52413	52443	52413	87.21053	77.88123	83.18597	73.79089	83.18539	73.80897	85.47502	76.52625	81.59806	79.50314	7.4791	7.6508	7.3647	7.2502	7.4219	7.2502	7.1548	6.5442	7.5166	7.3475	7.3257	7.3579	
52444	52474	52444	87.41379	77.61907	86.28705	74.2125	83.60016	73.73392	90.63073	79.66872	88.37932	81.6256	7.5364	7.8798	7.3647	7.5173	7.5936	7.4028	7.4601	6.9831	7.7847	7.6153	7.5931	7.6654	
52475	52504	52475	79.41266	73.14281	76.53867	69.68954	77.91225	69.98677	86.65536	80.48772	82.87095	79.24509	7.3074	7.6508	7.1739	7.2502	7.3647	7.2311	7.2693	6.8114	7.5179	7.3484	7.3261	7.4751	
52505	52535	52505	77.0046	70.2652	69.91985	64.33135	76.97277	67.00366	82.20529	76.43288	78.10468	75.40691	7.3265	7.7462	7.1929	7.3074	7.6127	7.4601	7.6127	6.8686	7.5763	7.4064	7.3837	7.8212	
52536	52565	52536	78.48507	74.33456	72.04639	66.85275	80.187	71.27238	85.1983	80.47459	81.71868	79.2506	7.4219	7.8607	7.4219	7.4219	7.8798	7.7272	7.937	7.0021	7.6908	7.521	7.4982	8.1848	
52566	52596	52566	86.56908	78.52306	73.61845	69.59144	85.52171	75.07906	85.82664	82.16202	84.41022	82.15907	7.8035	8.2423	7.918	7.8035	8.2614	8.1088	8.3377	7.3837	8.0772	7.9058	7.8812	8.5956	
52597	52627	52597	87.48645	78.60045	75.39502	70.04211	84.08946	74.34021	89.31972	82.5733	85.87086	82.21828	7.8854	8.3733	7.9634	7.9634	8.3343	8.1781	8.1391	7.2218	8.2418	8.0689	8.0426	8.4069	
52628	52656	52628	81.19875	75.79879	73.04644	69.02913	79.44241	72.19908	86.01877	82.02084	81.2677	80.53937	7.9439	8.2953	7.9244	7.983	8.4319	8.2562	8.5295	7.5536	8.2603	8.0877	8.0618	8.7951	
52657	52687	52657	74.93954	71.4861	67.37666	65.42248	70.94999	67.30455	74.69932	74.89491	72.17772	76.14359	7.7097	7.9634	7.5731	7.7292	7.9244	7.7878	7.9244	7.3779	8.0046	7.8327	7.8075	8.1859	
52688	52717	52688	71.6964	66.06987	65.32544	61.38057	67.58856	62.00437	66.77547	65.6545	63.74385	63.0618	7.456	7.6707	7.2803	7.4365	7.5145	7.3779	7.456	7.0656	7.701	7.5325	7.5114	7.6552	
52718	52748	52718	71.89898	63.72379	66.84039	63.30928	67.70666	59.6302	71.48648	67.55016	66.87351	65.36064	7.4755	7.6902	7.3584	7.456	7.495	7.3584	7.3779	7.0461	7.7203	7.5519	7.5308	7.5766	
52749	52778	52749	80.01016	66.79611	76.1441	67.25604	75.73582	62.65012	79.72034	71.48967	74.19064	69.79053	7.534	7.7097	7.456	7.2998	7.4755	7.3193	7.2413	6.6557	7.5651	7.3964	7.375	7.442	
52779	52809	52779	89.21637	79.6725	85.09925	75.48808	85.09865	75.50658	87.44095	78.28635	83.47482	81.3317	7.6512	7.8268	7.534	7.4169	7.5926	7.4169	7.3193	6.6948	7.6833	7.5143	7.4924	7.5225	
52810	52840	52810	89.42431	79.40431	88.27165	75.91939	85.52296	75.4298	92.71523	81.50111	90.41205	83.50298	7.7097	8.061	7.534	7.6902	7.7683	7.5731	7.6316	7.1437	7.9576	7.7882	7.766	7.837	
52841	52870	52841	81.23915	74.8251	78.29906	71.2924	79.70424	71.59647	88.64843	82.33894	84.77698	81.06773	7.4755	7.8268	7.3389	7.4169	7.534	7.3974	7.4365	6.968	7.6846	7.5151	7.4928	7.6423	
52871	52901	52871	78.7757	71.8813	71.528	65.81097	78.74315	68.54475	84.09602	78.19083	79.90109	77.14126	7.495	7.9244	7.3584	7.4755	7.7878	7.6316	7.7878	7.0266	7.7444	7.5745	7.5517	7.9963	
52902	52931	52902	80.29022	76.04425	73.70345	68.39037	82.0313	72.91165	87.15787	82.3255	83.59821	81.07336	7.5926	8.0415	7.5926	7.5926	8.061	7.9049	8.1196	7.1632	7.8616	7.6917	7.6689	8.3673	
52932	52962	52932	88.56017	80.32909	75.31168	71.19205	87.48871	76.80587	87.80066	84.05174	86.35166	84.04872	7.983	8.4319	8.1001	7.983	8.4514	8.2953	8.5295	7.5536	8.2567	8.0852	8.0607	8.7874	
52963	52993	52963	89.49864	80.40826	77.1291	71.65308	86.02352	76.05003	91.37407	84.47248	87.84589	84.1093	8.0667	8.5659	8.1466	8.1466	8.526	8.3662	8.3263	7.3879	8.4249	8.252	8.2257	8.5941	
52994	53021	52994	83.06631	77.54217	74.72651	70.6168	81.26958	73.85966	87.9972	83.90732	83.13686	82.39177	8.1266	8.486	8.1067	8.1666	8.6258	8.4461	8.7257	7.7273	8.4439	8.2713	8.2454	8.9912	
53022	53052	53022	76.66315	73.13028	68.92632	66.92719	72.58184	68.85255	76.4174	76.6175	73.83781	77.89489	7.887	8.1466	7.7473	7.907	8.1067	7.9669	8.1067	7.5476	8.1824	8.0104	7.9852	8.3682	
53053	53082	53053	73.34542	67.58948	66.82793	62.79232	69.1431	63.43047	68.3113	67.16455	65.20995	64.51222	7.6275	7.8471	7.4478	7.6075	7.6874	7.5476	7.6275	7.2281	7.8721	7.7036	7.6824	7.8267	
53083	53113	53083	73.55265	65.18945	68.37771	64.7654	69.26392	61.0017	73.13067	69.10381	68.41161	66.86393	7.6474	7.8671	7.5276	7.6275	7.6674	7.5276	7.5476	7.2081	7.8918	7.7234	7.7023	7.7463	
53114	53143	53114	81.8504	68.33243	77.89541	68.80293	77.47774	64.09106	81.55392	73.13393	75.89703	71.39571	7.7073	7.887	7.6275	7.4677	7.6474	7.4877	7.4078	6.8088	7.733	7.5643	7.5429	7.6086	
53144	53174	53144	91.26835	81.50497	87.05653	77.2243	87.05592	77.24323	89.45209	80.08694	85.39474	83.20233	7.8271	8.0068	7.7073	7.5875	7.7672	7.5875	7.4877	6.8487	7.8539	7.6848	7.663	7.6908	
53175	53205	53175	91.48106	81.23061	90.3019	77.66553	87.48999	77.16469	94.84769	83.37563	92.49152	85.42355	7.887	8.2464	7.7073	7.8671	7.9469	7.7473	7.8072	7.308	8.1345	7.9651	7.9429	8.0125	
53206	53235	53206	83.10765	76.54607	80.09993	72.93212	81.53744	73.24319	90.68734	84.23273	86.72685	82.93229	7.6474	8.0068	7.5077	7.5875	7.7073	7.5676	7.6075	7.1283	7.8552	7.6857	7.6634	7.8134	
53236	53266	53236	80.58755	73.53457	73.17315	67.32462	80.55424	70.12128	86.03022	79.98923	81.73882	78.91551	7.6674	8.1067	7.5276	7.6474	7.9669	7.8072	7.9669	7.1882	7.9163	7.7465	7.7237	8.1754	
53267	53296	53267	82.1369	77.79327	75.39864	69.96334	83.91802	74.58862	89.1625	84.21899	85.52097	82.93805	7.7672	8.2265	7.7672	7.7672	8.2464	8.0867	8.3063	7.328	8.0362	7.8663	7.8435	8.5541	
53297	53327	53297	90.59705	82.17665	77.04385	72.82946	89.50095	78.5724	89.82008	85.98494	88.33775	85.98184	8.1666	8.6258	8.2864	8.1666	8.6458	8.486	8.7257	7.7273	8.4403	8.2689	8.2443	8.9835	
53328	53358	53328	91.55711	82.25765	78.90307	73.3011	88.00207	77.79918	93.47567	86.41534	89.86634	86.04381	8.2523	8.7629	8.334	8.334	8.7221	8.5587	8.5178	7.5578	8.6123	8.4394	8.4131	8.7856	
53359	53386	53359	84.97684	79.32564	76.44522	72.24099	83.13879	75.55843	90.02113	85.83719	85.049	84.28678	8.3136	8.6812	8.2931	8.3544	8.8242	8.6404	8.9263	7.905	8.6317	8.4591	8.4332	9.1919	
53387	53417	53387	78.4264	74.81228	70.51163	68.46651	74.25122	70.43616	78.175	78.3797	75.53608	79.68648	8.0684	8.334	7.9254	8.0889	8.2931	8.1501	8.2931	7.7212	8.3643	8.1923	8.1671	8.5546	
53418	53447	53418	75.03236	69.14404	68.36497	64.23654	70.73339	64.88937	69.88246	68.70934	66.70979	65.996	7.8029	8.0276	7.6191	7.7825	7.8642	7.7212	7.8029	7.3944	8.047	7.8785	7.8574	8.0021	
53448	53478	53448	75.24436	66.6888	69.9504	66.255	70.85699	62.40474	74.81268	70.69319	69.98507	68.4018	7.8233	8.048	7.7008	7.8029	7.8437	7.7008	7.7212	7.3739	8.0672	7.8988	7.8777	7.9199	
53479	53508	53479	83.73296	69.90407	79.687	70.3854	79.25973	65.56516	83.42966	74.81601	77.64266	73.03781	7.8846	8.0684	7.8029	7.6395	7.8233	7.6599	7.5782	6.9654	7.9048	7.736	7.7146	7.7789	
53509	53539	53509	93.36752	83.37958	89.05883	79.00047	89.0582	79.01982	91.50948	81.92893	87.35882	85.11599	8.0072	8.191	7.8846	7.762	7.9459	7.762	7.6599	7.0063	8.0284	7.8594	7.8375	7.863	
53540	53570	53540	93.58513	83.09892	92.37885	79.45184	89.50226	78.93948	97.02918	85.29327	94.61883	87.3883	8.0684	8.4361	7.8846	8.048	8.1297	7.9254	7.9867	7.4761	8.3155	8.146	8.1238	8.1921	
53571	53600	53571																							

			COBHLH	COBLLH	Palo VerdeHL	Palo VerdeLL	Mid-Columbia	Mid-Columbia	NP 15HLH	NP 15LLH	SP 15HLH	SP 15LLH	Henry Hub Ga	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Cree	Lakeside	Z_CHEBRN*
Quote Date		**Data Type:**	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
6/30/2016		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
		Tue, 5/31/2005																						
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
07/01/16	07/31/16	Jul 2016	32.00	22.25	37.00	24.75	29.25	19.50	37.75	28.50	39.75	30.25	2.91	2.83	2.59	2.53	2.63	2.58	2.30	1.55	2.97	2.75	2.77	2.41
08/01/16	08/31/16	Aug 2016	35.80	25.50	36.75	25.75	31.50	23.50	38.25	30.50	41.00	32.00	2.92	3.01	2.82	2.73	2.83	2.81	2.44	1.91	2.98	2.82	2.80	2.61
09/01/16	09/30/16	Sep 2016	31.50	24.75	31.50	25.50	27.75	23.25	37.50	30.75	40.25	32.25	2.92	2.98	2.79	2.73	2.82	2.80	2.40	1.98	2.97	2.81	2.80	2.56
10/01/16	10/31/16	Oct 2016	30.46	25.92	28.58	24.24	26.55	22.28	39.60	30.40	37.53	31.35	2.95	2.95	2.81	2.76	2.87	2.85	2.66	2.05	3.01	2.85	2.83	2.83
11/01/16	11/30/16	Nov 2016	32.42	26.46	29.34	24.75	28.91	24.26	39.60	31.36	39.50	32.01	3.09	3.21	3.05	3.04	3.14	3.11	3.17	2.21	3.32	3.13	3.11	3.40
12/01/16	12/31/16	Dec 2016	35.37	28.82	33.28	26.77	32.45	27.72	40.80	34.24	41.48	35.64	3.32	3.66	3.37	3.42	3.46	3.43	3.64	2.45	3.71	3.51	3.49	3.91
01/01/17	01/31/17	Jan 2017	33.80	28.61	31.87	27.45	30.76	26.55	42.00	34.58	40.56	34.43	3.45	3.73	3.45	3.51	3.50	3.47	3.53	2.56	3.80	3.61	3.59	3.79
02/01/17	02/28/17	Feb 2017	33.15	27.25	31.11	26.51	29.84	25.25	40.80	33.58	39.78	32.75	3.43	3.66	3.46	3.47	3.47	3.44	3.43	2.54	3.76	3.57	3.55	3.68
03/01/17	03/31/17	Mar 2017	30.00	25.14	28.67	24.49	27.20	23.45	37.20	31.39	36.66	31.62	3.37	3.38	3.22	3.23	3.29	3.26	3.12	2.48	3.51	3.33	3.30	3.35
04/01/17	04/30/17	Apr 2017	25.74	18.69	25.15	21.78	22.20	15.51	31.44	27.19	28.13	27.28	3.07	2.98	2.87	2.79	2.89	2.87	2.40	2.20	3.06	2.87	2.86	2.56
05/01/17	05/31/17	May 2017	22.56	15.09	25.95	21.56	18.27	12.35	32.42	24.88	28.71	24.41	3.03	2.90	2.81	2.76	2.84	2.82	2.34	2.15	3.03	2.85	2.83	2.50
06/01/17	06/30/17	Jun 2017	22.80	14.83	28.89	22.91	18.58	11.05	34.39	25.93	30.16	26.46	3.06	2.94	2.85	2.79	2.88	2.85	2.34	2.13	3.05	2.87	2.86	2.50
07/01/17	07/31/17	Jul 2017	32.98	21.45	36.31	25.30	27.38	18.71	37.75	31.04	39.53	31.28	3.08	3.12	2.97	2.86	2.95	2.93	2.51	2.12	3.13	2.95	2.93	2.69
08/01/17	08/31/17	Aug 2017	35.36	28.05	35.62	27.04	32.67	24.10	38.88	33.60	39.91	33.22	3.09	3.17	2.99	2.87	2.98	2.95	2.58	2.18	3.14	2.96	2.94	2.76
09/01/17	09/30/17	Sep 2017	33.26	27.96	30.83	26.52	30.61	25.94	36.62	31.36	37.11	32.25	3.07	3.08	2.91	2.84	2.97	2.94	2.61	2.18	3.11	2.93	2.91	2.79
10/01/17	10/31/17	Oct 2017	30.31	26.01	31.88	25.75	28.74	22.73	39.60	32.14	36.10	31.51	3.10	3.03	2.87	2.90	2.98	2.95	2.74	2.28	3.17	2.99	2.97	2.93
11/01/17	11/30/17	Nov 2017	33.17	26.71	30.31	25.24	29.95	26.26	39.60	32.59	38.00	31.77	3.15	3.25	3.09	3.06	3.18	3.15	3.21	2.41	3.34	3.15	3.13	3.44
12/01/17	12/31/17	Dec 2017	36.18	28.89	31.56	26.82	32.07	26.77	40.80	35.58	39.90	35.37	3.28	3.50	3.25	3.28	3.32	3.29	3.52	2.52	3.56	3.37	3.35	3.78
01/01/18	01/31/18	Jan 2018	35.65	29.96	31.72	28.05	31.41	27.35	42.00	34.58	39.56	33.73	3.39	3.54	3.37	3.36	3.41	3.38	3.41	2.59	3.63	3.45	3.43	3.66
02/01/18	02/28/18	Feb 2018	33.35	28.60	31.11	28.21	30.34	25.75	40.80	33.63	38.78	32.75	3.35	3.48	3.32	3.31	3.37	3.34	3.29	2.56	3.58	3.40	3.38	3.53
03/01/18	03/31/18	Mar 2018	29.80	26.74	30.37	26.14	27.70	24.25	38.40	31.74	35.66	31.77	3.28	3.35	3.25	3.23	3.30	3.27	3.22	2.49	3.50	3.32	3.30	3.46
04/01/18	04/30/18	Apr 2018	23.69	20.74	23.90	20.03	22.65	17.21	29.74	25.34	27.63	25.08	2.88	2.79	2.71	2.70	2.68	2.65	2.21	2.12	2.96	2.79	2.77	2.36
05/01/18	05/31/18	May 2018	23.01	14.79	25.25	19.31	18.57	12.35	30.72	23.88	28.21	23.51	2.84	2.77	2.67	2.60	2.65	2.63	2.12	2.03	2.85	2.68	2.67	2.27
06/01/18	06/30/18	Jun 2018	23.25	15.63	28.19	20.41	17.78	10.40	32.69	24.68	29.66	23.51	2.87	2.82	2.70	2.62	2.68	2.66	2.11	2.02	2.88	2.71	2.69	2.25
07/01/18	07/31/18	Jul 2018	33.43	19.85	37.56	26.20	28.48	18.06	38.30	31.29	39.53	31.03	2.90	3.07	2.78	2.67	2.76	2.74	2.35	2.04	2.93	2.76	2.74	2.51
08/01/18	08/31/18	Aug 2018	35.81	27.75	36.87	28.54	33.92	23.35	39.43	33.85	39.91	32.97	2.91	3.08	2.81	2.68	2.79	2.76	2.35	2.05	2.94	2.77	2.75	2.51
09/01/18	09/30/18	Sep 2018	34.11	28.01	32.08	28.02	32.11	28.64	37.17	31.61	36.81	32.00	2.88	2.86	2.77	2.66	2.76	2.74	2.37	2.06	2.91	2.74	2.73	2.54
10/01/18	10/31/18	Oct 2018	32.61	27.51	32.63	28.80	30.99	24.53	40.10	32.39	36.10	31.41	2.90	2.79	2.74	2.68	2.77	2.75	2.51	2.08	2.93	2.76	2.75	2.68
11/01/18	11/30/18	Nov 2018	34.62	28.06	31.06	28.29	32.20	28.06	40.10	33.39	38.00	32.07	2.97	3.13	2.91	2.94	2.98	2.96	3.06	2.30	3.20	3.02	3.01	3.28
12/01/18	12/31/18	Dec 2018	37.63	30.24	32.31	29.32	34.32	28.57	41.30	36.38	39.90	35.67	3.12	3.32	3.07	3.13	3.14	3.11	3.45	2.39	3.39	3.22	3.20	3.70
01/01/19	01/31/19	Jan 2019	34.15	30.76	32.47	29.15	32.16	27.30	42.65	35.23	39.76	34.38	3.24	3.46	3.20	3.21	3.23	3.20	3.23	2.51	3.48	3.30	3.28	3.47
02/01/19	02/28/19	Feb 2019	33.50	29.40	31.86	28.36	31.29	26.55	41.45	34.23	38.98	33.40	3.21	3.40	3.18	3.18	3.21	3.18	3.02	2.49	3.45	3.28	3.26	3.24
03/01/19	03/31/19	Mar 2019	30.90	28.04	29.42	26.79	28.65	25.05	37.85	32.24	35.86	32.42	3.14	3.35	3.11	3.12	3.14	3.12	2.97	2.43	3.39	3.21	3.19	3.19
04/01/19	04/30/19	Apr 2019	28.29	22.74	25.90	19.08	26.00	17.21	29.34	28.14	27.83	26.33	2.85	2.86	2.76	2.70	2.68	2.66	2.31	2.17	2.96	2.79	2.77	2.47
05/01/19	05/31/19	May 2019	24.96	16.04	26.70	18.86	20.47	13.70	30.32	23.33	28.41	20.81	2.85	2.87	2.74	2.62	2.67	2.65	2.26	2.11	2.88	2.71	2.69	2.41
06/01/19	06/30/19	Jun 2019	25.20	16.88	29.64	19.96	19.68	11.75	32.29	24.13	29.86	20.81	2.88	2.90	2.78	2.65	2.71	2.68	2.24	2.10	2.91	2.74	2.72	2.40
07/01/19	07/31/19	Jul 2019	35.53	18.15	38.31	27.05	29.43	16.46	40.05	31.94	39.73	31.68	2.91	3.14	2.82	2.71	2.80	2.78	2.42	2.09	2.97	2.80	2.78	2.58
08/01/19	08/31/19	Aug 2019	37.91	26.05	37.62	29.39	34.87	21.75	41.18	34.50	40.11	33.62	2.93	3.16	2.85	2.72	2.82	2.80	2.43	2.11	2.98	2.81	2.79	2.60
09/01/19	09/30/19	Sep 2019	36.21	26.31	32.83	28.87	33.06	27.04	38.92	32.26	37.01	32.65	2.91	2.97	2.82	2.71	2.82	2.79	2.47	2.14	2.97	2.80	2.78	2.64
10/01/19	10/31/19	Oct 2019	32.16	28.31	33.38	29.65	31.24	25.53	40.75	33.39	36.30	32.21	2.93	2.88	2.83	2.73	2.83	2.80	2.47	2.15	2.98	2.81	2.80	2.64
11/01/19	11/30/19	Nov 2019	34.17	28.86	31.81	29.14	32.45	29.06	40.75	34.39	38.20	32.87	3.00	3.20	2.99	2.96	3.04	3.01	3.04	2.35	3.22	3.05	3.03	3.27
12/01/19	12/31/19	Dec 2019	37.18	31.04	33.06	30.17	34.57	29.57	41.95	37.38	40.10	36.47	3.15	3.40	3.16	3.16	3.20	3.17	3.43	2.48	3.42	3.25	3.23	3.68
01/01/20	01/31/20	Jan 2020	35.85	31.61	33.67	31.50	33.51	28.15	43.85	36.13	40.96	35.78	3.27	3.54	3.28	3.26	3.29	3.26	3.46	2.53	3.53	3.36	3.34	3.71
02/01/20	02/29/20	Feb 2020	35.20	30.25	33.06	30.71	32.64	27.40	42.65	35.13	40.18	34.80	3.24	3.49	3.25	3.24	3.27	3.24	3.22	2.52	3.51	3.33	3.31	3.45
03/01/20	03/31/20	Mar 2020	32.60	28.89	30.62	29.14	30.00	25.90	39.05	33.14	37.06	33.82	3.17	3.47	3.19	3.17	3.20	3.17	3.17	2.48	3.44	3.26	3.24	3.40
04/01/20	04/30/20	Apr 2020	29.79	21.39	26.80	21.18	27.25	17.51	30.19	29.24	29.03	28.18	2.89	2.96	2.80	2.77	2.80	2.77	2.57	2.22	3.03	2.86	2.84	2.77
05/01/20	05/31/20	May 2020	26.46	14.69	27.60	20.96	21.72	14.00	31.17	24.43	29.61	22.66	2.89	3.05	2.79	2.70	2.79	2.76	2.51	2.15	2.95	2.78	2.77	2.70
06/01/20	06/30/20	Jun 2020	26.70	15.53	30.54	22.06	20.93	12.05	33.14	25.23	31.06	22.66	2.92	3.10	2.83	2.73	2.83	2.80	2.52	2.16	2.99	2.82	2.80	2.71
07/01/20	07/31/20	Jul 2020	37.08	19.50	39.51	28.00	30.78	17.71	41.10	32.84	40.93	32.53	2.96	3.28	2.87	2.79	2.91	2.89	2.70	2.17	3.05	2.88	2.86	2.91
08/01/20	08/31/20	Aug 2020	39.46	27.40	38.82	30.34	36.22	23.00	42.23	35.40	41.31	34.47	2.99	3.30	2.93	2.82	2.96	2.93	2.70	2.16	3.08	2.91	2.89	2.91
09/01/20	09/30/20	Sep 2020	37.76	27.66	34.03	29.82	34.41	28.29	39.97	33.16	38.21	33.50	2.99	3.12	2.91	2.82	2.96	2.94	2.78	2.24	3.08	2.91	2.89	2.99
10/01/20	10/31/20	Oct 2020	33.56	29.16	34.58	31.30	32.54	26.08	41.95	34.89	37.50	34.41	3.02	3.06	2.92	2.85	2.99	2.97	2.87	2.26	3.11	2.94	2.92	3.09
11/01/20	11/30/20	Nov 2020	35.57	29.71	33.01	30.79	33.75	29.61	41.95	35.89	39.40	35.07	3.09	3.34	3.08	3.06	3.13	3.11	3.26	2.45	3.32	3.15	3.13	3.50
12/01/20	12/31/20	Dec 2020	38.58	31.89	34.26	31.82	35.87	30.12	43.15	38.88	41.30	38.67	3.24	3.52	3.26	3.26	3.29	3.26	3.68	2.57	3.53	3.35	3.33	3.95
01/01/21	01/31/21	Jan 2021	36.65	32.61	35.52	33.05	35.01	29.25	45.35	37.13	42.31	36.23	3.37	3.67	3.38	3.39	3.40	3.37	3.56	2.66	3.66	3.48	3.46	3.82
02/01/21	02/28/21	Feb 2021	36.00	31.25	34.91	32.26	34.14	28.50	44.15	36.13	41.53	35.25	3.34	3.63	3.35	3.36	3.37	3.34	3.34	2.64	3.63	3.45	3.43	3.59
03/01/21	03/31/21	Mar 2021	33.40	29.89	32.47	30.69	31.50	27.00	40.55	34.14	38.41	34.27	3.28	3.56	3.29	3.29	3.31	3.28	3.31	2.61	3.56	3.39	3.37	3.55
04/01/21	04/30/21	Apr 2021	31.14	23.44	28.95	22.03	28.60	18.61	31.39	29.69	30.38	28.68	3.03	3.22	2.99	2.94	2.93	2.91	2.74	2.41	3.20	3.03	3.01	2.95
05/01/21	05/31/21	May 2021	27.81	16.74	29.75	21.81	23.07	15.10	32.37	24.88	30.96	23.16	3.03	3.26	2.99	2.88	2.93	2.90	2.69	2.36	3.14	2.96	2.95	2.90
06/01/21	06/30/21	Jun 2021	28.05	17.58	32.69	22.91	22.28	13.15	34.34	25.68	32.41	23.16	3.06	3.30	3.03	2.91	2.97	2.94	2.69	2.35	3.17	3.00	2.98	2.89
07/01/21	07/31/21	Jul 2021	38.38	24.25	41.36	29.10	32.28	21.71	41.10	33.84	42.28	33.53	3.10	3.55	3.07	2.97	3.05	3.03	2.89	2.38	3.23	3.06	3.04	3.11
08/01/21	08/31/21	Aug 2021	40.76	32.15	40.67	31.44	37.72	27.00	42.23	36.40	42.66	35.47	3.13	3.58	3.14	3.00	3.11	3.08	2.89	2.37	3.27	3.09	3.08	3.11
09/01/21	09/30/21	Sep 2021	39.06	32.41	35.88	30.92	35.91	32.29	39.97	34.16	39.56	34.50	3.14	3.40	3.12	3.01	3.11	3.08	2.94	2.42	3.27	3.10	3.08	3.16
10/01/21	10/31/21	Oct 2021	36.56	30.26	36.43	30.65	34.79	27.48	43.45	34.64	38.85	33.61	3.17	3.33	3.13	3.04	3.14	3.11	3.02	2.46	3.30	3.13	3.11	3.24
11/01/21	11/30/21	Nov 2021	38.57	30.81	34.86	30.14	36.00	31.01	43.45	35.64	40.75	34.27	3.24	3.55	3.26	3.24	3.28	3.25	3.46	2.65	3.51	3.33	3.31	3.71

12/01/21	12/31/21	Dec 2021	41.58	32.99	36.11	31.17	38.12	31.52	44.65	38.63	42.65	37.87	3.39	3.73	3.44	3.44	3.44	3.41	3.85	2.77	3.71	3.53	3.51	4.12	
01/01/22	01/31/22	Jan 2022	40.95	33.96	37.52	32.20	36.51	30.50	46.60	38.28	43.66	37.23	3.53	3.89	3.57	3.57	3.56	3.53	3.80	2.94	3.85	3.67	3.64	4.07	
02/01/22	02/28/22	Feb 2022	40.30	32.60	36.91	31.41	35.64	29.75	45.40	37.28	42.88	36.25	3.50	3.84	3.55	3.53	3.53	3.50	3.61	2.93	3.81	3.63	3.61	3.87	
03/01/22	03/31/22	Mar 2022	37.70	31.24	34.47	29.84	33.00	28.25	41.80	35.29	39.76	35.27	3.44	3.77	3.48	3.47	3.47	3.44	3.57	2.89	3.74	3.57	3.54	3.83	
04/01/22	04/30/22	Apr 2022	33.04	26.29	30.95	26.43	29.00	19.86	36.04	33.39	31.73	33.18	3.19	3.43	3.16	3.15	3.09	3.07	2.87	2.63	3.41	3.24	3.22	3.08	
05/01/22	05/31/22	May 2022	29.71	19.59	31.75	26.21	23.47	16.35	37.02	28.58	32.31	27.66	3.19	3.44	3.16	3.08	3.09	3.06	2.83	2.58	3.34	3.17	3.15	3.04	
06/01/22	06/30/22	Jun 2022	29.95	20.43	34.69	27.31	22.68	14.40	38.99	29.38	33.76	27.66	3.22	3.48	3.20	3.11	3.13	3.10	2.82	2.57	3.37	3.20	3.18	3.04	
07/01/22	07/31/22	Jul 2022	40.13	25.50	43.36	30.35	33.78	22.96	42.35	34.99	43.63	34.53	3.26	3.73	3.24	3.17	3.21	3.18	3.02	2.60	3.44	3.26	3.24	3.25	
08/01/22	08/31/22	Aug 2022	41.36	34.22	42.55	34.87	39.85	31.41	43.54	37.65	43.90	38.16	3.51	3.78	3.43	3.35	3.44	3.39	3.22	2.65	3.62	3.44	3.42	3.45	
09/01/22	09/30/22	Sep 2022	38.37	32.93	37.88	33.33	38.18	34.02	41.22	36.31	41.26	37.32	3.46	3.66	3.38	3.32	3.41	3.35	3.24	2.74	3.59	3.42	3.40	3.46	
10/01/22	10/31/22	Oct 2022	36.75	31.55	38.60	34.19	36.99	30.96	43.28	36.71	41.20	37.24	3.50	3.65	3.40	3.36	3.45	3.38	3.29	2.78	3.63	3.45	3.43	3.51	
11/01/22	11/30/22	Nov 2022	37.96	32.52	34.24	31.36	36.77	32.61	43.26	37.71	41.67	37.03	3.62	3.86	3.55	3.58	3.64	3.57	3.62	3.05	3.86	3.68	3.66	3.89	
12/01/22	12/31/22	Dec 2022	40.84	35.17	35.42	32.58	38.22	33.30	44.20	40.11	43.10	39.66	3.82	4.06	3.80	3.79	3.83	3.76	3.94	3.21	4.07	3.89	3.87	4.22	
01/01/23	01/31/23	Jan 2023	41.10	36.19	37.27	34.06	38.33	33.58	46.68	40.85	44.59	40.21	4.01	4.28	4.02	3.98	4.02	3.97	4.03	3.41	4.27	4.09	4.06	4.32	
02/01/23	02/28/23	Feb 2023	40.34	35.26	37.14	33.92	38.34	33.80	45.87	40.29	44.09	39.66	4.01	4.24	3.97	3.95	4.00	3.91	3.93	3.41	4.24	4.06	4.03	4.21	
03/01/23	03/31/23	Mar 2023	37.40	33.62	33.97	31.58	34.62	31.20	40.48	36.84	39.46	36.95	3.83	4.04	3.78	3.75	3.79	3.74	3.77	3.23	4.04	3.86	3.83	4.05	
04/01/23	04/30/23	Apr 2023	32.81	27.09	30.17	27.22	29.82	22.92	34.94	31.81	31.20	29.62	3.56	3.73	3.46	3.46	3.47	3.42	3.25	2.85	3.73	3.55	3.53	3.48	
05/01/23	05/31/23	May 2023	29.61	21.55	32.38	27.56	25.06	17.65	35.40	28.42	32.30	26.13	3.58	3.74	3.47	3.41	3.46	3.41	3.17	2.84	3.68	3.50	3.48	3.40	
06/01/23	06/30/23	Jun 2023	31.98	24.08	36.67	30.12	26.64	19.54	38.74	30.99	35.45	28.67	3.61	3.77	3.52	3.42	3.48	3.42	3.17	2.84	3.70	3.52	3.50	3.40	
07/01/23	07/31/23	Jul 2023	40.62	30.84	44.13	34.58	37.09	28.67	43.09	37.12	43.81	37.82	3.64	3.91	3.54	3.47	3.53	3.47	3.28	2.90	3.74	3.56	3.54	3.51	
08/01/23	08/31/23	Aug 2023	41.95	36.30	44.42	38.30	41.97	35.82	44.85	38.89	45.14	40.84	3.88	3.99	3.72	3.69	3.78	3.69	3.56	2.93	3.96	3.79	3.77	3.78	
09/01/23	09/30/23	Sep 2023	37.67	33.46	39.88	35.74	40.46	35.74	42.46	38.46	42.96	40.14	3.79	3.93	3.64	3.64	3.72	3.62	3.53	3.06	3.91	3.74	3.72	3.76	
10/01/23	10/31/23	Oct 2023	36.94	32.84	40.77	37.74	39.18	34.45	43.11	38.78	43.55	40.88	3.83	3.96	3.67	3.68	3.75	3.64	3.56	3.10	3.95	3.77	3.75	3.78	
11/01/23	11/30/23	Nov 2023	37.35	34.23	33.62	32.58	37.54	34.20	43.07	39.79	42.60	39.80	4.00	4.17	3.84	3.93	4.00	3.89	3.78	3.44	4.20	4.03	4.00	4.05	
12/01/23	12/31/23	Dec 2023	40.11	37.36	34.72	34.00	38.32	35.08	43.75	41.59	43.56	41.45	4.25	4.38	4.15	4.15	4.21	4.10	4.04	3.64	4.43	4.25	4.23	4.32	
01/01/24	01/31/24	Jan 2024	41.24	38.42	37.03	35.91	40.14	36.65	46.75	43.43	45.53	43.18	4.50	4.67	4.46	4.40	4.48	4.41	4.27	3.88	4.68	4.50	4.47	4.56	
02/01/24	02/29/24	Feb 2024	40.38	37.91	37.37	36.43	41.05	37.85	46.35	43.29	45.29	43.07	4.51	4.65	4.40	4.37	4.46	4.32	4.24	3.89	4.66	4.47	4.45	4.53	
03/01/24	03/31/24	Mar 2024	37.10	36.01	33.47	33.33	36.24	34.15	39.16	38.39	39.17	38.63	4.22	4.31	4.08	4.04	4.12	4.04	3.97	3.57	4.32	4.14	4.12	4.25	
04/01/24	04/30/24	Apr 2024	32.58	27.90	29.39	28.01	30.64	25.98	33.84	30.23	30.68	26.06	3.94	4.03	3.76	3.76	3.84	3.78	3.64	3.07	4.04	3.86	3.84	3.86	
05/01/24	05/31/24	May 2024	29.52	23.52	33.02	28.91	26.64	18.95	33.79	28.26	32.30	24.59	3.97	4.04	3.79	3.74	3.83	3.76	3.51	3.09	4.01	3.83	3.81	3.74	
06/01/24	06/30/24	Jun 2024	34.01	27.73	38.66	32.93	30.59	24.68	38.49	32.61	37.13	29.68	4.00	4.07	3.85	3.74	3.83	3.75	3.52	3.11	4.01	3.84	3.81	3.75	
07/01/24	07/31/24	Jul 2024	41.10	36.18	44.90	38.82	40.41	34.38	43.83	39.26	44.00	41.11	4.03	4.08	3.85	3.76	3.85	3.76	3.54	3.21	4.04	3.86	3.84	3.77	
08/01/24	08/31/24	Aug 2024	44.01	37.73	46.49	39.99	44.01	37.53	46.69	40.40	46.85	42.30	4.05	4.17	3.89	3.89	3.95	3.86	3.71	3.25	4.16	3.98	3.96	3.94	
09/01/24	09/30/24	Sep 2024	41.01	36.03	43.06	37.99	44.02	37.99	45.90	41.38	46.17	42.21	4.08	4.22	3.94	3.94	4.00	3.92	3.83	3.44	4.21	4.04	4.01	4.05	
10/01/24	10/31/24	Oct 2024	40.44	36.62	44.03	40.39	42.72	37.16	47.01	42.98	46.98	43.51	4.28	4.42	4.13	4.16	4.21	4.14	4.02	3.61	4.43	4.25	4.23	4.24	
11/01/24	11/30/24	Nov 2024	41.43	38.97	37.69	36.09	41.39	37.42	47.65	44.23	46.93	44.18	4.57	4.74	4.41	4.50	4.53	4.47	4.32	4.09	4.77	4.60	4.57	4.59	
12/01/24	12/31/24	Dec 2024	42.85	39.69	37.41	36.33	40.99	37.32	47.09	44.48	46.49	44.65	4.60	4.70	4.51	4.45	4.51	4.45	4.22	4.03	4.73	4.55	4.52	4.50	
01/01/25	01/31/25	Jan 2025	43.20	39.92	38.42	37.21	42.00	38.10	48.74	45.18	47.36	44.85	4.69	4.83	4.65	4.60	4.65	4.56	4.44	4.12	4.88	4.70	4.67	4.73	
02/01/25	02/28/25	Feb 2025	42.31	39.68	38.97	38.00	43.16	39.73	48.47	45.16	47.24	45.30	4.72	4.85	4.62	4.61	4.66	4.58	4.49	4.13	4.89	4.71	4.69	4.78	
03/01/25	03/31/25	Mar 2025	40.17	38.87	35.79	35.79	38.89	36.79	41.51	40.30	41.95	42.52	4.57	4.65	4.47	4.39	4.47	4.40	4.32	3.92	4.67	4.49	4.47	4.61	
04/01/25	04/30/25	Apr 2025	37.40	33.70	33.74	32.24	35.41	31.50	39.72	36.93	36.15	32.14	4.41	4.52	4.25	4.25	4.31	4.26	4.10	3.49	4.52	4.34	4.32	4.33	
05/01/25	05/31/25	May 2025	32.75	27.11	35.03	31.98	29.92	23.08	36.96	32.02	35.07	28.37	4.23	4.30	4.07	4.00	4.08	4.03	3.77	3.41	4.27	4.10	4.08	4.00	
06/01/25	06/30/25	Jun 2025	37.10	30.48	41.27	35.21	33.77	27.34	41.82	35.68	40.27	32.70	4.26	4.31	4.12	3.99	4.07	4.01	3.72	3.39	4.26	4.09	4.06	3.95	
07/01/25	07/31/25	Jul 2025	43.84	38.89	47.64	41.26	42.98	36.75	46.74	41.57	46.99	43.68	4.30	4.35	4.16	4.03	4.12	4.03	3.78	3.47	4.30	4.12	4.10	4.01	
08/01/25	08/31/25	Aug 2025	47.06	40.19	50.16	42.98	47.43	40.61	50.54	43.35	51.00	45.83	4.34	4.45	4.16	4.10	4.20	4.12	3.94	3.50	4.37	4.20	4.18	4.16	
09/01/25	09/30/25	Sep 2025	43.13	36.73	45.78	39.79	46.43	39.80	48.37	42.14	49.41	44.50	4.22	4.39	4.08	4.03	4.10	4.01	3.90	3.58	4.30	4.12	4.10	4.12	
10/01/25	10/31/25	Oct 2025	41.36	36.64	44.58	40.96	43.38	37.42	48.00	43.01	48.16	45.26	4.25	4.45	4.09	4.07	4.14	4.05	3.92	3.58	4.34	4.16	4.14	4.15	
11/01/25	11/30/25	Nov 2025	40.47	36.73	36.85	35.63	40.23	36.80	46.82	42.76	45.53	43.28	4.30	4.48	4.14	4.18	4.25	4.18	3.96	3.81	4.46	4.28	4.26	4.23	
12/01/25	12/31/25	Dec 2025	43.33	39.98	38.14	36.78	41.79	37.52	47.26	44.34	47.19	44.83	4.56	4.70	4.48	4.41	4.48	4.41	4.18	3.92	4.70	4.52	4.49	4.46	
01/01/26	01/31/26	Jan 2026	43.95	41.10	39.58	38.37	43.45	39.24	50.53	47.01	48.98	46.97	4.78	4.92	4.75	4.64	4.71	4.63	4.41	4.09	4.93	4.75	4.72	4.69	
02/01/26	02/28/26	Feb 2026	43.75	41.81	40.04	39.14	44.73	41.40	50.48	47.24	49.27	48.00	4.82	4.96	4.75	4.68	4.76	4.68	4.46	4.10	4.97	4.79	4.76	4.74	
03/01/26	03/31/26	Mar 2026	41.67	40.41	37.38	36.98	40.24	38.10	43.97	42.69	44.10	45.02	4.66	4.74	4.52	4.47	4.55	4.49	4.34	3.83	4.76	4.58	4.55	4.62	
04/01/26	04/30/26	Apr 2026	37.63	33.95	34.47	32.87	35.47	31.30	41.53	38.21	37.42	33.11	4.49	4.56	4.30	4.27	4.35	4.29	4.14	3.55	4.55	4.37	4.35	4.37	
05/01/26	05/31/26	May 2026	33.65	28.99	36.84	34.03	30.04	22.25	39.16	34.58	37.49	31.11	4.35	4.41	4.18	4.08	4.17	4.10	3.84	3.50	4.35	4.17	4.15	4.07	
06/01/26	06/30/26	Jun 2026	39.24	32.24	43.32	36.98	35.23	28.67	44.75	38.00	42.96	35.66	4.38	4.42	4.25	4.09	4.17	4.10	3.79	3.48	4.36	4.19	4.16	4.01	
07/01/26	07/31/26	Jul 2026	45.97	40.55	49.47	42.96	44.58	38.02	50.12	44.05	49.86	46.44	4.42	4.47	4.27	4.12	4.22	4.13	3.88	3.58	4.39	4.21	4.19	4.11	
08/01/26	08/31/26	Aug 2026	47.68	41.85	51.50	44.07	49.08	41.79	53.64	45.82	53.50	47.95	4.45	4.60	4.30	4.22	4.30	4.23	4.05	3.64	4.49	4.32	4.30	4.27	
09/01/26	09/30/26	Sep 2026	43.81	38.28	46.77	41.14	47.05	40.66	50.14	44.21	50.79	45.95	4.34	4.54	4.18	4.13	4.22	4.14	3.96	3.65	4.40	4.22	4.20	4.18	
10/01/26	10/31/26	Oct 2026	42.84	38.28	46.51	43.07	45.07	39.08	49.76	44.82	49.97	47.27	4.37	4.58	4.20	4.18	4.25	4.18	3.98	3.68	4.45	4.28	4.26	4.21	
11/01/26	11/30/26	Nov 2026	41.90	38.81	38.42	36.97	42.30	38.38	48.86	44.99	47.72	45.26	4.43	4.68	4.26	4.30	4.38	4.30	4.09	3.98	4.58	4.40	4.38	4.36	
12/01/26	12/31/26	Dec 2026	43.32	41.15	38.78	37.81	42.74	38.83	48.99	46.26	48.32	46.45	4.70	4.83	4.63	4.54	4.62	4.54	4.31	3.92	4.82	4.64	4.62	4.59	
01/01/27	01/31/27	Jan 2027	45.46	42.66	41.21	40.02	45.18	41.08	51.96	48.22	50.69	48.52	5.00	5.15	5.03	4.88	4.95	4.87	4.64	4.38	5.17	4.99	4.96	4.93	
02/01/27	02/28/27	Feb 2027	45.14	43.24	41.61	40.71	46.60	43.31	51.88	48.20	51.25	49.95	5.04	5.18	4.99	4.91	4.98	4.89	4.66	4.40	5.19	5.01	4.99	4.95	
03/01/27	03/31/27	Mar 2027	43.37	42.12	38.47	38.71	41.84	39.75	45.13	44.40	45.49	47.46	4.85	4.95	4.75	4.68	4.76	4.69	4.56	4.10	4.96	4.78	4.76	4.84	
04/01/27	04/30/27	Apr 2027	39.11	35.35	35.43	34.03	36.93	32.74	42.64	39.46	38.80	34.55	4.66	4.75	4.49	4.45	4.53	4.49	4.30	3.83	4.72	4.55	4.52	4.53	
05/01/27	05/31/27	May 2027	34.99	29.92	38.48	35.67	31.57	23.85	40.43	35.66	38.95	32.58	4.53	4.57	4.37	4.26	4.35	4.31	4.09	3.73	4.53	4.36	4.34	4.31	
06/01/27	06/30/27	Jun 2027	40.78	33.24	45.19	38.50	37.17	30.13	46.18	39.12	44.75	37.39	4.56	4.58	4.44	4.25	4.35	4.31	4.03	3.73	4.52	4.34	4.32	4.26	
07/01/27	07/31/27	Jul 2027	47.32	42.21	50.83	44.25	46.01	39.63	50.92	44.27	51.09	47.79	4.60	4.66	4.44	4.29	4.38	4.34	4.10	3.84	4.56	4.38	4.36	4.33	
08/01/27	08/31/27	Aug 2027	48.57	42.95	52.77	45.11	50.29	43.01	54.10	45.76	54.56	49.01	4.64	4.75	4.46	4.35	4.46	4.41	4.19	3.88	4.62	4.45	4.43	4.42	
09/01/27	09/30/27	Sep 2027	45.16	39.57	47.94	42.57	48.69	42.35	51.13	45.19	52.17	47.94	4.60	4.77	4.46	4.35	4.45	4.40	4.25	4.03	4.62	4.45	4.43	4.47	
10/01/27	10/31/27	Oct 2027	45.17	40.44	48.69	45.13	47.79	41.55	52.11	46.91	52.74	49.81	4.64	4.88	4.48	4.48	4.54	4.48	4.41	4.07	4.75	4.57	4.55	4.64	
11/01/27	11/30/27	Nov 2027	44.73	42.22	41.09	39.56	45.54	41.19	51.92	48.02	50.94	48.32	4.79	5.06	4.61	4.66	4.77	4.72	4.58	4.40	4.94	4.76	4.74	4.85	
12/01/27	12/31/27	Dec 2027	46.51	44.17	41.82	40.53	46.36	41.89	51.98	49.23	52.06	50.09	5.08	5.24	5.04	4.96	5.04	4.96	4.92	4.46	5.24	5.06	5.04	5.20	
46753	46783	46753	46.4588	43.65241	41.41612	40.48159	45.77988	41.84629	52.96106	49.59487	51.22721	49.14259	4.9467	5.112	4.988	4.8364	4.9053	4.8089	4.8227	4.3955	5.1221	4.9414	4.9151	5.1101	

46784	46812	46784	45.45942	44.40418	41.89441	41.38704	47.16233	44.08173	52.32225	49.36621	51.37757	50.84018	4.988	5.1258	4.9467	4.864	4.9329	4.8502	4.8502	4.4093	5.1489	4.9684	4.9424	5.136	
46813	46843	46813	44.09768	42.43577	38.87306	39.04634	42.26336	39.9292	45.64303	44.44567	45.9125	47.63135	4.8502	4.9191	4.7124	4.6711	4.7538	4.6849	4.5884	4.1613	4.9541	4.7742	4.749	4.8702	
46844	46873	46844	40.58617	37.05667	37.02132	35.58369	38.59361	34.53837	44.18599	40.77873	40.22093	35.95542	4.6987	4.7676	4.5058	4.492	4.5746	4.5333	4.4369	3.9546	4.7646	4.5881	4.5667	4.6634	
46874	46904	46874	38.08934	32.69669	39.67659	37.32161	34.94347	28.03809	43.57313	38.63839	41.21461	35.34556	4.6987	4.7262	4.5471	4.4231	4.5333	4.4782	4.2715	3.9821	4.6956	4.5191	4.4978	4.4978	
46905	46934	46905	43.42182	35.31513	47.08604	40.23857	39.76794	32.16916	49.01146	41.37172	46.93682	39.78201	4.74	4.7538	4.616	4.4093	4.5333	4.4644	4.2991	4.0097	4.6828	4.506	4.4843	4.5273	
46935	46965	46935	50.40778	45.48801	52.90257	46.41309	48.76263	42.75644	53.8602	47.06845	53.58744	50.27331	4.8089	4.8227	4.6711	4.4782	4.5884	4.5195	4.3542	4.1337	4.7528	4.5756	4.5535	4.5848	
46966	46996	46966	51.27708	45.96575	55.05811	47.18994	52.87101	45.41833	57.22525	48.47729	57.35302	51.64598	4.8502	4.9467	4.6711	4.5746	4.6711	4.5884	4.5333	4.1475	4.8445	4.6689	4.6485	4.7572	
46997	47026	46997	46.75053	42.29423	48.94524	44.30394	50.11834	44.05593	53.03969	47.44398	53.66745	50.04365	4.7951	4.9329	4.6849	4.5746	4.6573	4.5746	4.5471	4.3266	4.8446	4.669	4.6485	4.7712	
47027	47057	47027	46.99783	42.49305	49.86179	45.89353	49.87423	43.55796	54.18171	49.0774	54.29167	51.64384	4.8364	5.0156	4.7262	4.6711	4.74	4.6435	4.616	4.3817	4.9422	4.7662	4.7454	4.8426	
47058	47087	47058	46.88739	43.79403	42.45889	40.76977	47.43979	42.72145	54.3069	49.92436	52.61492	49.79392	4.9467	5.1534	4.8364	4.8364	4.9467	4.864	4.864	4.6298	5.1136	4.9356	4.9125	5.1333	
47088	47118	47088	48.46066	45.98808	43.1586	42.29282	47.91896	43.68699	54.6385	51.65955	53.62606	51.67439	5.236	5.4014	5.2085	5.1258	5.1809	5.0845	5.0983	4.7676	5.4073	5.2279	5.2032	5.3768	
47119	47149	47119	49.16245	45.92476	44.09424	43.06635	48.42941	43.96248	56.18002	52.17181	53.91539	51.13849	5.2475	5.4163	5.2194	5.1912	5.2616	5.149	5.1772	4.7692	5.4769	5.2962	5.2699	5.4646	
47150	47177	47150	48.75692	46.57519	44.9807	44.20706	50.03502	46.74218	56.0392	52.21629	53.92329	53.06631	5.2897	5.4445	5.2053	5.2194	5.2757	5.1912	5.2053	4.7833	5.5042	5.3238	5.2978	5.4911	
47178	47208	47178	46.49878	45.88798	40.53329	41.08061	44.97281	43.24538	48.39512	47.49881	47.9578	50.54424	5.1209	5.2053	4.9943	5.0084	5.0787	4.9802	4.9802	4.5019	5.2913	5.1115	5.0862	5.262	
47209	47238	47209	42.10644	38.41686	38.24483	36.51678	39.98209	35.80998	45.31865	42.2872	41.36893	36.67617	4.938	5.0084	4.7973	4.727	4.8255	4.7692	4.6989	4.2065	4.9997	4.8232	4.8017	4.9254	
47239	47269	47239	38.1469	32.7441	40.47047	38.09076	34.91972	27.15581	43.66212	38.63247	41.55511	35.58526	4.7833	4.8114	4.6426	4.53	4.6285	4.5722	4.3753	4.1361	4.8025	4.6261	4.6047	4.6015	
47270	47299	47270	42.69908	35.37034	47.27371	40.68069	39.11628	32.06075	48.49187	41.49044	46.73554	39.69369	4.8255	4.8395	4.6989	4.516	4.6144	4.5722	4.4034	4.1502	4.7894	4.6127	4.5909	4.6317	
47300	47330	47300	51.34794	46.44866	54.56688	48.10911	49.80294	43.78926	55.20818	48.42007	54.67746	51.71411	4.8677	4.8958	4.7129	4.53	4.6426	4.5441	4.4175	4.1924	4.8046	4.6275	4.6053	4.6481	
47331	47361	47331	52.83981	46.87564	56.93246	48.79776	54.60377	46.70603	59.10372	50.07643	58.66082	53.20496	4.9099	4.9943	4.727	4.6285	4.7411	4.6566	4.6004	4.2346	4.8983	4.7228	4.7024	4.8242	
47362	47391	47362	48.96692	43.57608	51.64745	46.09477	52.09925	45.55416	55.86348	49.49234	56.17923	51.33098	4.7973	4.9802	4.6707	4.5863	4.6707	4.5722	4.53	4.3471	4.8562	4.6806	4.6602	4.7541	
47392	47422	47392	48.00231	42.72086	51.60258	47.83071	50.48085	43.75296	55.36021	49.58021	54.81126	51.83973	4.8255	5.0365	4.6989	4.6707	4.7551	4.6566	4.6285	4.3893	4.9418	4.7658	4.745	4.8551	
47423	47452	47423	47.16455	44.15223	42.19825	41.2719	47.1693	42.97075	54.69495	50.47787	52.26527	50.18167	4.938	5.2053	4.8677	4.8958	4.9521	4.8677	4.8817	4.6144	5.1729	4.995	4.9719	5.151	
47453	47483	47453	48.83807	46.43195	43.8136	43.0781	48.19034	44.20967	55.32892	51.95523	53.67444	51.67544	5.2053	5.3601	5.1912	5.135	5.2053	5.1068	5.1209	4.727	5.4164	5.2371	5.2124	5.3995	
47484	47514	47484	50.51382	46.89832	44.01388	42.94605	48.84227	44.6041	56.83047	52.86702	54.2282	51.85662	5.3342	5.478	5.3486	5.2623	5.3342	5.2479	5.2623	4.8597	5.5479	5.3672	5.341	5.5498	
47515	47542	47515	50.19423	48.42253	44.61584	44.2407	50.42872	47.20684	56.92251	53.22231	54.28865	53.7903	5.363	5.5067	5.3486	5.2911	5.363	5.2767	5.2911	4.9172	5.5759	5.3955	5.3695	5.5769	
47543	47573	47543	48.10451	47.07865	40.93645	41.86089	45.8834	44.12317	49.0538	48.27098	48.68638	50.94088	5.2192	5.3198	5.0754	5.1473	5.2192	5.1329	5.1473	4.6297	5.4303	5.2504	5.2251	5.429	
47574	47603	47574	43.37393	39.61084	37.99383	36.9425	40.83517	36.73027	46.2997	43.45378	42.29056	38.18801	5.0898	5.1617	4.9029	4.8885	4.9891	4.9316	4.8597	4.3853	5.1612	4.9847	4.9632	5.0863	
47604	47634	47604	40.13375	34.60573	42.67058	40.40948	36.72594	27.53035	45.70684	40.71321	43.60652	38.27195	5.061	5.1185	4.8885	4.831	4.9316	4.8741	4.7447	4.3709	5.1035	4.927	4.9057	4.971	
47635	47664	47635	44.50917	37.39273	49.10582	43.09274	40.93165	33.86086	50.28303	43.54352	48.50252	42.32186	5.1042	5.1329	4.9604	4.8166	4.9316	4.8741	4.7735	4.4284	5.0901	4.9133	4.8916	5.0017	
47665	47695	47665	55.56703	49.84665	56.84324	49.68441	53.08675	46.78891	57.54395	49.86927	57.00475	53.70353	5.1761	5.2048	4.9891	4.831	4.9604	4.9029	4.7591	4.5434	5.1056	4.9284	4.9063	4.9897	
47696	47726	47696	56.45338	51.39721	58.72911	50.8244	55.98935	49.33072	61.42887	51.62622	60.56989	55.38659	5.2048	5.3055	5.0323	4.9604	5.0754	4.9891	4.9316	4.5866	5.2302	5.0546	5.0342	5.1555	
47727	47756	47727	53.5421	48.83378	53.82664	48.46361	55.15964	48.28154	59.16286	52.1311	59.06353	54.17393	5.1617	5.3342	5.0035	5.0323	5.1042	5.0467	5.0323	4.7447	5.3022	5.1266	5.1062	5.2564	
47757	47787	47757	51.65035	46.74883	53.88141	50.09177	53.39976	46.43301	58.68908	53.26668	57.85624	55.29187	5.2048	5.3773	5.0179	5.1042	5.1617	5.061	5.1042	4.7878	5.3753	5.1993	5.1784	5.3308	
47788	47817	47788	51.09227	47.95618	44.3348	43.52971	49.72481	45.45146	58.17545	53.72279	55.15785	53.16575	5.3198	5.5499	5.1617	5.3198	5.363	5.2623	5.3055	4.9891	5.597	5.419	5.3959	5.5747	
47818	47848	47818	52.60705	49.32757	45.84212	44.83854	51.00701	46.66524	57.91858	54.52274	56.57953	54.58948	5.6074	5.7368	5.5499	5.5355	5.6074	5.5067	5.5355	5.2048	5.817	5.6376	5.6129	5.8141	
47849	47879	47849	52.29638	48.39914	45.70633	44.34977	50.8294	46.34189	58.54391	53.91601	56.61075	54.49781	5.4956	5.6573	5.4663	5.4516	5.525	5.4222	5.4369	5.0989	5.7372	5.5565	5.5302	5.7243	
47880	47907	47880	51.52417	50.14294	45.95776	46.15969	52.19709	48.99539	58.0672	54.74709	56.19851	55.96792	5.5397	5.7014	5.4222	5.4956	5.5691	5.4663	5.4809	5.1724	5.7805	5.6	5.5741	5.7668	
47908	47938	47908	49.77977	48.39264	42.43782	43.15434	47.49686	45.47012	50.19967	49.28092	50.30878	52.50368	5.3928	5.525	5.2311	5.3487	5.4075	5.3487	5.334	4.8197	5.6317	5.4518	5.4266	5.6158	
47939	47968	47939	45.5654	42.19228	40.3797	39.48653	43.27282	39.33433	48.26223	45.43693	44.56545	40.96984	5.2311	5.334	5.0695	5.0695	5.1577	5.1136	5.0401	4.6434	5.3422	5.1657	5.1442	5.2667	
47969	47999	47969	42.24995	36.5578	43.74247	41.50146	38.82505	31.98553	47.50325	42.51687	45.13715	40.27883	5.1871	5.2458	5.0254	4.952	5.0548	4.996	4.8785	4.5993	5.2245	5.048	5.0266	5.1047	
48000	48029	48000	46.7589	38.69331	50.90142	44.27245	43.24909	35.30489	52.37271	44.83367	50.61174	44.21851	5.2311	5.2605	5.0695	4.952	5.0548	4.996	4.8932	4.6287	5.2254	5.0487	5.0269	5.1214	
48030	48060	48030	57.35442	51.28565	58.36241	51.03651	54.88101	48.15809	58.7924	50.76649	58.88006	55.05671	5.334	5.3634	5.1577	4.996	5.1283	5.0695	4.9079	4.7168	5.2706	5.0935	5.0713	5.1385	
48061	48091	48061	57.68375	52.91554	60.3431	52.43735	57.78005	51.14545	62.40241	52.82957	62.33528	57.05364	5.3634	5.4663	5.1724	5.1136	5.2165	5.1577	5.0989	4.7609	5.3834	5.2078	5.1875	5.3227	
48092	48121	48092	54.10849	48.87181	54.8017	49.19594	56.30749	49.05068	59.74551	52.56928	60.50686	55.60408	5.2605	5.4516	5.0989	5.1283	5.2018	5.1283	5.1283	4.8785	5.3982	5.2226	5.2022	5.3524	
48122	48152	48122	52.36006	47.42842	54.47139	50.34607	54.47458	47.4267	59.55095	53.84073	59.20696	56.54704	5.2899	5.5103	5.1283	5.2165	5.2899	5.1724	5.2165	4.952	5.4876	5.3116	5.2907	5.4431	
48153	48182	48153	51.37034	49.01233	45.54264	44.74166	50.73334	46.73613	58.71298	54.43495	56.12805	54.5059	5.3634	5.6132	5.2311	5.3928	5.4369	5.3487	5.3634	5.0254	5.6699	5.492	5.4689	5.6327	
48183	48213	48183	53.11577	50.39526	46.61309	45.7899	52.14893	47.55222	58.24036	55.01898	57.91111	56.50654	5.672	5.8483	5.6132	5.5985	5.672	5.5691	5.5985	5.3046	5.88	5.7006	5.6759	5.8771	
48214	48244	48214	54.67505	51.05178	47.47783	46.11191	52.93289	48.56615	60.95815	56.90414	58.855	56.77691	5.7817	5.962	5.7517	5.7517	5.8118	5.7067	5.7367	5.3913	6.0373	5.8566	5.8304	6.0241	
48245	48273	48245	54.31961	52.95292	47.74577	47.63493	54.4885	51.38612	61.11821	57.58146	58.51315	57.87592	5.8268	6.007	5.7367	5.7968	5.8568	5.7517	5.7817	5.4363	6.0816	5.9012	5.8752	6.0676	
48274	48304	48274	51.92706	50.19624	44.10512	44.8521	49.57573	47.07293	52.94066	52.23122	52.48956	55.21774	5.5865	5.7517	5.4363	5.5565	5.6165	5.5264	5.5415	5.151	5.8394	5.6596	5.6343	5.8232	
48305	48334	48305	47.26258	43.35854	41.31272	40.56715	44.37683	40.27023	50.31333	47.61531	46.48708	42.87952	5.3763	5.5415	5.166	5.2862	5.3462	5.3012	5.2261	4.8356	5.5588	5.3823	5.3609	5.4527	
48335	48365	48335	42.14584	36.92958	44.4676	42.71275	38.4265	30.25384	48.06182	43.41899	45.87739	41.699	5.2711	5.3012	5.0909	5.0008	5.121	5.0309	4.9708	4.7305	5.2733	5.0969	5.0755	5.1971	
48366	48395	48366	48.81347	40.14441	52.3508	45.62668	45.3014	36.79174	54.36148	46.44062	52.36044	46.62389	5.3012	5.3462	5.151	5.0008	5.121	5.0609	4.9708	4.7606	5.2743	5.0975	5.0758	5.1991	
48396	48426	48396	58.62069	52.51503	59.02652	52.00334	55.83078	49.31676	59.52673	51.84689	59.08129	55.97088	5.3913	5.4363	5.2111	5.0459	5.181	5.106	4.9558	4.7906	5.3205	5.1433	5.1212	5.1864	
48427	48457	48427	58.73697	53.47947	61.55767	53.43929	58.53472	51.57865	63.6806	53.95761	63.52773	58.06915	5.4363	5.6015	5.2261	5.2411	5.3312	5.2561	5.1961	4.9107	5.5109	5.3354	5.315	5.4199	
48458	48487	48458	54.16832	49.57236	55.31115	50.03315	56.65173	49.98649	60.52037	53.77945	61.10446	57.05098	5.3162	5.5565	5.151	5.2411	5.3012	5.2261	5.2111	4.9558	5.5111	5.3354	5.315	5.4352	
48488	48518	48488	53.5639	48.37401	56.18071	52.50325	55.76284	48.72367	60.85321	55.27107	60.36163	58.02624	5.3613	5.6015	5.166	5.3312	5.3913	5.3012	5.3012	5.0158	5.6023	5.4263	5.4055	5.5278	
48519	48548	48519	52.4393	49.80327	46.36163	45.24796	52.79107	48.17018	60.37083	55.7403	57.80947	55.92192	5.4814	5.7667	5.3462	5.5114	5.6015	5.5114	5.5114	5.136	5.7885	5.6106	5.5875	5.7807	
48549	48579	48549	54.91643	51.89243	47.39924	46.8088	53.26971	48.95097	60.14769	57.41642	59.30719	58.11296	5.7517	5.962	5.7067	5.7517	5.8118	5.7067	5.7217	5.4514	6.0332	5.8538	5.8291	6.0002	
48580	48610	48580	56.71499	52.20495	48.41647	47.26119	54.1489	49.86391	63.12662	57.91715	59.86082	57.25555	5.8629	6.0624	5.8629	5.8782	5.9396	5.8169	5.8475	5.5252	6.1639	5.9832	5.9569	6.135	
48611	48638	48611	55.79104	54.25043	48.73486	49.0152	55.5386	52.37373	62.26927	58.68828	59.46604	59.30509	5.9089	6.1085	5.8475	5.9089	5.9703	5.8782	5.8782	5.5713	6.1938	6.0133	5.9874	6.1641	
48639	48669	48639	53.26065	51.58989	44.55699	45.66796	50.61436	48.36047	53.66793	52.86835	53.21447	56.07747	5.6787	5.8475	5.4945	5.6941	5.7708	5.6787	5.6787	5.1876	5.977	5.7972	5.7719	5.9605	
48670	48699	48670	48.41784	44.58806	41.56433	41.63537	45.38795	41.41447	51.18072	48.97053	47.09339	44.50127	5.4332	5.6634	5.2183	5.4332	5.4792	5.4178	5.3411	4.9113	5.7058	5.5293	5.5079	5.5676	
48700	48730	48700	44.05789	38.53845	46.35949	44.5514	40.29946	32.37287	49.97055	45.05144	47.50774	43.67104	5.4025	5.4945	5.2029	5.1876	5.295	5.2336	5.0955	4.8499	5.4601	5.2837	5.2623	5.3218	
48731	48760	48731	50.82504	41.86337	54.06908	47.23831	47.21673	38.5423	56.3249	48.29852	53.64094	48.3191	5.4332	5.4945	5.2643	5.1876	5.295	5.2336	5.0955	4.896	5.461	5.2843	5.2625	5.3238	
48761	48791	48761	61.50851	54.78276	61.1866	54.23796	58.35807	51.50301	62.06748	54.01772	60.82655	57.68279	5.5406	5.6327	5.3718	5.295	5.4639	5.4025	5.1722	5.0188	5.5696	5.3925	5.3703	5.4029	
48792	48822	48792	62.56919	56.54461	63.89087	55.52209	61.14779	53.94388	66.65113	55.98727	65.75417	60.34594	5.5866	5.7708	5.3564	5.4792	5.5713	5.4945	5.4025	5.1262	5.749	5.5734	5.5531	5.6263	
48823	48852	48823	56.85423	52.54306	56.83234	51.81913	57.887	51.42015	62.36303	55.58961	62.39203	58.35034	5.4945	5.7555	5.3104	5.4639	5.5252	5.4178	5.4025	5.1415	5.7338	5.5582	5.5377	5.6266	
48853	48883	48853	55.31087	51.0631	57.27377	53.73036	57.12063	50.38516	62.82996	57.45476	61.7597	59.60482	5.5252	5.8015	5.3257	5.5252	5.5866	5.4945	5.5252	5.1876	5.7964	5.6204	5.5995	5.7518	
48884	48913	48884	54.73926	51.96967	47.67288	46.51931	53.96879	49.50703	62.51205	57.86787	59.00608	57.38541	5.6327	5.9243	5.4945	5.6941	5.7862	5.6787	5.7555	5.295	5.9712	5.7932	5.7701	6.0247	
48914	48944	48914	57.27208	54.00999	48.84847	48.5694	55.06472	50.84448	62.46222	59.30365	60.57232	58.98551	5.955	6.1852	5.9089	5.9703	6.1238	6.001	6.1085	5.6327	6.2518	6.0724	6.0477	6.387	
48945	48975	48945	58.92946	54.88666	50.36596	48.95652	56.28812	52.11806	64.04784	59.64228	62.19339	59.77803	6.0389	6.2899	6.0076	6.086	6.2272	6.1174	6.2428	5.6939	6.3716	6.1909	6.1647	6.5303	
48976	49003	48976	58.05573	56.67767	50.64523	50.38755	57.7043	54.5558	63.51366	60.28301	61.61068	61.65806	6.086	6.3213	5.9762	6.1174	6.2585	6.1487	6.2585	5.7566	6.4022	6.2218	6.1958	6.5443	
49004	49034	49004	55.3362	53.14323	46.45409	46.83521	52.40583	49.81977	55.29626	54.36372	54.90257	57.55954	5.8664	6.0546	5.6625	5.8978	5.9448	5.8507	5.8978	5.3017	6.1807	6.0009	5.9756	6.1795	

49035	49064	49035	50.5875	46.52434	43.3733	43.18766	47.62477	43.26707	52.50871	49.69963	48.7625	45.71811	5.6311	5.835	5.4115	5.6154	5.6625	5.5841	5.537	5.0351	5.8881	5.7116	5.6901	5.7636
49065	49095	49065	47.08186	41.19246	47.94194	46.03965	43.63547	37.1256	52.24345	47.59651	49.80045	46.69195	5.5997	5.7252	5.3801	5.4586	5.5684	5.5056	5.3488	4.988	5.7311	5.5546	5.5332	5.575
49096	49125	49096	52.85995	43.38255	55.74182	48.88813	49.33359	40.01697	57.51989	49.62411	55.04554	50.65231	5.6311	5.7252	5.4899	5.4115	5.5527	5.5056	5.3174	5.0194	5.685	5.5082	5.4865	5.5457
49126	49156	49126	63.30322	56.48793	62.58573	55.40874	60.16524	53.13102	62.40511	54.74319	61.88726	58.89548	5.7095	5.8193	5.5213	5.4743	5.6154	5.537	5.3331	5.0978	5.7488	5.5717	5.5496	5.5637
49157	49187	49157	63.37647	57.27652	64.94682	56.78409	61.85902	54.4424	66.68834	56.79034	66.6527	61.47261	5.7409	5.9605	5.4899	5.6468	5.7252	5.6311	5.5684	5.1449	5.9166	5.741	5.7207	5.7922
49188	49217	49188	56.43844	52.76575	56.96397	52.30973	57.9258	52.13705	61.62195	55.85294	62.48603	59.82872	5.537	5.8193	5.3801	5.537	5.5841	5.4743	5.4899	5.1762	5.8069	5.6313	5.6109	5.714
49218	49248	49218	55.35256	51.93277	57.17895	53.78777	57.88969	51.39255	62.55783	58.07273	62.49183	61.00908	5.5841	5.8507	5.4115	5.5841	5.6468	5.5527	5.5841	5.2233	5.8552	5.6792	5.6583	5.8107
49249	49278	49249	54.39167	52.29489	48.02896	47.26941	54.21891	49.89527	61.76721	57.50723	59.21254	57.84644	5.6311	5.9135	5.4899	5.6782	5.788	5.6782	5.788	5.2547	5.9553	5.7773	5.7542	6.0573
49279	49309	49279	58.28368	55.10118	49.91051	49.16705	55.894	51.91891	62.52504	59.98824	61.88787	60.83842	5.9605	6.2272	5.9135	5.9762	6.1644	6.0546	6.1801	5.6468	6.2577	6.0783	6.0536	6.4587
49310	49340	49310	59.53516	55.82142	50.23922	48.80596	56.26044	52.40975	64.92405	60.88103	61.97103	60.0254	6.0596	6.284	6.0435	6.1077	6.284	6.1397	6.3161	5.755	6.3933	6.2126	6.1863	6.6035
49341	49368	49341	58.53653	57.13014	50.41783	50.06779	57.74982	54.55849	64.48781	61.36178	61.51999	61.40151	6.1077	6.3321	6.0275	6.1397	6.3161	6.1878	6.3321	5.771	6.4246	6.2441	6.2182	6.6179
49369	49399	49369	56.0481	54.32942	47.2671	47.18102	53.05148	50.93357	56.03325	55.64189	54.94172	58.12031	5.9153	6.1397	5.739	5.9474	6.0275	5.9153	5.9955	5.6107	6.2303	6.0505	6.0252	6.2772
49400	49429	49400	51.16154	46.69928	43.60505	42.88652	48.03297	43.4414	53.4577	50.51304	49.16828	45.47845	5.7229	5.9313	5.4985	5.7229	5.755	5.6588	5.7069	5.3222	5.9956	5.8191	5.7977	5.9335
49430	49460	49430	47.43174	41.26237	49.04718	47.22895	43.7348	33.89547	53.27327	48.12178	50.70017	47.35696	5.739	5.9153	5.5787	5.6909	5.755	5.6909	5.6107	5.2741	5.9634	5.7869	5.7655	5.837
49461	49490	49461	51.71912	43.34897	55.49441	49.36495	48.07654	39.42627	57.20624	49.95372	54.58484	50.78994	5.771	5.8832	5.6428	5.5947	5.7229	5.6428	5.5145	5.0977	5.8681	5.6914	5.6697	5.7428
49491	49521	49491	65.27011	57.81346	64.30777	56.99825	61.82504	54.38187	64.83965	56.6906	63.66724	60.66148	5.8672	5.9955	5.7229	5.7069	5.8351	5.7229	5.6107	5.1619	5.9815	5.8044	5.7822	5.8414
49522	49552	49522	66.08118	58.70115	66.70876	58.02124	63.9835	55.78577	69.76017	58.71059	68.43693	62.78761	5.9153	6.1077	5.7069	5.8351	5.9153	5.7871	5.771	5.3382	6.105	5.9294	5.909	5.9949
49553	49582	49553	60.15202	55.12675	59.70361	54.07083	60.9691	54.02603	65.90384	58.2706	66.0849	60.93697	5.739	5.9634	5.5787	5.755	5.7871	5.6588	5.7069	5.3542	6.0249	5.8493	5.8289	5.931
49583	49613	49583	57.67781	52.92533	59.35016	55.59103	58.84766	51.86208	65.17042	59.60367	63.61763	61.19708	5.755	5.9955	5.5947	5.771	5.8512	5.739	5.771	5.3703	6.0421	5.8661	5.8453	5.9976
49614	49643	49614	56.77109	53.69737	48.69543	47.33422	54.90105	50.73308	64.12888	59.68184	60.15504	58.78394	5.8191	6.1237	5.7229	5.8672	6.0435	5.9153	6.0435	5.4504	6.1443	5.9664	5.9433	6.3128
49644	49674	49644	60.25239	56.18713	50.77007	49.70314	57.01007	52.82726	64.27378	61.48465	62.86897	61.53091	6.1397	6.3802	6.0916	6.1397	6.3321	6.2199	6.3321	5.6909	6.4212	6.2418	6.2171	6.6107
49675	49705	49675	62.09267	58.31065	52.71138	51.21268	58.92868	54.98147	67.77968	64.02909	64.68797	62.75309	6.3076	6.6352	6.2748	6.3895	6.6352	6.5042	6.6352	5.7014	6.6751	6.4944	6.4682	6.9227
49706	49734	49706	60.52765	58.68563	52.39475	51.82183	59.73144	56.31504	66.61667	62.66305	63.52475	63.23816	6.3567	6.5533	6.2748	6.3567	6.4878	6.3895	6.4878	5.9963	6.6416	6.4611	6.4352	6.7736
49735	49765	49735	58.14677	55.986	48.86971	48.80047	55.05028	52.51028	58.3008	57.50883	57.06963	59.72935	6.1601	6.3567	5.9963	6.1765	6.2584	6.1437	6.242	5.8816	6.4595	6.2796	6.2544	6.5238
49766	49795	49766	52.96366	48.24936	45.28445	44.39064	49.83151	44.75006	55.34427	52.6563	51.27927	47.61106	5.9635	6.1274	5.7669	5.9471	5.9799	5.898	5.8816	5.5376	6.2198	6.0433	6.0219	6.1082
49796	49826	49796	48.83059	42.77381	50.85653	49.13552	44.68681	35.03066	54.70844	49.90407	52.08208	49.45409	5.9799	6.1274	5.8161	5.9144	5.9635	5.8816	5.8325	5.5048	6.1869	6.0104	5.989	6.0587
49827	49856	49827	54.93616	45.76332	58.19607	51.6981	51.2481	42.00694	60.18116	52.42397	57.37874	53.42405	6.0127	6.111	5.898	5.7833	5.9471	5.8488	5.7014	5.259	6.0568	5.88	5.8583	5.9297
49857	49887	49857	67.54379	59.71431	66.29398	58.46952	64.07487	56.20263	66.74017	58.11896	65.70664	62.46857	6.111	6.1929	5.9635	5.8816	6.0454	5.898	5.7669	5.2918	6.1562	5.9791	5.9569	5.9976
49888	49918	49888	68.79997	62.22178	68.85728	60.41162	66.06633	59.10476	71.85498	60.97876	70.6674	65.08463	6.1601	6.3567	5.9635	6.0946	6.1601	6.0454	6.0127	5.5867	6.3644	6.1888	6.1684	6.2365
49919	49948	49919	61.56669	56.76662	61.402	55.60048	62.49107	55.56388	67.86531	60.28476	68.15486	63.17457	5.9635	6.1929	5.8161	5.9635	6.0127	5.8816	5.9308	5.5867	6.2335	6.0579	6.0374	6.1549
49949	49979	49949	60.16444	54.84785	60.94381	57.36022	60.65528	53.10242	67.67464	62.12954	65.58535	63.00098	5.9963	6.2584	5.8325	5.9963	6.0946	5.9799	6.0291	5.6031	6.2674	6.0914	6.0705	6.2557
49980	50009	49980	59.07959	55.9943	50.63042	49.37993	56.86248	52.91942	66.34436	61.95845	62.32615	60.87114	6.0618	6.3567	5.9635	6.0946	6.2912	6.1601	6.2748	5.7014	6.3717	6.1938	6.1707	6.5441
50010	50040	50010	61.99508	58.07019	52.32985	51.40665	58.85116	54.57903	66.43587	63.47467	64.85349	63.53808	6.3895	6.5861	6.3567	6.3567	6.5697	6.4386	6.5697	5.8652	6.6382	6.4588	6.4341	6.8483
50041	50071	50041	64.48739	60.59769	54.4278	52.99709	61.22148	57.07268	70.27556	66.6048	66.82342	64.89555	6.4463	6.7812	6.4129	6.5133	6.7812	6.6473	6.798	5.8603	6.7989	6.6182	6.592	7.0854
50072	50099	50072	63.64437	61.63689	54.56944	54.08392	62.56295	58.85675	70.08234	66.67052	66.30064	65.72755	6.4966	6.7477	6.4296	6.4798	6.7645	6.6473	6.7812	5.9775	6.7647	6.5842	6.5583	7.067
50100	50130	50100	60.66785	58.07848	50.68718	50.35477	57.17713	54.51983	59.98508	58.74775	59.13138	61.10273	6.2956	6.4966	6.145	6.3124	6.4129	6.2956	6.3794	6.0277	6.5953	6.4155	6.3902	6.6611
50131	50160	50131	56.09483	51.06166	47.73078	47.1259	52.85832	47.56042	57.60223	55.13459	53.29317	50.61089	6.0947	6.2789	5.9105	6.0947	6.1282	5.9943	6.0445	5.7096	6.3674	6.1909	6.1694	6.2711
50161	50191	50161	52.49713	46.01861	52.43636	50.60833	48.67656	41.38704	57.64267	52.75866	54.47368	51.91188	6.1115	6.2789	5.9608	6.078	6.1282	5.9943	5.9775	5.6929	6.3505	6.174	6.1527	6.2038
50192	50221	50192	59.11443	48.50319	60.56012	53.72227	55.46148	44.97633	63.68365	55.31879	60.16117	56.13759	6.145	6.2622	6.078	5.9775	6.0947	6.011	5.8603	5.4417	6.251	6.0742	6.0525	6.0886
50222	50252	50222	70.7761	63.10357	68.31575	60.5089	67.08796	59.49703	69.37543	60.93331	67.66687	65.24824	6.2454	6.3626	6.1282	6.0612	6.1952	6.0445	5.9273	5.4082	6.3358	6.1587	6.1365	6.1579
50253	50283	50253	71.5378	65.0217	70.74629	62.29544	68.53207	61.69033	74.39442	63.56143	72.66602	67.57568	6.2956	6.5301	6.1115	6.2622	6.3124	6.2119	6.1952	5.8268	6.532	6.3564	6.336	6.419
50284	50313	50284	65.52538	60.09853	62.99298	57.22034	65.35902	57.87203	70.70881	62.76529	70.3745	65.30274	6.1115	6.3794	5.9775	6.0947	6.1617	6.0445	6.0947	5.7096	6.3647	6.189	6.1686	6.3188
50314	50344	50314	62.48338	57.67465	61.75862	57.9494	62.24823	55.01012	69.67508	64.52219	67.21323	65.06963	6.1282	6.3961	5.9608	6.1282	6.2119	6.0947	6.145	5.7264	6.3993	6.2233	6.2025	6.3716
50345	50374	50345	61.54986	58.11941	52.67177	51.21888	59.43577	54.963	68.77382	64.12802	64.38026	62.80796	6.1952	6.4966	6.0947	6.2287	6.4631	6.3459	6.4798	5.8771	6.5058	6.3278	6.3047	6.7491
50375	50405	50375	64.38215	60.23874	54.39652	52.97509	61.15767	56.65596	68.99384	65.86562	66.98694	65.53432	6.5301	6.7812	6.4966	6.5301	6.7812	6.6473	6.8314	6.0612	6.8115	6.6322	6.6075	7.11
50406	50436	50406	66.0893	62.99465	56.72747	55.94093	63.3647	59.47776	71.317	67.06848	68.80894	67.34853	6.7488	7.1427	6.7316	6.8002	7.1599	6.9886	7.1599	6.1321	7.0858	6.9051	6.8788	7.4473
50437	50464	50437	65.21091	63.97071	57.0245	56.13752	64.57359	61.00049	70.5831	66.49371	68.23265	67.73754	6.8002	7.0571	6.7488	6.783	7.1256	6.9543	7.177	6.3034	7.0679	6.8874	6.8615	7.4628
50465	50495	50465	62.37878	60.18093	53.11627	53.35891	58.70606	56.53018	60.34142	59.65023	60.08967	63.9832	6.5946	6.8002	6.4404	6.6117	6.6974	6.5946	6.6802	6.3205	6.8947	6.7148	6.6896	6.962
50496	50525	50496	57.60123	52.77164	49.60447	48.64806	54.13818	49.17567	58.6921	56.00682	54.85618	52.42201	6.3891	6.5775	6.1493	6.3719	6.4233	6.3205	6.3719	6.0122	6.6446	6.4681	6.4467	6.5985
50526	50556	50526	52.61694	45.85973	54.3223	52.76388	48.65559	39.58105	57.8279	53.05694	55.2638	53.58651	6.4062	6.5775	6.2349	6.3377	6.4062	6.2692	6.2349	5.9095	6.6102	6.4337	6.4123	6.4612
50557	50586	50557	61.04362	50.51331	62.48498	56.36171	57.34401	46.94258	64.36869	57.31976	61.1663	58.91188	6.4404	6.5603	6.3377	6.2692	6.3891	6.2692	6.1664	5.7382	6.5426	6.3659	6.3441	6.3946
50587	50617	50587	73.23457	64.72345	69.82378	62.4766	69.45329	61.03059	69.7783	62.07191	68.53798	67.02692	6.5432	6.6802	6.4062	6.3548	6.4918	6.3719	6.252	5.721	6.6294	6.4523	6.4301	6.4827
50618	50648	50618	75.33228	67.13403	72.8073	64.48137	71.62466	63.42707	74.94306	64.43157	74.44009	69.37178	6.5946	6.8858	6.4062	6.5603	6.6117	6.4918	6.509	6.0979	6.8302	6.6546	6.6342	6.7328
50649	50678	50649	66.8142	61.71795	64.49751	59.14008	66.31819	59.45202	70.18764	63.69515	70.92844	67.29681	6.3891	6.6974	6.2349	6.3891	6.4576	6.3377	6.3891	5.9951	6.659	6.4834	6.463	6.6132
50679	50709	50679	64.02575	59.52938	63.77505	60.34253	64.1078	57.24072	69.71757	65.32742	68.57493	66.7962	6.4233	6.7316	6.252	6.4062	6.5775	6.4404	6.5603	6.0122	6.6773	6.5013	6.4804	6.787
50710	50739	50710	60.89872	59.62284	54.88215	52.98132	62.05555	57.12449	69.1247	64.85349	66.50106	65.08989	6.4918	6.8515	6.3891	6.509	6.8344	6.6974	6.9029	6.1321	6.7861	6.6081	6.585	7.1722
50740	50770	50740	66.3723	62.75094	56.64477	55.42934	63.31631	59.09547	69.43998	66.98151	68.91018	68.34584	6.8344	7.1256	6.8344	6.8173	7.1599	7.0228	7.2112	6.4062	7.0987	6.9194	6.8947	7.4898
50771	50801	50771	68.804	65.22562	58.45968	57.6398	65.4555	61.4543	73.95907	69.26164	71.05426	69.2468	6.9566	7.3946	6.9741	6.9916	7.3596	7.2194	7.2369	6.3257	7.2772	7.0965	7.0703	7.5244
50802	50829	50802	67.13332	66.03786	58.61392	58.34266	66.80416	63.15632	72.689	69.78452	70.17223	70.36426	7.0091	7.3245	6.9566	7.0266	7.3946	7.2369	7.4472	6.536	7.3115	7.131	7.1051	7.733
50830	50860	50830	64.10088	61.94484	54.50128	55.10406	60.39534	58.20633	61.9697	61.45221	61.75217	65.76411	6.7988	6.9916	6.6236	6.8164	6.904	6.7988	6.8865	6.5185	7.0993	6.9195	6.8942	7.1682
50861	50890	50861	59.67108	54.36581	50.68945	50.20177	55.95652	50.70309	60.24682	57.54194	55.77119	54.55703	6.5886	6.7813	6.2907	6.5711	6.6236	6.4834	6.5711	6.2206	6.8437	6.6672	6.6458	6.7976
50891	50921	50891	55.20845	48.11115	56.27701	54.96712	51.2391	42.44048	60.00153	55.40509	57.2476	56.45614	6.6061	6.7988	6.4309	6.5886	6.6061	6.4834	6.4834	6.2031	6.8611	6.6846	6.6633	6.7097
50922	50951	50922	63.84031	52.69062	64.57807	58.32875	60.06011	49.02726	66.53124	59.17332	63.07263	61.05395	6.6411	6.7988	6.5711	6.4659	6.6061	6.4659	6.3783	5.9227	6.7394	6.5626	6.5409	6.6066
50952	50982	50952	75.59693	66.83403	71.91643	64.56623	71.72893	63.04714	72.41656	63.95593	70.72137	68.67591	6.7463	6.904	6.6411	6.5711	6.7112	6.5535	6.4659	5.9052	6.8456	6.6685	6.6464	6.6966
50983	51013	50983	77.28213	67.58945	74.74735	66.07987	73.53017	63.81165	77.51174	66.09628	76.61413	71.2963	6.7988	7.0967	6.6061	6.7813	6.8514	6.6762	6.7112	6.3257	7.0512	6.8756	6.8552	6.9351
51014	51043	51014	68.45373	63.68071	66.06695	60.91609	68.21455	61.45136	72.43612	65.68469	72.97736	69.48534	6.5886	6.9741	6.4484	6.5711	6.6587	6.5185	6.5886	6.1856	6.841	6.6654	6.6449	6.8127
51044	51074	51044	66.42142	62.26084	65.39787	62.1399	66.35374	59.45031	72.69853	67.43544	71.01548	68.88239	6.6236	6.9741	6.4659	6.6061	6.8339	6.7112	6.7988	6.2031	6.8772	6.7012	6.6803	7.0255
51075	51104	51075	64.75408	62.44105	57.06075	55.06087	64.4642	59.40007	72.81744	67.99602	69.04879	67.76298	6.6937	7.1318	6.6236	6.7288	7.0967	6.9566	7.0967	6.3082	7.0059	6.8279	6.8048	7.366
51105	51135	51105	68.54615	64.81906	58.49939	57.42237	65.4778	61.14565	72.47499	69.48672	71.21883	70.15456	7.0442	7.3596	7.1318	7.0266	7.3946	7.2544	7.4647	6.6411	7.3081	7.1287	7.104	7.7433
51136	51166	51136	72.3455	68.2725	61.14344	60.1121	68.70309	64.39898	77.6055	72.58302	74.29079	72.23092	7.242	7.6902	7.3137	7.3137	7.6543	7.5109	7.4751	6.6326	7.5994	7.4186	7.3924	7.7625
51167	51195	51167	72.09177	69.83161	61.20659	60.7135	69.71883	66.03239	77.18532	72.97132	72.88328	73.42397	7.2958	7.6185	7.2779	7.3317	7.744	7.5826	7.8336	6.9373	7.6165	7.4361	7.4101	8.1194
51196	51226	51196	66.97467	64.74502	57.09098	57.52873	63.23793	60.90677	65.57529	65.09007	64.45821	68.73705	7.0807	7.3137	6.9552	7.0986	7.2779	7.1524	7.2779	6.776	7.3816	7.2017	7.1765	7.5596
51227	51256	51227	62.67107	56.77076	53.1123	52.35314	58.85357	53.01391	63.53798	60.1905	58.92101	56.241	6.8477	7.0449	6.6863	6.8297	6.9014	6.776	6.8477	6.4892	7.1024	6.9259	6.9045	7.0742
51257	51287	51257	60.39396	52.01864	58.96018	57.11763	56.44244	47.60294	64.18063	59.09541	60.78374	60.04241	6.8656	7.0628	6.758	6.8477	6.8835	6.758	6.776	6.4712	7.1202	6.9437	6.9223	7.0022

51288	51317	51288	66.72128	55.14205	67.75409	61.07073	62.79382	51.32053	69.94056	61.84782	66.23254	63.96805	6.9194	7.0807	6.8477	6.7043	6.8656	6.7222	6.6505	6.1127	6.9777	6.801	6.7792	6.8787	
51318	51348	51318	79.11578	70.19726	75.12924	67.17528	75.1348	66.3149	76.06944	67.23725	73.88316	71.93509	7.0269	7.1883	6.9194	6.8118	6.9731	6.8118	6.7222	6.1486	7.0864	6.9093	6.8871	6.9528	
51349	51379	51349	80.70744	71.99599	77.84289	68.94322	76.70342	68.08524	81.30396	69.69927	80.29738	75.06678	7.0807	7.4034	6.9194	7.0628	7.1345	6.9552	7.009	6.5609	7.3326	7.157	7.1366	7.2328	
51380	51409	51380	71.36963	66.71697	67.43198	62.73102	69.55074	63.42113	74.71847	68.00382	74.55132	71.39988	6.8656	7.1883	6.7401	6.8118	6.9194	6.7939	6.8297	6.3995	7.0818	6.9061	6.8857	7.0538	
51410	51440	51410	70.46354	65.23028	67.35268	64.19221	68.9855	61.58945	76.14588	70.75723	73.77728	71.43861	6.8835	7.2779	6.758	6.8656	7.1524	7.009	7.1524	6.4533	7.1367	6.9607	6.9398	7.379	
51441	51470	51441	68.81008	65.47198	59.57785	57.3911	67.31684	62.0281	75.68705	70.73164	71.80676	70.21535	6.9731	7.3854	6.9731	6.9731	7.4034	7.26	7.4571	6.5788	7.2503	7.0723	7.0492	7.7264	
51471	51501	51471	72.40498	68.66727	61.36389	60.26631	68.74186	64.80317	76.20211	73.96237	74.41132	73.8657	7.3317	7.744	7.4392	7.3317	7.7619	7.6185	7.8336	6.9373	7.6131	7.4338	7.4091	8.1121	
51502	51532	51502	74.00945	69.84277	62.54974	61.49468	70.28326	65.88016	79.39043	74.25243	75.99948	73.89223	7.4086	7.8671	7.482	7.482	7.8304	7.6837	7.647	6.7851	7.7676	7.5869	7.5606	7.9344	
51533	51560	51533	73.74988	71.43774	62.61434	62.10991	71.32236	67.55113	78.96058	74.64966	74.55959	75.11272	7.4636	7.7937	7.4453	7.5003	7.9221	7.757	8.0138	7.0969	7.7852	7.6047	7.5787	8.2996	
51561	51591	51561	68.51509	66.23415	58.40407	58.85189	64.69241	62.30762	67.08352	66.58714	65.94075	70.318	7.2436	7.482	7.1152	7.2619	7.4453	7.3169	7.4453	6.9318	7.5449	7.365	7.3397	7.727	
51592	51621	51592	64.1125	58.07649	54.33388	53.55726	60.2072	54.23323	64.99935	61.57488	60.27619	57.53454	7.0052	7.2069	6.8401	6.9868	7.0602	6.9318	7.0052	6.6384	7.2595	7.083	7.0615	7.2317	
51622	51652	51622	61.78302	53.21507	60.31627	58.43134	57.74062	48.69781	65.65678	60.45461	62.18177	61.42339	7.0235	7.2252	6.9135	7.0052	7.0418	6.9135	6.9318	6.6201	7.2777	7.1012	7.0798	7.1581	
51653	51682	51653	68.25587	56.41032	69.31243	62.47536	64.23808	52.5009	71.54919	63.27032	67.75589	65.43932	7.0785	7.2436	7.0052	6.8585	7.0235	6.8768	6.8034	6.2533	7.1319	6.9552	6.9334	7.0317	
51683	51713	51683	80.93544	71.8118	76.85722	68.72031	76.8629	67.84014	77.81904	68.78371	75.58247	73.5896	7.1885	7.3536	7.0785	6.9685	7.1335	6.9685	6.8768	6.29	7.2431	7.0659	7.0438	7.1074	
51714	51744	51714	82.56371	73.6519	79.63328	70.52892	78.4676	69.6512	83.17395	71.30235	82.14422	76.79332	7.2436	7.5736	7.0785	7.2252	7.2986	7.1152	7.1702	6.7118	7.495	7.3195	7.2991	7.3941	
51745	51774	51745	73.01113	68.25146	68.98292	64.17384	71.15041	64.87981	76.437	69.56791	76.266	73.04208	7.0235	7.3536	6.8951	6.9685	7.0785	6.9501	6.9868	6.5467	7.2384	7.0628	7.0424	7.2109	
51775	51805	51775	72.0842	66.73058	68.90179	65.66863	70.57217	63.00601	77.89723	72.38464	75.47416	73.0817	7.0418	7.4453	6.9135	7.0235	7.3169	7.1702	7.3169	6.6017	7.2946	7.1186	7.0978	7.5435	
51806	51835	51806	70.39272	66.97784	60.94814	58.71109	68.86513	63.45475	77.42785	72.35847	73.45831	71.8303	7.1335	7.5553	7.1335	7.1335	7.5736	7.4269	7.6287	6.7301	7.4107	7.2327	7.2096	7.8979	
51836	51866	51836	74.0703	70.24662	62.77526	61.65244	70.32292	66.29364	77.95476	75.66351	76.12278	75.56461	7.5003	7.9221	7.6103	7.5003	7.9404	7.7937	8.0138	7.0969	7.7818	7.6024	7.5777	8.2923	
51867	51897	51867	75.71166	71.44915	63.98838	62.90906	71.89977	67.3954	81.21641	75.96024	77.74747	75.59175	7.579	8.048	7.654	7.654	8.0105	7.8604	7.8229	6.9412	7.9397	7.759	7.7327	8.1103	
51898	51925	51898	75.44613	73.0808	64.05447	63.53844	72.96278	69.10481	80.77667	76.3666	76.27447	76.84032	7.6353	7.973	7.6165	7.6728	8.1043	7.9354	8.1981	7.2601	7.9577	7.7772	7.7512	8.4839	
51926	51956	51926	70.09093	67.75754	59.74737	60.20548	66.18033	63.7407	68.62644	68.11864	67.45739	71.93532	7.4102	7.654	7.2788	7.4289	7.6165	7.4852	7.6165	7.0912	7.7119	7.532	7.5068	7.8983	
51957	51986	51957	65.58709	59.41225	55.58356	54.78908	61.59197	55.48059	66.49434	62.9911	61.66254	58.85784	7.1663	7.3726	6.9974	7.1475	7.2226	7.0912	7.1663	6.7911	7.4202	7.2437	7.2222	7.3929	
51987	52017	51987	63.20403	54.43901	61.70354	59.77526	59.06865	49.81786	67.16689	61.84506	63.61195	62.83612	7.185	7.3914	7.0725	7.1663	7.2038	7.0725	7.0912	6.7723	7.4388	7.2623	7.241	7.3175	
52018	52047	52018	69.82575	57.70776	70.90662	63.91229	65.71555	53.70842	73.19482	64.72554	69.31428	66.94442	7.2413	7.4102	7.1663	7.0162	7.185	7.035	6.9599	6.3971	7.2897	7.1129	7.0912	7.1882	
52048	52078	52048	82.79696	73.46347	78.62493	70.30088	78.63074	69.40047	79.60887	70.36573	77.32087	75.28216	7.3539	7.5227	7.2413	7.1288	7.2976	7.1288	7.035	6.4346	7.4033	7.2262	7.2041	7.2656	
52079	52109	52079	84.46268	75.34589	81.46484	72.15108	80.27235	71.25318	85.08695	72.94231	84.03354	78.55956	7.4102	7.7478	7.2413	7.3914	7.4664	7.2788	7.3351	6.8661	7.6612	7.4856	7.4653	7.559	
52110	52139	52110	74.69038	69.82124	70.56952	65.64983	72.78687	66.37206	78.19505	71.16797	78.02012	74.72205	7.185	7.5227	7.0537	7.1288	7.2413	7.11	7.1475	6.6973	7.3987	7.2231	7.2027	7.3716	
52140	52170	52140	73.74214	68.26538	70.48653	67.17901	72.19533	64.45515	79.68887	74.04949	77.21006	74.76258	7.2038	7.6165	7.0725	7.185	7.4852	7.3351	7.4852	6.7536	7.4562	7.2802	7.2593	7.7118	
52171	52200	52171	72.01174	68.51833	62.34995	60.06145	70.44903	64.91421	79.20869	74.02271	75.14786	73.4824	7.2976	7.7291	7.2976	7.2976	7.7478	7.5978	7.8041	6.8849	7.5747	7.3968	7.3737	8.0734	
52201	52231	52201	75.77391	71.86229	64.21909	63.07044	71.94035	67.8184	79.74772	77.40376	77.8736	77.3026	7.6728	8.1043	7.7854	7.6728	8.123	7.973	8.1981	7.2601	7.9543	7.7749	7.7502	8.4766	
52232	52262	52232	77.45303	73.09248	65.46011	64.35596	73.55347	68.9455	83.08438	77.70732	79.53566	77.33036	7.7533	8.2331	7.8301	7.8301	8.1947	8.0412	8.0028	7.1008	8.1157	7.935	7.9087	8.2902	
52263	52290	52263	77.18139	74.76167	65.52773	64.99982	74.64092	70.69422	82.63454	78.12303	78.02878	78.60764	7.8109	8.1563	7.7917	7.8493	8.2907	8.118	8.3866	7.4271	8.1341	7.9537	7.9277	8.6724	
52291	52321	52291	71.70303	69.31596	61.12156	61.59021	67.70248	65.20673	70.20485	69.68537	69.0089	73.58983	7.5806	7.8301	7.4463	7.5998	7.7917	7.6574	7.7917	7.2543	7.8827	7.7029	7.6776	8.0734	
52322	52351	52322	67.0956	60.77873	56.86198	56.04923	63.00858	56.75665	68.02371	64.4399	63.08078	60.21157	7.3311	7.5422	7.1584	7.3119	7.3887	7.2543	7.3311	6.9473	7.5846	7.4081	7.3866	7.5577	
52352	52382	52352	64.65772	55.69111	63.12272	61.15009	60.42723	50.96367	68.71173	63.2675	65.07502	64.28136	7.3503	7.5614	7.2351	7.3311	7.3695	7.2351	7.2543	6.9281	7.6036	7.4272	7.4058	7.4806	
52383	52412	52383	71.43175	59.03503	72.53748	65.38227	67.22701	54.94372	74.8783	66.21423	70.9085	68.48414	7.4079	7.5806	7.3311	7.1776	7.3503	7.1968	7.12	6.5443	7.451	7.2743	7.2525	7.3483	
52413	52443	52413	84.70129	75.15313	80.4333	71.9178	80.43925	70.99667	81.43988	71.98415	79.09925	77.01365	7.523	7.6957	7.4079	7.2927	7.4654	7.2927	7.1968	6.5826	7.5673	7.3902	7.368	7.4274	
52444	52474	52444	86.40532	77.07885	83.33853	73.81055	82.11861	72.892	87.04395	74.61998	85.96631	80.36643	7.5806	7.926	7.4079	7.5614	7.6382	7.4463	7.5038	7.024	7.8312	7.6557	7.6353	7.7277	
52475	52504	52475	76.40826	71.42713	72.19262	67.15977	74.46097	67.89861	79.99353	72.80483	79.81458	76.44065	7.3503	7.6957	7.216	7.2927	7.4079	7.2735	7.3119	6.8513	7.5627	7.3871	7.3666	7.536	
52505	52535	52505	75.43821	69.83548	72.10772	68.72413	73.85582	65.93761	81.52171	75.75263	78.98589	76.48212	7.3695	7.7917	7.2351	7.3503	7.6574	7.5038	7.6574	6.9089	7.6214	7.4454	7.4245	7.884	
52536	52565	52536	73.66801	70.09425	63.784	61.44286	72.06935	66.40723	81.03049	75.72523	76.87626	75.17249	7.4654	7.9068	7.4654	7.4654	7.926	7.7725	7.9836	7.0432	7.7426	7.5646	7.5415	8.2529	
52566	52596	52566	77.51671	73.51512	65.69613	64.52106	73.59498	69.37822	81.58192	79.18405	79.6647	79.08056	7.8493	8.2907	7.9644	7.8493	8.3099	8.1563	8.3866	7.4271	8.1307	7.9514	7.9267	8.6652	
52597	52627	52597	79.23445	74.77361	66.9657	65.83615	75.2452	70.53124	84.99532	79.49459	81.36497	79.10896	7.9316	8.4225	8.0102	8.0102	8.3832	8.2261	8.1869	7.2641	8.2958	8.1151	8.0888	8.4743	
52628	52656	52628	78.95656	76.48118	67.03486	66.49482	76.35767	72.32019	84.53513	79.91986	79.82344	80.41562	7.9905	8.3439	7.9709	8.0298	8.4814	8.3047	8.5795	7.5979	8.3147	8.1342	8.1082	8.8653	
52657	52687	52657	73.3522	70.91023	62.52735	63.00679	69.25963	66.70649	71.81956	71.28814	70.59611	75.28239	7.7549	8.0102	7.6175	7.7746	7.9709	7.8335	7.9709	7.4212	8.0575	7.8777	7.8524	8.2527	
52688	52717	52688	68.63879	62.17664	58.16981	57.33836	64.45778	58.06205	69.58826	65.92202	64.53164	61.59644	7.4997	7.7157	7.323	7.4801	7.5586	7.4212	7.4997	7.1071	7.7528	7.5763	7.5548	7.7263	
52718	52748	52718	66.14485	56.97201	64.57454	62.55654	61.81705	52.13583	70.2921	64.72265	66.57175	65.75983	7.5194	7.7353	7.4016	7.4997	7.539	7.4016	7.4212	7.0874	7.7722	7.5958	7.5744	7.6475	
52749	52778	52749	73.07468	60.39284	74.20583	66.88606	68.77323	56.20742	76.60051	67.73715	72.5394	70.05927	7.5783	7.7549	7.4997	7.3427	7.5194	7.3623	7.2838	6.6948	7.6161	7.4394	7.4176	7.512	
52779	52809	52779	86.64941	76.88165	82.28326	73.57191	82.28936	72.6296	83.313	73.63978	80.91853	78.78496	7.696	7.8727	7.5783	7.4605	7.6372	7.4605	7.3623	6.734	7.735	7.5579	7.5358	7.5929	
52810	52840	52810	88.39264	78.85166	85.25532	75.50819	84.00735	74.56852	89.04596	76.33624	87.94353	82.21486	7.7549	8.1083	7.5783	7.7353	7.8138	7.6175	7.6764	7.1856	8.0051	7.8296	7.8092	7.9003	
52841	52870	52841	78.16566	73.06995	73.85305	68.70445	76.17357	69.46027	81.83338	74.47935	81.65031	78.19878	7.5194	7.8727	7.3819	7.4605	7.5783	7.4408	7.4801	7.0089	7.7304	7.5548	7.5343	7.7042	
52871	52901	52871	77.17329	71.4417	73.7662	70.30478	75.5545	67.45418	83.39671	77.49494	80.80257	78.2412	7.539	7.9709	7.4016	7.5194	7.8335	7.6764	7.8335	7.0678	7.7905	7.6145	7.5936	8.0601	
52902	52931	52902	75.36238	71.70641	65.25103	62.85605	73.72695	67.9346	82.8942	77.46692	78.64441	76.90147	7.6372	8.0887	7.6372	7.6372	8.1083	7.9513	8.1672	7.2052	7.9143	7.7363	7.7132	8.4365	
52932	52962	52932	79.2996	75.20597	67.20714	66.00504	75.28767	70.97392	83.4583	81.00529	81.49699	80.89941	8.0298	8.4814	8.1476	8.0298	8.501	8.3439	8.5795	7.5979	8.3113	8.1319	8.1072	8.8581	
52963	52993	52963	81.05685	76.4934	68.50591	67.35038	76.97584	72.15346	86.95022	81.32297	83.23637	80.92847	8.1141	8.6162	8.1944	8.1944	8.576	8.4153	8.3752	7.4312	8.48	8.2993	8.2731	8.6626	
52994	53021	52994	80.77256	78.24025	68.57666	68.0242	78.11389	73.98355	86.47944	81.75802	81.65938	82.26517	8.1743	8.5358	8.1542	8.2145	8.6764	8.4957	8.7769	7.7726	8.4994	8.3189	8.2929	9.0627	
53022	53052	53022	75.0393	72.54117	63.96548	64.45594	70.8526	68.24074	73.47141	72.92776	72.21982	77.01389	7.9333	8.1944	7.7927	7.9534	8.1542	8.0136	8.1542	7.5919	8.2364	8.0565	8.0312	8.436	
53053	53082	53053	70.21748	63.6067	59.50772	58.65714	65.94031	59.39748	71.18878	67.43822	66.01587	63.01315	7.6722	7.8931	7.4915	7.6521	7.7325	7.5919	7.6722	7.2705	7.9248	7.7483	7.7269	7.8988	
53083	53113	53083	67.66618	58.28236	66.05975	63.99534	63.23885	53.33496	71.90881	66.21127	68.1029	67.2723	7.6923	7.9132	7.5718	7.6722	7.7124	7.5718	7.5919	7.2504	7.9447	7.7683	7.7469	7.8181	
53114	53143	53114	74.75539	61.78188	75.91257	68.42445	70.35502	57.50019	78.36232	69.2951	74.2078	71.67064	7.7526	7.9333	7.6722	7.5115	7.6923	7.5316	7.4513	6.8488	7.785	7.6082	7.5865	7.6796	
53144	53174	53144	88.64236	78.64993	84.17578	75.26406	84.18201	74.30008	85.22919	75.3335	82.77966	80.59702	7.8731	8.0538	7.7526	7.632	7.8128	7.632	7.5316	6.8889	7.9066	7.7295	7.7073	7.7623	
53175	53205	53175	90.42567	80.66525	87.21619	77.24489	85.93951	76.28359	91.09402	78.09197	89.96623	84.1058	7.9333	8.2948	7.7526	7.9132	7.9936	7.7927	7.853	7.3509	8.1831	8.0075	7.9871	8.0768	
53206	53235	53206	79.96347	74.75056	75.55167	70.28465	77.92556	71.05786	83.71555	76.19237	83.52827	79.99736	7.6923	8.0538	7.5517	7.632	7.7526	7.612	7.6521	7.1701	7.902	7.7264	7.7059	7.8762	
53236	53266	53236	78.94827	73.08486	75.46282	71.92179	77.29226	69.00562	85.31484	79.27733	82.66103	80.04076	7.7124	8.1542	7.5718	7.6923	8.0136	7.853	8.0136	7.2304	7.9634	7.7874	7.7666	8.2403	
53267	53296	53267	77.09571	73.35566	66.7518	64.30174	75.42267	69.49709	84.80076	79.24866	80.45323	78.6702	7.8128	8.2747	7.8128	7.8128	8.2948	8.1342	8.3551	7.371	8.0899	7.912	7.8889	8.6244	
53297	53327	53297	81.12349	76.93571	68.75291	67.52316	77.01928	72.60632	85.37784	82.86841	83.37141	82.76009	8.2145	8.6764	8.335	8.2145	8.6965	8.5358	8.7769	7.7726	8.496	8.3166	8.2919	9.0554	
53328	53358	53328	82.92115	78.25275	70.08154	68.89944	78.74628	73.81299	88.95007	83.19339	85.15081	82.78983	8.3007	8.8144	8.3829	8.3829	8.7733	8.6089	8.5678	7.6021	8.6685	8.4878	8.4615	8.8552	
53359	53386	53359	82.63033	80.03977	70.15393	69.58875	79.91051	75.68517	88.46847	83.63846	83.53754	84.15727	8.3623	8.7322	8.3418	8.4034	8.876	8.6911	8.9787	7.9514	8.6883	8.5078	8.4819	9.2645	
53387	53417	53387	76.7652	74.20962	65.43668	65.93843	72.48222	69.81028	75.16125	74.6051	73.88087	78.78521	8.1158	8.3829	7.972	8.1363	8.3418	8.198	8.3418	7.7665	8.4193	8.2394	8.2142	8.6235	
53418	53447	53418	71.83249	65.06966	60.87639	60.00626	67.45694	60.76362	72.82613	68.9893	67.53423	64.46246	7.8487	8.0747	7.6638	7.8281	7.9103	7.7665	7.8487	7.4378	8.1008	7.9243	7.9029	8.0752	
53448	53478	53448	69.2225	59.62286	67.57913	65.46723	64.69334	54.56166	73.56272	67.73413	69.66927	68.81956	7.8692	8.0952	7.7459	7.8487	7.8898	7.7459	7.7665	7.4172	8.1212	7.9447	7.9234	7.9928	
53479	53508	53479																							

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
3/31/2016		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
0316 Official Forward Price Curve: *Blend of...* Final March 2016 Aurora forecast 03/31/2016 forward market curve			**COB**		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
04/01/16	04/30/16	Apr 2016	14.65	9.85	17.75	15.25	12.25	8.25	22.50	17.00	20.00	16.25	1.90	1.63	1.52	1.48	1.61	1.55	1.40	0.89	1.85	1.64	1.66	1.54
05/01/16	05/31/16	May 2016	13.05	5.94	17.50	14.45	10.45	4.47	22.25	17.00	19.50	16.25	1.96	1.75	1.66	1.65	1.69	1.68	1.26	0.89	1.87	1.74	1.72	1.35
06/01/16	06/30/16	Jun 2016	15.65	8.25	20.75	16.25	13.00	6.50	24.00	18.00	23.00	17.50	2.05	1.84	1.77	1.74	1.79	1.77	1.26	0.99	1.97	1.83	1.81	1.35
07/01/16	07/31/16	Jul 2016	21.99	14.72	27.22	18.80	20.48	12.21	29.65	23.06	30.21	23.80	2.15	2.09	1.98	1.91	2.00	1.98	1.52	1.11	2.14	2.00	1.98	1.63
08/01/16	08/31/16	Aug 2016	25.58	20.39	28.36	20.80	23.85	18.48	31.67	25.73	32.45	25.75	2.21	2.25	2.07	2.01	2.07	2.05	1.65	1.22	2.24	2.11	2.08	1.76
09/01/16	09/30/16	Sep 2016	24.28	19.31	24.61	20.40	22.72	18.95	30.38	24.01	30.98	25.00	2.24	2.25	2.08	2.03	2.11	2.09	1.67	1.28	2.27	2.13	2.11	1.79
10/01/16	10/31/16	Oct 2016	23.87	21.59	25.49	21.95	21.70	19.58	35.64	28.26	32.54	27.55	2.29	2.27	2.11	2.11	2.18	2.16	1.97	1.44	2.35	2.21	2.18	2.11
11/01/16	11/30/16	Nov 2016	25.97	23.52	24.21	22.05	24.50	22.22	35.64	29.16	34.25	28.13	2.47	2.56	2.40	2.38	2.48	2.46	2.49	1.84	2.64	2.49	2.45	2.68
12/01/16	12/31/16	Dec 2016	30.51	25.44	27.55	22.95	27.50	23.26	36.97	31.83	35.96	31.32	2.74	3.20	2.70	2.82	2.85	2.83	3.02	2.07	3.09	2.94	2.90	3.24
01/01/17	01/31/17	Jan 2017	28.49	25.53	27.30	24.22	26.51	23.14	37.80	30.42	35.36	29.87	2.87	3.27	2.85	2.92	2.90	2.88	2.87	2.13	3.19	3.05	3.01	3.09
02/01/17	02/28/17	Feb 2017	27.86	24.30	26.78	23.45	25.76	22.47	36.72	29.54	34.68	29.00	2.86	3.15	2.85	2.90	2.89	2.86	2.74	2.14	3.17	3.03	2.99	2.95
03/01/17	03/31/17	Mar 2017	24.09	21.58	24.68	21.03	22.78	20.04	33.48	27.79	31.96	28.13	2.82	2.89	2.70	2.70	2.84	2.82	2.65	2.10	2.96	2.82	2.79	2.85
04/01/17	04/30/17	Apr 2017	20.13	17.39	20.81	18.80	18.85	14.64	27.12	22.42	24.01	22.43	2.63	2.55	2.43	2.34	2.44	2.42	2.04	1.94	2.59	2.45	2.42	2.18
05/01/17	05/31/17	May 2017	19.35	12.59	21.58	17.42	16.56	10.64	27.52	20.46	24.00	19.76	2.64	2.52	2.41	2.36	2.44	2.42	2.02	1.92	2.61	2.47	2.44	2.16
06/01/17	06/30/17	Jun 2017	20.02	11.53	24.03	19.57	16.84	8.85	29.66	21.12	25.74	20.16	2.68	2.57	2.46	2.40	2.49	2.47	2.01	1.92	2.65	2.51	2.48	2.15
07/01/17	07/31/17	Jul 2017	27.54	18.22	31.80	23.28	23.85	15.98	35.25	27.89	35.19	28.13	2.73	2.84	2.59	2.49	2.58	2.56	2.20	1.94	2.74	2.60	2.57	2.35
08/01/17	08/31/17	Aug 2017	30.76	25.13	31.20	23.83	28.62	21.25	36.31	30.19	35.54	29.87	2.74	2.84	2.60	2.50	2.61	2.58	2.22	1.96	2.75	2.61	2.58	2.38
09/01/17	09/30/17	Sep 2017	28.10	25.06	26.00	24.19	26.75	23.37	34.19	28.18	34.23	29.00	2.73	2.67	2.55	2.48	2.61	2.58	2.25	1.97	2.74	2.60	2.56	2.41
10/01/17	10/31/17	Oct 2017	26.37	23.33	27.80	23.74	24.99	20.93	36.63	29.26	33.01	28.74	2.75	2.67	2.53	2.51	2.62	2.59	2.41	2.07	2.76	2.63	2.59	2.57
11/01/17	11/30/17	Nov 2017	29.60	24.75	26.43	24.06	26.98	24.18	36.63	30.14	34.75	29.34	2.82	2.98	2.80	2.76	2.85	2.83	2.91	2.20	3.02	2.88	2.84	3.13
12/01/17	12/31/17	Dec 2017	32.94	26.77	27.52	25.25	28.89	24.65	37.74	32.90	36.49	32.67	2.97	3.18	2.94	2.98	3.01	2.98	3.23	2.31	3.26	3.12	3.07	3.46
01/01/18	01/31/18	Jan 2018	30.04	27.34	28.65	26.27	28.26	25.71	38.55	31.52	35.86	30.62	3.07	3.25	3.05	3.05	3.09	3.06	3.11	2.38	3.31	3.18	3.14	3.34
02/01/18	02/28/18	Feb 2018	29.47	25.85	28.28	25.74	27.51	23.59	37.47	30.64	35.18	29.75	3.06	3.22	3.03	3.03	3.08	3.05	3.01	2.37	3.29	3.16	3.11	3.23
03/01/18	03/31/18	Mar 2018	27.19	24.63	26.18	24.29	25.23	22.26	34.23	28.89	32.46	28.88	3.00	3.16	2.97	2.96	3.02	2.99	2.95	2.30	3.22	3.09	3.04	3.17
04/01/18	04/30/18	Apr 2018	24.33	20.64	21.57	17.28	22.45	15.57	27.37	24.92	24.51	24.73	2.72	2.66	2.57	2.55	2.53	2.50	2.15	2.11	2.79	2.66	2.63	2.30
05/01/18	05/31/18	May 2018	21.25	14.34	22.23	17.09	17.41	12.33	28.22	20.96	25.00	20.26	2.72	2.67	2.56	2.47	2.53	2.51	2.09	2.04	2.72	2.59	2.56	2.24
06/01/18	06/30/18	Jun 2018	21.47	15.13	24.68	18.04	16.69	10.53	29.91	21.62	26.24	20.26	2.75	2.73	2.60	2.51	2.57	2.55	2.09	2.05	2.75	2.63	2.59	2.23
07/01/18	07/31/18	Jul 2018	29.54	16.67	34.27	24.38	26.35	15.18	36.25	29.39	35.94	29.38	2.79	2.99	2.66	2.57	2.66	2.64	2.34	2.08	2.82	2.69	2.65	2.50
08/01/18	08/31/18	Aug 2018	31.66	23.88	33.67	26.58	31.12	19.95	37.31	31.69	36.29	31.12	2.80	3.00	2.69	2.58	2.68	2.66	2.34	2.08	2.83	2.70	2.66	2.50
09/01/18	09/30/18	Sep 2018	30.15	24.11	29.47	26.09	29.53	24.72	35.19	29.68	33.53	30.25	2.79	2.79	2.66	2.57	2.67	2.65	2.38	2.11	2.82	2.69	2.65	2.54
10/01/18	10/31/18	Oct 2018	29.82	25.59	29.55	26.50	28.89	23.18	38.38	31.21	34.26	30.49	2.81	2.73	2.66	2.59	2.69	2.66	2.42	2.13	2.84	2.71	2.67	2.58
11/01/18	11/30/18	Nov 2018	31.65	26.10	28.18	26.01	29.98	26.43	38.38	32.14	36.00	31.09	2.88	3.06	2.86	2.88	2.92	2.90	3.03	2.36	3.14	3.01	2.97	3.25
12/01/18	12/31/18	Dec 2018	34.39	28.12	29.27	27.00	31.89	26.90	39.49	34.90	37.74	34.42	3.02	3.25	3.02	3.08	3.08	3.05	3.41	2.45	3.34	3.21	3.17	3.66
01/01/19	01/31/19	Jan 2019	32.09	28.53	29.70	27.42	29.51	25.94	39.30	32.37	36.51	32.17	3.12	3.37	3.11	3.12	3.15	3.12	3.26	2.55	3.38	3.25	3.21	3.50
02/01/19	02/28/19	Feb 2019	31.52	27.30	29.18	26.69	28.76	25.27	38.22	31.49	35.83	31.30	3.11	3.33	3.10	3.10	3.14	3.11	3.05	2.53	3.37	3.24	3.19	3.28
03/01/19	03/31/19	Mar 2019	29.24	26.08	27.08	25.24	26.48	23.94	34.98	29.74	33.11	30.43	3.05	3.28	3.04	3.04	3.08	3.05	3.00	2.47	3.30	3.17	3.13	3.22
04/01/19	04/30/19	Apr 2019	26.82	21.69	22.82	17.11	24.50	16.36	27.12	25.87	25.53	23.93	2.78	2.80	2.69	2.63	2.59	2.57	2.39	2.26	2.88	2.75	2.71	2.56
05/01/19	05/31/19	May 2019	23.74	15.39	23.48	16.92	19.46	13.12	27.97	21.91	26.02	19.46	2.78	2.83	2.68	2.56	2.59	2.56	2.34	2.20	2.80	2.68	2.64	2.50
06/01/19	06/30/19	Jun 2019	23.96	16.18	25.93	17.87	18.74	11.32	29.66	22.57	27.26	19.46	2.81	2.87	2.71	2.59	2.62	2.60	2.34	2.20	2.84	2.71	2.67	2.50
07/01/19	07/31/19	Jul 2019	32.44	17.27	35.20	25.48	27.60	15.68	37.60	30.34	36.59	30.33	2.85	3.11	2.74	2.65	2.72	2.69	2.52	2.20	2.90	2.77	2.73	2.69
08/01/19	08/31/19	Aug 2019	34.56	24.48	34.60	27.68	32.37	20.45	38.66	32.64	36.94	32.07	2.87	3.13	2.78	2.67	2.75	2.72	2.54	2.22	2.92	2.79	2.75	2.71
09/01/19	09/30/19	Sep 2019	33.05	24.71	30.40	27.19	30.78	25.22	36.54	30.63	34.18	31.20	2.86	2.94	2.75	2.66	2.74	2.72	2.57	2.25	2.91	2.78	2.74	2.74
10/01/19	10/31/19	Oct 2019	30.32	27.04	30.45	27.60	29.39	24.63	39.13	32.16	34.91	31.44	2.88	2.86	2.76	2.68	2.76	2.73	2.69	2.28	2.93	2.80	2.76	2.87
11/01/19	11/30/19	Nov 2019	32.15	27.55	29.08	27.11	30.48	27.88	39.13	33.09	36.65	32.04	2.96	3.17	2.98	2.91	3.00	2.97	3.14	2.46	3.16	3.03	2.99	3.38
12/01/19	12/31/19	Dec 2019	34.89	29.57	30.17	28.10	32.39	28.35	40.24	35.85	38.39	35.37	3.10	3.36	3.14	3.11	3.16	3.13	3.54	2.59	3.38	3.25	3.20	3.80
01/01/20	01/31/20	Jan 2020	33.59	29.99	31.05	28.62	30.76	28.49	40.50	35.62	37.46	34.12	3.21	3.49	3.24	3.24	3.24	3.21	3.47	2.66	3.51	3.38	3.33	3.72
02/01/20	02/29/20	Feb 2020	33.02	28.76	30.53	27.89	30.01	27.82	39.42	34.74	36.78	33.25	3.20	3.46	3.22	3.23	3.23	3.20	3.23	2.66	3.50	3.37	3.32	3.47
03/01/20	03/31/20	Mar 2020	30.74	27.54	28.43	26.44	27.73	26.49	36.18	32.99	34.06	32.38	3.13	3.44	3.16	3.16	3.17	3.14	3.19	2.61	3.43	3.30	3.25	3.42
04/01/20	04/30/20	Apr 2020	28.33	20.89	24.17	18.71	25.85	17.14	28.72	23.02	27.01	25.73	2.88	3.02	2.81	2.79	2.77	2.74	2.61	2.42	3.05	2.92	2.88	2.80
05/01/20	05/31/20	May 2020	25.25	14.59	24.83	18.52	20.81	13.90	29.57	19.06	27.50	21.26	2.88	3.11	2.80	2.72	2.76	2.73	2.54	2.35	2.97	2.84	2.81	2.74
06/01/20	06/30/20	Jun 2020	25.47	15.38	27.28	19.47	20.09	12.10	31.26	19.72	28.74	21.26	2.91	3.16	2.83	2.75	2.80	2.77	2.56	2.36	3.01	2.88	2.84	2.75
07/01/20	07/31/20	Jul 2020	33.69	19.57	36.55	25.88	28.85	17.83	39.70	31.34	37.79	31.28	2.95	3.34	2.87	2.81	2.88	2.85	2.75	2.37	3.06	2.94	2.89	2.95
08/01/20	08/31/20	Aug 2020	35.81	26.78	35.95	28.08	33.62	22.60	40.76	33.64	38.14	33.02	2.97	3.35	2.93	2.83	2.92	2.90	2.74	2.37	3.09	2.96	2.92	2.95
09/01/20	09/30/20	Sep 2020	34.30	27.01	31.75	27.59	32.03	27.37	38.64	31.63	35.38	32.15	2.97	3.16	2.90	2.83	2.92	2.89	2.81	2.44	3.08	2.95	2.91	3.02
10/01/20	10/31/20	Oct 2020	31.67	28.19	31.80	28.45	30.74	25.78	40.33	35.06	35.86	32.99	3.00	3.11	2.91	2.86	2.95	2.92	2.85	2.46	3.12	2.99	2.95	3.06
11/01/20	11/30/20	Nov 2020	33.50	28.70	30.43	27.96	31.83	29.03	40.33	35.99	37.60	33.59	3.08	3.33	3.10	3.08	3.12	3.09	3.30	2.62	3.34	3.21	3.17	3.55
12/01/20	12/31/20	Dec 2020	36.24	30.72	31.52	28.95	33.74	29.50	41.44	38.75	39.34	36.92	3.23	3.52	3.27	3.29	3.29	3.26	3.74	2.76	3.56	3.43	3.38	4.01
01/01/21	01/31/21	Jan 2021	34.99	30.93	32.90	29.41	32.26	27.99	42.00	36.12	38.81	34.77	3.35	3.66	3.38	3.38	3.38	3.35	3.64	2.89	3.66	3.53	3.48	3.91
02/01/21	02/28/21	Feb 2021	34.42	29.70	32.38	28.68	31.51	27.32	40.92	35.24	38.13	33.90	3.34	3.63	3.36	3.37	3.37	3.34	3.43	2.88	3.64	3.51	3.46	3.68
03/01/21	03/31/21	Mar 2021	32.14	28.48	30.28	27.23	29.23	25.99	37.68	33.49	35.41	33.03	3.27	3.56	3.30	3.30	3.31	3.28	3.40	2.84	3.58	3.45	3.40	3.64
04/01/21	04/30/21	Apr 2021	29.83	24.89	26.02	22.25	26.35	18.74	30.82	27.87	27.46	27.63	3.01	3.23	2.96	2.95	2.89	2.87	2.76	2.61	3.21	3.08	3.04	2.97
05/01/21	05/31/21	May 2021	26.75	18.59	26.68	22.06	21.31	15.50	31.67	23.91	27.95	23.16	3.00	3.26	2.95	2.88	2.88	2.86	2.71	2.55	3.14	3.01	2.97	2.91
06/01/21	06/30/21	Jun 2021	26.97	19.38	29.13	23.01	20.59	13.70	33.36	24.57	29.19	23.16	3.03	3.30	2.98	2.91	2.92	2.89	2.71	2.55	3.17	3.04	3.00	2.91

07/01/21	07/31/21	Jul 2021	35.19	23.57	38.40	27.47	30.35	21.83	39.70	32.34	38.89	32.28	3.07	3.55	3.03	2.97	3.00	2.98	2.92	2.58	3.23	3.11	3.06	3.14
08/01/21	08/31/21	Aug 2021	37.31	30.78	37.80	29.67	35.12	26.60	40.76	34.64	39.24	34.02	3.10	3.57	3.09	3.01	3.06	3.03	2.91	2.57	3.27	3.14	3.09	3.13
09/01/21	09/30/21	Sep 2021	35.80	31.01	33.60	29.18	33.53	31.37	38.64	32.63	36.48	33.15	3.11	3.39	3.08	3.01	3.06	3.03	2.96	2.63	3.27	3.14	3.10	3.18
10/01/21	10/31/21	Oct 2021	34.22	29.44	33.65	29.44	32.89	27.03	41.83	34.16	37.21	33.39	3.14	3.33	3.09	3.04	3.09	3.06	2.99	2.67	3.31	3.18	3.13	3.22
11/01/21	11/30/21	Nov 2021	36.05	29.95	32.28	28.95	33.98	30.28	41.83	35.09	38.95	33.99	3.22	3.53	3.25	3.23	3.26	3.24	3.49	2.80	3.50	3.37	3.32	3.74
12/01/21	12/31/21	Dec 2021	38.79	31.97	33.37	29.94	35.89	30.75	42.94	37.85	40.69	37.32	3.38	3.72	3.44	3.44	3.43	3.40	3.89	2.94	3.72	3.59	3.53	4.17
01/01/22	01/31/22	Jan 2022	36.99	32.18	34.90	31.37	33.76	29.24	43.25	35.37	40.16	34.52	3.53	3.89	3.58	3.57	3.56	3.53	3.85	3.11	3.85	3.72	3.67	4.12
02/01/22	02/28/22	Feb 2022	36.42	30.95	34.38	30.64	33.01	28.57	42.17	34.49	39.48	33.65	3.51	3.85	3.57	3.55	3.55	3.51	3.66	3.10	3.83	3.70	3.65	3.93
03/01/22	03/31/22	Mar 2022	34.14	29.73	32.28	29.19	30.73	27.24	38.93	32.74	36.76	32.78	3.45	3.78	3.51	3.49	3.48	3.45	3.62	3.06	3.77	3.63	3.58	3.88
04/01/22	04/30/22	Apr 2022	31.33	26.14	28.02	24.21	27.85	19.99	32.07	28.87	28.81	28.63	3.17	3.43	3.13	3.16	3.05	3.03	2.89	2.81	3.43	3.30	3.25	3.11
05/01/22	05/31/22	May 2022	29.11	21.97	31.35	27.33	24.88	19.06	35.88	29.05	33.65	29.48	3.41	3.58	3.30	3.24	3.29	3.23	3.06	2.71	3.50	3.37	3.33	3.28
06/01/22	06/30/22	Jun 2022	31.92	23.56	34.45	28.36	27.10	19.30	39.08	30.47	36.20	29.92	3.43	3.61	3.34	3.24	3.31	3.24	3.06	2.71	3.51	3.38	3.33	3.28
07/01/22	07/31/22	Jul 2022	38.07	27.52	40.71	31.53	33.93	25.14	44.27	35.87	42.75	35.30	3.47	3.75	3.37	3.28	3.37	3.30	3.18	2.74	3.55	3.42	3.37	3.40
08/01/22	08/31/22	Aug 2022	41.26	32.31	41.29	32.97	38.36	28.67	46.25	37.55	44.17	36.79	3.50	3.79	3.41	3.36	3.43	3.37	3.25	2.75	3.63	3.50	3.45	3.47
09/01/22	09/30/22	Sep 2022	40.76	33.87	37.15	32.29	38.29	32.61	43.39	36.28	41.35	36.02	3.52	3.73	3.42	3.39	3.45	3.39	3.31	2.89	3.66	3.53	3.48	3.53
10/01/22	10/31/22	Oct 2022	37.79	31.88	36.72	32.49	35.43	29.11	43.88	36.95	40.82	36.18	3.55	3.71	3.44	3.42	3.48	3.42	3.33	2.94	3.69	3.56	3.52	3.56
11/01/22	11/30/22	Nov 2022	40.39	33.20	37.38	32.82	37.57	31.76	44.76	37.97	42.50	36.93	3.68	3.93	3.61	3.64	3.69	3.63	3.69	3.18	3.92	3.79	3.74	3.96
12/01/22	12/31/22	Dec 2022	42.60	35.47	38.40	34.10	39.58	33.26	45.84	40.19	43.85	39.43	3.88	4.12	3.87	3.86	3.89	3.82	4.03	3.35	4.15	4.02	3.96	4.31
01/01/23	01/31/23	Jan 2023	42.32	35.60	40.71	36.20	38.84	32.45	47.22	40.16	44.88	39.22	4.09	4.36	4.10	4.06	4.10	4.04	4.13	3.56	4.35	4.22	4.16	4.41
02/01/23	02/28/23	Feb 2023	42.88	36.00	40.74	36.09	39.36	33.13	46.76	39.83	44.82	39.06	4.09	4.33	4.06	4.04	4.08	3.99	4.02	3.56	4.32	4.19	4.13	4.31
03/01/23	03/31/23	Mar 2023	38.14	33.17	37.63	34.06	34.69	30.29	42.99	37.22	41.50	37.29	3.90	4.12	3.86	3.83	3.88	3.82	3.86	3.38	4.12	3.99	3.93	4.14
04/01/23	04/30/23	Apr 2023	35.31	30.35	34.35	30.89	31.87	25.69	38.25	33.51	36.44	34.43	3.63	3.80	3.51	3.52	3.51	3.46	3.33	2.99	3.80	3.67	3.62	3.55
05/01/23	05/31/23	May 2023	31.47	25.36	36.02	32.60	28.46	22.61	40.10	34.20	39.35	35.79	3.82	3.90	3.64	3.59	3.69	3.61	3.41	2.88	3.86	3.73	3.68	3.63
06/01/23	06/30/23	Jun 2023	36.86	27.74	39.77	33.72	33.61	24.89	44.80	36.36	43.21	36.68	3.83	3.91	3.69	3.57	3.70	3.59	3.41	2.88	3.84	3.71	3.66	3.63
07/01/23	07/31/23	Jul 2023	40.94	31.47	43.02	35.60	37.51	28.45	48.83	39.41	46.60	38.32	3.86	3.95	3.70	3.59	3.73	3.63	3.43	2.89	3.86	3.73	3.68	3.66
08/01/23	08/31/23	Aug 2023	45.21	33.85	44.79	36.27	41.60	30.73	51.74	40.46	49.11	39.55	3.90	4.01	3.73	3.72	3.80	3.72	3.58	2.93	3.99	3.86	3.81	3.81
09/01/23	09/30/23	Sep 2023	45.73	36.74	40.71	35.39	43.05	33.85	48.14	39.93	46.23	38.89	3.93	4.06	3.77	3.77	3.84	3.74	3.65	3.16	4.04	3.91	3.86	3.88
10/01/23	10/31/23	Oct 2023	41.36	34.32	39.79	35.54	37.97	31.20	45.93	39.73	44.43	38.96	3.95	4.10	3.79	3.80	3.88	3.77	3.67	3.20	4.07	3.94	3.89	3.90
11/01/23	11/30/23	Nov 2023	44.74	36.45	42.49	36.70	41.16	33.23	47.69	40.86	46.04	39.86	4.14	4.32	3.96	4.06	4.12	4.02	3.90	3.56	4.34	4.21	4.16	4.17
12/01/23	12/31/23	Dec 2023	46.41	38.98	43.43	38.27	43.27	35.77	48.74	42.54	47.01	41.55	4.38	4.53	4.30	4.28	4.35	4.23	4.17	3.77	4.57	4.44	4.38	4.45
01/01/24	01/31/24	Jan 2024	47.65	39.03	46.52	41.04	43.92	35.67	51.18	44.94	49.61	43.92	4.65	4.82	4.61	4.55	4.64	4.56	4.41	4.00	4.84	4.70	4.65	4.69
02/01/24	02/29/24	Feb 2024	49.34	41.05	47.11	41.54	45.72	37.68	51.36	45.16	50.16	44.47	4.66	4.81	4.55	4.52	4.61	4.47	4.38	4.02	4.81	4.68	4.62	4.67
03/01/24	03/31/24	Mar 2024	42.14	36.61	42.98	38.94	38.64	33.34	47.06	41.70	46.24	41.80	4.36	4.46	4.22	4.18	4.27	4.18	4.10	3.70	4.47	4.34	4.28	4.39
04/01/24	04/30/24	Apr 2024	39.29	34.56	40.69	37.57	35.89	31.38	44.44	38.15	44.07	40.23	4.08	4.17	3.89	3.89	3.97	3.90	3.76	3.18	4.16	4.03	3.98	3.99
05/01/24	05/31/24	May 2024	33.13	26.76	38.08	34.57	30.01	23.91	41.69	35.32	41.00	37.37	4.09	4.17	3.92	3.86	3.97	3.89	3.62	3.20	4.13	4.00	3.95	3.84
06/01/24	06/30/24	Jun 2024	38.28	29.81	41.59	36.09	34.92	26.83	45.95	38.13	44.69	38.76	4.13	4.19	3.98	3.86	3.95	3.88	3.65	3.21	4.13	4.00	3.96	3.87
07/01/24	07/31/24	Jul 2024	44.55	34.24	46.49	38.19	40.92	31.07	51.84	41.67	49.74	40.78	4.17	4.22	3.99	3.89	3.98	3.89	3.66	3.32	4.16	4.03	3.98	3.89
08/01/24	08/31/24	Aug 2024	49.52	37.45	48.34	39.20	45.71	34.13	54.66	43.07	51.98	42.11	4.19	4.31	4.02	4.02	4.09	3.99	3.84	3.36	4.29	4.16	4.11	4.06
09/01/24	09/30/24	Sep 2024	50.01	40.75	46.00	38.88	47.45	37.77	51.82	42.70	49.91	41.95	4.22	4.37	4.08	4.08	4.14	4.04	3.95	3.56	4.35	4.22	4.17	4.18
10/01/24	10/31/24	Oct 2024	46.01	37.88	45.46	39.58	42.48	34.59	50.63	42.45	48.58	42.52	4.42	4.57	4.27	4.29	4.34	4.28	4.16	3.74	4.57	4.44	4.39	4.38
11/01/24	11/30/24	Nov 2024	49.68	40.25	47.92	41.27	45.91	36.85	53.14	44.65	50.86	44.20	4.74	4.90	4.56	4.65	4.69	4.62	4.47	4.23	4.93	4.80	4.74	4.74
12/01/24	12/31/24	Dec 2024	49.46	41.89	46.63	41.29	46.09	38.51	51.75	44.44	49.70	44.24	4.65	4.76	4.55	4.50	4.56	4.48	4.26	4.05	4.78	4.65	4.59	4.53
01/01/25	01/31/25	Jan 2025	50.10	41.32	48.70	43.49	46.22	37.81	53.31	45.87	51.19	45.92	4.85	5.00	4.80	4.75	4.80	4.71	4.58	4.25	5.04	4.91	4.85	4.87
02/01/25	02/28/25	Feb 2025	52.31	44.00	49.33	44.37	48.56	40.49	52.81	45.50	51.90	46.83	4.88	5.02	4.78	4.76	4.83	4.74	4.65	4.27	5.05	4.92	4.86	4.93
03/01/25	03/31/25	Mar 2025	45.39	39.55	45.72	41.96	41.73	36.12	49.55	43.05	48.27	44.18	4.72	4.81	4.61	4.54	4.62	4.54	4.47	4.05	4.83	4.70	4.64	4.75
04/01/25	04/30/25	Apr 2025	43.09	37.64	44.10	40.50	39.51	34.34	47.30	41.33	46.88	42.57	4.57	4.67	4.39	4.39	4.47	4.40	4.25	3.60	4.66	4.53	4.48	4.47
05/01/25	05/31/25	May 2025	34.80	28.51	39.87	36.45	31.57	25.55	43.11	36.63	42.26	38.74	4.38	4.44	4.21	4.14	4.22	4.16	3.90	3.52	4.41	4.28	4.23	4.12
06/01/25	06/30/25	Jun 2025	41.10	31.62	44.20	38.04	37.59	28.52	48.57	39.33	46.64	40.31	4.40	4.45	4.26	4.13	4.21	4.14	3.85	3.50	4.40	4.27	4.22	4.07
07/01/25	07/31/25	Jul 2025	47.13	36.39	48.94	40.18	43.36	33.08	53.84	42.98	51.44	42.31	4.44	4.51	4.30	4.17	4.26	4.17	3.91	3.59	4.44	4.31	4.26	4.13
08/01/25	08/31/25	Aug 2025	53.34	40.84	52.26	42.71	49.31	37.34	58.29	44.98	55.55	45.28	4.48	4.60	4.30	4.25	4.34	4.26	4.08	3.63	4.52	4.39	4.34	4.30
09/01/25	09/30/25	Sep 2025	52.88	43.01	48.90	40.89	50.34	39.97	54.35	42.71	52.38	43.58	4.38	4.54	4.22	4.16	4.25	4.16	4.04	3.70	4.43	4.30	4.25	4.27
10/01/25	10/31/25	Oct 2025	46.46	38.37	46.54	40.43	42.76	35.04	51.32	41.47	49.45	43.02	4.39	4.61	4.22	4.21	4.29	4.20	4.05	3.69	4.48	4.35	4.30	4.28
11/01/25	11/30/25	Nov 2025	48.00	40.00	46.96	41.18	44.20	36.54	51.44	42.72	49.43	43.63	4.44	4.63	4.29	4.32	4.39	4.32	4.10	3.94	4.60	4.47	4.42	4.37
12/01/25	12/31/25	Dec 2025	51.59	43.45	49.03	43.03	48.02	39.96	53.34	44.53	51.64	45.45	4.71	4.85	4.62	4.56	4.63	4.56	4.32	4.05	4.84	4.71	4.65	4.60
01/01/26	01/31/26	Jan 2026	51.86	42.83	50.96	45.37	47.87	39.23	54.46	46.52	53.07	47.32	4.95	5.08	4.91	4.79	4.87	4.78	4.55	4.23	5.08	4.95	4.89	4.84
02/01/26	02/28/26	Feb 2026	54.10	44.90	51.91	46.57	50.23	41.30	53.97	46.98	54.30	48.68	4.99	5.13	4.91	4.84	4.92	4.84	4.60	4.25	5.13	5.00	4.94	4.89
03/01/26	03/31/26	Mar 2026	46.90	41.10	48.23	43.79	43.10	37.56	51.40	44.94	50.78	45.78	4.80	4.89	4.68	4.62	4.71	4.63	4.50	3.94	4.90	4.77	4.71	4.78
04/01/26	04/30/26	Apr 2026	44.83	39.31	46.14	42.35	41.18	35.96	48.77	43.03	48.73	44.29	4.63	4.72	4.45	4.42	4.51	4.43	4.27	3.67	4.69	4.56	4.51	4.50
05/01/26	05/31/26	May 2026	37.77	31.21	42.64	38.65	34.37	28.09	45.95	39.11	44.82	40.64	4.50	4.55	4.33	4.22	4.31	4.23	3.97	3.61	4.49	4.36	4.31	4.19
06/01/26	06/30/26	Jun 2026	43.26	33.02	46.23	39.95	39.62	29.82	50.65	40.47	48.56	41.88	4.54	4.58	4.39	4.23	4.31	4.25	3.92	3.60	4.50	4.37	4.32	4.14
07/01/26	07/31/26	Jul 2026	49.31	38.99	51.48	42.81	45.40	35.53	56.14	44.04	53.64	44.77	4.56	4.63	4.42	4.25	4.35	4.27	4.01	3.69	4.52	4.39	4.34	4.23
08/01/26	08/31/26	Aug 2026	55.07	42.65	54.21	44.85	50.93	39.04	59.46	46.35	56.68	46.94	4.60	4.76	4.45	4.37	4.45	4.38	4.18	3.76	4.64	4.51	4.46	4.41
09/01/26	09/30/26	Sep 2026	54.40	44.58	50.07	42.93	52.03	41.42	54.81	44.52	53.05	45.21	4.49	4.68	4.33	4.27	4.35	4.29	4.10	3.77	4.54	4.41	4.37	4.33
10/01/26	10/31/26	Oct 2026	48.08	39.91	47.68	41.99	44.33	36.47	51.93	43.33	50.36	44.08	4.51	4.74	4.34	4.33	4.39	4.33	4.13	3.80	4.60	4.47	4.42	4.36
11/01/26	11/30/26	Nov 2026	50.60	41.81	49.19	42.91	46.64	38.25	53.02	44.58	51.21	44.91	4.58	4.84	4.41	4.45	4.52	4.45	4.23	4.12	4.72	4.59	4.54	4.50
12/01/26	12/31/26	Dec 2026	53.35	44.62	50.87	44.67	49.58	41.04	54.40	46.30	52.91	46.62	4.85	4.99	4.79	4.70	4.78	4.70	4.46	4.05	4.98	4.85	4.79	4.74
01/01/27	01/31/27	Jan 2027	53.66	44.95	52.81	47.09	49.61	41.33	56.27	48.72	54.82	48.90	5.16	5.33	5.19	5.04	5.12	5.03	4.79	4.53	5.33	5.20	5.14	5.07
02/01/27	02/28/27	Feb 2027	56.03	47.12	53.77	48.10	52.25	43.48	55.68	48.68	56.16	49.99	5.20	5.35	5.16	5.07	5.15	5.06	4.83	4.54	5.36	5.23	5.17	5.11
03/01/27	03/31/27	Mar 2027	49.13	42.45	49.85	45.59	45.32	38.94	53.26	46.83	52.39	47.41	5.02	5.11	4.89	4.83	4.91	4.85	4.72	4.23	5.11	4.98	4.92	5.00
04/01/27	04/30/27	Apr 2027	45.97	40.41	47.25	43.48	42.30	37.05	50.51	44.26	49.69	45.26	4.83	4.91	4.64	4.60	4.69	4.64	4.45	3.96	4.87	4.74	4.69	4.68
05/01/27	05/31/27	May 2027	38.52	31.69	43.52	39.66	35.05	28.51	46.89	39.73	45.77	41.46	4.68	4.72	4.50	4.41	4.50	4.45	4.22	3.87	4.67	4.54	4.50	4.44
06/01/27	06/30/27	Jun 2027	45.25	34.71	47.92	41.50	41.48	31.40	52.45	42.29	50.24	43.31	4.71	4.73	4.58	4.40	4.50	4.45	4.17	3.87	4.66	4.53	4.49	4.39
07/01/27	07/31/27	Jul 2027	50.94	40.71	52.99	44.57	46.92	37.14	57.75	45.54	55.18	46.43	4.76	4.81	4.58	4.42	4.53	4.49	4.25	3.96	4.69	4.56	4.51	4.47

08/01/27	08/31/27	Aug 2027	57.12	44.34	55.56	46.15	52.93	40.62	60.98	47.61	58.15	48.48	4.79	4.91	4.61	4.50	4.61	4.56	4.34	4.02	4.77	4.64	4.59	4.57
09/01/27	09/30/27	Sep 2027	56.23	46.65	52.31	45.30	54.09	43.55	56.93	46.58	55.09	47.45	4.76	4.93	4.61	4.50	4.60	4.54	4.40	4.17	4.77	4.64	4.59	4.62
10/01/27	10/31/27	Oct 2027	51.34	43.02	50.62	44.67	47.68	39.55	54.81	46.04	53.57	46.93	4.79	5.04	4.62	4.62	4.69	4.62	4.56	4.21	4.90	4.77	4.72	4.79
11/01/27	11/30/27	Nov 2027	55.13	45.77	52.81	45.88	51.22	42.10	56.56	47.52	54.74	47.74	4.95	5.23	4.76	4.83	4.93	4.87	4.73	4.54	5.10	4.97	4.92	5.00
12/01/27	12/31/27	Dec 2027	56.82	47.92	54.49	47.87	53.49	44.21	57.42	49.55	56.42	49.69	5.26	5.42	5.22	5.14	5.20	5.14	5.10	4.61	5.42	5.29	5.23	5.37
01/01/28	01/31/28	Jan 2028	53.77	44.64	53.04	46.92	49.85	41.20	56.93	48.93	55.09	48.83	5.10	5.28	5.14	5.00	5.06	4.96	4.97	4.53	5.29	5.16	5.10	5.26
02/01/28	02/29/28	Feb 2028	56.04	46.64	53.56	48.34	52.59	43.83	56.25	49.05	56.15	50.34	5.14	5.29	5.11	5.02	5.10	5.00	5.00	4.55	5.30	5.17	5.11	5.29
03/01/28	03/31/28	Mar 2028	48.71	40.66	49.89	45.39	45.47	38.86	53.77	46.72	52.56	47.25	5.00	5.07	4.86	4.82	4.91	4.84	4.74	4.29	5.11	4.98	4.92	5.02
04/01/28	04/30/28	Apr 2028	46.02	40.43	47.17	43.72	42.69	37.30	51.01	44.91	49.85	45.51	4.85	4.92	4.66	4.64	4.73	4.68	4.57	4.09	4.92	4.79	4.74	4.80
05/01/28	05/31/28	May 2028	41.04	33.11	45.54	41.24	37.41	29.83	49.68	41.44	48.03	43.18	4.85	4.88	4.70	4.57	4.67	4.63	4.41	4.11	4.84	4.71	4.66	4.63
06/01/28	06/30/28	Jun 2028	47.45	36.36	49.73	43.08	43.54	32.96	55.03	44.15	52.42	44.96	4.89	4.92	4.77	4.56	4.67	4.60	4.44	4.13	4.83	4.70	4.65	4.66
07/01/28	07/31/28	Jul 2028	52.42	42.58	54.43	46.40	48.30	38.89	59.37	47.82	56.85	48.30	4.96	4.99	4.82	4.62	4.73	4.66	4.49	4.26	4.88	4.75	4.71	4.72
08/01/28	08/31/28	Aug 2028	58.53	45.43	57.26	47.47	54.38	41.66	62.84	49.18	59.82	49.70	5.00	5.10	4.82	4.73	4.82	4.74	4.67	4.29	5.00	4.87	4.82	4.90
09/01/28	09/30/28	Sep 2028	57.16	47.76	53.13	46.54	55.76	45.03	57.64	48.65	56.07	48.91	4.95	5.08	4.84	4.73	4.81	4.71	4.68	4.46	5.00	4.87	4.82	4.91
10/01/28	10/31/28	Oct 2028	53.08	43.62	51.76	45.72	49.69	40.91	56.35	47.61	54.95	48.02	4.99	5.17	4.88	4.82	4.89	4.80	4.77	4.52	5.09	4.96	4.91	5.00
11/01/28	11/30/28	Nov 2028	56.23	45.99	53.89	46.54	52.41	42.37	58.08	49.05	55.88	48.47	5.11	5.32	5.00	4.99	5.10	5.02	5.03	4.78	5.27	5.14	5.08	5.30
12/01/28	12/31/28	Dec 2028	57.91	49.09	55.70	49.31	54.89	45.49	59.07	50.95	57.76	51.18	5.40	5.57	5.37	5.29	5.35	5.25	5.26	4.92	5.57	5.44	5.39	5.54
01/01/29	01/31/29	Jan 2029	56.97	47.01	55.75	48.96	53.11	43.30	60.18	51.70	58.05	51.01	5.42	5.59	5.39	5.36	5.42	5.30	5.33	4.92	5.65	5.52	5.46	5.62
02/01/29	02/28/29	Feb 2029	59.37	49.54	55.97	50.55	56.16	46.43	59.64	52.05	58.91	52.83	5.46	5.61	5.37	5.37	5.44	5.35	5.37	4.92	5.66	5.53	5.47	5.66
03/01/29	03/31/29	Mar 2029	52.16	43.70	52.02	47.59	48.87	41.35	56.50	49.58	55.23	49.64	5.28	5.37	5.15	5.16	5.23	5.14	5.14	4.64	5.45	5.32	5.26	5.42
04/01/29	04/30/29	Apr 2029	49.19	42.92	49.21	45.47	45.94	39.97	53.82	47.62	52.76	47.70	5.09	5.16	4.94	4.88	4.98	4.92	4.85	4.33	5.15	5.02	4.97	5.08
05/01/29	05/31/29	May 2029	42.93	35.16	46.27	42.35	39.19	31.76	51.44	43.40	49.51	44.53	4.94	4.95	4.78	4.67	4.77	4.71	4.52	4.26	4.94	4.81	4.76	4.73
06/01/29	06/30/29	Jun 2029	46.98	36.73	49.21	43.35	43.05	33.29	54.82	44.83	52.45	45.44	4.98	4.99	4.84	4.66	4.77	4.71	4.53	4.28	4.92	4.79	4.75	4.75
07/01/29	07/31/29	Jul 2029	53.12	43.05	54.80	46.88	48.92	39.30	60.28	48.60	57.46	48.91	5.02	5.05	4.85	4.67	4.80	4.70	4.54	4.32	4.94	4.81	4.76	4.77
08/01/29	08/31/29	Aug 2029	60.44	46.62	58.09	48.35	56.26	42.76	64.42	50.22	61.07	50.49	5.06	5.15	4.87	4.78	4.88	4.80	4.74	4.38	5.05	4.92	4.87	4.97
09/01/29	09/30/29	Sep 2029	58.41	48.86	54.35	47.29	56.66	45.97	60.21	50.55	57.80	50.11	4.94	5.14	4.83	4.73	4.81	4.71	4.67	4.49	5.00	4.87	4.82	4.90
10/01/29	10/31/29	Oct 2029	52.82	43.36	51.85	45.46	49.08	40.36	57.62	48.42	55.81	48.26	4.98	5.21	4.85	4.83	4.91	4.80	4.77	4.53	5.10	4.97	4.92	5.00
11/01/29	11/30/29	Nov 2029	55.21	45.80	54.20	47.00	51.08	42.05	59.12	50.17	56.60	48.99	5.09	5.37	5.01	5.05	5.11	5.02	5.04	4.76	5.33	5.20	5.15	5.30
12/01/29	12/31/29	Dec 2029	58.04	49.54	55.64	49.20	54.86	45.87	59.63	51.85	58.01	51.20	5.37	5.53	5.35	5.29	5.37	5.26	5.29	4.88	5.57	5.44	5.39	5.57
01/01/30	01/31/30	Jan 2030	56.67	45.43	55.79	49.40	53.50	43.60	60.76	52.55	58.58	51.60	5.49	5.65	5.51	5.42	5.51	5.41	5.42	5.00	5.71	5.58	5.52	5.71
02/01/30	02/28/30	Feb 2030	57.84	45.73	55.95	50.60	57.69	46.93	60.24	52.61	59.69	53.24	5.54	5.68	5.52	5.46	5.54	5.43	5.45	5.08	5.75	5.62	5.56	5.73
03/01/30	03/31/30	Mar 2030	50.51	43.65	52.82	48.61	49.70	42.77	57.67	50.06	56.11	50.72	5.38	5.48	5.23	5.29	5.38	5.28	5.29	4.77	5.58	5.45	5.39	5.57
04/01/30	04/30/30	Apr 2030	48.37	42.69	49.82	46.96	46.97	40.86	54.27	47.78	53.34	49.02	5.23	5.32	5.05	5.03	5.13	5.08	5.00	4.51	5.31	5.17	5.12	5.23
05/01/30	05/31/30	May 2030	43.48	35.38	47.00	43.54	39.70	31.93	52.42	43.88	50.49	45.71	5.22	5.28	5.05	4.97	5.08	5.03	4.89	4.50	5.24	5.11	5.06	5.11
06/01/30	06/30/30	Jun 2030	48.86	38.40	51.02	45.23	44.94	35.05	57.09	46.70	54.70	47.51	5.26	5.29	5.10	4.96	5.08	5.02	4.92	4.56	5.23	5.10	5.05	5.14
07/01/30	07/31/30	Jul 2030	55.73	44.31	56.73	48.09	51.44	40.53	62.96	50.70	60.03	50.36	5.33	5.36	5.15	4.97	5.10	5.05	4.90	4.69	5.24	5.11	5.07	5.13
08/01/30	08/31/30	Aug 2030	62.52	48.21	59.96	49.78	58.63	44.43	66.96	52.43	63.50	52.37	5.36	5.46	5.18	5.12	5.22	5.13	5.09	4.72	5.39	5.26	5.21	5.32
09/01/30	09/30/30	Sep 2030	61.07	50.02	56.74	49.22	60.43	48.65	63.25	53.28	60.93	52.79	5.32	5.49	5.15	5.19	5.26	5.19	5.19	4.89	5.46	5.33	5.28	5.42
10/01/30	10/31/30	Oct 2030	54.68	43.57	54.35	48.20	53.00	44.02	60.91	51.42	58.73	51.55	5.35	5.55	5.18	5.26	5.32	5.22	5.26	4.93	5.53	5.40	5.35	5.49
11/01/30	11/30/30	Nov 2030	58.68	47.44	56.96	49.96	55.25	44.89	62.14	53.15	59.47	52.04	5.48	5.72	5.32	5.48	5.52	5.42	5.46	5.13	5.76	5.63	5.57	5.73
12/01/30	12/31/30	Dec 2030	60.63	50.51	58.11	52.03	58.64	48.13	62.87	54.94	60.88	54.15	5.77	5.91	5.72	5.71	5.77	5.68	5.69	5.36	5.99	5.86	5.80	5.97
01/01/31	01/31/31	Jan 2031	56.84	45.65	57.95	50.99	56.48	45.67	63.16	54.26	60.90	53.29	5.66	5.83	5.63	5.61	5.69	5.58	5.60	5.25	5.90	5.77	5.71	5.88
02/01/31	02/28/31	Feb 2031	57.50	46.68	57.98	52.40	60.63	49.53	62.78	54.55	61.90	55.22	5.70	5.86	5.58	5.66	5.73	5.63	5.64	5.32	5.95	5.81	5.76	5.93
03/01/31	03/31/31	Mar 2031	50.29	44.26	54.89	50.42	51.95	44.97	59.76	51.95	58.12	52.51	5.54	5.69	5.39	5.51	5.57	5.50	5.50	4.95	5.80	5.66	5.61	5.78
04/01/31	04/30/31	Apr 2031	48.84	43.23	51.19	48.32	48.89	42.52	56.26	49.40	54.77	50.35	5.39	5.50	5.22	5.22	5.32	5.26	5.19	4.78	5.49	5.36	5.31	5.41
05/01/31	05/31/31	May 2031	44.80	36.42	48.12	44.58	40.98	32.93	54.04	45.19	51.83	46.94	5.33	5.39	5.17	5.10	5.20	5.14	5.03	4.75	5.36	5.23	5.19	5.24
06/01/31	06/30/31	Jun 2031	50.30	39.96	52.79	46.49	47.09	36.65	59.41	48.44	56.83	49.01	5.38	5.41	5.23	5.10	5.20	5.14	5.04	4.76	5.37	5.24	5.19	5.26
07/01/31	07/31/31	Jul 2031	57.26	45.43	58.60	49.62	53.38	42.14	65.35	52.47	62.22	52.08	5.48	5.53	5.32	5.14	5.28	5.22	5.05	4.85	5.41	5.28	5.23	5.28
08/01/31	08/31/31	Aug 2031	63.55	49.66	61.62	51.64	60.30	46.56	69.25	54.94	65.60	54.72	5.53	5.63	5.32	5.26	5.36	5.30	5.25	4.89	5.53	5.40	5.35	5.47
09/01/31	09/30/31	Sep 2031	60.95	48.61	58.30	49.77	62.71	50.36	65.17	53.65	62.74	53.69	5.41	5.61	5.25	5.29	5.36	5.28	5.29	5.03	5.56	5.43	5.38	5.52
10/01/31	10/31/31	Oct 2031	53.27	44.09	55.80	49.30	54.22	45.41	62.29	52.62	60.08	52.60	5.45	5.67	5.28	5.36	5.44	5.32	5.36	5.10	5.63	5.50	5.46	5.59
11/01/31	11/30/31	Nov 2031	57.25	46.04	57.63	50.98	55.35	45.88	63.21	54.54	60.32	53.16	5.53	5.77	5.39	5.54	5.60	5.51	5.53	5.17	5.82	5.69	5.63	5.79
12/01/31	12/31/31	Dec 2031	60.74	48.89	59.35	52.63	61.00	49.38	64.40	55.52	62.34	54.89	5.83	6.01	5.77	5.77	5.83	5.73	5.76	5.45	6.06	5.93	5.87	6.04
01/01/32	01/31/32	Jan 2032	58.35	47.79	60.32	53.94	58.60	47.73	65.64	56.66	63.02	56.14	5.95	6.13	5.92	5.92	5.98	5.86	5.90	5.54	6.21	6.07	6.02	6.19
02/01/32	02/29/32	Feb 2032	58.98	48.35	60.04	54.61	61.82	51.02	65.10	56.55	63.84	57.24	5.99	6.17	5.90	5.96	6.02	5.92	5.95	5.59	6.25	6.12	6.06	6.23
03/01/32	03/31/32	Mar 2032	51.82	46.42	56.55	52.41	53.28	46.00	61.50	54.00	59.74	54.60	5.75	5.92	5.60	5.71	5.77	5.68	5.71	5.30	5.99	5.86	5.80	5.99
04/01/32	04/30/32	Apr 2032	50.62	44.94	53.51	50.32	50.38	44.39	58.98	51.46	57.61	52.84	5.54	5.69	5.32	5.44	5.51	5.45	5.38	4.99	5.71	5.58	5.53	5.60
05/01/32	05/31/32	May 2032	46.12	38.25	49.20	45.74	42.25	34.69	55.55	46.96	53.16	48.41	5.42	5.45	5.24	5.15	5.26	5.18	5.11	4.87	5.42	5.29	5.24	5.32
06/01/32	06/30/32	Jun 2032	51.37	40.68	53.81	47.26	47.75	37.17	60.71	49.46	57.85	49.91	5.47	5.50	5.29	5.15	5.26	5.20	5.11	4.90	5.42	5.29	5.24	5.33
07/01/32	07/31/32	Jul 2032	57.31	45.86	58.73	50.00	53.25	42.30	65.94	53.38	62.62	52.53	5.56	5.59	5.36	5.20	5.32	5.26	5.09	4.93	5.46	5.33	5.29	5.31
08/01/32	08/31/32	Aug 2032	64.58	50.02	62.54	52.08	61.55	46.86	70.48	55.88	66.73	55.20	5.60	5.77	5.38	5.39	5.48	5.41	5.35	5.05	5.66	5.53	5.48	5.57
09/01/32	09/30/32	Sep 2032	60.97	49.12	58.39	50.28	62.67	50.54	66.02	54.87	62.84	54.02	5.47	5.72	5.29	5.39	5.45	5.38	5.36	5.09	5.66	5.53	5.48	5.59
10/01/32	10/31/32	Oct 2032	53.98	45.00	56.67	50.60	54.61	46.10	63.52	53.60	60.81	53.53	5.51	5.77	5.32	5.48	5.56	5.45	5.45	5.15	5.75	5.62	5.57	5.68
11/01/32	11/30/32	Nov 2032	58.96	47.06	59.43	52.07	57.17	46.64	65.35	55.51	61.94	54.19	5.63	5.93	5.50	5.68	5.77	5.66	5.68	5.29	5.95	5.82	5.77	5.94
12/01/32	12/31/32	Dec 2032	61.26	50.11	60.47	54.01	61.71	50.48	65.92	57.98	63.22	56.27	5.92	6.14	5.87	5.92	5.98	5.87	5.89	5.60	6.20	6.07	6.01	6.16
01/01/33	01/31/33	Jan 2033	59.76	49.23	61.18	55.08	59.68	49.49	67.15	57.34	63.89	57.32	6.03	6.25	6.02	6.05	6.09	5.97	6.02	5.68	6.34	6.20	6.15	6.30
02/01/33	02/28/33	Feb 2033	60.57	49.57	61.00	55.69	63.71	52.31	66.23	57.19	64.89	58.41	6.06	6.28	6.00	6.08	6.14	6.03	6.05	5.74	6.37	6.23	6.18	6.33
03/01/33	03/31/33	Mar 2033	52.88	47.91	57.49	53.30	53.94	47.07	62.66	54.39	60.60	55.51	5.83	6.02	5.65	5.85	5.92	5.83	5.85	5.33	6.13	6.00	5.95	6.13
04/01/33	04/30/33	Apr 2033	51.97	46.56	54.52	51.37	50.90	44.97	59.92	52.68	58.42	53.95	5.59	5.82	5.36	5.59	5.63	5.57	5.49	5.05	5.86	5.73	5.68	5.72
05/01/33	05/31/33	May 2033	47.16	38.89	50.54	47.04	43.08	35.19	56.93	47.94	54.48	49.65	5.56	5.65	5.36	5.34	5.45	5.39	5.25	4.99	5.61	5.48	5.43	5.47
06/01/33	06/30/33	Jun 2033	52.99	42.09	55.15	48.50	49.11	38.45	62.57	50.66	59.15	51.18	5.59	5.65	5.42	5.33	5.45	5.39	5.25	5.02	5.59	5.46	5.42	5.47
07/01/33	07/31/33	Jul 2033	59.28	47.99	60.50	51.63	55.09	44.09	67.93	55.25	64.57	54.37	5.69	5.79	5.51	5.43	5.62	5.54	5.31	5.17	5.70	5.57	5.52	5.53
08/01/33	08/31/33	Aug 2033	66.27	51.34	64.22	53.05	63.00	48.13	72.47	56.74	68.46	56.20	5.74	5.94	5.51	5.63	5.72	5.65	5.56	5.26	5.90	5.77	5.72	5.78

09/01/33	09/30/33	Sep 2033	61.90	50.62	59.48	51.62	63.52	51.91	67.34	55.77	64.04	55.39	5.65	5.91	5.46	5.62	5.68	5.56	5.56	5.28	5.89	5.76	5.71	5.78
10/01/33	10/31/33	Oct 2033	55.96	46.33	58.02	52.08	56.72	48.02	65.02	54.71	62.54	55.46	5.68	5.96	5.48	5.68	5.74	5.65	5.68	5.33	5.95	5.82	5.77	5.91
11/01/33	11/30/33	Nov 2033	61.79	48.56	60.85	53.16	61.09	48.95	67.15	56.48	63.48	55.38	5.80	6.09	5.65	5.85	5.94	5.83	5.92	5.43	6.13	6.00	5.94	6.19
12/01/33	12/31/33	Dec 2033	63.06	52.26	61.61	55.86	63.85	52.54	67.68	59.11	64.43	58.09	6.12	6.35	6.08	6.12	6.29	6.17	6.28	5.80	6.41	6.28	6.22	6.55
01/01/34	01/31/34	Jan 2034	62.88	51.55	63.61	56.70	62.60	51.63	70.03	60.40	66.62	59.06	6.21	6.46	6.18	6.24	6.40	6.27	6.42	5.85	6.53	6.40	6.34	6.70
02/01/34	02/28/34	Feb 2034	63.04	51.91	63.14	57.80	66.35	54.86	68.92	60.25	67.27	60.67	6.26	6.49	6.13	6.29	6.43	6.32	6.43	5.90	6.58	6.45	6.39	6.72
03/01/34	03/31/34	Mar 2034	54.75	49.45	59.36	55.11	55.66	48.75	65.00	56.88	62.64	57.33	6.02	6.23	5.82	6.05	6.12	6.01	6.05	5.44	6.34	6.21	6.15	6.33
04/01/34	04/30/34	Apr 2034	53.79	47.98	56.04	52.88	52.55	46.30	61.72	54.25	60.08	55.39	5.79	5.99	5.55	5.77	5.80	5.74	5.69	5.18	6.05	5.91	5.86	5.92
05/01/34	05/31/34	May 2034	49.71	40.62	52.62	48.90	45.47	36.76	59.72	49.92	56.86	51.67	5.74	5.88	5.54	5.60	5.71	5.65	5.49	5.13	5.87	5.74	5.69	5.71
06/01/34	06/30/34	Jun 2034	55.56	44.25	57.59	50.33	51.42	40.43	65.48	53.20	61.99	53.18	5.79	5.88	5.63	5.55	5.71	5.65	5.47	5.14	5.82	5.69	5.64	5.69
07/01/34	07/31/34	Jul 2034	61.68	49.69	62.95	53.27	57.25	45.75	70.91	57.88	67.38	56.39	5.85	5.99	5.66	5.62	5.77	5.69	5.47	5.24	5.88	5.75	5.71	5.70
08/01/34	08/31/34	Aug 2034	68.65	53.04	66.56	54.59	65.27	49.85	75.47	59.43	71.28	58.28	5.90	6.12	5.65	5.80	5.88	5.79	5.73	5.29	6.07	5.94	5.89	5.95
09/01/34	09/30/34	Sep 2034	62.96	51.41	60.37	52.34	64.76	53.15	68.55	57.21	65.11	56.46	5.69	5.98	5.52	5.69	5.74	5.62	5.65	5.32	5.96	5.83	5.79	5.87
10/01/34	10/31/34	Oct 2034	57.52	47.15	59.13	52.73	57.50	48.83	67.02	56.56	63.67	56.14	5.73	6.01	5.55	5.74	5.80	5.69	5.74	5.38	6.01	5.88	5.83	5.97
11/01/34	11/30/34	Nov 2034	62.32	48.80	61.43	53.07	60.52	48.78	68.48	57.64	64.20	55.42	5.79	6.09	5.65	5.84	5.94	5.84	5.94	5.41	6.11	5.98	5.93	6.21
12/01/34	12/31/34	Dec 2034	64.05	53.50	62.46	56.69	64.50	53.96	69.33	61.41	65.75	59.09	6.12	6.40	6.09	6.13	6.34	6.23	6.35	5.79	6.42	6.29	6.23	6.63
01/01/35	01/31/35	Jan 2035	62.50	52.54	62.72	56.41	61.62	51.30	70.47	60.90	66.25	59.07	6.22	6.46	6.20	6.27	6.44	6.30	6.48	5.90	6.56	6.43	6.37	6.76
02/01/35	02/28/35	Feb 2035	63.59	52.36	62.42	57.25	66.49	55.13	69.72	60.68	66.86	60.36	6.27	6.49	6.19	6.30	6.48	6.36	6.51	5.92	6.59	6.46	6.40	6.79
03/01/35	03/31/35	Mar 2035	55.65	50.63	59.45	55.74	56.25	49.26	66.06	57.86	63.22	58.10	6.08	6.30	5.90	6.11	6.19	6.08	6.16	5.77	6.39	6.26	6.21	6.44
04/01/35	04/30/35	Apr 2035	54.60	49.15	56.89	53.61	53.80	47.69	63.36	55.36	61.44	56.76	5.88	6.09	5.66	5.88	5.92	5.80	5.85	5.47	6.16	6.03	5.98	6.08
05/01/35	05/31/35	May 2035	51.48	42.91	53.81	50.34	47.26	38.95	61.69	51.98	58.41	53.21	5.90	6.08	5.72	5.85	5.92	5.84	5.76	5.42	6.12	5.99	5.94	5.97
06/01/35	06/30/35	Jun 2035	55.36	44.10	57.39	50.63	51.01	40.09	65.80	53.38	61.95	53.57	5.93	6.04	5.79	5.74	5.88	5.79	5.66	5.23	6.01	5.88	5.83	5.88
07/01/35	07/31/35	Jul 2035	62.86	51.60	64.26	54.56	58.21	47.37	72.70	59.78	68.95	58.13	6.03	6.16	5.87	5.87	6.00	5.88	5.76	5.31	6.14	6.01	5.96	5.98
08/01/35	08/31/35	Aug 2035	70.20	54.99	68.69	56.13	66.21	51.12	78.39	61.86	73.53	60.32	6.08	6.27	5.87	6.00	6.08	5.95	5.93	5.48	6.27	6.13	6.09	6.16
09/01/35	09/30/35	Sep 2035	65.13	53.87	63.05	54.24	65.02	54.23	72.28	60.21	67.95	58.57	5.88	6.12	5.72	5.92	5.95	5.82	5.85	5.50	6.19	6.05	6.01	6.08
10/01/35	10/31/35	Oct 2035	58.45	48.26	60.03	53.44	57.04	48.74	68.87	57.70	64.71	56.83	5.92	6.16	5.74	5.93	6.00	5.90	5.93	5.50	6.20	6.07	6.02	6.16
11/01/35	11/30/35	Nov 2035	61.45	50.17	61.82	54.51	58.48	48.83	69.73	59.34	65.10	56.95	5.98	6.28	5.88	6.03	6.20	6.08	6.20	5.59	6.31	6.17	6.12	6.47
12/01/35	12/31/35	Dec 2035	65.16	55.03	63.56	57.42	65.32	54.38	71.36	62.46	67.13	59.97	6.30	6.54	6.25	6.30	6.51	6.38	6.51	5.85	6.58	6.45	6.40	6.79
01/01/36	01/31/36	Jan 2036	65.30	55.68	65.65	59.17	63.80	53.38	74.09	64.39	69.07	61.74	6.46	6.80	6.44	6.55	6.80	6.67	6.80	5.85	6.84	6.71	6.65	7.08
02/01/36	02/29/36	Feb 2036	65.83	53.65	64.83	59.53	68.25	56.08	72.20	62.84	69.31	62.70	6.52	6.73	6.44	6.52	6.67	6.55	6.67	6.16	6.81	6.68	6.62	6.95
03/01/36	03/31/36	Mar 2036	57.70	53.10	61.41	57.69	57.55	51.10	68.34	60.08	65.41	60.31	6.31	6.52	6.16	6.34	6.42	6.31	6.41	6.03	6.63	6.49	6.44	6.69
04/01/36	04/30/36	Apr 2036	56.48	50.70	58.57	55.37	55.02	48.59	65.72	57.14	63.13	58.37	6.11	6.29	5.91	6.09	6.13	6.05	6.03	5.69	6.37	6.24	6.19	6.25
05/01/36	05/31/36	May 2036	52.61	43.35	55.45	51.93	48.19	39.28	63.27	53.09	60.09	54.82	6.13	6.29	5.96	6.06	6.13	6.03	5.98	5.65	6.33	6.20	6.15	6.20
06/01/36	06/30/36	Jun 2036	57.90	46.44	59.75	52.65	53.33	42.28	68.77	56.13	64.46	55.82	6.18	6.26	6.05	5.93	6.09	6.01	5.85	5.41	6.20	6.07	6.02	6.07
07/01/36	07/31/36	Jul 2036	65.05	52.66	66.53	55.68	60.12	48.28	75.66	61.63	71.43	59.69	6.27	6.36	6.13	6.03	6.19	6.06	5.91	5.42	6.30	6.17	6.12	6.14
08/01/36	08/31/36	Aug 2036	72.05	57.09	70.69	58.29	67.80	53.19	81.03	64.84	75.75	62.93	6.32	6.52	6.11	6.24	6.32	6.21	6.18	5.73	6.51	6.38	6.33	6.40
09/01/36	09/30/36	Sep 2036	68.12	55.19	65.72	55.56	68.00	55.85	75.35	62.05	70.82	60.20	6.13	6.36	5.96	6.13	6.18	6.03	6.09	5.73	6.40	6.27	6.22	6.32
10/01/36	10/31/36	Oct 2036	61.54	50.42	62.99	55.44	60.00	50.58	72.16	60.52	68.01	59.43	6.14	6.42	5.98	6.14	6.24	6.13	6.19	5.75	6.41	6.28	6.24	6.42
11/01/36	11/30/36	Nov 2036	65.08	52.55	64.35	56.64	62.65	51.92	72.62	62.06	68.05	59.33	6.21	6.52	6.11	6.26	6.46	6.32	6.44	5.85	6.54	6.41	6.35	6.71
12/01/36	12/31/36	Dec 2036	67.65	56.80	65.65	59.19	67.48	55.39	74.03	64.68	69.36	61.82	6.55	6.77	6.52	6.52	6.73	6.60	6.73	6.01	6.80	6.67	6.62	7.01
01/01/37	01/31/37	Jan 2037	67.09	58.64	67.04	61.06	66.39	55.54	76.19	66.64	70.86	63.72	6.61	6.97	6.58	6.66	6.95	6.81	6.97	6.01	6.95	6.82	6.76	7.25
02/01/37	02/28/37	Feb 2037	67.51	58.41	66.64	61.77	70.30	58.78	74.79	65.52	71.12	64.89	6.66	6.92	6.60	6.65	6.95	6.81	6.95	6.13	6.94	6.80	6.75	7.23
03/01/37	03/31/37	Mar 2037	59.81	55.18	63.08	59.23	58.50	52.08	70.54	61.92	67.38	61.74	6.45	6.66	6.30	6.48	6.56	6.45	6.55	6.18	6.77	6.63	6.58	6.83
04/01/37	04/30/37	Apr 2037	58.18	52.68	60.30	57.06	55.74	49.61	67.82	58.75	64.87	59.99	6.25	6.45	6.06	6.25	6.28	6.15	6.20	5.84	6.52	6.39	6.34	6.42
05/01/37	05/31/37	May 2037	54.61	45.30	57.56	53.60	50.03	41.10	65.62	55.20	62.38	56.66	6.26	6.43	6.11	6.23	6.28	6.15	6.13	5.83	6.49	6.36	6.32	6.35
06/01/37	06/30/37	Jun 2037	60.15	48.44	62.21	54.60	55.43	44.10	71.32	58.37	66.99	57.85	6.31	6.43	6.23	6.13	6.25	6.16	6.01	5.58	6.40	6.27	6.22	6.23
07/01/37	07/31/37	Jul 2037	66.56	54.28	68.20	57.32	61.47	49.69	77.79	63.62	73.28	61.46	6.41	6.53	6.28	6.21	6.35	6.20	6.08	5.54	6.48	6.35	6.30	6.30
08/01/37	08/31/37	Aug 2037	73.01	58.57	72.23	60.04	68.66	54.34	82.89	66.86	77.40	64.72	6.46	6.68	6.26	6.43	6.48	6.36	6.35	5.96	6.70	6.57	6.52	6.57
09/01/37	09/30/37	Sep 2037	68.81	56.38	67.61	57.36	68.35	56.05	77.51	64.08	72.81	62.14	6.26	6.53	6.13	6.25	6.31	6.20	6.25	5.84	6.52	6.39	6.34	6.47
10/01/37	10/31/37	Oct 2037	62.45	52.17	64.33	57.18	60.31	51.26	73.56	61.94	69.36	60.99	6.28	6.56	6.09	6.28	6.36	6.25	6.31	5.88	6.55	6.42	6.37	6.54
11/01/37	11/30/37	Nov 2037	66.28	55.15	65.81	58.46	64.65	53.03	74.79	64.02	69.29	61.08	6.35	6.66	6.25	6.38	6.63	6.50	6.65	6.01	6.66	6.53	6.47	6.91
12/01/37	12/31/37	Dec 2037	69.62	61.09	67.50	61.19	71.03	58.73	76.16	66.90	71.21	63.88	6.70	6.95	6.66	6.70	6.95	6.81	7.00	6.21	6.98	6.85	6.79	7.28
01/01/38	01/31/38	Jan 2038	70.15	62.43	69.81	64.17	69.51	59.77	79.66	70.19	73.96	67.03	6.90	7.31	6.89	6.95	7.33	7.16	7.33	6.29	7.24	7.11	7.05	7.62
02/01/38	02/28/38	Feb 2038	71.26	60.62	69.52	64.60	74.74	62.58	78.23	68.60	74.42	67.75	6.97	7.23	6.92	6.95	7.30	7.13	7.35	6.46	7.24	7.11	7.05	7.63
03/01/38	03/31/38	Mar 2038	62.40	57.19	65.52	61.18	61.15	54.06	73.58	64.33	70.04	63.84	6.75	6.97	6.59	6.77	6.87	6.75	6.85	6.47	7.05	6.92	6.86	7.13
04/01/38	04/30/38	Apr 2038	61.02	55.37	63.09	59.79	58.97	52.84	71.29	61.77	68.18	63.32	6.54	6.73	6.30	6.53	6.58	6.47	6.53	6.17	6.80	6.67	6.62	6.75
05/01/38	05/31/38	May 2038	57.92	49.03	60.26	56.06	53.16	44.62	69.19	58.92	65.37	59.58	6.56	6.73	6.39	6.49	6.56	6.41	6.39	6.05	6.76	6.63	6.58	6.61
06/01/38	06/30/38	Jun 2038	63.11	51.21	64.57	56.96	58.25	46.70	74.58	61.50	69.67	60.45	6.59	6.73	6.49	6.42	6.54	6.42	6.32	5.88	6.69	6.56	6.51	6.54
07/01/38	07/31/38	Jul 2038	69.97	57.12	71.34	59.78	64.72	52.39	81.52	66.45	76.58	64.29	6.70	6.83	6.56	6.51	6.65	6.53	6.41	5.86	6.78	6.65	6.60	6.63
08/01/38	08/31/38	Aug 2038	76.68	61.16	75.91	62.58	72.29	56.85	87.12	69.81	81.25	67.56	6.75	7.04	6.56	6.71	6.78	6.65	6.66	6.25	6.98	6.85	6.81	6.89
09/01/38	09/30/38	Sep 2038	71.38	59.14	69.62	60.15	71.10	58.90	80.22	66.92	74.96	64.86	6.54	6.87	6.39	6.54	6.61	6.49	6.54	6.13	6.81	6.68	6.63	6.77
10/01/38	10/31/38	Oct 2038	65.19	54.73	66.39	59.78	63.30	54.30	76.42	64.93	71.58	63.57	6.58	6.89	6.41	6.56	6.73	6.61	6.71	6.15	6.83	6.70	6.65	6.94
11/01/38	11/30/38	Nov 2038	70.67	57.57	69.17	60.85	69.53	56.05	78.93	67.12	73.06	63.48	6.65	7.02	6.54	6.66	7.01	6.87	7.07	6.29	6.94	6.81	6.76	7.34
12/01/38	12/31/38	Dec 2038	73.12	63.73	70.26	63.78	74.88	62.37	79.55	70.02	74.27	66.59	7.01	7.30	6.99	6.99	7.33	7.19	7.40	6.56	7.27	7.14	7.09	7.68
01/01/39	01/31/39	Jan 2039	72.53	63.95	72.64	66.16	71.31	60.79	83.01	72.42	77.14	69.14	7.11	7.57	7.13	7.17	7.53	7.38	7.41	6.48	7.46	7.32	7.27	7.70
02/01/39	02/28/39	Feb 2039	73.85	62.85	72.15	67.46	77.06	65.02	81.36	71.73	77.06	70.65	7.17	7.48	7.11	7.18	7.57	7.41	7.62	6.69	7.47	7.34	7.28	7.91
03/01/39	03/31/39	Mar 2039	64.91	58.88	68.39	63.40	63.89	55.90	76.56	67.06	73.15	66.18	6.96	7.17	6.78	6.97	7.08	6.96	7.04	6.68	7.26	7.13	7.07	7.32
04/01/39	04/30/39	Apr 2039	62.99	57.25	65.15	62.08	60.78	54.56	73.56	64.19	70.22	65.77	6.75	6.94	6.45	6.73	6.78	6.64	6.73	6.38	7.00	6.87	6.82	6.95
05/01/39	05/31/39	May 2039	60.23	49.99	62.80	58.21	55.27	45.48	71.97	60.72	68.02	61.64	6.76	6.96	6.57	6.73	6.76	6.64	6.64	6.34	6.99	6.86	6.82	6.86
06/01/39	06/30/39	Jun 2039	66.25	53.61	67.91	59.22	61.11	48.94	78.16	64.31	73.16	62.90	6.80	6.96	6.71	6.62	6.75	6.62	6.52	6.06	6.89	6.76	6.71	6.74
07/01/39	07/31/39	Jul 2039	72.83	59.92	74.63	62.66	67.34	55.00	85.03	70.20	80.03	67.49	6.90	7.08	6.80	6.73	6.87	6.71	6.61	6.03	7.00	6.87	6.82	6.83
08/01/39	08/31/39	Aug 2039	79.87	63.26	79.14	64.87	75.25	58.74	90.60	72.67	84.64	70.04	6.96	7.25	6.76	6.94	7.01	6.83	6.87	6.47	7.21	7.08	7.03	7.09
09/01/39	09/30/39	Sep 2039	73.88	61.66	72.73	62.70	73.27	61.41	83.34	70.11	78.24	67.63	6.75	7.13	6.61	6.73	6.82	6.68	6.73	6.33	7.00	6.87	6.82	6.95

10/01/39	10/31/39	Oct 2039	68.83	57.23	69.91	62.01	66.99	56.75	80.16	67.92	75.44	66.32	6.78	7.13	6.62	6.76	6.99	6.87	6.97	6.36	7.04	6.90	6.86	7.20
11/01/39	11/30/39	Nov 2039	75.17	60.32	72.69	63.50	74.92	59.75	82.70	70.53	76.77	66.37	6.85	7.31	6.78	6.89	7.25	7.11	7.27	6.47	7.16	7.03	6.98	7.54
12/01/39	12/31/39	Dec 2039	75.64	64.43	72.95	66.50	77.21	64.30	82.67	72.97	77.27	69.58	7.22	7.53	7.31	7.20	7.57	7.43	7.64	6.80	7.49	7.35	7.30	7.92
01/01/40	01/31/40	Jan 2040	75.93	68.74	75.74	69.00	74.21	64.91	86.44	75.33	80.51	72.09	7.40	7.87	7.48	7.48	7.83	7.67	7.64	6.78	7.76	7.63	7.57	7.92
02/01/40	02/29/40	Feb 2040	76.18	69.03	75.03	70.18	80.04	70.57	84.79	74.58	80.10	73.44	7.46	7.80	7.46	7.51	7.92	7.76	8.01	7.10	7.80	7.67	7.61	8.30
03/01/40	03/31/40	Mar 2040	67.94	62.35	71.51	66.39	65.45	58.52	80.12	69.88	76.54	69.14	7.24	7.49	7.12	7.26	7.44	7.31	7.44	6.94	7.55	7.41	7.36	7.72
04/01/40	04/30/40	Apr 2040	64.96	59.43	67.38	64.14	61.87	56.34	76.46	66.13	72.56	67.43	7.01	7.21	6.85	6.99	7.04	6.92	7.01	6.65	7.26	7.13	7.08	7.23
05/01/40	05/31/40	May 2040	62.95	51.56	65.55	60.07	57.83	46.92	75.10	62.54	70.89	63.57	7.03	7.22	6.92	6.99	7.04	6.92	6.92	6.61	7.26	7.13	7.08	7.14
06/01/40	06/30/40	Jun 2040	68.81	55.72	70.89	61.54	63.46	50.90	81.41	66.73	76.29	65.35	7.06	7.24	7.01	6.87	7.01	6.87	6.79	6.26	7.13	7.00	6.96	7.01
07/01/40	07/31/40	Jul 2040	74.88	62.32	77.01	65.11	69.23	57.22	87.57	72.92	82.55	70.18	7.19	7.37	7.08	6.97	7.13	6.96	6.87	6.29	7.24	7.11	7.06	7.09
08/01/40	08/31/40	Aug 2040	81.06	65.68	80.79	67.33	76.21	60.95	92.28	75.21	86.43	72.67	7.24	7.56	7.08	7.22	7.30	7.12	7.17	6.72	7.49	7.36	7.32	7.40
09/01/40	09/30/40	Sep 2040	73.99	63.53	74.11	65.39	72.58	62.63	85.05	72.34	80.11	70.42	7.01	7.35	6.88	6.97	7.08	6.94	6.99	6.54	7.24	7.11	7.06	7.22
10/01/40	10/31/40	Oct 2040	71.20	59.53	72.63	64.76	69.13	58.24	83.19	70.46	78.21	68.76	7.04	7.46	6.90	7.03	7.31	7.17	7.31	6.61	7.30	7.17	7.12	7.54
11/01/40	11/30/40	Nov 2040	77.15	64.29	75.14	65.58	76.99	62.89	85.45	72.84	79.28	68.50	7.12	7.56	7.13	7.12	7.58	7.42	7.64	6.72	7.39	7.26	7.21	7.90
12/01/40	12/31/40	Dec 2040	78.62	70.59	75.95	70.05	80.65	69.84	86.19	76.63	80.52	73.13	7.51	7.91	7.60	7.49	7.94	7.80	8.01	7.10	7.78	7.65	7.59	8.29
01/01/41	01/31/41	Jan 2041	77.67	70.32	77.48	70.59	75.91	66.40	88.43	77.06	82.36	73.75	7.57	8.05	7.65	7.65	8.01	7.85	7.81	6.93	7.94	7.80	7.75	8.10
02/01/41	02/28/41	Feb 2041	77.93	70.61	76.75	71.79	81.88	72.20	86.74	76.30	81.94	75.13	7.63	7.98	7.63	7.68	8.11	7.94	8.20	7.26	7.97	7.84	7.78	8.48
03/01/41	03/31/41	Mar 2041	69.50	63.78	73.15	67.92	66.95	59.86	81.96	71.49	78.30	70.73	7.41	7.67	7.28	7.43	7.61	7.48	7.61	7.10	7.71	7.58	7.52	7.89
04/01/41	04/30/41	Apr 2041	66.46	60.80	68.93	65.61	63.29	57.64	78.22	67.65	74.23	68.98	7.17	7.37	7.01	7.15	7.21	7.08	7.17	6.80	7.42	7.29	7.24	7.40
05/01/41	05/31/41	May 2041	64.40	52.74	67.05	61.45	59.16	48.00	76.82	63.98	72.52	65.03	7.19	7.39	7.08	7.15	7.21	7.08	7.08	6.77	7.42	7.29	7.24	7.30
06/01/41	06/30/41	Jun 2041	70.40	57.00	72.52	62.96	64.92	52.07	83.28	68.27	78.04	66.85	7.23	7.41	7.17	7.02	7.17	7.02	6.95	6.40	7.29	7.16	7.11	7.17
07/01/41	07/31/41	Jul 2041	76.60	63.76	78.78	66.61	70.82	58.53	89.58	74.60	84.45	71.79	7.35	7.54	7.24	7.13	7.30	7.12	7.02	6.44	7.40	7.27	7.22	7.25
08/01/41	08/31/41	Aug 2041	82.93	67.19	82.64	68.88	77.97	62.36	94.41	76.94	88.41	74.35	7.41	7.74	7.24	7.39	7.46	7.28	7.34	6.88	7.66	7.53	7.48	7.56
09/01/41	09/30/41	Sep 2041	75.69	64.99	75.81	66.90	74.25	64.07	87.01	74.01	81.96	72.04	7.17	7.52	7.04	7.13	7.24	7.10	7.15	6.69	7.40	7.27	7.22	7.38
10/01/41	10/31/41	Oct 2041	72.83	60.90	74.30	66.25	70.72	59.58	85.10	72.08	80.00	70.34	7.21	7.63	7.06	7.19	7.48	7.34	7.48	6.77	7.46	7.33	7.28	7.71
11/01/41	11/30/41	Nov 2041	78.92	65.77	76.87	67.08	78.76	64.34	87.41	74.51	81.11	70.07	7.28	7.74	7.30	7.28	7.76	7.59	7.81	6.88	7.56	7.43	7.37	8.08
12/01/41	12/31/41	Dec 2041	80.42	72.21	77.70	71.66	82.51	71.44	88.17	78.40	82.38	74.81	7.68	8.09	7.78	7.67	8.12	7.98	8.20	7.26	7.95	7.82	7.76	8.47
01/01/42	01/31/42	Jan 2042	79.46	71.94	79.27	72.21	77.66	67.93	90.46	78.84	84.26	75.44	7.75	8.24	7.82	7.82	8.20	8.03	7.99	7.09	8.11	7.98	7.92	8.28
02/01/42	02/28/42	Feb 2042	79.73	72.24	78.52	73.44	83.77	73.86	88.74	78.05	83.82	76.86	7.80	8.16	7.80	7.86	8.29	8.12	8.39	7.43	8.15	8.02	7.96	8.67
03/01/42	03/31/42	Mar 2042	71.10	65.25	74.84	69.48	68.49	61.24	83.85	73.13	80.10	72.36	7.58	7.84	7.45	7.60	7.79	7.65	7.79	7.26	7.88	7.75	7.70	8.07
04/01/42	04/30/42	Apr 2042	67.99	62.19	70.52	67.12	64.75	58.96	80.02	69.21	75.94	70.57	7.34	7.54	7.17	7.32	7.37	7.24	7.34	6.96	7.59	7.46	7.41	7.56
05/01/42	05/31/42	May 2042	65.88	53.96	68.59	62.86	60.52	49.11	78.59	65.45	74.19	66.52	7.35	7.56	7.24	7.32	7.37	7.24	7.24	6.92	7.58	7.45	7.41	7.46
06/01/42	06/30/42	Jun 2042	72.02	58.31	74.19	64.41	66.41	53.27	85.19	69.84	79.84	68.39	7.39	7.58	7.34	7.19	7.34	7.19	7.11	6.55	7.45	7.32	7.28	7.33
07/01/42	07/31/42	Jul 2042	78.36	65.22	80.60	68.14	72.45	59.88	91.64	76.31	86.39	73.44	7.52	7.71	7.41	7.30	7.47	7.28	7.19	6.58	7.57	7.44	7.39	7.41
08/01/42	08/31/42	Aug 2042	84.84	68.74	84.55	70.46	79.76	63.79	96.58	78.71	90.45	76.06	7.58	7.92	7.41	7.56	7.64	7.45	7.50	7.04	7.83	7.70	7.65	7.73
09/01/42	09/30/42	Sep 2042	77.43	66.49	77.55	68.43	75.96	65.54	89.01	75.71	83.84	73.70	7.34	7.69	7.20	7.30	7.41	7.26	7.32	6.85	7.57	7.44	7.39	7.54
10/01/42	10/31/42	Oct 2042	74.51	62.30	76.01	67.78	72.35	60.95	87.06	73.74	81.84	71.96	7.37	7.80	7.22	7.35	7.65	7.50	7.65	6.92	7.63	7.49	7.45	7.88
11/01/42	11/30/42	Nov 2042	80.74	67.28	78.63	68.63	80.57	65.82	89.42	76.23	82.97	71.69	7.45	7.92	7.47	7.45	7.94	7.77	7.99	7.04	7.73	7.60	7.54	8.26
12/01/42	12/31/42	Dec 2042	82.27	73.87	79.49	73.31	84.40	73.08	90.20	80.20	84.27	76.53	7.86	8.27	7.95	7.84	8.31	8.16	8.39	7.43	8.13	7.99	7.94	8.66
01/01/43	01/31/43	Jan 2043	81.29	73.59	81.09	73.87	79.45	69.49	92.54	80.65	86.20	77.18	7.93	8.43	8.00	8.00	8.39	8.21	8.18	7.25	8.29	8.16	8.10	8.46
02/01/43	02/28/43	Feb 2043	81.56	73.90	80.32	75.13	85.69	75.56	90.78	79.85	85.75	78.63	7.98	8.35	7.98	8.04	8.48	8.31	8.58	7.60	8.33	8.20	8.14	8.86
03/01/43	03/31/43	Mar 2043	72.74	66.75	76.56	71.08	70.07	62.65	85.78	74.81	81.94	74.02	7.75	8.02	7.62	7.77	7.96	7.83	7.96	7.43	8.06	7.93	7.87	8.24
04/01/43	04/30/43	Apr 2043	69.55	63.62	72.14	68.67	66.23	60.32	81.86	70.80	77.68	72.19	7.50	7.71	7.33	7.48	7.54	7.41	7.50	7.12	7.76	7.63	7.58	7.73
05/01/43	05/31/43	May 2043	67.40	55.20	70.17	64.31	61.91	50.24	80.40	66.96	75.89	68.05	7.52	7.73	7.41	7.48	7.54	7.41	7.41	7.08	7.75	7.62	7.57	7.63
06/01/43	06/30/43	Jun 2043	73.67	59.65	75.89	65.89	67.94	54.50	87.15	71.44	81.67	69.96	7.56	7.75	7.50	7.35	7.50	7.35	7.27	6.70	7.62	7.49	7.44	7.49
07/01/43	07/31/43	Jul 2043	80.16	66.72	82.45	69.71	74.12	61.25	93.75	78.07	88.38	75.13	7.70	7.89	7.58	7.47	7.64	7.45	7.35	6.74	7.73	7.60	7.56	7.57
08/01/43	08/31/43	Aug 2043	86.79	70.32	86.49	72.08	81.59	65.26	98.80	80.52	92.53	77.80	7.75	8.10	7.58	7.73	7.81	7.62	7.68	7.20	8.00	7.87	7.83	7.90
09/01/43	09/30/43	Sep 2043	79.21	68.02	79.34	70.01	77.70	67.05	91.05	77.45	85.77	75.39	7.50	7.87	7.37	7.47	7.58	7.43	7.48	7.00	7.74	7.61	7.56	7.71
10/01/43	10/31/43	Oct 2043	76.22	63.74	77.76	69.34	74.01	62.36	89.06	75.44	83.73	73.61	7.54	7.98	7.39	7.52	7.83	7.68	7.83	7.08	7.79	7.66	7.61	8.06
11/01/43	11/30/43	Nov 2043	82.60	68.83	80.44	70.21	82.42	67.33	91.48	77.98	84.88	73.33	7.62	8.10	7.64	7.62	8.12	7.95	8.18	7.20	7.90	7.77	7.71	8.44
12/01/43	12/31/43	Dec 2043	84.17	75.57	81.32	74.99	86.34	74.77	92.27	82.04	86.21	78.29	8.04	8.46	8.14	8.02	8.50	8.35	8.58	7.60	8.31	8.17	8.12	8.86
01/01/44	01/31/44	Jan 2044	83.16	75.28	82.96	75.57	81.27	71.09	94.67	82.50	88.18	78.95	8.11	8.62	8.19	8.19	8.58	8.40	8.36	7.42	8.48	8.34	8.29	8.65
02/01/44	02/29/44	Feb 2044	83.43	75.60	82.17	76.86	87.66	77.29	92.87	81.68	87.72	80.44	8.17	8.54	8.17	8.23	8.68	8.50	8.78	7.77	8.51	8.38	8.32	9.06
03/01/44	03/31/44	Mar 2044	74.41	68.28	78.32	72.72	71.68	64.09	87.75	76.54	83.83	75.73	7.93	8.21	7.79	7.95	8.15	8.01	8.15	7.60	8.24	8.11	8.05	8.43
04/01/44	04/30/44	Apr 2044	71.15	65.09	73.80	70.25	67.76	61.71	83.74	72.43	79.47	73.85	7.68	7.89	7.50	7.66	7.72	7.58	7.68	7.28	7.93	7.80	7.75	7.90
05/01/44	05/31/44	May 2044	68.95	56.47	71.79	65.79	63.33	51.39	82.25	68.50	77.64	69.62	7.70	7.91	7.58	7.66	7.72	7.58	7.58	7.24	7.92	7.79	7.75	7.80
06/01/44	06/30/44	Jun 2044	75.37	61.03	77.64	67.40	69.50	55.75	89.16	73.08	83.55	71.57	7.74	7.93	7.68	7.52	7.68	7.52	7.44	6.85	7.79	7.66	7.61	7.66
07/01/44	07/31/44	Jul 2044	82.01	68.26	84.35	71.31	75.82	62.66	95.91	79.86	90.41	76.86	7.87	8.07	7.75	7.64	7.81	7.62	7.52	6.89	7.91	7.78	7.73	7.74
08/01/44	08/31/44	Aug 2044	88.78	71.94	88.48	73.74	83.47	66.76	101.07	82.37	94.66	79.59	7.93	8.29	7.75	7.91	7.99	7.79	7.85	7.36	8.18	8.05	8.00	8.08
09/01/44	09/30/44	Sep 2044	81.03	69.58	81.16	71.62	79.49	68.59	93.15	79.23	87.74	77.13	7.68	8.05	7.54	7.64	7.75	7.60	7.66	7.17	7.91	7.78	7.73	7.88
10/01/44	10/31/44	Oct 2044	77.98	65.20	79.55	70.93	75.71	63.79	91.11	77.17	85.65	75.31	7.72	8.17	7.56	7.70	8.01	7.85	8.01	7.24	7.97	7.84	7.79	8.24
11/01/44	11/30/44	Nov 2044	84.50	70.41	82.29	71.82	84.32	68.88	93.58	79.77	86.83	75.02	7.79	8.29	7.81	7.79	8.30	8.13	8.36	7.36	8.07	7.94	7.89	8.63
12/01/44	12/31/44	Dec 2044	86.10	77.31	83.19	76.72	88.33	76.48	94.40	83.93	88.19	80.09	8.23	8.66	8.32	8.21	8.70	8.54	8.78	7.77	8.49	8.36	8.30	9.05
01/01/45	01/31/45	Jan 2045	85.07	77.01	84.86	77.31	83.14	72.73	96.85	84.40	90.21	80.77	8.29	8.82	8.38	8.38	8.78	8.60	8.56	7.59	8.66	8.53	8.47	8.84
02/01/45	02/28/45	Feb 2045	85.35	77.34	84.06	78.63	89.68	79.07	95.00	83.56	89.74	82.29	8.36	8.74	8.36	8.42	8.88	8.70	8.98	7.95	8.70	8.57	8.51	9.26
03/01/45	03/31/45	Mar 2045	76.12	69.85	80.12	74.39	73.33	65.56	89.77	78.30	85.76	77.47	8.11	8.40	7.97	8.13	8.34	8.19	8.34	7.77	8.42	8.29	8.23	8.62
04/01/45	04/30/45	Apr 2045	72.79	66.59	75.50	71.86	69.32	63.13	85.67	74.10	81.30	75.55	7.85	8.07	7.67	7.83	7.89	7.75	7.85	7.45	8.11	7.98	7.93	8.08
05/01/45	05/31/45	May 2045	70.53	57.77	73.44	67.30	64.79	52.57	84.14	70.07	79.42	71.22	7.87	8.09	7.75	7.83	7.89	7.75	7.75	7.41	8.10	7.97	7.92	7.97
06/01/45	06/30/45	Jun 2045	77.10	62.43	79.42	68.95	71.10	57.03	91.21	74.77	85.47	73.22	7.91	8.11	7.85	7.69	7.85	7.69	7.61	7.01	7.96	7.83	7.78	7.83
07/01/45	07/31/45	Jul 2045	83.89	69.83	86.29	72.95	77.56	64.10	98.11	81.70	92.49	78.63	8.05	8.25	7.93	7.81	7.99	7.79	7.69	7.05	8.08	7.95	7.90	7.92
08/01/45	08/31/45	Aug 2045	90.83	73.59	90.51	75.44	85.39	68.29	103.39	84.26	96.83	81.42	8.11	8.48	7.93	8.09	8.17	7.97	8.03	7.53	8.36	8.23	8.19	8.26
09/01/45	09/30/45	Sep 2045	82.89	71.18	83.03	73.27	81.32	70.17	95.29	81.05	89.76	78.90	7.85	8.23	7.71	7.81	7.93	7.77	7.83	7.33	8.08	7.95	7.90	8.06
10/01/45	10/31/45	Oct 2045	79.77	66.70	81.38	72.56	77.45	65.26	93.21	78.95	87.62	77.04	7.89	8.36	7.73	7.87	8.19	8.03	8.19	7.41	8.14	8.01	7.96	8.42

	11/01/45	11/30/45	Nov 2045	86.44	72.03	84.19	73.47	86.26	70.46	95.74	81.61	88.83	76.75	7.97	8.48	7.99	7.97	8.50	8.31	8.56	7.53	8.25	8.12	8.07	8.82
	12/01/45	12/31/45	Dec 2045	88.08	79.09	85.10	78.48	90.36	78.24	96.57	85.86	90.22	81.93	8.42	8.86	8.52	8.40	8.90	8.74	8.98	7.95	8.68	8.55	8.49	9.25
	01/01/46	01/31/46	Jan 2046	87.03	78.78	86.81	79.09	85.06	74.40	99.07	86.34	92.28	82.63	8.49	9.02	8.57	8.57	8.98	8.79	8.75	7.77	8.86	8.72	8.67	9.04
	02/01/46	02/28/46	Feb 2046	87.32	79.12	85.99	80.43	91.74	80.89	97.19	85.48	91.81	84.18	8.55	8.94	8.55	8.61	9.08	8.90	9.18	8.14	8.90	8.77	8.71	9.47
	03/01/46	03/31/46	Mar 2046																						

			COBHLH	COBLLH	Palo Verde	Palo Verde	Mid-Colun	Mid-Colun	NP 15HLH	NP 15LLH	SP 15HLH	SP 15LLH	Henry Hub Ga	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Ga	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
Quote Date		**Data Type:**	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
3/3/2016		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
		Tue, 5/31/2005																						
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
03/04/16	03/31/16	Mar 2016	13.25	10.20	16.00	14.00	11.75	8.75	21.75	17.00	19.75	16.50	1.71	1.63	1.52	1.49	1.59	1.57	1.41	1.28	1.60	1.41	1.42	1.33
04/01/16	04/30/16	Apr 2016	12.75	9.60	16.00	12.50	11.50	7.95	23.00	17.00	20.00	16.50	1.64	1.52	1.43	1.42	1.49	1.47	1.18	0.97	1.63	1.49	1.48	1.27
05/01/16	05/31/16	May 2016	11.50	6.75	15.75	12.50	10.25	4.75	23.00	16.50	19.75	15.50	1.77	1.60	1.51	1.48	1.55	1.53	1.11	0.98	1.70	1.56	1.55	1.20
06/01/16	06/30/16	Jun 2016	14.00	8.25	19.25	14.15	12.50	6.25	24.00	17.75	23.00	17.00	1.88	1.76	1.67	1.66	1.71	1.69	1.18	1.02	1.88	1.73	1.72	1.27
07/01/16	07/31/16	Jul 2016	21.25	15.10	25.76	18.33	19.79	12.70	29.25	23.00	29.25	23.50	1.98	2.02	1.86	1.80	1.88	1.86	1.44	1.08	2.03	1.88	1.87	1.54
08/01/16	08/31/16	Aug 2016	25.50	20.49	26.77	20.28	23.06	17.66	30.64	25.73	30.90	25.24	2.02	2.14	1.93	1.87	1.94	1.92	1.49	1.12	2.10	1.96	1.94	1.60
09/01/16	09/30/16	Sep 2016	24.25	19.00	23.23	19.89	22.40	18.81	29.25	24.01	29.50	24.50	2.04	2.13	1.93	1.89	1.96	1.94	1.53	1.15	2.12	1.97	1.96	1.64
10/01/16	10/31/16	Oct 2016	23.75	21.55	23.75	20.75	21.85	18.23	33.75	26.84	31.11	26.13	2.09	2.14	1.94	1.95	2.00	1.98	1.77	1.24	2.20	2.04	2.02	1.89
11/01/16	11/30/16	Nov 2016	25.00	22.05	23.52	20.58	23.28	20.45	33.91	27.69	32.75	26.68	2.26	2.36	2.19	2.19	2.32	2.30	2.32	1.60	2.44	2.28	2.26	2.50
12/01/16	12/31/16	Dec 2016	29.16	23.85	25.25	21.42	26.13	21.85	35.25	30.23	34.39	29.70	2.53	2.98	2.53	2.58	2.66	2.64	2.83	1.86	2.85	2.68	2.65	3.04
01/01/17	01/31/17	Jan 2017	28.60	24.15	25.74	23.92	25.46	21.58	36.23	29.90	34.06	29.10	2.67	3.07	2.68	2.73	2.72	2.70	2.66	1.91	2.99	2.82	2.80	2.86
02/01/17	02/28/17	Feb 2017	27.25	23.00	25.25	23.23	24.74	21.10	35.19	29.04	33.41	28.25	2.66	2.98	2.68	2.72	2.71	2.69	2.55	1.95	2.99	2.82	2.80	2.74
03/01/17	03/31/17	Mar 2017	24.00	21.30	23.27	21.00	22.55	19.60	32.09	27.31	30.79	27.40	2.63	2.69	2.55	2.58	2.67	2.65	2.47	1.92	2.83	2.67	2.65	2.66
04/01/17	04/30/17	Apr 2017	18.90	16.80	18.80	17.33	17.50	13.60	26.30	21.75	23.30	22.10	2.48	2.41	2.28	2.25	2.31	2.28	1.90	1.81	2.49	2.34	2.32	2.03
05/01/17	05/31/17	May 2017	18.10	11.65	19.40	17.15	15.15	9.50	26.48	19.07	23.51	18.83	2.49	2.38	2.27	2.28	2.31	2.29	1.88	1.79	2.52	2.36	2.34	2.01
06/01/17	06/30/17	Jun 2017	18.50	10.40	21.60	18.03	15.50	7.75	28.09	19.95	24.70	19.50	2.54	2.43	2.32	2.32	2.36	2.34	1.90	1.81	2.56	2.41	2.38	2.03
07/01/17	07/31/17	Jul 2017	26.75	17.25	30.21	22.09	23.10	15.02	33.40	27.10	33.50	27.16	2.58	2.73	2.45	2.34	2.45	2.43	2.10	1.85	2.59	2.43	2.41	2.24
08/01/17	08/31/17	Aug 2017	30.00	23.95	29.64	24.10	27.54	20.25	34.51	28.75	33.99	28.84	2.59	2.70	2.46	2.35	2.48	2.45	2.11	1.85	2.60	2.44	2.42	2.26
09/01/17	09/30/17	Sep 2017	27.50	24.00	24.75	23.72	25.89	22.10	32.50	27.44	31.60	28.00	2.58	2.54	2.41	2.34	2.48	2.45	2.11	1.86	2.59	2.43	2.41	2.26
10/01/17	10/31/17	Oct 2017	26.50	23.65	26.78	24.25	24.85	20.93	35.15	28.98	32.06	28.50	2.60	2.52	2.38	2.35	2.48	2.46	2.21	1.89	2.60	2.44	2.42	2.36
11/01/17	11/30/17	Nov 2017	29.21	24.75	25.46	24.01	25.99	24.18	35.15	29.89	33.75	29.10	2.67	2.89	2.66	2.64	2.73	2.71	2.75	2.06	2.90	2.73	2.71	2.96
12/01/17	12/31/17	Dec 2017	31.86	26.77	26.51	24.99	29.00	24.65	36.21	32.64	35.44	32.30	2.81	3.07	2.78	2.81	2.89	2.86	3.06	2.16	3.07	2.91	2.88	3.29
01/01/18	01/31/18	Jan 2018	29.00	25.50	27.24	24.92	27.83	23.33	36.98	31.40	34.56	30.10	2.91	3.13	2.89	2.90	2.95	2.93	2.96	2.24	3.15	3.00	2.97	3.18
02/01/18	02/28/18	Feb 2018	28.00	24.35	26.75	24.23	27.03	22.71	35.94	30.54	33.91	29.25	2.89	3.09	2.87	2.87	2.94	2.91	2.85	2.22	3.13	2.97	2.94	3.07
03/01/18	03/31/18	Mar 2018	27.00	23.20	24.77	22.85	24.65	21.46	32.84	28.81	31.29	28.40	2.83	3.04	2.80	2.80	2.88	2.85	2.79	2.15	3.06	2.90	2.87	3.00
04/01/18	04/30/18	Apr 2018	23.82	19.50	19.80	18.08	23.40	17.81	26.38	23.03	23.54	23.50	2.56	2.51	2.44	2.40	2.38	2.36	2.01	1.97	2.64	2.49	2.47	2.15
05/01/18	05/31/18	May 2018	20.76	13.26	20.40	14.72	17.94	11.05	27.21	19.30	24.01	19.25	2.55	2.53	2.43	2.33	2.38	2.36	1.95	1.90	2.56	2.42	2.40	2.08
06/01/18	06/30/18	Jun 2018	20.98	14.04	22.60	15.20	17.16	10.14	28.85	19.92	25.20	19.00	2.58	2.58	2.46	2.36	2.42	2.39	1.93	1.90	2.60	2.45	2.43	2.07
07/01/18	07/31/18	Jul 2018	29.50	16.00	32.71	23.34	25.70	14.82	34.75	28.62	34.66	28.66	2.62	2.83	2.52	2.41	2.50	2.48	2.19	1.93	2.65	2.51	2.48	2.34
08/01/18	08/31/18	Aug 2018	31.50	23.10	32.14	25.43	30.29	19.25	35.76	30.98	34.99	30.34	2.63	2.85	2.56	2.42	2.53	2.50	2.18	1.94	2.66	2.51	2.49	2.33
09/01/18	09/30/18	Sep 2018	30.00	23.50	28.15	24.97	28.76	23.68	33.75	28.91	32.35	29.50	2.62	2.64	2.53	2.41	2.52	2.49	2.22	1.96	2.65	2.50	2.48	2.37
10/01/18	10/31/18	Oct 2018	28.50	25.54	28.25	26.50	27.31	23.18	36.63	31.23	33.00	30.50	2.64	2.58	2.53	2.43	2.53	2.51	2.25	1.96	2.67	2.52	2.50	2.40
11/01/18	11/30/18	Nov 2018	30.50	26.07	26.87	26.01	28.46	26.78	36.63	32.14	34.75	31.10	2.71	2.94	2.68	2.72	2.83	2.80	2.91	2.18	2.97	2.82	2.79	3.13
12/01/18	12/31/18	Dec 2018	33.25	28.20	27.98	26.99	30.48	27.30	37.74	34.89	36.50	34.40	2.84	3.12	2.83	2.90	2.99	2.96	3.30	2.27	3.16	3.00	2.97	3.54
01/01/19	01/31/19	Jan 2019	32.00	27.85	29.09	26.22	30.08	26.00	38.18	32.25	35.81	31.35	2.94	3.24	2.92	2.93	3.03	3.00	3.14	2.37	3.19	3.03	3.01	3.38
02/01/19	02/28/19	Feb 2019	31.50	26.70	28.60	25.53	29.28	25.25	37.14	31.50	35.16	30.50	2.92	3.19	2.90	2.92	3.01	2.99	2.93	2.35	3.18	3.02	2.99	3.15
03/01/19	03/31/19	Mar 2019	29.00	25.55	26.62	24.15	26.90	24.00	34.04	30.00	32.54	29.65	2.86	3.14	2.84	2.86	2.95	2.92	2.88	2.29	3.11	2.95	2.93	3.09
04/01/19	04/30/19	Apr 2019	25.82	21.35	21.65	18.50	25.65	19.66	25.25	24.00	24.79	22.75	2.59	2.60	2.53	2.44	2.46	2.44	2.27	2.08	2.69	2.54	2.51	2.43
05/01/19	05/31/19	May 2019	22.76	15.11	22.25	15.00	20.19	12.90	26.25	20.50	25.26	18.00	2.58	2.63	2.52	2.37	2.45	2.43	2.22	2.02	2.61	2.46	2.44	2.37
06/01/19	06/30/19	Jun 2019	22.98	15.89	24.45	15.50	19.41	11.99	28.00	21.27	26.45	18.25	2.62	2.67	2.56	2.40	2.49	2.47	2.21	2.01	2.64	2.50	2.47	2.36
07/01/19	07/31/19	Jul 2019	32.22	17.20	34.25	24.64	27.95	15.50	35.95	29.97	35.91	29.75	2.65	2.90	2.58	2.46	2.58	2.56	2.40	2.02	2.70	2.55	2.53	2.56
08/01/19	08/31/19	Aug 2019	34.27	24.45	33.50	26.73	32.54	20.00	36.96	32.33	36.24	31.00	2.67	2.92	2.62	2.48	2.61	2.59	2.41	2.03	2.72	2.57	2.55	2.58
09/01/19	09/30/19	Sep 2019	32.81	24.65	29.75	26.27	31.01	24.25	34.95	30.26	33.60	30.50	2.66	2.74	2.60	2.47	2.61	2.59	2.44	2.06	2.71	2.56	2.54	2.61
10/01/19	10/31/19	Oct 2019	30.00	27.39	30.10	27.80	29.00	25.03	37.83	32.58	33.75	31.75	2.69	2.67	2.61	2.50	2.63	2.61	2.50	2.08	2.74	2.59	2.57	2.67
11/01/19	11/30/19	Nov 2019	31.75	27.92	28.72	27.31	29.50	28.63	37.83	33.49	35.50	32.35	2.77	3.13	2.71	2.76	2.92	2.90	3.01	2.26	3.01	2.86	2.83	3.23
12/01/19	12/31/19	Dec 2019	34.25	30.05	29.83	28.29	31.50	29.15	38.94	36.24	37.00	35.65	2.90	3.31	2.88	2.94	3.10	3.08	3.40	2.38	3.20	3.04	3.01	3.64
01/01/20	01/31/20	Jan 2020	33.75	29.75	29.00	27.70	32.08	28.00	39.68	33.25	35.25	32.75	3.00	3.43	2.96	3.06	3.12	3.09	3.30	2.44	3.32	3.16	3.13	3.54
02/01/20	02/29/20	Feb 2020	33.25	28.35	28.50	27.00	31.28	28.00	38.64	32.50	34.60	31.90	2.98	3.40	2.95	3.04	3.11	3.08	3.07	2.44	3.30	3.14	3.11	3.29
03/01/20	03/31/20	Mar 2020	30.75	27.30	26.50	25.65	28.90	26.25	35.54	30.50	32.00	31.05	2.92	3.38	2.88	2.98	3.05	3.02	3.02	2.39	3.24	3.08	3.05	3.24
04/01/20	04/30/20	Apr 2020	27.82	21.00	25.50	22.25	27.65	19.31	27.00	25.25	29.50	26.49	2.67	2.78	2.59	2.60	2.61	2.59	2.39	2.21	2.85	2.70	2.67	2.58
05/01/20	05/31/20	May 2020	24.76	15.00	26.00	19.00	22.19	12.50	27.50	21.50	30.00	22.23	2.67	2.87	2.58	2.53	2.60	2.58	2.32	2.13	2.77	2.62	2.60	2.50
06/01/20	06/30/20	Jun 2020	24.98	15.85	28.25	19.75	21.41	11.50	29.50	22.00	31.25	22.23	2.70	2.92	2.62	2.56	2.64	2.62	2.33	2.14	2.80	2.65	2.63	2.51
07/01/20	07/31/20	Jul 2020	34.22	20.00	36.15	24.00	29.95	18.32	37.55	31.32	37.41	29.50	2.73	3.10	2.66	2.61	2.72	2.70	2.53	2.16	2.86	2.71	2.69	2.73
08/01/20	08/31/20	Aug 2020	36.27	26.85	35.40	26.25	34.54	22.75	38.60	33.68	37.74	31.50	2.76	3.12	2.71	2.64	2.77	2.74	2.52	2.15	2.89	2.73	2.71	2.71
09/01/20	09/30/20	Sep 2020	34.81	27.25	31.45	25.50	33.01	27.18	36.75	31.61	35.10	30.00	2.75	2.93	2.69	2.63	2.77	2.74	2.59	2.21	2.88	2.73	2.70	2.78
10/01/20	10/31/20	Oct 2020	31.50	29.04	29.10	27.00	30.00	26.50	39.33	33.93	33.00	32.00	2.78	2.87	2.70	2.66	2.79	2.76	2.63	2.23	2.91	2.76	2.73	2.83
11/01/20	11/30/20	Nov 2020	33.50	29.57	27.75	27.00	31.25	30.00	39.33	34.84	34.75	32.75	2.86	3.29	2.79	2.92	3.05	3.02	3.07	2.38	3.18	3.02	2.99	3.30
12/01/20	12/31/20	Dec 2020	36.25	31.70	28.50	28.00	32.25	30.50	40.44	37.59	36.25	36.00	3.01	3.48	2.98	3.11	3.25	3.22	3.50	2.52	3.38	3.22	3.19	3.76
01/01/21	01/31/21	Jan 2021	36.02	30.25	32.94	29.47	33.58	28.08	41.18	35.10	38.66	33.75	3.12	3.61	3.08	3.19	3.27	3.24	3.40	2.64	3.46	3.30	3.26	3.65
02/01/21	02/28/21	Feb 2021	35.44	29.10	32.45	28.78	32.78	27.46	40.14	34.24	38.01	32.90	3.10	3.58	3.06	3.18	3.26	3.23	3.19	2.63	3.45	3.28	3.25	3.42
03/01/21	03/31/21	Mar 2021	33.09	27.95	30.47	27.40	30.40	26.21	37.04	32.51	35.39	32.05	3.04	3.51	3.00	3.11	3.20	3.17	3.15	2.59	3.38	3.22	3.19	3.38
04/01/21	04/30/21	Apr 2021	29.32	24.25	25.50	22.63	29.15	22.56	30.58	26.73	27.64	27.49	2.78	2.94	2.68	2.75	2.72	2.70	2.51	2.40	3.01	2.85	2.82	2.70
05/01/21	05/31/21	May 2021	26.26	18.01	26.10	19.27	23.69	15.80	31.41	23.00	28.11	23.23	2.78	2.98	2.67	2.68	2.71	2.69	2.45	2.33	2.93	2.78	2.75	2.64

06/01/21	06/30/21	Jun 2021	26.48	18.79	28.30	19.75	22.91	14.89	33.05	23.62	29.30	23.23	2.81	3.01	2.71	2.71	2.75	2.72	2.44	2.32	2.96	2.81	2.78	2.63
07/01/21	07/31/21	Jul 2021	35.72	23.20	38.41	27.89	31.45	19.57	38.95	32.32	38.76	32.31	2.84	3.26	2.75	2.77	2.83	2.81	2.66	2.36	3.03	2.87	2.84	2.86
08/01/21	08/31/21	Aug 2021	37.77	30.44	37.84	29.98	36.04	24.00	39.96	34.68	39.09	33.99	2.87	3.29	2.82	2.80	2.89	2.86	2.65	2.35	3.06	2.90	2.88	2.85
09/01/21	09/30/21	Sep 2021	36.31	30.67	33.85	29.52	34.51	28.43	37.95	32.61	36.45	33.15	2.87	3.10	2.80	2.80	2.89	2.86	2.69	2.39	3.06	2.90	2.88	2.89
10/01/21	10/31/21	Oct 2021	34.66	30.29	33.95	31.05	33.06	27.93	40.83	34.93	37.66	34.15	2.91	3.04	2.81	2.84	2.92	2.89	2.76	2.43	3.10	2.94	2.91	2.97
11/01/21	11/30/21	Nov 2021	36.54	30.82	32.57	30.56	34.21	31.53	40.83	35.84	39.35	34.75	2.99	3.45	2.91	3.08	3.18	3.15	3.22	2.59	3.34	3.18	3.15	3.46
12/01/21	12/31/21	Dec 2021	39.36	32.95	33.68	31.54	36.23	32.05	41.94	38.59	41.04	38.05	3.15	3.64	3.10	3.28	3.40	3.37	3.63	2.74	3.55	3.39	3.36	3.89
01/01/22	01/31/22	Jan 2022	37.52	31.50	34.94	30.72	35.08	29.33	42.43	36.10	40.01	34.75	3.26	3.78	3.21	3.37	3.42	3.39	3.56	2.87	3.65	3.48	3.45	3.81
02/01/22	02/28/22	Feb 2022	36.94	30.35	34.45	30.03	34.28	28.71	41.39	35.24	39.36	33.90	3.25	3.74	3.19	3.36	3.41	3.38	3.38	2.87	3.63	3.47	3.43	3.62
03/01/22	03/31/22	Mar 2022	34.59	29.20	32.47	28.65	31.90	27.46	38.29	33.51	36.74	33.05	3.18	3.67	3.13	3.29	3.34	3.31	3.33	2.82	3.56	3.40	3.37	3.57
04/01/22	04/30/22	Apr 2022	32.95	28.26	32.15	28.96	31.24	25.89	36.40	31.75	34.92	33.04	3.38	3.51	3.26	3.27	3.30	3.25	3.11	2.70	3.53	3.37	3.35	3.31
05/01/22	05/31/22	May 2022	29.15	22.02	31.27	26.31	26.34	19.53	35.98	28.96	33.90	29.81	3.38	3.53	3.25	3.23	3.30	3.24	3.03	2.70	3.49	3.33	3.30	3.23
06/01/22	06/30/22	Jun 2022	32.17	23.63	34.45	26.93	28.74	20.24	39.38	30.35	36.63	30.26	3.41	3.56	3.28	3.24	3.31	3.25	3.02	2.69	3.50	3.34	3.31	3.23
07/01/22	07/31/22	Jul 2022	38.99	27.69	41.63	31.88	35.11	24.35	44.61	36.31	43.48	35.70	3.45	3.70	3.33	3.28	3.38	3.32	3.15	2.73	3.54	3.38	3.35	3.35
08/01/22	08/31/22	Aug 2022	42.06	32.48	42.22	33.26	39.36	27.69	46.31	37.88	44.64	37.01	3.48	3.74	3.37	3.35	3.43	3.38	3.20	2.72	3.61	3.45	3.42	3.41
09/01/22	09/30/22	Sep 2022	41.08	34.03	37.95	32.56	38.89	31.49	42.90	36.43	41.18	36.17	3.48	3.66	3.35	3.37	3.44	3.38	3.25	2.86	3.63	3.47	3.44	3.46
10/01/22	10/31/22	Oct 2022	38.28	32.62	37.33	33.39	35.78	29.87	43.30	37.49	41.06	36.74	3.48	3.62	3.39	3.38	3.46	3.39	3.27	2.88	3.64	3.48	3.45	3.48
11/01/22	11/30/22	Nov 2022	40.45	33.56	37.22	33.28	37.50	32.32	44.03	38.18	42.46	37.15	3.56	3.88	3.51	3.56	3.65	3.58	3.56	3.08	3.84	3.67	3.64	3.81
12/01/22	12/31/22	Dec 2022	42.30	35.50	37.88	34.36	39.09	33.45	44.47	40.04	43.28	39.28	3.67	3.98	3.59	3.69	3.77	3.70	3.81	3.16	3.96	3.80	3.76	4.06
01/01/23	01/31/23	Jan 2023	40.87	34.13	39.21	34.33	37.84	31.41	45.07	38.92	43.25	37.81	3.75	4.10	3.65	3.75	3.81	3.77	3.78	3.24	4.03	3.87	3.83	4.05
02/01/23	02/28/23	Feb 2023	41.23	34.64	39.19	34.22	38.14	32.14	44.08	38.27	43.10	37.56	3.72	4.04	3.61	3.71	3.78	3.70	3.65	3.23	3.99	3.82	3.79	3.92
03/01/23	03/31/23	Mar 2023	37.74	32.30	37.50	33.05	34.66	29.82	41.73	36.61	41.06	36.65	3.68	3.97	3.57	3.66	3.72	3.67	3.64	3.19	3.93	3.77	3.73	3.90
04/01/23	04/30/23	Apr 2023	36.58	32.27	38.79	35.29	33.34	29.21	42.23	36.77	42.21	38.59	3.98	4.08	3.84	3.79	3.88	3.81	3.72	3.00	4.05	3.89	3.87	3.92
05/01/23	05/31/23	May 2023	32.04	26.04	36.43	33.36	29.00	23.26	40.55	34.93	39.69	36.38	3.99	4.08	3.83	3.78	3.88	3.79	3.61	3.06	4.04	3.88	3.85	3.81
06/01/23	06/30/23	Jun 2023	37.87	28.47	40.61	34.10	34.57	25.58	45.71	37.08	43.97	37.28	4.02	4.10	3.85	3.77	3.88	3.78	3.61	3.06	4.03	3.87	3.84	3.81
07/01/23	07/31/23	Jul 2023	42.26	32.18	44.86	35.87	38.77	29.13	50.27	40.30	48.19	39.10	4.05	4.13	3.90	3.78	3.92	3.83	3.63	3.09	4.04	3.88	3.85	3.84
08/01/23	08/31/23	Aug 2023	46.35	34.53	46.60	36.53	42.68	31.38	52.67	41.09	50.20	40.03	4.08	4.19	3.92	3.89	3.98	3.89	3.76	3.10	4.15	3.99	3.97	3.96
09/01/23	09/30/23	Sep 2023	45.86	37.38	42.04	35.60	43.27	34.55	47.85	40.24	45.92	39.18	4.08	4.21	3.90	3.93	3.99	3.90	3.82	3.33	4.19	4.03	4.00	4.03
10/01/23	10/31/23	Oct 2023	41.90	34.95	40.72	35.73	38.49	31.81	45.78	40.05	44.45	39.32	4.05	4.20	3.97	3.92	3.99	3.88	3.78	3.33	4.18	4.02	3.99	3.99
11/01/23	11/30/23	Nov 2023	44.37	36.31	41.86	36.01	40.80	33.10	47.23	40.52	45.57	39.54	4.14	4.30	4.10	4.05	4.13	4.02	3.90	3.57	4.32	4.16	4.13	4.15
12/01/23	12/31/23	Dec 2023	45.24	38.05	42.09	37.18	41.96	34.85	46.99	41.50	45.53	40.51	4.19	4.33	4.08	4.09	4.15	4.04	3.98	3.58	4.37	4.20	4.17	4.24
01/01/24	01/31/24	Jan 2024	44.22	36.76	43.47	37.93	40.60	33.49	47.71	41.74	46.49	40.87	4.24	4.41	4.10	4.13	4.21	4.15	4.01	3.61	4.41	4.25	4.21	4.27
02/01/24	02/29/24	Feb 2024	45.52	38.93	43.93	38.41	41.99	35.58	46.76	41.31	46.84	41.22	4.20	4.35	4.02	4.07	4.15	4.02	3.93	3.59	4.35	4.18	4.15	4.20
03/01/24	03/31/24	Mar 2024	40.90	35.40	42.53	37.44	37.43	32.17	45.17	39.71	45.38	40.25	4.18	4.27	4.01	4.02	4.10	4.02	3.94	3.55	4.30	4.13	4.10	4.21
04/01/24	04/30/24	Apr 2024	39.29	34.09	40.96	36.72	35.89	30.96	43.86	37.84	44.01	39.72	4.15	4.24	3.99	3.97	4.05	3.98	3.84	3.27	4.23	4.07	4.04	4.04
05/01/24	05/31/24	May 2024	32.76	26.70	37.78	34.56	29.64	23.85	41.20	35.28	40.69	37.28	4.15	4.22	3.97	3.92	4.02	3.94	3.69	3.27	4.18	4.02	3.99	3.89
06/01/24	06/30/24	Jun 2024	38.33	29.73	41.33	35.59	34.97	26.75	45.63	37.99	44.53	38.62	4.17	4.22	3.99	3.91	3.99	3.92	3.69	3.27	4.17	4.01	3.98	3.89
07/01/24	07/31/24	Jul 2024	44.38	33.54	46.49	36.93	40.75	30.39	51.50	41.10	49.62	40.06	4.21	4.26	4.07	3.93	4.03	3.94	3.72	3.39	4.19	4.03	4.00	3.92
08/01/24	08/31/24	Aug 2024	49.37	36.95	48.96	38.16	45.56	33.65	54.66	42.54	52.35	41.50	4.24	4.35	4.08	4.06	4.13	4.05	3.89	3.42	4.32	4.16	4.13	4.10
09/01/24	09/30/24	Sep 2024	49.62	40.31	46.22	37.96	46.92	37.41	51.42	42.09	49.68	41.27	4.25	4.39	4.08	4.11	4.17	4.07	3.98	3.60	4.37	4.21	4.18	4.19
10/01/24	10/31/24	Oct 2024	44.59	36.85	44.39	37.99	41.06	33.60	48.94	40.85	47.50	41.05	4.27	4.43	4.17	4.15	4.20	4.13	4.01	3.60	4.41	4.25	4.22	4.22
11/01/24	11/30/24	Nov 2024	46.99	38.59	45.00	38.55	43.27	35.23	50.15	41.92	48.12	41.69	4.39	4.55	4.35	4.31	4.35	4.29	4.13	3.91	4.58	4.42	4.39	4.38
12/01/24	12/31/24	Dec 2024	48.13	40.65	45.12	39.47	44.72	37.31	49.95	42.53	48.20	42.56	4.45	4.55	4.35	4.30	4.36	4.30	4.07	3.88	4.58	4.41	4.37	4.33
01/01/25	01/31/25	Jan 2025	46.83	39.06	45.69	39.73	43.08	35.66	49.63	42.36	48.49	42.46	4.51	4.65	4.41	4.42	4.47	4.38	4.26	3.94	4.70	4.53	4.50	4.53
02/01/25	02/28/25	Feb 2025	48.98	41.80	46.83	40.87	45.30	38.29	48.96	42.13	49.47	43.42	4.54	4.67	4.37	4.42	4.48	4.39	4.30	3.94	4.70	4.53	4.50	4.57
03/01/25	03/31/25	Mar 2025	43.67	37.78	44.49	39.10	40.07	34.42	47.08	40.45	47.15	41.80	4.51	4.60	4.34	4.34	4.41	4.34	4.26	3.86	4.62	4.45	4.42	4.53
04/01/25	04/30/25	Apr 2025	41.78	36.30	42.89	38.25	38.25	33.07	45.60	39.80	45.74	41.09	4.46	4.55	4.32	4.28	4.35	4.29	4.13	3.52	4.54	4.38	4.35	4.34
05/01/25	05/31/25	May 2025	34.65	28.26	39.68	36.17	31.42	25.31	42.82	36.43	42.25	38.54	4.45	4.51	4.30	4.21	4.29	4.24	3.98	3.62	4.47	4.31	4.28	4.18
06/01/25	06/30/25	Jun 2025	41.42	31.46	44.06	37.43	37.88	28.36	48.30	39.08	46.88	40.09	4.48	4.54	4.30	4.21	4.29	4.22	3.94	3.60	4.47	4.31	4.28	4.14
07/01/25	07/31/25	Jul 2025	47.23	36.17	49.13	39.14	43.44	32.87	53.90	42.83	52.04	42.11	4.54	4.59	4.39	4.26	4.35	4.26	4.02	3.71	4.52	4.37	4.34	4.22
08/01/25	08/31/25	Aug 2025	52.99	40.44	53.00	41.54	48.96	36.96	58.13	44.79	56.22	44.80	4.57	4.69	4.42	4.35	4.43	4.35	4.17	3.75	4.62	4.46	4.43	4.38
09/01/25	09/30/25	Sep 2025	52.82	42.96	49.82	40.61	50.19	39.96	54.48	43.08	52.95	43.67	4.59	4.74	4.43	4.38	4.46	4.37	4.26	3.94	4.64	4.48	4.45	4.47
10/01/25	10/31/25	Oct 2025	46.95	39.08	47.07	40.47	43.23	35.69	51.06	42.04	50.04	43.53	4.55	4.76	4.46	4.38	4.45	4.37	4.22	3.87	4.64	4.48	4.45	4.44
11/01/25	11/30/25	Nov 2025	47.98	39.94	46.87	40.39	44.17	36.48	51.08	42.42	49.75	43.37	4.55	4.72	4.51	4.43	4.50	4.43	4.21	4.06	4.70	4.54	4.51	4.46
12/01/25	12/31/25	Dec 2025	50.00	41.98	47.83	41.01	46.43	38.52	51.14	42.92	50.69	43.81	4.56	4.70	4.50	4.42	4.48	4.42	4.19	3.93	4.70	4.53	4.49	4.45
01/01/26	01/31/26	Jan 2026	48.65	40.32	47.66	41.29	44.82	36.87	50.09	42.66	50.15	43.71	4.62	4.75	4.50	4.48	4.54	4.46	4.24	3.93	4.76	4.59	4.55	4.51
02/01/26	02/28/26	Feb 2026	50.92	43.11	49.11	42.87	47.15	39.50	49.39	42.97	51.47	45.04	4.64	4.77	4.45	4.50	4.57	4.49	4.26	3.92	4.78	4.61	4.58	4.53
03/01/26	03/31/26	Mar 2026	44.84	38.73	45.82	40.53	41.15	35.29	47.03	40.70	48.19	42.72	4.53	4.62	4.36	4.34	4.42	4.36	4.22	3.70	4.62	4.45	4.42	4.49
04/01/26	04/30/26	Apr 2026	42.83	36.96	44.04	39.47	39.24	33.69	44.99	39.78	46.24	41.59	4.44	4.53	4.30	4.24	4.32	4.25	4.09	3.50	4.50	4.34	4.31	4.29
05/01/26	05/31/26	May 2026	36.22	30.00	40.87	37.51	32.88	26.93	43.72	37.42	43.15	39.51	4.45	4.50	4.30	4.17	4.26	4.20	3.93	3.60	4.43	4.27	4.24	4.14
06/01/26	06/30/26	Jun 2026	42.43	31.72	45.12	38.07	38.81	28.57	49.06	38.65	47.65	40.53	4.49	4.53	4.33	4.19	4.28	4.20	3.88	3.58	4.45	4.29	4.26	4.08
07/01/26	07/31/26	Jul 2026	48.66	37.70	50.53	40.54	44.77	34.30	54.91	42.45	53.16	43.40	4.56	4.61	4.40	4.25	4.34	4.26	4.01	3.71	4.51	4.35	4.32	4.22
08/01/26	08/31/26	Aug 2026	54.29	41.61	53.29	42.26	50.20	38.05	57.94	44.49	56.20	45.23	4.60	4.75	4.42	4.36	4.44	4.37	4.19	3.79	4.62	4.46	4.43	4.39
09/01/26	09/30/26	Sep 2026	53.69	43.93	49.99	41.30	51.59	41.02	54.13	43.38	52.92	44.16	4.60	4.79	4.44	4.40	4.48	4.41	4.22	3.91	4.66	4.50	4.47	4.43
10/01/26	10/31/26	Oct 2026	48.32	40.12	47.57	40.89	44.60	36.68	51.10	42.52	50.24	43.72	4.60	4.81	4.53	4.41	4.48	4.41	4.21	3.89	4.67	4.51	4.48	4.42
11/01/26	11/30/26	Nov 2026	50.73	42.05	48.80	41.74	46.79	38.48	52.46	43.77	51.31	44.39	4.66	4.93	4.69	4.54	4.62	4.54	4.33	4.22	4.81	4.65	4.62	4.58
12/01/26	12/31/26	Dec 2026	51.79	43.57	49.11	42.33	48.34	40.02	51.07	43.55	51.60	44.74	4.72	4.85	4.66	4.56	4.64	4.56	4.33	3.93	4.83	4.67	4.63	4.59

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
12/31/2015		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
1215 Official Forward Price Curve: *Blend of...* Final December 2015 Aurora forecast 12/31/2015 forward market curve			**COB**		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/16	01/31/16	Jan 2016	26.00	23.50	24.50	21.75	24.25	22.00	32.50	28.00	32.00	27.50	2.32	2.60	2.21	2.25	2.45	2.25	2.58	1.67	2.76	2.62	2.64	2.81
02/01/16	02/29/16	Feb 2016	26.00	22.50	23.75	21.50	23.50	20.75	32.25	27.00	30.50	26.50	2.34	2.59	2.41	2.42	2.52	2.50	2.34	1.79	2.67	2.51	2.49	2.49
03/01/16	03/31/16	Mar 2016	23.50	19.25	22.25	20.25	20.00	17.25	30.50	24.75	28.50	24.25	2.36	2.41	2.26	2.27	2.39	2.37	2.07	1.77	2.52	2.37	2.35	2.21
04/01/16	04/30/16	Apr 2016	21.15	15.25	20.46	17.82	18.25	13.65	28.75	24.25	25.73	23.25	2.39	2.28	2.18	2.16	2.22	2.20	1.88	1.78	2.40	2.25	2.23	2.01
05/01/16	05/31/16	May 2016	19.25	12.75	20.68	17.64	16.73	10.54	28.71	21.75	26.24	21.03	2.42	2.29	2.21	2.19	2.26	2.24	1.73	1.78	2.43	2.28	2.26	1.86
06/01/16	06/30/16	Jun 2016	19.94	12.00	24.86	18.54	16.91	8.06	30.45	21.75	27.56	20.65	2.47	2.40	2.24	2.24	2.30	2.28	1.80	1.80	2.49	2.33	2.31	1.93
07/01/16	07/31/16	Jul 2016	28.25	19.75	31.54	21.75	24.46	16.47	34.75	26.92	34.94	27.16	2.51	2.69	2.44	2.36	2.45	2.43	1.92	1.81	2.60	2.45	2.43	2.05
08/01/16	08/31/16	Aug 2016	30.25	22.79	30.64	23.92	27.04	19.80	35.79	29.14	35.28	28.84	2.52	2.74	2.55	2.37	2.47	2.45	2.00	1.82	2.61	2.46	2.43	2.14
09/01/16	09/30/16	Sep 2016	28.50	22.50	27.07	23.46	25.75	20.25	34.25	27.80	33.65	28.00	2.52	2.65	2.42	2.34	2.46	2.44	1.98	1.83	2.59	2.43	2.41	2.11
10/01/16	10/31/16	Oct 2016	26.74	23.52	26.52	22.00	23.46	20.15	35.89	28.50	33.90	28.00	2.55	2.60	2.39	2.36	2.50	2.48	2.12	1.88	2.61	2.45	2.43	2.26
11/01/16	11/30/16	Nov 2016	28.46	24.01	25.22	21.56	24.99	22.25	35.89	29.16	34.50	28.13	2.62	2.78	2.55	2.54	2.65	2.62	2.52	2.00	2.80	2.63	2.61	2.71
12/01/16	12/31/16	Dec 2016	31.05	25.97	26.26	22.44	28.05	24.00	36.98	31.83	36.23	31.00	2.77	3.00	2.74	2.73	2.82	2.80	2.93	2.12	2.99	2.83	2.80	3.14
01/01/17	01/31/17	Jan 2017	29.38	25.00	27.56	24.70	26.25	23.14	36.49	31.20	34.58	30.39	2.87	3.07	2.92	2.84	2.87	2.84	2.78	2.18	3.10	2.94	2.91	2.99
02/01/17	02/28/17	Feb 2017	28.82	24.50	27.03	23.99	25.50	22.47	35.45	30.30	33.92	29.50	2.86	3.05	2.83	2.81	2.86	2.83	2.64	2.16	3.06	2.91	2.88	2.84
03/01/17	03/31/17	Mar 2017	26.25	23.25	25.15	22.56	23.25	21.14	33.00	28.50	31.95	28.62	2.83	2.96	2.79	2.77	2.82	2.79	2.57	2.11	3.02	2.87	2.84	2.76
04/01/17	04/30/17	Apr 2017	23.50	18.75	22.80	20.30	21.73	15.50	30.85	25.75	28.30	26.00	2.66	2.56	2.46	2.48	2.48	2.46	1.95	1.96	2.72	2.57	2.55	2.08
05/01/17	05/31/17	May 2017	22.56	13.60	23.52	20.09	19.25	11.64	30.44	23.25	27.97	22.79	2.67	2.60	2.47	2.42	2.49	2.47	1.97	1.97	2.67	2.52	2.49	2.11
06/01/17	06/30/17	Jun 2017	22.25	13.50	26.19	21.12	19.00	9.80	32.29	24.00	29.38	22.79	2.71	2.64	2.51	2.46	2.54	2.51	2.00	2.00	2.71	2.56	2.53	2.14
07/01/17	07/31/17	Jul 2017	29.75	18.57	32.75	23.00	25.75	16.17	36.25	29.10	35.96	29.10	2.75	2.96	2.68	2.53	2.63	2.60	2.18	2.02	2.78	2.63	2.60	2.33
08/01/17	08/31/17	Aug 2017	33.02	25.85	32.00	25.00	30.24	22.26	37.34	31.50	36.31	30.90	2.76	2.93	2.70	2.55	2.65	2.63	2.20	2.03	2.79	2.64	2.62	2.35
09/01/17	09/30/17	Sep 2017	30.25	26.07	26.75	24.99	28.56	24.25	35.80	29.40	35.00	30.00	2.76	2.76	2.59	2.54	2.66	2.64	2.21	2.05	2.79	2.64	2.61	2.36
10/01/17	10/31/17	Oct 2017	27.25	23.74	27.80	25.00	25.75	22.05	37.13	30.16	34.50	29.45	2.78	2.68	2.57	2.56	2.66	2.64	2.26	2.07	2.80	2.65	2.63	2.42
11/01/17	11/30/17	Nov 2017	30.94	25.97	26.43	24.50	27.72	25.48	37.13	31.12	35.25	30.07	2.85	3.00	2.77	2.72	2.81	2.79	2.79	2.22	2.97	2.82	2.79	3.00
12/01/17	12/31/17	Dec 2017	33.75	28.09	27.52	25.50	29.68	25.97	38.25	33.97	37.01	33.48	2.99	3.17	2.94	2.90	2.97	2.94	3.07	2.32	3.16	3.00	2.97	3.30
01/01/18	01/31/18	Jan 2018	31.23	27.08	28.31	25.45	28.50	25.14	37.99	32.70	35.83	31.89	3.09	3.25	3.01	3.01	3.05	3.02	3.04	2.40	3.26	3.11	3.08	3.27
02/01/18	02/28/18	Feb 2018	30.67	25.85	27.78	24.74	27.75	24.47	36.95	31.80	35.17	31.00	3.08	3.22	3.00	3.00	3.04	3.01	2.83	2.39	3.25	3.10	3.07	3.04
03/01/18	03/31/18	Mar 2018	28.41	24.63	25.66	23.31	25.50	23.14	33.82	30.00	32.51	30.12	3.03	3.18	2.95	2.94	2.99	2.96	2.77	2.33	3.19	3.04	3.01	2.98
04/01/18	04/30/18	Apr 2018	27.74	21.35	23.80	20.55	23.73	17.35	30.52	28.75	29.40	28.93	2.77	2.75	2.67	2.63	2.61	2.58	2.11	2.16	2.87	2.72	2.70	2.25
05/01/18	05/31/18	May 2018	24.41	14.95	24.52	20.34	20.96	14.04	31.44	24.25	29.97	23.79	2.76	2.76	2.65	2.55	2.61	2.58	2.06	2.10	2.79	2.65	2.62	2.20
06/01/18	06/30/18	Jun 2018	24.65	15.75	27.19	21.37	20.57	12.20	33.29	25.00	31.38	23.79	2.79	2.81	2.69	2.59	2.65	2.62	2.05	2.11	2.82	2.68	2.66	2.19
07/01/18	07/31/18	Jul 2018	32.65	19.50	34.86	24.70	27.70	17.92	38.25	31.35	37.71	30.85	2.83	3.07	2.75	2.65	2.74	2.71	2.30	2.13	2.89	2.74	2.72	2.45
08/01/18	08/31/18	Aug 2018	34.87	26.75	34.24	26.90	32.74	22.75	39.34	33.75	38.06	32.65	2.85	3.09	2.79	2.66	2.76	2.74	2.30	2.14	2.90	2.76	2.73	2.45
09/01/18	09/30/18	Sep 2018	33.28	27.00	29.90	26.45	31.06	27.58	37.16	31.65	35.24	31.75	2.84	2.88	2.76	2.65	2.76	2.73	2.33	2.16	2.89	2.75	2.73	2.49
10/01/18	10/31/18	Oct 2018	30.91	26.79	28.30	26.75	29.60	24.80	39.63	32.91	35.74	31.70	2.87	2.83	2.77	2.68	2.78	2.75	2.35	2.18	2.92	2.78	2.75	2.51
11/01/18	11/30/18	Nov 2018	32.79	27.32	27.50	26.25	30.72	28.23	39.63	33.87	37.50	32.32	2.94	3.11	2.88	2.86	2.98	2.96	3.03	2.38	3.11	2.96	2.93	3.26
12/01/18	12/31/18	Dec 2018	35.60	29.44	28.50	27.25	32.68	28.72	40.75	36.72	39.26	35.73	3.09	3.26	3.05	3.06	3.16	3.14	3.40	2.50	3.31	3.16	3.13	3.64
01/01/19	01/31/19	Jan 2019	33.98	30.50	30.00	26.80	31.25	28.50	39.69	33.75	37.43	33.24	3.19	3.38	3.14	3.12	3.19	3.16	3.29	2.60	3.37	3.22	3.19	3.53
02/01/19	02/28/19	Feb 2019	33.42	29.35	29.00	26.09	30.50	27.75	38.65	33.00	36.77	32.35	3.18	3.35	3.13	3.11	3.19	3.16	3.10	2.59	3.37	3.22	3.19	3.33
03/01/19	03/31/19	Mar 2019	31.16	28.13	27.25	24.66	28.25	26.25	35.52	31.00	34.11	31.47	3.13	3.31	3.08	3.06	3.13	3.10	3.04	2.53	3.31	3.16	3.13	3.27
04/01/19	04/30/19	Apr 2019	28.75	22.85	25.75	21.90	26.48	18.85	32.22	30.00	32.25	30.28	2.89	2.92	2.82	2.76	2.78	2.75	2.49	2.38	3.00	2.86	2.83	2.66
05/01/19	05/31/19	May 2019	25.50	16.45	26.47	21.69	23.71	15.54	33.14	25.50	32.75	25.14	2.88	2.95	2.81	2.69	2.77	2.74	2.45	2.33	2.93	2.78	2.76	2.62
06/01/19	06/30/19	Jun 2019	26.50	17.25	29.15	22.72	23.32	13.70	34.99	26.25	34.00	25.14	2.92	2.99	2.85	2.72	2.81	2.78	2.44	2.33	2.96	2.82	2.79	2.61
07/01/19	07/31/19	Jul 2019	35.40	20.50	36.00	25.75	30.45	18.75	39.95	32.00	39.31	32.20	2.95	3.23	2.88	2.78	2.90	2.87	2.62	2.33	3.02	2.87	2.85	2.80
08/01/19	08/31/19	Aug 2019	37.62	28.00	35.10	27.75	35.49	23.50	41.04	34.25	39.66	34.00	2.97	3.25	2.92	2.79	2.93	2.90	2.64	2.34	3.04	2.89	2.87	2.82
09/01/19	09/30/19	Sep 2019	36.03	28.00	31.00	27.25	33.81	28.25	38.86	32.25	36.84	33.10	2.96	3.06	2.90	2.79	2.93	2.90	2.66	2.37	3.03	2.89	2.86	2.84
10/01/19	10/31/19	Oct 2019	33.00	29.00	30.75	27.50	32.00	26.30	41.33	33.50	37.00	32.00	2.99	2.99	2.92	2.82	2.95	2.92	2.69	2.39	3.06	2.92	2.89	2.87
11/01/19	11/30/19	Nov 2019	35.00	29.50	29.25	27.25	33.25	29.73	41.33	34.50	38.75	32.50	3.07	3.34	2.99	2.98	3.15	3.12	3.18	2.51	3.23	3.08	3.05	3.41
12/01/19	12/31/19	Dec 2019	37.25	32.00	31.00	28.00	35.00	30.22	42.45	37.25	40.50	37.00	3.24	3.55	3.19	3.19	3.34	3.31	3.54	2.66	3.45	3.29	3.26	3.80
01/01/20	01/31/20	Jan 2020	35.73	33.25	32.01	28.45	33.00	31.00	40.89	35.10	38.53	34.24	3.35	3.69	3.29	3.34	3.39	3.36	3.52	2.76	3.60	3.45	3.42	3.78
02/01/20	02/29/20	Feb 2020	35.17	32.00	31.48	27.74	32.25	31.25	39.85	34.20	37.87	33.35	3.34	3.67	3.28	3.34	3.39	3.36	3.33	2.76	3.60	3.45	3.41	3.57
03/01/20	03/31/20	Mar 2020	32.91	30.50	29.50	26.31	30.00	29.75	36.72	32.40	35.21	32.47	3.29	3.65	3.23	3.28	3.33	3.30	3.30	2.73	3.54	3.39	3.36	3.54
04/01/20	04/30/20	Apr 2020	31.00	24.10	27.60	23.55	28.23	19.75	33.42	31.15	33.75	31.28	3.03	3.17	2.96	2.98	2.99	2.96	2.65	2.56	3.23	3.08	3.05	2.85
05/01/20	05/31/20	May 2020	28.00	17.70	28.50	23.34	25.46	16.65	34.34	26.65	34.50	26.14	3.03	3.26	2.94	2.90	2.98	2.95	2.60	2.50	3.15	3.00	2.98	2.79
06/01/20	06/30/20	Jun 2020	28.00	18.50	31.00	24.37	25.07	14.80	36.19	27.40	35.75	26.14	3.06	3.30	2.98	2.93	3.01	2.99	2.60	2.51	3.18	3.04	3.01	2.80
07/01/20	07/31/20	Jul 2020	37.15	22.67	38.56	26.00	32.20	20.67	41.15	33.75	41.25	33.20	3.09	3.49	3.02	2.99	3.10	3.07	2.80	2.52	3.24	3.09	3.06	3.01
08/01/20	08/31/20	Aug 2020	39.37	29.95	37.94	28.40	37.24	25.50	42.24	36.15	41.50	35.00	3.12	3.50	3.07	3.02	3.14	3.11	2.79	2.51	3.27	3.12	3.09	3.00
09/01/20	09/30/20	Sep 2020	37.78	30.19	33.60	27.75	35.56	30.33	40.06	34.05	38.75	34.10	3.11	3.31	3.05	3.01	3.14	3.11	2.85	2.57	3.26	3.11	3.08	3.06
10/01/20	10/31/20	Oct 2020	35.00	29.75	31.50	29.75	33.75	27.55	42.53	35.31	38.44	34.05	3.14	3.26	3.06	3.04	3.17	3.14	2.86	2.58	3.29	3.14	3.11	3.08
11/01/20	11/30/20	Nov 2020	36.75	30.07	30.00	29.25	35.00	30.98	42.53	36.27	40.20	34.67	3.22	3.57	3.13	3.20	3.34	3.31	3.30	2.71	3.45	3.30	3.27	3.54
12/01/20	12/31/20	Dec 2020	39.75	32.19	31.00	30.25	37.00	31.47	43.65	39.12	41.96	38.08	3.39	3.77	3.33	3.41	3.53	3.50	3.68	2.86	3.67	3.52	3.48	3.94
01/01/21	01/31/21	Jan 2021	37.23	31.08	34.86	30.20	34.50	29.14	42.39	36.10	39.88	35.24	3.50	3.90	3.44	3.51	3.58	3.55	3.63	2.99	3.78	3.62	3.59	3.89
02/01/21	02/28/21	Feb 2021	36.67	29.85	34.33	29.49	33.75	28.47	41.35	35.20	39.22	34.35	3.49	3.88	3.43	3.51	3.57	3.54	3.44	2.98	3.78	3.62	3.58	3.69
03/01/21	03/31/21	Mar 2021	34.41	28.63	32.21	28.06	31.50	27.14	38.22	33.40	36.56	33.47	3.43	3.81	3.37	3.45	3.51	3.48	3.40	2.95	3.71	3.56	3.52	3.65

04/01/21	04/30/21	Apr 2021	33.74	25.35	29.35	25.30	29.73	21.35	34.92	32.15	33.45	32.28	3.15	3.33	3.05	3.14	3.10	3.08	2.77	2.75	3.39	3.24	3.21	2.98
05/01/21	05/31/21	May 2021	30.41	18.95	30.07	25.09	26.96	18.04	35.84	27.65	34.02	27.14	3.14	3.37	3.04	3.07	3.09	3.07	2.72	2.70	3.32	3.17	3.14	2.93
06/01/21	06/30/21	Jun 2021	30.65	19.75	32.74	26.12	26.57	16.20	37.69	28.40	35.43	27.14	3.17	3.40	3.08	3.10	3.13	3.10	2.73	2.71	3.35	3.20	3.17	2.93
07/01/21	07/31/21	Jul 2021	38.65	23.92	40.41	29.53	33.70	21.92	42.65	34.75	41.76	34.20	3.21	3.66	3.12	3.16	3.22	3.19	2.93	2.73	3.41	3.26	3.23	3.15
08/01/21	08/31/21	Aug 2021	40.87	31.20	39.79	31.73	38.74	26.75	43.74	37.15	42.11	36.00	3.24	3.68	3.19	3.19	3.27	3.24	2.92	2.71	3.45	3.29	3.26	3.14
09/01/21	09/30/21	Sep 2021	39.28	31.44	35.45	31.24	37.06	31.58	41.56	35.05	39.29	35.10	3.24	3.50	3.17	3.19	3.27	3.24	2.96	2.76	3.45	3.29	3.26	3.18
10/01/21	10/31/21	Oct 2021	36.91	30.79	35.85	31.50	35.60	28.80	44.03	36.31	39.79	35.05	3.28	3.43	3.18	3.23	3.30	3.27	3.00	2.80	3.49	3.33	3.30	3.22
11/01/21	11/30/21	Nov 2021	38.79	31.32	34.48	31.00	36.72	32.23	44.03	37.27	41.55	35.67	3.36	3.73	3.25	3.36	3.47	3.44	3.34	2.92	3.63	3.47	3.44	3.59
12/01/21	12/31/21	Dec 2021	41.60	33.44	35.57	32.00	38.68	32.72	45.15	40.12	43.31	39.08	3.53	3.93	3.46	3.58	3.67	3.64	3.71	3.07	3.85	3.69	3.65	3.98
01/01/22	01/31/22	Jan 2022	38.73	32.33	36.86	31.45	36.00	30.39	43.64	37.10	41.23	36.24	3.65	4.07	3.57	3.69	3.72	3.69	3.68	3.22	3.97	3.81	3.77	3.94
02/01/22	02/28/22	Feb 2022	40.12	33.54	38.39	33.52	36.90	31.22	43.76	38.12	42.39	37.49	3.84	4.12	3.72	3.81	3.87	3.80	3.68	3.13	4.09	3.92	3.89	3.95
03/01/22	03/31/22	Mar 2022	36.56	31.21	36.61	32.29	33.44	28.90	41.45	36.43	40.44	36.67	3.78	4.04	3.67	3.73	3.79	3.72	3.66	3.08	4.00	3.84	3.80	3.92
04/01/22	04/30/22	Apr 2022	35.16	28.81	34.07	30.29	31.53	25.28	38.57	34.46	37.83	35.44	3.56	3.71	3.45	3.47	3.49	3.44	3.24	2.88	3.73	3.57	3.54	3.46
05/01/22	05/31/22	May 2022	31.23	22.49	33.25	29.22	27.98	20.65	38.20	31.29	36.85	31.76	3.57	3.72	3.44	3.42	3.49	3.43	3.16	2.88	3.69	3.53	3.50	3.39
06/01/22	06/30/22	Jun 2022	34.26	24.11	36.67	30.11	30.57	20.89	41.70	32.74	39.70	32.21	3.59	3.75	3.47	3.43	3.50	3.44	3.17	2.88	3.70	3.54	3.51	3.39
07/01/22	07/31/22	Jul 2022	40.45	28.05	42.63	32.70	36.23	25.53	46.46	37.53	44.97	36.65	3.63	3.89	3.51	3.47	3.57	3.51	3.28	2.91	3.73	3.58	3.54	3.51
08/01/22	08/31/22	Aug 2022	43.61	32.87	43.20	34.13	40.71	29.06	48.20	39.12	46.15	38.01	3.66	3.93	3.55	3.54	3.62	3.57	3.34	2.91	3.81	3.65	3.62	3.56
09/01/22	09/30/22	Sep 2022	42.57	34.41	38.75	33.42	40.16	33.07	44.71	37.65	42.60	37.14	3.66	3.86	3.54	3.56	3.63	3.57	3.39	3.05	3.83	3.67	3.63	3.62
10/01/22	10/31/22	Oct 2022	39.41	32.87	38.28	33.62	37.04	30.30	44.90	38.18	42.12	37.19	3.67	3.82	3.57	3.57	3.65	3.58	3.39	3.07	3.84	3.68	3.65	3.62
11/01/22	11/30/22	Nov 2022	41.58	33.82	38.17	33.50	38.76	32.67	45.63	38.89	43.56	37.61	3.75	4.01	3.68	3.71	3.80	3.73	3.62	3.24	3.98	3.82	3.78	3.88
12/01/22	12/31/22	Dec 2022	43.42	35.74	38.83	34.59	40.32	33.79	46.07	40.81	44.42	39.79	3.86	4.13	3.77	3.83	3.91	3.84	3.85	3.33	4.11	3.95	3.91	4.11
01/01/23	01/31/23	Jan 2023	41.47	34.54	40.17	34.69	38.30	31.94	45.67	39.42	43.86	38.55	3.94	4.24	3.83	3.91	3.97	3.92	3.84	3.41	4.19	4.03	3.99	4.11
02/01/23	02/28/23	Feb 2023	43.57	37.24	42.45	37.56	40.04	33.97	46.17	41.04	45.56	40.62	4.18	4.36	4.02	4.12	4.18	4.05	3.93	3.27	4.39	4.23	4.19	4.19
03/01/23	03/31/23	Mar 2023	38.71	33.79	41.01	36.52	35.37	30.67	44.68	39.45	44.32	39.88	4.13	4.26	3.97	4.00	4.08	3.97	3.92	3.21	4.28	4.12	4.08	4.18
04/01/23	04/30/23	Apr 2023	36.58	32.27	38.79	35.29	33.34	29.21	42.23	36.77	42.21	38.59	3.98	4.08	3.84	3.79	3.88	3.81	3.72	3.00	4.06	3.90	3.87	3.94
05/01/23	05/31/23	May 2023	32.04	26.04	36.43	33.36	29.00	23.26	40.55	34.93	39.69	36.38	3.99	4.08	3.83	3.78	3.88	3.79	3.61	3.06	4.04	3.89	3.86	3.83
06/01/23	06/30/23	Jun 2023	37.87	28.47	40.61	34.10	34.57	25.58	45.71	37.08	43.97	37.28	4.02	4.10	3.85	3.77	3.88	3.78	3.61	3.06	4.03	3.88	3.84	3.83
07/01/23	07/31/23	Jul 2023	42.26	32.18	44.86	35.87	38.77	29.13	50.27	40.30	48.19	39.10	4.05	4.13	3.90	3.78	3.92	3.83	3.63	3.09	4.05	3.89	3.86	3.86
08/01/23	08/31/23	Aug 2023	46.35	34.53	46.60	36.53	42.68	31.38	52.67	41.09	50.20	40.03	4.08	4.19	3.92	3.89	3.98	3.89	3.76	3.10	4.16	4.00	3.97	3.98
09/01/23	09/30/23	Sep 2023	45.86	37.38	42.04	35.60	43.27	34.55	47.85	40.24	45.92	39.18	4.08	4.21	3.90	3.93	3.99	3.90	3.82	3.33	4.20	4.04	4.01	4.05
10/01/23	10/31/23	Oct 2023	41.90	34.95	40.72	35.73	38.49	31.81	45.78	40.05	44.45	39.32	4.05	4.20	3.97	3.92	3.99	3.88	3.78	3.33	4.19	4.03	3.99	4.01
11/01/23	11/30/23	Nov 2023	44.37	36.31	41.86	36.01	40.80	33.10	47.23	40.52	45.57	39.54	4.14	4.30	4.10	4.05	4.13	4.02	3.90	3.57	4.32	4.17	4.13	4.16
12/01/23	12/31/23	Dec 2023	45.24	38.05	42.09	37.18	41.96	34.85	46.99	41.50	45.53	40.51	4.19	4.33	4.08	4.09	4.15	4.04	3.98	3.58	4.37	4.21	4.17	4.24
01/01/24	01/31/24	Jan 2024	44.22	36.76	43.47	37.93	40.60	33.49	47.71	41.74	46.49	40.87	4.24	4.41	4.10	4.13	4.21	4.15	4.01	3.61	4.42	4.25	4.21	4.28
02/01/24	02/29/24	Feb 2024	45.52	38.93	43.93	38.41	41.99	35.58	46.76	41.31	46.84	41.22	4.20	4.35	4.02	4.07	4.15	4.02	3.93	3.59	4.35	4.18	4.15	4.19
03/01/24	03/31/24	Mar 2024	40.90	35.40	42.53	37.44	37.43	32.17	45.17	39.71	45.38	40.25	4.18	4.27	4.01	4.02	4.10	4.02	3.94	3.55	4.29	4.13	4.10	4.20
04/01/24	04/30/24	Apr 2024	39.29	34.09	40.96	36.72	35.89	30.96	43.86	37.84	44.01	39.72	4.15	4.24	3.99	3.97	4.05	3.98	3.84	3.27	4.23	4.08	4.04	4.06
05/01/24	05/31/24	May 2024	32.76	26.70	37.78	34.56	29.64	23.85	41.20	35.28	40.69	37.28	4.15	4.22	3.97	3.92	4.02	3.94	3.69	3.27	4.18	4.03	3.99	3.91
06/01/24	06/30/24	Jun 2024	38.33	29.73	41.33	35.59	34.97	26.75	45.63	37.99	44.53	38.62	4.17	4.22	3.99	3.91	3.99	3.92	3.69	3.27	4.17	4.01	3.98	3.91
07/01/24	07/31/24	Jul 2024	44.38	33.54	46.49	36.93	40.75	30.39	51.50	41.10	49.62	40.06	4.21	4.26	4.07	3.93	4.03	3.94	3.72	3.39	4.20	4.04	4.01	3.94
08/01/24	08/31/24	Aug 2024	49.37	36.95	48.96	38.16	45.56	33.65	54.66	42.54	52.35	41.50	4.24	4.35	4.08	4.06	4.13	4.05	3.89	3.42	4.32	4.17	4.13	4.12
09/01/24	09/30/24	Sep 2024	49.62	40.31	46.22	37.96	46.92	37.41	51.42	42.09	49.68	41.27	4.25	4.39	4.08	4.11	4.17	4.07	3.98	3.60	4.38	4.22	4.18	4.21
10/01/24	10/31/24	Oct 2024	44.59	36.85	44.39	37.99	41.06	33.60	48.94	40.85	47.50	41.05	4.27	4.43	4.17	4.15	4.20	4.13	4.01	3.60	4.41	4.26	4.22	4.24
11/01/24	11/30/24	Nov 2024	46.99	38.59	45.00	38.55	43.27	35.23	50.15	41.92	48.12	41.69	4.39	4.55	4.35	4.31	4.35	4.29	4.13	3.91	4.58	4.42	4.39	4.39
12/01/24	12/31/24	Dec 2024	48.13	40.65	45.12	39.47	44.72	37.31	49.95	42.53	48.20	42.56	4.45	4.55	4.35	4.30	4.36	4.30	4.07	3.88	4.58	4.41	4.38	4.34
01/01/25	01/31/25	Jan 2025	46.83	39.06	45.69	39.73	43.08	35.66	49.63	42.36	48.49	42.46	4.51	4.65	4.41	4.42	4.47	4.38	4.26	3.94	4.70	4.54	4.50	4.54
02/01/25	02/28/25	Feb 2025	48.98	41.80	46.83	40.87	45.30	38.29	48.96	42.13	49.47	43.42	4.54	4.67	4.37	4.42	4.48	4.39	4.30	3.94	4.69	4.53	4.50	4.56
03/01/25	03/31/25	Mar 2025	43.67	37.78	44.49	39.10	40.07	34.42	47.08	40.45	47.15	41.80	4.51	4.60	4.34	4.34	4.41	4.34	4.26	3.86	4.61	4.45	4.42	4.52
04/01/25	04/30/25	Apr 2025	41.78	36.30	42.89	38.25	38.25	33.07	45.60	39.80	45.74	41.09	4.46	4.55	4.32	4.28	4.35	4.29	4.13	3.52	4.54	4.38	4.35	4.35
05/01/25	05/31/25	May 2025	34.65	28.26	39.68	36.17	31.42	25.31	42.82	36.43	42.25	38.54	4.45	4.51	4.30	4.21	4.29	4.24	3.98	3.62	4.47	4.32	4.29	4.20
06/01/25	06/30/25	Jun 2025	41.42	31.46	44.06	37.43	37.88	28.36	48.30	39.08	46.88	40.09	4.48	4.54	4.30	4.21	4.29	4.22	3.94	3.60	4.48	4.32	4.29	4.16
07/01/25	07/31/25	Jul 2025	47.23	36.17	49.13	39.14	43.44	32.87	53.90	42.83	52.04	42.11	4.54	4.59	4.39	4.26	4.35	4.26	4.02	3.71	4.53	4.37	4.34	4.24
08/01/25	08/31/25	Aug 2025	52.99	40.44	53.00	41.54	48.96	36.96	58.13	44.79	56.22	44.80	4.57	4.69	4.42	4.35	4.43	4.35	4.17	3.75	4.62	4.46	4.43	4.40
09/01/25	09/30/25	Sep 2025	52.82	42.96	49.82	40.61	50.19	39.96	54.48	43.08	52.95	43.67	4.59	4.74	4.43	4.38	4.46	4.37	4.26	3.94	4.65	4.49	4.46	4.49
10/01/25	10/31/25	Oct 2025	46.95	39.08	47.07	40.47	43.23	35.69	51.06	42.04	50.04	43.53	4.55	4.76	4.46	4.38	4.45	4.37	4.22	3.87	4.65	4.49	4.46	4.45
11/01/25	11/30/25	Nov 2025	47.98	39.94	46.87	40.39	44.17	36.48	51.08	42.42	49.75	43.37	4.55	4.72	4.51	4.43	4.50	4.43	4.21	4.06	4.70	4.54	4.51	4.47
12/01/25	12/31/25	Dec 2025	50.00	41.98	47.83	41.01	46.43	38.52	51.14	42.92	50.69	43.81	4.56	4.70	4.50	4.42	4.48	4.42	4.19	3.93	4.70	4.53	4.50	4.45
01/01/26	01/31/26	Jan 2026	48.65	40.32	47.66	41.29	44.82	36.87	50.09	42.66	50.15	43.71	4.62	4.75	4.50	4.48	4.54	4.46	4.24	3.93	4.76	4.59	4.56	4.51
02/01/26	02/28/26	Feb 2026	50.92	43.11	49.11	42.87	47.15	39.50	49.39	42.97	51.47	45.04	4.64	4.77	4.45	4.50	4.57	4.49	4.26	3.92	4.78	4.62	4.58	4.53
03/01/26	03/31/26	Mar 2026	44.84	38.73	45.82	40.53	41.15	35.29	47.03	40.70	48.19	42.72	4.53	4.62	4.36	4.34	4.42	4.36	4.22	3.70	4.62	4.46	4.42	4.48
04/01/26	04/30/26	Apr 2026	42.83	36.96	44.04	39.47	39.24	33.69	44.99	39.78	46.24	41.59	4.44	4.53	4.30	4.24	4.32	4.25	4.09	3.50	4.50	4.35	4.31	4.31
05/01/26	05/31/26	May 2026	36.22	30.00	40.87	37.51	32.88	26.93	43.72	37.42	43.15	39.51	4.45	4.50	4.30	4.17	4.26	4.20	3.93	3.60	4.44	4.28	4.25	4.15
06/01/26	06/30/26	Jun 2026	42.43	31.72	45.12	38.07	38.81	28.57	49.06	38.65	47.65	40.53	4.49	4.53	4.33	4.19	4.28	4.20	3.88	3.58	4.45	4.29	4.26	4.10
07/01/26	07/31/26	Jul 2026	48.66	37.70	50.53	40.54	44.77	34.30	54.91	42.45	53.16	43.40	4.56	4.61	4.40	4.25	4.34	4.26	4.01	3.71	4.52	4.36	4.33	4.24
08/01/26	08/31/26	Aug 2026	54.29	41.61	53.29	42.26	50.20	38.05	57.94	44.49	56.20	45.23	4.60	4.75	4.42	4.36	4.44	4.37	4.19	3.79	4.62	4.47	4.43	4.41
09/01/26	09/30/26	Sep 2026	53.69	43.93	49.99	41.30	51.59	41.02	54.13	43.38	52.92	44.16	4.60	4.79	4.44	4.40	4.48	4.41	4.22	3.91	4.66	4.51	4.47	4.45
10/01/26	10/31/26	Oct 2026	48.32	40.12	47.57	40.89	44.60	36.68	51.10	42.52	50.24	43.72	4.60	4.81	4.53	4.41	4.48	4.41	4.21	3.89	4.68	4.52	4.49	4.44
11/01/26	11/30/26	Nov 2026	50.73	42.05	48.80	41.74	46.79	38.48	52.46	43.77	51.31	44.39	4.66	4.93	4.69	4.54	4.62	4.54	4.33	4.22	4.81	4.66	4.62	4.59
12/01/26	12/31/26	Dec 2026	51.79	43.57	49.11	42.33	48.34	40.02	51.07	43.55	51.60	44.74	4.72	4.85	4.66	4.56	4.64	4.56	4.33	3.93	4.83	4.67	4.63	4.60
01/01/27	01/31/27	Jan 2027	50.09	42.14	49.20	42.84	46.14	38.61	52.03	44.73	51.65	45.23	4.76	4.91	4.66	4.64	4.72	4.64	4.40	3.93	4.92	4.76	4.72	4.67
02/01/27	02/28/27	Feb 2027	52.08	44.14	50.26	43.79	48.21	40.48	50.80	44.62	52.60	45.99	4.78	4.91	4.60	4.64	4.71	4.63	4.40	3.90	4.92	4.76	4.72	4.66
03/01/27	03/31/27	Mar 2027	47.04	40.03	47.44	41.92	43.22	36.50	49.14	42.66	49.68	44.15	4.74	4.82	4.58	4.55	4.63	4.56	4.44	3.84	4.82	4.66	4.63	4.70
04/01/27	04/30/27	Apr 2027	43.93	38.16	45.02	40.52	40.25	34.82	46.46	41.15	47.08	42.71	4.62	4.70	4.49	4.41	4.49	4.44	4.25	3.68	4.68	4.52	4.49	4.47

05/01/27	05/31/27	May 2027	37.08	30.65	42.06	38.67	33.66	27.51	44.91	38.38	44.19	40.56	4.62	4.67	4.45	4.36	4.45	4.40	4.18	3.72	4.62	4.47	4.43	4.40
06/01/27	06/30/27	Jun 2027	44.68	33.50	47.16	39.56	40.92	30.24	51.21	40.29	49.50	42.04	4.64	4.68	4.48	4.35	4.44	4.40	4.11	3.75	4.61	4.45	4.42	4.34
07/01/27	07/31/27	Jul 2027	50.55	39.24	52.36	41.96	46.54	35.73	56.78	44.07	54.87	44.83	4.72	4.78	4.58	4.41	4.51	4.47	4.22	3.90	4.68	4.52	4.49	4.45
08/01/27	08/31/27	Aug 2027	56.62	43.31	55.10	43.82	52.38	39.62	59.71	45.97	58.03	46.75	4.76	4.89	4.60	4.49	4.59	4.53	4.33	3.95	4.76	4.60	4.57	4.56
09/01/27	09/30/27	Sep 2027	56.04	46.08	52.05	43.36	53.82	43.21	56.18	45.32	54.86	46.14	4.79	4.95	4.62	4.55	4.64	4.58	4.44	4.26	4.82	4.66	4.62	4.67
10/01/27	10/31/27	Oct 2027	51.79	43.27	50.92	43.94	48.03	39.68	53.86	45.10	53.40	46.53	4.85	5.09	4.81	4.68	4.76	4.70	4.62	4.32	4.95	4.79	4.76	4.85
11/01/27	11/30/27	Nov 2027	55.14	45.61	52.21	44.35	51.12	41.91	55.99	46.74	54.74	46.98	4.95	5.24	4.99	4.85	4.95	4.89	4.75	4.63	5.12	4.96	4.92	5.01
12/01/27	12/31/27	Dec 2027	54.91	46.35	51.74	44.47	51.46	42.65	54.41	46.75	54.26	46.99	5.01	5.17	4.97	4.89	4.95	4.89	4.85	4.44	5.16	5.00	4.96	5.11
01/01/28	01/31/28	Jan 2028	52.78	45.06	51.71	45.48	48.72	41.35	54.96	47.10	54.20	47.95	5.10	5.27	4.97	5.01	5.06	4.97	4.98	4.55	5.29	5.13	5.09	5.25
02/01/28	02/29/28	Feb 2028	54.96	47.21	53.18	46.70	51.07	43.43	53.78	46.77	55.35	48.86	5.09	5.23	4.90	4.97	5.04	4.95	4.97	4.51	5.24	5.08	5.04	5.23
03/01/28	03/31/28	Mar 2028	49.41	42.53	50.08	44.46	45.49	38.87	52.01	44.94	52.26	46.85	5.09	5.16	4.94	4.92	4.99	4.92	4.84	4.40	5.20	5.04	5.00	5.10
04/01/28	04/30/28	Apr 2028	46.60	41.00	47.28	42.94	42.84	37.49	49.08	43.92	49.15	45.29	5.04	5.10	4.91	4.83	4.91	4.87	4.77	4.29	5.09	4.94	4.90	4.99
05/01/28	05/31/28	May 2028	40.49	32.85	45.53	41.08	36.89	29.58	48.56	40.82	47.44	43.01	5.05	5.08	4.91	4.79	4.88	4.83	4.62	4.33	5.05	4.89	4.86	4.84
06/01/28	06/30/28	Jun 2028	48.18	36.32	50.70	42.36	44.24	32.90	54.94	43.30	52.97	44.79	5.09	5.10	4.91	4.76	4.87	4.80	4.63	4.36	5.02	4.87	4.83	4.86
07/01/28	07/31/28	Jul 2028	53.73	42.67	55.22	45.23	49.54	38.97	59.87	47.50	57.67	48.19	5.16	5.17	5.04	4.81	4.92	4.87	4.70	4.47	5.08	4.92	4.89	4.93
08/01/28	08/31/28	Aug 2028	59.43	45.75	58.01	46.10	55.10	41.93	63.01	48.56	60.93	49.10	5.17	5.27	5.08	4.91	5.01	4.92	4.87	4.48	5.18	5.02	4.99	5.10
09/01/28	09/30/28	Sep 2028	58.09	48.75	54.27	46.55	56.07	45.67	58.28	48.19	56.92	49.10	5.20	5.33	5.09	4.97	5.05	4.97	4.94	4.73	5.23	5.08	5.04	5.17
10/01/28	10/31/28	Oct 2028	54.20	45.92	53.08	46.15	50.53	42.17	56.38	47.29	55.61	48.83	5.20	5.38	5.19	5.05	5.12	5.02	4.99	4.76	5.32	5.16	5.13	5.22
11/01/28	11/30/28	Nov 2028	56.44	47.09	53.78	45.78	52.32	43.27	57.81	48.50	56.32	48.39	5.24	5.44	5.22	5.13	5.23	5.15	5.16	4.91	5.40	5.24	5.21	5.41
12/01/28	12/31/28	Dec 2028	56.65	48.99	53.97	47.08	53.26	45.20	56.21	48.83	56.52	49.63	5.30	5.45	5.22	5.17	5.24	5.15	5.16	4.83	5.45	5.29	5.25	5.42
01/01/29	01/31/29	Jan 2029	54.83	46.29	53.90	46.99	51.02	42.65	57.64	49.04	56.51	49.52	5.36	5.54	5.23	5.32	5.37	5.26	5.29	4.89	5.60	5.43	5.39	5.56
02/01/29	02/28/29	Feb 2029	57.25	48.51	55.35	48.80	54.30	45.67	56.84	49.25	57.62	51.08	5.40	5.56	5.26	5.33	5.39	5.30	5.32	4.89	5.61	5.44	5.41	5.58
03/01/29	03/31/29	Mar 2029	50.75	44.47	51.87	46.51	47.80	41.25	54.22	47.19	53.75	48.92	5.36	5.46	5.22	5.25	5.32	5.23	5.23	4.75	5.52	5.36	5.32	5.49
04/01/29	04/30/29	Apr 2029	48.80	43.58	49.52	45.32	46.08	40.46	51.14	45.75	50.79	47.39	5.32	5.39	5.17	5.10	5.20	5.15	5.08	4.58	5.37	5.21	5.18	5.30
05/01/29	05/31/29	May 2029	43.21	35.70	47.89	43.51	39.45	32.27	50.83	43.38	49.35	45.34	5.32	5.34	5.16	5.06	5.16	5.10	4.92	4.67	5.32	5.17	5.14	5.14
06/01/29	06/30/29	Jun 2029	47.56	37.09	50.74	43.56	43.60	33.60	54.90	44.32	52.75	45.75	5.29	5.32	5.12	4.98	5.09	5.03	4.86	4.61	5.24	5.09	5.05	5.09
07/01/29	07/31/29	Jul 2029	54.56	43.52	56.05	46.07	50.29	39.74	60.73	48.20	58.29	48.94	5.30	5.32	5.19	4.96	5.08	4.98	4.85	4.62	5.23	5.07	5.04	5.07
08/01/29	08/31/29	Aug 2029	61.00	47.00	59.20	47.11	56.87	43.12	64.44	49.67	62.04	50.18	5.29	5.37	5.16	5.00	5.12	5.03	4.98	4.61	5.27	5.11	5.08	5.20
09/01/29	09/30/29	Sep 2029	58.91	49.96	55.88	47.54	57.45	47.39	60.69	50.10	58.69	50.25	5.29	5.47	5.22	5.08	5.16	5.06	5.02	4.84	5.34	5.19	5.15	5.25
10/01/29	10/31/29	Oct 2029	53.63	45.38	53.58	46.45	50.10	41.96	57.57	47.72	56.25	49.23	5.25	5.46	5.22	5.09	5.17	5.06	5.03	4.81	5.36	5.20	5.17	5.26
11/01/29	11/30/29	Nov 2029	54.95	46.47	53.73	46.31	50.89	42.65	58.05	48.77	56.33	49.00	5.25	5.51	5.26	5.20	5.27	5.17	5.20	4.92	5.47	5.32	5.28	5.46
12/01/29	12/31/29	Dec 2029	56.06	49.01	53.60	47.08	53.23	45.38	57.09	48.91	56.20	49.62	5.30	5.46	5.29	5.23	5.30	5.20	5.22	4.82	5.51	5.35	5.31	5.48
01/01/30	01/31/30	Jan 2030	55.26	46.20	54.57	47.60	51.70	42.81	58.97	50.14	57.24	50.18	5.40	5.56	5.27	5.35	5.42	5.33	5.33	4.94	5.63	5.46	5.42	5.60
02/01/30	02/28/30	Feb 2030	57.17	48.26	56.20	49.63	55.38	46.57	58.14	50.32	58.56	51.94	5.48	5.61	5.29	5.40	5.48	5.38	5.39	5.03	5.68	5.52	5.48	5.65
03/01/30	03/31/30	Mar 2030	50.86	45.04	53.13	47.57	49.39	42.63	55.65	48.61	55.07	50.00	5.48	5.56	5.30	5.39	5.48	5.38	5.39	4.88	5.66	5.50	5.47	5.65
04/01/30	04/30/30	Apr 2030	48.88	43.91	50.31	46.02	46.87	40.82	52.44	46.71	51.72	48.45	5.38	5.45	5.23	5.19	5.27	5.22	5.14	4.67	5.45	5.30	5.26	5.36
05/01/30	05/31/30	May 2030	43.34	35.81	48.49	44.27	39.53	32.33	51.63	44.00	49.97	46.12	5.38	5.43	5.20	5.14	5.24	5.20	5.07	4.68	5.41	5.25	5.22	5.29
06/01/30	06/30/30	Jun 2030	49.03	38.99	52.46	45.60	44.97	35.40	56.73	46.61	54.46	47.70	5.43	5.46	5.24	5.14	5.26	5.20	5.09	4.75	5.41	5.25	5.22	5.31
07/01/30	07/31/30	Jul 2030	56.41	44.70	57.82	47.46	52.03	40.82	62.75	49.87	60.19	50.37	5.49	5.53	5.33	5.16	5.29	5.23	5.09	4.88	5.42	5.27	5.23	5.31
08/01/30	08/31/30	Aug 2030	63.39	48.91	61.78	49.44	59.34	44.91	67.11	51.90	64.62	52.44	5.55	5.64	5.36	5.30	5.40	5.32	5.27	4.91	5.57	5.41	5.38	5.50
09/01/30	09/30/30	Sep 2030	61.83	51.88	58.81	49.96	61.15	49.73	63.81	52.55	61.62	52.71	5.55	5.72	5.39	5.42	5.49	5.43	5.42	5.13	5.69	5.53	5.49	5.65
10/01/30	10/31/30	Oct 2030	56.06	47.57	56.80	49.99	53.76	45.15	60.82	51.04	59.25	52.67	5.59	5.78	5.55	5.51	5.56	5.46	5.51	5.19	5.77	5.62	5.58	5.74
11/01/30	11/30/30	Nov 2030	58.99	49.92	57.12	49.68	55.19	46.19	61.86	52.19	59.86	52.34	5.68	5.91	5.65	5.68	5.74	5.62	5.68	5.36	5.95	5.79	5.76	5.93
12/01/30	12/31/30	Dec 2030	59.27	51.96	57.16	50.30	56.95	48.43	61.06	52.47	59.93	52.95	5.75	5.90	5.65	5.69	5.75	5.66	5.69	5.36	5.97	5.81	5.77	5.96
01/01/31	01/31/31	Jan 2031	59.43	50.30	58.02	50.85	56.00	46.78	63.29	53.53	60.89	53.67	5.87	6.05	5.72	5.84	5.90	5.81	5.82	5.48	6.12	5.96	5.92	6.10
02/01/31	02/28/31	Feb 2031	61.46	52.08	59.34	52.77	60.30	50.27	62.07	53.28	61.79	55.20	5.91	6.09	5.75	5.88	5.96	5.85	5.87	5.56	6.16	6.00	5.96	6.13
03/01/31	03/31/31	Mar 2031	53.96	47.63	55.79	50.38	52.09	45.93	59.07	51.60	57.95	53.14	5.91	6.03	5.75	5.87	5.93	5.87	5.85	5.34	6.14	5.98	5.95	6.11
04/01/31	04/30/31	Apr 2031	52.40	47.09	53.30	48.62	50.43	43.82	55.85	49.52	55.11	51.44	5.81	5.91	5.66	5.65	5.74	5.69	5.62	5.22	5.91	5.75	5.72	5.84
05/01/31	05/31/31	May 2031	46.20	38.11	51.12	46.65	42.23	34.49	54.48	46.44	52.66	48.70	5.81	5.87	5.65	5.57	5.68	5.62	5.50	5.23	5.84	5.68	5.65	5.72
06/01/31	06/30/31	Jun 2031	52.62	41.60	55.61	47.96	48.35	37.85	60.48	48.96	57.83	50.17	5.85	5.88	5.65	5.57	5.68	5.62	5.51	5.25	5.84	5.68	5.65	5.74
07/01/31	07/31/31	Jul 2031	60.42	48.02	61.44	50.43	55.84	43.95	67.04	53.13	64.12	53.52	5.93	5.97	5.76	5.60	5.74	5.68	5.51	5.32	5.87	5.71	5.68	5.74
08/01/31	08/31/31	Aug 2031	65.87	52.53	64.42	52.57	61.70	48.44	70.58	55.71	67.50	55.73	5.97	6.08	5.79	5.72	5.82	5.75	5.69	5.37	5.99	5.83	5.80	5.92
09/01/31	09/30/31	Sep 2031	64.94	55.04	61.89	52.38	64.39	52.73	67.45	55.18	64.94	55.33	5.99	6.19	5.85	5.87	5.94	5.87	5.87	5.62	6.14	5.98	5.94	6.10
10/01/31	10/31/31	Oct 2031	58.91	50.29	59.11	51.80	56.13	47.63	64.13	53.36	61.97	54.80	5.96	6.16	5.90	5.87	5.94	5.84	5.87	5.60	6.14	5.98	5.94	6.10
11/01/31	11/30/31	Nov 2031	60.87	51.89	58.73	51.37	56.85	47.93	64.18	54.38	61.70	54.35	5.94	6.19	5.93	5.96	6.02	5.93	5.94	5.60	6.23	6.07	6.03	6.20
12/01/31	12/31/31	Dec 2031	61.86	53.91	59.40	51.98	59.76	50.27	63.87	54.47	62.31	54.86	6.03	6.21	5.96	5.97	6.03	5.94	5.96	5.66	6.25	6.09	6.05	6.22
01/01/32	01/31/32	Jan 2032	61.50	52.12	59.77	52.47	58.00	48.54	65.55	55.54	62.67	55.54	6.12	6.30	5.97	6.09	6.15	6.04	6.07	5.73	6.37	6.21	6.17	6.35
02/01/32	02/29/32	Feb 2032	63.19	53.54	61.16	54.23	61.87	51.62	64.44	55.09	63.76	56.68	6.06	6.24	5.85	6.03	6.09	6.00	6.03	5.68	6.30	6.14	6.11	6.29
03/01/32	03/31/32	Mar 2032	55.38	48.29	57.25	51.46	53.70	46.82	60.72	52.73	59.47	54.34	6.00	6.15	5.82	5.95	6.01	5.92	5.94	5.56	6.23	6.07	6.03	6.20
04/01/32	04/30/32	Apr 2032	54.14	48.92	55.17	50.90	51.89	45.64	57.91	51.41	56.79	53.42	5.91	6.06	5.74	5.80	5.88	5.82	5.74	5.36	6.06	5.91	5.88	5.96
05/01/32	05/31/32	May 2032	48.05	40.45	52.28	48.22	43.94	36.69	56.12	48.40	53.93	50.26	5.91	5.95	5.73	5.65	5.76	5.68	5.62	5.38	5.91	5.76	5.73	5.84
06/01/32	06/30/32	Jun 2032	53.98	42.74	56.79	48.84	49.62	38.88	62.01	50.28	59.16	51.32	5.92	5.97	5.71	5.62	5.74	5.68	5.59	5.38	5.88	5.73	5.70	5.81
07/01/32	07/31/32	Jul 2032	61.08	48.67	62.15	51.12	56.43	44.54	67.91	54.04	64.94	54.35	5.98	6.01	5.80	5.63	5.76	5.70	5.53	5.36	5.90	5.74	5.71	5.75
08/01/32	08/31/32	Aug 2032	67.05	53.33	65.42	53.29	62.89	49.19	71.93	56.53	68.60	56.53	5.98	6.15	5.80	5.79	5.88	5.80	5.74	5.45	6.05	5.90	5.86	5.97
09/01/32	09/30/32	Sep 2032	64.68	55.36	61.56	52.34	64.35	53.14	67.59	55.51	64.57	55.46	5.95	6.19	5.82	5.86	5.94	5.86	5.85	5.59	6.13	5.97	5.94	6.07
10/01/32	10/31/32	Oct 2032	59.31	51.05	59.27	52.22	56.28	48.29	64.74	54.33	62.28	55.39	5.94	6.19	5.89	5.92	5.98	5.89	5.89	5.60	6.19	6.03	6.00	6.12
11/01/32	11/30/32	Nov 2032	62.09	52.69	59.56	51.44	58.25	48.71	65.73	55.06	62.59	54.48	5.92	6.21	5.91	5.95	6.04	5.95	5.95	5.57	6.22	6.06	6.03	6.21
12/01/32	12/31/32	Dec 2032	62.27	54.79	59.78	52.21	60.33	51.08	65.03	55.38	62.67	55.08	5.97	6.18	5.91	5.97	6.03	5.92	5.94	5.66	6.24	6.08	6.04	6.20
01/01/33	01/31/33	Jan 2033	61.87	52.64	60.48	53.27	58.33	49.12	66.22	55.87	63.31	55.98	6.04	6.25	5.87	6.07	6.11	6.01	6.04	5.71	6.35	6.19	6.15	6.31
02/01/33	02/28/33	Feb 2033	63.90	54.32	61.78	54.90	62.57	52.35	65.15	55.93	64.37	57.47	6.07	6.27	5.85	6.08	6.14	6.04	6.05	5.74	6.36	6.20	6.16	6.31
03/01/33	03/31/33	Mar 2033	56.24	49.84	58.12	52.08	54.02	47.60	61.85	53.54	60.31	54.90	5.99	6.18	5.81	6.02	6.08	5.99	6.01	5.51	6.29	6.13	6.10	6.26
04/01/33	04/30/33	Apr 2033	54.35	49.10	55.34	50.96	51.84	45.68	58.25	52.22	56.90	53.83	5.85	6.07	5.70	5.85	5.90	5.84	5.77	5.34	6.11	5.96	5.93	6.00
05/01/33	05/31/33	May 2033	47.62	40.06	52.51	48.59	43.49	36.26	56.40	48.58	54.11	50.58	5.85	5.94	5.67	5.65	5.76	5.70	5.56	5.31	5.91	5.76	5.73	5.78

06/01/33	06/30/33	Jun 2033	54.45	43.52	57.42	49.64	50.02	39.60	62.76	51.03	59.86	52.02	5.91	5.96	5.68	5.65	5.76	5.71	5.57	5.36	5.91	5.76	5.73	5.80
07/01/33	07/31/33	Jul 2033	62.21	50.08	63.29	52.49	57.45	45.84	69.13	55.73	66.12	55.73	6.01	6.08	5.84	5.74	5.93	5.85	5.62	5.48	6.01	5.85	5.82	5.84
08/01/33	08/31/33	Aug 2033	68.57	53.94	67.00	53.95	64.35	49.71	73.60	57.19	70.18	57.37	6.04	6.24	5.85	5.93	6.02	5.94	5.87	5.57	6.20	6.04	6.00	6.09
09/01/33	09/30/33	Sep 2033	66.03	56.54	63.03	54.03	65.84	54.43	69.07	56.79	65.94	56.97	6.07	6.33	5.93	6.05	6.10	5.99	5.99	5.73	6.32	6.16	6.13	6.22
10/01/33	10/31/33	Oct 2033	61.78	53.05	62.14	54.59	58.92	50.28	67.25	56.23	64.74	57.45	6.13	6.39	6.08	6.13	6.19	6.10	6.13	5.77	6.40	6.24	6.21	6.36
11/01/33	11/30/33	Nov 2033	65.62	55.52	62.84	53.95	62.37	51.48	68.69	57.36	65.76	56.83	6.18	6.47	6.14	6.22	6.31	6.22	6.30	5.84	6.49	6.33	6.30	6.55
12/01/33	12/31/33	Dec 2033	64.92	57.03	62.57	54.54	63.02	53.22	67.68	57.73	65.46	57.44	6.25	6.47	6.13	6.25	6.41	6.30	6.41	5.93	6.53	6.37	6.33	6.67
01/01/34	01/31/34	Jan 2034	64.38	55.66	63.33	55.72	60.48	51.97	69.71	58.83	66.28	58.50	6.35	6.60	6.14	6.38	6.54	6.41	6.55	6.00	6.66	6.50	6.46	6.83
02/01/34	02/28/34	Feb 2034	66.18	56.99	64.18	57.11	63.91	54.34	68.23	58.62	66.83	59.78	6.36	6.60	6.14	6.40	6.54	6.44	6.54	6.03	6.67	6.51	6.47	6.80
03/01/34	03/31/34	Mar 2034	58.23	51.46	60.35	54.34	55.16	49.32	64.60	56.24	62.66	57.28	6.33	6.52	6.13	6.36	6.41	6.32	6.36	5.76	6.64	6.48	6.44	6.62
04/01/34	04/30/34	Apr 2034	56.72	51.15	57.63	52.89	53.46	47.34	60.90	54.30	59.39	55.64	6.19	6.38	6.05	6.18	6.21	6.14	6.10	5.59	6.44	6.28	6.25	6.32
05/01/34	05/31/34	May 2034	50.61	42.06	55.40	50.80	46.29	38.13	59.77	50.92	57.17	53.00	6.16	6.29	5.97	6.00	6.13	6.06	5.91	5.56	6.26	6.11	6.08	6.13
06/01/34	06/30/34	Jun 2034	57.05	45.98	60.30	51.80	52.46	41.88	65.72	53.67	62.62	54.32	6.18	6.27	5.92	5.95	6.11	6.05	5.88	5.56	6.22	6.06	6.03	6.10
07/01/34	07/31/34	Jul 2034	64.56	52.34	66.40	54.82	59.64	47.95	72.41	58.15	69.13	58.03	6.24	6.36	6.08	6.00	6.16	6.08	5.88	5.64	6.27	6.11	6.08	6.10
08/01/34	08/31/34	Aug 2034	70.55	56.10	69.72	56.25	65.99	51.74	76.40	59.50	72.85	59.67	6.25	6.48	6.08	6.16	6.24	6.14	6.08	5.65	6.43	6.27	6.24	6.31
09/01/34	09/30/34	Sep 2034	67.10	58.00	64.52	55.80	66.43	55.88	70.56	58.32	67.32	58.66	6.25	6.52	6.11	6.25	6.29	6.18	6.19	5.89	6.52	6.36	6.33	6.42
10/01/34	10/31/34	Oct 2034	62.97	54.00	63.08	55.15	59.61	50.89	68.55	57.03	65.81	58.13	6.21	6.48	6.16	6.21	6.27	6.18	6.21	5.86	6.48	6.32	6.28	6.44
11/01/34	11/30/34	Nov 2034	65.19	55.37	62.98	53.66	61.13	51.18	69.24	57.58	65.89	56.59	6.13	6.43	6.13	6.19	6.30	6.19	6.29	5.76	6.46	6.30	6.27	6.54
12/01/34	12/31/34	Dec 2034	64.76	58.00	62.83	55.22	62.45	54.12	68.13	58.66	65.71	58.02	6.18	6.44	6.11	6.19	6.40	6.29	6.40	5.86	6.47	6.31	6.27	6.66
01/01/35	01/31/35	Jan 2035	65.41	55.75	64.21	55.60	61.90	52.09	70.25	59.12	67.14	58.35	6.29	6.53	6.12	6.33	6.51	6.38	6.54	5.98	6.62	6.45	6.41	6.82
02/01/35	02/28/35	Feb 2035	67.31	57.90	64.88	57.53	66.26	55.39	69.26	59.23	67.27	60.08	6.33	6.56	6.11	6.37	6.54	6.41	6.56	5.99	6.64	6.48	6.44	6.82
03/01/35	03/31/35	Mar 2035	59.65	52.71	60.95	55.13	56.97	50.62	65.25	56.96	63.14	57.74	6.30	6.51	6.12	6.33	6.40	6.30	6.38	5.99	6.61	6.45	6.41	6.64
04/01/35	04/30/35	Apr 2035	57.67	52.42	58.92	54.28	55.42	49.01	61.65	55.05	60.10	56.53	6.19	6.40	6.06	6.19	6.22	6.12	6.17	5.78	6.45	6.30	6.26	6.39
05/01/35	05/31/35	May 2035	53.25	45.20	58.18	52.86	48.80	41.08	61.80	53.21	59.03	54.92	6.25	6.41	6.09	6.19	6.25	6.19	6.11	5.78	6.45	6.30	6.26	6.33
06/01/35	06/30/35	Jun 2035	56.76	46.32	60.65	52.93	52.14	42.16	65.55	54.34	62.31	55.18	6.29	6.38	6.08	6.09	6.22	6.14	6.01	5.59	6.36	6.20	6.17	6.23
07/01/35	07/31/35	Jul 2035	65.60	53.81	67.71	56.16	60.58	49.31	73.65	59.27	70.29	59.40	6.38	6.50	6.22	6.22	6.33	6.24	6.11	5.67	6.49	6.33	6.30	6.33
08/01/35	08/31/35	Aug 2035	74.41	58.44	73.40	58.34	69.60	53.83	80.12	61.59	76.37	61.64	6.43	6.62	6.25	6.35	6.43	6.30	6.29	5.85	6.62	6.46	6.43	6.51
09/01/35	09/30/35	Sep 2035	70.64	60.19	67.91	57.97	68.84	57.54	74.60	61.36	70.90	60.87	6.41	6.64	6.32	6.43	6.46	6.35	6.38	6.04	6.70	6.54	6.51	6.61
10/01/35	10/31/35	Oct 2035	64.21	54.72	64.90	56.27	60.22	51.42	70.95	58.83	67.75	59.30	6.37	6.61	6.33	6.38	6.46	6.35	6.38	5.98	6.65	6.49	6.46	6.61
11/01/35	11/30/35	Nov 2035	65.83	56.58	64.98	55.40	61.34	52.14	71.38	59.76	67.93	58.38	6.38	6.67	6.35	6.41	6.59	6.48	6.61	6.01	6.69	6.53	6.49	6.86
12/01/35	12/31/35	Dec 2035	67.36	59.72	65.56	57.09	65.03	55.85	71.36	60.89	68.48	59.97	6.46	6.71	6.40	6.46	6.66	6.54	6.66	6.03	6.74	6.58	6.54	6.92
01/01/36	01/31/36	Jan 2036	66.54	55.20	67.19	58.57	63.36	53.75	73.71	62.72	70.24	61.45	6.59	6.93	6.45	6.69	6.93	6.79	6.93	6.00	6.98	6.81	6.77	7.20
02/01/36	02/29/36	Feb 2036	66.28	54.49	66.49	58.99	66.33	55.47	70.85	60.45	69.10	61.68	6.55	6.74	6.36	6.56	6.69	6.58	6.69	6.20	6.84	6.68	6.64	6.96
03/01/36	03/31/36	Mar 2036	58.65	52.13	62.74	57.23	57.65	52.60	67.17	58.55	64.98	59.71	6.53	6.74	6.38	6.56	6.64	6.53	6.61	6.26	6.84	6.68	6.64	6.87
04/01/36	04/30/36	Apr 2036	57.64	52.81	60.55	55.68	56.07	49.79	63.74	56.40	61.99	58.22	6.41	6.59	6.30	6.40	6.43	6.35	6.35	6.00	6.66	6.50	6.47	6.57
05/01/36	05/31/36	May 2036	52.93	44.93	59.04	54.08	48.47	40.78	62.66	53.97	60.00	56.16	6.40	6.55	6.25	6.33	6.38	6.30	6.25	5.93	6.59	6.44	6.41	6.47
06/01/36	06/30/36	Jun 2036	58.09	47.91	62.70	54.82	53.45	43.80	67.74	56.27	64.46	57.01	6.45	6.55	6.25	6.23	6.38	6.30	6.15	5.70	6.50	6.34	6.31	6.37
07/01/36	07/31/36	Jul 2036	66.53	54.10	69.28	57.24	61.43	49.54	75.45	60.59	72.00	60.59	6.58	6.66	6.43	6.35	6.51	6.38	6.23	5.77	6.61	6.46	6.42	6.46
08/01/36	08/31/36	Aug 2036	74.15	59.79	74.20	60.58	69.32	55.37	81.27	64.08	77.29	63.99	6.63	6.83	6.46	6.56	6.63	6.51	6.48	6.07	6.83	6.67	6.64	6.71
09/01/36	09/30/36	Sep 2036	71.46	59.32	70.16	59.08	70.50	58.26	76.83	62.30	73.03	62.00	6.58	6.81	6.48	6.58	6.64	6.50	6.56	6.21	6.85	6.69	6.65	6.79
10/01/36	10/31/36	Oct 2036	64.46	53.75	67.85	58.75	62.64	53.17	73.30	60.83	70.22	61.51	6.56	6.83	6.53	6.56	6.64	6.53	6.59	6.17	6.83	6.67	6.64	6.83
11/01/36	11/30/36	Nov 2036	68.49	58.75	67.88	58.52	65.04	55.25	74.12	62.91	70.76	61.50	6.69	6.99	6.66	6.73	6.93	6.79	6.91	6.33	7.00	6.84	6.80	7.16
12/01/36	12/31/36	Dec 2036	68.04	59.35	67.86	59.27	66.63	56.85	74.01	63.18	70.86	62.29	6.76	6.96	6.69	6.74	6.94	6.81	6.94	6.23	7.02	6.86	6.82	7.21
01/01/37	01/31/37	Jan 2037	67.71	58.01	69.39	60.87	66.36	56.01	75.94	65.16	72.45	63.89	6.85	7.20	6.70	6.92	7.19	7.07	7.20	6.27	7.20	7.03	6.99	7.48
02/01/37	02/28/37	Feb 2037	69.53	57.86	69.68	62.18	70.99	58.70	74.66	63.99	72.38	64.79	6.90	7.15	6.71	6.88	7.17	7.05	7.19	6.39	7.16	7.00	6.96	7.45
03/01/37	03/31/37	Mar 2037	60.75	55.42	65.20	59.51	59.74	54.76	69.81	60.62	67.41	61.95	6.80	7.00	6.65	6.81	6.92	6.80	6.90	6.53	7.09	6.93	6.89	7.16
04/01/37	04/30/37	Apr 2037	58.91	54.74	62.17	57.56	57.26	51.68	65.83	58.23	63.76	60.32	6.63	6.81	6.56	6.63	6.65	6.53	6.58	6.24	6.89	6.74	6.70	6.80
05/01/37	05/31/37	May 2037	54.97	47.12	61.15	56.13	50.37	42.82	64.98	56.30	62.17	58.15	6.61	6.78	6.49	6.58	6.63	6.49	6.48	6.19	6.84	6.69	6.65	6.70
06/01/37	06/30/37	Jun 2037	60.45	50.19	65.37	56.88	55.69	45.82	70.44	58.42	67.01	59.30	6.65	6.76	6.46	6.48	6.59	6.51	6.37	5.95	6.74	6.58	6.55	6.60
07/01/37	07/31/37	Jul 2037	68.46	56.20	72.21	59.72	63.21	51.50	78.35	63.12	74.72	63.00	6.81	6.92	6.68	6.61	6.75	6.61	6.49	5.97	6.88	6.72	6.69	6.72
08/01/37	08/31/37	Aug 2037	75.74	61.46	76.57	62.68	71.12	56.81	83.52	66.23	79.48	66.19	6.87	7.08	6.68	6.83	6.88	6.76	6.76	6.37	7.10	6.94	6.91	6.99
09/01/37	09/30/37	Sep 2037	72.68	60.40	73.12	62.02	71.95	59.66	79.62	65.14	75.78	64.88	6.88	7.15	6.78	6.87	6.93	6.81	6.87	6.49	7.13	6.98	6.94	7.09
10/01/37	10/31/37	Oct 2037	65.23	55.76	69.30	60.63	62.93	54.43	75.05	63.04	71.81	63.58	6.85	7.12	6.81	6.83	6.93	6.81	6.87	6.44	7.10	6.94	6.91	7.10
11/01/37	11/30/37	Nov 2037	68.71	59.63	69.32	59.74	66.11	56.10	76.16	64.57	72.37	62.79	6.83	7.14	6.83	6.87	7.10	6.98	7.12	6.51	7.14	6.98	6.94	7.37
12/01/37	12/31/37	Dec 2037	69.81	61.07	70.37	61.68	70.14	59.44	76.65	65.60	73.39	64.60	6.97	7.22	6.92	6.97	7.22	7.08	7.27	6.49	7.24	7.08	7.04	7.54
01/01/38	01/31/38	Jan 2038	69.50	60.31	71.66	63.59	67.29	58.21	78.48	67.79	74.65	66.41	7.07	7.46	6.92	7.11	7.47	7.30	7.49	6.47	7.39	7.23	7.19	7.76
02/01/38	02/28/38	Feb 2038	70.10	59.31	71.37	63.65	70.82	59.89	76.74	65.92	73.93	66.29	7.09	7.35	6.85	7.07	7.42	7.25	7.47	6.59	7.35	7.19	7.15	7.73
03/01/38	03/31/38	Mar 2038	62.43	56.59	67.09	61.48	60.91	56.17	71.87	62.53	69.28	64.05	6.99	7.20	6.83	7.02	7.11	6.99	7.09	6.71	7.30	7.14	7.10	7.35
04/01/38	04/30/38	Apr 2038	60.58	56.49	65.88	60.52	59.00	53.95	68.62	60.64	66.09	62.65	6.83	7.02	6.75	6.82	6.87	6.76	6.82	6.47	7.08	6.92	6.89	7.04
05/01/38	05/31/38	May 2038	58.41	51.15	65.11	59.00	53.62	46.64	68.32	59.50	64.94	60.90	6.88	7.06	6.75	6.82	6.88	6.75	6.71	6.38	7.08	6.92	6.89	6.93
06/01/38	06/30/38	Jun 2038	62.92	52.72	68.15	59.38	57.97	48.19	73.44	61.32	69.44	61.79	6.92	7.04	6.73	6.75	6.87	6.75	6.64	6.21	7.01	6.85	6.82	6.86
07/01/38	07/31/38	Jul 2038	70.53	58.36	74.64	61.99	65.15	53.51	80.86	65.40	76.95	65.20	7.04	7.16	6.88	6.85	6.99	6.87	6.75	6.21	7.12	6.96	6.93	6.97
08/01/38	08/31/38	Aug 2038	78.20	63.84	79.32	64.98	73.34	59.06	86.46	68.70	82.12	68.48	7.06	7.35	6.90	7.02	7.09	6.97	6.97	6.57	7.29	7.13	7.10	7.20
09/01/38	09/30/38	Sep 2038	72.92	61.71	73.89	63.22	71.90	61.13	80.68	66.68	76.40	66.17	7.01	7.32	6.92	7.01	7.07	6.95	7.01	6.61	7.27	7.12	7.08	7.23
10/01/38	10/31/38	Oct 2038	66.63	58.00	70.47	62.40	64.38	56.60	76.70	65.40	73.05	65.44	7.02	7.32	7.01	6.99	7.16	7.04	7.14	6.61	7.26	7.10	7.06	7.37
11/01/38	11/30/38	Nov 2038	71.48	62.12	72.01	62.01	68.44	58.38	79.31	66.97	75.15	64.91	7.07	7.42	7.09	7.09	7.42	7.28	7.47	6.71	7.36	7.20	7.17	7.73
12/01/38	12/31/38	Dec 2038	71.61	63.01	72.32	63.25	71.39	61.34	78.78	67.64	75.26	66.20	7.14	7.44	7.07	7.13	7.46	7.32	7.52	6.71	7.40	7.24	7.20	7.79
01/01/39	01/31/39	Jan 2039	72.02	62.95	74.14	65.37	69.38	59.38	81.17	69.88	77.08	68.19	7.24	7.68	7.08	7.27	7.64	7.50	7.52	6.62	7.55	7.39	7.35	7.79
02/01/39	02/28/39	Feb 2039	72.55	61.33	73.94	65.96	73.25	61.47	79.43	68.56	76.25	68.59	7.27	7.57	6.99	7.27	7.66	7.49	7.70	6.80	7.55	7.39	7.35	7.96
03/01/39	03/31/39	Mar 2039	64.46	58.68	69.43	63.34	62.94	57.57	74.42	64.88	71.54	65.95	7.17	7.38	6.99	7.18	7.29	7.17	7.26	6.90	7.46	7.30	7.26	7.51
04/01/39	04/30/39	Apr 2039	62.32	57.99	67.43	62.02	60.44	55.08	70.53	62.46	67.86	64.48	7.01	7.20	6.92	6.99	7.04	6.90	6.99	6.64	7.25	7.10	7.07	7.21
05/01/39	05/31/39	May 2039	59.37	51.26	66.55	60.45	54.43	46.68	69.73	60.69	66.26	62.34	6.97	7.17	6.88	6.95	6.99	6.87	6.87	6.58	7.22	7.06	7.03	7.09
06/01/39	06/30/39	Jun 2039	65.30	54.53	71.20	61.36	60.14	49.84	76.23	63.36	71.98	63.62	7.03	7.18	6.83	6.85	6.97	6.85	6.76	6.30	7.11	6.96	6.92	6.98

07/01/39	07/31/39	Jul 2039	72.65	60.37	77.48	64.52	67.12	55.38	83.45	68.09	79.39	67.47	7.15	7.31	7.01	6.97	7.11	6.95	6.87	6.30	7.24	7.08	7.05	7.09
08/01/39	08/31/39	Aug 2039	80.74	64.95	82.66	66.50	75.69	60.07	89.43	70.04	84.98	69.90	7.17	7.47	7.03	7.15	7.22	7.06	7.10	6.69	7.42	7.26	7.23	7.32
09/01/39	09/30/39	Sep 2039	74.85	63.42	77.01	65.37	73.63	62.88	83.32	68.84	79.05	68.22	7.17	7.54	7.10	7.15	7.24	7.11	7.17	6.76	7.42	7.26	7.23	7.39
10/01/39	10/31/39	Oct 2039	69.35	60.00	74.29	64.91	67.13	58.45	79.51	67.57	75.83	67.52	7.17	7.52	7.26	7.15	7.38	7.26	7.34	6.76	7.42	7.26	7.23	7.57
11/01/39	11/30/39	Nov 2039	76.15	64.73	75.69	64.67	73.81	61.06	83.07	69.88	78.77	67.60	7.27	7.72	7.36	7.31	7.68	7.54	7.68	6.90	7.58	7.42	7.39	7.93
12/01/39	12/31/39	Dec 2039	73.91	64.98	74.97	65.35	73.39	63.08	81.39	70.28	77.67	68.31	7.34	7.66	7.33	7.33	7.68	7.54	7.75	6.94	7.60	7.44	7.40	8.02
01/01/40	01/31/40	Jan 2040	74.55	64.64	76.48	67.39	71.28	61.08	84.26	72.18	79.50	70.34	7.46	7.91	7.35	7.53	7.87	7.73	7.69	6.86	7.81	7.65	7.61	7.97
02/01/40	02/29/40	Feb 2040	74.60	62.88	76.07	67.36	74.75	63.10	81.99	70.38	78.48	70.16	7.40	7.71	7.22	7.44	7.84	7.69	7.93	7.04	7.72	7.55	7.52	8.19
03/01/40	03/31/40	Mar 2040	66.61	60.72	71.47	65.58	64.89	59.63	76.92	67.23	73.67	68.33	7.39	7.62	7.28	7.42	7.59	7.46	7.59	7.10	7.70	7.54	7.50	7.84
04/01/40	04/30/40	Apr 2040	64.52	60.09	69.12	63.86	62.60	57.03	73.12	64.29	70.06	66.17	7.24	7.44	7.19	7.22	7.30	7.17	7.24	6.90	7.49	7.33	7.30	7.46
05/01/40	05/31/40	May 2040	62.47	53.25	69.65	62.28	57.35	48.52	73.40	62.78	69.56	64.42	7.24	7.42	7.13	7.20	7.24	7.13	7.13	6.84	7.47	7.31	7.28	7.35
06/01/40	06/30/40	Jun 2040	67.57	56.42	73.09	63.16	62.22	51.56	79.18	65.67	74.48	65.62	7.28	7.44	7.11	7.06	7.22	7.08	7.01	6.48	7.32	7.17	7.14	7.23
07/01/40	07/31/40	Jul 2040	75.77	62.54	80.82	66.58	70.05	57.40	87.19	70.50	82.77	69.69	7.40	7.57	7.28	7.20	7.35	7.19	7.10	6.54	7.47	7.31	7.28	7.32
08/01/40	08/31/40	Aug 2040	83.48	68.06	85.15	69.22	78.27	63.01	92.57	72.91	87.62	72.67	7.46	7.78	7.31	7.44	7.51	7.33	7.39	6.95	7.71	7.55	7.52	7.61
09/01/40	09/30/40	Sep 2040	77.20	67.15	79.20	68.70	75.66	66.23	85.53	71.67	81.08	71.40	7.49	7.84	7.51	7.46	7.57	7.44	7.48	7.04	7.73	7.57	7.53	7.70
10/01/40	10/31/40	Oct 2040	73.16	62.93	77.03	67.16	70.36	60.80	83.48	70.61	79.41	70.20	7.49	7.87	7.59	7.48	7.77	7.60	7.75	7.06	7.74	7.59	7.55	7.98
11/01/40	11/30/40	Nov 2040	78.36	67.55	77.65	67.17	75.31	63.41	85.56	72.61	80.97	70.17	7.59	8.00	7.75	7.59	8.02	7.87	8.07	7.20	7.86	7.70	7.66	8.33
12/01/40	12/31/40	Dec 2040	77.64	69.20	78.09	68.86	76.46	66.96	85.08	74.01	81.01	71.92	7.68	8.07	7.80	7.68	8.11	7.97	8.18	7.30	7.95	7.79	7.75	8.45
01/01/41	01/31/41	Jan 2041	76.27	66.12	78.24	68.94	72.91	62.48	86.20	73.84	81.33	71.96	7.63	8.09	7.52	7.70	8.06	7.91	7.87	7.02	7.99	7.82	7.78	8.14
02/01/41	02/28/41	Feb 2041	76.32	64.32	77.82	68.91	76.47	64.55	83.87	72.00	80.28	71.77	7.57	7.89	7.39	7.61	8.02	7.87	8.11	7.20	7.89	7.73	7.69	8.37
03/01/41	03/31/41	Mar 2041	68.15	62.12	73.11	67.09	66.38	61.00	78.69	68.77	75.36	69.90	7.56	7.80	7.44	7.59	7.76	7.63	7.76	7.26	7.87	7.71	7.67	8.02
04/01/41	04/30/41	Apr 2041	66.00	61.47	70.71	65.33	64.04	58.34	74.80	65.77	71.67	67.69	7.41	7.61	7.35	7.39	7.46	7.33	7.41	7.06	7.65	7.50	7.46	7.63
05/01/41	05/31/41	May 2041	63.91	54.48	71.25	63.71	58.67	49.64	75.09	64.23	71.16	65.90	7.41	7.59	7.30	7.37	7.41	7.30	7.30	7.00	7.63	7.48	7.45	7.52
06/01/41	06/30/41	Jun 2041	69.13	57.72	74.78	64.62	63.65	52.75	81.00	67.18	76.19	67.13	7.44	7.61	7.28	7.22	7.39	7.24	7.17	6.63	7.49	7.33	7.30	7.39
07/01/41	07/31/41	Jul 2041	77.52	63.97	82.68	68.12	71.66	58.72	89.20	72.12	84.67	71.30	7.57	7.74	7.44	7.37	7.52	7.35	7.26	6.69	7.64	7.48	7.45	7.48
08/01/41	08/31/41	Aug 2041	85.40	69.62	87.10	70.81	80.07	64.46	94.70	74.59	89.64	74.34	7.63	7.96	7.48	7.61	7.69	7.50	7.56	7.11	7.88	7.72	7.69	7.78
09/01/41	09/30/41	Sep 2041	78.97	68.69	81.02	70.28	77.40	67.76	87.50	73.32	82.94	73.04	7.67	8.02	7.69	7.63	7.74	7.61	7.65	7.20	7.90	7.74	7.71	7.88
10/01/41	10/31/41	Oct 2041	74.84	64.38	78.80	68.71	71.97	62.19	85.40	72.23	81.24	71.81	7.67	8.06	7.76	7.65	7.94	7.78	7.93	7.22	7.92	7.76	7.72	8.16
11/01/41	11/30/41	Nov 2041	80.17	69.11	79.44	68.72	77.04	64.87	87.52	74.28	82.83	71.78	7.76	8.19	7.93	7.76	8.20	8.06	8.26	7.37	8.03	7.87	7.84	8.51
12/01/41	12/31/41	Dec 2041	79.42	70.79	79.89	70.45	78.22	68.50	87.04	75.71	82.87	73.58	7.85	8.26	7.98	7.85	8.30	8.15	8.37	7.46	8.13	7.97	7.93	8.64
01/01/42	01/31/42	Jan 2042	78.10	67.71	80.12	70.59	74.66	63.98	88.27	75.62	83.28	73.69	7.81	8.29	7.70	7.89	8.25	8.10	8.06	7.19	8.17	8.01	7.97	8.33
02/01/42	02/28/42	Feb 2042	78.15	65.87	79.68	70.56	78.31	66.10	85.88	73.73	82.21	73.49	7.76	8.08	7.57	7.79	8.21	8.06	8.31	7.38	8.07	7.91	7.87	8.57
03/01/42	03/31/42	Mar 2042	69.78	63.61	74.86	68.70	67.97	62.46	80.57	70.43	77.17	71.58	7.74	7.98	7.62	7.78	7.95	7.81	7.95	7.43	8.05	7.89	7.85	8.20
04/01/42	04/30/42	Apr 2042	67.59	62.95	72.41	66.90	65.58	59.74	76.59	67.35	73.39	69.31	7.59	7.79	7.53	7.57	7.64	7.51	7.59	7.23	7.83	7.67	7.64	7.81
05/01/42	05/31/42	May 2042	65.45	55.79	72.96	65.24	60.08	50.83	76.89	65.77	72.87	67.48	7.59	7.78	7.47	7.55	7.59	7.47	7.47	7.17	7.81	7.66	7.62	7.69
06/01/42	06/30/42	Jun 2042	70.79	59.11	76.57	66.17	65.18	54.01	82.94	68.79	78.02	68.74	7.62	7.79	7.45	7.40	7.57	7.41	7.34	6.79	7.66	7.50	7.47	7.56
07/01/42	07/31/42	Jul 2042	79.38	65.51	84.67	69.75	73.38	60.13	91.34	73.85	86.71	73.01	7.76	7.93	7.62	7.55	7.70	7.53	7.43	6.85	7.81	7.66	7.62	7.66
08/01/42	08/31/42	Aug 2042	87.45	71.30	89.20	72.51	81.99	66.00	96.97	76.38	91.79	76.13	7.81	8.15	7.66	7.79	7.87	7.68	7.74	7.28	8.06	7.90	7.87	7.96
09/01/42	09/30/42	Sep 2042	80.87	70.34	82.96	71.97	79.26	69.38	89.60	75.08	84.93	74.79	7.85	8.21	7.87	7.81	7.93	7.79	7.83	7.38	8.08	7.92	7.89	8.06
10/01/42	10/31/42	Oct 2042	76.63	65.93	80.70	70.36	73.70	63.69	87.45	73.97	83.19	73.53	7.85	8.25	7.95	7.83	8.14	7.96	8.12	7.40	8.10	7.94	7.91	8.35
11/01/42	11/30/42	Nov 2042	82.09	70.77	81.35	70.37	78.89	66.43	89.63	76.07	84.82	73.50	7.95	8.38	8.12	7.95	8.40	8.25	8.46	7.55	8.22	8.06	8.02	8.71
12/01/42	12/31/42	Dec 2042	81.33	72.49	81.80	72.14	80.10	70.14	89.12	77.53	84.86	75.34	8.04	8.46	8.17	8.04	8.50	8.34	8.57	7.64	8.32	8.16	8.12	8.84
01/01/43	01/31/43	Jan 2043	79.97	69.34	82.04	72.28	76.46	65.52	90.39	77.43	85.28	75.45	8.00	8.49	7.88	8.08	8.45	8.29	8.25	7.36	8.36	8.20	8.16	8.53
02/01/43	02/28/43	Feb 2043	80.02	67.45	81.60	72.26	80.19	67.69	87.95	75.50	84.18	75.26	7.94	8.27	7.75	7.98	8.41	8.25	8.51	7.55	8.26	8.10	8.06	8.77
03/01/43	03/31/43	Mar 2043	71.46	65.13	76.66	70.35	69.60	63.96	82.51	72.12	79.02	73.30	7.92	8.18	7.81	7.96	8.14	8.00	8.14	7.61	8.24	8.08	8.04	8.39
04/01/43	04/30/43	Apr 2043	69.21	64.46	74.15	68.51	67.15	61.18	78.43	68.97	75.16	70.98	7.77	7.98	7.71	7.75	7.83	7.69	7.77	7.40	8.01	7.86	7.82	7.99
05/01/43	05/31/43	May 2043	67.02	57.12	74.71	66.80	61.52	52.05	78.73	67.35	74.62	69.10	7.77	7.96	7.65	7.73	7.77	7.65	7.65	7.34	7.99	7.84	7.80	7.87
06/01/43	06/30/43	Jun 2043	72.49	60.53	78.41	67.75	66.74	55.31	84.93	70.44	79.89	70.39	7.81	7.98	7.63	7.57	7.75	7.59	7.52	6.95	7.84	7.68	7.65	7.74
07/01/43	07/31/43	Jul 2043	81.28	67.08	86.70	71.42	75.14	61.57	93.53	75.63	88.79	74.76	7.94	8.12	7.81	7.73	7.88	7.71	7.61	7.01	7.99	7.84	7.80	7.84
08/01/43	08/31/43	Aug 2043	89.54	73.01	91.34	74.25	83.96	67.59	99.30	78.21	93.99	77.95	8.00	8.35	7.85	7.98	8.06	7.86	7.92	7.46	8.25	8.09	8.06	8.15
09/01/43	09/30/43	Sep 2043	82.81	72.03	84.95	73.70	81.16	71.05	91.75	76.88	86.97	76.59	8.04	8.41	8.06	8.00	8.12	7.98	8.02	7.55	8.27	8.11	8.08	8.25
10/01/43	10/31/43	Oct 2043	78.47	67.51	82.63	72.04	75.47	65.22	89.55	75.74	85.18	75.30	8.04	8.45	8.14	8.02	8.33	8.16	8.31	7.57	8.29	8.13	8.10	8.54
11/01/43	11/30/43	Nov 2043	84.06	72.46	83.30	72.06	80.78	68.02	91.78	77.89	86.86	75.27	8.14	8.58	8.31	8.14	8.60	8.45	8.66	7.73	8.41	8.25	8.21	8.91
12/01/43	12/31/43	Dec 2043	83.28	74.23	83.77	73.87	82.02	71.82	91.26	79.39	86.90	77.15	8.23	8.66	8.37	8.23	8.70	8.54	8.78	7.83	8.51	8.35	8.31	9.04
01/01/44	01/31/44	Jan 2044	81.89	71.00	84.01	74.02	78.29	67.09	92.56	79.29	87.33	77.26	8.19	8.69	8.07	8.27	8.65	8.49	8.45	7.54	8.55	8.39	8.35	8.72
02/01/44	02/29/44	Feb 2044	81.94	69.07	83.55	73.99	82.11	69.31	90.06	77.31	86.21	77.06	8.13	8.47	7.93	8.17	8.61	8.45	8.71	7.74	8.45	8.29	8.25	8.97
03/01/44	03/31/44	Mar 2044	73.17	66.70	78.50	72.03	71.27	65.50	84.49	73.85	80.92	75.06	8.11	8.37	7.99	8.15	8.33	8.19	8.33	7.79	8.43	8.27	8.23	8.59
04/01/44	04/30/44	Apr 2044	70.87	66.01	75.92	70.15	68.76	62.65	80.31	70.62	76.96	72.68	7.95	8.17	7.89	7.93	8.01	7.87	7.95	7.58	8.20	8.04	8.01	8.17
05/01/44	05/31/44	May 2044	68.62	58.50	76.50	68.41	62.99	53.30	80.62	68.96	76.41	70.76	7.95	8.15	7.83	7.91	7.95	7.83	7.83	7.52	8.18	8.02	7.99	8.06
06/01/44	06/30/44	Jun 2044	74.23	61.98	80.29	69.38	68.35	56.64	86.97	72.13	81.81	72.08	7.99	8.17	7.81	7.76	7.93	7.77	7.70	7.12	8.02	7.86	7.83	7.92
07/01/44	07/31/44	Jul 2044	83.23	68.69	88.78	73.14	76.95	63.05	95.77	77.44	90.92	76.55	8.13	8.31	7.99	7.91	8.07	7.89	7.79	7.18	8.18	8.02	7.99	8.02
08/01/44	08/31/44	Aug 2044	91.69	74.76	93.53	76.03	85.98	69.21	101.68	80.09	96.25	79.83	8.19	8.55	8.03	8.17	8.25	8.05	8.11	7.64	8.44	8.28	8.25	8.34
09/01/44	09/30/44	Sep 2044	84.79	73.76	86.99	75.47	83.11	72.75	93.95	78.72	89.06	78.43	8.23	8.61	8.25	8.19	8.31	8.17	8.21	7.74	8.46	8.30	8.27	8.44
10/01/44	10/31/44	Oct 2044	80.36	69.13	84.62	73.77	77.28	66.78	91.70	77.56	87.23	77.11	8.23	8.65	8.33	8.21	8.53	8.35	8.51	7.76	8.48	8.32	8.29	8.74
11/01/44	11/30/44	Nov 2044	86.08	74.20	85.30	73.78	82.72	69.65	93.98	79.76	88.94	77.07	8.33	8.79	8.51	8.33	8.81	8.65	8.87	7.91	8.60	8.44	8.41	9.12
12/01/44	12/31/44	Dec 2044	85.28	76.01	85.78	75.64	83.99	73.55	93.45	81.29	88.98	79.00	8.43	8.87	8.57	8.43	8.91	8.75	8.99	8.01	8.71	8.55	8.51	9.25
01/01/45	01/31/45	Jan 2045	83.86	72.70	86.03	75.80	80.17	68.70	94.78	81.19	89.42	79.12	8.39	8.90	8.27	8.47	8.86	8.69	8.65	7.72	8.75	8.59	8.55	8.93
02/01/45	02/28/45	Feb 2045	83.91	70.73	85.56	75.77	84.08	70.98	92.22	79.17	88.27	78.91	8.33	8.67	8.12	8.37	8.82	8.65	8.92	7.92	8.64	8.48	8.45	9.18
03/01/45	03/31/45	Mar 2045	74.93	68.30	80.38	73.76	72.99	67.07	86.52	75.62	82.86	76.86	8.31	8.57	8.19	8.35	8.53	8.39	8.53	7.98	8.62	8.46	8.43	8.79
04/01/45	04/30/45	Apr 2045	72.57	67.59	77.75	71.83	70.41	64.15	82.24	72.32	78.81	74.42	8.14	8.37	8.08	8.12	8.21	8.06	8.14	7.76	8.39	8.23	8.20	8.37
05/01/45	05/31/45	May 2045	70.27	59.90	78.34	70.05	64.51	54.58	82.56	70.62	78.24	72.46	8.14	8.35	8.02	8.10	8.14	8.02	8.02	7.70	8.37	8.21	8.18	8.24
06/01/45	06/30/45	Jun 2045	76.01	63.47	82.22	71.05	69.99	58.00	89.06	73.86	83.77	73.81	8.19	8.37	8.00	7.94	8.12	7.96	7.88	7.29	8.21	8.05	8.02	8.10
07/01/45	07/31/45	Jul 2045	85.23	70.34	90.91	74.89	78.79	64.56	98.07	79.30	93.10	78.39	8.33	8.51	8.19	8.10	8.27	8.08	7.98	7.35	8.37	8.21	8.18	8.21

	08/01/45	08/31/45	Aug 2045	93.89	76.55	95.77	77.85	88.04	70.87	104.12	82.01	98.56	81.74	8.39	8.76	8.23	8.37	8.45	8.25	8.31	7.82	8.64	8.48	8.44	8.53
	09/01/45	09/30/45	Sep 2045	86.83	75.53	89.08	77.28	85.11	74.50	96.20	80.61	91.19	80.31	8.43	8.82	8.45	8.39	8.51	8.37	8.41	7.92	8.66	8.50	8.47	8.64
	10/01/45	10/31/45	Oct 2045	82.29	70.79	86.65	75.54	79.14	68.38	93.90	79.42	89.32	78.96	8.43	8.86	8.53	8.41	8.74	8.55	8.71	7.94	8.68	8.52	8.49	8.94
	11/01/45	11/30/45	Nov 2045	88.14	75.98	87.34	75.56	84.71	71.32	96.23	81.68	91.08	78.92	8.53	9.00	8.71	8.53	9.02	8.86	9.08	8.10	8.80	8.64	8.61	9.34
	12/01/45	12/31/45	Dec 2045																						

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
11/9/2015		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
		Tue, 5/31/2005																						
			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/16	01/31/16	Jan 2016	27.25	23.25	23.75	21.25	25 00	22 25	32.50	27.50	31.50	27.25	2.45	2.54	2.38	2.41	2.46	2.43	2.34	1.91	2.66	2.51	2.49	2.50
02/01/16	02/29/16	Feb 2016	26.00	23.00	22.75	20.50	23.75	21.00	31.75	26.50	30.75	26.25	2.48	2.56	2.41	2.43	2.48	2.46	2.31	1.92	2.68	2.53	2.50	2.47
03/01/16	03/31/16	Mar 2016	24.25	20.75	22.00	20.50	21.50	18.50	31.00	26.25	30.00	26.00	2.48	2.46	2.32	2.33	2.45	2.43	2.13	1.91	2.57	2.43	2.40	2.27
04/01/16	04/30/16	Apr 2016	23.59	18.32	22.08	19.06	20.54	15.24	30.56	25.41	28.13	24.91	2.45	2.38	2.25	2.21	2.30	2.28	1.97	1.87	2.46	2.30	2.28	2.11
05/01/16	05/31/16	May 2016	22.70	16.75	22.08	18.87	19.75	12.85	31.19	23.28	28.71	22.56	2.48	2.43	2.28	2.25	2.35	2.32	1.84	1.87	2.49	2.34	2.32	1.97
06/01/16	06/30/16	Jun 2016	20.72	14.83	27.84	19.83	18.96	11.66	33.08	23.28	30.16	22.56	2.52	2.48	2.33	2.30	2.39	2.36	1.96	1.87	2.54	2.39	2.37	2.10
07/01/16	07/31/16	Jul 2016	30.20	22.18	33.13	22.56	27.75	18.69	36.25	27.65	36.21	28.37	2.57	2.67	2.42	2.40	2.45	2.43	1.97	1.89	2.65	2.49	2.47	2.10
08/01/16	08/31/16	Aug 2016	31.42	24.80	32.19	24.44	29.42	22.47	37.34	29.93	36.57	30.13	2.59	2.68	2.47	2.39	2.49	2.47	2.06	1.90	2.63	2.48	2.45	2.20
09/01/16	09/30/16	Sep 2016	29.89	23.85	28.13	23.97	26.64	22.05	35.16	28.22	34.08	29.25	2.59	2.61	2.44	2.35	2.49	2.47	2.02	1.91	2.59	2.44	2.42	2.15
10/01/16	10/31/16	Oct 2016	28.13	24.00	27.29	22.75	25.07	20.70	36.88	29.40	33.95	28.67	2.61	2.58	2.41	2.39	2.47	2.45	2.15	1.94	2.64	2.49	2.46	2.30
11/01/16	11/30/16	Nov 2016	29.95	24.50	25.95	22.30	26.71	23.21	36.88	29.40	35.00	28.37	2.70	2.72	2.54	2.54	2.60	2.58	2.56	2.08	2.80	2.64	2.61	2.76
12/01/16	12/31/16	Dec 2016	32.67	26.50	27.02	23.21	29.98	24.12	38.00	32.10	36.75	31.59	2.85	2.92	2.71	2.74	2.80	2.77	3.01	2.21	3.00	2.84	2.81	3.23
01/01/17	01/31/17	Jan 2017	30.94	26.41	27.30	25.22	28.35	23.92	37.01	31.72	35.10	30.90	2.96	2.97	2.84	2.82	2.87	2.84	2.86	2.28	3.08	2.92	2.89	3.07
02/01/17	02/28/17	Feb 2017	30.35	24.90	26.78	24.49	27.54	23.23	35.96	30.81	34.43	30.00	2.95	2.95	2.83	2.79	2.87	2.84	2.63	2.27	3.04	2.89	2.86	2.83
03/01/17	03/31/17	Mar 2017	27.37	23.39	25.46	23.04	25.11	21.85	34.19	28.98	32.06	29.10	2.90	2.91	2.77	2.74	2.82	2.79	2.58	2.23	2.99	2.84	2.81	2.77
04/01/17	04/30/17	Apr 2017	25.14	20.08	24.21	22.03	23.38	17.69	31.77	27.30	29.10	27.27	2.72	2.64	2.52	2.54	2.56	2.53	2.08	2.09	2.78	2.63	2.61	2.22
05/01/17	05/31/17	May 2017	23.42	15.51	24.98	21.81	20.61	13.63	32.42	24.72	29.70	23.99	2.72	2.65	2.52	2.47	2.55	2.53	2.06	2.06	2.71	2.56	2.54	2.20
06/01/17	06/30/17	Jun 2017	23.66	15.15	27.81	22.92	20.40	11.60	34.06	24.72	31.20	23.99	2.76	2.70	2.56	2.51	2.60	2.58	2.09	2.10	2.76	2.61	2.58	2.24
07/01/17	07/31/17	Jul 2017	31.77	19.16	33.39	24.90	27.79	16.97	37.25	29.34	36.47	29.34	2.81	2.97	2.63	2.59	2.69	2.67	2.28	2.13	2.84	2.69	2.66	2.44
08/01/17	08/31/17	Aug 2017	34.06	26.68	32.76	25.64	31.59	23.06	38.37	31.76	36.82	31.16	2.82	2.95	2.66	2.61	2.72	2.70	2.30	2.14	2.86	2.70	2.68	2.46
09/01/17	09/30/17	Sep 2017	32.42	26.92	28.35	25.14	28.37	26.75	36.13	29.65	33.96	30.25	2.82	2.78	2.65	2.60	2.73	2.71	2.31	2.16	2.85	2.70	2.68	2.47
10/01/17	10/31/17	Oct 2017	29.99	24.48	28.82	26.10	27.55	21.15	37.87	29.93	34.20	29.21	2.84	2.78	2.64	2.62	2.74	2.71	2.37	2.18	2.87	2.71	2.69	2.54
11/01/17	11/30/17	Nov 2017	31.93	24.99	27.40	25.58	28.71	24.44	37.87	30.87	36.00	29.83	2.92	2.98	2.78	2.84	2.87	2.85	2.90	2.36	3.10	2.94	2.91	3.12
12/01/17	12/31/17	Dec 2017	34.83	27.03	28.53	26.62	30.74	24.91	39.02	33.71	37.80	33.21	3.07	3.14	2.96	3.01	3.03	3.01	3.22	2.46	3.28	3.12	3.09	3.46
01/01/18	01/31/18	Jan 2018	32.79	27.76	28.80	26.47	30.60	25.67	38.01	33.72	36.10	32.70	3.16	3.23	3.03	3.06	3.11	3.08	3.17	2.54	3.31	3.16	3.13	3.41
02/01/18	02/28/18	Feb 2018	32.20	26.25	28.28	25.74	29.79	24.98	36.96	32.81	35.43	31.75	3.15	3.20	3.01	3.05	3.10	3.07	2.96	2.52	3.30	3.15	3.12	3.18
03/01/18	03/31/18	Mar 2018	29.22	24.74	26.96	24.29	27.36	23.60	35.19	30.98	33.06	30.80	3.09	3.16	2.96	2.99	3.04	3.01	2.90	2.46	3.24	3.09	3.06	3.12
04/01/18	04/30/18	Apr 2018	26.64	21.43	25.21	21.03	24.63	18.69	32.27	28.65	29.85	28.57	2.81	2.84	2.66	2.66	2.68	2.66	2.22	2.29	2.90	2.76	2.73	2.38
05/01/18	05/31/18	May 2018	24.92	16.86	25.98	20.81	21.86	14.63	32.92	26.07	30.45	25.29	2.80	2.86	2.64	2.58	2.68	2.66	2.17	2.23	2.82	2.68	2.66	2.32
06/01/18	06/30/18	Jun 2018	25.16	16.50	28.81	21.92	21.65	12.60	34.56	26.07	31.95	25.29	2.83	2.91	2.68	2.62	2.72	2.69	2.16	2.24	2.85	2.71	2.69	2.31
07/01/18	07/31/18	Jul 2018	33.62	19.41	35.39	26.40	30.04	17.46	38.75	30.69	37.72	30.64	2.87	3.16	2.73	2.67	2.81	2.78	2.41	2.25	2.91	2.77	2.75	2.57
08/01/18	08/31/18	Aug 2018	35.91	26.93	34.76	27.14	33.84	23.55	39.87	33.11	38.07	32.46	2.88	3.18	2.78	2.69	2.83	2.81	2.40	2.26	2.93	2.78	2.76	2.57
09/01/18	09/30/18	Sep 2018	34.27	27.17	30.35	26.64	30.62	27.24	37.63	31.00	35.21	31.55	2.88	2.98	2.75	2.68	2.83	2.80	2.44	2.29	2.92	2.78	2.75	2.61
10/01/18	10/31/18	Oct 2018	31.34	25.83	29.82	27.85	30.30	23.15	38.37	31.28	35.20	30.51	2.90	2.92	2.76	2.71	2.85	2.82	2.45	2.30	2.95	2.80	2.78	2.62
11/01/18	11/30/18	Nov 2018	33.28	26.34	28.40	27.33	31.46	26.44	38.37	32.22	37.00	31.13	2.98	3.12	2.89	2.91	3.01	2.99	3.12	2.47	3.16	3.01	2.98	3.35
12/01/18	12/31/18	Dec 2018	36.18	28.38	29.53	28.37	33.49	26.91	39.52	35.06	38.80	34.51	3.14	3.27	3.07	3.11	3.20	3.17	3.49	2.59	3.37	3.22	3.19	3.74
01/01/19	01/31/19	Jan 2019	34.59	30.00	30.40	27.87	32.40	27.50	39.36	35.07	37.35	33.25	3.25	3.42	3.17	3.18	3.23	3.21	3.38	2.70	3.44	3.28	3.25	3.63
02/01/19	02/28/19	Feb 2019	34.00	28.50	29.88	27.14	31.59	27.00	38.31	34.16	36.68	32.25	3.23	3.39	3.16	3.17	3.22	3.20	3.19	2.68	3.43	3.27	3.24	3.42
03/01/19	03/31/19	Mar 2019	31.02	26.75	28.56	25.69	29.16	25.50	36.54	32.33	34.31	31.25	3.18	3.35	3.10	3.11	3.16	3.13	3.13	2.62	3.37	3.21	3.18	3.36
04/01/19	04/30/19	Apr 2019	28.44	22.85	26.81	22.43	26.43	19.75	33.62	29.00	31.60	30.00	2.90	3.06	2.79	2.76	2.87	2.84	2.52	2.42	3.00	2.86	2.83	2.69
05/01/19	05/31/19	May 2019	26.72	18.35	27.58	22.21	23.66	16.10	34.27	24.75	32.50	24.50	2.89	3.09	2.78	2.69	2.86	2.83	2.48	2.37	2.93	2.78	2.76	2.65
06/01/19	06/30/19	Jun 2019	26.96	18.00	30.41	23.32	23.45	14.00	35.91	24.75	33.75	24.25	2.92	3.12	2.82	2.72	2.90	2.87	2.47	2.36	2.96	2.82	2.79	2.64
07/01/19	07/31/19	Jul 2019	35.42	19.75	36.99	27.80	31.84	18.00	40.10	31.00	38.97	31.94	2.96	3.37	2.86	2.77	2.99	2.96	2.65	2.36	3.02	2.87	2.84	2.83
08/01/19	08/31/19	Aug 2019	37.71	27.00	36.36	28.54	35.64	22.75	41.22	33.00	39.32	33.76	2.97	3.38	2.90	2.79	3.01	2.99	2.67	2.37	3.03	2.89	2.86	2.85
09/01/19	09/30/19	Sep 2019	36.07	27.00	31.95	28.04	32.42	27.00	38.98	32.00	36.46	32.85	2.97	3.19	2.88	2.78	3.01	2.99	2.69	2.40	3.03	2.88	2.85	2.87
10/01/19	10/31/19	Oct 2019	33.14	28.25	31.42	29.25	32.10	25.00	39.72	32.63	36.45	31.81	3.00	3.12	2.88	2.81	3.04	3.01	2.72	2.42	3.06	2.91	2.88	2.90
11/01/19	11/30/19	Nov 2019	35.08	28.75	30.00	28.73	33.26	28.50	39.72	33.57	38.25	32.43	3.08	3.33	2.99	2.99	3.14	3.11	3.23	2.56	3.24	3.09	3.06	3.47
12/01/19	12/31/19	Dec 2019	37.98	30.75	31.13	29.77	35.29	29.00	40.87	36.41	40.05	35.81	3.25	3.55	3.20	3.20	3.33	3.30	3.59	2.72	3.46	3.31	3.27	3.85
01/01/20	01/31/20	Jan 2020	35.99	33.75	31.90	29.37	33.80	30.75	40.46	36.07	38.45	35.00	3.37	3.67	3.31	3.36	3.40	3.37	3.53	2.82	3.63	3.47	3.44	3.78
02/01/20	02/29/20	Feb 2020	35.40	32.25	31.38	28.64	32.99	30.25	39.41	35.16	37.78	34.05	3.36	3.64	3.30	3.35	3.38	3.35	3.33	2.82	3.62	3.46	3.43	3.57
03/01/20	03/31/20	Mar 2020	32.42	30.75	30.06	27.19	30.56	30.50	37.64	33.33	35.41	33.10	3.30	3.60	3.24	3.29	3.32	3.29	3.29	2.78	3.55	3.40	3.37	3.53
04/01/20	04/30/20	Apr 2020	29.84	23.25	29.00	23.93	27.83	20.00	34.72	30.75	33.75	31.75	3.02	3.25	2.94	2.95	3.06	3.03	2.59	2.58	3.20	3.06	3.03	2.79
05/01/20	05/31/20	May 2020	28.12	18.50	29.75	23.71	25.06	16.50	35.37	26.00	34.25	27.25	3.01	3.34	2.93	2.88	3.05	3.02	2.54	2.52	3.13	2.98	2.95	2.73
06/01/20	06/30/20	Jun 2020	28.36	18.00	32.75	24.82	24.85	14.25	37.01	26.75	35.75	26.50	3.04	3.39	2.97	2.91	3.08	3.06	2.54	2.53	3.16	3.01	2.98	2.74
07/01/20	07/31/20	Jul 2020	36.82	22.21	38.49	27.00	33.24	20.26	41.20	33.04	41.07	32.94	3.08	3.57	3.01	2.97	3.17	3.14	2.74	2.54	3.22	3.07	3.04	2.94
08/01/20	08/31/20	Aug 2020	39.11	29.73	37.86	27.75	37.04	26.35	42.32	35.46	41.50	34.76	3.10	3.58	3.06	2.99	3.21	3.18	2.73	2.52	3.24	3.09	3.06	2.93
09/01/20	09/30/20	Sep 2020	37.47	29.97	33.45	28.00	33.82	30.04	40.08	33.35	38.50	33.85	3.10	3.40	3.04	2.99	3.21	3.18	2.79	2.59	3.24	3.09	3.06	3.00
10/01/20	10/31/20	Oct 2020	34.54	28.63	32.92	30.75	33.50	25.95	40.82	33.63	37.55	32.81	3.13	3.34	3.05	3.02	3.23	3.21	2.80	2.60	3.27	3.12	3.09	3.02
11/01/20	11/30/20	Nov 2020	36.48	29.14	31.50	30.23	34.66	29.24	40.82	34.57	39.35	33.43	3.21	3.50	3.12	3.18	3.31	3.28	3.27	2.75	3.44	3.29	3.26	3.52
12/01/20	12/31/20	Dec 2020	39.38	31.18	32.63	31.27	36.69	29.71	41.97	37.41	41.15	36.81	3.38	3.71	3.33	3.40	3.51	3.48	3.66	2.91	3.67	3.51	3.48	3.93
01/01/21	01/31/21	Jan 2021	37.49	31.71	33.80	30.62	35.30	29.62	41.81	37.07	39.80	36.00	3.51	3.86	3.44	3.52	3.57	3.54	3.61	3.04	3.79	3.63	3.59	3.87
02/01/21	02/28/21	Feb 2021	36.90	30.20	33.28	29.89	34.49	28.93	40.76	36.16	39.13	35.05	3.49	3.83	3.43	3.51	3.55	3.52	3.42	3.03	3.78	3.62	3.58	3.67
03/01/21	03/31/21	Mar 2021	33.92	28.69	31.96	28.44	32.06	27.55	38.99	34.33	36.76	34.10	3.43	3.76	3.37	3.45	3.49	3.46	3.38	3.00	3.71	3.56	3.52	3.63

04/01/21	04/30/21	Apr 2021	31.34	25.38	30.21	25.18	29.33	22.64	36.07	32.00	33.55	31.87	3.16	3.44	3.07	3.14	3.20	3.17	2.74	2.80	3.39	3.24	3.21	2.95
05/01/21	05/31/21	May 2021	29.62	20.81	30.98	24.96	26.56	18.58	36.72	29.42	34.15	28.59	3.15	3.47	3.06	3.07	3.19	3.16	2.70	2.74	3.32	3.17	3.14	2.90
06/01/21	06/30/21	Jun 2021	29.86	20.45	33.81	26.07	26.35	16.55	38.36	29.42	35.65	28.59	3.18	3.51	3.09	3.10	3.22	3.19	2.70	2.75	3.35	3.20	3.17	2.90
07/01/21	07/31/21	Jul 2021	38.32	23.36	40.39	30.55	34.74	21.41	42.55	34.04	41.42	33.94	3.22	3.76	3.13	3.15	3.31	3.28	2.90	2.77	3.41	3.26	3.23	3.12
08/01/21	08/31/21	Aug 2021	40.61	30.88	39.76	31.29	38.54	27.50	43.67	36.46	41.77	35.76	3.25	3.78	3.20	3.18	3.36	3.33	2.89	2.75	3.44	3.29	3.26	3.11
09/01/21	09/30/21	Sep 2021	38.97	31.12	35.35	30.79	35.32	31.19	41.43	34.35	38.91	34.85	3.24	3.60	3.18	3.18	3.36	3.33	2.93	2.79	3.44	3.29	3.26	3.15
10/01/21	10/31/21	Oct 2021	36.04	29.78	34.82	32.00	35.00	27.10	42.17	34.63	38.90	33.81	3.28	3.53	3.19	3.22	3.39	3.36	2.97	2.84	3.48	3.32	3.29	3.19
11/01/21	11/30/21	Nov 2021	37.98	30.29	33.40	31.48	36.16	30.39	42.17	35.57	40.70	34.43	3.36	3.68	3.26	3.37	3.46	3.43	3.33	2.97	3.63	3.47	3.44	3.57
12/01/21	12/31/21	Dec 2021	40.30	33.11	36.78	33.86	37.26	30.81	43.62	38.22	42.95	38.26	3.72	3.95	3.66	3.65	3.75	3.68	3.69	3.06	3.92	3.76	3.73	3.94
01/01/22	01/31/22	Jan 2022	39.65	33.58	38.23	34.43	36.83	30.95	44.02	39.06	42.84	38.56	3.82	4.08	3.77	3.79	3.85	3.78	3.73	3.12	4.07	3.91	3.87	3.99
02/01/22	02/28/22	Feb 2022	40.51	33.85	38.60	34.54	37.56	31.59	43.75	38.62	42.87	38.49	3.83	4.09	3.78	3.80	3.86	3.79	3.67	3.15	4.08	3.92	3.88	3.93
03/01/22	03/31/22	Mar 2022	36.58	31.34	37.35	33.22	33.98	29.21	42.05	36.94	40.92	37.48	3.77	4.01	3.70	3.72	3.78	3.70	3.64	3.10	3.99	3.83	3.80	3.90
04/01/22	04/30/22	Apr 2022	34.65	29.09	35.36	31.04	32.01	26.24	39.51	34.45	38.56	35.83	3.56	3.75	3.47	3.46	3.53	3.45	3.22	2.89	3.72	3.57	3.54	3.44
05/01/22	05/31/22	May 2022	31.54	23.73	34.69	30.06	28.47	21.21	39.28	32.45	37.89	33.11	3.57	3.77	3.46	3.42	3.53	3.43	3.14	2.90	3.68	3.53	3.49	3.36
06/01/22	06/30/22	Jun 2022	34.04	24.65	37.78	30.80	30.63	21.26	42.08	33.39	40.33	33.45	3.59	3.80	3.49	3.42	3.55	3.44	3.14	2.90	3.69	3.53	3.50	3.37
07/01/22	07/31/22	Jul 2022	40.35	27.97	42.92	33.90	36.82	25.47	46.35	37.17	45.08	37.05	3.63	3.94	3.53	3.46	3.61	3.49	3.26	2.92	3.73	3.57	3.54	3.49
08/01/22	08/31/22	Aug 2022	42.98	32.83	43.14	34.45	40.13	29.57	47.94	38.76	46.16	38.36	3.66	3.98	3.60	3.53	3.66	3.57	3.32	2.93	3.80	3.64	3.61	3.55
09/01/22	09/30/22	Sep 2022	42.10	34.34	39.11	33.83	38.79	32.94	44.80	37.29	42.99	37.54	3.66	3.90	3.59	3.54	3.67	3.60	3.36	3.06	3.81	3.65	3.62	3.59
10/01/22	10/31/22	Oct 2022	39.19	32.51	38.25	34.47	36.98	29.60	44.33	37.40	42.44	37.12	3.66	3.86	3.59	3.56	3.68	3.61	3.37	3.08	3.83	3.67	3.64	3.60
11/01/22	11/30/22	Nov 2022	40.73	33.16	38.26	34.42	38.06	31.61	44.74	38.09	43.69	37.53	3.74	3.99	3.69	3.70	3.79	3.73	3.61	3.27	3.98	3.82	3.78	3.87
12/01/22	12/31/22	Dec 2022	41.22	35.04	40.94	36.45	37.82	31.91	45.27	39.04	44.74	39.70	4.06	4.18	3.98	3.90	3.98	3.88	3.71	3.22	4.17	4.01	3.98	3.96
01/01/23	01/31/23	Jan 2023	41.82	35.46	42.66	38.23	38.35	32.29	46.23	41.04	45.87	41.13	4.14	4.31	4.10	4.07	4.13	4.02	3.85	3.21	4.34	4.18	4.14	4.11
02/01/23	02/28/23	Feb 2023	44.13	37.51	43.93	39.19	40.63	34.26	46.74	41.09	46.62	41.93	4.17	4.35	4.14	4.10	4.17	4.05	3.92	3.27	4.38	4.22	4.18	4.18
03/01/23	03/31/23	Mar 2023	39.25	33.98	42.75	38.01	35.91	30.87	45.10	39.56	45.08	40.86	4.12	4.25	4.04	3.99	4.07	3.94	3.91	3.21	4.27	4.11	4.07	4.17
04/01/23	04/30/23	Apr 2023	37.95	32.81	40.52	36.90	34.70	29.84	42.96	36.91	43.57	39.79	3.97	4.07	3.87	3.78	3.87	3.74	3.70	2.99	4.05	3.89	3.86	3.92
05/01/23	05/31/23	May 2023	33.46	26.64	38.40	35.16	30.37	23.85	41.84	35.47	41.62	37.63	3.98	4.07	3.87	3.77	3.87	3.70	3.59	3.06	4.04	3.88	3.85	3.81
06/01/23	06/30/23	Jun 2023	38.22	28.85	41.76	35.53	34.91	25.96	45.80	37.35	45.02	38.31	4.01	4.09	3.88	3.75	3.87	3.69	3.59	3.06	4.01	3.86	3.82	3.81
07/01/23	07/31/23	Jul 2023	42.38	32.58	45.44	37.25	38.90	29.53	50.15	40.30	48.74	40.17	4.04	4.12	3.92	3.77	3.91	3.71	3.62	3.07	4.04	3.88	3.85	3.85
08/01/23	08/31/23	Aug 2023	45.34	34.79	46.53	37.60	41.73	31.64	52.22	41.06	50.55	40.96	4.07	4.18	3.99	3.88	3.97	3.82	3.75	3.10	4.15	3.99	3.96	3.97
09/01/23	09/30/23	Sep 2023	45.22	37.57	42.87	36.86	42.25	34.68	48.17	40.23	47.08	40.22	4.07	4.20	3.99	3.91	3.98	3.87	3.80	3.33	4.17	4.02	3.98	4.02
10/01/23	10/31/23	Oct 2023	42.34	35.25	41.69	36.94	38.96	32.10	46.50	40.18	45.99	40.43	4.04	4.19	3.99	3.91	3.98	3.87	3.77	3.32	4.18	4.02	3.98	4.00
11/01/23	11/30/23	Nov 2023	43.49	36.04	43.11	37.36	39.95	32.83	47.32	40.61	46.68	40.64	4.13	4.30	4.12	4.04	4.12	4.03	3.89	3.56	4.31	4.15	4.12	4.15
12/01/23	12/31/23	Dec 2023	43.21	36.84	43.03	38.45	39.71	33.60	46.83	41.29	46.22	41.37	4.18	4.31	4.13	4.08	4.14	4.05	3.97	3.58	4.35	4.19	4.16	4.22
01/01/24	01/31/24	Jan 2024	44.03	37.04	44.52	39.76	40.45	33.77	47.51	41.87	47.09	42.14	4.22	4.39	4.19	4.12	4.20	4.08	3.98	3.59	4.40	4.24	4.20	4.25
02/01/24	02/29/24	Feb 2024	46.27	39.13	45.05	40.21	42.83	35.84	47.19	41.49	46.93	42.31	4.19	4.34	4.11	4.06	4.14	4.01	3.92	3.57	4.34	4.17	4.14	4.18
03/01/24	03/31/24	Mar 2024	41.64	35.62	44.26	39.23	38.19	32.46	45.64	39.80	45.47	41.24	4.17	4.26	4.05	4.00	4.08	3.93	3.93	3.53	4.27	4.11	4.07	4.19
04/01/24	04/30/24	Apr 2024	40.87	34.88	42.62	38.36	37.59	31.87	44.65	38.01	45.24	40.88	4.14	4.22	4.01	3.95	4.03	3.87	3.83	3.27	4.21	4.06	4.02	4.05
05/01/24	05/31/24	May 2024	34.13	27.37	39.63	36.43	30.97	24.51	42.49	35.88	42.27	38.55	4.14	4.21	4.00	3.91	4.00	3.80	3.68	3.27	4.17	4.02	3.98	3.90
06/01/24	06/30/24	Jun 2024	38.67	29.97	42.24	36.88	35.31	26.99	45.77	38.13	45.04	39.52	4.15	4.21	4.00	3.90	3.98	3.78	3.68	3.26	4.16	4.01	3.97	3.91
07/01/24	07/31/24	Jul 2024	44.58	34.08	47.07	38.09	40.96	30.92	51.50	41.13	49.82	41.06	4.20	4.25	4.03	3.92	4.01	3.81	3.70	3.38	4.19	4.03	4.00	3.92
08/01/24	08/31/24	Aug 2024	47.98	37.36	48.49	39.19	44.22	34.06	53.89	42.52	52.16	42.48	4.22	4.34	4.14	4.05	4.12	3.96	3.88	3.42	4.31	4.16	4.12	4.11
09/01/24	09/30/24	Sep 2024	48.46	40.38	46.33	39.31	45.38	37.38	51.04	42.20	49.82	42.31	4.24	4.37	4.17	4.10	4.15	4.03	3.97	3.58	4.36	4.21	4.17	4.20
10/01/24	10/31/24	Oct 2024	45.16	37.22	46.37	39.60	41.70	33.97	50.01	40.90	48.75	42.13	4.26	4.40	4.21	4.14	4.19	4.08	4.00	3.59	4.40	4.25	4.21	4.23
11/01/24	11/30/24	Nov 2024	45.76	38.30	46.22	40.15	42.08	34.96	50.37	41.89	48.89	42.82	4.37	4.54	4.35	4.30	4.34	4.25	4.12	3.90	4.57	4.41	4.38	4.38
12/01/24	12/31/24	Dec 2024	45.88	39.17	45.62	40.74	42.22	35.79	49.83	42.43	48.43	43.40	4.44	4.54	4.35	4.29	4.35	4.24	4.06	3.87	4.56	4.40	4.36	4.31
01/01/25	01/31/25	Jan 2025	46.87	39.34	46.67	41.56	43.15	35.94	49.74	42.41	48.95	43.78	4.50	4.64	4.43	4.41	4.46	4.35	4.24	3.92	4.68	4.52	4.48	4.50
02/01/25	02/28/25	Feb 2025	49.46	41.87	47.67	42.53	45.98	38.45	49.17	42.22	49.24	44.40	4.52	4.65	4.44	4.41	4.46	4.35	4.29	3.93	4.68	4.52	4.48	4.55
03/01/25	03/31/25	Mar 2025	44.29	37.97	45.89	40.94	40.74	34.66	47.22	40.64	47.49	43.23	4.50	4.57	4.37	4.32	4.39	4.26	4.25	3.84	4.59	4.43	4.39	4.51
04/01/25	04/30/25	Apr 2025	42.99	37.03	44.20	39.99	39.60	33.86	45.89	40.03	46.54	42.35	4.43	4.53	4.34	4.26	4.34	4.19	4.12	3.51	4.53	4.37	4.34	4.34
05/01/25	05/31/25	May 2025	35.86	28.84	41.46	38.02	32.59	25.88	44.03	36.88	43.49	39.78	4.43	4.50	4.29	4.20	4.28	4.08	3.97	3.60	4.46	4.31	4.28	4.19
06/01/25	06/30/25	Jun 2025	41.56	31.67	44.74	38.72	38.04	28.58	48.50	39.26	47.17	41.02	4.46	4.52	4.32	4.20	4.26	4.02	3.93	3.60	4.47	4.31	4.28	4.15
07/01/25	07/31/25	Jul 2025	47.22	36.71	49.47	40.31	43.45	33.40	53.74	42.84	51.86	43.08	4.52	4.57	4.37	4.24	4.34	4.12	4.01	3.69	4.51	4.35	4.31	4.23
08/01/25	08/31/25	Aug 2025	51.11	40.69	51.88	42.30	47.17	37.20	57.06	44.66	55.20	45.58	4.56	4.68	4.44	4.33	4.42	4.23	4.16	3.73	4.60	4.44	4.41	4.39
09/01/25	09/30/25	Sep 2025	51.86	43.02	49.74	41.68	48.63	39.91	54.22	43.00	52.82	44.56	4.56	4.73	4.47	4.37	4.44	4.29	4.24	3.92	4.63	4.48	4.44	4.47
10/01/25	10/31/25	Oct 2025	47.62	39.27	48.92	41.73	43.95	35.89	53.12	41.89	51.42	44.58	4.53	4.74	4.46	4.35	4.43	4.29	4.20	3.87	4.62	4.47	4.43	4.43
11/01/25	11/30/25	Nov 2025	46.80	39.74	47.76	41.74	43.04	36.29	51.98	42.39	50.30	44.50	4.52	4.70	4.48	4.42	4.47	4.35	4.19	4.05	4.69	4.53	4.50	4.44
12/01/25	12/31/25	Dec 2025	48.00	40.40	48.19	42.32	44.20	36.92	51.94	42.60	50.36	44.60	4.55	4.68	4.46	4.39	4.47	4.34	4.16	3.92	4.67	4.51	4.47	4.42
01/01/26	01/31/26	Jan 2026	48.08	39.67	48.93	43.24	44.36	36.32	49.91	42.82	50.15	44.88	4.61	4.74	4.53	4.46	4.53	4.41	4.23	3.91	4.74	4.58	4.54	4.49
02/01/26	02/28/26	Feb 2026	50.69	42.36	50.59	44.68	47.28	39.08	49.10	43.13	50.66	45.87	4.62	4.77	4.54	4.49	4.56	4.44	4.25	3.91	4.77	4.60	4.57	4.52
03/01/26	03/31/26	Mar 2026	44.70	38.33	47.76	42.37	41.26	35.21	46.78	40.78	47.69	43.44	4.52	4.61	4.38	4.33	4.41	4.27	4.21	3.69	4.61	4.45	4.41	4.47
04/01/26	04/30/26	Apr 2026	43.47	37.37	46.35	41.28	40.50	34.55	45.21	39.73	46.57	42.63	4.42	4.52	4.31	4.21	4.31	4.14	4.08	3.49	4.48	4.32	4.29	4.30
05/01/26	05/31/26	May 2026	37.89	30.48	43.41	39.23	34.49	27.41	45.56	37.78	44.22	40.50	4.44	4.49	4.28	4.16	4.25	4.04	3.93	3.58	4.43	4.27	4.24	4.15
06/01/26	06/30/26	Jun 2026	42.60	32.13	46.34	39.68	38.99	28.99	49.16	38.93	47.67	41.70	4.48	4.52	4.31	4.17	4.25	3.95	3.87	3.57	4.44	4.28	4.25	4.10
07/01/26	07/31/26	Jul 2026	48.22	37.92	50.80	41.70	44.36	34.52	54.44	42.28	52.48	44.24	4.54	4.59	4.37	4.24	4.33	4.11	4.00	3.70	4.51	4.35	4.32	4.23
08/01/26	08/31/26	Aug 2026	51.33	41.27	52.39	43.21	47.36	37.72	56.53	44.40	54.85	46.01	4.58	4.74	4.46	4.35	4.42	4.25	4.17	3.77	4.61	4.46	4.42	4.40
09/01/26	09/30/26	Sep 2026	51.76	43.34	50.58	42.44	48.86	40.33	53.76	43.52	52.64	45.00	4.58	4.78	4.46	4.38	4.46	4.31	4.21	3.90	4.65	4.50	4.46	4.44
10/01/26	10/31/26	Oct 2026	48.17	39.84	49.25	42.28	44.59	36.44	52.46	42.58	51.13	44.90	4.58	4.79	4.49	4.40	4.46	4.35	4.20	3.89	4.67	4.51	4.47	4.43
11/01/26	11/30/26	Nov 2026	48.97	41.11	49.96	43.39	45.09	37.57	53.33	43.93	51.64	45.66	4.65	4.91	4.61	4.53	4.61	4.48	4.32	4.21	4.80	4.64	4.61	4.57
12/01/26	12/31/26	Dec 2026	49.21	41.43	49.84	43.91	45.50	37.93	51.91	43.71	50.81	45.53	4.70	4.83	4.59	4.56	4.62	4.49	4.32	3.93	4.83	4.67	4.63	4.57

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
11/2/2015		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
		Tue, 5/31/2005																						
			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/16	01/31/16	Jan 2016	28.00	23.75	23.25	20.25	25 75	22 25	32.00	26.50	31.00	26.25	2.45	2.56	2.40	2.43	2.49	2.47	2.36	1.98	2.68	2.53	2.51	2.52
02/01/16	02/29/16	Feb 2016	28.00	23.00	22.25	20.50	24.75	21.00	31.25	26.25	30.25	26.00	2.47	2.57	2.43	2.45	2.53	2.51	2.35	2.00	2.70	2.55	2.53	2.51
03/01/16	03/31/16	Mar 2016	25.75	20.50	21.50	19.75	22.25	18.25	30.50	25.25	29.50	25.00	2.47	2.46	2.30	2.33	2.43	2.40	2.15	1.98	2.57	2.43	2.40	2.30
04/01/16	04/30/16	Apr 2016	25.44	19.75	21.85	19.31	21.58	16.39	30.24	25.00	28.13	24.75	2.43	2.38	2.25	2.22	2.30	2.28	2.02	1.92	2.46	2.30	2.28	2.16
05/01/16	05/31/16	May 2016	24.48	17.75	22.33	19.11	20.75	13.82	31.19	22.75	28.71	22.50	2.46	2.42	2.29	2.25	2.34	2.32	1.87	1.91	2.49	2.33	2.31	2.00
06/01/16	06/30/16	Jun 2016	22.08	16.47	27.55	20.09	19.92	12.54	33.08	22.80	30.16	22.50	2.51	2.46	2.33	2.29	2.39	2.36	1.99	1.91	2.54	2.38	2.36	2.13
07/01/16	07/31/16	Jul 2016	30.94	22.45	33.13	22.56	27.72	19.36	36.25	28.13	36.21	28.86	2.56	2.65	2.42	2.40	2.45	2.43	2.00	1.93	2.65	2.49	2.47	2.14
08/01/16	08/31/16	Aug 2016	32.19	25.25	32.19	24.96	29.40	23.06	37.34	30.45	36.57	30.64	2.57	2.67	2.46	2.38	2.49	2.47	2.09	1.94	2.63	2.47	2.45	2.24
09/01/16	09/30/16	Sep 2016	30.63	23.60	28.44	24.30	27.16	22.84	35.16	28.42	34.00	29.75	2.57	2.61	2.44	2.34	2.48	2.46	2.04	1.94	2.59	2.43	2.41	2.18
10/01/16	10/31/16	Oct 2016	29.06	24.48	27.54	23.25	25.76	21.16	36.88	28.98	33.80	28.30	2.60	2.58	2.41	2.39	2.46	2.44	2.18	1.97	2.64	2.48	2.46	2.33
11/01/16	11/30/16	Nov 2016	30.00	24.99	26.19	22.79	27.44	23.25	36.88	29.89	35.00	28.86	2.69	2.71	2.53	2.54	2.62	2.59	2.62	2.11	2.80	2.64	2.61	2.82
12/01/16	12/31/16	Dec 2016	33.75	27.03	27.27	23.72	30.80	25.34	38.00	32.64	36.75	32.13	2.84	2.91	2.70	2.73	2.81	2.78	3.06	2.26	2.99	2.83	2.80	3.28
01/01/17	01/31/17	Jan 2017	31.46	26.25	27.04	24.70	28.09	23.66	37.54	31.46	34.84	30.39	2.94	2.95	2.80	2.81	2.87	2.85	2.89	2.32	3.06	2.91	2.88	3.11
02/01/17	02/28/17	Feb 2017	30.86	25.00	26.52	23.99	27.29	22.98	36.47	30.55	34.17	29.50	2.94	2.94	2.79	2.78	2.87	2.85	2.68	2.33	3.03	2.88	2.85	2.88
03/01/17	03/31/17	Mar 2017	28.44	23.75	25.74	22.56	24.88	21.61	34.00	28.74	32.10	28.62	2.88	2.90	2.73	2.73	2.82	2.80	2.62	2.30	2.98	2.82	2.80	2.82
04/01/17	04/30/17	Apr 2017	25.75	20.95	23.97	21.78	24.14	18.60	31.50	26.75	29.05	26.70	2.70	2.62	2.50	2.52	2.54	2.51	2.10	2.12	2.76	2.61	2.59	2.25
05/01/17	05/31/17	May 2017	23.99	15.50	24.74	21.56	21.32	14.10	31.68	24.18	29.45	23.72	2.70	2.64	2.50	2.45	2.53	2.51	2.09	2.10	2.69	2.54	2.52	2.24
06/01/17	06/30/17	Jun 2017	24.24	15.93	27.54	22.50	20.66	12.15	33.60	24.96	30.94	23.72	2.74	2.69	2.55	2.49	2.58	2.56	2.12	2.13	2.73	2.58	2.56	2.27
07/01/17	07/31/17	Jul 2017	32.11	19.75	33.66	23.60	28.12	17.33	37.25	29.83	36.25	29.83	2.79	2.95	2.62	2.57	2.67	2.65	2.31	2.16	2.81	2.66	2.64	2.47
08/01/17	08/31/17	Aug 2017	34.42	27.50	33.02	25.74	31.97	23.63	38.37	31.50	37.08	31.67	2.80	2.93	2.65	2.59	2.70	2.68	2.33	2.17	2.83	2.68	2.66	2.49
09/01/17	09/30/17	Sep 2017	32.77	27.75	28.58	25.25	28.71	27.23	36.13	30.14	34.20	30.75	2.79	2.76	2.63	2.58	2.71	2.68	2.33	2.18	2.83	2.67	2.65	2.49
10/01/17	10/31/17	Oct 2017	30.23	24.72	28.56	25.50	27.79	21.38	37.62	30.16	33.96	29.45	2.82	2.76	2.62	2.59	2.72	2.69	2.37	2.21	2.84	2.69	2.66	2.54
11/01/17	11/30/17	Nov 2017	32.18	25.24	27.16	24.99	28.96	24.70	37.62	31.12	35.75	30.07	2.90	2.97	2.76	2.83	2.87	2.84	2.94	2.38	3.08	2.93	2.90	3.16
12/01/17	12/31/17	Dec 2017	35.10	27.30	28.28	26.01	31.01	25.18	38.76	33.97	37.54	33.48	3.05	3.13	2.95	3.01	3.03	3.01	3.24	2.48	3.27	3.11	3.08	3.48
01/01/18	01/31/18	Jan 2018	33.31	27.60	28.54	25.95	30.34	25.66	38.29	32.81	35.59	31.89	3.14	3.22	3.02	3.05	3.10	3.07	3.19	2.56	3.30	3.15	3.12	3.43
02/01/18	02/28/18	Feb 2018	32.71	26.35	28.02	25.24	29.54	24.98	37.22	31.90	34.92	31.00	3.13	3.19	3.00	3.04	3.09	3.06	2.98	2.54	3.29	3.14	3.11	3.20
03/01/18	03/31/18	Mar 2018	30.29	25.10	27.24	23.81	27.13	23.61	34.00	30.09	32.24	30.12	3.07	3.14	2.94	2.98	3.03	3.00	2.91	2.48	3.23	3.08	3.05	3.13
04/01/18	04/30/18	Apr 2018	28.75	23.54	24.97	20.78	25.14	19.60	31.47	29.61	29.61	29.82	2.78	2.82	2.64	2.64	2.66	2.63	2.21	2.28	2.88	2.73	2.71	2.36
05/01/18	05/31/18	May 2018	25.25	16.44	25.74	20.56	22.32	15.10	32.43	24.93	30.20	24.47	2.78	2.84	2.63	2.56	2.66	2.63	2.16	2.22	2.80	2.66	2.63	2.31
06/01/18	06/30/18	Jun 2018	25.50	17.33	28.54	21.66	21.66	13.15	34.35	25.71	31.69	24.47	2.81	2.89	2.66	2.60	2.70	2.67	2.15	2.23	2.83	2.69	2.67	2.30
07/01/18	07/31/18	Jul 2018	33.96	20.00	35.66	25.01	30.37	17.75	38.25	31.18	37.47	31.13	2.85	3.15	2.71	2.65	2.78	2.76	2.40	2.24	2.89	2.75	2.72	2.56
08/01/18	08/31/18	Aug 2018	36.27	27.00	35.02	27.24	34.22	24.05	39.37	33.64	37.83	32.97	2.86	3.17	2.76	2.67	2.81	2.78	2.39	2.25	2.91	2.76	2.74	2.56
09/01/18	09/30/18	Sep 2018	34.62	27.50	30.58	26.75	30.96	27.65	37.13	31.49	34.95	32.05	2.85	2.96	2.73	2.66	2.80	2.78	2.43	2.27	2.90	2.76	2.73	2.60
10/01/18	10/31/18	Oct 2018	32.08	26.07	29.31	27.25	30.54	22.73	37.62	31.51	34.71	30.75	2.88	2.90	2.74	2.69	2.82	2.80	2.44	2.29	2.93	2.78	2.76	2.61
11/01/18	11/30/18	Nov 2018	34.03	26.59	27.91	26.74	31.71	26.05	37.62	32.47	36.50	31.37	2.96	3.11	2.86	2.90	3.01	2.98	3.13	2.48	3.15	3.00	2.98	3.36
12/01/18	12/31/18	Dec 2018	36.95	28.65	29.03	27.76	33.76	26.53	38.76	35.32	38.29	34.78	3.11	3.26	3.04	3.11	3.19	3.16	3.50	2.60	3.36	3.21	3.18	3.75
01/01/19	01/31/19	Jan 2019	34.81	30.10	30.04	27.30	31.84	28.25	39.44	33.91	36.74	32.50	3.22	3.41	3.14	3.19	3.23	3.20	3.39	2.70	3.45	3.29	3.26	3.64
02/01/19	02/28/19	Feb 2019	34.21	28.85	29.52	26.59	31.04	27.25	38.37	33.00	36.07	31.50	3.21	3.37	3.13	3.18	3.22	3.19	3.19	2.69	3.44	3.28	3.25	3.43
03/01/19	03/31/19	Mar 2019	31.79	27.65	28.74	25.16	28.63	25.75	35.15	31.19	33.39	30.75	3.15	3.33	3.07	3.12	3.15	3.13	3.13	2.63	3.37	3.22	3.19	3.37
04/01/19	04/30/19	Apr 2019	29.87	24.50	26.50	22.13	26.64	20.25	32.62	28.50	31.50	29.00	2.86	3.03	2.77	2.74	2.83	2.81	2.51	2.41	2.99	2.84	2.82	2.68
05/01/19	05/31/19	May 2019	26.25	17.25	27.24	21.91	23.82	16.25	33.58	24.00	32.25	24.00	2.86	3.06	2.75	2.67	2.83	2.80	2.47	2.36	2.91	2.77	2.74	2.64
06/01/19	06/30/19	Jun 2019	26.50	18.25	30.10	23.01	23.16	14.00	35.50	24.81	32.50	23.75	2.89	3.09	2.79	2.70	2.86	2.84	2.46	2.35	2.94	2.80	2.77	2.63
07/01/19	07/31/19	Jul 2019	35.46	20.00	37.16	26.36	31.87	18.00	39.40	32.00	38.62	32.23	2.93	3.34	2.83	2.76	2.96	2.93	2.64	2.35	3.00	2.86	2.83	2.82
08/01/19	08/31/19	Aug 2019	37.77	27.00	36.52	28.59	35.72	23.25	40.52	32.25	38.98	34.07	2.94	3.35	2.88	2.78	2.98	2.95	2.66	2.36	3.02	2.87	2.85	2.84
09/01/19	09/30/19	Sep 2019	36.12	27.50	32.08	28.10	32.46	28.00	38.28	30.00	36.10	33.15	2.94	3.17	2.85	2.77	2.98	2.95	2.68	2.39	3.01	2.87	2.84	2.86
10/01/19	10/31/19	Oct 2019	33.58	29.00	30.81	28.60	32.04	25.75	38.77	32.25	35.86	31.00	2.96	3.09	2.86	2.80	3.00	2.98	2.71	2.41	3.04	2.90	2.87	2.89
11/01/19	11/30/19	Nov 2019	35.53	29.50	29.41	28.09	33.21	29.00	38.77	33.25	37.65	31.75	3.04	3.30	2.97	2.99	3.12	3.10	3.23	2.56	3.24	3.09	3.06	3.47
12/01/19	12/31/19	Dec 2019	38.45	30.75	30.53	29.11	35.26	29.25	39.91	36.25	39.44	35.00	3.22	3.52	3.18	3.21	3.32	3.29	3.60	2.72	3.47	3.32	3.29	3.86
01/01/20	01/31/20	Jan 2020	35.96	34.00	31.54	28.65	32.99	31.60	40.59	34.91	37.89	33.99	3.35	3.65	3.30	3.36	3.39	3.36	3.54	2.83	3.62	3.47	3.43	3.80
02/01/20	02/29/20	Feb 2020	35.36	33.00	31.02	27.94	32.19	31.00	39.52	34.00	37.22	33.10	3.33	3.62	3.28	3.35	3.38	3.35	3.34	2.83	3.61	3.46	3.42	3.58
03/01/20	03/31/20	Mar 2020	32.94	31.50	30.24	26.51	29.78	29.50	36.30	32.19	34.54	32.22	3.27	3.58	3.22	3.29	3.32	3.29	3.30	2.79	3.55	3.40	3.36	3.54
04/01/20	04/30/20	Apr 2020	31.75	24.64	29.25	23.48	27.79	20.50	33.77	30.00	33.25	31.75	3.00	3.23	2.93	2.94	3.04	3.01	2.60	2.58	3.19	3.04	3.02	2.79
05/01/20	05/31/20	May 2020	28.25	17.50	29.50	23.26	24.97	16.50	34.73	25.50	33.75	26.25	2.99	3.32	2.92	2.87	3.03	3.00	2.54	2.52	3.12	2.97	2.94	2.73
06/01/20	06/30/20	Jun 2020	28.50	18.00	32.25	24.36	24.31	14.00	36.65	26.25	35.25	26.25	3.02	3.37	2.95	2.90	3.06	3.03	2.54	2.53	3.15	3.00	2.97	2.74
07/01/20	07/31/20	Jul 2020	36.61	24.00	38.66	26.25	32.25	20.93	40.55	32.25	40.25	32.25	3.05	3.55	2.99	2.95	3.14	3.12	2.74	2.54	3.20	3.06	3.03	2.95
08/01/20	08/31/20	Aug 2020	38.92	31.75	38.02	27.75	37.50	27.23	41.67	35.00	40.75	34.07	3.08	3.56	3.05	2.98	3.19	3.16	2.73	2.53	3.23	3.08	3.05	2.93
09/01/20	09/30/20	Sep 2020	37.27	31.75	33.58	27.25	36.75	30.83	39.43	32.25	37.75	33.15	3.07	3.38	3.02	2.97	3.19	3.16	2.79	2.59	3.22	3.08	3.05	3.00
10/01/20	10/31/20	Oct 2020	34.73	29.17	32.31	29.95	33.19	25.83	39.92	33.61	37.01	32.85	3.11	3.32	3.03	3.01	3.21	3.19	2.81	2.61	3.26	3.11	3.08	3.02
11/01/20	11/30/20	Nov 2020	36.68	29.69	30.91	29.44	34.36	29.15	39.92	34.57	38.80	33.47	3.19	3.49	3.10	3.18	3.31	3.28	3.29	2.76	3.44	3.28	3.25	3.53
12/01/20	12/31/20	Dec 2020	39.60	31.75	32.03	30.46	36.41	29.63	41.06	37.42	40.59	36.88	3.36	3.70	3.31	3.40	3.51	3.48	3.68	2.92	3.66	3.51	3.47	3.94
01/01/21	01/31/21	Jan 2021	37.61	32.60	33.44	29.90	34.64	30.66	41.74	35.91	39.04	34.99	3.49	3.85	3.43	3.52	3.57	3.54	3.63	3.06	3.79	3.63	3.59	3.89
02/01/21	02/28/21	Feb 2021	37.01	31.35	32.92	29.19	33.84	29.98	40.67	35.00	38.37	34.10	3.48	3.82	3.42	3.51	3.56	3.53	3.44	3.05	3.78	3.62	3.58	3.69
03/01/21	03/31/21	Mar 2021	34.59	30.10	32.14	27.76	31.43	28.61	37.45	33.19	35.69	33.22	3.42	3.75	3.36	3.45	3.49	3.46	3.40	3.01	3.71	3.56	3.52	3.65

04/01/21	04/30/21	Apr 2021	33.67	28.54	29.87	24.73	29.44	24.60	34.92	32.71	33.06	32.92	3.14	3.43	3.06	3.13	3.18	3.15	2.75	2.81	3.39	3.24	3.21	2.96
05/01/21	05/31/21	May 2021	30.14	21.44	30.64	24.51	26.62	20.10	35.88	28.03	33.65	27.57	3.14	3.46	3.05	3.06	3.17	3.14	2.70	2.75	3.31	3.16	3.13	2.91
06/01/21	06/30/21	Jun 2021	30.39	22.33	33.44	25.61	25.96	18.15	37.80	28.81	35.14	27.57	3.17	3.50	3.09	3.09	3.21	3.18	2.71	2.76	3.35	3.20	3.16	2.91
07/01/21	07/31/21	Jul 2021	38.26	26.10	40.56	28.96	34.67	22.83	41.70	34.28	40.92	34.23	3.20	3.75	3.13	3.15	3.29	3.26	2.91	2.78	3.41	3.26	3.22	3.13
08/01/21	08/31/21	Aug 2021	40.57	33.85	39.92	31.19	38.52	29.13	42.82	36.74	41.28	36.07	3.23	3.77	3.19	3.18	3.34	3.31	2.90	2.76	3.44	3.29	3.25	3.12
09/01/21	09/30/21	Sep 2021	38.92	34.10	35.48	30.70	35.26	32.73	40.58	34.59	38.40	35.15	3.23	3.59	3.17	3.18	3.34	3.31	2.94	2.80	3.44	3.28	3.25	3.16
10/01/21	10/31/21	Oct 2021	36.38	31.07	34.21	31.20	34.84	27.73	41.07	34.61	38.16	33.85	3.27	3.52	3.18	3.21	3.37	3.35	2.98	2.84	3.47	3.32	3.29	3.20
11/01/21	11/30/21	Nov 2021	38.33	31.59	32.81	30.69	36.01	31.05	41.07	35.57	39.95	34.47	3.35	3.67	3.25	3.37	3.47	3.44	3.35	2.99	3.63	3.48	3.44	3.59
12/01/21	12/31/21	Dec 2021	40.41	33.39	36.48	33.46	37.11	30.77	43.17	38.23	42.66	38.29	3.71	3.94	3.65	3.65	3.75	3.68	3.69	3.07	3.92	3.76	3.73	3.95
01/01/22	01/31/22	Jan 2022	39.71	34.03	38.05	34.07	36.50	31.47	43.98	38.48	42.46	38.06	3.82	4.08	3.77	3.79	3.85	3.78	3.74	3.13	4.07	3.91	3.87	4.00
02/01/22	02/28/22	Feb 2022	40.57	34.43	38.42	34.19	37.23	32.12	43.70	38.05	42.50	38.01	3.82	4.08	3.78	3.80	3.86	3.79	3.68	3.16	4.08	3.92	3.88	3.94
03/01/22	03/31/22	Mar 2022	36.92	32.04	37.44	32.88	33.67	29.74	41.27	36.37	40.38	37.04	3.77	4.00	3.70	3.72	3.78	3.70	3.65	3.11	3.99	3.83	3.80	3.91
04/01/22	04/30/22	Apr 2022	35.81	30.67	35.20	30.81	32.07	27.22	38.94	34.81	38.31	36.36	3.55	3.75	3.47	3.46	3.53	3.44	3.22	2.90	3.72	3.57	3.53	3.45
05/01/22	05/31/22	May 2022	31.80	24.04	34.52	29.84	28.49	21.97	38.86	31.75	37.64	32.60	3.56	3.76	3.46	3.42	3.52	3.42	3.15	2.91	3.68	3.52	3.49	3.37
06/01/22	06/30/22	Jun 2022	34.30	25.59	37.60	30.57	30.44	22.06	41.80	33.08	40.08	32.94	3.59	3.79	3.48	3.42	3.54	3.43	3.15	2.91	3.68	3.53	3.49	3.37
07/01/22	07/31/22	Jul 2022	40.32	29.34	43.00	33.10	36.78	26.18	45.92	37.29	44.83	37.20	3.62	3.93	3.52	3.46	3.60	3.49	3.27	2.93	3.73	3.57	3.54	3.49
08/01/22	08/31/22	Aug 2022	42.96	34.32	43.22	34.40	40.12	30.38	47.52	38.90	45.92	38.52	3.65	3.97	3.59	3.53	3.66	3.57	3.32	2.93	3.80	3.64	3.61	3.55
09/01/22	09/30/22	Sep 2022	42.07	35.84	39.17	33.78	38.76	33.70	44.38	37.41	42.74	37.69	3.65	3.89	3.58	3.54	3.66	3.59	3.37	3.07	3.81	3.65	3.62	3.59
10/01/22	10/31/22	Oct 2022	39.36	33.16	37.95	34.07	36.90	29.91	43.79	37.40	42.08	37.14	3.65	3.85	3.59	3.56	3.68	3.61	3.37	3.08	3.83	3.67	3.64	3.60
11/01/22	11/30/22	Nov 2022	40.91	33.81	37.96	34.02	37.98	31.94	44.19	38.09	43.32	37.55	3.74	3.99	3.68	3.70	3.79	3.73	3.62	3.28	3.98	3.82	3.78	3.87
12/01/22	12/31/22	Dec 2022	41.22	35.04	40.94	36.45	37.82	31.91	45.27	39.04	44.74	39.70	4.06	4.18	3.98	3.90	3.98	3.88	3.71	3.22	4.17	4.01	3.98	3.96
01/01/23	01/31/23	Jan 2023	41.82	35.46	42.66	38.23	38.35	32.29	46.23	41.04	45.87	41.13	4.14	4.31	4.10	4.07	4.13	4.02	3.85	3.21	4.34	4.18	4.14	4.11
02/01/23	02/28/23	Feb 2023	44.13	37.51	43.93	39.19	40.63	34.26	46.74	41.09	46.62	41.93	4.17	4.35	4.14	4.10	4.17	4.05	3.92	3.27	4.38	4.22	4.18	4.18
03/01/23	03/31/23	Mar 2023	39.25	33.98	42.75	38.01	35.91	30.87	45.10	39.56	45.08	40.86	4.12	4.25	4.04	3.99	4.07	3.94	3.91	3.21	4.27	4.11	4.07	4.17
04/01/23	04/30/23	Apr 2023	37.95	32.81	40.52	36.90	34.70	29.84	42.96	36.91	43.57	39.79	3.97	4.07	3.87	3.78	3.87	3.74	3.70	2.99	4.05	3.89	3.86	3.92
05/01/23	05/31/23	May 2023	33.46	26.64	38.40	35.16	30.37	23.85	41.84	35.47	41.62	37.63	3.98	4.07	3.87	3.77	3.87	3.70	3.59	3.06	4.04	3.88	3.85	3.81
06/01/23	06/30/23	Jun 2023	38.22	28.85	41.76	35.53	34.91	25.96	45.80	37.35	45.02	38.31	4.01	4.09	3.88	3.75	3.87	3.69	3.59	3.06	4.01	3.86	3.82	3.81
07/01/23	07/31/23	Jul 2023	42.38	32.58	45.44	37.25	38.90	29.53	50.15	40.30	48.74	40.17	4.04	4.12	3.92	3.77	3.91	3.71	3.62	3.07	4.04	3.88	3.85	3.85
08/01/23	08/31/23	Aug 2023	45.34	34.79	46.53	37.60	41.73	31.64	52.22	41.06	50.55	40.96	4.07	4.18	3.99	3.88	3.97	3.82	3.75	3.10	4.15	3.99	3.96	3.98
09/01/23	09/30/23	Sep 2023	45.22	37.57	42.87	36.86	42.25	34.68	48.17	40.23	47.08	40.22	4.07	4.20	3.99	3.91	3.98	3.87	3.80	3.33	4.17	4.02	3.98	4.02
10/01/23	10/31/23	Oct 2023	42.34	35.25	41.69	36.94	38.96	32.10	46.50	40.18	45.99	40.43	4.04	4.19	3.99	3.91	3.98	3.87	3.77	3.32	4.18	4.02	3.98	4.00
11/01/23	11/30/23	Nov 2023	43.49	36.04	43.11	37.36	39.95	32.83	47.32	40.61	46.68	40.64	4.13	4.30	4.12	4.04	4.12	4.03	3.89	3.56	4.31	4.16	4.12	4.14
12/01/23	12/31/23	Dec 2023	43.21	36.84	43.03	38.45	39.71	33.60	46.83	41.29	46.22	41.37	4.18	4.31	4.13	4.08	4.14	4.05	3.97	3.58	4.35	4.19	4.16	4.22
01/01/24	01/31/24	Jan 2024	44.03	37.04	44.52	39.76	40.45	33.77	47.51	41.87	47.09	42.14	4.22	4.39	4.19	4.12	4.20	4.08	3.98	3.59	4.40	4.24	4.20	4.25
02/01/24	02/29/24	Feb 2024	46.27	39.13	45.05	40.21	42.83	35.84	47.19	41.49	46.93	42.31	4.19	4.34	4.11	4.06	4.14	4.01	3.92	3.57	4.34	4.17	4.14	4.19
03/01/24	03/31/24	Mar 2024	41.64	35.62	44.26	39.23	38.19	32.46	45.64	39.80	45.47	41.24	4.17	4.26	4.05	4.00	4.08	3.93	3.93	3.53	4.27	4.11	4.07	4.19
04/01/24	04/30/24	Apr 2024	40.87	34.88	42.62	38.36	37.59	31.87	44.65	38.01	45.24	40.88	4.14	4.22	4.01	3.95	4.03	3.87	3.83	3.27	4.21	4.06	4.02	4.06
05/01/24	05/31/24	May 2024	34.13	27.37	39.63	36.43	30.97	24.51	42.49	35.88	42.27	38.55	4.14	4.21	4.00	3.91	4.00	3.80	3.68	3.27	4.17	4.02	3.98	3.90
06/01/24	06/30/24	Jun 2024	38.67	29.97	42.24	36.88	35.31	26.99	45.77	38.13	45.04	39.52	4.15	4.21	4.00	3.90	3.98	3.78	3.68	3.26	4.16	4.01	3.97	3.91
07/01/24	07/31/24	Jul 2024	44.58	34.08	47.07	38.09	40.96	30.92	51.50	41.13	49.82	41.06	4.20	4.25	4.03	3.92	4.01	3.81	3.70	3.38	4.19	4.03	4.00	3.92
08/01/24	08/31/24	Aug 2024	47.98	37.36	48.49	39.19	44.22	34.06	53.89	42.52	52.16	42.48	4.22	4.34	4.14	4.05	4.12	3.96	3.88	3.42	4.31	4.16	4.12	4.11
09/01/24	09/30/24	Sep 2024	48.46	40.38	46.33	39.31	45.38	37.38	51.04	42.20	49.82	42.31	4.24	4.37	4.17	4.10	4.15	4.03	3.97	3.58	4.36	4.21	4.17	4.20
10/01/24	10/31/24	Oct 2024	45.16	37.22	46.37	39.60	41.70	33.97	50.01	40.90	48.75	42.13	4.26	4.40	4.21	4.14	4.19	4.08	4.00	3.59	4.40	4.25	4.21	4.23
11/01/24	11/30/24	Nov 2024	45.76	38.30	46.22	40.15	42.08	34.96	50.37	41.89	48.89	42.82	4.37	4.54	4.35	4.30	4.34	4.25	4.12	3.90	4.57	4.41	4.38	4.37
12/01/24	12/31/24	Dec 2024	45.88	39.17	45.62	40.74	42.22	35.79	49.83	42.43	48.43	43.40	4.44	4.54	4.35	4.29	4.35	4.24	4.06	3.87	4.56	4.40	4.36	4.32
01/01/25	01/31/25	Jan 2025	46.87	39.34	46.67	41.56	43.15	35.94	49.74	42.41	48.95	43.78	4.50	4.64	4.43	4.41	4.46	4.35	4.24	3.92	4.68	4.52	4.48	4.50
02/01/25	02/28/25	Feb 2025	49.46	41.87	47.67	42.53	45.98	38.45	49.17	42.22	49.24	44.40	4.52	4.65	4.44	4.41	4.46	4.35	4.29	3.93	4.68	4.52	4.48	4.55
03/01/25	03/31/25	Mar 2025	44.29	37.97	45.89	40.94	40.74	34.66	47.22	40.64	47.49	43.23	4.50	4.57	4.37	4.32	4.39	4.26	4.25	3.84	4.59	4.43	4.39	4.51
04/01/25	04/30/25	Apr 2025	42.99	37.03	44.20	39.99	39.60	33.86	45.89	40.03	46.54	42.35	4.43	4.53	4.34	4.26	4.34	4.19	4.12	3.51	4.53	4.37	4.34	4.35
05/01/25	05/31/25	May 2025	35.86	28.84	41.46	38.02	32.59	25.88	44.03	36.88	43.49	39.78	4.43	4.50	4.29	4.20	4.28	4.08	3.97	3.60	4.46	4.31	4.28	4.19
06/01/25	06/30/25	Jun 2025	41.56	31.67	44.74	38.72	38.04	28.58	48.50	39.26	47.17	41.02	4.46	4.52	4.32	4.20	4.26	4.02	3.93	3.60	4.47	4.31	4.28	4.15
07/01/25	07/31/25	Jul 2025	47.22	36.71	49.47	40.31	43.45	33.40	53.74	42.84	51.86	43.08	4.52	4.57	4.37	4.24	4.34	4.12	4.01	3.69	4.51	4.35	4.31	4.23
08/01/25	08/31/25	Aug 2025	51.11	40.69	51.88	42.30	47.17	37.20	57.06	44.66	55.20	45.58	4.56	4.68	4.44	4.33	4.42	4.23	4.16	3.73	4.60	4.44	4.41	4.39
09/01/25	09/30/25	Sep 2025	51.86	43.02	49.74	41.68	48.63	39.91	54.22	43.00	52.82	44.56	4.56	4.73	4.47	4.37	4.44	4.29	4.24	3.92	4.63	4.48	4.44	4.47
10/01/25	10/31/25	Oct 2025	47.62	39.27	48.92	41.73	43.95	35.89	53.12	41.89	51.42	44.58	4.53	4.74	4.46	4.35	4.43	4.29	4.20	3.87	4.62	4.47	4.43	4.43
11/01/25	11/30/25	Nov 2025	46.80	39.74	47.76	41.74	43.04	36.29	51.98	42.39	50.30	44.50	4.52	4.70	4.48	4.42	4.47	4.35	4.19	4.05	4.69	4.53	4.50	4.43
12/01/25	12/31/25	Dec 2025	48.00	40.40	48.19	42.32	44.20	36.92	51.94	42.60	50.36	44.60	4.55	4.68	4.46	4.39	4.47	4.34	4.16	3.92	4.67	4.51	4.47	4.42
01/01/26	01/31/26	Jan 2026	48.08	39.67	48.93	43.24	44.36	36.32	49.91	42.82	50.15	44.88	4.61	4.74	4.53	4.46	4.53	4.41	4.23	3.91	4.74	4.58	4.54	4.49
02/01/26	02/28/26	Feb 2026	50.69	42.36	50.59	44.68	47.28	39.08	49.10	43.13	50.66	45.87	4.62	4.77	4.54	4.49	4.56	4.44	4.25	3.91	4.77	4.60	4.57	4.52
03/01/26	03/31/26	Mar 2026	44.70	38.33	47.76	42.37	41.26	35.21	46.78	40.78	47.69	43.44	4.52	4.61	4.38	4.33	4.41	4.27	4.21	3.69	4.61	4.45	4.41	4.47
04/01/26	04/30/26	Apr 2026	43.47	37.37	46.35	41.28	40.50	34.55	45.21	39.73	46.57	42.63	4.42	4.52	4.31	4.21	4.31	4.14	4.08	3.49	4.48	4.32	4.29	4.30
05/01/26	05/31/26	May 2026	37.89	30.48	43.41	39.23	34.49	27.41	45.56	37.78	44.22	40.50	4.44	4.49	4.28	4.16	4.25	4.04	3.93	3.58	4.43	4.27	4.24	4.15
06/01/26	06/30/26	Jun 2026	42.60	32.13	46.34	39.68	38.99	28.99	49.16	38.93	47.67	41.70	4.48	4.52	4.31	4.17	4.25	3.95	3.87	3.57	4.44	4.28	4.25	4.10
07/01/26	07/31/26	Jul 2026	48.22	37.92	50.80	41.70	44.36	34.52	54.44	42.28	52.48	44.24	4.54	4.59	4.37	4.24	4.33	4.11	4.00	3.70	4.51	4.35	4.32	4.23
08/01/26	08/31/26	Aug 2026	51.33	41.27	52.39	43.21	47.36	37.72	56.53	44.40	54.85	46.01	4.58	4.74	4.46	4.35	4.42	4.25	4.17	3.77	4.61	4.46	4.42	4.40
09/01/26	09/30/26	Sep 2026	51.76	43.34	50.58	42.44	48.86	40.33	53.76	43.52	52.64	45.00	4.58	4.78	4.46	4.38	4.46	4.31	4.21	3.90	4.65	4.50	4.46	4.44
10/01/26	10/31/26	Oct 2026	48.17	39.84	49.25	42.28	44.59	36.44	52.46	42.58	51.13	44.90	4.58	4.79	4.49	4.40	4.46	4.35	4.20	3.89	4.67	4.51	4.47	4.43
11/01/26	11/30/26	Nov 2026	48.97	41.11	49.96	43.39	45.09	37.57	53.33	43.93	51.64	45.66	4.65	4.91	4.61	4.53	4.61	4.48	4.32	4.21	4.80	4.64	4.61	4.56
12/01/26	12/31/26	Dec 2026	49.21	41.43	49.84	43.91	45.50	37.93	51.91	43.71	50.81	45.53	4.70	4.83	4.59	4.56	4.62	4.49	4.32	3.93	4.83	4.67	4.63	4.58

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
9/30/2015		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
0915 Official Forward Price Curve: *Blend of...* Final September 2015 Aurora forecast 09/30/2015 forward market curve			**COB**		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
10/01/15	10/31/15	Oct 2015	28.00	23.25	27.25	21.50	24.00	21.50	36.50	28.50	35.25	28.50	2.56	2.62	2.43	2.41	2.52	2.48	2.41	2.09	2.60	2.42	2.44	2.54
11/01/15	11/30/15	Nov 2015	27.75	23.00	25.50	21.25	25.00	21.50	35.50	29.00	33.00	27.75	2.52	2.57	2.42	2.46	2.55	2.53	2.41	2.04	2.71	2.56	2.54	2.58
12/01/15	12/31/15	Dec 2015	31.75	25.75	26.50	22.25	30.00	24.75	35.50	29.25	34.25	28.50	2.70	2.80	2.64	2.66	2.72	2.69	2.89	2.11	2.92	2.77	2.74	3.08
01/01/16	01/31/16	Jan 2016	29.00	25.00	26.78	23.21	27.00	24.25	35.70	29.90	34.84	29.10	2.83	2.91	2.76	2.77	2.81	2.79	2.73	2.17	3.03	2.88	2.85	2.91
02/01/16	02/29/16	Feb 2016	27.25	23.75	26.25	22.75	25.25	22.75	34.68	29.04	34.17	28.25	2.84	2.92	2.78	2.78	2.83	2.81	2.66	2.18	3.04	2.89	2.86	2.84
03/01/16	03/31/16	Mar 2016	25.12	22.50	25.73	22.30	22.75	19.76	31.62	27.31	31.49	27.40	2.81	2.78	2.64	2.64	2.71	2.68	2.37	2.17	2.90	2.75	2.72	2.53
04/01/16	04/30/16	Apr 2016	24.10	18.98	24.98	20.79	21.37	16.10	31.68	26.00	29.59	25.70	2.69	2.61	2.48	2.44	2.55	2.53	2.20	2.06	2.69	2.54	2.51	2.35
05/01/16	05/31/16	May 2016	23.28	17.42	23.50	20.58	20.54	14.58	32.67	23.50	30.20	23.25	2.70	2.62	2.49	2.45	2.57	2.54	2.10	2.05	2.70	2.54	2.52	2.24
06/01/16	06/30/16	Jun 2016	23.06	15.35	29.10	21.63	20.34	12.00	34.65	24.00	31.72	23.79	2.73	2.66	2.52	2.49	2.60	2.58	2.17	2.06	2.74	2.58	2.56	2.32
07/01/16	07/31/16	Jul 2016	30.94	22.90	33.92	23.13	28.00	19.50	37.50	28.62	37.23	28.62	2.77	2.85	2.60	2.59	2.65	2.62	2.19	2.07	2.85	2.69	2.66	2.34
08/01/16	08/31/16	Aug 2016	32.50	25.02	32.96	25.48	29.68	22.47	38.63	30.98	37.60	30.39	2.78	2.86	2.65	2.57	2.68	2.65	2.26	2.10	2.82	2.66	2.64	2.41
09/01/16	09/30/16	Sep 2016	30.63	23.10	28.75	24.80	26.32	21.62	36.38	28.91	34.68	29.50	2.77	2.73	2.61	2.52	2.66	2.64	2.24	2.10	2.77	2.62	2.59	2.39
10/01/16	10/31/16	Oct 2016	27.75	24.24	28.05	24.50	25.53	21.86	37.87	29.93	34.50	28.98	2.80	2.76	2.59	2.58	2.64	2.62	2.26	2.14	2.83	2.67	2.65	2.42
11/01/16	11/30/16	Nov 2016	29.25	24.50	26.68	24.01	27.20	23.00	37.87	30.87	35.75	29.59	2.88	2.89	2.71	2.72	2.82	2.79	2.76	2.25	2.98	2.82	2.79	2.97
12/01/16	12/31/16	Dec 2016	32.94	26.77	27.80	24.99	30.53	24.65	39.02	33.71	37.54	32.94	3.05	3.11	2.87	2.90	3.01	2.99	3.19	2.39	3.17	3.00	2.97	3.42
01/01/17	01/31/17	Jan 2017	29.74	25.94	28.00	25.74	29.69	24.44	38.50	31.72	36.32	31.67	3.15	3.16	2.98	3.04	3.05	3.02	3.03	2.47	3.31	3.15	3.12	3.26
02/01/17	02/28/17	Feb 2017	29.17	24.70	28.00	25.00	28.31	23.97	38.25	30.81	36.21	30.75	3.15	3.13	2.97	3.00	3.05	3.02	2.82	2.47	3.26	3.10	3.07	3.03
03/01/17	03/31/17	Mar 2017	26.80	23.47	26.32	23.51	25.25	22.09	34.88	28.98	33.37	29.83	3.09	3.09	2.90	2.95	2.99	2.96	2.73	2.41	3.21	3.05	3.02	2.94
04/01/17	04/30/17	Apr 2017	25.50	21.10	25.18	21.25	24.03	18.91	31.20	26.75	30.07	26.75	2.85	2.75	2.65	2.66	2.67	2.64	2.14	2.18	2.91	2.75	2.73	2.29
05/01/17	05/31/17	May 2017	23.05	15.75	25.97	19.55	21.36	14.57	32.18	24.00	30.69	23.48	2.84	2.76	2.64	2.58	2.65	2.63	2.11	2.14	2.83	2.68	2.65	2.26
06/01/17	06/30/17	Jun 2017	23.04	15.75	28.36	20.19	21.36	12.71	33.75	24.24	32.24	23.58	2.87	2.80	2.68	2.61	2.69	2.67	2.14	2.16	2.86	2.71	2.68	2.28
07/01/17	07/31/17	Jul 2017	31.53	19.10	34.45	23.75	27.45	16.97	38.15	29.59	37.24	30.07	2.91	3.05	2.73	2.68	2.78	2.75	2.31	2.17	2.93	2.78	2.75	2.47
08/01/17	08/31/17	Aug 2017	33.80	27.40	33.80	26.00	32.94	21.75	39.40	32.03	38.11	31.93	2.93	3.03	2.77	2.70	2.81	2.79	2.33	2.18	2.95	2.80	2.77	2.49
09/01/17	09/30/17	Sep 2017	32.18	27.00	29.25	25.50	31.11	26.54	37.10	29.89	35.15	31.00	2.92	2.87	2.75	2.69	2.82	2.79	2.34	2.21	2.94	2.79	2.76	2.50
10/01/17	10/31/17	Oct 2017	29.99	25.44	29.07	25.85	28.26	22.05	38.12	30.64	34.44	30.88	2.95	2.86	2.74	2.71	2.83	2.80	2.39	2.24	2.96	2.81	2.78	2.55
11/01/17	11/30/17	Nov 2017	31.93	25.97	27.65	25.33	29.45	25.48	38.12	31.61	36.25	31.53	3.02	3.09	2.88	2.94	2.98	2.95	2.99	2.42	3.20	3.04	3.02	3.21
12/01/17	12/31/17	Dec 2017	34.83	28.09	28.79	26.37	31.54	25.97	39.27	34.51	38.06	35.10	3.18	3.25	3.07	3.13	3.15	3.12	3.31	2.52	3.39	3.23	3.20	3.55
01/01/18	01/31/18	Jan 2018	31.59	27.29	30.32	27.04	31.54	26.69	40.03	33.07	37.67	32.97	3.29	3.36	3.17	3.19	3.23	3.20	3.27	2.62	3.45	3.29	3.26	3.51
02/01/18	02/28/18	Feb 2018	31.02	26.05	29.76	26.30	30.16	26.22	38.90	32.16	36.96	32.05	3.27	3.33	3.14	3.17	3.21	3.18	3.05	2.60	3.43	3.28	3.25	3.28
03/01/18	03/31/18	Mar 2018	28.73	24.82	27.52	24.81	27.10	24.34	35.53	30.33	34.12	31.13	3.21	3.28	3.09	3.11	3.15	3.12	2.99	2.53	3.37	3.21	3.18	3.21
04/01/18	04/30/18	Apr 2018	28.01	23.03	26.38	24.51	25.28	19.16	31.85	29.38	30.82	30.09	2.89	2.92	2.76	2.74	2.72	2.69	2.31	2.26	2.98	2.84	2.81	2.47
05/01/18	05/31/18	May 2018	24.65	16.03	27.17	20.05	22.61	14.82	32.83	24.83	31.44	24.78	2.88	2.93	2.74	2.66	2.72	2.69	2.26	2.20	2.90	2.76	2.74	2.42
06/01/18	06/30/18	Jun 2018	24.89	17.00	29.56	20.69	22.61	12.96	34.78	25.59	32.99	24.78	2.92	2.98	2.78	2.70	2.75	2.73	2.26	2.21	2.94	2.79	2.77	2.42
07/01/18	07/31/18	Jul 2018	33.38	20.86	35.65	25.05	29.30	17.12	38.90	30.94	38.49	31.37	2.95	3.23	2.82	2.75	2.84	2.82	2.47	2.22	3.00	2.85	2.83	2.64
08/01/18	08/31/18	Aug 2018	35.65	25.12	35.00	27.30	34.79	21.90	40.05	33.38	38.86	33.23	2.97	3.26	2.87	2.77	2.87	2.84	2.48	2.23	3.01	2.87	2.84	2.65
09/01/18	09/30/18	Sep 2018	34.03	24.50	30.45	26.80	32.96	26.69	37.75	31.24	35.90	32.30	2.96	3.05	2.84	2.76	2.86	2.83	2.50	2.26	3.00	2.86	2.83	2.67
10/01/18	10/31/18	Oct 2018	31.84	26.79	29.77	23.35	30.11	24.15	38.77	31.99	35.19	32.18	2.98	2.99	2.84	2.79	2.88	2.85	2.52	2.27	3.03	2.88	2.86	2.69
11/01/18	11/30/18	Nov 2018	33.78	27.32	28.35	22.83	31.30	27.58	38.77	32.96	37.00	32.83	3.06	3.21	2.94	2.99	3.09	3.06	3.15	2.50	3.24	3.09	3.06	3.39
12/01/18	12/31/18	Dec 2018	36.68	29.44	29.49	23.87	33.39	28.07	39.92	35.86	38.81	36.40	3.21	3.35	3.13	3.19	3.26	3.23	3.52	2.62	3.44	3.29	3.26	3.77
01/01/19	01/31/19	Jan 2019	32.84	30.00	30.75	28.19	32.79	27.94	41.03	33.97	38.57	33.30	3.33	3.50	3.23	3.31	3.31	3.28	3.42	2.73	3.57	3.41	3.38	3.67
02/01/19	02/28/19	Feb 2019	32.27	28.90	30.75	27.45	31.41	27.47	39.90	33.06	37.86	32.50	3.31	3.45	3.22	3.29	3.29	3.26	3.22	2.71	3.56	3.40	3.37	3.46
03/01/19	03/31/19	Mar 2019	29.98	27.50	28.25	25.96	28.35	25.59	36.53	31.23	35.02	31.50	3.25	3.41	3.16	3.24	3.23	3.20	3.16	2.65	3.50	3.34	3.31	3.39
04/01/19	04/30/19	Apr 2019	29.26	24.48	28.25	25.66	26.53	20.41	32.85	29.00	31.72	30.00	2.95	3.10	2.86	2.89	2.88	2.85	2.52	2.42	3.14	2.99	2.96	2.69
05/01/19	05/31/19	May 2019	25.90	17.48	28.75	21.20	23.86	16.07	33.83	24.50	32.34	24.68	2.95	3.13	2.84	2.82	2.87	2.84	2.48	2.37	3.06	2.91	2.89	2.65
06/01/19	06/30/19	Jun 2019	26.14	18.35	31.00	21.84	23.86	14.21	35.78	25.25	33.89	24.50	2.98	3.16	2.88	2.85	2.91	2.88	2.47	2.37	3.09	2.95	2.92	2.64
07/01/19	07/31/19	Jul 2019	34.63	22.11	36.80	26.20	30.55	18.37	39.90	30.84	39.39	32.27	3.02	3.41	2.92	2.91	3.00	2.97	2.65	2.36	3.15	3.01	2.98	2.83
08/01/19	08/31/19	Aug 2019	36.90	26.25	36.15	28.45	36.04	23.15	41.05	33.24	39.76	34.13	3.03	3.42	2.97	2.92	3.02	3.00	2.67	2.38	3.17	3.02	2.99	2.85
09/01/19	09/30/19	Sep 2019	35.28	27.50	31.60	27.95	34.21	27.94	38.75	31.00	36.80	33.20	3.02	3.23	2.94	2.91	3.02	2.99	2.69	2.40	3.16	3.01	2.98	2.87
10/01/19	10/31/19	Oct 2019	33.09	28.55	30.92	26.75	31.36	26.00	39.77	32.89	36.09	32.00	3.05	3.15	2.94	2.94	3.04	3.01	2.71	2.42	3.18	3.04	3.01	2.89
11/01/19	11/30/19	Nov 2019	35.03	29.50	29.50	26.25	32.55	29.25	39.77	33.86	37.90	32.50	3.13	3.37	3.05	3.09	3.18	3.15	3.25	2.58	3.34	3.19	3.16	3.49
12/01/19	12/31/19	Dec 2019	37.93	30.75	30.64	27.25	34.64	29.75	40.92	36.76	39.71	35.10	3.30	3.59	3.26	3.30	3.37	3.35	3.61	2.74	3.56	3.41	3.38	3.88
01/01/20	01/31/20	Jan 2020	35.49	31.80	33.75	30.10	35.44	32.50	42.83	35.37	40.37	35.17	3.42	3.71	3.37	3.41	3.44	3.41	3.55	2.84	3.68	3.52	3.49	3.81
02/01/20	02/29/20	Feb 2020	34.92	30.75	33.00	29.40	34.06	31.80	41.70	34.46	39.66	34.25	3.40	3.68	3.35	3.40	3.43	3.40	3.34	2.84	3.67	3.51	3.48	3.59
03/01/20	03/31/20	Mar 2020	32.63	29.50	30.75	27.90	31.00	30.40	38.33	32.63	36.82	33.33	3.35	3.64	3.30	3.34	3.37	3.34	3.31	2.80	3.61	3.45	3.42	3.55
04/01/20	04/30/20	Apr 2020	31.75	23.75	30.53	27.20	29.18	19.66	34.65	30.68	33.75	32.29	3.06	3.27	2.99	3.05	3.05	3.02	2.59	2.58	3.30	3.15	3.12	2.79
05/01/20	05/31/20	May 2020	28.25	18.00	31.32	22.80	26.51	15.48	35.63	26.13	34.50	26.98	3.06	3.37	2.98	2.98	3.05	3.02	2.54	2.52	3.23	3.08	3.05	2.73
06/01/20	06/30/20	Jun 2020	28.50	19.25	33.71	23.25	26.51	13.15	37.58	26.89	36.00	26.98	3.08	3.41	3.02	3.00	3.08	3.05	2.54	2.52	3.25	3.11	3.08	2.73
07/01/20	07/31/20	Jul 2020	37.28	23.50	39.80	26.00	33.20	20.62	41.70	33.00	41.19	33.20	3.11	3.59	3.05	3.05	3.15	3.13	2.73	2.53	3.31	3.16	3.13	2.94
08/01/20	08/31/20	Aug 2020	39.55	31.50	39.15	28.50	38.69	25.40	42.85	35.25	41.56	35.00	3.14	3.60	3.11	3.08	3.20	3.17	2.72	2.52	3.33	3.18	3.15	2.92
09/01/20	09/30/20	Sep 2020	37.93	31.50	34.60	28.25	36.86	30.19	40.55	33.25	38.60	34.25	3.13	3.41	3.08	3.07	3.20	3.17	2.78	2.58	3.33	3.18	3.15	2.99
10/01/20	10/31/20	Oct 2020	35.74	30.29	33.92	26.50	34.01	28.75	41.57	34.29	37.89	34.38	3.16	3.36	3.09	3.10	3.22	3.19	2.79	2.59	3.36	3.21	3.18	3.00
11/01/20	11/30/20	Nov 2020	37.68	30.82	32.50	25.98	35.20	32.18	41.57	35.26	39.70	35.03	3.24	3.53	3.16	3.22	3.33	3.30	3.29	2.79	3.48	3.33	3.29	3.53
12/01/20	12/31/20	Dec 2020	40.58	32.94	33.64	27.02	37.29	32.67	42.72	38.16	41.51	38.60	3.42	3.74	3.37	3.44	3.54	3.51	3.68	2.95	3.70	3.55	3.51	3.94

01/01/21	01/31/21	Jan 2021	37.49	32.29	36.47	31.69	37.44	31.69	44.58	36.37	42.12	36.17	3.55	3.89	3.49	3.56	3.60	3.57	3.63	3.09	3.83	3.67	3.64	3.89
02/01/21	02/28/21	Feb 2021	36.92	31.05	35.91	30.95	36.06	31.22	43.45	35.46	41.41	35.25	3.53	3.86	3.48	3.55	3.58	3.55	3.44	3.08	3.82	3.66	3.63	3.69
03/01/21	03/31/21	Mar 2021	34.63	29.82	33.67	29.46	33.00	29.34	40.08	33.63	38.57	34.33	3.47	3.80	3.42	3.49	3.52	3.49	3.40	3.04	3.76	3.60	3.57	3.65
04/01/21	04/30/21	Apr 2021	33.91	28.23	32.53	29.16	31.18	24.16	36.40	32.68	35.27	33.29	3.19	3.45	3.11	3.22	3.18	3.15	2.78	2.84	3.48	3.33	3.30	2.99
05/01/21	05/31/21	May 2021	30.55	21.23	33.32	24.70	28.51	19.82	37.38	28.13	35.89	27.98	3.18	3.49	3.10	3.15	3.17	3.15	2.74	2.78	3.41	3.26	3.23	2.94
06/01/21	06/30/21	Jun 2021	30.79	22.10	35.71	25.34	28.51	17.96	39.33	28.89	37.44	27.98	3.21	3.52	3.13	3.18	3.21	3.18	2.74	2.79	3.44	3.29	3.26	2.95
07/01/21	07/31/21	Jul 2021	39.28	25.86	41.80	29.70	35.20	22.12	43.45	34.24	42.94	34.57	3.25	3.78	3.18	3.24	3.29	3.26	2.95	2.81	3.50	3.35	3.32	3.17
08/01/21	08/31/21	Aug 2021	41.55	33.52	41.15	31.95	40.69	26.90	44.60	36.68	43.31	36.43	3.28	3.80	3.24	3.27	3.34	3.31	2.93	2.80	3.53	3.38	3.35	3.15
09/01/21	09/30/21	Sep 2021	39.93	33.77	36.60	31.45	38.86	31.69	42.30	34.54	40.35	35.50	3.28	3.62	3.22	3.27	3.35	3.32	2.97	2.84	3.53	3.38	3.35	3.19
10/01/21	10/31/21	Oct 2021	37.74	31.79	35.92	28.00	36.01	29.15	43.32	35.29	39.64	35.38	3.32	3.55	3.24	3.31	3.38	3.35	3.02	2.89	3.57	3.42	3.39	3.24
11/01/21	11/30/21	Nov 2021	39.39	32.62	36.88	30.91	36.45	31.75	43.77	37.05	42.49	37.14	3.62	3.85	3.57	3.56	3.65	3.58	3.51	2.99	3.83	3.67	3.64	3.75
12/01/21	12/31/21	Dec 2021	40.90	33.99	37.29	31.74	37.55	32.29	44.00	38.60	43.13	39.15	3.74	3.96	3.68	3.67	3.76	3.69	3.69	3.08	3.94	3.78	3.74	3.95
01/01/22	01/31/22	Jan 2022	39.66	33.87	39.56	34.96	37.90	31.99	45.40	38.71	44.00	38.65	3.84	4.10	3.80	3.81	3.86	3.79	3.74	3.15	4.09	3.93	3.89	4.00
02/01/22	02/28/22	Feb 2022	40.52	34.28	39.92	35.07	38.34	32.74	45.09	38.27	44.02	38.59	3.85	4.10	3.81	3.83	3.87	3.80	3.68	3.17	4.10	3.94	3.90	3.94
03/01/22	03/31/22	Mar 2022	36.94	31.90	38.21	33.73	34.45	30.10	42.59	36.59	41.82	37.59	3.80	4.03	3.73	3.74	3.80	3.72	3.65	3.13	4.02	3.86	3.82	3.92
04/01/22	04/30/22	Apr 2022	35.93	30.52	36.52	33.03	32.94	27.00	39.68	34.79	39.42	36.54	3.58	3.76	3.49	3.50	3.53	3.44	3.24	2.91	3.77	3.61	3.58	3.47
05/01/22	05/31/22	May 2022	32.01	23.93	35.86	29.93	29.44	21.83	39.61	31.80	38.76	32.80	3.58	3.78	3.48	3.46	3.52	3.42	3.16	2.92	3.73	3.57	3.54	3.39
06/01/22	06/30/22	Jun 2022	34.50	25.48	38.73	30.43	31.71	21.96	42.56	33.12	41.23	33.14	3.61	3.81	3.51	3.46	3.54	3.43	3.16	2.93	3.73	3.58	3.54	3.39
07/01/22	07/31/22	Jul 2022	40.83	29.22	43.62	33.47	37.05	25.82	46.80	37.27	45.84	37.37	3.65	3.95	3.55	3.51	3.60	3.49	3.29	2.94	3.78	3.62	3.58	3.51
08/01/22	08/31/22	Aug 2022	43.45	34.15	43.84	34.78	41.21	29.27	48.41	38.87	46.93	38.70	3.67	3.99	3.62	3.58	3.66	3.57	3.34	2.95	3.85	3.69	3.65	3.57
09/01/22	09/30/22	Sep 2022	42.57	35.67	39.73	34.16	40.55	33.18	45.24	37.38	43.71	37.86	3.67	3.91	3.61	3.59	3.66	3.59	3.38	3.08	3.86	3.70	3.67	3.62
10/01/22	10/31/22	Oct 2022	40.04	33.52	38.80	32.47	37.49	30.63	44.91	37.74	42.81	37.90	3.68	3.87	3.61	3.61	3.68	3.61	3.40	3.10	3.88	3.72	3.69	3.63
11/01/22	11/30/22	Nov 2022	41.10	34.43	41.27	35.83	37.71	31.33	45.98	38.85	45.28	39.26	4.00	4.18	3.98	3.90	3.97	3.86	3.73	3.19	4.17	4.01	3.98	3.98
12/01/22	12/31/22	Dec 2022	41.22	35.04	40.94	36.45	37.82	31.91	45.27	39.04	44.74	39.70	4.06	4.18	3.98	3.90	3.98	3.88	3.71	3.22	4.17	4.01	3.98	3.96
01/01/23	01/31/23	Jan 2023	41.82	35.46	42.66	38.23	38.35	32.29	46.23	41.04	45.87	41.13	4.14	4.31	4.10	4.07	4.13	4.02	3.85	3.21	4.35	4.18	4.14	4.11
02/01/23	02/28/23	Feb 2023	44.13	37.51	43.93	39.19	40.63	34.26	46.74	41.09	46.62	41.93	4.17	4.35	4.14	4.10	4.17	4.05	3.92	3.27	4.38	4.22	4.18	4.18
03/01/23	03/31/23	Mar 2023	39.25	33.98	42.75	38.01	35.91	30.87	45.10	39.56	45.08	40.86	4.12	4.25	4.04	3.99	4.07	3.94	3.91	3.21	4.27	4.11	4.07	4.17
04/01/23	04/30/23	Apr 2023	37.95	32.81	40.52	36.90	34.70	29.84	42.96	36.91	43.57	39.79	3.97	4.07	3.87	3.78	3.87	3.74	3.70	2.99	4.05	3.89	3.86	3.92
05/01/23	05/31/23	May 2023	33.46	26.64	38.40	35.16	30.37	23.85	41.84	35.47	41.62	37.63	3.98	4.07	3.87	3.77	3.87	3.70	3.59	3.06	4.04	3.88	3.85	3.81
06/01/23	06/30/23	Jun 2023	38.22	28.85	41.76	35.53	34.91	25.96	45.80	37.35	45.02	38.31	4.01	4.09	3.88	3.75	3.87	3.69	3.59	3.06	4.02	3.86	3.82	3.81
07/01/23	07/31/23	Jul 2023	42.38	32.58	45.44	37.25	38.90	29.53	50.15	40.30	48.74	40.17	4.04	4.12	3.92	3.77	3.91	3.71	3.62	3.07	4.04	3.88	3.85	3.85
08/01/23	08/31/23	Aug 2023	45.34	34.79	46.53	37.60	41.73	31.64	52.22	41.06	50.55	40.96	4.07	4.18	3.99	3.88	3.97	3.82	3.75	3.10	4.15	3.99	3.96	3.98
09/01/23	09/30/23	Sep 2023	45.22	37.57	42.87	36.86	42.25	34.68	48.17	40.23	47.08	40.22	4.07	4.20	3.99	3.91	3.98	3.87	3.80	3.33	4.18	4.02	3.98	4.03
10/01/23	10/31/23	Oct 2023	42.34	35.25	41.69	36.94	38.96	32.10	46.50	40.18	45.99	40.43	4.04	4.19	3.99	3.91	3.98	3.87	3.77	3.32	4.18	4.02	3.98	4.01
11/01/23	11/30/23	Nov 2023	43.49	36.04	43.11	37.36	39.95	32.83	47.32	40.61	46.68	40.64	4.13	4.30	4.12	4.04	4.12	4.03	3.89	3.56	4.31	4.15	4.12	4.14
12/01/23	12/31/23	Dec 2023	43.21	36.84	43.03	38.45	39.71	33.60	46.83	41.29	46.22	41.37	4.18	4.31	4.13	4.08	4.14	4.05	3.97	3.58	4.35	4.19	4.16	4.23
01/01/24	01/31/24	Jan 2024	44.03	37.04	44.52	39.76	40.45	33.77	47.51	41.87	47.09	42.14	4.22	4.39	4.19	4.12	4.20	4.08	3.98	3.59	4.40	4.24	4.20	4.25
02/01/24	02/29/24	Feb 2024	46.27	39.13	45.05	40.21	42.83	35.84	47.19	41.49	46.93	42.31	4.19	4.34	4.11	4.06	4.14	4.01	3.92	3.57	4.34	4.18	4.14	4.19
03/01/24	03/31/24	Mar 2024	41.64	35.62	44.26	39.23	38.19	32.46	45.64	39.80	45.47	41.24	4.17	4.26	4.05	4.00	4.08	3.93	3.93	3.53	4.27	4.11	4.07	4.19
04/01/24	04/30/24	Apr 2024	40.87	34.88	42.62	38.36	37.59	31.87	44.65	38.01	45.24	40.88	4.14	4.22	4.01	3.95	4.03	3.87	3.83	3.27	4.21	4.06	4.02	4.06
05/01/24	05/31/24	May 2024	34.13	27.37	39.63	36.43	30.97	24.51	42.49	35.88	42.27	38.55	4.14	4.21	4.00	3.91	4.00	3.80	3.68	3.27	4.18	4.02	3.99	3.91
06/01/24	06/30/24	Jun 2024	38.67	29.97	42.24	36.88	35.31	26.99	45.77	38.13	45.04	39.52	4.15	4.21	4.00	3.90	3.98	3.78	3.68	3.26	4.16	4.01	3.97	3.91
07/01/24	07/31/24	Jul 2024	44.58	34.08	47.07	38.09	40.96	30.92	51.50	41.13	49.82	41.06	4.20	4.25	4.03	3.92	4.01	3.81	3.70	3.38	4.19	4.03	4.00	3.92
08/01/24	08/31/24	Aug 2024	47.98	37.36	48.49	39.19	44.22	34.06	53.89	42.52	52.16	42.48	4.22	4.34	4.14	4.05	4.12	3.96	3.88	3.42	4.32	4.16	4.12	4.11
09/01/24	09/30/24	Sep 2024	48.46	40.38	46.33	39.31	45.38	37.38	51.04	42.20	49.82	42.31	4.24	4.37	4.17	4.10	4.15	4.03	3.97	3.58	4.37	4.21	4.17	4.20
10/01/24	10/31/24	Oct 2024	45.16	37.22	46.37	39.60	41.70	33.97	50.01	40.90	48.75	42.13	4.26	4.40	4.21	4.14	4.19	4.08	4.00	3.59	4.41	4.25	4.21	4.23
11/01/24	11/30/24	Nov 2024	45.76	38.30	46.22	40.15	42.08	34.96	50.37	41.89	48.89	42.82	4.37	4.54	4.35	4.30	4.34	4.25	4.12	3.90	4.57	4.41	4.37	4.37
12/01/24	12/31/24	Dec 2024	45.88	39.17	45.62	40.74	42.22	35.79	49.83	42.43	48.43	43.40	4.44	4.54	4.35	4.29	4.35	4.24	4.06	3.87	4.56	4.40	4.36	4.32
01/01/25	01/31/25	Jan 2025	46.87	39.34	46.67	41.56	43.15	35.94	49.74	42.41	48.95	43.78	4.50	4.64	4.43	4.41	4.46	4.35	4.24	3.92	4.68	4.52	4.48	4.50
02/01/25	02/28/25	Feb 2025	49.46	41.87	47.67	42.53	45.98	38.45	49.17	42.22	49.24	44.40	4.52	4.65	4.44	4.41	4.46	4.35	4.29	3.93	4.68	4.52	4.48	4.55
03/01/25	03/31/25	Mar 2025	44.29	37.97	45.89	40.94	40.74	34.66	47.22	40.64	47.49	43.23	4.50	4.57	4.37	4.32	4.39	4.26	4.25	3.84	4.59	4.43	4.39	4.51
04/01/25	04/30/25	Apr 2025	42.99	37.03	44.20	39.99	39.60	33.86	45.89	40.03	46.54	42.35	4.43	4.53	4.34	4.26	4.34	4.19	4.12	3.51	4.53	4.38	4.34	4.35
05/01/25	05/31/25	May 2025	35.86	28.84	41.46	38.02	32.59	25.88	44.03	36.88	43.49	39.78	4.43	4.50	4.29	4.20	4.28	4.08	3.97	3.60	4.47	4.31	4.28	4.19
06/01/25	06/30/25	Jun 2025	41.56	31.67	44.74	38.72	38.04	28.58	48.50	39.26	47.17	41.02	4.46	4.52	4.32	4.20	4.26	4.02	3.93	3.60	4.47	4.31	4.28	4.16
07/01/25	07/31/25	Jul 2025	47.22	36.71	49.47	40.31	43.45	33.40	53.74	42.84	51.86	43.08	4.52	4.57	4.37	4.24	4.34	4.12	4.01	3.69	4.51	4.35	4.32	4.24
08/01/25	08/31/25	Aug 2025	51.11	40.69	51.88	42.30	47.17	37.20	57.06	44.66	55.20	45.58	4.56	4.68	4.44	4.33	4.42	4.23	4.16	3.73	4.60	4.44	4.41	4.39
09/01/25	09/30/25	Sep 2025	51.86	43.02	49.74	41.68	48.63	39.91	54.22	43.00	52.82	44.56	4.56	4.73	4.47	4.37	4.44	4.29	4.24	3.92	4.64	4.48	4.44	4.47
10/01/25	10/31/25	Oct 2025	47.62	39.27	48.92	41.73	43.95	35.89	53.12	41.89	51.42	44.58	4.53	4.74	4.46	4.35	4.43	4.29	4.20	3.87	4.63	4.47	4.43	4.43
11/01/25	11/30/25	Nov 2025	46.80	39.74	47.76	41.74	43.04	36.29	51.98	42.39	50.30	44.50	4.52	4.70	4.48	4.42	4.47	4.35	4.19	4.05	4.69	4.53	4.50	4.43
12/01/25	12/31/25	Dec 2025	48.00	40.40	48.19	42.32	44.20	36.92	51.94	42.60	50.36	44.60	4.55	4.68	4.46	4.39	4.47	4.34	4.16	3.92	4.67	4.51	4.47	4.42
01/01/26	01/31/26	Jan 2026	48.08	39.67	48.93	43.24	44.36	36.32	49.91	42.82	50.15	44.88	4.61	4.74	4.53	4.46	4.53	4.41	4.23	3.91	4.74	4.58	4.54	4.49
02/01/26	02/28/26	Feb 2026	50.69	42.36	50.59	44.68	47.28	39.08	49.10	43.13	50.66	45.87	4.62	4.77	4.54	4.49	4.56	4.44	4.25	3.91	4.77	4.61	4.57	4.52
03/01/26	03/31/26	Mar 2026	44.70	38.33	47.76	42.37	41.26	35.21	46.78	40.78	47.69	43.44	4.52	4.61	4.38	4.33	4.41	4.27	4.21	3.69	4.61	4.45	4.41	4.47
04/01/26	04/30/26	Apr 2026	43.47	37.37	46.35	41.28	40.50	34.55	45.21	39.73	46.57	42.63	4.42	4.52	4.31	4.21	4.31	4.14	4.08	3.49	4.48	4.32	4.29	4.31
05/01/26	05/31/26	May 2026	37.89	30.48	43.41	39.23	34.49	27.41	45.56	37.78	44.22	40.50	4.44	4.49	4.28	4.16	4.25	4.04	3.93	3.58	4.43	4.27	4.24	4.15
06/01/26	06/30/26	Jun 2026	42.60	32.13	46.34	39.68	38.99	28.99	49.16	38.93	47.67	41.70	4.48	4.52	4.31	4.17	4.25	3.95	3.87	3.57	4.44	4.29	4.25	4.10
07/01/26	07/31/26	Jul 2026	48.22	37.92	50.80	41.70	44.36	34.52	54.44	42.28	52.48	44.24	4.54	4.59	4.37	4.24	4.33	4.11	4.00	3.70	4.51	4.35	4.32	4.23
08/01/26	08/31/26	Aug 2026	51.33	41.27	52.39	43.21	47.36	37.72	56.53	44.40	54.85	46.01	4.58	4.74	4.46	4.35	4.42	4.25	4.17	3.77	4.62	4.46	4.42	4.41
09/01/26	09/30/26	Sep 2026	51.76	43.34	50.58	42.44	48.86	40.33	53.76	43.52	52.64	45.00	4.58	4.78	4.46	4.38	4.46	4.31	4.21	3.90	4.66	4.50	4.46	4.44
10/01/26	10/31/26	Oct 2026	48.17	39.84	49.25	42.28	44.59	36.44	52.46	42.58	51.13	44.90	4.58	4.79	4.49	4.40	4.46	4.35	4.20	3.89	4.67	4.51	4.47	4.43
11/01/26	11/30/26	Nov 2026	48.97	41.11	49.96	43.39	45.09	37.57	53.33	43.93	51.64	45.66	4.65	4.91	4.61	4.53	4.61	4.48	4.32	4.21	4.80	4.64	4.61	4.56
12/01/26	12/31/26	Dec 2026	49.21	41.43	49.84	43.91	45.50	37.93	51.91	43.71	50.81	45.53	4.70	4.83	4.59	4.56	4.62	4.49	4.32	3.93	4.83	4.67	4.63	4.58
01/01/27	01/31/27	Jan 2027	49.39	41.05	50.94	44.85	45.65	37.97	51.89	45.12	51.84	46.32	4.76	4.91	4.70	4.64	4.71	4.58	4.40	3.92	4.92	4.76	4.72	4.67

02/01/27	02/28/27	Feb 2027	51.78	42.35	52.68	46.07	48.67	40.38	50.82	44.76	52.24	46.98	4.76	4.91	4.68	4.64	4.71	4.58	4.40	3.90	4.92	4.76	4.72	4.67
03/01/27	03/31/27	Mar 2027	46.33	38.43	50.23	44.03	43.63	36.61	49.03	43.13	49.71	45.05	4.72	4.82	4.60	4.53	4.63	4.48	4.43	3.84	4.81	4.65	4.61	4.69
04/01/27	04/30/27	Apr 2027	44.22	38.45	47.69	42.65	41.81	35.79	46.97	41.77	47.80	43.94	4.62	4.70	4.48	4.40	4.48	4.32	4.25	3.68	4.67	4.51	4.48	4.48
05/01/27	05/31/27	May 2027	38.39	31.11	44.67	40.49	34.93	27.97	46.26	38.67	44.92	41.51	4.62	4.66	4.45	4.35	4.44	4.25	4.17	3.72	4.61	4.46	4.42	4.40
06/01/27	06/30/27	Jun 2027	44.47	33.82	48.55	41.21	40.74	30.57	51.13	40.65	49.17	43.15	4.64	4.67	4.45	4.33	4.44	4.21	4.12	3.74	4.60	4.44	4.41	4.35
07/01/27	07/31/27	Jul 2027	49.71	39.39	52.81	43.39	45.75	35.88	56.10	43.91	53.86	45.84	4.72	4.78	4.53	4.40	4.51	4.29	4.23	3.89	4.67	4.51	4.48	4.45
08/01/27	08/31/27	Aug 2027	52.99	42.56	54.29	44.78	48.92	38.92	58.08	45.52	56.25	47.42	4.76	4.87	4.60	4.48	4.59	4.40	4.32	3.94	4.75	4.59	4.56	4.55
09/01/27	09/30/27	Sep 2027	53.37	45.04	52.52	44.83	50.87	42.36	55.36	45.18	53.93	47.08	4.79	4.95	4.66	4.55	4.64	4.47	4.43	4.27	4.82	4.66	4.63	4.66
10/01/27	10/31/27	Oct 2027	51.30	41.97	53.35	46.00	48.19	39.43	55.46	45.68	54.20	47.83	4.84	5.09	4.76	4.68	4.75	4.63	4.62	4.32	4.95	4.80	4.76	4.85
11/01/27	11/30/27	Nov 2027	53.48	43.87	53.76	45.93	49.65	40.44	56.62	46.87	54.79	47.83	4.95	5.22	4.94	4.84	4.94	4.84	4.75	4.62	5.11	4.95	4.92	5.00
12/01/27	12/31/27	Dec 2027	52.14	43.14	52.93	46.54	48.68	40.05	54.71	46.89	53.77	48.12	4.99	5.17	4.94	4.87	4.95	4.83	4.83	4.43	5.14	4.98	4.95	5.09
01/01/28	01/31/28	Jan 2028	53.08	44.64	53.57	47.63	49.52	41.43	55.21	47.44	54.19	49.12	5.10	5.27	5.03	5.00	5.06	4.94	4.98	4.55	5.28	5.12	5.08	5.24
02/01/28	02/29/28	Feb 2028	55.82	45.92	55.00	48.93	53.17	44.21	53.60	47.15	54.45	49.57	5.09	5.24	5.00	4.98	5.05	4.91	4.96	4.51	5.26	5.09	5.06	5.23
03/01/28	03/31/28	Mar 2028	49.42	41.46	52.05	46.36	46.77	39.39	51.85	45.07	51.83	47.65	5.09	5.16	4.94	4.92	5.00	4.85	4.84	4.40	5.20	5.04	5.00	5.10
04/01/28	04/30/28	Apr 2028	47.71	41.98	49.62	45.12	45.15	38.89	49.72	44.19	49.74	46.59	5.03	5.10	4.88	4.83	4.91	4.74	4.77	4.29	5.09	4.94	4.90	5.00
05/01/28	05/31/28	May 2028	42.43	33.55	48.27	43.09	38.76	30.26	50.43	41.34	48.16	44.14	5.06	5.07	4.85	4.79	4.88	4.68	4.62	4.33	5.05	4.90	4.86	4.85
06/01/28	06/30/28	Jun 2028	48.01	36.95	51.90	44.22	44.09	33.52	54.84	43.92	52.34	45.98	5.09	5.10	4.88	4.76	4.87	4.63	4.63	4.36	5.03	4.87	4.83	4.86
07/01/28	07/31/28	Jul 2028	53.60	42.98	56.37	46.51	49.43	39.28	59.82	47.72	56.99	48.94	5.16	5.17	4.95	4.81	4.94	4.70	4.70	4.47	5.08	4.92	4.89	4.93
08/01/28	08/31/28	Aug 2028	56.70	45.76	57.80	47.04	52.52	41.98	62.06	48.51	59.38	49.75	5.18	5.28	5.02	4.91	5.00	4.84	4.87	4.48	5.18	5.02	4.99	5.10
09/01/28	09/30/28	Sep 2028	56.12	48.47	55.14	48.25	53.92	45.80	57.68	48.40	55.95	50.06	5.20	5.33	5.05	4.98	5.06	4.91	4.94	4.73	5.25	5.09	5.05	5.17
10/01/28	10/31/28	Oct 2028	54.51	45.02	55.01	47.92	51.31	42.41	57.84	47.67	56.16	50.07	5.21	5.39	5.10	5.05	5.11	4.99	4.99	4.76	5.32	5.16	5.12	5.22
11/01/28	11/30/28	Nov 2028	55.67	46.36	55.24	47.90	51.72	42.74	58.80	48.78	56.46	49.68	5.24	5.44	5.22	5.13	5.22	5.13	5.16	4.91	5.40	5.24	5.20	5.40
12/01/28	12/31/28	Dec 2028	54.52	46.81	55.17	49.16	50.92	43.58	57.33	49.34	55.81	50.77	5.29	5.46	5.22	5.18	5.24	5.11	5.16	4.83	5.46	5.30	5.26	5.41
01/01/29	01/31/29	Jan 2029	55.93	47.18	56.14	49.62	52.49	43.83	57.15	49.61	56.31	50.90	5.37	5.55	5.31	5.33	5.38	5.28	5.30	4.89	5.60	5.44	5.40	5.56
02/01/29	02/28/29	Feb 2029	58.44	49.13	57.58	51.55	56.57	46.97	56.49	49.56	56.66	51.74	5.41	5.56	5.34	5.34	5.40	5.28	5.33	4.90	5.62	5.45	5.42	5.59
03/01/29	03/31/29	Mar 2029	52.58	44.63	54.38	49.07	50.00	42.37	53.77	47.38	53.36	49.84	5.37	5.47	5.24	5.26	5.33	5.20	5.24	4.75	5.53	5.37	5.33	5.50
04/01/29	04/30/29	Apr 2029	50.54	44.98	51.97	47.90	48.79	42.22	51.61	46.32	50.92	48.80	5.31	5.40	5.17	5.12	5.20	5.05	5.09	4.58	5.38	5.23	5.19	5.31
05/01/29	05/31/29	May 2029	45.69	36.71	50.76	45.45	41.93	33.25	52.59	43.91	50.14	46.41	5.33	5.35	5.13	5.06	5.17	4.96	4.92	4.68	5.33	5.17	5.14	5.14
06/01/29	06/30/29	Jun 2029	48.37	37.84	52.70	45.78	44.39	34.34	54.84	44.71	52.46	46.95	5.30	5.33	5.10	4.99	5.10	4.88	4.88	4.62	5.26	5.10	5.07	5.10
07/01/29	07/31/29	Jul 2029	54.82	44.38	57.75	48.34	50.57	40.58	60.67	48.60	57.75	50.12	5.31	5.33	5.10	4.96	5.09	4.88	4.85	4.62	5.23	5.07	5.04	5.08
08/01/29	08/31/29	Aug 2029	58.55	47.63	59.51	48.77	54.33	43.73	63.13	49.63	60.34	51.03	5.30	5.38	5.12	5.02	5.12	4.95	4.99	4.62	5.29	5.13	5.09	5.22
09/01/29	09/30/29	Sep 2029	57.62	50.07	57.07	49.67	55.30	47.55	59.99	50.34	57.79	51.28	5.30	5.48	5.16	5.09	5.17	5.02	5.03	4.85	5.36	5.20	5.16	5.26
10/01/29	10/31/29	Oct 2029	54.39	45.05	55.64	48.39	50.88	42.56	58.35	47.93	56.31	50.33	5.24	5.47	5.16	5.10	5.17	5.05	5.05	4.81	5.37	5.21	5.18	5.28
11/01/29	11/30/29	Nov 2029	54.36	46.55	55.73	48.62	50.27	42.87	58.46	48.86	56.21	50.01	5.26	5.52	5.28	5.21	5.27	5.19	5.20	4.93	5.48	5.32	5.29	5.44
12/01/29	12/31/29	Dec 2029	54.89	47.64	55.76	49.46	51.33	44.32	57.77	49.52	55.87	50.79	5.31	5.47	5.23	5.24	5.31	5.19	5.23	4.83	5.52	5.35	5.32	5.48
01/01/30	01/31/30	Jan 2030	55.85	47.42	57.47	50.67	52.00	43.75	58.47	50.50	57.07	51.56	5.43	5.57	5.33	5.37	5.44	5.33	5.36	4.96	5.65	5.49	5.45	5.62
02/01/30	02/28/30	Feb 2030	59.13	49.82	59.23	53.06	56.50	47.03	57.73	50.63	57.49	52.55	5.49	5.63	5.39	5.41	5.49	5.37	5.41	5.04	5.69	5.53	5.49	5.68
03/01/30	03/31/30	Mar 2030	53.35	45.50	55.74	50.22	50.09	43.07	55.50	48.92	54.50	50.55	5.49	5.59	5.34	5.40	5.49	5.37	5.40	4.90	5.68	5.51	5.48	5.66
04/01/30	04/30/30	Apr 2030	51.02	45.19	52.58	48.20	48.73	41.94	52.69	46.99	51.69	49.49	5.39	5.47	5.24	5.20	5.28	5.14	5.17	4.68	5.47	5.31	5.28	5.40
05/01/30	05/31/30	May 2030	45.39	36.57	51.50	46.56	41.52	33.07	53.01	44.50	50.51	47.34	5.40	5.44	5.21	5.16	5.27	5.08	5.08	4.70	5.42	5.27	5.23	5.31
06/01/30	06/30/30	Jun 2030	49.50	39.71	54.44	47.83	45.43	36.09	56.51	46.86	53.81	48.84	5.44	5.47	5.24	5.16	5.27	5.06	5.11	4.77	5.42	5.27	5.23	5.34
07/01/30	07/31/30	Jul 2030	56.45	46.03	59.99	50.18	52.07	42.12	62.78	50.44	59.62	51.73	5.51	5.54	5.30	5.18	5.30	5.07	5.10	4.90	5.45	5.30	5.26	5.33
08/01/30	08/31/30	Aug 2030	60.62	49.67	62.34	51.40	56.26	45.65	65.78	52.10	62.76	53.40	5.56	5.66	5.41	5.31	5.41	5.26	5.28	4.93	5.58	5.43	5.39	5.52
09/01/30	09/30/30	Sep 2030	60.31	52.28	60.66	52.74	57.95	49.52	63.06	52.89	60.70	53.97	5.57	5.74	5.50	5.44	5.51	5.40	5.44	5.14	5.71	5.55	5.52	5.67
10/01/30	10/31/30	Oct 2030	57.80	48.16	59.85	52.68	54.48	45.51	62.06	51.60	59.76	53.99	5.61	5.80	5.59	5.53	5.59	5.49	5.53	5.21	5.80	5.64	5.61	5.76
11/01/30	11/30/30	Nov 2030	58.27	50.31	59.76	52.49	54.00	46.40	62.20	52.93	59.79	53.59	5.70	5.93	5.71	5.70	5.76	5.69	5.69	5.37	5.97	5.81	5.78	5.93
12/01/30	12/31/30	Dec 2030	57.98	50.73	59.60	53.00	54.26	47.07	61.66	53.15	59.43	54.19	5.77	5.92	5.69	5.71	5.77	5.67	5.70	5.39	5.99	5.83	5.79	5.96
01/01/31	01/31/31	Jan 2031	59.87	50.94	61.42	54.57	56.04	47.27	62.62	54.41	61.29	55.52	5.90	6.08	5.83	5.86	5.93	5.83	5.85	5.51	6.14	5.98	5.94	6.11
02/01/31	02/28/31	Feb 2031	62.69	53.05	62.95	56.93	60.73	50.48	61.81	54.14	61.46	56.31	5.95	6.11	5.88	5.92	5.98	5.88	5.89	5.58	6.20	6.03	6.00	6.15
03/01/31	03/31/31	Mar 2031	55.64	48.72	59.34	53.35	53.16	46.01	59.33	51.92	58.20	53.86	5.93	6.07	5.83	5.89	5.96	5.86	5.89	5.36	6.17	6.00	5.97	6.15
04/01/31	04/30/31	Apr 2031	54.09	48.30	56.35	51.47	52.03	45.05	56.42	50.10	55.35	52.94	5.83	5.93	5.70	5.67	5.77	5.63	5.64	5.25	5.94	5.78	5.75	5.87
05/01/31	05/31/31	May 2031	48.10	39.31	54.52	49.71	44.08	35.64	55.96	47.33	53.30	50.38	5.83	5.89	5.66	5.60	5.70	5.52	5.54	5.26	5.86	5.71	5.67	5.76
06/01/31	06/30/31	Jun 2031	52.83	42.59	58.35	50.80	48.58	38.80	60.40	49.71	57.37	51.68	5.88	5.90	5.67	5.60	5.70	5.52	5.54	5.27	5.87	5.71	5.67	5.76
07/01/31	07/31/31	Jul 2031	60.30	49.39	64.05	53.26	55.72	45.28	67.13	53.74	63.67	55.00	5.96	5.99	5.76	5.64	5.76	5.55	5.54	5.35	5.91	5.75	5.72	5.77
08/01/31	08/31/31	Aug 2031	64.58	53.54	66.55	55.30	60.04	49.34	70.02	56.07	66.81	57.21	5.99	6.10	5.85	5.74	5.85	5.68	5.73	5.39	6.01	5.86	5.82	5.96
09/01/31	09/30/31	Sep 2031	63.85	55.61	64.27	55.93	61.62	53.11	66.95	56.03	64.33	57.26	6.02	6.23	5.96	5.90	5.96	5.86	5.90	5.64	6.18	6.02	5.98	6.14
10/01/31	10/31/31	Oct 2031	59.92	50.85	62.21	55.33	56.52	47.94	64.66	54.19	62.45	56.70	5.98	6.20	5.96	5.90	5.98	5.86	5.90	5.64	6.18	6.02	5.98	6.14
11/01/31	11/30/31	Nov 2031	60.19	52.17	62.00	54.96	55.82	48.07	64.54	55.44	61.94	56.07	5.98	6.21	5.98	5.99	6.04	5.98	5.98	5.64	6.26	6.10	6.07	6.22
12/01/31	12/31/31	Dec 2031	60.56	52.91	62.44	55.43	56.82	48.99	64.14	55.54	62.09	56.64	6.07	6.24	5.99	5.99	6.07	5.96	5.99	5.70	6.27	6.11	6.07	6.25
01/01/32	01/31/32	Jan 2032	60.83	49.73	63.96	56.89	58.42	49.25	65.26	56.77	63.65	57.91	6.16	6.34	6.10	6.13	6.19	6.10	6.13	5.77	6.41	6.25	6.21	6.40
02/01/32	02/29/32	Feb 2032	61.92	50.43	65.16	59.31	62.41	52.50	63.93	56.30	63.30	58.32	6.12	6.30	6.06	6.09	6.15	6.06	6.07	5.73	6.36	6.20	6.16	6.33
03/01/32	03/31/32	Mar 2032	54.56	47.78	61.01	55.26	54.75	47.56	60.94	53.52	59.65	55.46	6.04	6.21	5.95	6.00	6.06	5.97	6.00	5.61	6.27	6.11	6.07	6.26
04/01/32	04/30/32	Apr 2032	54.72	49.14	59.47	54.74	53.72	47.07	59.10	52.41	57.80	55.58	5.95	6.10	5.86	5.85	5.92	5.80	5.79	5.40	6.11	5.96	5.92	6.01
05/01/32	05/31/32	May 2032	50.19	41.92	57.40	52.00	46.23	38.21	58.24	49.88	55.23	52.28	5.97	6.00	5.76	5.70	5.80	5.61	5.67	5.41	5.96	5.81	5.77	5.89
06/01/32	06/30/32	Jun 2032	54.16	43.67	60.69	52.51	50.01	39.93	62.24	51.29	59.10	53.38	5.97	6.01	5.77	5.67	5.77	5.58	5.64	5.43	5.93	5.78	5.74	5.86
07/01/32	07/31/32	Jul 2032	60.89	49.58	65.25	54.60	56.31	45.47	68.01	54.60	64.49	56.05	6.03	6.06	5.82	5.67	5.80	5.59	5.58	5.41	5.94	5.78	5.74	5.80
08/01/32	08/31/32	Aug 2032	65.80	53.86	68.32	56.61	61.51	49.86	71.50	57.10	68.24	58.28	6.03	6.19	5.92	5.83	5.92	5.79	5.79	5.50	6.10	5.94	5.91	6.02
09/01/32	09/30/32	Sep 2032	62.69	53.92	64.49	56.50	61.45	53.37	67.18	56.40	64.20	57.72	6.00	6.24	5.98	5.91	5.98	5.88	5.89	5.62	6.18	6.02	5.98	6.12
10/01/32	10/31/32	Oct 2032	58.05	48.76	63.00	56.23	56.85	49.03	65.58	55.36	63.29	57.69	6.00	6.24	6.01	5.97	6.03	5.92	5.94	5.64	6.24	6.08	6.04	6.17
11/01/32	11/30/32	Nov 2032	61.03	49.54	63.35	55.33	57.13	48.77	66.38	56.10	63.27	56.37	5.97	6.25	6.01	6.01	6.10	6.03	6.01	5.62	6.28	6.12	6.09	6.26
12/01/32	12/31/32	Dec 2032	60.42	49.39	63.70	56.54	57.68	49.66	65.39	56.41	62.93	57.31	6.03	6.24	6.00	6.03	6.07	5.98	6.00	5.71	6.30	6.14	6.10	6.25
01/01/33	01/31/33	Jan 2033	58.33	48.51	64.32	57.55	58.06	49.84	66.14	56.79	63.63	57.93	6.10	6.32	6.07	6.13	6.18	6.10	6.10	5.77	6.41	6.25	6.21	6.37
02/01/33	02/28/33	Feb 2033	59.42	49.09	66.06	60.17	62.29	52.08	65.24	56.35	63.48	58.42	6.13	6.33	6.09	6.15	6.21	6.12	6.12	5.81	6.43	6.26	6.23	6.38

03/01/33	03/31/33	Mar 2033	52.68	49.26	61.63	56.01	54.25	48.06	61.94	53.92	59.78	56.00	6.06	6.24	6.00	6.09	6.15	6.09	6.07	5.57	6.36	6.20	6.16	6.33
04/01/33	04/30/33	Apr 2033	53.89	48.92	59.39	54.91	52.89	46.93	59.67	53.06	57.72	55.96	5.92	6.13	5.90	5.92	5.96	5.84	5.83	5.40	6.19	6.03	5.99	6.05
05/01/33	05/31/33	May 2033	49.47	41.36	57.52	52.31	45.36	37.52	58.20	49.63	54.99	52.34	5.92	6.01	5.77	5.72	5.81	5.63	5.63	5.37	5.99	5.83	5.80	5.85
06/01/33	06/30/33	Jun 2033	54.35	44.41	61.77	53.45	50.54	40.67	63.35	52.07	59.95	54.03	5.96	6.03	5.78	5.72	5.83	5.63	5.63	5.41	5.99	5.83	5.80	5.85
07/01/33	07/31/33	Jul 2033	61.23	50.88	66.66	56.29	56.91	46.98	69.32	56.47	65.65	57.52	6.07	6.15	5.87	5.81	5.98	5.73	5.69	5.55	6.08	5.92	5.89	5.92
08/01/33	08/31/33	Aug 2033	65.96	54.03	69.74	57.88	62.06	50.64	73.11	57.97	69.47	59.39	6.10	6.30	6.06	6.00	6.09	5.95	5.92	5.64	6.27	6.11	6.07	6.15
09/01/33	09/30/33	Sep 2033	62.77	53.44	66.73	58.34	62.32	54.55	69.09	57.76	65.72	59.18	6.13	6.41	6.16	6.12	6.16	6.10	6.06	5.80	6.39	6.23	6.19	6.29
10/01/33	10/31/33	Oct 2033	58.55	48.91	66.61	59.04	59.48	51.06	67.58	57.06	65.46	59.78	6.19	6.46	6.27	6.19	6.26	6.19	6.19	5.84	6.47	6.31	6.27	6.43
11/01/33	11/30/33	Nov 2033	62.38	50.22	66.51	58.00	60.86	51.29	69.12	58.44	66.05	58.72	6.24	6.53	6.35	6.29	6.38	6.35	6.36	5.89	6.55	6.40	6.36	6.61
12/01/33	12/31/33	Dec 2033	60.43	50.79	66.26	58.98	60.37	52.13	68.04	58.77	65.43	59.65	6.32	6.55	6.33	6.33	6.49	6.46	6.47	6.00	6.61	6.45	6.41	6.73
01/01/34	01/31/34	Jan 2034	62.57	52.05	68.01	60.54	62.55	53.67	69.73	59.90	66.91	60.77	6.43	6.68	6.48	6.48	6.64	6.60	6.64	6.09	6.76	6.59	6.56	6.90
02/01/34	02/28/34	Feb 2034	63.66	52.77	69.00	63.02	67.16	56.06	68.43	59.35	66.50	61.23	6.45	6.68	6.48	6.48	6.62	6.60	6.62	6.12	6.76	6.59	6.56	6.88
03/01/34	03/31/34	Mar 2034	54.96	49.60	64.34	58.32	57.01	51.95	65.02	56.40	62.78	58.38	6.42	6.60	6.38	6.45	6.49	6.45	6.45	5.84	6.72	6.56	6.52	6.71
04/01/34	04/30/34	Apr 2034	56.77	51.36	61.62	56.40	55.92	49.26	62.48	55.06	60.49	57.58	6.27	6.46	6.26	6.26	6.29	6.23	6.18	5.66	6.53	6.37	6.33	6.41
05/01/34	05/31/34	May 2034	52.96	43.57	60.94	54.56	48.70	39.58	61.84	52.06	58.34	54.95	6.23	6.37	6.13	6.09	6.20	6.10	5.99	5.63	6.35	6.20	6.16	6.22
06/01/34	06/30/34	Jun 2034	57.56	47.17	64.75	56.11	53.56	43.20	66.39	54.71	62.86	56.60	6.26	6.35	6.10	6.04	6.18	6.07	5.94	5.65	6.31	6.15	6.12	6.17
07/01/34	07/31/34	Jul 2034	63.88	53.47	69.27	58.63	59.39	49.44	72.08	58.86	68.26	59.96	6.32	6.45	6.20	6.09	6.24	6.13	5.94	5.71	6.36	6.20	6.16	6.17
08/01/34	08/31/34	Aug 2034	68.06	56.00	72.15	60.02	63.92	52.48	75.48	60.17	71.77	61.56	6.34	6.56	6.29	6.23	6.32	6.24	6.16	5.73	6.50	6.34	6.30	6.40
09/01/34	09/30/34	Sep 2034	64.32	55.18	68.95	60.27	63.81	55.88	70.83	59.64	67.55	61.08	6.34	6.60	6.38	6.34	6.37	6.32	6.27	5.96	6.61	6.45	6.41	6.51
10/01/34	10/31/34	Oct 2034	60.27	49.80	67.49	59.30	60.63	52.32	69.34	57.77	66.60	60.30	6.27	6.56	6.37	6.29	6.35	6.31	6.29	5.93	6.56	6.40	6.37	6.52
11/01/34	11/30/34	Nov 2034	63.23	50.33	66.56	57.20	61.54	51.63	69.89	58.69	66.48	58.29	6.21	6.51	6.32	6.27	6.38	6.35	6.37	5.85	6.54	6.38	6.35	6.61
12/01/34	12/31/34	Dec 2034	61.53	51.59	66.93	59.88	61.72	53.40	68.51	59.67	65.67	60.08	6.26	6.53	6.34	6.27	6.48	6.46	6.48	5.94	6.55	6.39	6.35	6.74
01/01/35	01/31/35	Jan 2035	62.87	51.68	68.77	60.80	62.09	53.12	70.20	60.22	67.24	60.68	6.39	6.63	6.42	6.43	6.61	6.60	6.64	6.08	6.71	6.55	6.51	6.91
02/01/35	02/28/35	Feb 2035	64.23	52.61	69.99	63.18	66.92	55.52	69.32	60.16	66.79	60.93	6.43	6.66	6.43	6.47	6.64	6.63	6.66	6.08	6.74	6.58	6.54	6.92
03/01/35	03/31/35	Mar 2035	55.69	49.91	65.37	59.60	57.56	52.94	65.64	57.71	62.84	58.91	6.39	6.63	6.42	6.43	6.50	6.47	6.47	6.10	6.71	6.55	6.51	6.73
04/01/35	04/30/35	Apr 2035	55.94	50.18	63.79	58.61	57.07	51.66	62.88	56.22	61.09	58.95	6.29	6.50	6.27	6.29	6.32	6.26	6.26	5.87	6.56	6.40	6.37	6.48
05/01/35	05/31/35	May 2035	55.71	47.17	63.58	57.41	51.46	43.04	64.01	54.71	60.38	57.28	6.34	6.51	6.31	6.29	6.35	6.27	6.21	5.87	6.56	6.40	6.37	6.43
06/01/35	06/30/35	Jun 2035	56.84	47.71	65.52	57.73	52.83	43.57	66.49	55.69	62.65	57.67	6.37	6.48	6.23	6.19	6.32	6.23	6.11	5.68	6.46	6.30	6.27	6.34
07/01/35	07/31/35	Jul 2035	65.38	54.93	72.00	60.65	60.60	50.68	74.20	60.61	70.33	61.61	6.48	6.60	6.35	6.31	6.43	6.32	6.21	5.76	6.58	6.42	6.38	6.44
08/01/35	08/31/35	Aug 2035	70.53	58.26	74.86	62.15	66.07	54.42	78.30	62.69	74.36	63.53	6.53	6.72	6.50	6.45	6.53	6.45	6.39	5.94	6.72	6.56	6.53	6.62
09/01/35	09/30/35	Sep 2035	67.33	57.12	72.36	62.81	65.49	57.54	74.69	62.71	71.20	63.27	6.51	6.74	6.53	6.53	6.56	6.50	6.48	6.13	6.80	6.64	6.61	6.71
10/01/35	10/31/35	Oct 2035	61.74	50.97	69.46	60.56	60.94	52.62	71.79	59.94	68.60	61.55	6.47	6.71	6.50	6.48	6.56	6.50	6.48	6.07	6.75	6.60	6.56	6.72
11/01/35	11/30/35	Nov 2035	63.83	52.15	68.86	59.41	60.86	52.88	72.18	60.97	68.48	60.36	6.48	6.77	6.58	6.51	6.69	6.66	6.71	6.11	6.78	6.63	6.59	6.95
12/01/35	12/31/35	Dec 2035	63.96	53.63	70.20	61.98	63.27	55.04	71.75	62.28	68.57	61.92	6.56	6.80	6.55	6.56	6.77	6.74	6.77	6.11	6.84	6.68	6.64	7.03
01/01/36	01/31/36	Jan 2036	66.86	54.94	73.23	64.03	65.43	55.65	74.54	64.22	71.64	63.95	6.71	7.04	6.76	6.80	7.04	7.03	7.04	6.11	7.07	6.91	6.87	7.31
02/01/36	02/29/36	Feb 2036	66.35	54.14	72.16	65.81	68.90	57.12	71.55	61.73	68.92	63.12	6.66	6.86	6.66	6.66	6.81	6.78	6.81	6.30	6.94	6.78	6.74	7.08
03/01/36	03/31/36	Mar 2036	57.84	51.85	68.22	61.88	59.61	55.34	68.04	59.73	65.45	60.96	6.65	6.86	6.66	6.66	6.75	6.73	6.73	6.37	6.94	6.78	6.74	6.99
04/01/36	04/30/36	Apr 2036	58.99	53.65	65.94	60.23	58.57	51.87	65.58	58.03	63.39	60.85	6.53	6.70	6.52	6.52	6.55	6.48	6.45	6.09	6.78	6.63	6.59	6.68
05/01/36	05/31/36	May 2036	55.89	46.74	64.48	58.29	51.37	42.52	64.87	55.42	61.27	58.30	6.50	6.66	6.45	6.44	6.50	6.44	6.35	6.02	6.70	6.55	6.51	6.58
06/01/36	06/30/36	Jun 2036	59.25	49.76	68.35	59.93	54.95	45.47	69.14	57.82	65.32	59.57	6.57	6.65	6.40	6.34	6.48	6.37	6.25	5.81	6.60	6.45	6.41	6.48
07/01/36	07/31/36	Jul 2036	67.47	56.02	74.57	62.29	62.52	51.69	76.74	62.06	72.59	63.28	6.70	6.78	6.52	6.45	6.63	6.50	6.34	5.86	6.72	6.56	6.53	6.57
08/01/36	08/31/36	Aug 2036	72.55	60.56	77.41	65.11	67.87	56.95	80.80	65.20	76.67	66.15	6.75	6.94	6.73	6.66	6.75	6.66	6.60	6.17	6.94	6.78	6.74	6.83
09/01/36	09/30/36	Sep 2036	69.63	58.49	74.96	64.60	67.68	59.17	77.10	63.55	73.51	64.63	6.70	6.93	6.71	6.70	6.75	6.70	6.66	6.32	6.97	6.81	6.77	6.90
10/01/36	10/31/36	Oct 2036	64.49	52.58	73.30	64.05	63.96	54.50	74.45	62.02	71.30	63.80	6.66	6.94	6.75	6.66	6.76	6.73	6.71	6.27	6.94	6.78	6.74	6.95
11/01/36	11/30/36	Nov 2036	68.00	55.37	73.32	63.27	65.21	56.23	75.87	64.37	71.98	63.77	6.81	7.11	6.91	6.85	7.04	7.03	7.03	6.45	7.11	6.96	6.92	7.27
12/01/36	12/31/36	Dec 2036	67.51	55.89	73.71	64.89	66.36	57.02	75.37	65.01	72.15	65.04	6.88	7.09	6.86	6.86	7.06	7.04	7.06	6.35	7.14	6.98	6.94	7.32
01/01/37	01/31/37	Jan 2037	70.07	57.71	75.64	66.72	70.17	59.63	77.18	66.59	73.75	66.09	6.99	7.34	6.99	7.05	7.34	7.31	7.34	6.40	7.33	7.17	7.13	7.60
02/01/37	02/28/37	Feb 2037	71.18	58.39	76.10	68.52	75.14	62.06	75.36	65.19	72.63	65.99	7.04	7.29	7.00	7.02	7.31	7.27	7.32	6.52	7.30	7.14	7.10	7.59
03/01/37	03/31/37	Mar 2037	60.66	54.16	71.02	63.96	62.82	57.64	71.11	62.02	68.02	63.04	6.94	7.14	6.95	6.95	7.04	7.00	7.02	6.67	7.23	7.07	7.03	7.28
04/01/37	04/30/37	Apr 2037	60.78	54.32	67.51	61.72	60.89	54.31	67.98	59.57	65.39	62.49	6.77	6.95	6.77	6.75	6.78	6.73	6.72	6.35	7.02	6.86	6.83	6.94
05/01/37	05/31/37	May 2037	58.22	49.21	67.11	60.65	53.59	44.83	67.55	57.85	63.71	60.37	6.75	6.90	6.72	6.70	6.75	6.68	6.62	6.31	6.97	6.81	6.78	6.84
06/01/37	06/30/37	Jun 2037	62.36	52.19	70.98	62.41	57.63	47.71	71.85	60.03	67.86	62.10	6.78	6.90	6.65	6.60	6.73	6.63	6.48	6.06	6.87	6.71	6.68	6.71
07/01/37	07/31/37	Jul 2037	70.55	58.96	78.03	65.15	65.32	54.22	80.25	64.70	75.88	66.00	6.94	7.05	6.80	6.75	6.89	6.78	6.62	6.10	7.02	6.86	6.83	6.85
08/01/37	08/31/37	Aug 2037	75.50	62.61	81.01	67.57	70.64	58.52	84.20	67.54	80.01	68.56	6.99	7.22	7.00	6.97	7.02	6.95	6.89	6.50	7.24	7.08	7.05	7.12
09/01/37	09/30/37	Sep 2037	72.28	60.85	78.11	67.21	70.14	61.50	80.35	66.45	76.68	67.41	7.02	7.29	7.09	7.00	7.07	7.02	7.00	6.62	7.27	7.11	7.08	7.23
10/01/37	10/31/37	Oct 2037	66.87	54.93	75.14	65.38	65.91	56.22	76.96	64.34	73.74	65.92	6.97	7.25	7.05	6.97	7.05	7.00	7.00	6.57	7.24	7.08	7.05	7.24
11/01/37	11/30/37	Nov 2037	70.42	57.05	74.27	64.00	68.71	58.55	77.50	65.70	73.52	64.73	6.97	7.27	7.09	7.00	7.24	7.24	7.25	6.63	7.27	7.11	7.08	7.50
12/01/37	12/31/37	Dec 2037	71.42	58.42	76.23	66.95	72.23	61.09	77.52	66.83	74.13	66.33	7.10	7.36	7.14	7.10	7.36	7.36	7.41	6.62	7.38	7.22	7.18	7.66
01/01/38	01/31/38	Jan 2038	71.36	60.18	78.31	68.95	70.73	62.61	80.00	69.35	76.34	68.28	7.22	7.63	7.23	7.27	7.63	7.63	7.64	6.60	7.55	7.38	7.35	7.91
02/01/38	02/28/38	Feb 2038	71.79	59.73	78.41	71.26	74.77	63.23	77.99	67.68	74.70	67.94	7.25	7.51	7.23	7.23	7.58	7.56	7.63	6.73	7.51	7.35	7.31	7.89
03/01/38	03/31/38	Mar 2038	62.38	55.52	73.59	66.22	63.54	59.04	73.52	63.96	70.18	65.05	7.15	7.35	7.16	7.16	7.27	7.23	7.23	6.85	7.44	7.28	7.24	7.49
04/01/38	04/30/38	Apr 2038	61.69	55.37	71.07	64.95	62.10	56.94	70.57	62.25	67.90	65.10	6.97	7.18	6.97	6.97	7.03	6.97	6.97	6.60	7.24	7.09	7.05	7.20
05/01/38	05/31/38	May 2038	61.50	53.27	70.24	63.72	56.86	48.81	70.83	61.11	66.60	63.27	7.03	7.20	6.99	6.96	7.03	6.96	6.85	6.53	7.22	7.07	7.03	7.08
06/01/38	06/30/38	Jun 2038	64.47	54.65	73.58	65.02	59.60	50.02	74.80	63.06	70.52	64.75	7.06	7.20	6.96	6.89	7.01	6.91	6.79	6.36	7.16	7.00	6.97	7.01
07/01/38	07/31/38	Jul 2038	72.77	60.71	80.96	67.44	67.38	55.80	83.07	67.19	78.64	68.31	7.18	7.32	7.06	6.99	7.13	7.03	6.89	6.34	7.26	7.10	7.07	7.12
08/01/38	08/31/38	Aug 2038	77.91	64.28	84.39	70.12	72.96	60.08	87.75	70.15	83.40	71.00	7.22	7.51	7.22	7.18	7.23	7.16	7.13	6.72	7.45	7.29	7.26	7.36
09/01/38	09/30/38	Sep 2038	72.78	62.35	79.53	69.01	70.59	62.96	82.40	68.57	78.39	69.30	7.16	7.47	7.23	7.15	7.23	7.18	7.15	6.75	7.42	7.26	7.22	7.38
10/01/38	10/31/38	Oct 2038	68.17	57.04	76.41	67.11	66.85	58.39	78.96	66.81	75.53	67.95	7.16	7.47	7.23	7.15	7.32	7.28	7.30	6.75	7.42	7.26	7.22	7.53
11/01/38	11/30/38	Nov 2038	72.35	59.62	77.49	66.35	70.70	61.43	80.95	68.50	76.67	67.29	7.22	7.59	7.32	7.25	7.58	7.59	7.64	6.85	7.52	7.36	7.33	7.89
12/01/38	12/31/38	Dec 2038	72.87	60.25	79.33	69.68	73.50	62.59	80.35	69.29	76.62	68.54	7.30	7.59	7.32	7.28	7.63	7.63	7.68	6.85	7.56	7.40	7.36	7.94
01/01/39	01/31/39	Jan 2039	73.50	64.53	81.12	72.52	73.58	63.79	82.62	71.76	78.77	70.71	7.42	7.86	7.42	7.46	7.83	7.83	7.71	6.77	7.74	7.57	7.54	7.97
02/01/39	02/28/39	Feb 2039	74.72	63.43	81.20	73.62	78.66	68.00	81.11	70.44	77.40	70.48	7.44	7.76	7.42	7.46	7.85	7.85	7.88	6.97	7.74	7.57	7.54	8.15
03/01/39	03/31/39	Mar 2039	64.07	57.16	75.91	68.58	65.30	60.63	75.76	66.04	72.08	66.79	7.34	7.55	7.37	7.37	7.46	7.42	7.42	7.05	7.65	7.49	7.45	7.68

04/01/39	04/30/39	Apr 2039	63.16	57.41	72.64	66.94	63.09	58.15	72.47	64.20	69.52	67.20	7.18	7.37	7.20	7.16	7.21	7.18	7.16	6.81	7.43	7.27	7.24	7.38
05/01/39	05/31/39	May 2039	62.23	53.64	71.93	65.75	57.47	49.07	72.76	62.73	68.27	65.19	7.14	7.34	7.16	7.12	7.16	7.11	7.04	6.74	7.39	7.23	7.20	7.26
06/01/39	06/30/39	Jun 2039	66.11	56.20	75.93	67.08	61.09	51.42	77.23	65.00	72.67	66.62	7.20	7.35	7.09	7.02	7.14	7.04	6.91	6.46	7.29	7.13	7.10	7.14
07/01/39	07/31/39	Jul 2039	73.92	62.14	83.00	69.79	68.37	57.10	84.90	69.82	80.32	70.23	7.32	7.48	7.21	7.14	7.28	7.18	7.02	6.46	7.41	7.25	7.22	7.25
08/01/39	08/31/39	Aug 2039	79.87	65.28	87.21	71.87	74.95	60.86	90.73	71.83	86.07	72.70	7.35	7.65	7.39	7.32	7.39	7.32	7.27	6.86	7.59	7.43	7.39	7.50
09/01/39	09/30/39	Sep 2039	73.42	63.64	81.29	71.18	71.52	64.34	84.35	70.68	80.32	71.47	7.35	7.72	7.42	7.34	7.41	7.35	7.34	6.93	7.61	7.45	7.41	7.57
10/01/39	10/31/39	Oct 2039	70.95	59.16	80.23	70.73	70.46	60.76	81.94	69.13	78.43	70.28	7.34	7.71	7.41	7.32	7.56	7.55	7.53	6.91	7.59	7.43	7.40	7.76
11/01/39	11/30/39	Nov 2039	76.54	62.53	81.85	69.71	77.13	65.33	84.41	71.68	79.95	70.20	7.46	7.90	7.55	7.49	7.86	7.88	7.88	7.07	7.76	7.60	7.57	8.13
12/01/39	12/31/39	Dec 2039	75.02	62.90	82.01	72.95	76.74	66.58	82.79	71.91	78.90	70.99	7.53	7.85	7.53	7.49	7.86	7.88	7.93	7.11	7.77	7.61	7.57	8.19
01/01/40	01/31/40	Jan 2040	75.76	66.32	84.12	75.19	75.85	65.87	85.30	74.27	81.41	73.01	7.67	8.14	7.67	7.75	8.09	8.09	7.91	7.04	8.02	7.86	7.82	8.17
02/01/40	02/29/40	Feb 2040	76.13	65.65	83.09	75.55	79.75	70.88	83.03	72.18	79.01	72.00	7.60	7.93	7.60	7.64	8.05	8.07	8.14	7.24	7.92	7.75	7.72	8.41
03/01/40	03/31/40	Mar 2040	66.57	60.88	78.67	71.59	67.09	63.11	78.62	69.18	74.59	69.89	7.58	7.84	7.64	7.62	7.78	7.76	7.80	7.30	7.90	7.73	7.70	8.06
04/01/40	04/30/40	Apr 2040	65.43	60.00	75.00	68.41	64.84	59.78	75.34	66.17	72.04	68.76	7.44	7.64	7.44	7.42	7.49	7.44	7.44	7.08	7.69	7.53	7.50	7.66
05/01/40	05/31/40	May 2040	65.56	55.90	75.24	68.73	60.53	51.07	76.35	65.15	71.51	67.73	7.44	7.64	7.44	7.40	7.44	7.39	7.33	7.03	7.67	7.51	7.48	7.56
06/01/40	06/30/40	Jun 2040	69.04	58.63	79.51	69.82	63.73	53.72	81.03	67.79	76.33	69.29	7.48	7.66	7.35	7.26	7.42	7.30	7.21	6.67	7.53	7.37	7.34	7.43
07/01/40	07/31/40	Jul 2040	77.13	64.76	86.73	73.15	71.36	59.53	88.89	72.84	84.04	72.95	7.60	7.78	7.48	7.40	7.55	7.40	7.30	6.72	7.67	7.52	7.48	7.52
08/01/40	08/31/40	Aug 2040	81.82	68.35	89.64	75.04	76.71	63.66	93.46	74.90	88.70	75.69	7.66	8.00	7.71	7.64	7.71	7.60	7.58	7.13	7.91	7.75	7.71	7.81
09/01/40	09/30/40	Sep 2040	75.33	67.69	83.42	74.80	73.18	66.73	86.47	73.61	82.14	74.26	7.71	8.05	7.76	7.67	7.76	7.69	7.67	7.24	7.94	7.79	7.75	7.90
10/01/40	10/31/40	Oct 2040	74.35	62.36	83.29	73.22	73.64	63.97	85.55	72.49	81.72	73.43	7.69	8.11	7.76	7.67	7.96	7.96	7.96	7.26	7.95	7.79	7.75	8.20
11/01/40	11/30/40	Nov 2040	79.64	67.14	84.40	72.05	80.29	71.22	87.53	74.56	82.66	72.84	7.80	8.23	7.87	7.80	8.25	8.29	8.30	7.40	8.07	7.91	7.88	8.55
12/01/40	12/31/40	Dec 2040	78.92	69.08	86.21	76.84	80.84	73.54	86.96	76.05	82.78	74.91	7.89	8.30	7.94	7.89	8.34	8.36	8.39	7.49	8.16	8.00	7.97	8.65
01/01/41	01/31/41	Jan 2041	77.58	67.91	86.14	76.99	77.67	67.45	87.35	76.05	83.36	74.77	7.86	8.34	7.86	7.93	8.28	8.28	8.10	7.21	8.21	8.05	8.01	8.36
02/01/41	02/28/41	Feb 2041	77.96	67.23	85.09	77.36	81.66	72.58	85.03	73.91	80.90	73.73	7.78	8.12	7.78	7.82	8.25	8.26	8.34	7.42	8.10	7.94	7.90	8.60
03/01/41	03/31/41	Mar 2041	68.17	62.34	80.56	73.31	68.70	64.62	80.51	70.84	76.38	71.56	7.77	8.02	7.82	7.80	7.97	7.95	7.99	7.47	8.08	7.92	7.88	8.25
04/01/41	04/30/41	Apr 2041	67.00	61.44	76.80	70.06	66.40	61.21	77.15	67.76	73.77	70.41	7.62	7.82	7.62	7.60	7.67	7.62	7.62	7.25	7.87	7.71	7.68	7.84
05/01/41	05/31/41	May 2041	67.14	57.24	77.05	70.38	61.98	52.29	78.19	66.72	73.23	69.36	7.62	7.82	7.62	7.58	7.62	7.56	7.51	7.19	7.85	7.69	7.66	7.73
06/01/41	06/30/41	Jun 2041	70.70	60.03	81.41	71.49	65.26	55.01	82.98	69.41	78.16	70.95	7.66	7.84	7.53	7.43	7.60	7.47	7.38	6.83	7.70	7.54	7.51	7.60
07/01/41	07/31/41	Jul 2041	78.98	66.31	88.81	74.90	73.07	60.96	91.02	74.59	86.06	74.70	7.78	7.97	7.66	7.58	7.73	7.58	7.47	6.88	7.85	7.69	7.66	7.70
08/01/41	08/31/41	Aug 2041	83.78	69.99	91.80	76.84	78.55	65.19	95.71	76.70	90.83	77.51	7.84	8.19	7.90	7.82	7.90	7.78	7.77	7.30	8.09	7.93	7.90	8.00
09/01/41	09/30/41	Sep 2041	77.14	69.31	85.42	76.59	74.94	68.33	88.54	75.38	84.11	76.04	7.90	8.25	7.95	7.86	7.95	7.88	7.86	7.42	8.13	7.97	7.93	8.09
10/01/41	10/31/41	Oct 2041	76.14	63.86	85.28	74.98	75.41	65.51	87.60	74.23	83.68	75.20	7.88	8.30	7.95	7.86	8.15	8.15	8.15	7.43	8.13	7.97	7.94	8.39
11/01/41	11/30/41	Nov 2041	81.55	68.75	86.43	73.78	82.21	72.93	89.63	76.35	84.64	74.59	7.99	8.43	8.06	7.99	8.45	8.49	8.50	7.58	8.25	8.10	8.06	8.75
12/01/41	12/31/41	Dec 2041	80.82	70.74	88.28	78.68	82.78	75.31	89.05	77.88	84.77	76.71	8.08	8.50	8.13	8.08	8.54	8.56	8.60	7.67	8.35	8.19	8.16	8.85
01/01/42	01/31/42	Jan 2042	79.44	69.54	88.21	78.84	79.54	69.07	89.45	77.88	85.37	76.56	8.05	8.54	8.05	8.12	8.48	8.48	8.29	7.39	8.40	8.24	8.20	8.56
02/01/42	02/28/42	Feb 2042	79.83	68.84	87.13	79.22	83.62	74.33	87.07	75.68	82.84	75.50	7.97	8.31	7.97	8.01	8.44	8.46	8.54	7.59	8.29	8.12	8.09	8.80
03/01/42	03/31/42	Mar 2042	69.80	63.84	82.49	75.07	70.35	66.17	82.44	72.55	78.21	73.28	7.95	8.22	8.01	7.99	8.16	8.14	8.18	7.65	8.27	8.10	8.07	8.44
04/01/42	04/30/42	Apr 2042	68.61	62.91	78.64	71.74	67.99	62.68	79.00	69.38	75.54	72.10	7.80	8.01	7.80	7.78	7.86	7.80	7.80	7.42	8.05	7.89	7.86	8.03
05/01/42	05/31/42	May 2042	68.75	58.61	78.89	72.07	63.47	53.55	80.06	68.32	74.98	71.02	7.80	8.01	7.80	7.76	7.80	7.74	7.69	7.37	8.03	7.87	7.84	7.91
06/01/42	06/30/42	Jun 2042	72.40	61.48	83.37	73.21	66.83	56.33	84.97	71.08	80.03	72.65	7.84	8.03	7.71	7.61	7.78	7.65	7.56	6.99	7.88	7.72	7.69	7.78
07/01/42	07/31/42	Jul 2042	80.87	67.90	90.94	76.70	74.83	62.42	93.20	76.38	88.13	76.49	7.97	8.16	7.84	7.76	7.91	7.76	7.65	7.05	8.03	7.87	7.84	7.88
08/01/42	08/31/42	Aug 2042	85.79	71.67	94.00	78.68	80.43	66.75	98.00	78.54	93.01	79.37	8.03	8.39	8.08	8.01	8.08	7.97	7.95	7.48	8.28	8.12	8.09	8.18
09/01/42	09/30/42	Sep 2042	78.99	70.97	87.47	78.43	76.74	69.97	90.67	77.19	86.13	77.87	8.08	8.44	8.14	8.05	8.14	8.07	8.05	7.59	8.32	8.16	8.12	8.28
10/01/42	10/31/42	Oct 2042	77.97	65.39	87.33	76.77	77.22	67.08	89.70	76.02	85.69	77.00	8.07	8.50	8.14	8.05	8.35	8.35	8.35	7.61	8.32	8.16	8.12	8.58
11/01/42	11/30/42	Nov 2042	83.51	70.40	88.50	75.55	84.19	74.68	91.78	78.18	86.67	76.38	8.18	8.63	8.25	8.18	8.65	8.69	8.71	7.76	8.45	8.29	8.26	8.95
12/01/42	12/31/42	Dec 2042	82.76	72.44	90.40	80.57	84.76	77.11	91.18	79.75	86.80	78.55	8.27	8.71	8.33	8.27	8.75	8.76	8.80	7.86	8.55	8.39	8.35	9.06
01/01/43	01/31/43	Jan 2043	81.35	71.21	90.32	80.73	81.44	70.73	91.59	79.74	87.41	78.40	8.24	8.74	8.24	8.32	8.68	8.68	8.49	7.56	8.60	8.43	8.40	8.76
02/01/43	02/28/43	Feb 2043	81.75	70.49	89.22	81.12	85.63	76.11	89.16	77.50	84.83	77.31	8.16	8.51	8.16	8.20	8.65	8.67	8.74	7.78	8.48	8.32	8.28	9.01
03/01/43	03/31/43	Mar 2043	71.48	65.37	84.47	76.87	72.03	67.76	84.42	74.29	80.09	75.04	8.14	8.41	8.20	8.18	8.36	8.34	8.38	7.83	8.46	8.30	8.26	8.64
04/01/43	04/30/43	Apr 2043	70.26	64.42	80.53	73.46	69.62	64.19	80.90	71.05	77.36	73.83	7.99	8.20	7.99	7.97	8.05	7.99	7.99	7.60	8.24	8.08	8.05	8.21
05/01/43	05/31/43	May 2043	70.40	60.02	80.79	73.80	64.99	54.83	81.98	69.96	76.78	72.73	7.99	8.20	7.99	7.95	7.99	7.93	7.87	7.54	8.22	8.06	8.03	8.10
06/01/43	06/30/43	Jun 2043	74.13	62.95	85.37	74.96	68.43	57.68	87.01	72.78	81.95	74.39	8.03	8.22	7.89	7.80	7.97	7.83	7.74	7.16	8.06	7.91	7.87	7.96
07/01/43	07/31/43	Jul 2043	82.82	69.53	93.13	78.54	76.62	63.92	95.44	78.21	90.24	78.33	8.16	8.36	8.03	7.95	8.10	7.95	7.83	7.21	8.22	8.06	8.03	8.06
08/01/43	08/31/43	Aug 2043	87.85	73.39	96.26	80.57	82.36	68.36	100.35	80.42	95.24	81.27	8.22	8.59	8.28	8.20	8.28	8.16	8.14	7.66	8.47	8.31	8.28	8.37
09/01/43	09/30/43	Sep 2043	80.89	72.68	89.57	80.31	78.58	71.65	92.84	79.04	88.20	79.73	8.28	8.65	8.34	8.24	8.34	8.26	8.24	7.78	8.51	8.35	8.32	8.47
10/01/43	10/31/43	Oct 2043	79.84	66.96	89.43	78.62	79.07	68.69	91.85	77.84	87.75	78.85	8.26	8.70	8.34	8.24	8.55	8.55	8.55	7.80	8.51	8.35	8.32	8.78
11/01/43	11/30/43	Nov 2043	85.52	72.09	90.62	77.37	86.21	76.47	93.99	80.06	88.75	78.21	8.38	8.84	8.45	8.38	8.86	8.90	8.92	7.95	8.64	8.49	8.45	9.16
12/01/43	12/31/43	Dec 2043	84.74	74.17	92.57	82.50	86.80	78.96	93.37	81.66	88.88	80.43	8.47	8.92	8.53	8.47	8.96	8.97	9.01	8.05	8.75	8.59	8.55	9.27
01/01/44	01/31/44	Jan 2044	83.30	72.92	92.49	82.67	83.40	72.43	93.79	81.66	89.51	80.28	8.44	8.95	8.44	8.52	8.89	8.89	8.70	7.74	8.80	8.63	8.60	8.96
02/01/44	02/29/44	Feb 2044	83.71	72.18	91.36	83.07	87.69	77.94	91.30	79.36	86.87	79.17	8.36	8.71	8.36	8.40	8.85	8.87	8.95	7.96	8.68	8.51	8.48	9.22
03/01/44	03/31/44	Mar 2044	73.19	66.94	86.50	78.71	73.76	69.39	86.44	76.07	82.01	76.84	8.34	8.62	8.40	8.38	8.56	8.54	8.58	8.02	8.65	8.49	8.46	8.84
04/01/44	04/30/44	Apr 2044	71.94	65.97	82.46	75.22	71.29	65.73	82.84	72.75	79.21	75.60	8.18	8.40	8.18	8.16	8.24	8.18	8.18	7.78	8.43	8.27	8.24	8.40
05/01/44	05/31/44	May 2044	72.09	61.46	82.73	75.57	66.55	56.15	83.95	71.64	78.63	74.47	8.18	8.40	8.18	8.14	8.18	8.12	8.06	7.72	8.41	8.25	8.22	8.29
06/01/44	06/30/44	Jun 2044	75.91	64.46	87.42	76.76	70.08	59.07	89.09	74.53	83.92	76.18	8.22	8.42	8.08	7.98	8.16	8.02	7.92	7.33	8.25	8.09	8.06	8.15
07/01/44	07/31/44	Jul 2044	84.80	71.20	95.36	80.43	78.46	65.46	97.73	80.09	92.41	80.21	8.36	8.56	8.22	8.14	8.30	8.14	8.02	7.39	8.41	8.25	8.22	8.25
08/01/44	08/31/44	Aug 2044	89.96	75.16	98.57	82.50	84.34	70.00	102.76	82.35	97.52	83.22	8.42	8.79	8.48	8.40	8.48	8.36	8.34	7.84	8.67	8.51	8.47	8.57
09/01/44	09/30/44	Sep 2044	82.83	74.42	91.72	82.24	80.46	73.37	95.07	80.94	90.32	81.65	8.48	8.85	8.54	8.44	8.54	8.46	8.44	7.96	8.71	8.55	8.51	8.67
10/01/44	10/31/44	Oct 2044	81.75	68.56	91.57	80.50	80.97	70.34	94.06	79.71	89.86	80.74	8.46	8.91	8.54	8.44	8.75	8.75	8.75	7.98	8.71	8.55	8.51	8.99
11/01/44	11/30/44	Nov 2044	87.57	73.82	92.80	79.22	88.28	78.31	96.24	81.98	90.88	80.09	8.58	9.05	8.66	8.58	9.07	9.11	9.13	8.14	8.84	8.69	8.65	9.38
12/01/44	12/31/44	Dec 2044	86.78	75.96	94.79	84.48	88.88	80.86	95.61	83.62	91.02	82.36	8.68	9.13	8.73	8.68	9.17	9.19	9.23	8.24	8.95	8.79	8.75	9.49
01/01/45	01/31/45	Jan 2045	85.30	74.67	94.71	84.65	85.40	74.16	96.04	83.62	91.66	82.21	8.64	9.17	8.64	8.72	9.11	9.11	8.90	7.93	9.00	8.84	8.80	9.17
02/01/45	02/28/45	Feb 2045	85.72	73.91	93.55	85.06	89.79	79.81	93.49	81.26	88.95	81.07	8.56	8.92	8.56	8.60	9.07	9.09	9.17	8.15	8.88	8.72	8.68	9.43
03/01/45	03/31/45	Mar 2045	74.95	68.55	88.58	80.60	75.53	71.05	88.52	77.89	83.98	78.69	8.54	8.82	8.60	8.58	8.76	8.74	8.78	8.21	8.86	8.69	8.66	9.04
04/01/45	04/30/45	Apr 2045	73.67	67.55	84.44	77.03	73.00	67.30	84.83	74.50	81.11	77.42	8.38	8.60	8.38	8.36	8.44	8.38	8.38	7.97	8.62	8.47	8.43	8.60

	05/01/45	05/31/45	May 2045	73.82	62.94	84.71	77.39	68.15	57.50	85.97	73.36	80.51	76.26	8.38	8.60	8.38	8.34	8.38	8.32	8.25	7.91	8.60	8.45	8.41	8.48
	06/01/45	06/30/45	Jun 2045	77.73	66.01	89.52	78.61	71.76	60.49	91.23	76.32	85.94	78.01	8.42	8.62	8.28	8.17	8.36	8.21	8.11	7.50	8.44	8.28	8.25	8.34
	07/01/45	07/31/45	Jul 2045	86.84	72.91	97.65	82.36	80.34	67.03	100.08	82.01	94.63	82.13	8.56	8.76	8.42	8.34	8.50	8.34	8.21	7.57	8.61	8.45	8.41	8.44
	08/01/45	08/31/45	Aug 2045	92.12	76.96	100.93	84.48	86.36	71.68	105.23	84.33	99.86	85.22	8.62	9.01	8.68	8.60	8.68	8.56	8.54	8.03	8.87	8.71	8.68	8.77
	09/01/45	09/30/45	Sep 2045																						

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
6/30/2015		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
0615 Official Forward Price Curve: *Blend of...* Final June 2015 Aurora forecast 06/30/2015 forward market curve			**COB**		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
07/01/15	07/31/15	Jul 2015	59.75	33.25	40.00	26.50	55.50	32.00	47.50	33.50	45.50	32.50	2.77	2.90	2.66	2.63	2.77	2.67	2.23	2.07	2.98	2.80	2.82	2.35
08/01/15	08/31/15	Aug 2015	47.25	30.25	36.50	26.00	45.25	29.50	46.00	33.00	44.25	32.50	2.83	3.02	2.79	2.72	2.84	2.82	2.21	2.12	2.98	2.82	2.79	2.37
09/01/15	09/30/15	Sep 2015	39.00	29.25	32.25	25.00	37.00	27.50	42.75	32.75	41.75	32.25	2.84	3.00	2.78	2.71	2.82	2.79	2.22	2.14	2.96	2.80	2.78	2.38
10/01/15	10/31/15	Oct 2015	31.96	26.56	29.84	25.75	28.52	23.50	39.60	32.25	37.75	31.43	2.87	2.96	2.78	2.73	2.84	2.82	2.27	2.20	2.99	2.83	2.81	2.43
11/01/15	11/30/15	Nov 2015	32.30	27.69	28.96	24.50	30.38	25.75	39.60	31.61	38.25	31.12	2.97	3.01	2.85	2.84	2.92	2.89	2.86	2.36	3.11	2.95	2.92	3.08
12/01/15	12/31/15	Dec 2015	37.74	30.51	28.96	24.75	34.10	28.33	40.80	32.90	39.02	32.70	3.13	3.22	3.03	3.05	3.13	3.10	3.35	2.44	3.33	3.16	3.14	3.59
01/01/16	01/31/16	Jan 2016	32.00	27.30	29.54	26.78	31.63	25.95	40.16	33.02	38.74	32.45	3.24	3.30	3.14	3.16	3.14	3.12	3.10	2.50	3.45	3.27	3.24	3.33
02/01/16	02/29/16	Feb 2016	30.50	26.00	29.25	26.01	28.46	24.49	39.02	32.07	38.00	31.50	3.24	3.30	3.16	3.14	3.16	3.13	2.94	2.51	3.43	3.26	3.22	3.16
03/01/16	03/31/16	Mar 2016	27.75	24.70	28.96	24.46	26.16	22.31	35.57	30.16	35.02	30.56	3.20	3.23	3.09	3.02	3.10	3.07	2.83	2.46	3.31	3.13	3.11	3.04
04/01/16	04/30/16	Apr 2016	30.25	22.60	30.00	22.77	27.50	19.84	34.56	28.50	33.22	28.50	3.05	2.96	2.84	2.77	2.84	2.82	2.47	2.31	3.03	2.87	2.84	2.64
05/01/16	05/31/16	May 2016	28.00	17.60	29.50	22.54	23.25	15.20	35.64	25.75	33.91	25.75	3.06	2.97	2.84	2.78	2.85	2.82	2.28	2.29	3.04	2.87	2.85	2.43
06/01/16	06/30/16	Jun 2016	27.25	18.00	29.75	23.69	23.50	13.75	37.80	27.00	35.62	27.00	3.09	3.02	2.88	2.81	2.89	2.86	2.30	2.30	3.07	2.91	2.88	2.46
07/01/16	07/31/16	Jul 2016	36.13	22.00	39.22	25.75	31.74	20.00	42.50	30.56	42.08	30.56	3.13	3.22	2.95	2.93	2.99	2.96	2.47	2.31	3.20	3.03	3.00	2.63
08/01/16	08/31/16	Aug 2016	39.49	28.09	38.48	27.56	36.57	26.40	43.78	33.08	42.49	32.45	3.14	3.23	3.00	2.91	3.02	2.99	2.48	2.32	3.17	3.01	2.98	2.65
09/01/16	09/30/16	Sep 2016	36.13	26.50	32.75	26.75	35.19	25.75	41.23	30.87	39.19	31.50	3.14	3.10	2.96	2.85	3.02	2.99	2.51	2.33	3.11	2.95	2.92	2.69
10/01/16	10/31/16	Oct 2016	30.26	25.89	31.75	26.25	28.52	23.76	39.85	31.11	37.05	30.88	3.17	3.12	2.94	2.91	3.03	3.00	2.60	2.42	3.18	3.01	2.99	2.78
11/01/16	11/30/16	Nov 2016	33.25	26.71	30.56	25.73	30.38	26.00	39.85	32.10	39.00	31.53	3.25	3.32	3.14	3.07	3.13	3.10	3.17	2.56	3.34	3.17	3.14	3.40
12/01/16	12/31/16	Dec 2016	36.24	28.89	31.82	26.78	34.10	26.77	41.06	35.04	40.95	34.75	3.41	3.48	3.28	3.27	3.32	3.29	3.56	2.71	3.55	3.38	3.34	3.81
01/01/17	01/31/17	Jan 2017	33.50	28.30	29.79	27.53	32.13	26.45	40.41	34.02	39.24	33.20	3.53	3.57	3.40	3.39	3.38	3.35	3.42	2.77	3.67	3.50	3.47	3.67
02/01/17	02/28/17	Feb 2017	30.79	27.00	29.50	26.76	28.96	24.99	39.27	33.07	38.50	32.25	3.52	3.55	3.40	3.39	3.38	3.35	3.20	2.76	3.66	3.50	3.46	3.44
03/01/17	03/31/17	Mar 2017	28.79	24.85	29.75	25.21	26.66	22.81	37.50	31.50	36.25	31.31	3.46	3.50	3.33	3.33	3.32	3.29	3.16	2.72	3.60	3.44	3.40	3.39
04/01/17	04/30/17	Apr 2017	28.48	22.60	30.25	23.02	26.75	20.09	34.81	30.00	34.00	30.25	3.22	3.11	3.02	2.97	2.93	2.91	2.47	2.43	3.23	3.07	3.04	2.63
05/01/17	05/31/17	May 2017	26.18	17.60	30.75	22.79	23.50	15.45	35.89	25.83	34.16	25.83	3.22	3.15	3.01	2.90	2.93	2.90	2.44	2.40	3.15	3.00	2.97	2.61
06/01/17	06/30/17	Jun 2017	25.60	18.00	27.75	23.94	22.25	13.21	38.05	26.65	35.87	25.83	3.26	3.19	3.06	2.93	2.97	2.94	2.47	2.43	3.19	3.03	3.01	2.64
07/01/17	07/31/17	Jul 2017	36.88	22.00	40.72	25.91	32.49	20.20	43.25	32.56	43.08	32.31	3.30	3.44	3.12	3.00	3.06	3.03	2.67	2.44	3.26	3.10	3.07	2.85
08/01/17	08/31/17	Aug 2017	40.24	28.09	39.98	28.56	37.32	27.40	44.53	35.08	43.49	34.20	3.31	3.43	3.16	3.01	3.09	3.06	2.68	2.45	3.27	3.11	3.08	2.86
09/01/17	09/30/17	Sep 2017	36.88	26.50	34.80	28.03	35.94	27.40	41.98	32.87	40.19	33.25	3.30	3.25	3.13	3.00	3.09	3.06	2.70	2.47	3.26	3.10	3.07	2.88
10/01/17	10/31/17	Oct 2017	32.26	27.89	33.13	28.00	28.77	24.73	40.10	33.61	37.55	33.13	3.32	3.23	3.11	3.02	3.09	3.07	2.73	2.49	3.28	3.12	3.09	2.91
11/01/17	11/30/17	Nov 2017	35.25	28.71	31.56	27.48	30.63	28.26	40.10	34.60	39.50	33.78	3.39	3.50	3.30	3.30	3.30	3.27	3.49	2.71	3.57	3.40	3.37	3.74
12/01/17	12/31/17	Dec 2017	38.24	30.89	32.82	28.53	34.35	28.77	41.31	37.54	41.45	37.35	3.55	3.67	3.50	3.50	3.49	3.46	3.82	2.83	3.78	3.61	3.57	4.10
01/01/18	01/31/18	Jan 2018	34.25	30.50	31.04	28.93	34.13	29.00	41.16	35.27	40.24	34.50	3.68	3.81	3.61	3.62	3.58	3.55	3.80	2.94	3.90	3.74	3.70	4.07
02/01/18	02/28/18	Feb 2018	32.79	29.00	30.75	28.16	30.96	28.00	40.02	34.32	39.50	33.75	3.66	3.77	3.59	3.61	3.57	3.53	3.58	2.92	3.88	3.72	3.69	3.84
03/01/18	03/31/18	Mar 2018	30.79	28.00	30.46	26.61	28.66	25.50	36.57	32.41	36.52	32.75	3.60	3.72	3.53	3.55	3.50	3.47	3.52	2.85	3.82	3.66	3.62	3.77
04/01/18	04/30/18	Apr 2018	30.48	24.10	33.95	23.50	31.50	21.59	35.56	32.03	34.47	32.85	3.28	3.30	3.19	3.09	3.07	3.04	2.85	2.59	3.35	3.20	3.17	3.04
05/01/18	05/31/18	May 2018	28.18	19.10	31.00	23.00	25.25	16.95	36.64	27.08	35.16	27.08	3.28	3.32	3.18	3.02	3.07	3.05	2.80	2.54	3.28	3.13	3.10	2.99
06/01/18	06/30/18	Jun 2018	27.60	19.50	28.05	24.25	24.00	14.71	38.80	27.90	36.87	27.08	3.32	3.38	3.22	3.06	3.11	3.09	2.80	2.55	3.31	3.16	3.13	2.99
07/01/18	07/31/18	Jul 2018	38.88	22.00	41.97	27.31	34.49	22.00	44.00	33.81	44.08	33.56	3.35	3.63	3.26	3.12	3.20	3.18	3.01	2.57	3.38	3.22	3.19	3.22
08/01/18	08/31/18	Aug 2018	42.24	27.00	41.23	29.96	39.32	24.75	45.28	36.33	44.49	35.45	3.37	3.65	3.30	3.13	3.23	3.20	3.02	2.57	3.39	3.24	3.21	3.22
09/01/18	09/30/18	Sep 2018	38.88	27.25	36.05	29.43	37.94	24.50	42.73	34.12	41.19	34.50	3.36	3.44	3.28	3.12	3.22	3.19	3.04	2.60	3.38	3.23	3.20	3.25
10/01/18	10/31/18	Oct 2018	34.26	29.39	34.38	29.40	30.77	26.23	40.85	34.86	38.55	34.38	3.38	3.38	3.28	3.15	3.24	3.21	3.06	2.61	3.40	3.25	3.22	3.26
11/01/18	11/30/18	Nov 2018	37.25	30.21	32.81	28.88	32.63	29.76	40.85	35.85	40.50	35.03	3.45	3.63	3.36	3.36	3.47	3.44	3.63	2.87	3.62	3.47	3.43	3.89
12/01/18	12/31/18	Dec 2018	40.24	32.39	34.07	29.93	36.35	30.27	42.06	38.79	42.45	38.60	3.61	3.78	3.55	3.56	3.66	3.62	3.97	3.00	3.83	3.68	3.64	4.25
01/01/19	01/31/19	Jan 2019	35.38	33.00	32.19	30.58	35.48	30.00	42.06	36.50	41.19	35.65	3.74	3.93	3.67	3.68	3.71	3.68	3.86	3.06	3.95	3.79	3.75	4.14
02/01/19	02/28/19	Feb 2019	34.14	31.00	31.90	29.81	32.31	29.75	40.92	35.75	40.45	34.70	3.72	3.89	3.65	3.66	3.69	3.66	3.65	3.04	3.94	3.78	3.74	3.91
03/01/19	03/31/19	Mar 2019	32.14	30.00	31.61	28.26	30.01	28.25	37.47	33.75	37.47	33.76	3.66	3.85	3.59	3.60	3.63	3.59	3.59	2.98	3.87	3.71	3.68	3.85
04/01/19	04/30/19	Apr 2019	31.50	25.40	35.10	25.50	32.25	22.50	36.46	33.18	35.75	34.05	3.34	3.47	3.26	3.21	3.29	3.26	2.95	2.76	3.47	3.31	3.28	3.15
05/01/19	05/31/19	May 2019	29.25	20.40	32.15	25.25	26.00	18.25	37.54	28.23	36.50	28.28	3.35	3.50	3.26	3.14	3.29	3.26	2.91	2.72	3.40	3.25	3.22	3.11
06/01/19	06/30/19	Jun 2019	28.95	20.80	29.20	25.25	25.00	16.01	39.70	29.05	38.00	28.28	3.38	3.54	3.30	3.18	3.33	3.30	2.91	2.72	3.43	3.28	3.25	3.11
07/01/19	07/31/19	Jul 2019	40.23	22.50	44.00	28.96	35.84	19.00	44.90	34.96	45.03	35.00	3.42	3.78	3.34	3.23	3.42	3.39	3.10	2.72	3.49	3.34	3.31	3.31
08/01/19	08/31/19	Aug 2019	43.59	30.00	43.00	31.61	40.67	28.00	46.18	37.48	45.44	37.00	3.43	3.80	3.39	3.25	3.45	3.42	3.12	2.73	3.51	3.36	3.33	3.33
09/01/19	09/30/19	Sep 2019	40.23	32.00	39.00	31.08	39.29	29.00	43.63	35.27	42.14	36.00	3.43	3.61	3.36	3.24	3.45	3.42	3.14	2.76	3.50	3.35	3.32	3.35
10/01/19	10/31/19	Oct 2019	35.61	31.00	34.00	31.05	32.12	27.75	41.75	36.01	39.50	35.58	3.45	3.53	3.36	3.27	3.47	3.44	3.16	2.77	3.53	3.37	3.34	3.37
11/01/19	11/30/19	Nov 2019	38.60	32.00	33.00	30.53	33.98	31.25	41.75	37.00	41.45	36.23	3.53	3.78	3.45	3.44	3.57	3.54	3.68	2.95	3.70	3.55	3.51	3.94
12/01/19	12/31/19	Dec 2019	41.59	34.00	35.00	31.58	37.70	31.57	42.96	39.94	43.40	39.80	3.71	4.01	3.67	3.66	3.78	3.75	4.06	3.12	3.94	3.78	3.74	4.34
01/01/20	01/31/20	Jan 2020	37.53	37.50	34.44	32.73	37.73	34.75	44.31	38.25	42.74	37.05	3.84	4.14	3.79	3.78	3.85	3.81	3.96	3.20	4.06	3.90	3.86	4.25
02/01/20	02/29/20	Feb 2020	36.39	34.75	34.15	31.96	34.56	33.00	43.17	37.50	42.00	36.10	3.82	4.10	3.77	3.77	3.84	3.80	3.76	3.19	4.04	3.88	3.84	4.03
03/01/20	03/31/20	Mar 2020	34.39	33.00	33.86	30.41	32.26	31.00	39.72	35.75	39.02	35.16	3.76	4.05	3.71	3.70	3.77	3.74	3.71	3.14	3.98	3.82	3.78	3.98
04/01/20	04/30/20	Apr 2020	32.00	25.00	38.00	28.22	32.00	21.50	38.71	34.58	38.00	35.45	3.44	3.62	3.37	3.35	3.43	3.40	3.00	2.92	3.61	3.45	3.42	3.22
05/01/20	05/31/20	May 2020	31.78	20.00	35.00	27.99	25.00	18.50	39.79	29.63	38.75	29.68	3.44	3.72	3.36	3.28	3.43	3.40	2.94	2.86	3.54	3.38	3.35	3.16
06/01/20	06/30/20	Jun 2020	30.50	19.00	31.45	29.14	27.85	17.00	41.95	30.45	40.25	29.68	3.47	3.76	3.39	3.31	3.46	3.43	2.95	2.87	3.57	3.41	3.38	3.17
07/01/20	07/31/20	Jul 2020	42.48	26.95	45.37	31.11	38.09	25.15	47.15	36.36	46.58	36.16	3.50	3.94	3.43	3.36	3.54	3.51	3.15	2.88	3.63	3.47	3.44	3.38
08/01/20	08/31/20	Aug 2020	45.84	33.04	44.63	33.76	42.92	32.35	48.43	38.88	46.99	38.05	3.52	3.96	3.49	3.39	3.59	3.56	3.13	2.87	3.65	3.49	3.46	3.36
09/01/20	09/30/20	Sep 2020	42.48	31.45	39.45	33.23	41.54	32.35	45.88	36.67	43.69	37.10	3.52	3.77	3.46	3.38	3.59	3.56	3.20	2.94	3.65	3.49	3.46	3.44

10/01/20	10/31/20	Oct 2020	37.86	32.84	37.78	33.20	34.37	29.68	44.00	37.41	41.05	36.98	3.55	3.71	3.47	3.41	3.61	3.58	3.21	2.95	3.68	3.52	3.49	3.45
11/01/20	11/30/20	Nov 2020	40.85	33.66	36.21	32.68	36.23	33.21	44.00	38.40	43.00	37.63	3.63	3.92	3.54	3.55	3.71	3.68	3.71	3.16	3.82	3.67	3.63	3.97
12/01/20	12/31/20	Dec 2020	43.84	35.84	37.47	33.73	39.95	33.72	45.21	41.34	44.95	41.20	3.81	4.14	3.76	3.78	3.92	3.89	4.08	3.32	4.06	3.90	3.86	4.37
01/01/21	01/31/21	Jan 2021	39.53	34.75	36.44	34.23	39.73	32.90	46.06	38.82	44.49	38.05	3.94	4.29	3.88	3.90	3.99	3.95	4.01	3.42	4.19	4.02	3.98	4.30
02/01/21	02/28/21	Feb 2021	38.39	33.45	36.15	33.46	36.56	31.44	44.92	37.87	43.75	37.10	3.92	4.25	3.86	3.88	3.96	3.93	3.80	3.41	4.17	4.00	3.96	4.08
03/01/21	03/31/21	Mar 2021	36.39	32.15	35.86	31.91	34.26	29.26	41.47	35.96	40.77	36.16	3.86	4.19	3.80	3.82	3.90	3.86	3.75	3.36	4.10	3.94	3.90	4.02
04/01/21	04/30/21	Apr 2021	36.08	29.05	39.35	29.72	37.60	26.54	40.46	35.58	38.72	36.45	3.54	3.78	3.47	3.52	3.54	3.51	3.11	3.15	3.79	3.63	3.60	3.34
05/01/21	05/31/21	May 2021	33.78	24.05	36.40	29.49	31.10	21.90	41.54	30.63	39.41	30.68	3.54	3.82	3.46	3.46	3.54	3.50	3.06	3.10	3.73	3.57	3.53	3.29
06/01/21	06/30/21	Jun 2021	33.20	24.45	33.45	30.64	29.85	19.66	43.70	31.45	41.12	30.68	3.57	3.85	3.50	3.49	3.57	3.54	3.07	3.11	3.76	3.60	3.56	3.29
07/01/21	07/31/21	Jul 2021	44.48	28.45	47.37	32.61	40.09	26.65	48.90	37.36	48.33	37.16	3.61	4.11	3.54	3.55	3.66	3.62	3.28	3.13	3.82	3.66	3.62	3.52
08/01/21	08/31/21	Aug 2021	46.74	33.85	48.16	35.82	43.44	31.95	52.17	39.99	51.08	39.64	3.83	4.10	3.77	3.66	3.81	3.72	3.46	3.04	3.93	3.77	3.74	3.69
09/01/21	09/30/21	Sep 2021	44.94	34.72	43.84	35.35	42.64	33.54	48.93	38.52	47.62	39.13	3.84	4.03	3.78	3.69	3.84	3.76	3.56	3.13	3.96	3.80	3.77	3.79
10/01/21	10/31/21	Oct 2021	42.21	35.04	42.27	35.65	38.66	31.85	47.77	38.34	45.92	39.51	3.87	4.02	3.81	3.73	3.87	3.79	3.57	3.15	4.00	3.84	3.80	3.81
11/01/21	11/30/21	Nov 2021	44.32	36.15	40.94	35.11	40.17	34.29	47.01	39.68	46.18	39.47	3.92	4.15	3.87	3.83	3.95	3.88	3.83	3.28	4.11	3.95	3.91	4.09
12/01/21	12/31/21	Dec 2021	46.05	37.66	41.73	36.27	42.25	34.94	47.49	41.45	47.17	41.79	4.05	4.28	3.99	3.97	4.07	4.00	4.01	3.39	4.25	4.08	4.05	4.29
01/01/22	01/31/22	Jan 2022	44.61	37.65	42.38	37.59	42.80	35.02	49.11	40.91	48.33	41.47	4.18	4.43	4.12	4.12	4.19	4.12	4.06	3.44	4.41	4.24	4.20	4.34
02/01/22	02/28/22	Feb 2022	45.98	38.49	43.04	37.79	43.09	35.72	48.62	40.51	48.39	41.35	4.19	4.45	4.15	4.14	4.21	4.14	4.01	3.48	4.43	4.26	4.22	4.29
03/01/22	03/31/22	Mar 2022	42.17	35.56	42.13	36.22	39.24	32.44	46.18	38.82	46.34	40.38	4.17	4.40	4.10	4.08	4.16	4.08	4.01	3.46	4.37	4.20	4.16	4.29
04/01/22	04/30/22	Apr 2022	40.08	33.07	43.52	34.92	39.06	30.19	44.46	37.65	44.74	39.98	3.92	4.08	3.84	3.81	3.87	3.78	3.57	3.24	4.09	3.93	3.89	3.81
05/01/22	05/31/22	May 2022	36.99	27.06	41.30	33.36	33.96	24.51	45.19	34.43	44.23	35.58	3.93	4.11	3.84	3.78	3.87	3.77	3.50	3.25	4.06	3.90	3.86	3.73
06/01/22	06/30/22	Jun 2022	39.65	28.39	41.58	33.50	36.15	24.47	48.46	35.79	46.99	35.67	3.96	4.14	3.86	3.79	3.89	3.78	3.50	3.26	4.07	3.90	3.87	3.74
07/01/22	07/31/22	Jul 2022	46.72	32.47	50.31	36.36	42.63	29.96	53.16	40.36	52.37	40.23	4.00	4.29	3.91	3.84	3.96	3.85	3.63	3.29	4.12	3.95	3.92	3.87
08/01/22	08/31/22	Aug 2022	47.65	34.66	51.69	37.87	43.97	31.55	55.91	41.11	55.18	41.24	4.13	4.25	4.06	3.94	4.03	3.88	3.78	3.22	4.21	4.05	4.01	4.02
09/01/22	09/30/22	Sep 2022	47.40	37.98	48.24	37.47	43.75	34.73	51.98	40.37	51.55	41.17	4.16	4.30	4.09	4.00	4.09	3.96	3.91	3.32	4.27	4.11	4.07	4.15
10/01/22	10/31/22	Oct 2022	46.57	37.25	46.76	38.11	42.95	34.03	51.53	39.27	50.79	42.04	4.19	4.33	4.14	4.04	4.13	4.01	3.92	3.35	4.32	4.16	4.12	4.16
11/01/22	11/30/22	Nov 2022	47.79	38.65	45.67	37.54	44.10	35.36	50.01	40.96	49.37	41.31	4.21	4.38	4.19	4.12	4.19	4.08	3.95	3.41	4.39	4.23	4.19	4.21
12/01/22	12/31/22	Dec 2022	48.26	39.49	45.99	38.82	44.55	36.17	49.77	41.56	49.39	42.38	4.30	4.43	4.22	4.15	4.22	4.12	3.95	3.46	4.44	4.27	4.23	4.22
01/01/23	01/31/23	Jan 2023	49.69	40.54	48.31	40.94	45.88	37.14	52.16	43.00	52.16	44.89	4.41	4.57	4.36	4.34	4.40	4.29	4.10	3.46	4.63	4.46	4.42	4.39
02/01/23	02/28/23	Feb 2023	53.57	43.53	49.92	42.12	49.62	40.00	52.32	43.15	53.03	45.60	4.46	4.64	4.44	4.40	4.46	4.35	4.21	3.55	4.69	4.52	4.48	4.50
03/01/23	03/31/23	Mar 2023	47.94	38.96	48.41	40.53	44.21	35.63	50.90	41.69	51.92	44.61	4.47	4.61	4.40	4.35	4.42	4.30	4.26	3.56	4.64	4.47	4.43	4.54
04/01/23	04/30/23	Apr 2023	44.08	37.09	47.69	40.13	40.52	33.84	48.46	39.72	50.76	43.51	4.29	4.39	4.20	4.10	4.20	4.05	4.03	3.32	4.38	4.22	4.18	4.27
05/01/23	05/31/23	May 2023	40.21	30.07	46.19	37.24	36.82	27.13	48.84	38.24	49.05	40.49	4.32	4.41	4.21	4.10	4.21	4.03	3.93	3.39	4.38	4.22	4.18	4.17
06/01/23	06/30/23	Jun 2023	46.10	32.33	49.71	36.36	42.45	29.28	53.22	40.13	52.87	40.67	4.35	4.44	4.23	4.09	4.21	4.03	3.93	3.40	4.37	4.21	4.17	4.17
07/01/23	07/31/23	Jul 2023	48.95	36.50	53.26	40.10	45.17	33.28	57.42	43.37	56.41	43.30	4.40	4.47	4.28	4.13	4.26	4.07	3.98	3.44	4.41	4.24	4.21	4.22
08/01/23	08/31/23	Aug 2023	50.95	37.14	54.46	39.73	47.09	33.88	58.68	43.06	57.90	43.19	4.44	4.55	4.36	4.25	4.34	4.19	4.12	3.46	4.52	4.36	4.33	4.35
09/01/23	09/30/23	Sep 2023	50.45	40.19	50.51	39.11	46.63	36.80	54.54	42.66	54.26	43.36	4.45	4.58	4.37	4.30	4.36	4.25	4.19	3.71	4.57	4.41	4.38	4.43
10/01/23	10/31/23	Oct 2023	50.28	39.95	48.29	39.32	46.45	36.57	53.24	42.65	53.29	44.17	4.45	4.58	4.40	4.30	4.37	4.26	4.18	3.72	4.57	4.41	4.38	4.42
11/01/23	11/30/23	Nov 2023	52.79	42.30	49.62	40.08	48.84	38.82	54.02	43.48	53.69	44.15	4.52	4.69	4.51	4.44	4.51	4.42	4.29	3.96	4.71	4.55	4.51	4.55
12/01/23	12/31/23	Dec 2023	52.66	43.15	49.70	41.87	48.72	39.63	53.44	44.41	53.36	45.47	4.57	4.71	4.52	4.46	4.52	4.44	4.35	3.96	4.75	4.58	4.54	4.63
01/01/24	01/31/24	Jan 2024	52.93	42.68	48.81	40.98	48.95	39.14	52.76	43.55	52.59	44.65	4.61	4.79	4.58	4.51	4.60	4.47	4.39	4.00	4.80	4.63	4.59	4.67
02/01/24	02/29/24	Feb 2024	55.14	45.33	49.61	41.89	51.40	41.96	52.14	43.11	52.59	45.23	4.55	4.70	4.49	4.42	4.50	4.39	4.30	3.95	4.71	4.55	4.50	4.58
03/01/24	03/31/24	Mar 2024	49.86	40.62	47.52	40.18	46.01	37.18	50.02	41.60	50.93	43.87	4.52	4.61	4.40	4.35	4.44	4.29	4.29	3.88	4.64	4.47	4.43	4.56
04/01/24	04/30/24	Apr 2024	45.71	38.57	46.50	39.79	42.04	35.23	48.28	39.83	50.46	43.85	4.44	4.52	4.32	4.26	4.34	4.17	4.14	3.57	4.54	4.38	4.34	4.37
05/01/24	05/31/24	May 2024	39.35	30.27	44.51	37.09	35.96	27.28	47.28	38.15	47.34	40.31	4.44	4.50	4.30	4.21	4.30	4.10	3.97	3.56	4.49	4.32	4.29	4.21
06/01/24	06/30/24	Jun 2024	45.65	33.32	48.54	36.56	41.98	30.19	52.03	40.57	51.79	41.23	4.44	4.50	4.29	4.17	4.26	4.06	3.96	3.54	4.45	4.29	4.25	4.20
07/01/24	07/31/24	Jul 2024	50.11	37.08	53.74	39.66	46.25	33.79	57.77	42.69	56.78	42.73	4.46	4.51	4.30	4.19	4.29	4.08	3.97	3.65	4.46	4.30	4.26	4.21
08/01/24	08/31/24	Aug 2024	52.60	38.50	55.09	40.20	48.63	35.15	59.59	43.52	58.53	43.58	4.49	4.60	4.40	4.31	4.39	4.22	4.15	3.68	4.58	4.42	4.39	4.39
09/01/24	09/30/24	Sep 2024	52.61	42.01	51.84	39.68	48.67	38.51	55.68	43.09	55.17	43.72	4.47	4.61	4.42	4.34	4.40	4.27	4.22	3.83	4.61	4.45	4.41	4.46
10/01/24	10/31/24	Oct 2024	51.60	41.04	51.63	41.34	47.73	37.60	54.96	41.62	54.36	44.54	4.49	4.64	4.44	4.36	4.41	4.31	4.22	3.82	4.63	4.47	4.44	4.46
11/01/24	11/30/24	Nov 2024	53.22	43.22	49.79	41.03	49.22	39.66	54.11	42.46	53.32	44.70	4.58	4.74	4.54	4.49	4.54	4.44	4.32	4.08	4.77	4.60	4.57	4.59
12/01/24	12/31/24	Dec 2024	53.06	44.12	48.77	41.52	49.07	40.52	53.33	42.92	52.70	45.28	4.59	4.69	4.50	4.44	4.50	4.37	4.20	4.01	4.72	4.56	4.52	4.47
01/01/25	01/31/25	Jan 2025	53.57	43.59	50.52	43.56	49.52	39.98	53.13	43.72	54.06	47.16	4.65	4.79	4.60	4.56	4.61	4.51	4.41	4.07	4.85	4.68	4.64	4.69
02/01/25	02/28/25	Feb 2025	57.39	46.54	52.12	44.12	53.25	42.81	52.60	43.41	54.90	47.26	4.68	4.80	4.60	4.55	4.61	4.51	4.44	4.08	4.84	4.67	4.63	4.73
03/01/25	03/31/25	Mar 2025	50.59	41.84	48.44	41.27	46.67	38.30	49.18	41.67	52.81	45.79	4.61	4.70	4.48	4.43	4.51	4.39	4.37	3.97	4.72	4.55	4.51	4.65
04/01/25	04/30/25	Apr 2025	46.15	39.04	46.76	40.11	42.43	35.62	47.34	40.50	51.31	44.70	4.47	4.56	4.37	4.29	4.37	4.21	4.15	3.53	4.57	4.40	4.37	4.39
05/01/25	05/31/25	May 2025	40.11	30.19	46.43	38.45	36.65	27.16	47.50	37.44	48.92	41.31	4.44	4.51	4.30	4.21	4.29	4.11	3.98	3.62	4.49	4.33	4.29	4.22
06/01/25	06/30/25	Jun 2025	46.81	34.18	50.12	38.01	43.05	30.98	52.71	40.06	52.90	42.51	4.47	4.53	4.33	4.21	4.28	4.03	3.94	3.61	4.49	4.33	4.29	4.18
07/01/25	07/31/25	Jul 2025	51.28	38.63	54.75	41.03	47.32	35.23	58.59	42.62	57.52	44.01	4.53	4.60	4.39	4.26	4.35	4.15	4.02	3.71	4.54	4.38	4.34	4.26
08/01/25	08/31/25	Aug 2025	55.35	40.99	58.09	43.35	51.22	37.49	62.27	44.51	61.37	46.77	4.59	4.70	4.47	4.35	4.44	4.26	4.19	3.75	4.63	4.47	4.43	4.43
09/01/25	09/30/25	Sep 2025	54.18	43.24	54.74	42.15	50.12	39.64	57.91	42.69	57.69	46.13	4.59	4.75	4.48	4.38	4.47	4.32	4.26	3.94	4.65	4.49	4.46	4.50
10/01/25	10/31/25	Oct 2025	51.79	41.50	52.18	42.16	47.81	37.98	56.24	42.44	56.08	46.52	4.53	4.75	4.47	4.37	4.43	4.30	4.21	3.87	4.64	4.48	4.44	4.45
11/01/25	11/30/25	Nov 2025	52.28	42.71	50.72	42.37	48.28	39.14	54.44	42.53	54.40	46.30	4.50	4.68	4.46	4.38	4.44	4.32	4.16	4.01	4.66	4.50	4.46	4.43
12/01/25	12/31/25	Dec 2025	53.08	43.19	50.48	43.02	49.05	39.60	53.53	42.67	54.41	46.52	4.50	4.62	4.41	4.34	4.42	4.29	4.11	3.87	4.63	4.46	4.42	4.39
01/01/26	01/31/26	Jan 2026	56.46	45.84	49.80	43.41	52.47	42.23	52.47	43.40	53.82	46.73	4.56	4.69	4.48	4.41	4.49	4.37	4.19	3.87	4.70	4.53	4.49	4.47
02/01/26	02/28/26	Feb 2026	59.07	49.19	51.60	44.16	55.64	45.72	51.58	43.18	54.48	47.20	4.57	4.71	4.49	4.44	4.50	4.38	4.20	3.86	4.73	4.56	4.52	4.48
03/01/26	03/31/26	Mar 2026	49.85	41.16	47.61	41.24	45.93	37.63	46.70	40.26	50.63	44.40	4.42	4.52	4.29	4.24	4.33	4.17	4.12	3.60	4.53	4.36	4.32	4.40
04/01/26	04/30/26	Apr 2026	45.47	38.56	47.46	40.95	41.73	35.14	45.67	39.53	49.79	43.74	4.29	4.38	4.17	4.10	4.17	4.02	3.95	3.36	4.37	4.21	4.17	4.19
05/01/26	05/31/26	May 2026	40.38	31.47	46.46	39.12	36.87	28.35	46.75	37.72	48.53	41.55	4.31	4.36	4.15	4.03	4.12	3.91	3.79	3.45	4.31	4.14	4.11	4.03
06/01/26	06/30/26	Jun 2026	46.20	33.30	48.77	36.64	42.43	30.10	51.12	39.07	51.38	41.26	4.33	4.37	4.16	4.04	4.12	3.81	3.74	3.43	4.32	4.16	4.12	3.98
07/01/26	07/31/26	Jul 2026	51.34	38.58	53.78	40.74	47.35	35.15	57.62	42.14	56.49	43.80	4.41	4.46	4.24	4.11	4.21	3.99	3.87	3.57	4.39	4.22	4.19	4.11
08/01/26	08/31/26	Aug 2026	54.90	41.71	55.88	41.78	50.75	38.14	59.93	43.64	58.96	45.12	4.46	4.62	4.35	4.23	4.31	4.14	4.06	3.65	4.50	4.34	4.30	4.30
09/01/26	09/30/26	Sep 2026	55.01	44.77	52.12	40.76	50.98	41.15	55.01	42.42	55.06	44.76	4.46	4.66	4.35	4.27	4.35	4.17	4.08	3.78	4.54	4.38	4.34	4.32
10/01/26	10/31/26	Oct 2026	53.29	43.64	50.02	41.59	49.23	40.01	53.28	42.16	53.73	45.71	4.45	4.67	4.37	4.28	4.35	4.23	4.08	3.77	4.55	4.39	4.36	4.32

11/01/26	11/30/26	Nov 2026	56.06	46.06	50.89	42.90	51.86	42.33	53.65	43.08	54.15	46.16	4.50	4.77	4.45	4.38	4.45	4.33	4.17	4.06	4.66	4.50	4.46	4.44
12/01/26	12/31/26	Dec 2026	56.61	45.52	50.43	42.97	52.54	41.95	52.76	43.10	53.94	46.15	4.56	4.67	4.45	4.40	4.46	4.33	4.16	3.77	4.68	4.52	4.48	4.44
01/01/27	01/31/27	Jan 2027	55.40	45.15	49.77	43.04	51.24	41.67	52.48	43.55	53.53	46.36	4.60	4.75	4.53	4.48	4.55	4.43	4.24	3.76	4.77	4.60	4.56	4.52
02/01/27	02/28/27	Feb 2027	57.61	48.39	50.83	43.97	53.71	44.86	50.95	43.13	53.64	47.05	4.60	4.74	4.52	4.47	4.53	4.41	4.23	3.73	4.76	4.59	4.55	4.51
03/01/27	03/31/27	Mar 2027	49.58	41.16	47.55	41.52	45.63	37.58	46.65	40.92	50.58	44.92	4.53	4.63	4.41	4.36	4.44	4.29	4.24	3.66	4.65	4.48	4.44	4.52
04/01/27	04/30/27	Apr 2027	45.39	39.08	47.03	41.18	41.62	35.59	45.62	40.10	49.80	44.22	4.43	4.51	4.29	4.21	4.29	4.13	4.07	3.49	4.49	4.33	4.29	4.30
05/01/27	05/31/27	May 2027	39.90	31.06	46.44	39.10	36.38	27.92	47.01	38.01	48.58	41.74	4.43	4.48	4.27	4.17	4.25	4.07	4.00	3.53	4.45	4.29	4.25	4.24
06/01/27	06/30/27	Jun 2027	47.19	34.66	49.62	37.43	43.34	31.36	52.16	40.48	52.30	42.30	4.45	4.48	4.27	4.15	4.25	4.03	3.93	3.56	4.42	4.26	4.22	4.17
07/01/27	07/31/27	Jul 2027	51.04	39.39	53.42	40.99	47.02	35.88	57.41	43.21	56.08	44.49	4.53	4.60	4.36	4.23	4.32	4.12	4.04	3.70	4.50	4.34	4.30	4.28
08/01/27	08/31/27	Aug 2027	53.91	41.91	54.97	41.38	49.76	38.30	59.32	44.32	58.09	45.31	4.59	4.70	4.43	4.31	4.41	4.21	4.15	3.77	4.58	4.42	4.38	4.38
09/01/27	09/30/27	Sep 2027	55.12	45.49	52.67	41.66	51.04	41.84	55.34	43.44	55.32	45.61	4.62	4.78	4.48	4.37	4.47	4.31	4.27	4.09	4.65	4.49	4.45	4.51
10/01/27	10/31/27	Oct 2027	55.96	46.08	53.78	44.87	51.76	42.34	56.27	44.41	56.18	47.83	4.68	4.92	4.60	4.52	4.59	4.47	4.45	4.16	4.80	4.63	4.60	4.70
11/01/27	11/30/27	Nov 2027	59.55	48.83	53.54	44.62	55.18	45.13	56.62	45.44	56.47	47.80	4.80	5.07	4.78	4.70	4.79	4.70	4.60	4.47	4.97	4.81	4.77	4.87
12/01/27	12/31/27	Dec 2027	58.82	47.69	52.34	44.65	54.73	43.98	54.67	45.70	55.93	47.97	4.86	5.02	4.80	4.74	4.80	4.68	4.70	4.29	5.02	4.86	4.82	4.97
01/01/28	01/31/28	Jan 2028	58.95	48.59	50.34	44.28	55.03	44.86	55.15	46.72	55.82	48.85	4.98	5.14	4.91	4.87	4.94	4.81	4.85	4.43	5.16	4.99	4.95	5.14
02/01/28	02/29/28	Feb 2028	60.90	52.64	52.90	45.87	57.80	49.23	53.97	45.89	56.04	49.20	4.96	5.10	4.87	4.84	4.91	4.77	4.83	4.37	5.13	4.96	4.92	5.11
03/01/28	03/31/28	Mar 2028	54.86	44.87	47.99	41.03	50.71	41.10	49.96	44.31	53.98	48.25	4.98	5.06	4.83	4.81	4.90	4.74	4.73	4.29	5.10	4.93	4.89	5.01
04/01/28	04/30/28	Apr 2028	51.29	43.21	48.19	40.99	47.22	39.50	48.75	43.94	52.98	47.86	4.96	5.03	4.81	4.76	4.84	4.68	4.69	4.22	5.03	4.87	4.84	4.93
05/01/28	05/31/28	May 2028	44.15	33.77	49.15	41.35	40.39	30.47	51.22	41.03	51.46	44.62	4.98	5.00	4.77	4.70	4.81	4.59	4.54	4.26	4.98	4.82	4.78	4.78
06/01/28	06/30/28	Jun 2028	51.87	38.16	53.04	39.83	47.77	34.67	56.67	44.33	56.34	45.57	5.02	5.03	4.81	4.69	4.80	4.57	4.57	4.28	4.97	4.80	4.77	4.80
07/01/28	07/31/28	Jul 2028	55.61	43.62	56.85	42.39	51.36	39.89	61.88	47.44	60.26	47.50	5.10	5.11	4.90	4.76	4.87	4.65	4.63	4.42	5.04	4.87	4.84	4.88
08/01/28	08/31/28	Aug 2028	58.25	45.40	57.63	41.78	53.87	41.60	63.06	47.21	61.36	47.57	5.11	5.21	4.96	4.85	4.95	4.79	4.80	4.43	5.13	4.97	4.93	5.04
09/01/28	09/30/28	Sep 2028	59.37	49.47	55.56	43.97	55.30	45.73	58.54	47.44	58.63	48.80	5.16	5.29	5.00	4.94	5.02	4.88	4.91	4.69	5.21	5.05	5.01	5.15
10/01/28	10/31/28	Oct 2028	60.41	50.14	54.14	44.90	56.14	46.30	59.06	47.76	58.60	50.75	5.18	5.36	5.07	5.02	5.09	4.96	4.96	4.73	5.29	5.13	5.10	5.20
11/01/28	11/30/28	Nov 2028	62.69	51.57	53.56	44.69	58.52	47.83	58.74	48.32	58.14	50.05	5.22	5.43	5.20	5.11	5.21	5.11	5.14	4.90	5.39	5.23	5.19	5.41
12/01/28	12/31/28	Dec 2028	61.77	52.31	52.60	46.54	57.99	48.42	57.65	49.32	57.92	51.01	5.29	5.46	5.22	5.18	5.24	5.11	5.16	4.83	5.47	5.30	5.26	5.43
01/01/29	01/31/29	Jan 2029	65.79	52.98	53.17	44.75	62.37	49.36	59.94	50.23	60.43	51.54	5.38	5.55	5.33	5.33	5.40	5.28	5.31	4.90	5.62	5.45	5.41	5.60
02/01/29	02/28/29	Feb 2029	68.36	58.40	57.18	48.92	67.82	55.94	60.22	50.42	61.67	53.71	5.41	5.56	5.34	5.34	5.40	5.28	5.33	4.90	5.63	5.46	5.42	5.61
03/01/29	03/31/29	Mar 2029	61.11	49.84	51.49	43.33	57.08	45.89	54.62	47.93	58.20	51.91	5.37	5.47	5.24	5.26	5.33	5.20	5.24	4.76	5.54	5.38	5.33	5.52
04/01/29	04/30/29	Apr 2029	57.31	47.58	53.87	45.90	53.06	43.78	52.73	47.11	57.21	51.14	5.33	5.40	5.17	5.12	5.21	5.05	5.09	4.58	5.39	5.23	5.19	5.32
05/01/29	05/31/29	May 2029	48.59	37.96	52.17	43.20	44.60	34.44	54.68	44.84	54.74	47.47	5.33	5.35	5.13	5.06	5.17	4.96	4.92	4.68	5.33	5.17	5.14	5.16
06/01/29	06/30/29	Jun 2029	54.14	40.17	53.95	40.55	49.91	36.55	57.87	46.33	58.01	47.38	5.30	5.33	5.10	4.99	5.10	4.88	4.88	4.62	5.27	5.10	5.07	5.12
07/01/29	07/31/29	Jul 2029	57.84	46.20	57.76	42.67	53.45	42.32	63.50	49.13	61.90	49.01	5.31	5.34	5.12	4.96	5.09	4.88	4.85	4.62	5.24	5.08	5.04	5.09
08/01/29	08/31/29	Aug 2029	62.83	48.48	59.13	42.17	58.24	44.50	65.91	48.82	63.81	49.02	5.30	5.38	5.12	5.02	5.13	4.95	4.99	4.62	5.29	5.13	5.09	5.23
09/01/29	09/30/29	Sep 2029	63.17	52.48	56.56	43.75	59.18	48.86	61.43	49.64	60.94	50.32	5.30	5.48	5.16	5.09	5.17	5.02	5.03	4.85	5.36	5.20	5.16	5.27
10/01/29	10/31/29	Oct 2029	62.49	50.89	54.55	42.81	59.04	47.21	60.73	48.57	60.13	50.76	5.26	5.47	5.16	5.10	5.19	5.05	5.05	4.81	5.37	5.21	5.18	5.29
11/01/29	11/30/29	Nov 2029	63.93	52.10	52.81	43.54	60.06	48.24	59.77	49.56	59.28	50.93	5.26	5.52	5.28	5.21	5.28	5.19	5.21	4.93	5.49	5.33	5.29	5.48
12/01/29	12/31/29	Dec 2029	65.46	54.64	52.28	45.10	62.86	50.93	59.47	50.57	59.57	51.72	5.31	5.47	5.23	5.24	5.31	5.19	5.23	4.83	5.53	5.36	5.32	5.50
01/01/30	01/31/30	Jan 2030	65.42	52.42	52.17	43.69	62.06	48.72	60.38	51.24	60.55	52.00	5.43	5.59	5.34	5.37	5.44	5.33	5.36	4.97	5.66	5.49	5.45	5.64
02/01/30	02/28/30	Feb 2030	67.59	57.76	55.16	46.68	66.91	54.97	60.49	51.67	61.33	53.89	5.50	5.64	5.40	5.43	5.50	5.39	5.41	5.04	5.72	5.55	5.51	5.70
03/01/30	03/31/30	Mar 2030	60.80	49.83	50.33	44.12	56.45	45.79	56.29	49.63	58.99	53.23	5.50	5.59	5.36	5.41	5.50	5.39	5.41	4.90	5.70	5.53	5.49	5.69
04/01/30	04/30/30	Apr 2030	56.25	48.00	49.98	43.06	51.93	44.01	52.87	47.91	56.88	51.92	5.40	5.47	5.24	5.20	5.30	5.14	5.17	4.70	5.47	5.31	5.28	5.41
05/01/30	05/31/30	May 2030	47.49	37.38	50.55	40.64	43.51	33.85	54.44	45.13	54.30	47.50	5.40	5.46	5.21	5.17	5.27	5.08	5.08	4.71	5.45	5.28	5.25	5.32
06/01/30	06/30/30	Jun 2030	54.55	41.45	53.98	41.29	50.26	37.73	58.68	48.07	58.67	48.77	5.44	5.47	5.24	5.17	5.27	5.06	5.11	4.77	5.45	5.29	5.25	5.35
07/01/30	07/31/30	Jul 2030	58.56	47.21	58.28	42.40	54.09	43.24	64.99	50.00	63.27	49.71	5.51	5.56	5.31	5.18	5.31	5.08	5.10	4.90	5.46	5.30	5.26	5.34
08/01/30	08/31/30	Aug 2030	62.98	49.42	59.82	42.93	58.33	45.36	67.38	50.68	65.28	50.59	5.57	5.66	5.41	5.33	5.43	5.26	5.28	4.93	5.60	5.44	5.40	5.52
09/01/30	09/30/30	Sep 2030	65.05	53.77	58.94	45.36	60.72	49.77	63.97	51.99	63.53	52.50	5.57	5.74	5.50	5.44	5.51	5.41	5.44	5.16	5.71	5.56	5.52	5.68
10/01/30	10/31/30	Oct 2030	65.50	53.63	59.58	47.93	62.02	49.93	64.10	52.04	63.59	53.68	5.63	5.81	5.59	5.53	5.59	5.49	5.53	5.21	5.80	5.64	5.61	5.77
11/01/30	11/30/30	Nov 2030	68.95	56.61	56.43	46.18	65.81	52.87	64.04	53.65	63.66	54.53	5.70	5.94	5.71	5.70	5.76	5.69	5.70	5.39	5.98	5.82	5.78	5.96
12/01/30	12/31/30	Dec 2030	69.11	57.30	54.57	46.18	66.56	53.45	63.11	54.20	63.03	54.63	5.79	5.92	5.69	5.71	5.79	5.69	5.71	5.39	6.00	5.83	5.79	5.99
01/01/31	01/31/31	Jan 2031	71.15	57.04	54.68	46.03	68.52	53.29	64.84	55.06	64.94	55.58	5.90	6.08	5.83	5.86	5.93	5.83	5.86	5.51	6.15	5.98	5.94	6.14
02/01/31	02/28/31	Feb 2031	74.84	63.51	58.76	48.94	74.98	61.23	66.10	55.80	67.79	58.80	5.95	6.12	5.88	5.92	5.98	5.88	5.90	5.58	6.21	6.04	6.00	6.19
03/01/31	03/31/31	Mar 2031	65.82	54.43	51.98	45.44	61.41	50.23	60.00	53.04	63.25	56.19	5.93	6.07	5.83	5.90	5.96	5.86	5.89	5.36	6.19	6.02	5.98	6.17
04/01/31	04/30/31	Apr 2031	61.89	51.99	51.49	45.90	57.32	47.78	56.90	51.66	61.13	55.85	5.85	5.95	5.70	5.67	5.77	5.64	5.64	5.25	5.95	5.78	5.75	5.88
05/01/31	05/31/31	May 2031	50.97	40.66	52.42	42.42	46.80	36.93	58.29	48.87	57.69	50.28	5.85	5.89	5.66	5.61	5.71	5.52	5.54	5.26	5.89	5.73	5.69	5.78
06/01/31	06/30/31	Jun 2031	58.54	45.17	56.50	43.57	54.03	41.25	62.36	51.61	62.03	51.95	5.88	5.90	5.67	5.61	5.71	5.52	5.54	5.27	5.89	5.73	5.69	5.78
07/01/31	07/31/31	Jul 2031	63.10	51.14	60.68	44.56	58.39	46.96	69.19	53.24	67.09	52.86	5.96	6.01	5.76	5.64	5.76	5.55	5.54	5.35	5.92	5.76	5.72	5.78
08/01/31	08/31/31	Aug 2031	67.86	53.90	61.91	45.85	62.95	49.61	71.45	54.55	69.15	54.45	6.01	6.10	5.85	5.74	5.85	5.68	5.73	5.39	6.02	5.86	5.82	5.97
09/01/31	09/30/31	Sep 2031	70.85	57.83	61.97	46.64	66.50	53.74	68.60	55.05	67.83	55.57	6.02	6.23	5.96	5.90	5.98	5.86	5.90	5.64	6.18	6.02	5.98	6.14
10/01/31	10/31/31	Oct 2031	70.48	57.45	59.62	47.60	67.47	53.48	67.83	55.19	67.17	57.00	5.99	6.20	5.96	5.90	5.98	5.86	5.90	5.64	6.18	6.02	5.98	6.15
11/01/31	11/30/31	Nov 2031	72.25	58.46	56.45	46.86	68.87	54.53	67.10	55.95	66.63	56.64	5.98	6.21	5.98	5.99	6.05	5.98	5.98	5.64	6.27	6.11	6.07	6.24
12/01/31	12/31/31	Dec 2031	74.03	60.35	56.78	47.40	72.24	56.39	66.82	56.37	66.76	57.03	6.07	6.24	6.01	6.01	6.07	5.96	5.99	5.70	6.29	6.13	6.09	6.27
01/01/32	01/31/32	Jan 2032	74.27	59.88	57.50	48.02	71.93	56.16	67.64	57.63	67.47	58.03	6.18	6.36	6.10	6.13	6.21	6.10	6.13	5.79	6.42	6.25	6.21	6.41
02/01/32	02/29/32	Feb 2032	77.40	65.24	60.65	50.47	77.83	62.95	68.95	58.18	69.72	60.40	6.12	6.30	6.06	6.09	6.15	6.06	6.07	5.73	6.37	6.21	6.17	6.35
03/01/32	03/31/32	Mar 2032	68.07	55.72	54.05	46.74	63.73	51.40	62.67	54.48	64.69	57.43	6.04	6.21	5.97	6.00	6.07	5.97	6.00	5.61	6.28	6.12	6.07	6.27
04/01/32	04/30/32	Apr 2032	63.59	53.91	57.16	49.34	59.00	49.60	59.88	53.42	63.11	57.19	5.95	6.10	5.86	5.85	5.92	5.80	5.80	5.41	6.12	5.96	5.92	6.04
05/01/32	05/31/32	May 2032	54.03	43.94	56.19	45.64	49.68	40.03	60.94	51.51	60.05	52.54	5.97	6.00	5.76	5.70	5.80	5.61	5.67	5.41	5.97	5.81	5.77	5.90
06/01/32	06/30/32	Jun 2032	60.20	45.60	57.93	43.78	55.57	41.61	63.92	52.54	63.18	52.44	5.98	6.01	5.77	5.67	5.79	5.58	5.64	5.43	5.94	5.78	5.74	5.87
07/01/32	07/31/32	Jul 2032	63.81	51.53	61.76	45.27	59.03	47.29	70.09	53.97	67.73	53.56	6.03	6.06	5.82	5.68	5.80	5.59	5.58	5.41	5.96	5.80	5.76	5.82
08/01/32	08/31/32	Aug 2032	68.83	54.37	63.35	46.57	63.83	50.00	72.14	55.35	69.70	55.11	6.03	6.19	5.92	5.83	5.92	5.79	5.79	5.50	6.10	5.94	5.91	6.02
09/01/32	09/30/32	Sep 2032	70.89	57.93	61.08	46.62	66.59	53.81	67.79	55.47	66.98	55.65	6.00	6.24	5.98	5.92	5.98	5.88	5.89	5.64	6.19	6.03	6.00	6.13
10/01/32	10/31/32	Oct 2032	71.12	58.36	58.29	47.39	68.19	54.40	67.52	56.51	66.84	57.71	6.00	6.25	6.01	5.97	6.04	5.92	5.94	5.65	6.24	6.08	6.04	6.18
11/01/32	11/30/32	Nov 2032	74.60	60.14	57.90	47.60	72.26	56.32	68.86	57.20	68.03	57.55	5.97	6.25	6.01	6.01	6.10	6.03	6.01	5.62	6.29	6.13	6.09	6.27

12/01/32	12/31/32	Dec 2032	74.98	61.06	57.34	47.76	73.45	57.15	67.51	57.50	67.13	57.45	6.03	6.24	6.00	6.03	6.07	5.98	6.00	5.71	6.31	6.14	6.10	6.27
01/01/33	01/31/33	Jan 2033	73.86	60.38	56.91	48.44	71.83	56.92	67.33	58.00	67.21	58.39	6.12	6.33	6.09	6.13	6.19	6.10	6.10	5.78	6.42	6.25	6.21	6.39
02/01/33	02/28/33	Feb 2033	77.12	65.14	59.98	50.28	77.61	62.92	68.88	58.20	69.71	60.41	6.15	6.35	6.10	6.15	6.21	6.12	6.12	5.81	6.44	6.27	6.23	6.40
03/01/33	03/31/33	Mar 2033	67.59	55.83	53.56	47.31	63.30	51.51	62.14	55.26	64.50	57.89	6.07	6.24	6.01	6.09	6.16	6.09	6.07	5.58	6.37	6.21	6.17	6.35
04/01/33	04/30/33	Apr 2033	62.02	53.65	53.83	47.53	57.42	49.31	58.89	54.14	62.51	57.82	5.93	6.15	5.90	5.92	5.96	5.84	5.84	5.40	6.19	6.03	6.00	6.08
05/01/33	05/31/33	May 2033	52.15	42.98	53.65	44.08	47.83	39.06	59.50	51.07	58.69	52.31	5.92	6.01	5.77	5.72	5.83	5.64	5.63	5.37	5.99	5.83	5.80	5.86
06/01/33	06/30/33	Jun 2033	60.69	46.29	58.10	44.15	56.00	42.23	64.28	52.95	63.58	53.03	5.98	6.03	5.78	5.72	5.84	5.63	5.64	5.43	6.00	5.83	5.80	5.88
07/01/33	07/31/33	Jul 2033	64.22	53.38	61.85	46.60	59.37	49.01	70.61	55.48	68.26	55.12	6.07	6.16	5.87	5.81	6.00	5.73	5.69	5.55	6.09	5.93	5.89	5.93
08/01/33	08/31/33	Aug 2033	70.04	55.55	63.61	46.56	64.94	51.08	73.21	55.95	70.74	55.76	6.12	6.30	6.06	6.00	6.09	5.95	5.93	5.64	6.27	6.11	6.07	6.17
09/01/33	09/30/33	Sep 2033	71.61	59.03	62.05	47.89	67.41	54.74	68.65	56.71	68.19	57.07	6.15	6.41	6.16	6.13	6.18	6.12	6.07	5.80	6.41	6.25	6.21	6.31
10/01/33	10/31/33	Oct 2033	74.08	60.93	63.14	51.03	71.83	57.39	70.49	58.17	69.96	59.95	6.19	6.47	6.27	6.19	6.26	6.19	6.19	5.84	6.47	6.31	6.27	6.44
11/01/33	11/30/33	Nov 2033	79.40	64.77	61.59	50.19	79.28	61.64	72.58	59.50	71.99	60.26	6.26	6.55	6.35	6.30	6.39	6.36	6.38	5.90	6.58	6.42	6.38	6.64
12/01/33	12/31/33	Dec 2033	78.06	63.77	59.75	49.60	77.31	59.89	70.27	59.68	70.12	59.67	6.32	6.55	6.33	6.33	6.49	6.46	6.47	6.00	6.62	6.45	6.41	6.75
01/01/34	01/31/34	Jan 2034	76.30	65.37	59.02	50.69	75.23	62.22	69.31	60.44	69.36	61.16	6.43	6.70	6.48	6.48	6.64	6.62	6.65	6.09	6.77	6.60	6.56	6.94
02/01/34	02/28/34	Feb 2034	78.75	69.40	62.09	53.30	79.88	68.19	70.20	61.32	71.33	63.87	6.46	6.70	6.48	6.49	6.64	6.62	6.64	6.12	6.78	6.62	6.57	6.92
03/01/34	03/31/34	Mar 2034	69.83	61.46	55.05	48.96	66.33	57.07	63.72	57.82	66.22	60.60	6.42	6.62	6.38	6.45	6.51	6.45	6.45	5.84	6.73	6.57	6.53	6.73
04/01/34	04/30/34	Apr 2034	66.34	57.16	55.58	49.80	61.67	52.66	60.71	56.32	65.06	60.22	6.27	6.48	6.26	6.26	6.31	6.24	6.18	5.68	6.53	6.37	6.34	6.42
05/01/34	05/31/34	May 2034	57.36	45.55	57.90	46.37	52.76	41.48	63.28	53.58	62.79	54.70	6.24	6.38	6.13	6.10	6.21	6.10	5.99	5.63	6.38	6.22	6.18	6.23
06/01/34	06/30/34	Jun 2034	64.34	49.17	60.54	46.12	59.44	44.94	66.97	55.28	66.29	55.39	6.26	6.35	6.10	6.04	6.20	6.09	5.96	5.65	6.32	6.15	6.12	6.20
07/01/34	07/31/34	Jul 2034	67.35	55.85	64.79	48.33	62.31	51.32	73.21	57.42	71.01	57.07	6.34	6.46	6.20	6.09	6.24	6.15	5.96	5.73	6.36	6.20	6.16	6.20
08/01/34	08/31/34	Aug 2034	72.06	57.88	65.93	48.41	66.86	53.26	74.96	57.97	72.77	57.89	6.34	6.56	6.31	6.24	6.32	6.26	6.16	5.74	6.52	6.36	6.32	6.40
09/01/34	09/30/34	Sep 2034	72.65	61.79	63.51	49.36	68.42	57.41	69.05	58.41	69.13	58.90	6.34	6.62	6.38	6.34	6.38	6.34	6.29	5.96	6.61	6.45	6.41	6.53
10/01/34	10/31/34	Oct 2034	74.32	62.70	61.22	50.41	72.46	58.89	70.02	58.77	69.62	60.61	6.29	6.57	6.37	6.31	6.37	6.31	6.31	5.94	6.58	6.42	6.38	6.55
11/01/34	11/30/34	Nov 2034	77.33	64.95	59.52	49.73	76.39	61.56	70.89	59.32	70.56	60.43	6.23	6.51	6.32	6.27	6.38	6.35	6.38	5.85	6.55	6.39	6.35	6.65
12/01/34	12/31/34	Dec 2034	76.80	66.19	59.36	50.76	76.41	62.64	69.43	60.54	69.58	61.04	6.26	6.54	6.34	6.29	6.48	6.46	6.49	5.94	6.58	6.41	6.37	6.77
01/01/35	01/31/35	Jan 2035	74.11	63.79	57.52	50.16	74.08	60.40	68.83	60.46	69.08	61.16	6.39	6.63	6.42	6.43	6.61	6.61	6.64	6.08	6.72	6.56	6.51	6.93
02/01/35	02/28/35	Feb 2035	78.12	68.88	61.41	52.94	80.25	68.03	69.97	61.14	71.50	63.63	6.43	6.66	6.45	6.47	6.64	6.63	6.68	6.10	6.76	6.59	6.55	6.96
03/01/35	03/31/35	Mar 2035	69.64	61.84	55.02	49.34	67.98	57.80	63.91	57.75	66.53	61.09	6.40	6.63	6.42	6.43	6.51	6.47	6.48	6.10	6.72	6.55	6.51	6.76
04/01/35	04/30/35	Apr 2035	66.90	58.72	58.85	51.40	64.31	55.03	61.57	56.79	66.54	61.56	6.29	6.50	6.29	6.29	6.32	6.26	6.26	5.89	6.57	6.40	6.37	6.50
05/01/35	05/31/35	May 2035	59.30	48.19	58.13	48.07	54.62	43.96	63.78	55.09	63.74	56.84	6.35	6.51	6.31	6.29	6.35	6.29	6.21	5.87	6.57	6.40	6.37	6.45
06/01/35	06/30/35	Jun 2035	63.10	49.59	57.61	46.31	58.36	45.33	64.82	55.69	64.71	56.24	6.39	6.48	6.24	6.19	6.32	6.23	6.11	5.68	6.47	6.31	6.27	6.35
07/01/35	07/31/35	Jul 2035	69.09	57.05	64.73	49.27	63.94	52.42	74.80	58.87	72.54	58.52	6.48	6.61	6.35	6.32	6.43	6.32	6.21	5.76	6.60	6.44	6.40	6.45
08/01/35	08/31/35	Aug 2035	73.09	59.77	65.63	49.30	68.17	55.06	77.43	59.34	74.74	59.23	6.53	6.72	6.50	6.45	6.53	6.45	6.39	5.94	6.72	6.56	6.53	6.63
09/01/35	09/30/35	Sep 2035	72.15	63.12	61.35	50.05	68.72	59.00	70.88	59.97	70.34	60.25	6.51	6.74	6.53	6.55	6.58	6.50	6.48	6.13	6.82	6.66	6.62	6.72
10/01/35	10/31/35	Oct 2035	71.39	62.44	60.80	50.20	70.38	58.92	71.40	59.66	70.86	61.57	6.48	6.71	6.50	6.48	6.56	6.51	6.48	6.08	6.76	6.60	6.56	6.72
11/01/35	11/30/35	Nov 2035	74.85	64.31	59.02	50.61	73.80	60.50	71.61	60.63	71.06	61.37	6.48	6.79	6.58	6.53	6.71	6.68	6.71	6.11	6.81	6.65	6.61	6.97
12/01/35	12/31/35	Dec 2035	76.43	65.92	59.35	51.39	77.64	62.75	70.73	62.12	71.13	62.28	6.56	6.80	6.55	6.58	6.77	6.74	6.77	6.11	6.86	6.70	6.66	7.05
01/01/36	01/31/36	Jan 2036	78.38	67.73	61.06	52.99	78.66	64.54	72.47	64.12	72.54	64.63	6.71	7.04	6.76	6.81	7.04	7.03	7.04	6.11	7.10	6.93	6.89	7.33
02/01/36	02/29/36	Feb 2036	81.07	71.66	64.16	55.09	83.27	71.19	71.32	62.56	73.87	65.88	6.66	6.88	6.66	6.68	6.81	6.78	6.81	6.30	6.97	6.80	6.76	7.10
03/01/36	03/31/36	Mar 2036	71.67	64.08	56.68	51.26	69.95	59.89	65.54	59.76	68.33	63.16	6.65	6.86	6.68	6.68	6.76	6.73	6.73	6.37	6.97	6.80	6.76	7.01
04/01/36	04/30/36	Apr 2036	67.51	59.24	58.10	51.54	64.05	55.01	62.77	57.98	67.59	62.66	6.53	6.71	6.52	6.52	6.55	6.50	6.45	6.11	6.79	6.63	6.59	6.69
05/01/36	05/31/36	May 2036	57.56	47.46	57.56	48.18	52.90	43.21	63.49	55.63	63.30	57.50	6.52	6.66	6.47	6.44	6.50	6.44	6.35	6.04	6.71	6.55	6.51	6.59
06/01/36	06/30/36	Jun 2036	64.28	51.62	60.69	48.51	59.43	47.20	67.13	57.59	66.78	58.07	6.57	6.65	6.40	6.34	6.48	6.39	6.25	5.81	6.61	6.45	6.41	6.49
07/01/36	07/31/36	Jul 2036	70.56	57.39	67.43	49.83	65.29	52.70	76.61	59.55	74.24	59.24	6.70	6.78	6.52	6.47	6.63	6.50	6.35	5.88	6.75	6.58	6.55	6.59
08/01/36	08/31/36	Aug 2036	74.97	61.49	68.99	51.67	69.88	56.72	79.20	61.68	76.53	61.55	6.75	6.94	6.73	6.68	6.75	6.68	6.60	6.17	6.95	6.79	6.76	6.84
09/01/36	09/30/36	Sep 2036	74.83	64.05	65.67	51.13	71.59	59.93	73.05	60.75	72.57	61.22	6.70	6.93	6.73	6.70	6.76	6.70	6.68	6.32	6.97	6.81	6.77	6.92
10/01/36	10/31/36	Oct 2036	74.92	64.73	66.91	54.60	74.90	61.48	73.34	61.85	73.10	63.68	6.68	6.94	6.75	6.68	6.76	6.73	6.71	6.29	6.95	6.79	6.76	6.95
11/01/36	11/30/36	Nov 2036	80.38	69.59	64.43	53.94	81.15	66.73	74.86	63.73	74.98	64.91	6.81	7.11	6.91	6.86	7.04	7.03	7.03	6.45	7.14	6.98	6.94	7.29
12/01/36	12/31/36	Dec 2036	80.08	69.22	62.67	53.48	81.88	66.45	73.71	63.93	74.19	64.60	6.88	7.09	6.86	6.86	7.06	7.04	7.06	6.35	7.15	6.98	6.94	7.33
01/01/37	01/31/37	Jan 2037	81.63	69.79	62.33	55.50	81.71	66.52	74.36	66.16	74.54	66.74	6.99	7.34	6.99	7.05	7.34	7.32	7.34	6.40	7.34	7.17	7.13	7.62
02/01/37	02/28/37	Feb 2037	85.38	74.36	66.34	57.29	87.55	73.48	76.22	66.26	78.10	68.66	7.04	7.29	7.00	7.02	7.32	7.29	7.32	6.52	7.31	7.14	7.10	7.60
03/01/37	03/31/37	Mar 2037	72.05	65.03	57.41	52.13	69.81	60.71	67.48	61.28	69.53	64.39	6.94	7.14	6.95	6.95	7.05	7.00	7.04	6.67	7.24	7.07	7.03	7.31
04/01/37	04/30/37	Apr 2037	67.53	59.90	57.21	51.92	63.73	55.49	63.83	59.14	68.73	63.64	6.77	6.95	6.77	6.75	6.78	6.73	6.72	6.36	7.03	6.87	6.83	6.95
05/01/37	05/31/37	May 2037	59.01	49.42	59.75	51.48	54.20	45.02	65.73	57.64	65.74	60.15	6.75	6.92	6.72	6.70	6.75	6.70	6.62	6.31	6.98	6.81	6.78	6.85
06/01/37	06/30/37	Jun 2037	63.82	52.19	61.27	50.30	58.80	47.67	68.07	59.06	67.77	59.64	6.78	6.90	6.67	6.62	6.73	6.63	6.50	6.06	6.89	6.73	6.69	6.74
07/01/37	07/31/37	Jul 2037	71.50	58.59	68.43	52.37	66.14	53.80	78.66	61.48	76.27	61.20	6.95	7.05	6.82	6.75	6.89	6.78	6.63	6.10	7.03	6.87	6.83	6.87
08/01/37	08/31/37	Aug 2037	76.61	62.39	69.46	53.71	71.18	57.46	81.29	63.44	78.80	63.37	7.00	7.22	7.00	6.97	7.02	6.95	6.89	6.52	7.24	7.08	7.05	7.12
09/01/37	09/30/37	Sep 2037	75.34	65.21	65.93	53.61	71.54	60.83	74.97	63.34	74.47	63.75	7.02	7.29	7.09	7.00	7.07	7.02	7.00	6.62	7.28	7.12	7.08	7.24
10/01/37	10/31/37	Oct 2037	76.00	66.14	65.55	54.92	75.38	62.40	74.61	63.86	74.64	65.90	6.99	7.25	7.05	6.97	7.07	7.02	7.00	6.58	7.24	7.08	7.05	7.24
11/01/37	11/30/37	Nov 2037	82.27	70.10	63.08	53.82	83.07	66.93	76.44	64.72	76.36	65.57	6.97	7.27	7.09	7.00	7.24	7.24	7.27	6.65	7.28	7.12	7.08	7.54
12/01/37	12/31/37	Dec 2037	84.00	71.62	63.80	55.42	85.70	69.25	76.02	66.07	76.76	66.83	7.10	7.36	7.15	7.10	7.37	7.36	7.41	6.63	7.39	7.22	7.18	7.68
01/01/38	01/31/38	Jan 2038	85.82	75.02	64.31	57.50	86.16	71.99	77.55	68.80	77.72	69.76	7.22	7.63	7.25	7.27	7.64	7.64	7.64	6.61	7.56	7.39	7.35	7.93
02/01/38	02/28/38	Feb 2038	88.37	78.12	67.93	58.89	90.90	77.74	78.69	68.07	80.87	71.54	7.25	7.51	7.23	7.23	7.58	7.58	7.63	6.73	7.52	7.35	7.31	7.91
03/01/38	03/31/38	Mar 2038	75.74	68.87	58.64	53.60	74.84	64.45	68.89	62.26	71.13	66.33	7.15	7.35	7.16	7.16	7.27	7.23	7.25	6.87	7.45	7.28	7.24	7.53
04/01/38	04/30/38	Apr 2038	69.52	63.38	61.89	54.93	66.40	59.10	65.18	61.28	69.90	66.05	6.99	7.18	6.99	6.97	7.03	6.97	6.97	6.61	7.25	7.09	7.05	7.21
05/01/38	05/31/38	May 2038	62.44	53.50	61.95	53.64	57.43	48.88	68.46	60.35	67.81	62.60	7.03	7.20	7.01	6.97	7.03	6.96	6.87	6.53	7.25	7.09	7.05	7.11
06/01/38	06/30/38	Jun 2038	69.14	54.93	63.43	52.00	64.08	50.31	71.61	61.32	71.14	61.93	7.08	7.20	6.96	6.89	7.03	6.92	6.79	6.36	7.17	7.00	6.97	7.02
07/01/38	07/31/38	Jul 2038	77.12	62.36	69.51	53.32	71.46	57.36	81.95	64.13	79.02	63.84	7.20	7.32	7.06	7.01	7.15	7.04	6.89	6.36	7.29	7.12	7.09	7.13
08/01/38	08/31/38	Aug 2038	81.83	64.97	70.62	54.88	76.14	59.89	83.57	65.27	81.01	65.23	7.22	7.51	7.22	7.18	7.25	7.16	7.13	6.72	7.45	7.29	7.26	7.37
09/01/38	09/30/38	Sep 2038	78.03	67.91	63.62	54.16	74.32	63.65	74.35	64.74	74.13	65.63	7.16	7.47	7.23	7.16	7.23	7.18	7.16	6.77	7.44	7.28	7.24	7.40
10/01/38	10/31/38	Oct 2038	80.44	70.11	64.05	55.36	80.38	66.69	76.26	66.29	76.36	68.11	7.16	7.47	7.25	7.15	7.34	7.30	7.30	6.75	7.42	7.26	7.22	7.54
11/01/38	11/30/38	Nov 2038	87.35	74.05	65.86	56.03	88.83	71.39	79.53	67.51	79.91	68.16	7.23	7.59	7.34	7.25	7.58	7.59	7.64	6.85	7.53	7.37	7.33	7.91
12/01/38	12/31/38	Dec 2038	88.26	75.92	66.12	57.42	89.61	73.50	78.85	68.15	79.87	69.38	7.30	7.59	7.32	7.28	7.63	7.63	7.68	6.87	7.57	7.40	7.36	7.96

01/01/39	01/31/39	Jan 2039	88.65	77.25	66.07	58.99	88.88	74.47	79.41	70.84	79.93	71.66	7.42	7.88	7.42	7.46	7.85	7.83	7.72	6.79	7.75	7.58	7.54	8.01
02/01/39	02/28/39	Feb 2039	90.82	80.87	69.49	60.86	93.37	80.67	80.62	70.09	83.07	74.03	7.46	7.76	7.42	7.46	7.85	7.85	7.90	6.97	7.75	7.58	7.54	8.18
03/01/39	03/31/39	Mar 2039	77.33	70.29	60.00	55.05	75.78	65.64	70.46	64.28	72.87	68.26	7.35	7.56	7.37	7.37	7.46	7.42	7.44	7.07	7.66	7.49	7.45	7.72
04/01/39	04/30/39	Apr 2039	70.96	64.81	61.40	55.40	67.28	60.23	66.58	62.88	71.48	67.88	7.18	7.37	7.20	7.16	7.21	7.18	7.16	6.81	7.44	7.27	7.24	7.40
05/01/39	05/31/39	May 2039	63.09	53.38	61.35	53.93	57.99	48.71	69.10	61.05	68.62	63.72	7.16	7.35	7.16	7.14	7.16	7.11	7.04	6.76	7.42	7.26	7.22	7.27
06/01/39	06/30/39	Jun 2039	69.09	56.34	63.97	53.38	63.75	51.54	71.93	62.49	71.49	63.28	7.20	7.35	7.11	7.02	7.16	7.04	6.93	6.47	7.30	7.13	7.10	7.17
07/01/39	07/31/39	Jul 2039	75.61	62.52	69.80	55.18	69.96	57.45	82.05	65.33	79.20	65.04	7.32	7.49	7.23	7.14	7.28	7.20	7.04	6.46	7.42	7.26	7.22	7.28
08/01/39	08/31/39	Aug 2039	84.06	66.15	71.79	56.04	78.18	60.98	85.74	66.15	83.18	66.18	7.35	7.65	7.39	7.34	7.39	7.32	7.27	6.86	7.61	7.45	7.41	7.50
09/01/39	09/30/39	Sep 2039	79.65	69.81	65.94	55.99	76.00	65.35	75.99	66.64	75.89	67.65	7.35	7.74	7.42	7.34	7.42	7.35	7.34	6.93	7.61	7.45	7.41	7.57
10/01/39	10/31/39	Oct 2039	84.01	73.44	70.59	59.13	84.58	70.62	78.67	68.00	79.42	70.78	7.35	7.71	7.42	7.32	7.56	7.55	7.53	6.93	7.59	7.43	7.40	7.77
11/01/39	11/30/39	Nov 2039	93.10	79.74	70.71	59.83	95.03	79.12	83.62	71.06	84.85	72.62	7.46	7.92	7.56	7.49	7.86	7.90	7.88	7.07	7.77	7.61	7.57	8.15
12/01/39	12/31/39	Dec 2039	89.93	78.27	66.99	59.05	91.23	77.13	80.27	69.85	81.30	71.18	7.53	7.85	7.55	7.51	7.88	7.88	7.95	7.11	7.80	7.63	7.59	8.23
01/01/40	01/31/40	Jan 2040	93.06	83.14	68.49	61.94	93.42	84.08	82.24	73.00	83.14	75.79	7.67	8.14	7.69	7.75	8.09	8.09	7.91	7.04	8.04	7.87	7.83	8.19
02/01/40	02/29/40	Feb 2040	92.88	82.92	70.43	62.13	95.56	83.49	82.71	71.12	84.80	75.90	7.60	7.94	7.60	7.66	8.05	8.07	8.16	7.24	7.95	7.78	7.74	8.44
03/01/40	03/31/40	Mar 2040	79.77	74.18	61.17	57.29	78.64	69.58	72.97	66.43	74.79	70.87	7.60	7.84	7.66	7.62	7.80	7.78	7.80	7.30	7.91	7.74	7.70	8.08
04/01/40	04/30/40	Apr 2040	72.48	67.64	61.06	56.18	69.27	63.10	68.69	64.68	73.68	69.67	7.46	7.64	7.46	7.42	7.49	7.44	7.44	7.08	7.70	7.54	7.50	7.68
05/01/40	05/31/40	May 2040	65.56	55.68	63.31	55.93	60.32	50.85	72.06	63.13	71.47	65.98	7.44	7.64	7.44	7.40	7.44	7.40	7.33	7.03	7.68	7.52	7.48	7.57
06/01/40	06/30/40	Jun 2040	70.55	58.85	65.43	55.60	65.07	53.88	74.32	64.59	73.66	65.74	7.48	7.66	7.37	7.26	7.42	7.31	7.21	6.67	7.54	7.37	7.34	7.44
07/01/40	07/31/40	Jul 2040	78.83	65.10	71.66	56.95	72.99	59.86	84.94	67.53	81.90	67.36	7.62	7.78	7.49	7.40	7.57	7.40	7.30	6.72	7.68	7.52	7.48	7.54
08/01/40	08/31/40	Aug 2040	85.87	69.18	72.74	58.25	79.95	63.87	87.46	68.64	84.89	68.71	7.66	8.00	7.71	7.64	7.71	7.62	7.58	7.13	7.91	7.75	7.71	7.82
09/01/40	09/30/40	Sep 2040	81.44	73.21	65.38	58.92	77.83	68.82	76.77	69.52	77.08	71.14	7.71	8.05	7.78	7.67	7.78	7.71	7.67	7.24	7.95	7.79	7.75	7.91
10/01/40	10/31/40	Oct 2040	88.76	78.08	70.75	60.86	90.25	75.64	81.79	71.04	82.84	74.20	7.71	8.11	7.76	7.67	7.98	7.96	7.96	7.26	7.95	7.79	7.75	8.20
11/01/40	11/30/40	Nov 2040	95.58	81.61	71.79	61.12	97.56	80.27	85.71	73.08	87.14	74.37	7.80	8.23	7.87	7.80	8.25	8.29	8.30	7.40	8.08	7.92	7.88	8.57
12/01/40	12/31/40	Dec 2040	95.81	83.42	71.67	62.81	97.41	82.92	85.51	74.39	86.82	75.98	7.91	8.30	7.94	7.89	8.34	8.36	8.41	7.49	8.18	8.01	7.97	8.69
01/01/41	01/31/41	Jan 2041	95.29	85.14	70.14	63.43	95.66	86.10	84.21	74.75	85.13	77.61	7.86	8.34	7.88	7.93	8.28	8.28	8.10	7.21	8.22	8.05	8.01	8.38
02/01/41	02/28/41	Feb 2041	95.11	84.91	72.12	63.62	97.86	85.50	84.70	72.83	86.83	77.72	7.78	8.13	7.78	7.84	8.25	8.26	8.36	7.42	8.13	7.96	7.92	8.64
03/01/41	03/31/41	Mar 2041	81.68	75.96	62.64	58.66	80.53	71.25	74.72	68.02	76.58	72.57	7.78	8.02	7.84	7.80	7.99	7.97	7.99	7.47	8.09	7.92	7.88	8.27
04/01/41	04/30/41	Apr 2041	74.22	69.27	62.53	57.53	70.93	64.62	70.33	66.24	75.45	71.35	7.64	7.82	7.64	7.60	7.67	7.62	7.62	7.25	7.88	7.71	7.68	7.86
05/01/41	05/31/41	May 2041	67.14	57.02	64.83	57.27	61.76	52.07	73.79	64.64	73.18	67.56	7.62	7.82	7.62	7.58	7.62	7.58	7.51	7.19	7.86	7.70	7.66	7.74
06/01/41	06/30/41	Jun 2041	72.24	60.26	67.00	56.93	66.63	55.18	76.10	66.14	75.42	67.32	7.66	7.84	7.54	7.43	7.60	7.49	7.38	6.83	7.71	7.55	7.51	7.62
07/01/41	07/31/41	Jul 2041	80.73	66.66	73.38	58.32	74.74	61.30	86.97	69.15	83.87	68.98	7.80	7.97	7.67	7.58	7.75	7.58	7.47	6.88	7.86	7.70	7.66	7.71
08/01/41	08/31/41	Aug 2041	87.93	70.84	74.48	59.65	81.87	65.40	89.56	70.29	86.93	70.36	7.84	8.19	7.90	7.82	7.90	7.80	7.77	7.30	8.09	7.93	7.90	8.00
09/01/41	09/30/41	Sep 2041	83.39	74.97	66.95	60.34	79.70	70.48	78.61	71.19	78.93	72.85	7.90	8.25	7.97	7.86	7.97	7.90	7.86	7.42	8.13	7.97	7.94	8.10
10/01/41	10/31/41	Oct 2041	90.89	79.95	72.44	62.32	92.41	77.46	83.76	72.75	84.83	75.98	7.90	8.30	7.95	7.86	8.17	8.15	8.15	7.43	8.13	7.97	7.94	8.39
11/01/41	11/30/41	Nov 2041	97.88	83.56	73.51	62.59	99.90	82.19	87.77	74.83	89.23	76.16	7.99	8.43	8.06	7.99	8.45	8.49	8.50	7.58	8.27	8.10	8.07	8.77
12/01/41	12/31/41	Dec 2041	98.11	85.42	73.39	64.32	99.75	84.92	87.56	76.18	88.90	77.80	8.10	8.50	8.13	8.08	8.54	8.56	8.61	7.67	8.36	8.20	8.16	8.89
01/01/42	01/31/42	Jan 2042	97.58	87.18	71.82	64.95	97.96	88.17	86.24	76.54	87.18	79.47	8.05	8.54	8.07	8.12	8.48	8.48	8.29	7.39	8.41	8.24	8.20	8.58
02/01/42	02/28/42	Feb 2042	97.39	86.94	73.85	65.15	100.21	87.55	86.73	74.58	88.92	79.59	7.97	8.33	7.97	8.03	8.44	8.46	8.56	7.59	8.32	8.15	8.11	8.84
03/01/42	03/31/42	Mar 2042	83.64	77.78	64.14	60.07	82.46	72.96	76.51	69.66	78.42	74.31	7.97	8.22	8.03	7.99	8.18	8.16	8.18	7.65	8.28	8.11	8.07	8.46
04/01/42	04/30/42	Apr 2042	76.01	70.93	64.03	58.91	72.63	66.17	72.02	67.83	77.26	73.06	7.82	8.01	7.82	7.78	7.86	7.80	7.80	7.42	8.06	7.90	7.86	8.04
05/01/42	05/31/42	May 2042	68.75	58.39	66.38	58.65	63.25	53.32	75.56	66.19	74.94	69.18	7.80	8.01	7.80	7.76	7.80	7.76	7.69	7.37	8.04	7.88	7.84	7.92
06/01/42	06/30/42	Jun 2042	73.97	61.71	68.61	58.30	68.23	56.50	77.93	67.73	77.23	68.93	7.84	8.03	7.73	7.61	7.78	7.67	7.56	6.99	7.89	7.73	7.69	7.79
07/01/42	07/31/42	Jul 2042	82.66	68.26	75.14	59.72	76.54	62.77	89.06	70.81	85.88	70.63	7.99	8.16	7.86	7.76	7.93	7.76	7.65	7.05	8.04	7.88	7.84	7.89
08/01/42	08/31/42	Aug 2042	90.04	72.54	76.27	61.08	83.83	66.97	91.71	71.98	89.02	72.04	8.03	8.39	8.08	8.01	8.08	7.99	7.95	7.48	8.28	8.12	8.09	8.19
09/01/42	09/30/42	Sep 2042	85.40	76.76	68.55	61.78	81.61	72.17	80.49	72.90	80.83	74.60	8.08	8.44	8.16	8.05	8.16	8.08	8.05	7.59	8.32	8.16	8.12	8.29
10/01/42	10/31/42	Oct 2042	93.07	81.87	74.18	63.81	94.63	79.32	85.77	74.50	86.87	77.81	8.08	8.50	8.14	8.05	8.37	8.35	8.35	7.61	8.32	8.16	8.12	8.59
11/01/42	11/30/42	Nov 2042	100.23	85.57	75.28	64.09	102.29	84.17	89.87	76.63	91.37	77.98	8.18	8.63	8.25	8.18	8.65	8.69	8.71	7.76	8.46	8.29	8.26	8.97
12/01/42	12/31/42	Dec 2042	100.47	87.47	75.15	65.86	102.14	86.95	89.66	78.01	91.04	79.67	8.29	8.71	8.33	8.27	8.75	8.76	8.82	7.86	8.56	8.39	8.35	9.10
01/01/43	01/31/43	Jan 2043	99.92	89.28	73.54	66.51	100.31	90.28	88.31	78.38	89.27	81.38	8.24	8.74	8.26	8.32	8.68	8.68	8.49	7.56	8.61	8.44	8.40	8.78
02/01/43	02/28/43	Feb 2043	99.73	89.03	75.63	66.72	102.61	89.65	88.81	76.37	91.05	81.50	8.16	8.53	8.16	8.22	8.65	8.67	8.76	7.78	8.51	8.34	8.30	9.04
03/01/43	03/31/43	Mar 2043	85.65	79.65	65.68	61.51	84.44	74.71	78.35	71.33	80.30	76.10	8.16	8.41	8.22	8.18	8.38	8.36	8.38	7.83	8.47	8.30	8.26	8.65
04/01/43	04/30/43	Apr 2043	77.83	72.63	65.56	60.32	74.37	67.76	73.75	69.45	79.11	74.81	8.01	8.20	8.01	7.97	8.05	7.99	7.99	7.60	8.24	8.08	8.05	8.23
05/01/43	05/31/43	May 2043	70.40	59.79	67.98	60.06	64.76	54.60	77.38	67.78	76.74	70.84	7.99	8.20	7.99	7.95	7.99	7.95	7.87	7.54	8.22	8.06	8.03	8.11
06/01/43	06/30/43	Jun 2043	75.75	63.19	70.26	59.70	69.86	57.86	79.80	69.36	79.09	70.59	8.03	8.22	7.91	7.80	7.97	7.85	7.74	7.16	8.07	7.91	7.87	7.98
07/01/43	07/31/43	Jul 2043	84.65	69.90	76.94	61.15	78.37	64.28	91.20	72.51	87.94	72.33	8.18	8.36	8.05	7.95	8.12	7.95	7.83	7.21	8.23	8.07	8.03	8.07
08/01/43	08/31/43	Aug 2043	92.20	74.29	78.10	62.54	85.85	68.58	93.91	73.71	91.15	73.77	8.22	8.59	8.28	8.20	8.28	8.18	8.14	7.66	8.47	8.31	8.28	8.38
09/01/43	09/30/43	Sep 2043	87.45	78.61	70.20	63.27	83.57	73.90	82.43	74.65	82.77	76.39	8.28	8.65	8.36	8.24	8.36	8.28	8.24	7.78	8.51	8.35	8.32	8.48
10/01/43	10/31/43	Oct 2043	95.30	83.83	75.96	65.34	96.90	81.22	87.82	76.28	88.95	79.67	8.28	8.70	8.34	8.24	8.57	8.55	8.55	7.80	8.51	8.35	8.32	8.79
11/01/43	11/30/43	Nov 2043	102.63	87.62	77.08	65.63	104.75	86.19	92.03	78.47	93.56	79.86	8.38	8.84	8.45	8.38	8.86	8.90	8.92	7.95	8.65	8.49	8.45	9.18
12/01/43	12/31/43	Dec 2043	102.88	89.57	76.95	67.44	104.60	89.04	91.81	79.88	93.22	81.58	8.49	8.92	8.53	8.47	8.96	8.97	9.03	8.05	8.76	8.59	8.55	9.31
01/01/44	01/31/44	Jan 2044	102.32	91.42	75.31	68.11	102.71	92.45	90.42	80.26	91.41	83.33	8.44	8.95	8.46	8.52	8.89	8.89	8.70	7.74	8.81	8.64	8.60	8.98
02/01/44	02/29/44	Feb 2044	102.13	91.17	77.44	68.32	105.07	91.80	90.94	78.20	93.24	83.45	8.36	8.73	8.36	8.42	8.85	8.87	8.97	7.96	8.71	8.54	8.50	9.26
03/01/44	03/31/44	Mar 2044	87.70	81.56	67.26	62.99	86.46	76.50	80.23	73.04	82.23	77.92	8.36	8.62	8.42	8.38	8.58	8.56	8.58	8.02	8.66	8.50	8.46	8.85
04/01/44	04/30/44	Apr 2044	79.70	74.37	67.14	61.77	76.16	69.38	75.52	71.12	81.01	76.61	8.20	8.40	8.20	8.16	8.24	8.18	8.18	7.78	8.44	8.27	8.24	8.42
05/01/44	05/31/44	May 2044	72.09	61.22	69.61	61.50	66.32	55.91	79.23	69.41	78.58	72.54	8.18	8.40	8.18	8.14	8.18	8.14	8.06	7.72	8.42	8.25	8.22	8.30
06/01/44	06/30/44	Jun 2044	77.57	64.71	71.94	61.13	71.54	59.25	81.71	71.02	80.99	72.28	8.22	8.42	8.10	7.98	8.16	8.04	7.92	7.33	8.26	8.10	8.06	8.16
07/01/44	07/31/44	Jul 2044	86.68	71.58	78.79	62.62	80.25	65.82	93.39	74.25	90.05	74.06	8.38	8.56	8.24	8.14	8.32	8.14	8.02	7.39	8.42	8.26	8.22	8.26
08/01/44	08/31/44	Aug 2044	94.41	76.07	79.98	64.04	87.91	70.23	96.16	75.47	93.34	75.54	8.42	8.79	8.48	8.40	8.48	8.38	8.34	7.84	8.67	8.51	8.48	8.58
09/01/44	09/30/44	Sep 2044	89.54	80.49	71.88	64.79	85.57	75.67	84.40	76.44	84.75	78.22	8.48	8.85	8.56	8.44	8.56	8.48	8.44	7.96	8.71	8.55	8.51	8.68
10/01/44	10/31/44	Oct 2044	97.59	85.84	77.79	66.91	99.23	83.17	89.93	78.11	91.09	81.58	8.48	8.91	8.54	8.44	8.77	8.75	8.75	7.98	8.71	8.55	8.51	9.00
11/01/44	11/30/44	Nov 2044	105.10	89.73	78.93	67.20	107.26	88.25	94.24	80.35	95.81	81.77	8.58	9.05	8.66	8.58	9.07	9.11	9.13	8.14	8.85	8.69	8.65	9.40
12/01/44	12/31/44	Dec 2044	105.35	91.72	78.80	69.06	107.11	91.18	94.01	81.80	95.46	83.54	8.70	9.13	8.73	8.68	9.17	9.19	9.25	8.24	8.96	8.79	8.75	9.53
01/01/45	01/31/45	Jan 2045	104.78	93.61	77.11	69.74	105.18	94.67	92.59	82.19	93.61	85.33	8.64	9.17	8.66	8.72	9.11	9.11	8.90	7.93	9.01	8.84	8.80	9.19

	02/01/45	02/28/45	Feb 2045	104.58	93.35	79.30	69.96	107.60	94.01	93.12	80.08	95.47	85.45	8.56	8.94	8.56	8.62	9.07	9.09	9.19	8.15	8.91	8.74	8.70	9.47
	03/01/45	03/31/45	Mar 2045	89.81	83.52	68.87	64.50	88.54	78.34	82.15	74.79	84.20	79.79	8.56	8.82	8.62	8.58	8.78	8.76	8.78	8.21	8.87	8.70	8.66	9.06
	04/01/45	04/30/45	Apr 2045	81.61	76.16	68.75	63.25	77.99	71.05	77.33	72.83	82.95	78.44	8.40	8.60	8.40	8.36	8.44	8.38	8.38	7.97	8.63	8.47	8.43	8.61
	05/01/45	05/31/45	May 2045	73.82	62.69	71.28	62.97	67.91	57.26	81.13	71.07	80.46	74.28	8.38	8.60	8.38	8.34	8.38	8.34	8.25	7.91	8.61	8.45	8.41	8.49
	06/01/45	06/30/45	Jun 2045																						

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
3/31/2015		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
0315 Official Forward Price Curve: *Blend of...* Final March 2015 Aurora forecast 03/31/2015 forward market curve			**COB**		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
04/01/15	04/30/15	Apr 2015	22.50	16.75	24.00	21.50	20.50	15.00	34.00	27.00	30.25	25.50	2.60	2.48	2.33	2.23	2.39	2.29	2.16	2.11	2.51	2.34	2.36	2.29
05/01/15	05/31/15	May 2015	24.50	18.25	26.75	21.25	21.75	15.50	33.00	25.50	30.75	25.00	2.64	2.47	2.33	2.30	2.36	2.34	2.11	2.09	2.55	2.39	2.37	2.26
06/01/15	06/30/15	Jun 2015	27.00	20.00	28.50	21.25	22.75	16.50	32.00	25.50	31.75	25.00	2.69	2.53	2.39	2.35	2.41	2.38	2.22	2.10	2.60	2.44	2.42	2.37
07/01/15	07/31/15	Jul 2015	34.40	24.61	34.65	24.50	31.50	23.28	37.37	30.05	38.38	29.75	2.75	2.68	2.52	2.47	2.54	2.51	2.27	2.12	2.73	2.56	2.54	2.42
08/01/15	08/31/15	Aug 2015	36.14	28.09	34.32	25.49	34.34	24.94	38.51	30.64	39.14	30.64	2.78	2.76	2.57	2.49	2.57	2.55	2.34	2.13	2.75	2.59	2.56	2.50
09/01/15	09/30/15	Sep 2015	33.71	27.55	30.03	24.01	28.67	23.04	37.37	28.56	36.48	28.86	2.79	2.76	2.54	2.50	2.59	2.56	2.34	2.14	2.76	2.59	2.57	2.50
10/01/15	10/31/15	Oct 2015	29.38	24.91	28.05	24.72	25.71	21.60	37.87	31.25	36.75	30.69	2.81	2.74	2.55	2.52	2.63	2.60	2.38	2.20	2.78	2.61	2.59	2.54
11/01/15	11/30/15	Nov 2015	29.69	25.97	27.23	23.52	27.69	24.72	37.87	30.63	37.50	30.38	2.92	2.89	2.72	2.71	2.79	2.76	2.77	2.34	3.00	2.83	2.80	2.98
12/01/15	12/31/15	Dec 2015	34.69	28.62	27.23	23.76	31.36	25.68	39.02	31.88	38.25	31.93	3.08	3.10	2.92	2.92	3.01	2.98	3.16	2.47	3.21	3.04	3.01	3.40
01/01/16	01/31/16	Jan 2016	30.68	26.25	28.28	26.00	29.98	24.88	37.85	32.76	37.34	31.93	3.19	3.14	3.04	3.01	3.07	3.04	3.03	2.55	3.31	3.13	3.10	3.25
02/01/16	02/29/16	Feb 2016	29.50	25.00	28.00	25.25	27.25	23.48	37.49	31.82	36.98	31.00	3.17	3.15	3.02	2.99	3.06	3.03	2.87	2.53	3.29	3.11	3.08	3.08
03/01/16	03/31/16	Mar 2016	28.32	23.75	27.72	23.75	24.80	21.39	34.91	29.93	34.44	30.07	3.13	3.08	2.95	2.94	3.02	2.99	2.75	2.47	3.24	3.06	3.03	2.96
04/01/16	04/30/16	Apr 2016	26.24	19.36	28.82	21.72	24.12	17.08	32.83	26.78	32.34	27.56	3.00	2.87	2.77	2.62	2.71	2.69	2.41	2.32	2.90	2.73	2.70	2.58
05/01/16	05/31/16	May 2016	23.51	14.88	27.12	21.29	22.75	13.30	33.17	25.25	32.67	25.46	3.00	2.89	2.77	2.62	2.70	2.68	2.24	2.28	2.90	2.73	2.70	2.39
06/01/16	06/30/16	Jun 2016	23.76	14.40	28.82	21.50	21.39	11.20	34.51	24.48	33.99	25.73	3.03	2.94	2.80	2.65	2.74	2.71	2.27	2.31	2.94	2.76	2.74	2.42
07/01/16	07/31/16	Jul 2016	33.81	20.30	37.90	24.98	29.67	18.60	39.25	31.04	40.25	30.80	3.07	3.16	2.84	2.79	2.84	2.81	2.44	2.31	3.08	2.91	2.88	2.61
08/01/16	08/31/16	Aug 2016	35.88	27.23	37.18	26.27	34.19	26.04	40.43	33.60	41.46	32.70	3.08	3.16	2.88	2.76	2.86	2.83	2.44	2.31	3.05	2.87	2.85	2.61
09/01/16	09/30/16	Sep 2016	33.47	26.98	32.18	26.01	32.90	25.11	38.07	31.36	39.04	31.75	3.07	2.98	2.85	2.70	2.85	2.83	2.47	2.31	2.98	2.81	2.78	2.64
10/01/16	10/31/16	Oct 2016	30.92	27.12	31.06	26.73	28.75	24.53	38.86	31.44	37.20	31.11	3.10	2.97	2.86	2.72	2.87	2.85	2.57	2.41	3.01	2.83	2.81	2.74
11/01/16	11/30/16	Nov 2016	32.92	27.69	30.14	26.46	30.63	28.34	38.86	32.10	38.75	31.77	3.17	3.22	3.05	2.97	3.06	3.03	3.12	2.53	3.27	3.09	3.06	3.36
12/01/16	12/31/16	Dec 2016	35.91	30.79	31.06	27.81	34.38	28.89	40.04	34.72	40.30	35.37	3.35	3.40	3.21	3.19	3.27	3.24	3.51	2.68	3.50	3.32	3.28	3.77
01/01/17	01/31/17	Jan 2017	34.00	29.75	30.28	28.00	32.23	28.00	39.60	34.76	39.09	33.93	3.50	3.56	3.36	3.34	3.34	3.31	3.40	2.76	3.64	3.47	3.43	3.64
02/01/17	02/28/17	Feb 2017	32.00	28.50	30.00	27.25	29.50	25.98	39.24	33.82	38.73	33.00	3.49	3.54	3.35	3.33	3.34	3.31	3.17	2.75	3.63	3.46	3.42	3.41
03/01/17	03/31/17	Mar 2017	30.82	27.25	29.72	25.75	27.05	23.89	36.66	31.93	36.19	32.07	3.44	3.50	3.29	3.28	3.29	3.26	3.14	2.71	3.58	3.40	3.37	3.37
04/01/17	04/30/17	Apr 2017	28.50	22.36	30.57	22.72	26.12	19.08	33.83	28.28	33.59	29.06	3.20	3.13	3.04	2.87	2.96	2.93	2.62	2.51	3.15	2.98	2.95	2.80
05/01/17	05/31/17	May 2017	25.75	17.88	28.87	22.29	24.75	15.30	34.17	26.75	33.92	26.96	3.21	3.18	3.04	2.80	2.96	2.93	2.60	2.48	3.08	2.91	2.89	2.77
06/01/17	06/30/17	Jun 2017	26.00	17.40	30.57	22.50	23.39	13.20	35.51	25.98	35.24	27.23	3.24	3.23	3.08	2.84	3.00	2.98	2.63	2.52	3.12	2.95	2.93	2.81
07/01/17	07/31/17	Jul 2017	37.06	21.30	40.15	27.98	33.67	19.10	42.50	33.79	43.75	33.55	3.28	3.48	3.12	2.90	3.09	3.07	2.83	2.53	3.19	3.02	2.99	3.03
08/01/17	08/31/17	Aug 2017	39.13	28.23	39.43	29.27	38.19	26.54	43.68	36.35	44.96	35.45	3.30	3.47	3.17	2.91	3.12	3.09	2.84	2.54	3.20	3.03	3.00	3.03
09/01/17	09/30/17	Sep 2017	36.72	27.98	34.43	29.01	36.90	25.61	41.32	34.11	42.54	34.50	3.28	3.29	3.13	2.90	3.12	3.09	2.86	2.56	3.18	3.02	2.99	3.05
10/01/17	10/31/17	Oct 2017	33.17	31.62	32.81	29.48	32.00	28.28	41.36	34.69	39.95	33.11	3.31	3.26	3.13	2.92	3.12	3.09	2.89	2.57	3.21	3.04	3.01	3.08
11/01/17	11/30/17	Nov 2017	35.17	32.19	31.89	29.21	33.88	32.09	41.36	35.35	41.50	33.77	3.38	3.52	3.27	3.28	3.34	3.31	3.52	2.75	3.58	3.41	3.37	3.78
12/01/17	12/31/17	Dec 2017	38.16	35.29	32.81	30.56	37.63	32.64	42.54	37.97	43.05	37.37	3.55	3.71	3.47	3.50	3.54	3.50	3.86	2.88	3.80	3.62	3.59	4.14
01/01/18	01/31/18	Jan 2018	37.00	31.65	32.48	29.80	35.75	29.90	41.35	36.41	40.84	35.58	3.68	3.87	3.59	3.63	3.62	3.59	3.81	2.96	3.93	3.76	3.72	4.08
02/01/18	02/28/18	Feb 2018	35.00	30.40	32.20	29.05	33.25	27.88	40.99	35.47	40.48	34.65	3.66	3.83	3.57	3.61	3.60	3.57	3.59	2.93	3.91	3.74	3.70	3.85
03/01/18	03/31/18	Mar 2018	33.25	29.15	31.92	27.55	30.50	25.79	38.41	33.58	37.94	33.72	3.60	3.79	3.51	3.55	3.54	3.51	3.52	2.86	3.85	3.68	3.64	3.78
04/01/18	04/30/18	Apr 2018	30.40	23.50	32.77	23.75	28.02	20.98	35.58	29.93	35.50	30.71	3.29	3.39	3.18	3.07	3.12	3.09	2.94	2.63	3.35	3.19	3.16	3.14
05/01/18	05/31/18	May 2018	27.65	20.00	31.07	23.50	26.65	17.20	35.92	28.40	36.00	28.61	3.29	3.41	3.17	3.00	3.13	3.10	2.90	2.58	3.28	3.12	3.09	3.10
06/01/18	06/30/18	Jun 2018	27.90	20.50	32.77	23.50	25.29	15.10	37.26	27.63	37.25	28.88	3.32	3.47	3.21	3.03	3.16	3.14	2.90	2.58	3.31	3.15	3.12	3.09
07/01/18	07/31/18	Jul 2018	38.96	22.25	42.35	29.50	35.57	20.25	44.25	35.44	45.50	35.20	3.36	3.72	3.24	3.09	3.25	3.22	3.11	2.60	3.37	3.21	3.18	3.32
08/01/18	08/31/18	Aug 2018	41.03	29.00	41.63	30.75	40.09	27.50	45.43	38.00	46.71	37.10	3.37	3.74	3.28	3.10	3.28	3.25	3.11	2.61	3.38	3.22	3.19	3.32
09/01/18	09/30/18	Sep 2018	38.62	28.75	36.63	30.50	38.80	26.50	43.07	35.76	44.29	36.15	3.36	3.53	3.26	3.09	3.27	3.24	3.14	2.63	3.37	3.21	3.18	3.35
10/01/18	10/31/18	Oct 2018	35.07	32.00	35.01	28.75	33.90	28.50	43.11	36.34	41.50	34.76	3.39	3.47	3.26	3.12	3.29	3.26	3.15	2.65	3.40	3.24	3.21	3.36
11/01/18	11/30/18	Nov 2018	37.07	32.50	34.09	28.25	35.78	32.25	43.11	37.00	43.00	35.42	3.46	3.72	3.33	3.39	3.51	3.48	3.69	2.90	3.68	3.51	3.48	3.96
12/01/18	12/31/18	Dec 2018	40.06	34.75	35.01	30.50	39.53	32.75	44.29	39.62	44.50	39.02	3.63	3.89	3.54	3.61	3.71	3.67	4.05	3.04	3.90	3.73	3.70	4.34
01/01/19	01/31/19	Jan 2019	38.75	34.00	34.00	30.50	38.50	32.50	42.70	37.81	42.19	36.98	3.77	4.05	3.67	3.73	3.77	3.74	3.95	3.11	4.03	3.86	3.82	4.23
02/01/19	02/28/19	Feb 2019	37.50	32.30	34.00	30.00	35.75	30.50	42.34	36.87	41.83	36.05	3.74	4.00	3.64	3.71	3.75	3.71	3.73	3.09	4.01	3.84	3.80	4.00
03/01/19	03/31/19	Mar 2019	36.25	31.05	34.00	28.50	32.75	28.50	39.76	34.98	39.29	35.12	3.68	3.95	3.58	3.65	3.68	3.65	3.67	3.02	3.95	3.78	3.74	3.93
04/01/19	04/30/19	Apr 2019	32.50	25.40	35.47	25.40	29.62	22.88	36.93	31.33	36.85	31.25	3.37	3.56	3.29	3.25	3.34	3.31	3.02	2.80	3.53	3.37	3.33	3.22
05/01/19	05/31/19	May 2019	29.25	21.90	33.77	25.15	28.25	19.10	37.27	29.80	37.35	29.25	3.36	3.59	3.28	3.17	3.33	3.30	2.97	2.75	3.46	3.29	3.26	3.17
06/01/19	06/30/19	Jun 2019	29.50	22.40	35.47	25.15	26.89	17.00	38.61	29.03	38.60	29.50	3.40	3.63	3.32	3.21	3.37	3.34	2.97	2.75	3.49	3.33	3.30	3.17
07/01/19	07/31/19	Jul 2019	42.00	24.15	45.00	31.15	37.50	22.15	45.60	36.84	46.85	36.60	3.43	3.87	3.35	3.26	3.46	3.43	3.16	2.75	3.55	3.38	3.35	3.37
08/01/19	08/31/19	Aug 2019	43.00	30.90	45.50	32.40	42.00	29.40	46.78	39.40	48.06	38.50	3.45	3.89	3.40	3.28	3.49	3.46	3.17	2.76	3.57	3.40	3.37	3.39
09/01/19	09/30/19	Sep 2019	41.50	30.65	39.50	32.15	40.75	28.40	44.42	37.16	45.64	37.55	3.44	3.70	3.37	3.27	3.49	3.46	3.19	2.79	3.56	3.39	3.36	3.41
10/01/19	10/31/19	Oct 2019	37.00	33.90	34.75	30.40	35.50	30.40	44.00	37.50	42.00	35.25	3.46	3.62	3.37	3.29	3.50	3.47	3.21	2.80	3.58	3.42	3.38	3.43
11/01/19	11/30/19	Nov 2019	38.67	34.40	33.75	29.90	37.38	34.15	44.00	38.25	43.50	36.00	3.54	3.83	3.42	3.47	3.60	3.57	3.72	2.97	3.76	3.60	3.56	3.99
12/01/19	12/31/19	Dec 2019	41.66	36.65	34.75	32.15	41.13	34.65	45.25	40.75	44.50	39.50	3.72	4.06	3.64	3.69	3.80	3.77	4.10	3.13	4.00	3.82	3.79	4.39
01/01/20	01/31/20	Jan 2020	41.75	37.50	36.70	32.60	41.20	35.75	44.35	39.21	43.74	38.38	3.86	4.19	3.77	3.82	3.88	3.85	4.01	3.22	4.13	3.95	3.91	4.30
02/01/20	02/29/20	Feb 2020	40.50	35.75	36.70	32.10	38.45	33.75	43.99	38.27	43.38	37.45	3.84	4.16	3.75	3.80	3.87	3.83	3.80	3.21	4.11	3.93	3.90	4.08
03/01/20	03/31/20	Mar 2020	38.95	34.25	36.70	30.60	35.45	31.50	41.41	36.38	40.84	36.52	3.78	4.11	3.68	3.74	3.80	3.77	3.76	3.16	4.04	3.87	3.83	4.03
04/01/20	04/30/20	Apr 2020	35.20	27.00	38.17	27.50	32.32	24.88	38.58	32.73	38.40	32.65	3.48	3.72	3.39	3.39	3.47	3.44	3.04	2.95	3.69	3.52	3.49	3.27
05/01/20	05/31/20	May 2020	31.95	23.50	36.47	27.25	30.95	21.10	38.92	31.20	38.90	30.65	3.48	3.82	3.38	3.32	3.47	3.44	2.99	2.89	3.61	3.45	3.41	3.21
06/01/20	06/30/20	Jun 2020	32.20	24.00	38.17	27.25	29.59	19.00	40.26	30.43	40.15	30.90	3.51	3.86	3.42	3.35	3.50	3.47	2.99	2.90	3.64	3.48	3.45	3.22

07/01/20	07/31/20	Jul 2020	44.70	26.75	47.70	33.25	40.20	24.15	47.25	38.24	48.40	38.00	3.54	4.04	3.45	3.41	3.58	3.55	3.19	2.91	3.70	3.53	3.50	3.43
08/01/20	08/31/20	Aug 2020	45.70	33.50	48.20	34.50	44.70	31.40	48.43	40.80	49.61	39.90	3.56	4.06	3.50	3.43	3.63	3.59	3.18	2.90	3.72	3.56	3.52	3.41
09/01/20	09/30/20	Sep 2020	44.20	33.25	42.20	34.25	43.45	30.40	46.07	38.56	47.19	38.95	3.55	3.87	3.48	3.42	3.62	3.59	3.24	2.96	3.72	3.55	3.51	3.48
10/01/20	10/31/20	Oct 2020	39.70	35.90	37.45	32.50	38.20	32.40	45.65	38.90	43.55	36.65	3.58	3.80	3.48	3.45	3.64	3.61	3.25	2.97	3.74	3.57	3.54	3.49
11/01/20	11/30/20	Nov 2020	41.37	36.40	36.45	32.00	40.08	36.15	45.65	39.65	45.05	37.40	3.67	3.99	3.53	3.58	3.74	3.70	3.76	3.17	3.88	3.71	3.67	4.03
12/01/20	12/31/20	Dec 2020	44.36	38.65	37.45	34.25	43.83	36.65	46.90	42.15	46.05	40.90	3.85	4.21	3.75	3.81	3.95	3.92	4.13	3.34	4.12	3.95	3.91	4.43
01/01/21	01/31/21	Jan 2021	44.00	39.00	38.70	34.10	43.45	37.25	46.10	40.21	45.49	39.38	3.99	4.37	3.88	3.94	4.02	3.99	4.07	3.45	4.25	4.08	4.04	4.36
02/01/21	02/28/21	Feb 2021	42.75	37.25	38.70	33.60	40.70	35.25	45.74	39.27	45.13	38.45	3.97	4.33	3.86	3.92	4.00	3.97	3.86	3.43	4.23	4.06	4.02	4.14
03/01/21	03/31/21	Mar 2021	41.20	35.75	38.70	32.10	37.70	33.00	43.16	37.38	42.59	37.52	3.91	4.27	3.80	3.86	3.93	3.90	3.81	3.38	4.17	3.99	3.95	4.09
04/01/21	04/30/21	Apr 2021	37.45	28.50	40.17	29.00	34.57	26.38	40.33	33.73	40.15	33.65	3.62	3.91	3.53	3.61	3.61	3.58	3.17	3.21	3.91	3.73	3.70	3.41
05/01/21	05/31/21	May 2021	36.34	26.38	41.72	31.65	34.15	23.75	43.51	33.58	44.34	34.69	3.90	4.12	3.81	3.74	3.85	3.75	3.47	3.18	4.04	3.87	3.84	3.71
06/01/21	06/30/21	Jun 2021	38.39	27.90	42.62	31.07	35.32	23.91	45.15	34.33	44.81	34.70	3.93	4.15	3.84	3.76	3.86	3.75	3.46	3.18	4.06	3.89	3.85	3.70
07/01/21	07/31/21	Jul 2021	45.95	30.98	48.92	35.53	41.88	28.12	50.65	39.51	50.68	39.31	3.96	4.26	3.88	3.80	3.93	3.83	3.58	3.19	4.10	3.93	3.89	3.82
08/01/21	08/31/21	Aug 2021	47.86	34.73	50.85	36.24	45.48	32.10	52.66	40.88	53.14	40.44	3.99	4.29	3.92	3.83	3.97	3.87	3.62	3.20	4.13	3.96	3.92	3.86
09/01/21	09/30/21	Sep 2021	47.99	36.16	47.81	36.41	45.70	33.10	51.64	40.08	52.27	40.50	4.00	4.22	3.91	3.85	3.99	3.91	3.71	3.28	4.15	3.98	3.94	3.96
10/01/21	10/31/21	Oct 2021	44.49	37.31	43.70	35.57	41.87	33.92	49.34	39.59	48.33	39.53	4.01	4.20	3.94	3.88	4.01	3.94	3.72	3.30	4.18	4.01	3.97	3.96
11/01/21	11/30/21	Nov 2021	45.44	37.84	42.81	34.95	42.92	36.07	49.03	40.56	48.70	39.54	4.07	4.32	4.00	3.98	4.09	4.03	3.99	3.43	4.29	4.11	4.07	4.26
12/01/21	12/31/21	Dec 2021	47.01	39.04	43.04	36.89	44.87	36.39	49.18	42.22	48.82	41.81	4.20	4.45	4.12	4.11	4.22	4.15	4.17	3.53	4.42	4.24	4.20	4.44
01/01/22	01/31/22	Jan 2022	46.99	39.67	42.69	37.45	44.81	37.10	49.16	41.87	49.02	41.88	4.34	4.62	4.27	4.28	4.35	4.28	4.24	3.61	4.60	4.42	4.38	4.52
02/01/22	02/28/22	Feb 2022	47.43	39.98	42.53	37.54	44.49	37.25	47.91	41.31	47.82	41.46	4.35	4.62	4.28	4.30	4.36	4.29	4.18	3.64	4.61	4.43	4.39	4.46
03/01/22	03/31/22	Mar 2022	44.51	37.71	42.53	35.79	40.91	34.65	46.33	39.71	46.33	40.35	4.31	4.56	4.22	4.23	4.30	4.23	4.16	3.60	4.54	4.36	4.32	4.44
04/01/22	04/30/22	Apr 2022	41.78	33.84	43.74	35.14	38.52	31.11	44.32	37.30	45.36	38.93	4.15	4.34	4.06	4.05	4.10	4.01	3.80	3.46	4.36	4.18	4.15	4.04
05/01/22	05/31/22	May 2022	40.73	29.25	46.96	36.05	37.36	26.39	48.11	35.96	49.79	38.74	4.33	4.43	4.25	4.16	4.23	4.06	3.96	3.47	4.46	4.29	4.25	4.20
06/01/22	06/30/22	Jun 2022	44.58	31.79	47.08	34.89	41.05	28.82	50.04	38.22	49.47	38.50	4.35	4.44	4.26	4.16	4.21	4.02	3.94	3.46	4.46	4.29	4.26	4.17
07/01/22	07/31/22	Jul 2022	47.20	35.21	50.14	37.81	43.55	32.08	54.04	40.78	52.96	40.61	4.39	4.48	4.31	4.19	4.28	4.10	3.97	3.47	4.49	4.32	4.28	4.21
08/01/22	08/31/22	Aug 2022	50.03	35.96	53.50	37.98	46.25	32.80	56.90	40.96	56.68	40.97	4.41	4.52	4.34	4.22	4.32	4.15	4.07	3.51	4.52	4.35	4.32	4.31
09/01/22	09/30/22	Sep 2022	51.78	39.08	53.43	38.57	47.96	35.80	57.20	41.60	57.34	42.05	4.44	4.57	4.35	4.27	4.35	4.23	4.19	3.60	4.57	4.40	4.36	4.43
10/01/22	10/31/22	Oct 2022	49.28	38.71	49.96	38.64	45.55	35.43	53.02	40.28	53.12	42.41	4.45	4.59	4.40	4.31	4.38	4.27	4.19	3.63	4.61	4.44	4.40	4.43
11/01/22	11/30/22	Nov 2022	49.52	39.28	49.17	37.91	45.77	35.98	52.41	41.48	52.34	41.67	4.48	4.65	4.46	4.38	4.45	4.35	4.22	3.69	4.68	4.51	4.47	4.49
12/01/22	12/31/22	Dec 2022	49.65	39.42	48.62	39.53	45.92	36.13	51.46	42.28	51.59	42.71	4.54	4.68	4.48	4.40	4.48	4.38	4.20	3.72	4.71	4.54	4.50	4.48
01/01/23	01/31/23	Jan 2023	49.98	40.34	46.68	40.81	46.17	36.96	52.21	43.53	52.56	44.38	4.69	4.86	4.66	4.62	4.68	4.57	4.40	3.77	4.94	4.76	4.72	4.69
02/01/23	02/28/23	Feb 2023	52.12	42.71	46.35	41.48	48.27	39.26	50.09	43.35	50.51	44.46	4.73	4.91	4.69	4.67	4.73	4.62	4.49	3.84	4.99	4.81	4.76	4.77
03/01/23	03/31/23	Mar 2023	47.83	39.66	46.36	39.49	44.11	36.31	49.49	42.05	50.07	43.19	4.72	4.85	4.64	4.60	4.67	4.56	4.51	3.82	4.91	4.73	4.69	4.79
04/01/23	04/30/23	Apr 2023	46.12	39.18	47.32	41.28	42.48	35.84	48.32	40.87	50.58	44.21	4.68	4.78	4.60	4.50	4.60	4.45	4.43	3.72	4.80	4.63	4.59	4.67
05/01/23	05/31/23	May 2023	45.44	32.63	50.16	38.64	41.83	29.59	52.77	39.41	53.68	41.59	4.72	4.80	4.61	4.51	4.61	4.43	4.33	3.80	4.81	4.64	4.60	4.56
06/01/23	06/30/23	Jun 2023	47.37	34.37	47.67	37.10	43.67	31.24	52.60	40.92	51.94	41.11	4.73	4.82	4.61	4.49	4.61	4.41	4.33	3.80	4.78	4.61	4.58	4.57
07/01/23	07/31/23	Jul 2023	50.17	38.21	51.54	39.98	46.35	34.92	56.97	43.26	55.65	43.03	4.78	4.85	4.66	4.51	4.64	4.45	4.36	3.83	4.81	4.64	4.60	4.60
08/01/23	08/31/23	Aug 2023	52.42	38.40	53.90	39.70	48.51	35.10	59.14	43.12	58.81	43.12	4.74	4.85	4.68	4.57	4.66	4.51	4.44	3.79	4.87	4.70	4.66	4.68
09/01/23	09/30/23	Sep 2023	54.39	41.33	52.78	39.63	50.43	37.92	59.52	43.93	59.68	44.16	4.75	4.89	4.68	4.61	4.67	4.56	4.50	4.02	4.91	4.74	4.70	4.74
10/01/23	10/31/23	Oct 2023	52.68	41.11	51.61	39.68	48.76	37.69	55.90	43.57	56.10	44.24	4.74	4.89	4.69	4.61	4.67	4.57	4.47	4.04	4.91	4.74	4.70	4.72
11/01/23	11/30/23	Nov 2023	53.72	42.03	50.51	39.78	49.75	38.57	55.96	43.95	56.06	44.15	4.78	4.95	4.77	4.69	4.77	4.69	4.55	4.22	5.00	4.83	4.79	4.81
12/01/23	12/31/23	Dec 2023	53.07	42.39	48.28	41.61	49.15	38.94	54.17	44.70	54.48	45.18	4.83	4.96	4.78	4.73	4.79	4.69	4.62	4.23	5.04	4.87	4.82	4.90
01/01/24	01/31/24	Jan 2024	53.21	42.85	51.69	41.92	49.23	39.35	54.84	45.08	55.26	46.29	4.93	5.10	4.89	4.83	4.92	4.79	4.70	4.32	5.15	4.97	4.92	4.99
02/01/24	02/29/24	Feb 2024	54.81	44.68	50.66	42.28	51.09	41.25	52.38	44.09	53.08	45.38	4.87	5.00	4.79	4.74	4.82	4.69	4.61	4.26	5.06	4.88	4.84	4.89
03/01/24	03/31/24	Mar 2024	49.55	41.26	48.10	40.09	45.74	37.80	50.27	42.67	51.12	44.12	4.82	4.92	4.70	4.65	4.73	4.59	4.58	4.19	4.97	4.79	4.75	4.86
04/01/24	04/30/24	Apr 2024	46.87	39.90	47.34	40.16	43.16	36.51	48.06	40.73	50.31	44.17	4.70	4.79	4.58	4.53	4.61	4.44	4.41	3.85	4.84	4.66	4.62	4.65
05/01/24	05/31/24	May 2024	44.13	31.65	50.61	38.06	40.54	28.61	51.63	38.59	53.75	41.08	4.67	4.74	4.54	4.46	4.54	4.34	4.22	3.82	4.75	4.58	4.55	4.46
06/01/24	06/30/24	Jun 2024	46.04	34.37	48.38	36.74	42.38	31.21	51.37	40.76	50.83	41.15	4.68	4.74	4.53	4.42	4.51	4.31	4.21	3.80	4.72	4.55	4.51	4.45
07/01/24	07/31/24	Jul 2024	49.85	37.76	51.91	38.96	46.01	34.45	56.53	42.29	55.10	42.04	4.70	4.75	4.54	4.43	4.52	4.32	4.22	3.90	4.73	4.56	4.52	4.46
08/01/24	08/31/24	Aug 2024	53.29	39.26	55.51	40.09	49.30	35.89	59.97	43.48	59.26	43.42	4.74	4.85	4.67	4.57	4.64	4.48	4.41	3.95	4.87	4.70	4.66	4.65
09/01/24	09/30/24	Sep 2024	56.56	42.95	57.08	41.16	52.47	39.44	62.33	44.87	62.56	45.41	4.73	4.87	4.67	4.59	4.65	4.53	4.47	4.09	4.89	4.72	4.69	4.71
10/01/24	10/31/24	Oct 2024	53.68	41.54	54.61	41.76	49.70	38.08	57.60	42.72	57.90	44.86	4.74	4.89	4.69	4.62	4.67	4.57	4.48	4.08	4.92	4.75	4.71	4.73
11/01/24	11/30/24	Nov 2024	53.75	42.85	52.46	40.60	49.75	39.32	55.67	43.18	56.19	44.98	4.79	4.95	4.77	4.72	4.75	4.67	4.54	4.32	5.02	4.85	4.81	4.81
12/01/24	12/31/24	Dec 2024	53.15	43.07	51.25	41.26	49.20	39.56	54.36	43.14	55.10	45.55	4.80	4.90	4.72	4.65	4.72	4.59	4.43	4.24	4.97	4.79	4.75	4.71
01/01/25	01/31/25	Jan 2025	54.32	44.18	51.35	43.74	50.25	40.59	55.50	45.54	56.02	48.02	5.08	5.22	5.01	4.99	5.04	4.94	4.82	4.50	5.30	5.12	5.08	5.11
02/01/25	02/28/25	Feb 2025	56.11	46.39	51.49	44.73	52.29	42.87	53.19	44.52	54.23	47.85	5.06	5.19	5.00	4.95	5.00	4.90	4.83	4.48	5.27	5.09	5.04	5.12
03/01/25	03/31/25	Mar 2025	50.99	43.27	47.33	40.67	47.09	39.71	50.92	43.19	52.17	46.64	5.01	5.09	4.88	4.83	4.91	4.80	4.77	4.38	5.15	4.97	4.93	5.05
04/01/25	04/30/25	Apr 2025	48.19	41.34	47.12	40.62	44.39	37.86	48.92	42.17	51.02	45.73	4.90	5.00	4.80	4.73	4.80	4.66	4.59	3.98	5.04	4.86	4.83	4.84
05/01/25	05/31/25	May 2025	45.27	32.95	51.48	40.09	41.60	29.82	52.56	39.99	54.86	43.24	4.90	4.96	4.76	4.67	4.74	4.55	4.44	4.08	4.97	4.80	4.76	4.68
06/01/25	06/30/25	Jun 2025	48.51	36.33	49.72	38.97	44.69	33.05	53.81	42.29	53.15	43.41	4.92	4.97	4.77	4.66	4.73	4.48	4.39	4.06	4.95	4.78	4.75	4.63
07/01/25	07/31/25	Jul 2025	52.64	40.17	54.67	41.23	48.65	36.72	59.36	44.26	57.96	44.38	4.97	5.04	4.83	4.71	4.80	4.59	4.46	4.16	5.01	4.84	4.80	4.71
08/01/25	08/31/25	Aug 2025	57.09	42.06	60.15	43.20	52.90	38.53	64.45	46.18	63.93	47.16	5.01	5.13	4.90	4.78	4.87	4.69	4.62	4.18	5.08	4.91	4.88	4.86
09/01/25	09/30/25	Sep 2025	59.03	44.70	60.24	43.11	54.80	41.08	64.74	44.69	65.57	47.84	5.01	5.18	4.91	4.81	4.90	4.74	4.69	4.38	5.11	4.94	4.90	4.94
10/01/25	10/31/25	Oct 2025	55.27	43.49	55.17	42.95	51.17	39.90	59.23	43.90	59.61	47.45	4.97	5.19	4.91	4.81	4.87	4.74	4.66	4.31	5.11	4.94	4.90	4.90
11/01/25	11/30/25	Nov 2025	54.47	44.19	52.13	41.25	50.39	40.56	56.98	43.99	57.73	47.42	4.95	5.13	4.91	4.83	4.90	4.78	4.62	4.46	5.14	4.97	4.93	4.88
12/01/25	12/31/25	Dec 2025	54.94	44.13	51.70	43.18	50.86	40.51	56.09	43.90	57.25	47.65	4.97	5.11	4.88	4.83	4.90	4.77	4.60	4.35	5.15	4.97	4.93	4.88
01/01/26	01/31/26	Jan 2026	56.53	46.63	52.08	44.67	52.54	43.58	53.84	45.32	56.94	48.89	5.10	5.25	5.03	4.97	5.04	4.92	4.74	4.43	5.29	5.11	5.07	5.03
02/01/26	02/28/26	Feb 2026	58.37	49.65	52.43	45.91	55.21	47.94	52.10	45.15	55.56	49.21	5.10	5.25	5.03	4.97	5.04	4.92	4.74	4.40	5.29	5.11	5.07	5.03
03/01/26	03/31/26	Mar 2026	51.44	43.81	49.41	42.92	47.47	40.27	49.52	43.14	53.19	47.23	5.01	5.10	4.88	4.83	4.91	4.77	4.71	4.19	5.15	4.97	4.93	5.00
04/01/26	04/30/26	Apr 2026	49.07	41.81	49.58	43.13	45.20	38.28	48.46	42.15	52.54	46.26	4.90	4.99	4.78	4.70	4.78	4.62	4.56	3.97	5.01	4.83	4.79	4.80
05/01/26	05/31/26	May 2026	46.80	35.12	53.39	42.06	43.03	31.86	52.93	41.48	56.79	45.21	4.90	4.95	4.74	4.62	4.71	4.51	4.39	4.05	4.92	4.75	4.72	4.63
06/01/26	06/30/26	Jun 2026	49.10	36.45	49.53	38.82	45.23	33.13	53.08	42.12	52.86	44.04	4.91	4.95	4.74	4.62	4.70	4.39	4.32	4.03	4.92	4.75	4.72	4.56
07/01/26	07/31/26	Jul 2026	52.97	41.43	54.35	41.86	48.93	37.89	59.12	44.45	57.69	45.28	4.99	5.04	4.82	4.69	4.78	4.56	4.45	4.16	4.99	4.82	4.78	4.70

08/01/26	08/31/26	Aug 2026	56.64	43.68	58.09	43.23	52.44	40.05	62.57	46.30	61.83	47.18	5.01	5.17	4.90	4.78	4.87	4.70	4.61	4.22	5.08	4.91	4.87	4.85
09/01/26	09/30/26	Sep 2026	59.06	46.48	58.49	43.05	54.83	42.98	63.18	45.66	64.26	48.11	5.01	5.21	4.90	4.81	4.90	4.73	4.64	4.34	5.11	4.93	4.90	4.88
10/01/26	10/31/26	Oct 2026	56.03	45.99	54.81	43.43	51.92	42.63	57.02	44.82	58.99	48.38	5.00	5.22	4.92	4.83	4.90	4.78	4.64	4.32	5.13	4.96	4.92	4.88
11/01/26	11/30/26	Nov 2026	58.09	47.36	54.08	43.34	53.84	44.06	56.48	45.65	58.65	48.73	5.04	5.30	4.99	4.92	4.99	4.87	4.71	4.60	5.23	5.05	5.02	4.98
12/01/26	12/31/26	Dec 2026	57.88	46.89	52.40	44.11	54.23	43.84	54.91	45.54	57.81	48.47	5.10	5.23	5.00	4.95	5.03	4.90	4.73	4.34	5.26	5.08	5.04	5.01
01/01/27	01/31/27	Jan 2027	57.21	47.88	52.51	45.37	53.34	45.37	55.49	46.91	57.96	50.45	5.22	5.37	5.16	5.11	5.18	5.05	4.87	4.40	5.42	5.24	5.20	5.15
02/01/27	02/28/27	Feb 2027	58.95	50.35	52.89	46.80	56.41	49.28	52.93	46.24	56.23	50.39	5.21	5.36	5.13	5.09	5.16	5.03	4.84	4.35	5.41	5.23	5.19	5.13
03/01/27	03/31/27	Mar 2027	52.67	44.84	49.93	43.33	48.62	41.30	50.40	44.45	53.84	48.54	5.14	5.24	5.03	4.97	5.05	4.91	4.85	4.28	5.29	5.11	5.07	5.13
04/01/27	04/30/27	Apr 2027	50.21	43.03	50.00	43.37	46.26	39.50	49.35	43.05	53.35	47.15	5.04	5.11	4.91	4.83	4.91	4.75	4.67	4.10	5.13	4.96	4.92	4.91
05/01/27	05/31/27	May 2027	46.33	34.79	53.01	42.23	42.54	31.51	52.88	41.71	56.63	45.57	5.01	5.07	4.85	4.76	4.84	4.65	4.59	4.12	5.06	4.89	4.85	4.82
06/01/27	06/30/27	Jun 2027	50.65	37.80	50.46	39.27	46.67	34.38	54.58	43.24	54.01	44.99	5.04	5.07	4.85	4.73	4.84	4.61	4.51	4.15	5.03	4.86	4.83	4.75
07/01/27	07/31/27	Jul 2027	54.26	42.86	54.98	42.36	50.13	39.23	60.15	45.63	58.51	46.14	5.11	5.16	4.92	4.80	4.89	4.68	4.61	4.28	5.10	4.93	4.89	4.86
08/01/27	08/31/27	Aug 2027	58.00	44.67	58.82	43.37	53.71	40.98	63.56	47.06	62.69	47.66	5.14	5.25	4.99	4.87	4.97	4.77	4.71	4.34	5.17	5.00	4.96	4.95
09/01/27	09/30/27	Sep 2027	60.36	47.62	59.47	44.45	56.13	44.40	64.30	47.11	65.08	49.41	5.16	5.33	5.04	4.92	5.01	4.85	4.81	4.64	5.22	5.05	5.01	5.06
10/01/27	10/31/27	Oct 2027	59.65	48.96	58.96	47.86	55.68	46.06	60.51	47.81	62.41	51.43	5.22	5.46	5.14	5.07	5.14	5.01	5.00	4.71	5.37	5.20	5.16	5.24
11/01/27	11/30/27	Nov 2027	62.89	51.29	57.86	45.56	58.54	48.53	60.22	48.00	62.24	50.64	5.32	5.58	5.30	5.21	5.30	5.21	5.12	4.99	5.52	5.34	5.30	5.38
12/01/27	12/31/27	Dec 2027	61.74	50.42	55.02	46.17	58.56	47.57	58.20	48.23	60.86	51.28	5.40	5.56	5.34	5.28	5.34	5.22	5.24	4.84	5.59	5.41	5.37	5.52
01/01/28	01/31/28	Jan 2028	60.64	51.64	55.00	46.38	57.22	49.25	59.11	49.77	62.14	53.58	5.55	5.70	5.47	5.44	5.51	5.39	5.43	5.01	5.76	5.58	5.54	5.72
02/01/28	02/29/28	Feb 2028	61.82	53.58	54.71	47.67	60.95	53.15	55.26	48.73	59.08	52.96	5.51	5.65	5.42	5.39	5.46	5.33	5.39	4.94	5.71	5.53	5.48	5.67
03/01/28	03/31/28	Mar 2028	54.93	48.19	49.54	43.34	50.97	44.67	53.25	47.43	57.20	51.87	5.52	5.59	5.37	5.35	5.43	5.28	5.27	4.83	5.66	5.48	5.44	5.55
04/01/28	04/30/28	Apr 2028	53.39	46.29	51.94	43.83	49.36	42.71	52.80	47.10	57.03	51.04	5.50	5.56	5.35	5.31	5.37	5.23	5.24	4.77	5.61	5.44	5.40	5.48
05/01/28	05/31/28	May 2028	51.20	37.90	57.46	44.41	47.16	34.45	58.05	45.25	61.69	48.86	5.51	5.54	5.31	5.24	5.33	5.13	5.08	4.81	5.54	5.37	5.33	5.31
06/01/28	06/30/28	Jun 2028	54.09	41.23	53.98	41.53	49.92	37.62	58.77	47.08	58.16	48.25	5.54	5.55	5.33	5.21	5.32	5.09	5.09	4.82	5.51	5.34	5.30	5.33
07/01/28	07/31/28	Jul 2028	58.45	46.93	58.40	44.35	54.09	43.08	64.45	49.79	62.62	49.82	5.60	5.62	5.40	5.27	5.39	5.16	5.16	4.93	5.57	5.40	5.36	5.40
08/01/28	08/31/28	Aug 2028	62.05	48.06	61.86	44.12	57.53	44.17	67.59	49.89	66.55	50.33	5.56	5.66	5.42	5.31	5.40	5.24	5.25	4.89	5.61	5.44	5.40	5.50
09/01/28	09/30/28	Sep 2028	63.29	50.85	62.42	46.62	59.25	47.56	67.21	50.72	68.13	52.67	5.59	5.73	5.44	5.37	5.46	5.31	5.35	5.13	5.68	5.50	5.47	5.59
10/01/28	10/31/28	Oct 2028	63.10	52.02	60.15	47.20	59.15	49.14	63.49	49.94	65.54	53.64	5.60	5.78	5.50	5.44	5.51	5.39	5.39	5.16	5.74	5.57	5.54	5.63
11/01/28	11/30/28	Nov 2028	65.02	52.86	57.09	45.05	60.78	49.97	62.39	50.36	64.58	52.96	5.62	5.82	5.59	5.51	5.60	5.51	5.54	5.29	5.82	5.64	5.60	5.80
12/01/28	12/31/28	Dec 2028	63.48	53.02	56.17	46.82	60.77	50.36	60.40	50.56	63.25	53.66	5.65	5.81	5.59	5.54	5.60	5.48	5.52	5.19	5.85	5.67	5.63	5.80
01/01/29	01/31/29	Jan 2029	63.05	53.45	55.94	46.49	59.49	50.59	60.63	51.74	63.99	54.80	5.81	5.98	5.76	5.77	5.83	5.73	5.74	5.34	6.09	5.91	5.87	6.03
02/01/29	02/28/29	Feb 2029	65.33	56.10	55.70	47.54	63.86	55.75	58.11	51.31	61.90	55.01	5.84	5.99	5.77	5.77	5.83	5.72	5.76	5.33	6.09	5.91	5.87	6.04
03/01/29	03/31/29	Mar 2029	57.98	50.83	51.93	45.46	53.82	47.28	55.90	50.18	59.97	54.46	5.79	5.88	5.65	5.68	5.74	5.61	5.65	5.18	5.99	5.81	5.77	5.93
04/01/29	04/30/29	Apr 2029	55.89	48.79	55.77	47.47	51.68	45.28	55.19	49.28	59.67	53.38	5.74	5.83	5.61	5.55	5.63	5.48	5.52	5.03	5.86	5.68	5.64	5.77
05/01/29	05/31/29	May 2029	54.52	41.07	59.88	45.72	50.30	37.45	60.13	47.86	64.25	51.10	5.74	5.76	5.54	5.48	5.58	5.39	5.34	5.11	5.78	5.61	5.57	5.58
06/01/29	06/30/29	Jun 2029	53.44	41.76	53.15	42.02	49.27	38.13	58.01	48.10	57.89	49.30	5.70	5.72	5.50	5.39	5.50	5.28	5.28	5.03	5.68	5.51	5.48	5.51
07/01/29	07/31/29	Jul 2029	58.35	47.42	58.43	44.17	53.96	43.51	64.69	50.63	63.06	50.45	5.70	5.72	5.50	5.36	5.48	5.28	5.25	5.03	5.66	5.49	5.45	5.49
08/01/29	08/31/29	Aug 2029	62.85	49.11	61.98	43.98	58.26	45.15	68.74	50.60	67.60	50.88	5.66	5.74	5.48	5.40	5.50	5.33	5.36	5.00	5.70	5.53	5.49	5.60
09/01/29	09/30/29	Sep 2029	64.56	51.64	62.53	46.45	60.10	48.29	69.56	52.60	70.39	53.80	5.61	5.79	5.47	5.40	5.48	5.34	5.34	5.16	5.70	5.53	5.49	5.59
10/01/29	10/31/29	Oct 2029	61.26	50.62	58.45	45.23	56.99	47.52	62.97	49.99	64.68	52.98	5.54	5.74	5.44	5.39	5.47	5.33	5.33	5.11	5.69	5.52	5.48	5.58
11/01/29	11/30/29	Nov 2029	61.89	51.18	55.04	44.14	57.39	47.80	61.21	50.25	63.50	52.69	5.51	5.77	5.54	5.47	5.52	5.44	5.45	5.19	5.78	5.60	5.56	5.72
12/01/29	12/31/29	Dec 2029	62.14	52.33	53.62	44.80	58.97	49.57	58.81	50.22	62.10	52.72	5.52	5.68	5.44	5.45	5.52	5.40	5.44	5.05	5.77	5.59	5.55	5.72
01/01/30	01/31/30	Jan 2030	60.81	52.55	52.91	45.07	57.45	49.40	59.36	50.58	62.85	54.56	5.63	5.79	5.55	5.58	5.65	5.54	5.56	5.17	5.90	5.72	5.67	5.85
02/01/30	02/28/30	Feb 2030	62.77	55.04	53.22	45.58	61.69	54.00	56.12	50.21	59.96	54.43	5.69	5.83	5.59	5.62	5.69	5.58	5.61	5.25	5.94	5.76	5.72	5.89
03/01/30	03/31/30	Mar 2030	57.10	51.27	50.46	45.53	53.12	47.87	55.36	50.21	59.50	54.70	5.72	5.82	5.58	5.63	5.72	5.61	5.63	5.14	5.95	5.77	5.73	5.92
04/01/30	04/30/30	Apr 2030	55.42	49.08	52.01	45.14	51.26	45.44	54.22	48.80	58.71	53.19	5.70	5.78	5.55	5.51	5.61	5.45	5.48	5.01	5.81	5.64	5.60	5.72
05/01/30	05/31/30	May 2030	53.12	39.99	57.60	43.17	48.93	36.37	59.11	47.19	63.42	50.66	5.69	5.73	5.51	5.47	5.56	5.38	5.38	5.01	5.76	5.59	5.56	5.62
06/01/30	06/30/30	Jun 2030	54.00	42.84	52.95	42.50	49.77	39.12	58.12	48.91	58.00	50.19	5.72	5.75	5.52	5.44	5.55	5.34	5.39	5.06	5.74	5.57	5.53	5.63
07/01/30	07/31/30	Jul 2030	59.27	48.54	58.29	43.76	54.80	44.55	65.29	50.96	63.34	50.82	5.79	5.82	5.58	5.47	5.58	5.35	5.38	5.18	5.77	5.59	5.56	5.62
08/01/30	08/31/30	Aug 2030	63.43	50.31	61.50	44.10	58.79	46.27	69.18	51.48	68.02	51.77	5.78	5.86	5.62	5.54	5.63	5.47	5.49	5.16	5.84	5.67	5.63	5.74
09/01/30	09/30/30	Sep 2030	65.95	52.92	63.68	47.07	61.56	49.36	71.07	53.61	71.89	54.98	5.75	5.93	5.68	5.63	5.70	5.59	5.63	5.34	5.94	5.76	5.73	5.88
10/01/30	10/31/30	Oct 2030	63.63	52.89	62.94	48.53	59.62	49.54	65.74	52.14	67.97	55.37	5.80	5.99	5.78	5.70	5.78	5.68	5.70	5.39	6.01	5.83	5.80	5.95
11/01/30	11/30/30	Nov 2030	65.56	54.82	58.27	46.33	61.03	51.55	64.72	52.86	67.62	55.56	5.87	6.11	5.89	5.87	5.93	5.86	5.87	5.56	6.18	6.01	5.97	6.14
12/01/30	12/31/30	Dec 2030	64.77	55.58	56.28	46.62	61.22	52.41	62.92	52.81	66.48	55.94	5.96	6.10	5.87	5.90	5.96	5.86	5.89	5.56	6.22	6.04	6.00	6.17
01/01/31	01/31/31	Jan 2031	64.17	56.32	55.24	46.92	60.57	53.43	62.57	53.42	66.07	57.30	6.07	6.24	6.01	6.04	6.11	6.01	6.03	5.69	6.36	6.18	6.14	6.31
02/01/31	02/28/31	Feb 2031	66.21	58.88	55.60	48.20	64.96	58.85	59.17	53.51	63.59	58.00	6.11	6.28	6.04	6.08	6.14	6.04	6.07	5.75	6.40	6.22	6.18	6.35
03/01/31	03/31/31	Mar 2031	60.01	54.04	51.76	46.80	55.92	50.71	58.28	52.57	62.41	57.12	6.10	6.23	5.98	6.05	6.11	6.03	6.04	5.54	6.37	6.19	6.15	6.32
04/01/31	04/30/31	Apr 2031	57.80	51.59	52.37	46.43	53.61	47.98	56.79	51.13	61.17	55.70	6.01	6.11	5.87	5.84	5.94	5.81	5.81	5.42	6.14	5.97	5.93	6.05
05/01/31	05/31/31	May 2031	55.21	41.99	59.39	44.21	50.90	38.25	61.09	49.32	65.46	52.64	6.01	6.07	5.84	5.78	5.88	5.71	5.71	5.45	6.08	5.91	5.87	5.95
06/01/31	06/30/31	Jun 2031	56.37	44.98	54.83	43.71	51.99	41.15	60.69	50.84	60.36	52.13	6.04	6.07	5.84	5.77	5.87	5.68	5.71	5.45	6.07	5.90	5.86	5.95
07/01/31	07/31/31	Jul 2031	62.18	50.76	60.64	45.20	57.55	46.63	68.82	53.16	66.37	52.83	6.11	6.14	5.91	5.78	5.91	5.71	5.69	5.51	6.08	5.91	5.87	5.94
08/01/31	08/31/31	Aug 2031	65.64	53.58	63.56	46.71	60.87	49.42	72.16	54.92	70.84	54.91	6.14	6.24	6.00	5.90	6.00	5.84	5.87	5.54	6.20	6.03	5.99	6.11
09/01/31	09/30/31	Sep 2031	68.52	55.69	66.36	47.95	64.01	52.39	74.11	55.41	74.94	56.58	6.14	6.33	6.07	6.01	6.08	5.97	6.01	5.77	6.31	6.14	6.10	6.25
10/01/31	10/31/31	Oct 2031	65.59	55.56	62.60	48.51	61.29	52.49	67.27	53.84	69.73	57.10	6.11	6.31	6.08	6.03	6.10	5.98	6.03	5.77	6.33	6.16	6.12	6.27
11/01/31	11/30/31	Nov 2031	66.35	56.84	57.94	47.34	61.63	53.57	65.71	54.64	68.62	56.83	6.11	6.34	6.11	6.13	6.17	6.11	6.11	5.78	6.43	6.26	6.22	6.38
12/01/31	12/31/31	Dec 2031	66.44	57.88	57.03	47.82	62.59	55.11	64.22	54.21	67.82	57.34	6.20	6.37	6.14	6.14	6.20	6.10	6.13	5.84	6.45	6.28	6.24	6.40
01/01/32	01/31/32	Jan 2032	66.80	58.50	57.14	48.67	63.29	54.84	64.13	55.26	68.22	59.38	6.34	6.52	6.28	6.31	6.37	6.28	6.30	5.96	6.63	6.45	6.41	6.59
02/01/32	02/29/32	Feb 2032	68.08	59.73	56.74	49.31	66.42	58.14	60.90	54.85	65.52	59.54	6.30	6.48	6.24	6.27	6.33	6.24	6.27	5.92	6.59	6.41	6.37	6.55
03/01/32	03/31/32	Mar 2032	61.46	56.27	53.32	48.30	57.30	52.62	59.52	53.90	64.03	58.63	6.26	6.42	6.17	6.21	6.27	6.18	6.20	5.81	6.53	6.35	6.31	6.48
04/01/32	04/30/32	Apr 2032	59.30	54.42	57.51	49.93	54.98	50.72	59.10	53.51	63.73	58.33	6.21	6.36	6.14	6.11	6.18	6.08	6.06	5.68	6.41	6.24	6.20	6.31
05/01/32	05/31/32	May 2032	58.93	45.93	63.09	47.21	54.42	41.99	64.16	51.86	68.63	55.44	6.27	6.30	6.06	6.01	6.11	5.92	5.98	5.73	6.30	6.13	6.10	6.21
06/01/32	06/30/32	Jun 2032	58.82	46.73	57.01	44.59	54.30	42.73	63.28	52.53	62.74	53.74	6.27	6.30	6.06	5.96	6.08	5.87	5.93	5.73	6.26	6.09	6.05	6.17
07/01/32	07/31/32	Jul 2032	63.37	52.82	62.11	46.46	58.64	48.56	70.37	54.82	67.99	54.60	6.33	6.36	6.12	5.98	6.11	5.90	5.89	5.73	6.28	6.10	6.07	6.13
08/01/32	08/31/32	Aug 2032	66.80	54.50	64.91	47.10	61.95	50.19	73.06	55.78	71.90	55.88	6.23	6.39	6.12	6.03	6.12	5.99	5.99	5.71	6.34	6.16	6.13	6.23

09/01/32	09/30/32	Sep 2032	68.19	55.93	64.94	47.32	63.87	52.18	73.26	55.49	74.16	57.15	6.17	6.40	6.14	6.08	6.15	6.03	6.06	5.80	6.38	6.21	6.17	6.31
10/01/32	10/31/32	Oct 2032	66.12	56.48	60.40	48.35	61.84	52.98	66.69	54.64	69.85	58.56	6.14	6.39	6.17	6.12	6.18	6.08	6.09	5.80	6.43	6.25	6.22	6.34
11/01/32	11/30/32	Nov 2032	68.67	57.57	58.28	47.47	64.12	53.94	67.10	54.65	70.22	57.65	6.12	6.40	6.17	6.17	6.26	6.18	6.17	5.79	6.47	6.30	6.26	6.43
12/01/32	12/31/32	Dec 2032	67.32	58.04	56.66	47.80	63.82	54.46	64.50	54.61	68.39	57.94	6.17	6.37	6.14	6.17	6.23	6.14	6.14	5.87	6.48	6.30	6.26	6.42
01/01/33	01/31/33	Jan 2033	64.76	59.39	55.89	48.76	62.13	56.04	63.10	55.35	67.45	59.63	6.30	6.51	6.27	6.31	6.37	6.28	6.28	5.97	6.63	6.45	6.41	6.57
02/01/33	02/28/33	Feb 2033	65.99	60.96	55.79	49.23	65.51	59.71	60.63	55.00	65.31	59.80	6.31	6.52	6.28	6.33	6.39	6.30	6.30	6.00	6.64	6.46	6.42	6.58
03/01/33	03/31/33	Mar 2033	61.39	57.01	52.72	48.36	57.70	53.30	59.52	53.99	64.24	58.91	6.25	6.43	6.19	6.28	6.34	6.28	6.27	5.77	6.60	6.42	6.38	6.55
04/01/33	04/30/33	Apr 2033	59.70	54.74	54.67	49.06	55.48	50.86	58.61	53.75	63.26	58.58	6.18	6.39	6.16	6.16	6.22	6.10	6.09	5.67	6.47	6.29	6.25	6.33
05/01/33	05/31/33	May 2033	58.18	44.92	61.54	46.62	53.65	40.97	63.75	51.17	68.22	55.06	6.15	6.24	6.00	5.95	6.04	5.86	5.86	5.61	6.25	6.08	6.04	6.10
06/01/33	06/30/33	Jun 2033	59.13	47.54	56.41	45.01	54.56	43.47	63.13	52.45	62.47	54.05	6.21	6.25	6.01	5.95	6.07	5.86	5.88	5.67	6.25	6.08	6.04	6.12
07/01/33	07/31/33	Jul 2033	63.48	53.97	61.55	47.06	58.71	49.62	70.24	55.37	67.83	55.10	6.31	6.39	6.12	6.06	6.22	5.98	5.94	5.80	6.36	6.19	6.15	6.18
08/01/33	08/31/33	Aug 2033	66.28	55.35	63.55	46.97	61.43	51.04	72.48	55.41	71.42	55.77	6.24	6.43	6.19	6.13	6.22	6.07	6.06	5.77	6.43	6.26	6.22	6.30
09/01/33	09/30/33	Sep 2033	67.69	57.34	65.54	48.04	63.69	53.54	73.17	55.89	74.39	58.15	6.22	6.48	6.24	6.19	6.25	6.19	6.13	5.88	6.49	6.32	6.28	6.37
10/01/33	10/31/33	Oct 2033	66.64	58.84	64.22	50.79	63.07	55.69	67.23	55.72	70.95	60.10	6.25	6.52	6.33	6.25	6.31	6.25	6.25	5.92	6.55	6.38	6.34	6.50
11/01/33	11/30/33	Nov 2033	69.40	60.63	59.62	49.01	65.64	57.62	68.15	56.03	71.39	58.95	6.31	6.60	6.42	6.36	6.45	6.42	6.43	5.97	6.66	6.49	6.45	6.70
12/01/33	12/31/33	Dec 2033	66.92	60.50	56.88	49.48	64.28	57.08	65.16	55.62	69.15	59.41	6.37	6.60	6.37	6.37	6.54	6.51	6.52	6.06	6.68	6.51	6.47	6.80
01/01/34	01/31/34	Jan 2034	65.85	62.12	57.66	50.72	63.58	59.07	64.69	57.07	69.02	62.17	6.52	6.77	6.57	6.57	6.72	6.69	6.72	6.18	6.88	6.70	6.66	7.01
02/01/34	02/28/34	Feb 2034	67.34	63.05	57.73	50.81	67.73	63.12	62.24	56.72	66.84	61.66	6.54	6.77	6.57	6.57	6.72	6.69	6.72	6.21	6.88	6.70	6.66	7.00
03/01/34	03/31/34	Mar 2034	61.39	58.55	53.20	49.52	57.53	54.78	60.94	55.72	65.25	60.79	6.49	6.69	6.46	6.52	6.57	6.52	6.52	5.92	6.84	6.66	6.62	6.80
04/01/34	04/30/34	Apr 2034	59.31	55.96	54.64	49.96	54.82	52.08	59.37	54.94	64.13	59.89	6.40	6.60	6.38	6.38	6.43	6.37	6.31	5.80	6.69	6.51	6.48	6.55
05/01/34	05/31/34	May 2034	60.13	46.42	63.81	47.65	55.46	42.36	65.69	52.63	70.32	56.88	6.37	6.51	6.28	6.23	6.34	6.25	6.12	5.77	6.53	6.36	6.32	6.36
06/01/34	06/30/34	Jun 2034	58.99	48.95	58.12	46.07	54.37	44.80	64.52	53.27	63.93	55.57	6.40	6.47	6.23	6.17	6.32	6.21	6.09	5.79	6.47	6.30	6.26	6.33
07/01/34	07/31/34	Jul 2034	63.40	54.92	63.11	47.99	58.59	50.48	70.97	56.29	68.95	56.50	6.47	6.60	6.34	6.25	6.40	6.29	6.11	5.88	6.55	6.37	6.34	6.35
08/01/34	08/31/34	Aug 2034	66.54	56.14	65.32	47.61	61.61	51.74	73.25	56.29	72.31	57.12	6.35	6.57	6.31	6.25	6.34	6.26	6.18	5.76	6.55	6.37	6.34	6.43
09/01/34	09/30/34	Sep 2034	67.51	58.32	65.81	48.83	63.25	54.48	72.49	56.39	73.94	59.25	6.32	6.58	6.37	6.32	6.37	6.31	6.28	5.95	6.62	6.45	6.41	6.52
10/01/34	10/31/34	Oct 2034	66.21	59.25	61.91	50.27	62.52	55.96	66.61	55.55	70.58	60.37	6.28	6.54	6.35	6.28	6.34	6.29	6.28	5.92	6.58	6.41	6.37	6.52
11/01/34	11/30/34	Nov 2034	68.73	61.19	58.46	49.30	65.10	58.16	67.75	55.81	71.20	59.90	6.34	6.61	6.43	6.38	6.49	6.46	6.47	5.97	6.69	6.51	6.48	6.74
12/01/34	12/31/34	Dec 2034	66.58	61.59	57.49	50.06	64.66	58.79	65.22	56.26	69.40	60.97	6.35	6.61	6.43	6.37	6.57	6.54	6.57	6.05	6.68	6.50	6.46	6.84
01/01/35	01/31/35	Jan 2035	67.60	63.38	55.98	50.74	66.33	60.76	64.37	57.54	68.65	62.71	6.52	6.75	6.55	6.56	6.74	6.74	6.77	6.22	6.88	6.70	6.66	7.05
02/01/35	02/28/35	Feb 2035	68.97	65.26	56.44	51.42	71.69	66.69	62.70	57.66	66.97	62.62	6.56	6.80	6.58	6.59	6.78	6.77	6.80	6.24	6.91	6.73	6.69	7.08
03/01/35	03/31/35	Mar 2035	63.59	60.36	53.28	49.92	60.90	56.91	61.14	56.08	65.65	61.24	6.47	6.70	6.50	6.52	6.59	6.55	6.56	6.19	6.83	6.65	6.61	6.84
04/01/35	04/30/35	Apr 2035	61.87	58.11	56.91	51.78	57.76	54.47	59.93	55.60	65.01	60.75	6.42	6.63	6.42	6.42	6.45	6.39	6.39	6.02	6.73	6.55	6.52	6.64
05/01/35	05/31/35	May 2035	63.37	49.74	64.21	49.54	58.55	45.51	66.94	54.03	71.83	58.61	6.47	6.64	6.44	6.42	6.49	6.42	6.34	6.02	6.72	6.55	6.52	6.58
06/01/35	06/30/35	Jun 2035	59.78	50.10	57.27	47.53	55.09	45.84	63.96	54.29	64.17	57.36	6.59	6.70	6.45	6.42	6.55	6.45	6.33	5.92	6.72	6.55	6.52	6.57
07/01/35	07/31/35	Jul 2035	65.54	57.31	62.45	50.20	60.59	52.73	72.73	58.06	70.47	59.04	6.74	6.84	6.61	6.56	6.69	6.58	6.47	6.03	6.86	6.69	6.66	6.71
08/01/35	08/31/35	Aug 2035	71.11	59.82	65.29	50.39	66.00	55.25	77.48	59.09	76.16	60.03	6.74	6.92	6.70	6.66	6.74	6.66	6.59	6.17	6.96	6.79	6.75	6.84
09/01/35	09/30/35	Sep 2035	72.93	62.73	66.65	52.05	68.30	58.81	78.16	60.17	79.06	62.75	6.69	6.91	6.70	6.70	6.74	6.67	6.66	6.31	7.01	6.83	6.80	6.90
10/01/35	10/31/35	Oct 2035	69.09	61.76	62.23	51.38	65.75	58.45	70.70	57.47	73.93	62.32	6.63	6.86	6.64	6.64	6.70	6.66	6.64	6.24	6.94	6.77	6.73	6.89
11/01/35	11/30/35	Nov 2035	70.52	63.76	60.13	51.48	67.02	60.53	69.56	58.17	73.35	62.37	6.67	6.97	6.77	6.72	6.89	6.86	6.91	6.31	7.03	6.85	6.81	7.17
12/01/35	12/31/35	Dec 2035	70.38	65.18	58.77	52.20	69.20	62.84	67.88	58.94	71.91	63.52	6.75	6.99	6.74	6.77	6.95	6.92	6.95	6.31	7.08	6.90	6.86	7.23
01/01/36	01/31/36	Jan 2036	69.56	65.58	58.66	53.36	69.02	61.95	67.57	60.65	71.70	65.80	6.83	7.15	6.88	6.92	7.15	7.13	7.15	6.24	7.24	7.06	7.02	7.43
02/01/36	02/29/36	Feb 2036	69.96	65.33	57.22	52.63	73.06	64.56	62.95	58.05	67.83	63.36	6.77	6.96	6.77	6.77	6.89	6.88	6.89	6.41	7.08	6.90	6.86	7.18
03/01/36	03/31/36	Mar 2036	65.41	62.39	54.85	52.46	62.50	58.60	62.65	58.57	67.55	63.96	6.77	6.97	6.78	6.78	6.88	6.85	6.85	6.49	7.10	6.92	6.88	7.13
04/01/36	04/30/36	Apr 2036	63.36	59.13	56.90	52.55	59.34	55.16	61.64	57.29	66.70	62.64	6.70	6.86	6.69	6.69	6.70	6.65	6.62	6.27	6.99	6.82	6.78	6.87
05/01/36	05/31/36	May 2036	62.09	48.96	62.32	49.90	57.26	44.70	66.38	54.94	71.57	59.54	6.65	6.80	6.61	6.59	6.65	6.59	6.51	6.19	6.89	6.72	6.68	6.75
06/01/36	06/30/36	Jun 2036	60.11	50.95	57.61	48.77	55.36	46.62	64.90	54.89	64.94	58.27	6.69	6.78	6.54	6.46	6.62	6.51	6.38	5.95	6.76	6.59	6.55	6.62
07/01/36	07/31/36	Jul 2036	65.58	56.42	62.95	49.89	60.59	51.83	73.26	57.10	70.97	59.00	6.78	6.86	6.62	6.56	6.72	6.59	6.45	5.98	6.86	6.69	6.65	6.69
08/01/36	08/31/36	Aug 2036	71.77	60.15	66.29	51.91	66.53	55.47	78.35	59.50	77.24	61.53	6.85	7.04	6.81	6.77	6.85	6.77	6.70	6.27	7.07	6.89	6.86	6.94
09/01/36	09/30/36	Sep 2036	73.69	62.06	68.05	52.84	68.99	57.86	78.64	59.33	80.18	62.90	6.81	7.04	6.83	6.81	6.86	6.80	6.78	6.43	7.11	6.94	6.91	7.02
10/01/36	10/31/36	Oct 2036	70.07	62.72	66.90	54.63	67.67	59.40	71.31	59.05	75.26	64.23	6.77	7.02	6.85	6.77	6.86	6.81	6.81	6.38	7.07	6.90	6.86	7.06
11/01/36	11/30/36	Nov 2036	72.92	65.74	62.63	53.54	71.53	62.77	71.24	59.67	75.76	64.59	6.85	7.13	6.94	6.88	7.07	7.04	7.05	6.49	7.18	7.01	6.97	7.32
12/01/36	12/31/36	Dec 2036	71.29	65.18	59.87	52.90	71.17	61.83	68.55	59.67	73.23	64.84	6.88	7.07	6.85	6.85	7.05	7.04	7.05	6.35	7.16	6.98	6.94	7.33
01/01/37	01/31/37	Jan 2037	70.57	68.03	60.70	54.58	72.03	66.10	68.63	62.02	74.05	67.18	6.92	7.25	6.92	6.97	7.25	7.23	7.27	6.34	7.29	7.11	7.07	7.55
02/01/37	02/28/37	Feb 2037	72.17	69.88	59.53	55.28	76.39	72.17	65.59	61.40	71.01	66.44	6.96	7.22	6.92	6.94	7.23	7.20	7.23	6.45	7.26	7.08	7.04	7.52
03/01/37	03/31/37	Mar 2037	67.57	64.49	57.69	53.52	66.77	61.11	65.24	59.99	70.60	65.42	6.92	7.12	6.94	6.94	7.04	7.01	7.02	6.66	7.25	7.08	7.04	7.30
04/01/37	04/30/37	Apr 2037	65.48	60.74	57.73	53.12	62.51	56.89	63.79	58.48	69.17	63.96	6.87	7.05	6.87	6.87	6.89	6.84	6.83	6.48	7.18	7.01	6.97	7.07
05/01/37	05/31/37	May 2037	64.54	50.97	62.42	52.16	59.59	46.58	68.81	57.00	74.15	61.67	6.84	7.01	6.81	6.81	6.86	6.79	6.71	6.42	7.11	6.94	6.90	6.95
06/01/37	06/30/37	Jun 2037	62.39	52.59	59.82	50.21	57.52	48.15	66.71	56.80	67.27	59.97	6.87	6.97	6.74	6.70	6.81	6.71	6.58	6.17	6.99	6.82	6.79	6.82
07/01/37	07/31/37	Jul 2037	67.46	58.32	64.15	51.73	62.34	53.62	75.19	59.73	73.22	60.86	6.99	7.10	6.86	6.79	6.92	6.83	6.68	6.16	7.09	6.92	6.89	6.92
08/01/37	08/31/37	Aug 2037	72.90	62.45	67.04	53.88	67.62	57.76	79.88	62.25	78.73	63.69	7.05	7.27	7.05	7.02	7.07	7.01	6.94	6.58	7.32	7.15	7.11	7.18
09/01/37	09/30/37	Sep 2037	74.56	65.75	69.28	55.30	71.00	62.09	80.84	62.62	82.84	65.45	7.07	7.33	7.14	7.05	7.12	7.07	7.05	6.68	7.36	7.18	7.15	7.30
10/01/37	10/31/37	Oct 2037	70.11	66.04	64.93	56.17	69.49	63.12	73.04	61.69	77.61	66.94	7.01	7.27	7.09	7.01	7.09	7.04	7.02	6.61	7.31	7.14	7.10	7.27
11/01/37	11/30/37	Nov 2037	72.75	68.61	63.33	54.95	72.81	66.94	72.36	61.72	76.98	66.60	6.97	7.27	7.09	7.01	7.23	7.23	7.25	6.65	7.31	7.14	7.10	7.52
12/01/37	12/31/37	Dec 2037	71.97	68.98	62.24	54.68	74.13	67.69	70.40	62.01	75.59	67.11	7.02	7.27	7.05	7.02	7.27	7.27	7.31	6.55	7.33	7.16	7.12	7.59
01/01/38	01/31/38	Jan 2038	73.61	69.24	62.13	55.50	76.72	66.29	70.83	63.90	75.06	68.16	7.10	7.48	7.12	7.15	7.50	7.50	7.50	6.50	7.47	7.29	7.25	7.79
02/01/38	02/28/38	Feb 2038	75.62	69.84	61.22	55.16	80.84	70.47	67.54	61.86	71.78	66.57	7.12	7.39	7.12	7.12	7.45	7.44	7.50	6.64	7.44	7.26	7.21	7.79
03/01/38	03/31/38	Mar 2038	70.07	65.56	59.11	53.00	69.71	61.66	66.63	60.48	71.41	65.48	7.09	7.29	7.10	7.10	7.20	7.17	7.17	6.82	7.42	7.24	7.20	7.45
04/01/38	04/30/38	Apr 2038	66.75	62.04	62.43	55.69	64.88	57.98	64.63	59.87	69.39	65.33	7.04	7.22	7.04	7.02	7.07	7.02	7.02	6.67	7.32	7.15	7.11	7.26
05/01/38	05/31/38	May 2038	68.58	54.57	66.71	54.61	63.37	49.97	71.06	59.03	76.12	64.06	7.07	7.24	7.05	7.02	7.07	7.00	6.92	6.59	7.32	7.15	7.11	7.16
06/01/38	06/30/38	Jun 2038	65.27	54.54	61.95	51.66	60.29	49.95	69.37	59.26	69.05	61.79	7.10	7.22	6.99	6.92	7.05	6.94	6.82	6.40	7.22	7.05	7.01	7.06
07/01/38	07/31/38	Jul 2038	69.78	59.88	65.31	53.05	64.51	55.05	77.36	61.69	74.67	61.91	7.19	7.32	7.07	7.00	7.14	7.04	6.89	6.37	7.30	7.13	7.09	7.13
08/01/38	08/31/38	Aug 2038	75.70	62.96	69.84	54.73	70.31	58.08	82.21	63.76	81.01	64.27	7.22	7.50	7.22	7.19	7.25	7.17	7.14	6.74	7.49	7.31	7.28	7.38
09/01/38	09/30/38	Sep 2038	76.54	64.86	70.07	55.15	72.84	60.52	81.85	63.67	83.02	65.78	7.19	7.48	7.25	7.17	7.25	7.20	7.17	6.79	7.47	7.30	7.26	7.41

10/01/38	10/31/38	Oct 2038	72.34	65.96	65.81	56.14	72.43	62.45	74.47	63.05	78.40	67.98	7.17	7.47	7.24	7.15	7.32	7.29	7.30	6.77	7.45	7.28	7.25	7.55
11/01/38	11/30/38	Nov 2038	76.21	69.13	64.54	55.21	77.85	66.26	74.80	63.28	78.21	67.14	7.15	7.50	7.25	7.17	7.50	7.50	7.57	6.80	7.48	7.30	7.26	7.83
12/01/38	12/31/38	Dec 2038	75.94	69.43	63.46	55.04	79.73	67.12	72.26	63.18	76.66	67.47	7.17	7.47	7.20	7.15	7.48	7.48	7.55	6.75	7.47	7.29	7.25	7.83
01/01/39	01/31/39	Jan 2039	78.33	71.41	63.45	57.28	82.34	68.65	72.21	66.00	77.28	70.43	7.28	7.72	7.28	7.31	7.68	7.67	7.56	6.65	7.63	7.45	7.41	7.85
02/01/39	02/28/39	Feb 2039	79.74	72.49	62.89	56.95	85.50	73.02	69.69	64.44	74.49	68.82	7.31	7.60	7.28	7.31	7.68	7.68	7.73	6.83	7.63	7.45	7.41	8.02
03/01/39	03/31/39	Mar 2039	71.78	67.48	59.74	54.66	71.63	63.66	67.80	62.18	72.26	67.46	7.28	7.48	7.29	7.29	7.38	7.34	7.36	7.00	7.61	7.43	7.39	7.64
04/01/39	04/30/39	Apr 2039	68.61	63.65	61.33	55.67	65.87	59.41	65.80	61.41	71.27	66.93	7.21	7.41	7.22	7.21	7.26	7.21	7.21	6.85	7.51	7.34	7.30	7.45
05/01/39	05/31/39	May 2039	69.82	54.60	64.96	55.46	64.50	49.96	72.31	59.96	77.92	65.13	7.16	7.34	7.17	7.14	7.17	7.12	7.05	6.77	7.44	7.27	7.23	7.29
06/01/39	06/30/39	Jun 2039	66.97	56.04	62.67	53.86	61.88	51.33	70.36	60.79	70.43	63.07	7.17	7.34	7.09	7.00	7.14	7.04	6.92	6.48	7.30	7.13	7.10	7.16
07/01/39	07/31/39	Jul 2039	71.50	61.14	67.16	54.59	66.11	56.21	78.59	63.39	76.03	63.34	7.28	7.43	7.17	7.11	7.22	7.14	6.99	6.43	7.41	7.23	7.20	7.23
08/01/39	08/31/39	Aug 2039	78.43	63.82	71.18	55.61	73.29	58.88	84.06	64.55	83.06	64.98	7.31	7.60	7.36	7.29	7.36	7.28	7.22	6.83	7.59	7.42	7.39	7.47
09/01/39	09/30/39	Sep 2039	77.97	66.30	71.25	57.10	76.71	62.29	82.29	65.54	85.15	67.84	7.33	7.70	7.39	7.31	7.38	7.33	7.31	6.92	7.61	7.44	7.40	7.55
10/01/39	10/31/39	Oct 2039	77.41	68.54	70.22	59.31	79.80	65.93	76.53	65.35	81.78	70.37	7.31	7.65	7.38	7.28	7.51	7.50	7.48	6.90	7.58	7.41	7.37	7.72
11/01/39	11/30/39	Nov 2039	85.12	73.35	68.31	57.96	90.88	72.29	77.84	66.18	82.49	70.35	7.34	7.79	7.43	7.38	7.73	7.75	7.75	6.97	7.68	7.51	7.47	8.02
12/01/39	12/31/39	Dec 2039	82.35	72.54	65.37	57.24	87.84	70.03	74.40	65.62	79.45	70.21	7.38	7.68	7.38	7.36	7.70	7.72	7.79	6.97	7.67	7.50	7.46	8.06
01/01/40	01/31/40	Jan 2040	82.33	73.96	65.14	59.12	87.34	71.54	73.64	68.14	78.92	72.58	7.50	7.95	7.52	7.57	7.91	7.90	7.72	6.89	7.89	7.71	7.66	8.01
02/01/40	02/29/40	Feb 2040	82.27	74.83	63.60	57.99	88.19	76.30	71.02	66.05	75.87	70.62	7.43	7.74	7.43	7.46	7.86	7.88	7.95	7.06	7.78	7.60	7.56	8.23
03/01/40	03/31/40	Mar 2040	74.89	69.75	61.55	56.84	74.50	66.49	69.29	64.53	73.82	69.94	7.45	7.69	7.50	7.48	7.65	7.62	7.65	7.15	7.80	7.62	7.58	7.94
04/01/40	04/30/40	Apr 2040	70.71	65.80	61.67	56.33	67.97	61.76	66.94	62.80	72.28	68.38	7.41	7.60	7.41	7.39	7.45	7.39	7.39	7.06	7.70	7.53	7.49	7.64
05/01/40	05/31/40	May 2040	72.97	56.16	66.43	56.88	67.58	51.40	74.18	61.49	79.91	66.65	7.38	7.57	7.38	7.34	7.38	7.32	7.27	6.98	7.64	7.47	7.43	7.51
06/01/40	06/30/40	Jun 2040	70.74	58.14	65.03	55.88	66.15	53.30	72.72	62.94	72.40	64.98	7.39	7.57	7.27	7.19	7.34	7.24	7.13	6.61	7.48	7.31	7.28	7.37
07/01/40	07/31/40	Jul 2040	75.38	63.48	69.02	56.62	69.80	58.41	81.91	65.07	78.73	64.75	7.50	7.67	7.38	7.29	7.45	7.31	7.19	6.63	7.59	7.42	7.38	7.43
08/01/40	08/31/40	Aug 2040	81.67	66.43	73.11	57.97	76.62	61.38	86.70	66.78	85.23	67.08	7.57	7.88	7.62	7.55	7.62	7.52	7.50	7.06	7.85	7.68	7.64	7.74
09/01/40	09/30/40	Sep 2040	79.96	69.38	71.11	59.69	78.14	65.61	81.87	67.91	85.07	70.74	7.64	7.97	7.69	7.60	7.69	7.62	7.60	7.19	7.90	7.73	7.69	7.84
10/01/40	10/31/40	Oct 2040	82.44	72.46	70.08	60.07	85.66	70.63	78.22	67.53	83.61	72.87	7.60	7.98	7.65	7.57	7.86	7.84	7.84	7.17	7.87	7.70	7.66	8.09
11/01/40	11/30/40	Nov 2040	88.39	75.83	69.25	59.53	94.12	74.35	79.06	67.80	83.69	72.07	7.62	8.04	7.69	7.62	8.05	8.09	8.11	7.24	7.93	7.75	7.71	8.37
12/01/40	12/31/40	Dec 2040	86.36	76.04	67.34	59.93	92.07	74.24	76.37	68.95	81.43	73.09	7.65	8.05	7.69	7.65	8.09	8.11	8.14	7.27	7.97	7.79	7.75	8.42
01/01/41	01/31/41	Jan 2041	84.49	75.31	66.20	60.38	89.68	72.36	75.69	69.52	80.11	74.29	7.66	8.12	7.67	7.73	8.08	8.06	7.89	7.04	8.04	7.86	7.82	8.17
02/01/41	02/28/41	Feb 2041	84.32	77.09	64.71	59.70	90.39	78.87	73.83	67.91	77.36	72.59	7.58	7.90	7.58	7.62	8.03	8.05	8.12	7.21	7.94	7.76	7.72	8.40
03/01/41	03/31/41	Mar 2041	77.70	71.77	62.91	58.24	78.16	69.26	71.40	66.11	75.07	71.57	7.60	7.85	7.66	7.64	7.81	7.78	7.81	7.30	7.95	7.77	7.73	8.10
04/01/41	04/30/41	Apr 2041	72.80	68.47	64.44	58.83	70.74	64.76	68.32	64.43	73.17	70.23	7.57	7.76	7.57	7.55	7.60	7.55	7.55	7.21	7.85	7.68	7.64	7.79
05/01/41	05/31/41	May 2041	73.51	60.04	67.20	58.55	68.10	55.06	74.59	63.47	80.39	68.99	7.53	7.73	7.53	7.50	7.53	7.48	7.42	7.12	7.79	7.62	7.59	7.66
06/01/41	06/30/41	Jun 2041	69.29	59.23	64.79	57.37	64.42	54.28	71.96	64.06	72.28	66.87	7.55	7.73	7.42	7.34	7.50	7.39	7.28	6.75	7.64	7.46	7.43	7.52
07/01/41	07/31/41	Jul 2041	75.16	65.60	69.74	57.79	69.51	60.42	81.80	66.06	79.53	66.31	7.66	7.83	7.53	7.44	7.60	7.46	7.34	6.77	7.74	7.57	7.54	7.58
08/01/41	08/31/41	Aug 2041	84.05	68.68	74.41	59.38	78.76	63.66	89.00	68.32	87.37	68.55	7.73	8.05	7.78	7.71	7.78	7.67	7.66	7.21	8.01	7.84	7.80	7.90
09/01/41	09/30/41	Sep 2041	83.35	71.26	74.98	60.79	81.35	67.18	88.05	70.00	89.45	72.57	7.80	8.13	7.85	7.76	7.85	7.78	7.76	7.34	8.06	7.89	7.85	8.00
10/01/41	10/31/41	Oct 2041	82.67	73.05	70.83	60.48	84.22	70.59	81.34	68.96	85.34	73.91	7.76	8.15	7.81	7.73	8.03	8.01	8.01	7.32	8.03	7.86	7.82	8.25
11/01/41	11/30/41	Nov 2041	86.57	76.11	68.99	60.63	90.53	73.56	79.77	68.93	83.65	73.58	7.78	8.20	7.85	7.78	8.22	8.26	8.28	7.39	8.09	7.91	7.87	8.54
12/01/41	12/31/41	Dec 2041	88.62	77.96	68.82	61.38	94.54	75.96	79.08	70.22	83.55	74.83	7.81	8.22	7.85	7.81	8.26	8.28	8.31	7.42	8.13	7.95	7.91	8.59
01/01/42	01/31/42	Jan 2042	90.35	77.28	68.43	61.70	94.41	74.94	78.15	71.24	83.42	75.80	7.82	8.29	7.83	7.89	8.25	8.23	8.05	7.18	8.21	8.03	7.98	8.34
02/01/42	02/28/42	Feb 2042	88.74	79.48	66.86	61.02	94.72	81.65	76.56	69.70	80.36	74.33	7.74	8.07	7.74	7.78	8.20	8.21	8.29	7.36	8.10	7.92	7.88	8.57
03/01/42	03/31/42	Mar 2042	81.05	73.29	64.33	59.49	80.61	70.77	73.34	67.64	76.78	73.16	7.76	8.02	7.82	7.80	7.98	7.94	7.98	7.45	8.11	7.93	7.89	8.26
04/01/42	04/30/42	Apr 2042	74.52	69.62	64.33	59.19	72.12	66.08	70.18	65.91	75.64	71.76	7.73	7.92	7.73	7.71	7.76	7.71	7.71	7.36	8.01	7.84	7.80	7.95
05/01/42	05/31/42	May 2042	74.93	59.10	68.55	58.82	69.27	54.11	76.70	64.78	82.91	70.32	7.69	7.89	7.69	7.65	7.69	7.64	7.58	7.27	7.95	7.78	7.75	7.82
06/01/42	06/30/42	Jun 2042	70.24	61.10	65.64	58.31	64.76	56.08	72.85	65.87	73.59	68.38	7.71	7.89	7.58	7.49	7.65	7.54	7.44	6.89	7.79	7.62	7.58	7.67
07/01/42	07/31/42	Jul 2042	77.56	67.03	71.01	58.77	71.79	61.71	83.68	67.77	81.13	67.66	7.82	8.00	7.69	7.60	7.76	7.62	7.49	6.91	7.90	7.73	7.69	7.73
08/01/42	08/31/42	Aug 2042	90.07	70.57	78.84	60.72	84.15	65.56	93.65	70.49	92.13	70.66	7.89	8.21	7.94	7.87	7.94	7.83	7.82	7.36	8.17	8.00	7.96	8.06
09/01/42	09/30/42	Sep 2042	88.42	72.99	77.09	61.30	85.09	68.88	89.82	70.84	92.29	73.50	7.96	8.30	8.02	7.92	8.02	7.94	7.92	7.49	8.23	8.05	8.02	8.17
10/01/42	10/31/42	Oct 2042	88.40	75.42	74.67	63.73	90.45	73.49	83.63	71.10	88.69	76.46	7.92	8.32	7.98	7.89	8.20	8.18	8.18	7.47	8.19	8.02	7.98	8.42
11/01/42	11/30/42	Nov 2042	93.56	80.29	72.47	62.94	99.29	79.53	82.51	71.69	87.59	76.54	7.94	8.38	8.02	7.94	8.40	8.43	8.45	7.54	8.25	8.07	8.04	8.72
12/01/42	12/31/42	Dec 2042	93.12	79.74	71.11	62.72	99.09	78.29	81.43	72.02	86.44	76.89	7.98	8.40	8.02	7.98	8.43	8.45	8.49	7.58	8.29	8.11	8.07	8.76
01/01/43	01/31/43	Jan 2043	90.30	78.97	69.07	63.07	94.54	76.70	79.67	72.98	84.13	77.65	7.98	8.46	8.00	8.05	8.42	8.41	8.22	7.33	8.37	8.19	8.15	8.51
02/01/43	02/28/43	Feb 2043	89.77	81.89	67.57	62.54	96.09	84.27	78.99	71.85	81.48	76.25	7.91	8.24	7.91	7.94	8.37	8.39	8.46	7.52	8.26	8.08	8.04	8.75
03/01/43	03/31/43	Mar 2043	83.79	75.51	65.64	61.08	83.86	73.23	76.30	69.56	78.16	74.87	7.92	8.18	7.98	7.96	8.15	8.11	8.15	7.61	8.28	8.10	8.06	8.43
04/01/43	04/30/43	Apr 2043	77.21	71.60	65.13	60.18	73.94	68.35	72.56	67.78	77.06	73.78	7.89	8.09	7.89	7.87	7.92	7.87	7.87	7.52	8.17	8.00	7.96	8.11
05/01/43	05/31/43	May 2043	75.94	61.80	69.33	61.14	70.21	56.67	77.96	66.72	83.85	71.93	7.85	8.05	7.85	7.81	7.85	7.80	7.74	7.43	8.11	7.94	7.91	7.98
06/01/43	06/30/43	Jun 2043	72.05	62.78	66.70	59.50	66.54	57.64	75.01	67.51	75.01	69.52	7.87	8.05	7.74	7.65	7.81	7.70	7.59	7.04	7.95	7.78	7.74	7.83
07/01/43	07/31/43	Jul 2043	80.11	68.99	71.61	60.45	74.16	63.65	85.63	69.40	83.20	69.36	7.98	8.16	7.85	7.76	7.92	7.78	7.65	7.06	8.06	7.89	7.85	7.89
08/01/43	08/31/43	Aug 2043	89.39	72.76	78.05	62.50	83.52	67.84	92.58	71.88	91.51	72.22	8.05	8.39	8.11	8.04	8.11	8.00	7.98	7.52	8.34	8.17	8.13	8.22
09/01/43	09/30/43	Sep 2043	89.27	75.18	78.08	62.90	85.75	71.44	91.11	72.41	93.21	75.52	8.13	8.48	8.18	8.09	8.18	8.11	8.09	7.65	8.39	8.22	8.18	8.33
10/01/43	10/31/43	Oct 2043	88.94	77.01	74.03	64.15	90.31	75.49	84.28	72.38	88.84	77.88	8.09	8.50	8.15	8.05	8.37	8.35	8.35	7.63	8.36	8.18	8.15	8.59
11/01/43	11/30/43	Nov 2043	93.96	81.83	72.67	63.87	98.53	80.57	83.98	73.47	88.29	78.16	8.11	8.55	8.18	8.11	8.57	8.61	8.63	7.70	8.42	8.24	8.20	8.89
12/01/43	12/31/43	Dec 2043	93.80	82.29	71.69	64.35	99.45	82.19	83.46	74.09	87.18	78.93	8.15	8.57	8.18	8.15	8.61	8.63	8.66	7.74	8.46	8.28	8.24	8.94
01/01/44	01/31/44	Jan 2044	92.20	80.63	70.52	64.39	96.53	78.31	81.34	74.51	85.90	79.28	8.15	8.64	8.17	8.22	8.60	8.58	8.39	7.49	8.54	8.36	8.32	8.68
02/01/44	02/29/44	Feb 2044	91.66	83.61	68.99	63.85	98.11	86.04	80.65	73.36	83.19	77.85	8.07	8.41	8.07	8.11	8.54	8.56	8.64	7.68	8.43	8.25	8.21	8.92
03/01/44	03/31/44	Mar 2044	85.55	77.09	67.02	62.36	85.62	74.77	77.90	71.03	79.80	76.44	8.09	8.36	8.15	8.13	8.32	8.28	8.32	7.77	8.44	8.27	8.22	8.60
04/01/44	04/30/44	Apr 2044	78.84	73.10	66.50	61.44	75.49	69.78	74.08	69.20	78.68	75.33	8.05	8.26	8.05	8.03	8.09	8.03	8.03	7.68	8.34	8.17	8.13	8.28
05/01/44	05/31/44	May 2044	77.54	63.10	70.78	62.42	71.68	57.86	79.60	68.12	85.61	73.44	8.02	8.22	8.02	7.98	8.02	7.96	7.90	7.58	8.28	8.11	8.07	8.14
06/01/44	06/30/44	Jun 2044	73.57	64.10	68.10	60.75	67.94	58.85	76.58	68.93	76.59	70.98	8.03	8.22	7.90	7.81	7.98	7.86	7.75	7.19	8.11	7.94	7.90	7.99
07/01/44	07/31/44	Jul 2044	81.79	70.44	73.11	61.72	75.72	64.99	87.43	70.86	84.95	70.82	8.15	8.34	8.02	7.92	8.09	7.94	7.81	7.20	8.22	8.05	8.01	8.05
08/01/44	08/31/44	Aug 2044	91.26	74.29	79.69	63.81	85.28	69.26	94.52	73.39	93.43	73.73	8.22	8.56	8.28	8.20	8.28	8.17	8.15	7.68	8.51	8.33	8.30	8.39
09/01/44	09/30/44	Sep 2044	91.14	76.76	79.72	64.22	87.55	72.94	93.02	73.93	95.17	77.10	8.30	8.66	8.36	8.26	8.36	8.28	8.26	7.81	8.56	8.39	8.35	8.50
10/01/44	10/31/44	Oct 2044	90.81	78.62	75.58	65.50	92.21	77.08	86.05	73.90	90.71	79.51	8.26	8.68	8.32	8.22	8.54	8.52	8.52	7.79	8.53	8.35	8.32	8.77

	11/01/44	11/30/44	Nov 2044	95.94	83.55	74.20	65.21	100.60	82.27	85.74	75.01	90.15	79.80	8.28	8.73	8.36	8.28	8.75	8.79	8.81	7.86	8.59	8.41	8.37	9.07
	12/01/44	12/31/44	Dec 2044	95.77	84.01	73.20	65.70	101.54	83.92	85.21	75.65	89.01	80.59	8.32	8.75	8.36	8.32	8.79	8.81	8.85	7.90	8.63	8.45	8.41	9.12
	01/01/45	01/31/45	Jan 2045	94.14	82.32	72.00	65.74	98.55	79.95	83.05	76.07	87.70	80.95	8.32	8.82	8.34	8.40	8.78	8.76	8.57	7.64	8.71	8.53	8.49	8.86
	02/01/45	02/28/45	Feb 2045	93.58	85.36	70.44	65.19	100.17	87.85	82.34	74.90	84.94	79.49	8.24	8.59	8.24	8.28	8.72	8.74	8.82	7.84	8.60	8.42	8.38	9.10
	03/01/45	03/31/45	Mar 2045	87.35	78.71	68.42	63.67	87.42	76.34	79.54	72.52	81.48	78.04	8.26	8.53	8.32	8.30	8.49	8.45	8.49	7.93	8.61	8.44	8.39	8.77

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
12/31/2014		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
1214 Official Forward Price Curve: *Blend of...* Final December 2014 Aurora forecast 12/31/2014 forward market curve			**COB**		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/15	01/31/15	Jan 2015	27.75	23.75	28.50	25.25	25.50	22.00	36.25	30.50	36.25	30.50	3.19	3.26	3.03	3.02	3.16	3.10	3.25	2.90	3.27	3.03	3.05	3.18
02/01/15	02/28/15	Feb 2015	27.25	22.25	28.00	25.50	24.75	20.50	36.75	30.25	37.25	30.50	2.89	2.98	2.84	2.88	2.92	2.89	2.85	2.36	3.17	2.99	2.97	3.07
03/01/15	03/31/15	Mar 2015	27.50	21.50	28.00	23.75	24.00	19.00	36.00	29.25	37.00	30.00	2.90	2.93	2.77	2.74	2.82	2.80	2.56	2.34	3.02	2.85	2.82	2.75
04/01/15	04/30/15	Apr 2015	29.98	20.06	27.55	22.66	24.12	16.64	37.01	27.56	37.28	27.56	2.88	2.87	2.73	2.60	2.66	2.64	2.56	2.28	2.87	2.70	2.67	2.74
05/01/15	05/31/15	May 2015	26.98	16.32	29.29	21.34	22.07	12.65	34.55	25.46	34.79	25.44	2.90	2.89	2.74	2.61	2.68	2.66	2.32	2.27	2.88	2.71	2.68	2.48
06/01/15	06/30/15	Jun 2015	25.89	14.62	30.16	22.00	22.07	11.96	34.19	25.73	34.44	26.50	2.95	2.94	2.78	2.66	2.74	2.71	2.33	2.28	2.93	2.76	2.73	2.49
07/01/15	07/31/15	Jul 2015	36.38	23.06	37.54	26.78	30.32	19.07	41.97	32.07	42.84	32.00	3.01	3.09	2.86	2.73	2.81	2.78	2.50	2.31	3.00	2.83	2.81	2.67
08/01/15	08/31/15	Aug 2015	37.49	28.62	35.75	25.25	33.22	25.58	41.57	33.02	43.26	32.96	3.03	3.15	2.85	2.75	2.83	2.80	2.57	2.33	3.02	2.85	2.83	2.74
09/01/15	09/30/15	Sep 2015	36.38	27.83	33.96	24.48	33.22	25.11	38.71	30.16	39.90	31.04	3.01	3.08	2.83	2.73	2.82	2.79	2.57	2.32	3.00	2.83	2.81	2.75
10/01/15	10/31/15	Oct 2015	31.26	26.09	31.19	24.98	27.30	22.98	41.83	35.00	40.67	33.41	3.04	3.06	2.84	2.76	2.86	2.83	2.68	2.37	3.03	2.86	2.84	2.86
11/01/15	11/30/15	Nov 2015	32.92	27.20	30.24	25.75	29.40	26.01	41.83	34.30	41.50	33.08	3.17	3.27	3.05	3.03	3.15	3.12	3.21	2.64	3.32	3.15	3.12	3.44
12/01/15	12/31/15	Dec 2015	35.58	29.97	33.08	26.52	33.30	26.77	43.10	35.70	42.33	34.76	3.38	3.54	3.28	3.30	3.38	3.35	3.49	2.72	3.60	3.42	3.39	3.74
01/01/16	01/31/16	Jan 2016	36.40	28.88	33.33	28.05	34.10	27.55	43.58	35.62	43.16	35.02	3.53	3.64	3.44	3.39	3.46	3.43	3.53	2.86	3.71	3.52	3.48	3.78
02/01/16	02/29/16	Feb 2016	35.70	27.50	33.00	28.05	30.69	26.01	42.33	34.59	42.33	34.00	3.53	3.62	3.42	3.40	3.46	3.43	3.39	2.85	3.71	3.52	3.49	3.64
03/01/16	03/31/16	Mar 2016	32.90	26.13	32.67	26.40	28.21	23.69	38.60	32.54	39.01	32.98	3.49	3.57	3.37	3.36	3.42	3.39	3.28	2.81	3.67	3.48	3.45	3.52
04/01/16	04/30/16	Apr 2016	33.52	24.38	36.58	24.44	27.30	18.61	37.68	32.47	37.59	33.92	3.34	3.36	3.17	3.01	3.16	3.13	2.84	2.63	3.31	3.13	3.10	3.03
05/01/16	05/31/16	May 2016	29.21	16.58	33.25	23.03	25.75	14.49	38.86	27.20	38.36	27.67	3.34	3.38	3.16	3.02	3.15	3.12	2.67	2.55	3.32	3.13	3.11	2.85
06/01/16	06/30/16	Jun 2016	29.52	17.55	29.93	23.03	24.21	12.20	41.21	28.08	40.30	27.67	3.38	3.42	3.20	3.05	3.18	3.15	2.70	2.58	3.35	3.17	3.14	2.88
07/01/16	07/31/16	Jul 2016	38.80	22.32	42.67	26.79	32.66	19.50	44.25	34.44	46.16	34.68	3.41	3.66	3.24	3.20	3.28	3.25	2.96	2.65	3.50	3.32	3.29	3.16
08/01/16	08/31/16	Aug 2016	41.60	31.08	41.86	29.64	37.63	28.60	45.58	37.28	46.61	36.82	3.42	3.66	3.28	3.17	3.30	3.27	2.96	2.65	3.47	3.29	3.26	3.16
09/01/16	09/30/16	Sep 2016	39.60	31.36	36.23	29.07	36.21	29.90	42.92	34.79	42.99	35.75	3.41	3.48	3.24	3.10	3.30	3.27	2.93	2.62	3.40	3.22	3.19	3.13
10/01/16	10/31/16	Oct 2016	34.41	29.52	35.45	29.75	31.28	26.55	44.06	35.63	41.56	35.39	3.44	3.47	3.25	3.13	3.32	3.29	3.01	2.72	3.43	3.25	3.21	3.21
11/01/16	11/30/16	Nov 2016	36.63	30.14	33.71	29.16	33.32	30.68	44.06	36.75	43.75	36.13	3.53	3.73	3.47	3.42	3.51	3.47	3.60	2.90	3.73	3.54	3.51	3.86
12/01/16	12/31/16	Dec 2016	39.96	32.60	35.10	30.35	37.40	31.27	45.39	40.13	45.94	40.23	3.72	3.92	3.64	3.65	3.72	3.69	3.96	3.06	3.97	3.78	3.74	4.24
01/01/17	01/31/17	Jan 2017	39.15	30.13	36.58	30.30	37.60	31.30	46.33	38.87	45.66	38.52	3.87	4.08	3.79	3.81	3.80	3.77	3.93	3.21	4.12	3.94	3.90	4.21
02/01/17	02/28/17	Feb 2017	38.45	28.75	36.25	30.30	34.19	29.76	45.08	37.84	44.83	37.50	3.87	4.06	3.78	3.80	3.81	3.77	3.72	3.19	4.11	3.93	3.89	3.99
03/01/17	03/31/17	Mar 2017	35.65	27.38	35.92	28.65	31.71	27.44	41.35	35.79	41.51	36.48	3.82	4.03	3.72	3.75	3.76	3.72	3.69	3.16	4.06	3.88	3.84	3.96
04/01/17	04/30/17	Apr 2017	36.27	25.63	40.33	25.94	29.05	17.71	38.93	33.97	38.84	35.67	3.64	3.70	3.52	3.39	3.48	3.45	3.12	2.92	3.69	3.51	3.48	3.33
05/01/17	05/31/17	May 2017	31.96	17.83	37.00	24.53	27.50	13.59	40.11	28.70	39.61	29.42	3.64	3.74	3.51	3.32	3.48	3.45	3.09	2.89	3.62	3.44	3.41	3.30
06/01/17	06/30/17	Jun 2017	32.27	18.80	33.68	24.53	25.96	11.30	42.46	29.58	41.55	29.42	3.67	3.79	3.55	3.35	3.51	3.48	3.12	2.92	3.65	3.47	3.44	3.33
07/01/17	07/31/17	Jul 2017	41.55	23.32	47.17	29.29	37.16	20.75	47.50	36.94	49.41	38.68	3.71	4.03	3.59	3.41	3.60	3.57	3.32	2.93	3.71	3.53	3.50	3.54
08/01/17	08/31/17	Aug 2017	44.35	32.08	46.36	32.14	42.13	29.85	48.83	39.78	49.86	40.82	3.72	4.02	3.63	3.42	3.63	3.59	3.32	2.93	3.72	3.54	3.51	3.54
09/01/17	09/30/17	Sep 2017	42.35	32.36	40.73	31.57	40.71	31.15	46.17	37.29	46.24	39.75	3.71	3.84	3.60	3.41	3.62	3.59	3.33	2.94	3.71	3.53	3.50	3.55
10/01/17	10/31/17	Oct 2017	37.16	31.77	38.95	32.75	35.03	30.05	45.81	39.13	44.06	38.64	3.73	3.81	3.60	3.43	3.63	3.60	3.36	2.97	3.73	3.56	3.52	3.58
11/01/17	11/30/17	Nov 2017	39.38	32.39	37.21	32.16	37.07	34.18	45.81	40.25	46.25	39.38	3.81	4.14	3.77	3.78	3.85	3.82	4.05	3.23	4.10	3.91	3.87	4.34
12/01/17	12/31/17	Dec 2017	42.71	34.85	38.60	33.35	41.15	34.77	47.14	43.63	48.44	43.48	3.99	4.33	3.98	4.00	4.05	4.02	4.41	3.37	4.32	4.13	4.09	4.72
01/01/18	01/31/18	Jan 2018	43.15	32.63	40.33	32.95	41.60	33.80	48.58	40.62	47.91	40.27	4.14	4.51	4.12	4.14	4.15	4.12	4.32	3.46	4.46	4.28	4.24	4.63
02/01/18	02/28/18	Feb 2018	42.45	31.25	40.00	32.95	38.19	32.26	47.33	39.59	47.08	39.25	4.12	4.47	4.10	4.13	4.14	4.10	4.10	3.43	4.45	4.27	4.22	4.39
03/01/18	03/31/18	Mar 2018	39.65	29.88	39.67	31.30	35.71	29.94	43.60	37.54	43.76	38.23	4.06	4.42	4.04	4.07	4.08	4.04	4.04	3.37	4.38	4.21	4.16	4.33
04/01/18	04/30/18	Apr 2018	40.27	20.63	44.08	28.59	33.05	22.61	41.18	35.72	41.09	37.42	3.82	4.07	3.78	3.68	3.72	3.68	3.48	3.10	3.98	3.81	3.77	3.71
05/01/18	05/31/18	May 2018	35.96	14.03	40.75	27.18	31.50	14.03	42.36	30.45	41.86	31.17	3.82	4.09	3.77	3.61	3.71	3.68	3.43	3.05	3.90	3.73	3.70	3.66
06/01/18	06/30/18	Jun 2018	36.27	14.85	37.43	27.18	29.96	12.87	44.71	31.33	43.80	31.17	3.85	4.14	3.80	3.64	3.75	3.71	3.43	3.05	3.94	3.76	3.73	3.66
07/01/18	07/31/18	Jul 2018	45.55	25.82	50.92	31.94	41.16	23.25	49.75	38.69	51.66	40.43	3.88	4.39	3.84	3.69	3.83	3.80	3.63	3.07	3.99	3.82	3.78	3.87
08/01/18	08/31/18	Aug 2018	48.35	34.58	50.11	34.79	46.13	32.35	51.08	41.53	52.11	42.57	3.89	4.41	3.88	3.70	3.86	3.83	3.63	3.07	4.01	3.83	3.80	3.88
09/01/18	09/30/18	Sep 2018	46.35	34.86	44.48	34.22	44.71	33.65	48.42	39.04	48.49	41.50	3.89	4.21	3.85	3.70	3.85	3.82	3.67	3.10	4.00	3.83	3.79	3.91
10/01/18	10/31/18	Oct 2018	41.16	34.27	42.70	35.40	39.03	32.55	48.06	40.88	46.31	40.39	3.91	4.14	3.86	3.72	3.87	3.84	3.68	3.11	4.02	3.85	3.81	3.92
11/01/18	11/30/18	Nov 2018	43.38	34.89	40.96	34.81	41.07	36.68	48.06	42.00	48.50	41.13	3.99	4.35	3.93	3.96	4.07	4.04	4.21	3.39	4.27	4.09	4.05	4.51
12/01/18	12/31/18	Dec 2018	46.71	37.35	42.35	36.00	45.15	37.27	49.39	45.38	50.69	45.23	4.17	4.52	4.14	4.18	4.27	4.24	4.57	3.54	4.50	4.32	4.27	4.89
01/01/19	01/31/19	Jan 2019	45.90	38.33	42.58	34.95	44.35	37.96	49.83	40.37	49.16	41.37	4.31	4.67	4.27	4.31	4.34	4.30	4.47	3.62	4.63	4.45	4.40	4.79
02/01/19	02/28/19	Feb 2019	45.20	36.50	42.25	34.95	40.94	36.87	48.58	39.34	48.33	40.35	4.29	4.64	4.25	4.29	4.32	4.28	4.26	3.60	4.62	4.43	4.39	4.56
03/01/19	03/31/19	Mar 2019	42.40	34.68	41.92	33.30	38.46	34.68	44.85	37.29	45.01	39.33	4.23	4.60	4.19	4.23	4.26	4.22	4.20	3.54	4.55	4.37	4.33	4.50
04/01/19	04/30/19	Apr 2019	43.02	23.13	46.33	30.59	35.80	25.11	42.43	35.47	42.34	38.52	3.97	4.23	3.94	3.91	3.95	3.91	3.60	3.34	4.22	4.05	4.01	3.84
05/01/19	05/31/19	May 2019	38.71	16.53	43.00	29.18	34.25	16.53	43.61	30.20	43.11	32.27	3.97	4.26	3.93	3.84	3.94	3.91	3.56	3.29	4.15	3.98	3.94	3.79
06/01/19	06/30/19	Jun 2019	39.02	17.35	39.68	29.18	32.71	15.37	45.96	31.08	45.05	32.27	4.00	4.29	3.97	3.87	3.97	3.94	3.55	3.29	4.18	4.01	3.97	3.79
07/01/19	07/31/19	Jul 2019	48.30	28.32	53.17	33.94	43.91	25.75	51.00	38.44	52.91	41.53	4.03	4.53	4.00	3.93	4.06	4.03	3.73	3.28	4.24	4.06	4.02	3.98
08/01/19	08/31/19	Aug 2019	51.10	37.08	52.36	36.79	48.88	34.85	52.33	41.28	53.36	43.67	4.05	4.55	4.05	3.94	4.09	4.05	3.75	3.30	4.25	4.08	4.04	4.00
09/01/19	09/30/19	Sep 2019	49.10	37.36	46.73	36.22	47.46	36.15	49.67	38.79	49.74	42.60	4.04	4.36	4.02	3.93	4.08	4.05	3.77	3.32	4.24	4.07	4.03	4.02
10/01/19	10/31/19	Oct 2019	43.91	36.77	44.95	37.40	41.78	35.05	49.31	40.63	47.56	41.49	4.06	4.28	4.02	3.96	4.10	4.07	3.79	3.34	4.27	4.09	4.05	4.04
11/01/19	11/30/19	Nov 2019	46.13	37.39	43.21	36.81	43.82	39.18	49.31	41.75	49.75	42.23	4.15	4.54	4.08	4.11	4.20	4.16	4.26	3.51	4.43	4.25	4.21	4.57
12/01/19	12/31/19	Dec 2019	49.46	39.85	44.60	38.00	47.90	39.77	50.64	45.13	51.94	46.33	4.33	4.77	4.30	4.34	4.40	4.36	4.64	3.68	4.66	4.48	4.44	4.97
01/01/20	01/31/20	Jan 2020	48.65	40.33	45.33	36.95	47.10	39.96	51.58	41.87	50.91	42.87	4.46	4.90	4.42	4.46	4.47	4.43	4.55	3.76	4.79	4.61	4.56	4.87
02/01/20	02/29/20	Feb 2020	47.95	38.50	45.00	36.95	43.69	38.87	50.33	40.84	50.08	41.85	4.44	4.86	4.40	4.44	4.45	4.41	4.34	3.75	4.77	4.59	4.54	4.65
03/01/20	03/31/20	Mar 2020	45.15	36.68	44.67	35.30	41.21	36.68	46.60	38.79	46.76	40.83	4.38	4.81	4.34	4.38	4.39	4.35	4.30	3.70	4.71	4.52	4.48	4.60

04/01/20	04/30/20	Apr 2020	45.77	25.13	49.08	32.59	38.55	27.11	44.18	36.97	44.09	40.02	4.10	4.41	4.05	4.07	4.08	4.04	3.64	3.55	4.39	4.21	4.17	3.90
05/01/20	05/31/20	May 2020	41.46	18.53	45.75	31.18	37.00	18.53	45.36	31.70	44.86	33.77	4.10	4.51	4.04	4.00	4.07	4.04	3.58	3.49	4.32	4.14	4.10	3.84
06/01/20	06/30/20	Jun 2020	41.77	19.35	42.43	31.18	35.46	17.37	47.71	32.58	46.80	33.77	4.13	4.55	4.07	4.03	4.10	4.07	3.58	3.50	4.34	4.16	4.12	3.84
07/01/20	07/31/20	Jul 2020	51.05	30.32	55.92	35.94	46.66	27.75	52.75	39.94	54.66	43.03	4.15	4.72	4.10	4.08	4.17	4.14	3.78	3.50	4.40	4.22	4.17	4.05
08/01/20	08/31/20	Aug 2020	53.85	39.08	55.11	38.79	51.63	36.85	54.08	42.78	55.11	45.17	4.18	4.73	4.15	4.10	4.22	4.18	3.76	3.49	4.42	4.24	4.20	4.03
09/01/20	09/30/20	Sep 2020	51.85	39.36	49.48	38.22	50.21	38.15	51.42	40.29	51.49	44.10	4.17	4.55	4.13	4.10	4.22	4.18	3.83	3.55	4.41	4.23	4.19	4.10
10/01/20	10/31/20	Oct 2020	46.66	38.77	47.70	39.40	44.53	37.05	51.06	42.13	49.31	42.99	4.20	4.49	4.13	4.12	4.24	4.20	3.84	3.56	4.44	4.26	4.22	4.11
11/01/20	11/30/20	Nov 2020	48.88	39.39	45.96	38.81	46.57	41.18	51.06	43.25	51.50	43.73	4.28	4.70	4.20	4.24	4.35	4.31	4.31	3.77	4.56	4.38	4.34	4.62
12/01/20	12/31/20	Dec 2020	52.21	41.85	47.35	40.00	50.65	41.77	52.39	46.63	53.69	47.83	4.47	4.92	4.42	4.47	4.56	4.53	4.69	3.94	4.80	4.61	4.57	5.02
01/01/21	01/31/21	Jan 2021	50.90	41.83	47.33	38.45	49.35	41.46	53.33	42.87	52.66	43.87	4.59	5.05	4.53	4.58	4.61	4.58	4.61	4.03	4.91	4.72	4.68	4.93
02/01/21	02/28/21	Feb 2021	50.84	42.27	47.49	40.04	46.74	40.64	51.18	42.82	51.14	43.94	4.55	4.84	4.52	4.52	4.56	4.48	4.37	3.89	4.86	4.67	4.62	4.69
03/01/21	03/31/21	Mar 2021	47.11	38.73	46.13	37.84	43.26	37.04	49.03	40.76	48.87	42.24	4.51	4.78	4.45	4.44	4.48	4.41	4.36	3.82	4.77	4.59	4.54	4.68
04/01/21	04/30/21	Apr 2021	45.47	31.68	47.73	36.16	40.07	31.03	46.78	38.91	46.59	41.28	4.29	4.50	4.22	4.20	4.24	4.16	3.92	3.57	4.52	4.34	4.30	4.19
05/01/21	05/31/21	May 2021	41.18	24.72	46.41	34.76	37.25	23.25	46.94	34.87	46.81	37.09	4.29	4.54	4.21	4.15	4.22	4.11	3.83	3.54	4.47	4.29	4.25	4.11
06/01/21	06/30/21	Jun 2021	43.98	26.47	45.31	34.39	39.01	23.94	49.58	36.05	48.47	36.84	4.31	4.56	4.24	4.17	4.23	4.11	3.82	3.54	4.49	4.31	4.26	4.10
07/01/21	07/31/21	Jul 2021	51.72	34.14	56.02	38.42	47.57	31.22	56.12	41.60	56.45	42.96	4.35	4.68	4.27	4.20	4.30	4.19	3.95	3.55	4.53	4.34	4.30	4.23
08/01/21	08/31/21	Aug 2021	57.35	39.52	57.70	39.43	54.11	36.73	59.19	42.80	59.27	43.90	4.36	4.70	4.32	4.23	4.33	4.24	3.98	3.56	4.56	4.37	4.33	4.26
09/01/21	09/30/21	Sep 2021	55.33	41.55	52.55	39.59	52.66	39.24	55.49	41.81	55.06	43.90	4.37	4.62	4.31	4.25	4.35	4.27	4.07	3.64	4.57	4.39	4.34	4.34
10/01/21	10/31/21	Oct 2021	49.81	40.13	49.15	39.99	46.80	37.57	52.81	41.92	51.56	43.27	4.38	4.59	4.32	4.27	4.36	4.29	4.06	3.64	4.59	4.41	4.36	4.34
11/01/21	11/30/21	Nov 2021	55.19	42.70	48.89	40.11	52.05	41.87	53.50	43.77	53.40	44.09	4.46	4.75	4.41	4.39	4.48	4.41	4.34	3.80	4.72	4.54	4.49	4.64
12/01/21	12/31/21	Dec 2021	57.27	44.90	49.73	41.76	54.99	43.27	54.05	46.30	54.51	47.18	4.60	4.89	4.55	4.53	4.62	4.54	4.54	3.92	4.87	4.68	4.63	4.85
01/01/22	01/31/22	Jan 2022	57.28	45.94	49.16	41.33	54.51	43.99	55.89	45.77	55.17	46.56	4.71	5.03	4.66	4.67	4.71	4.64	4.57	3.96	5.01	4.82	4.77	4.89
02/01/22	02/28/22	Feb 2022	53.74	46.03	49.98	43.13	49.78	42.41	52.03	44.79	52.20	46.04	4.67	4.82	4.63	4.61	4.67	4.55	4.39	4.03	4.94	4.75	4.70	4.71
03/01/22	03/31/22	Mar 2022	49.07	40.79	47.59	40.39	45.32	37.40	51.46	42.73	50.98	43.65	4.64	4.75	4.56	4.51	4.58	4.47	4.43	3.93	4.84	4.65	4.61	4.74
04/01/22	04/30/22	Apr 2022	45.17	38.23	46.38	39.73	41.59	34.95	49.38	40.86	49.09	42.54	4.47	4.58	4.40	4.33	4.40	4.27	4.21	3.58	4.65	4.47	4.42	4.48
05/01/22	05/31/22	May 2022	40.89	30.92	47.08	38.33	37.50	27.97	48.52	38.05	48.76	40.40	4.47	4.57	4.38	4.30	4.37	4.18	4.09	3.59	4.62	4.44	4.40	4.36
06/01/22	06/30/22	Jun 2022	46.20	33.58	48.19	37.60	42.57	30.52	51.45	39.52	50.14	39.92	4.49	4.58	4.40	4.30	4.35	4.16	4.06	3.58	4.63	4.44	4.40	4.34
07/01/22	07/31/22	Jul 2022	52.38	37.96	56.12	40.91	48.48	34.70	59.48	43.27	58.25	42.90	4.55	4.63	4.45	4.33	4.43	4.24	4.12	3.61	4.65	4.47	4.43	4.40
08/01/22	08/31/22	Aug 2022	60.86	39.96	60.29	40.07	56.59	36.61	64.29	42.83	63.44	42.63	4.55	4.67	4.49	4.37	4.45	4.29	4.20	3.64	4.69	4.51	4.46	4.47
09/01/22	09/30/22	Sep 2022	58.81	43.73	55.62	40.95	55.10	40.32	59.55	43.33	58.64	43.70	4.57	4.70	4.49	4.40	4.49	4.37	4.30	3.73	4.72	4.54	4.50	4.58
10/01/22	10/31/22	Oct 2022	52.96	41.49	50.61	40.59	49.08	38.09	54.57	41.71	53.80	43.55	4.56	4.70	4.51	4.41	4.49	4.38	4.29	3.71	4.74	4.55	4.51	4.57
11/01/22	11/30/22	Nov 2022	61.50	46.02	51.83	41.41	57.54	42.56	55.94	44.29	55.29	44.45	4.64	4.81	4.62	4.55	4.61	4.51	4.38	3.83	4.88	4.69	4.64	4.68
12/01/22	12/31/22	Dec 2022	62.34	47.96	52.11	43.53	59.33	44.76	55.71	45.98	55.33	46.52	4.74	4.87	4.67	4.59	4.67	4.56	4.39	3.89	4.93	4.74	4.69	4.70
01/01/23	01/31/23	Jan 2023	63.66	50.06	51.00	44.22	59.67	46.52	58.45	48.67	57.67	49.25	4.83	5.00	4.79	4.76	4.81	4.70	4.53	3.89	5.10	4.91	4.86	4.85
02/01/23	02/28/23	Feb 2023	56.11	47.77	50.15	43.60	52.01	44.04	54.57	46.04	54.82	47.76	4.85	5.04	4.81	4.79	4.85	4.74	4.59	3.94	5.12	4.93	4.89	4.91
03/01/23	03/31/23	Mar 2023	51.23	42.28	50.48	41.13	47.35	38.80	54.09	44.28	54.07	45.57	4.81	4.95	4.74	4.69	4.76	4.65	4.60	3.90	5.02	4.83	4.79	4.92
04/01/23	04/30/23	Apr 2023	49.47	42.03	50.84	43.85	45.66	38.55	53.12	43.51	53.82	46.86	4.80	4.90	4.70	4.62	4.70	4.57	4.54	3.83	4.94	4.76	4.71	4.81
05/01/23	05/31/23	May 2023	44.62	33.16	47.90	38.84	41.03	30.08	51.86	40.34	51.38	41.71	4.83	4.91	4.72	4.62	4.72	4.54	4.43	3.90	4.94	4.76	4.71	4.70
06/01/23	06/30/23	Jun 2023	49.05	35.27	49.55	37.96	45.27	32.10	54.33	41.29	52.91	41.31	4.85	4.94	4.73	4.59	4.72	4.53	4.43	3.90	4.91	4.73	4.69	4.70
07/01/23	07/31/23	Jul 2023	56.35	39.91	59.74	41.73	52.25	36.53	63.48	45.01	62.15	44.62	4.90	4.97	4.76	4.63	4.76	4.57	4.48	3.94	4.95	4.77	4.73	4.76
08/01/23	08/31/23	Aug 2023	62.83	40.20	61.27	39.17	58.44	36.81	65.95	42.28	64.78	42.10	4.59	4.70	4.52	4.41	4.49	4.35	4.27	3.62	4.73	4.55	4.50	4.55
09/01/23	09/30/23	Sep 2023	59.06	44.51	53.46	40.05	55.37	41.02	58.61	43.75	57.57	44.12	4.59	4.73	4.52	4.43	4.51	4.40	4.32	3.85	4.75	4.57	4.53	4.60
10/01/23	10/31/23	Oct 2023	55.69	43.87	51.10	40.82	51.68	40.31	55.86	43.98	55.42	45.04	4.64	4.78	4.59	4.49	4.57	4.46	4.37	3.92	4.82	4.63	4.59	4.65
11/01/23	11/30/23	Nov 2023	65.74	49.01	53.23	42.35	61.62	45.50	59.04	46.27	58.49	46.79	4.76	4.94	4.76	4.69	4.76	4.68	4.54	4.21	5.02	4.83	4.79	4.84
12/01/23	12/31/23	Dec 2023	65.38	51.04	51.75	44.55	62.24	47.71	57.94	47.83	57.56	48.96	4.85	4.99	4.80	4.75	4.81	4.72	4.64	4.25	5.09	4.90	4.85	4.95
01/01/24	01/31/24	Jan 2024	63.33	48.95	48.99	41.65	60.28	45.71	56.79	47.01	55.43	47.05	4.86	5.04	4.83	4.76	4.84	4.73	4.64	4.24	5.10	4.91	4.86	4.96
02/01/24	02/29/24	Feb 2024	55.88	47.26	48.24	42.09	51.83	43.61	52.56	45.13	52.02	45.65	4.84	4.99	4.78	4.71	4.79	4.68	4.59	4.24	5.05	4.86	4.81	4.91
03/01/24	03/31/24	Mar 2024	51.40	42.08	47.72	40.30	47.48	38.58	51.73	43.68	50.95	44.06	4.84	4.94	4.73	4.68	4.75	4.61	4.60	4.21	5.01	4.82	4.77	4.92
04/01/24	04/30/24	Apr 2024	47.51	40.66	47.58	41.13	43.76	37.22	50.48	41.51	50.74	44.30	4.69	4.78	4.58	4.51	4.59	4.44	4.39	3.83	4.83	4.65	4.61	4.66
05/01/24	05/31/24	May 2024	41.54	30.38	44.71	36.22	38.05	27.39	49.09	37.52	48.22	39.16	4.66	4.74	4.54	4.44	4.54	4.34	4.21	3.80	4.76	4.58	4.53	4.48
06/01/24	06/30/24	Jun 2024	46.05	34.14	45.65	36.10	42.36	30.98	50.80	40.11	49.53	40.12	4.71	4.78	4.56	4.45	4.54	4.34	4.24	3.82	4.77	4.59	4.55	4.51
07/01/24	07/31/24	Jul 2024	55.89	39.34	59.01	41.05	51.77	35.95	62.87	44.21	61.56	43.91	4.79	4.85	4.64	4.53	4.61	4.41	4.30	3.98	4.85	4.66	4.62	4.57
08/01/24	08/31/24	Aug 2024	67.28	44.00	64.33	41.64	62.66	40.40	69.80	45.32	68.25	45.00	4.94	5.05	4.86	4.78	4.84	4.69	4.60	4.14	5.10	4.92	4.87	4.88
09/01/24	09/30/24	Sep 2024	65.51	48.18	59.27	42.91	61.47	44.60	65.68	46.86	63.93	47.02	4.95	5.09	4.89	4.81	4.88	4.75	4.69	4.31	5.14	4.95	4.91	4.97
10/01/24	10/31/24	Oct 2024	58.43	45.47	54.37	43.01	54.51	41.86	58.75	44.68	57.79	46.21	4.98	5.13	4.93	4.85	4.90	4.80	4.71	4.31	5.18	4.99	4.95	4.99
11/01/24	11/30/24	Nov 2024	67.21	50.73	55.36	44.21	63.22	47.21	60.95	47.00	59.17	48.29	5.08	5.24	5.05	4.99	5.04	4.94	4.83	4.59	5.32	5.13	5.09	5.13
12/01/24	12/31/24	Dec 2024	67.28	51.60	51.18	43.49	64.30	48.42	59.36	47.05	57.60	48.55	5.05	5.15	4.97	4.90	4.97	4.84	4.68	4.49	5.24	5.05	5.00	4.99
01/01/25	01/31/25	Jan 2025	69.66	54.94	55.24	47.69	65.47	51.06	64.13	53.55	63.29	54.03	5.36	5.50	5.29	5.27	5.32	5.22	5.10	4.78	5.61	5.42	5.37	5.42
02/01/25	02/28/25	Feb 2025	61.94	52.70	53.71	46.92	57.52	48.68	58.64	50.05	59.19	52.20	5.27	5.40	5.19	5.15	5.20	5.10	5.04	4.66	5.48	5.30	5.25	5.36
03/01/25	03/31/25	Mar 2025	55.77	47.05	52.16	43.87	51.62	43.29	57.93	47.81	58.35	50.09	5.24	5.32	5.11	5.06	5.14	5.01	5.00	4.59	5.39	5.21	5.16	5.31
04/01/25	04/30/25	Apr 2025	53.23	45.30	54.46	46.09	49.19	41.61	57.07	47.45	58.03	50.21	5.24	5.33	5.14	5.06	5.14	4.98	4.92	4.30	5.38	5.20	5.16	5.19
05/01/25	05/31/25	May 2025	48.62	35.18	53.39	41.82	44.79	31.94	56.95	42.91	57.17	45.23	5.38	5.45	5.24	5.15	5.24	5.05	4.92	4.56	5.47	5.29	5.25	5.19
06/01/25	06/30/25	Jun 2025	53.63	39.80	53.11	41.06	49.58	36.35	58.56	46.22	57.65	46.30	5.42	5.47	5.27	5.15	5.23	4.97	4.88	4.55	5.47	5.29	5.25	5.15
07/01/25	07/31/25	Jul 2025	61.64	44.36	64.41	45.57	57.23	40.71	68.75	49.82	67.30	49.34	5.50	5.55	5.34	5.23	5.32	5.10	4.98	4.66	5.55	5.37	5.32	5.26
08/01/25	08/31/25	Aug 2025	70.93	48.58	69.40	45.58	66.11	44.74	75.28	51.42	73.98	51.33	5.47	5.59	5.36	5.24	5.33	5.15	5.07	4.64	5.56	5.38	5.34	5.35
09/01/25	09/30/25	Sep 2025	71.45	52.48	65.91	46.79	67.01	48.64	72.59	50.94	70.91	51.97	5.49	5.65	5.38	5.29	5.37	5.22	5.16	4.84	5.62	5.43	5.39	5.44
10/01/25	10/31/25	Oct 2025	63.12	50.33	60.97	48.14	58.69	46.42	65.72	50.48	65.23	53.05	5.47	5.68	5.40	5.29	5.37	5.24	5.15	4.80	5.62	5.43	5.39	5.43
11/01/25	11/30/25	Nov 2025	70.76	54.40	60.07	48.07	66.13	50.47	66.62	51.56	66.33	53.79	5.50	5.68	5.46	5.38	5.45	5.33	5.16	5.01	5.71	5.53	5.48	5.46
12/01/25	12/31/25	Dec 2025	73.81	57.14	59.38	50.13	70.53	53.34	67.15	53.18	67.53	56.03	5.64	5.77	5.55	5.49	5.56	5.43	5.25	5.01	5.82	5.63	5.58	5.56
01/01/26	01/31/26	Jan 2026	72.11	57.91	60.79	54.10	69.14	54.32	66.12	55.00	65.60	57.74	5.72	5.86	5.64	5.57	5.65	5.54	5.35	5.04	5.91	5.72	5.67	5.67
02/01/26	02/28/26	Feb 2026	68.13	57.51	61.04	54.10	63.43	53.28	62.29	53.40	64.32	57.51	5.72	5.86	5.64	5.59	5.67	5.54	5.35	5.01	5.92	5.73	5.69	5.67
03/01/26	03/31/26	Mar 2026	59.50	50.19	58.96	49.52	55.15	46.25	61.02	50.21	63.14	53.89	5.63	5.72	5.50	5.44	5.54	5.38	5.33	4.80	5.77	5.59	5.54	5.64
04/01/26	04/30/26	Apr 2026	56.73	48.01	58.89	50.27	52.50	44.17	59.90	49.66	62.13	53.49	5.51	5.60	5.39	5.31	5.39	5.22	5.17	4.58	5.63	5.45	5.41	5.44

05/01/26	05/31/26	May 2026	50.53	38.72	55.47	45.40	46.58	35.29	58.95	46.31	59.05	48.87	5.52	5.57	5.35	5.25	5.34	5.13	5.00	4.67	5.57	5.39	5.34	5.27
06/01/26	06/30/26	Jun 2026	54.68	41.61	55.16	43.80	50.55	38.05	59.84	48.17	58.82	48.95	5.54	5.57	5.35	5.23	5.31	5.00	4.93	4.63	5.55	5.37	5.33	5.20
07/01/26	07/31/26	Jul 2026	61.80	46.45	64.93	48.21	57.35	42.67	69.05	51.26	67.35	51.42	5.61	5.67	5.44	5.31	5.40	5.18	5.08	4.77	5.63	5.45	5.41	5.35
08/01/26	08/31/26	Aug 2026	67.40	49.49	65.97	47.74	62.70	45.58	71.39	52.06	69.52	52.19	5.54	5.69	5.40	5.30	5.38	5.21	5.13	4.72	5.62	5.44	5.40	5.41
09/01/26	09/30/26	Sep 2026	70.03	53.67	64.30	47.12	65.83	49.81	70.90	51.89	69.00	53.15	5.54	5.73	5.40	5.33	5.40	5.25	5.15	4.84	5.65	5.47	5.42	5.43
10/01/26	10/31/26	Oct 2026	64.24	51.66	60.95	49.30	59.84	47.71	65.29	51.14	64.94	53.99	5.52	5.73	5.43	5.34	5.40	5.29	5.14	4.83	5.66	5.48	5.44	5.42
11/01/26	11/30/26	Nov 2026	71.73	56.67	62.16	50.54	68.41	52.82	67.09	53.10	66.56	55.60	5.57	5.84	5.54	5.46	5.54	5.40	5.25	5.13	5.79	5.60	5.55	5.55
12/01/26	12/31/26	Dec 2026	73.06	58.30	62.06	53.52	71.11	54.75	66.01	54.04	66.39	57.38	5.65	5.78	5.55	5.50	5.57	5.44	5.26	4.87	5.83	5.64	5.59	5.57
01/01/27	01/31/27	Jan 2027	72.08	58.37	59.26	52.87	68.29	54.72	66.78	56.41	66.19	58.30	5.75	5.89	5.66	5.62	5.69	5.56	5.37	4.90	5.96	5.77	5.72	5.69
02/01/27	02/28/27	Feb 2027	67.71	56.57	59.21	51.94	62.98	52.32	62.79	53.53	64.47	57.01	5.76	5.91	5.68	5.62	5.70	5.57	5.38	4.89	5.96	5.77	5.72	5.70
03/01/27	03/31/27	Mar 2027	60.10	50.08	59.39	48.48	55.69	46.11	61.89	50.79	63.77	54.11	5.68	5.77	5.56	5.50	5.58	5.44	5.38	4.79	5.83	5.65	5.60	5.70
04/01/27	04/30/27	Apr 2027	56.89	48.22	58.95	49.93	52.62	44.33	60.43	50.02	62.47	53.77	5.56	5.64	5.42	5.34	5.42	5.26	5.20	4.62	5.66	5.48	5.44	5.47
05/01/27	05/31/27	May 2027	49.25	38.09	54.29	45.37	45.31	34.65	58.04	46.00	57.83	48.98	5.56	5.61	5.40	5.29	5.38	5.20	5.13	4.66	5.61	5.43	5.39	5.40
06/01/27	06/30/27	Jun 2027	55.28	42.02	55.52	43.64	51.08	38.40	60.42	48.60	59.08	49.18	5.58	5.62	5.41	5.29	5.38	5.17	5.06	4.70	5.61	5.43	5.39	5.33
07/01/27	07/31/27	Jul 2027	61.91	46.58	65.19	47.76	57.42	42.76	69.29	51.43	67.56	51.16	5.66	5.72	5.48	5.34	5.45	5.24	5.17	4.82	5.67	5.48	5.44	5.44
08/01/27	08/31/27	Aug 2027	67.84	49.64	66.43	46.89	63.09	45.69	71.96	52.30	70.15	52.08	5.64	5.76	5.49	5.37	5.46	5.28	5.21	4.82	5.69	5.51	5.47	5.49
09/01/27	09/30/27	Sep 2027	69.79	55.11	63.90	48.48	65.56	51.05	70.81	53.24	69.00	54.78	5.65	5.81	5.52	5.41	5.50	5.33	5.29	5.13	5.73	5.55	5.51	5.57
10/01/27	10/31/27	Oct 2027	67.56	54.73	64.75	53.24	63.19	50.65	68.51	53.73	68.43	57.00	5.70	5.95	5.62	5.54	5.61	5.49	5.46	5.17	5.87	5.69	5.64	5.74
11/01/27	11/30/27	Nov 2027	75.34	60.51	65.12	52.97	73.66	56.78	70.36	55.55	69.49	58.25	5.83	6.09	5.80	5.72	5.81	5.72	5.62	5.49	6.05	5.86	5.82	5.92
12/01/27	12/31/27	Dec 2027	76.13	61.28	62.66	55.16	74.17	57.49	69.15	57.01	69.27	60.16	5.95	6.11	5.88	5.83	5.89	5.77	5.79	5.37	6.16	5.97	5.92	6.10
01/01/28	01/31/28	Jan 2028	71.08	57.58	61.57	54.82	68.60	54.31	67.11	57.66	65.06	58.34	6.05	6.22	5.98	5.96	6.01	5.89	5.93	5.50	6.30	6.10	6.06	6.25
02/01/28	02/29/28	Feb 2028	68.32	58.02	61.85	54.42	64.38	53.95	63.26	54.62	64.45	57.67	6.04	6.17	5.94	5.91	5.98	5.85	5.90	5.45	6.25	6.06	6.01	6.22
03/01/28	03/31/28	Mar 2028	60.37	50.47	58.44	50.46	55.92	46.46	61.54	52.75	61.97	54.99	6.01	6.08	5.86	5.85	5.93	5.76	5.76	5.33	6.18	5.99	5.94	6.08
04/01/28	04/30/28	Apr 2028	57.89	49.25	58.99	51.24	53.54	45.30	60.70	51.69	62.25	54.60	5.91	5.98	5.76	5.71	5.79	5.63	5.64	5.16	6.03	5.85	5.81	5.91
05/01/28	05/31/28	May 2028	50.99	39.21	56.10	47.17	46.94	35.68	60.23	47.70	58.57	50.13	5.96	5.97	5.75	5.68	5.78	5.56	5.52	5.23	6.00	5.82	5.78	5.79
06/01/28	06/30/28	Jun 2028	55.88	44.11	57.80	46.97	51.62	40.37	61.82	51.08	60.22	51.03	5.98	6.01	5.78	5.66	5.76	5.53	5.53	5.25	5.98	5.79	5.75	5.80
07/01/28	07/31/28	Jul 2028	62.85	49.08	67.18	51.27	58.28	45.12	70.55	54.53	68.15	53.74	6.05	6.08	5.85	5.72	5.83	5.60	5.60	5.37	6.05	5.86	5.82	5.88
08/01/28	08/31/28	Aug 2028	66.65	49.86	66.23	49.25	62.00	45.87	71.30	52.88	68.77	52.51	5.86	5.96	5.71	5.60	5.68	5.52	5.55	5.16	5.92	5.74	5.70	5.82
09/01/28	09/30/28	Sep 2028	66.63	54.43	62.93	50.50	63.19	50.66	68.16	53.74	65.95	54.20	5.87	6.01	5.72	5.64	5.72	5.59	5.61	5.41	5.96	5.78	5.74	5.89
10/01/28	10/31/28	Oct 2028	65.07	53.87	61.39	51.95	61.16	49.83	65.48	53.22	64.71	55.23	5.87	6.05	5.76	5.71	5.78	5.66	5.66	5.42	6.03	5.85	5.81	5.93
11/01/28	11/30/28	Nov 2028	71.85	57.65	62.11	51.71	70.38	54.21	67.37	54.49	65.71	55.23	5.93	6.13	5.91	5.82	5.93	5.82	5.85	5.60	6.15	5.96	5.92	6.15
12/01/28	12/31/28	Dec 2028	72.52	59.34	62.23	54.77	71.92	55.99	65.99	56.39	65.30	58.27	6.05	6.22	6.00	5.94	6.01	5.89	5.93	5.59	6.28	6.09	6.04	6.24
01/01/29	01/31/29	Jan 2029	71.66	57.56	61.89	55.77	69.25	54.12	68.29	58.90	66.14	59.96	6.17	6.34	6.12	6.12	6.19	6.09	6.10	5.70	6.46	6.27	6.22	6.42
02/01/29	02/28/29	Feb 2029	69.22	58.48	61.82	55.46	65.33	54.26	65.19	56.44	65.71	59.43	6.20	6.37	6.13	6.13	6.20	6.09	6.12	5.70	6.46	6.28	6.23	6.44
03/01/29	03/31/29	Mar 2029	62.24	52.40	61.06	52.72	57.68	48.27	63.73	54.67	64.70	57.15	6.17	6.27	6.05	6.06	6.13	6.01	6.05	5.56	6.39	6.21	6.16	6.36
04/01/29	04/30/29	Apr 2029	60.47	51.67	62.62	54.02	55.97	47.57	63.29	53.97	65.46	57.31	6.13	6.21	5.99	5.94	6.02	5.85	5.89	5.41	6.25	6.07	6.03	6.16
05/01/29	05/31/29	May 2029	54.52	42.65	58.62	49.40	50.28	38.94	63.47	50.90	61.89	53.11	6.19	6.20	5.98	5.92	6.02	5.82	5.78	5.53	6.24	6.06	6.02	6.05
06/01/29	06/30/29	Jun 2029	55.05	44.74	55.91	47.11	50.79	40.93	60.41	51.99	59.38	52.22	6.19	6.20	5.98	5.87	5.98	5.75	5.75	5.50	6.19	6.00	5.96	6.03
07/01/29	07/31/29	Jul 2029	63.36	49.75	67.99	51.51	58.73	45.72	71.38	55.26	69.01	54.48	6.23	6.24	6.02	5.88	6.01	5.78	5.77	5.55	6.20	6.02	5.98	6.04
08/01/29	08/31/29	Aug 2029	69.53	52.32	69.24	50.01	64.72	48.18	75.02	55.33	72.19	54.61	6.17	6.26	5.99	5.89	6.01	5.82	5.87	5.50	6.22	6.03	5.99	6.14
09/01/29	09/30/29	Sep 2029	68.18	55.79	65.47	51.93	64.16	51.67	72.18	56.11	69.44	56.43	5.98	6.16	5.84	5.77	5.85	5.70	5.71	5.53	6.09	5.91	5.86	5.99
10/01/29	10/31/29	Oct 2029	63.77	53.36	62.31	52.36	59.58	49.17	66.75	53.96	65.97	56.46	5.88	6.10	5.78	5.73	5.81	5.67	5.67	5.43	6.05	5.87	5.82	5.95
11/01/29	11/30/29	Nov 2029	69.29	55.11	62.28	51.22	66.45	51.18	67.44	54.39	66.23	55.61	5.82	6.10	5.85	5.78	5.85	5.75	5.78	5.50	6.11	5.93	5.88	6.08
12/01/29	12/31/29	Dec 2029	70.40	57.00	59.96	53.14	69.16	53.69	64.67	55.26	64.14	57.08	5.85	6.02	5.78	5.78	5.85	5.74	5.78	5.38	6.12	5.93	5.88	6.09
01/01/30	01/31/30	Jan 2030	70.41	55.67	58.76	51.59	69.59	52.56	66.17	55.85	63.59	55.83	5.95	6.10	5.86	5.88	5.95	5.84	5.87	5.47	6.22	6.03	5.98	6.19
02/01/30	02/28/30	Feb 2030	68.49	57.69	59.59	52.90	66.12	54.18	62.37	54.30	63.06	56.56	6.03	6.15	5.91	5.95	6.03	5.91	5.94	5.57	6.29	6.10	6.05	6.26
03/01/30	03/31/30	Mar 2030	61.15	50.60	58.40	49.66	56.65	46.52	61.62	52.91	62.12	54.24	6.01	6.11	5.87	5.93	6.01	5.90	5.93	5.41	6.26	6.07	6.02	6.24
04/01/30	04/30/30	Apr 2030	57.47	48.96	57.87	50.85	53.07	44.94	59.69	51.21	60.99	54.27	5.91	5.98	5.76	5.71	5.80	5.66	5.68	5.20	6.03	5.85	5.81	5.96
05/01/30	05/31/30	May 2030	49.90	39.11	53.55	46.49	45.83	35.51	59.17	47.74	57.03	49.94	5.91	5.95	5.73	5.67	5.77	5.59	5.59	5.22	5.99	5.81	5.77	5.86
06/01/30	06/30/30	Jun 2030	52.53	43.62	53.28	46.33	48.34	39.82	57.76	50.76	56.64	50.90	5.95	5.98	5.74	5.66	5.77	5.56	5.61	5.27	5.98	5.80	5.75	5.89
07/01/30	07/31/30	Jul 2030	61.26	48.36	66.39	50.49	56.69	44.36	69.18	53.37	66.54	52.98	6.03	6.05	5.80	5.68	5.80	5.59	5.60	5.40	6.01	5.82	5.78	5.87
08/01/30	08/31/30	Aug 2030	68.02	51.29	67.02	49.27	63.23	47.15	72.50	53.27	69.63	53.06	5.94	6.04	5.78	5.70	5.80	5.63	5.66	5.30	6.02	5.84	5.80	5.93
09/01/30	09/30/30	Sep 2030	69.30	55.18	64.53	51.46	65.27	51.21	70.86	54.89	68.02	55.03	5.88	6.07	5.81	5.77	5.84	5.73	5.77	5.47	6.09	5.91	5.87	6.05
10/01/30	10/31/30	Oct 2030	64.67	53.58	62.43	51.90	61.11	49.63	66.27	53.69	65.57	55.34	5.93	6.11	5.90	5.84	5.90	5.80	5.84	5.51	6.16	5.98	5.94	6.12
11/01/30	11/30/30	Nov 2030	73.29	58.17	63.67	51.56	72.92	54.87	68.54	55.44	67.51	56.13	6.04	6.27	6.05	6.04	6.10	6.03	6.03	5.71	6.37	6.18	6.14	6.32
12/01/30	12/31/30	Dec 2030	73.61	59.59	61.93	53.45	74.86	56.67	67.26	56.62	67.04	57.98	6.17	6.31	6.08	6.11	6.17	6.07	6.10	5.77	6.45	6.26	6.21	6.41
01/01/31	01/31/31	Jan 2031	70.54	57.44	61.51	54.85	71.74	54.71	68.26	58.10	65.86	58.54	6.23	6.41	6.16	6.19	6.26	6.16	6.19	5.86	6.53	6.34	6.29	6.51
02/01/31	02/28/31	Feb 2031	68.01	58.33	61.12	55.16	67.95	55.43	64.09	56.52	64.95	58.91	6.29	6.45	6.22	6.26	6.32	6.22	6.23	5.91	6.60	6.41	6.36	6.55
03/01/31	03/31/31	Mar 2031	61.60	52.54	60.69	53.33	57.15	48.39	63.47	54.96	64.49	57.11	6.26	6.39	6.15	6.22	6.28	6.19	6.20	5.68	6.55	6.36	6.32	6.52
04/01/31	04/30/31	Apr 2031	59.29	51.41	60.59	54.14	54.85	47.31	62.15	53.72	63.98	57.69	6.12	6.22	5.99	5.96	6.04	5.91	5.91	5.52	6.28	6.10	6.05	6.19
05/01/31	05/31/31	May 2031	51.50	41.52	56.17	50.14	47.32	37.78	60.94	50.41	58.98	53.22	6.15	6.20	5.96	5.91	6.02	5.83	5.84	5.57	6.23	6.05	6.01	6.11
06/01/31	06/30/31	Jun 2031	53.93	45.48	54.78	50.19	49.65	41.57	59.51	52.61	57.93	53.58	6.19	6.22	5.99	5.91	6.02	5.83	5.86	5.58	6.23	6.05	6.01	6.13
07/01/31	07/31/31	Jul 2031	63.47	50.42	69.17	53.72	58.76	46.29	71.54	55.51	68.72	55.52	6.26	6.29	6.06	5.93	6.06	5.86	5.84	5.64	6.25	6.07	6.03	6.12
08/01/31	08/31/31	Aug 2031	68.49	53.72	68.26	53.60	64.10	49.54	74.16	56.58	71.17	56.48	6.31	6.41	6.16	6.06	6.16	5.99	6.03	5.70	6.38	6.20	6.16	6.31
09/01/31	09/30/31	Sep 2031	70.46	57.16	68.17	54.51	67.35	53.52	74.15	57.27	71.56	57.67	6.26	6.47	6.20	6.15	6.22	6.10	6.15	5.89	6.47	6.29	6.24	6.42
10/01/31	10/31/31	Oct 2031	66.47	55.71	65.45	54.60	63.16	51.67	69.73	56.06	69.04	58.04	6.26	6.47	6.23	6.18	6.25	6.13	6.18	5.91	6.50	6.32	6.27	6.45
11/01/31	11/30/31	Nov 2031	72.17	58.70	65.40	55.12	71.82	55.35	70.23	57.80	69.47	58.85	6.31	6.55	6.32	6.33	6.38	6.31	6.31	5.97	6.66	6.48	6.43	6.60
12/01/31	12/31/31	Dec 2031	72.85	60.71	63.85	56.43	76.33	58.28	68.58	58.51	68.45	60.25	6.47	6.65	6.41	6.41	6.47	6.36	6.41	6.10	6.74	6.55	6.51	6.72
01/01/32	01/31/32	Jan 2032	70.37	59.87	62.55	57.42	72.60	57.00	69.98	60.64	67.47	61.40	6.59	6.79	6.54	6.56	6.62	6.54	6.56	6.21	6.90	6.71	6.66	6.88
02/01/32	02/29/32	Feb 2032	66.47	59.79	62.04	57.39	67.33	57.00	65.17	58.77	66.03	61.32	6.59	6.79	6.54	6.56	6.62	6.54	6.56	6.21	6.90	6.71	6.66	6.89
03/01/32	03/31/32	Mar 2032	61.82	54.39	61.91	55.45	57.69	50.13	65.66	57.25	65.87	59.52	6.56	6.73	6.49	6.54	6.59	6.49	6.52	6.14	6.87	6.68	6.63	6.84
04/01/32	04/30/32	Apr 2032	61.35	54.75	64.54	58.56	56.79	50.49	65.22	57.31	67.33	61.64	6.51	6.65	6.43	6.40	6.48	6.36	6.36	5.97	6.72	6.54	6.50	6.63
05/01/32	05/31/32	May 2032	55.60	46.09	60.26	53.93	51.20	42.11	65.28	54.84	63.28	57.10	6.61	6.65	6.40	6.34	6.46	6.25	6.31	6.06	6.66	6.48	6.44	6.58

06/01/32	06/30/32	Jun 2032	57.21	48.27	58.88	53.20	52.74	44.20	63.87	55.98	62.50	56.81	6.62	6.67	6.43	6.33	6.43	6.24	6.30	6.08	6.65	6.47	6.42	6.57
07/01/32	07/31/32	Jul 2032	68.00	53.93	73.65	57.01	63.05	49.61	76.83	59.15	74.69	59.42	6.71	6.74	6.51	6.36	6.49	6.28	6.27	6.11	6.68	6.50	6.45	6.54
08/01/32	08/31/32	Aug 2032	70.07	55.49	70.09	55.74	65.67	51.18	76.18	58.87	73.44	59.04	6.54	6.70	6.42	6.33	6.42	6.28	6.28	6.00	6.65	6.47	6.42	6.56
09/01/32	09/30/32	Sep 2032	69.32	57.67	67.22	55.31	66.25	54.05	73.79	58.44	71.13	58.88	6.43	6.67	6.40	6.34	6.42	6.30	6.33	6.06	6.67	6.48	6.44	6.61
10/01/32	10/31/32	Oct 2032	65.45	56.79	64.81	55.65	62.49	52.72	69.17	57.54	68.96	59.77	6.40	6.65	6.42	6.37	6.43	6.33	6.34	6.05	6.70	6.51	6.47	6.62
11/01/32	11/30/32	Nov 2032	72.32	59.91	65.19	55.52	73.88	56.95	71.09	58.75	70.18	59.66	6.43	6.71	6.48	6.46	6.56	6.49	6.46	6.09	6.79	6.60	6.56	6.76
12/01/32	12/31/32	Dec 2032	73.00	61.38	63.67	57.21	77.09	59.11	68.85	59.43	69.01	61.21	6.54	6.74	6.51	6.54	6.59	6.49	6.51	6.24	6.87	6.68	6.63	6.82
01/01/33	01/31/33	Jan 2033	70.62	61.04	59.82	56.93	72.94	58.66	70.96	61.60	68.51	62.10	6.65	6.86	6.62	6.68	6.73	6.65	6.65	6.32	7.02	6.83	6.78	6.97
02/01/33	02/28/33	Feb 2033	65.83	59.99	61.33	57.83	66.18	57.26	65.11	59.67	66.24	62.28	6.68	6.89	6.65	6.70	6.76	6.67	6.67	6.36	7.03	6.84	6.79	6.99
03/01/33	03/31/33	Mar 2033	61.58	55.40	58.50	55.40	58.38	51.08	64.80	57.77	65.45	60.51	6.59	6.77	6.53	6.62	6.68	6.62	6.61	6.11	6.95	6.76	6.72	6.92
04/01/33	04/30/33	Apr 2033	61.31	55.30	64.61	58.71	56.85	51.02	65.63	58.17	68.34	62.45	6.50	6.71	6.47	6.49	6.53	6.41	6.39	5.97	6.80	6.62	6.58	6.67
05/01/33	05/31/33	May 2033	54.89	45.07	59.56	53.51	50.48	41.09	64.85	54.04	63.66	57.25	6.45	6.55	6.30	6.24	6.35	6.17	6.15	5.90	6.56	6.38	6.34	6.42
06/01/33	06/30/33	Jun 2033	56.94	47.28	57.51	52.54	52.44	43.21	63.57	54.92	61.56	56.29	6.55	6.59	6.35	6.29	6.39	6.20	6.21	5.99	6.61	6.43	6.38	6.49
07/01/33	07/31/33	Jul 2033	66.69	54.49	71.76	56.99	61.77	50.10	75.55	59.39	72.94	59.47	6.67	6.76	6.47	6.41	6.59	6.33	6.29	6.14	6.73	6.55	6.51	6.56
08/01/33	08/31/33	Aug 2033	69.19	55.18	68.39	54.81	64.70	50.78	74.99	57.81	72.11	58.23	6.47	6.67	6.42	6.36	6.45	6.30	6.29	6.00	6.69	6.50	6.46	6.57
09/01/33	09/30/33	Sep 2033	68.33	57.99	66.36	56.59	65.39	54.15	71.81	58.43	70.50	60.41	6.39	6.67	6.42	6.38	6.42	6.36	6.32	6.05	6.70	6.52	6.48	6.60
10/01/33	10/31/33	Oct 2033	65.51	57.75	64.79	57.05	63.15	53.87	67.80	58.05	69.41	61.32	6.42	6.70	6.50	6.42	6.50	6.42	6.42	6.08	6.75	6.57	6.52	6.70
11/01/33	11/30/33	Nov 2033	74.60	61.36	60.99	55.93	77.76	59.73	69.86	59.31	71.26	61.11	6.52	6.80	6.62	6.56	6.65	6.62	6.64	6.17	6.89	6.70	6.66	6.93
12/01/33	12/31/33	Dec 2033	73.90	62.00	60.43	56.63	77.65	59.96	68.49	59.82	70.08	62.46	6.62	6.85	6.62	6.62	6.79	6.74	6.77	6.30	6.96	6.77	6.72	7.08
01/01/34	01/31/34	Jan 2034	71.92	62.53	62.01	56.71	74.28	59.96	71.18	62.08	68.25	62.40	6.75	7.00	6.78	6.78	6.94	6.92	6.95	6.40	7.12	6.93	6.88	7.27
02/01/34	02/28/34	Feb 2034	66.98	61.81	62.63	57.54	67.34	58.91	66.58	60.16	66.82	62.40	6.78	7.01	6.81	6.81	6.95	6.94	6.95	6.45	7.15	6.96	6.91	7.27
03/01/34	03/31/34	Mar 2034	62.38	55.91	62.46	52.73	57.97	51.46	65.93	57.99	66.51	60.82	6.72	6.91	6.69	6.75	6.80	6.75	6.75	6.14	7.08	6.90	6.85	7.07
04/01/34	04/30/34	Apr 2034	60.24	54.19	62.16	56.14	55.66	49.78	64.31	57.30	65.83	60.44	6.58	6.77	6.57	6.57	6.60	6.54	6.49	5.98	6.89	6.71	6.66	6.76
05/01/34	05/31/34	May 2034	55.77	44.87	59.12	51.52	51.29	40.87	65.88	54.18	63.11	55.87	6.60	6.74	6.51	6.46	6.57	6.48	6.35	6.00	6.78	6.60	6.56	6.62
06/01/34	06/30/34	Jun 2034	58.14	49.10	58.91	50.31	53.55	44.91	64.48	56.43	62.82	56.87	6.66	6.74	6.49	6.43	6.58	6.48	6.35	6.05	6.75	6.57	6.53	6.63
07/01/34	07/31/34	Jul 2034	66.61	55.37	71.66	56.07	61.65	50.90	75.40	59.88	72.41	59.39	6.77	6.89	6.63	6.54	6.69	6.58	6.40	6.17	6.86	6.68	6.63	6.67
08/01/34	08/31/34	Aug 2034	69.62	55.94	69.61	52.94	65.10	51.50	75.80	58.25	72.63	58.01	6.52	6.74	6.48	6.41	6.51	6.43	6.35	5.92	6.74	6.56	6.51	6.63
09/01/34	09/30/34	Sep 2034	67.61	58.61	65.25	53.85	64.67	54.65	71.31	58.67	69.11	59.10	6.46	6.74	6.51	6.46	6.51	6.45	6.41	6.09	6.78	6.60	6.56	6.69
10/01/34	10/31/34	Oct 2034	66.31	58.21	65.52	55.06	63.41	54.02	69.13	57.82	69.37	59.90	6.43	6.71	6.51	6.45	6.51	6.45	6.45	6.08	6.77	6.59	6.54	6.72
11/01/34	11/30/34	Nov 2034	75.12	62.78	66.85	54.06	77.26	60.24	72.78	60.40	71.95	61.13	6.66	6.95	6.77	6.72	6.83	6.80	6.81	6.29	7.05	6.87	6.82	7.11
12/01/34	12/31/34	Dec 2034	74.76	63.96	63.97	57.39	78.45	62.06	70.02	61.18	70.31	62.70	6.74	7.01	6.81	6.75	6.95	6.92	6.95	6.41	7.09	6.90	6.85	7.26
01/01/35	01/31/35	Jan 2035	75.66	65.31	65.95	60.07	77.37	62.42	73.27	63.69	70.66	64.33	6.89	7.12	6.92	6.95	7.12	7.11	7.15	6.59	7.29	7.10	7.05	7.47
02/01/35	02/28/35	Feb 2035	70.82	64.91	65.65	60.74	71.01	61.91	69.54	62.32	69.76	64.79	6.97	7.20	6.98	7.00	7.19	7.17	7.20	6.64	7.33	7.14	7.10	7.52
03/01/35	03/31/35	Mar 2035	65.49	58.94	63.68	58.35	61.15	54.43	67.91	59.57	67.75	62.55	6.81	7.03	6.83	6.86	6.92	6.89	6.89	6.51	7.19	7.00	6.95	7.20
04/01/35	04/30/35	Apr 2035	63.82	57.85	67.04	61.28	59.13	53.37	67.04	59.54	69.73	64.15	6.72	6.90	6.70	6.72	6.73	6.68	6.68	6.29	7.03	6.85	6.81	6.96
05/01/35	05/31/35	May 2035	59.13	49.41	63.54	56.80	54.46	45.17	68.96	58.17	66.77	60.32	6.78	6.95	6.73	6.73	6.79	6.72	6.65	6.31	7.05	6.87	6.83	6.92
06/01/35	06/30/35	Jun 2035	59.28	51.36	60.89	56.79	54.60	47.03	65.53	58.85	64.61	60.56	7.00	7.11	6.86	6.83	6.95	6.86	6.73	6.32	7.15	6.96	6.92	7.00
07/01/35	07/31/35	Jul 2035	70.46	58.71	77.97	62.02	65.28	54.05	79.60	63.53	77.13	63.62	7.19	7.31	7.06	7.03	7.15	7.03	6.92	6.48	7.35	7.17	7.13	7.19
08/01/35	08/31/35	Aug 2035	77.30	61.87	76.87	60.30	72.46	57.14	83.17	63.66	80.02	63.64	7.17	7.36	7.14	7.09	7.17	7.09	7.03	6.59	7.41	7.23	7.19	7.31
09/01/35	09/30/35	Sep 2035	75.87	64.47	74.34	61.12	72.10	60.18	80.88	64.56	78.34	64.85	7.08	7.30	7.09	7.09	7.12	7.06	7.05	6.70	7.41	7.23	7.19	7.32
10/01/35	10/31/35	Oct 2035	70.63	62.45	70.71	60.33	67.64	57.82	75.31	62.30	74.95	64.55	7.03	7.25	7.05	7.03	7.11	7.06	7.03	6.62	7.35	7.17	7.13	7.31
11/01/35	11/30/35	Nov 2035	79.00	66.38	71.06	61.36	78.54	62.61	77.12	64.65	76.05	65.77	7.15	7.45	7.25	7.20	7.37	7.34	7.39	6.79	7.53	7.35	7.30	7.69
12/01/35	12/31/35	Dec 2035	79.79	69.02	69.51	62.62	83.23	66.94	74.98	65.60	74.79	66.94	7.25	7.48	7.23	7.26	7.45	7.42	7.45	6.81	7.60	7.41	7.36	7.76
01/01/36	01/31/36	Jan 2036	77.43	67.98	68.63	63.47	79.45	64.89	76.74	67.02	73.36	67.60	7.19	7.51	7.24	7.27	7.51	7.50	7.51	6.58	7.61	7.42	7.37	7.83
02/01/36	02/29/36	Feb 2036	70.87	65.18	65.41	61.46	71.05	61.91	69.52	62.81	69.45	65.55	7.15	7.34	7.15	7.15	7.27	7.26	7.27	6.79	7.48	7.29	7.24	7.59
03/01/36	03/31/36	Mar 2036	66.01	60.53	65.36	60.74	61.24	55.75	69.13	61.93	69.50	65.23	7.15	7.35	7.16	7.16	7.26	7.23	7.23	6.87	7.49	7.31	7.26	7.54
04/01/36	04/30/36	Apr 2036	64.57	58.93	68.69	62.73	59.71	54.24	69.02	61.60	71.43	66.08	7.08	7.26	7.06	7.06	7.10	7.05	7.00	6.65	7.38	7.20	7.16	7.27
05/01/36	05/31/36	May 2036	59.46	49.55	65.05	58.59	54.73	45.26	69.55	59.08	67.78	61.94	7.05	7.21	7.00	6.98	7.05	6.98	6.90	6.58	7.30	7.12	7.08	7.18
06/01/36	06/30/36	Jun 2036	59.61	52.29	61.86	57.73	54.87	47.87	66.14	59.80	65.18	61.34	7.08	7.18	6.94	6.86	7.02	6.90	6.78	6.34	7.18	7.00	6.95	7.05
07/01/36	07/31/36	Jul 2036	69.17	57.89	77.53	61.46	64.02	53.23	78.38	62.73	75.97	62.99	7.21	7.29	7.03	6.97	7.15	7.02	6.86	6.39	7.29	7.11	7.07	7.13
08/01/36	08/31/36	Aug 2036	75.96	62.22	76.99	61.86	70.79	57.40	82.62	64.91	79.64	65.03	7.27	7.47	7.26	7.19	7.27	7.19	7.13	6.70	7.52	7.33	7.29	7.41
09/01/36	09/30/36	Sep 2036	75.55	64.85	75.40	61.89	71.93	60.18	81.12	64.85	79.01	65.29	7.26	7.48	7.27	7.26	7.31	7.24	7.23	6.87	7.58	7.40	7.35	7.50
10/01/36	10/31/36	Oct 2036	71.72	63.86	73.76	63.12	68.81	59.16	76.59	64.35	76.83	66.83	7.23	7.50	7.31	7.23	7.32	7.27	7.27	6.84	7.55	7.37	7.32	7.55
11/01/36	11/30/36	Nov 2036	81.29	69.30	73.59	63.09	82.40	66.51	77.56	66.02	77.80	67.41	7.31	7.59	7.40	7.34	7.53	7.51	7.51	6.94	7.67	7.48	7.43	7.81
12/01/36	12/31/36	Dec 2036	79.52	69.12	70.39	63.18	83.02	66.72	75.16	65.89	75.21	67.33	7.35	7.56	7.34	7.34	7.53	7.51	7.53	6.82	7.67	7.48	7.44	7.84
01/01/37	01/31/37	Jan 2037	77.97	69.01	69.77	64.54	81.41	66.62	77.67	68.05	74.18	68.76	7.29	7.63	7.29	7.35	7.61	7.60	7.63	6.70	7.69	7.50	7.45	7.95
02/01/37	02/28/37	Feb 2037	72.93	67.97	68.01	63.22	75.83	65.39	72.58	65.76	72.16	67.43	7.35	7.60	7.32	7.34	7.61	7.60	7.63	6.83	7.67	7.48	7.44	7.95
03/01/37	03/31/37	Mar 2037	69.55	63.59	66.88	62.62	65.46	58.85	71.19	63.49	71.17	66.87	7.32	7.52	7.34	7.34	7.43	7.39	7.40	7.04	7.67	7.48	7.43	7.72
04/01/37	04/30/37	Apr 2037	67.45	61.23	69.81	63.90	62.55	56.47	71.00	63.15	73.57	67.80	7.26	7.45	7.26	7.26	7.29	7.24	7.21	6.86	7.57	7.39	7.35	7.48
05/01/37	05/31/37	May 2037	61.63	51.88	66.80	60.51	56.76	47.44	71.89	61.33	69.72	64.14	7.26	7.42	7.22	7.21	7.26	7.21	7.12	6.81	7.53	7.34	7.30	7.40
06/01/37	06/30/37	Jun 2037	62.36	54.14	64.10	59.34	57.46	49.60	68.38	61.71	67.29	63.05	7.27	7.39	7.16	7.09	7.22	7.12	6.99	6.57	7.41	7.23	7.19	7.27
07/01/37	07/31/37	Jul 2037	72.13	60.28	79.62	63.29	66.80	55.47	81.38	64.75	78.54	64.97	7.40	7.52	7.27	7.21	7.35	7.24	7.09	6.57	7.53	7.35	7.30	7.37
08/01/37	08/31/37	Aug 2037	77.62	64.76	78.70	63.83	72.85	59.85	84.22	66.93	81.27	67.09	7.48	7.71	7.50	7.45	7.52	7.45	7.39	7.01	7.77	7.59	7.55	7.66
09/01/37	09/30/37	Sep 2037	77.98	66.66	78.11	64.50	74.95	62.43	83.97	67.46	81.92	68.18	7.50	7.76	7.57	7.48	7.55	7.50	7.48	7.09	7.81	7.62	7.58	7.76
10/01/37	10/31/37	Oct 2037	72.14	65.07	73.98	64.89	70.19	60.63	77.91	66.16	78.02	69.09	7.43	7.71	7.52	7.43	7.52	7.47	7.45	7.04	7.76	7.58	7.53	7.73
11/01/37	11/30/37	Nov 2037	80.75	70.28	73.54	64.13	83.19	67.49	79.07	67.27	78.05	68.40	7.42	7.71	7.53	7.45	7.68	7.68	7.70	7.09	7.78	7.59	7.55	8.00
12/01/37	12/31/37	Dec 2037	80.98	70.91	71.91	64.44	85.86	69.34	76.73	67.53	76.57	68.72	7.48	7.73	7.52	7.48	7.73	7.73	7.78	7.01	7.82	7.63	7.58	8.09
01/01/38	01/31/38	Jan 2038	77.99	72.71	68.80	66.11	82.07	70.47	78.09	70.51	73.22	70.40	7.48	7.88	7.50	7.53	7.88	7.88	7.90	6.87	7.87	7.68	7.63	8.22
02/01/38	02/28/38	Feb 2038	73.83	71.79	66.89	64.25	77.37	69.35	72.91	67.35	71.09	68.54	7.52	7.78	7.52	7.52	7.85	7.83	7.90	7.02	7.85	7.66	7.62	8.22
03/01/38	03/31/38	Mar 2038	71.00	65.52	67.72	62.72	66.76	60.60	72.79	64.81	72.05	68.03	7.48	7.68	7.50	7.50	7.58	7.57	7.57	7.20	7.83	7.64	7.60	7.88
04/01/38	04/30/38	Apr 2038	69.19	63.56	72.16	66.55	64.29	58.77	73.56	65.35	74.48	69.65	7.45	7.63	7.45	7.43	7.48	7.43	7.43	7.08	7.75	7.57	7.53	7.70
05/01/38	05/31/38	May 2038	64.97	54.78	69.06	62.44	59.91	50.17	75.17	64.07	71.87	65.95	7.48	7.67	7.45	7.43	7.48	7.42	7.32	7.00	7.75	7.57	7.53	7.59
06/01/38	06/30/38	Jun 2038	64.40	56.29	65.87	61.05	59.43	51.62	70.41	63.97	69.02	64.80	7.52	7.63	7.40	7.33	7.45	7.35	7.23	6.80	7.65	7.47	7.43	7.51

07/01/38	07/31/38	Jul 2038	74.36	62.31	81.90	65.30	68.89	57.37	83.87	66.96	80.74	66.87	7.60	7.73	7.48	7.42	7.55	7.45	7.30	6.77	7.74	7.56	7.51	7.58
08/01/38	08/31/38	Aug 2038	80.43	66.46	81.38	65.27	75.57	61.48	87.24	68.55	84.27	68.51	7.65	7.93	7.65	7.62	7.67	7.60	7.57	7.17	7.94	7.76	7.71	7.84
09/01/38	09/30/38	Sep 2038	78.24	67.66	77.00	65.10	75.38	63.95	83.97	68.77	81.20	69.05	7.62	7.92	7.68	7.60	7.67	7.62	7.60	7.22	7.92	7.74	7.70	7.88
10/01/38	10/31/38	Oct 2038	73.33	66.06	73.45	65.22	71.83	62.30	78.58	68.15	77.64	69.66	7.58	7.90	7.67	7.57	7.75	7.72	7.72	7.18	7.89	7.71	7.66	8.00
11/01/38	11/30/38	Nov 2038	80.79	73.53	72.16	64.86	85.16	71.16	78.95	69.04	76.60	69.29	7.58	7.93	7.68	7.60	7.93	7.93	7.98	7.22	7.93	7.74	7.70	8.28
12/01/38	12/31/38	Dec 2038	81.02	74.09	70.51	65.30	86.58	72.64	76.48	69.12	74.96	69.65	7.62	7.90	7.63	7.58	7.93	7.93	7.98	7.18	7.92	7.73	7.68	8.29
01/01/39	01/31/39	Jan 2039	77.66	71.47	69.03	66.37	82.67	70.13	79.25	71.71	74.03	70.89	7.64	8.08	7.64	7.67	8.05	8.03	7.93	7.01	8.01	7.82	7.77	8.25
02/01/39	02/28/39	Feb 2039	71.36	65.94	67.05	65.15	74.40	70.37	73.72	68.87	71.54	69.61	7.67	7.98	7.64	7.67	8.07	8.07	8.10	7.20	8.01	7.82	7.77	8.42
03/01/39	03/31/39	Mar 2039	69.20	66.39	67.67	65.72	68.29	62.65	73.24	66.48	72.23	70.16	7.64	7.85	7.67	7.67	7.76	7.73	7.73	7.37	8.01	7.82	7.77	8.04
04/01/39	04/30/39	Apr 2039	69.11	63.68	72.49	67.41	65.06	59.64	74.25	66.44	76.26	71.14	7.59	7.78	7.61	7.57	7.62	7.59	7.57	7.23	7.89	7.71	7.67	7.84
05/01/39	05/31/39	May 2039	64.91	54.94	69.30	63.29	59.85	50.29	76.01	64.67	73.21	67.25	7.54	7.74	7.56	7.52	7.56	7.50	7.44	7.15	7.84	7.66	7.62	7.71
06/01/39	06/30/39	Jun 2039	65.74	56.44	66.05	61.48	60.74	51.78	72.31	64.33	70.34	65.61	7.57	7.73	7.47	7.39	7.52	7.42	7.30	6.84	7.71	7.52	7.48	7.57
07/01/39	07/31/39	Jul 2039	75.02	62.17	82.13	65.70	69.69	57.30	85.16	67.83	82.17	67.79	7.66	7.81	7.56	7.49	7.62	7.52	7.37	6.81	7.81	7.63	7.58	7.64
08/01/39	08/31/39	Aug 2039	80.55	65.60	81.28	65.26	75.27	60.63	87.62	68.51	84.95	68.77	7.69	8.00	7.74	7.67	7.74	7.67	7.62	7.22	8.00	7.82	7.77	7.90
09/01/39	09/30/39	Sep 2039	76.62	65.19	76.77	67.31	73.91	63.67	82.95	70.24	80.92	71.48	7.73	8.10	7.79	7.69	7.78	7.73	7.71	7.32	8.01	7.83	7.79	7.99
10/01/39	10/31/39	Oct 2039	73.50	64.08	73.97	67.00	72.21	62.89	78.37	69.62	78.45	71.33	7.69	8.05	7.78	7.67	7.91	7.90	7.88	7.28	8.00	7.82	7.77	8.16
11/01/39	11/30/39	Nov 2039	83.27	73.65	72.39	66.87	88.65	73.16	80.18	71.23	78.09	71.32	7.74	8.19	7.83	7.78	8.13	8.17	8.15	7.37	8.11	7.92	7.87	8.45
12/01/39	12/31/39	Dec 2039	81.35	71.96	70.15	66.29	86.73	72.60	77.65	70.67	75.66	70.85	7.78	8.08	7.78	7.76	8.12	8.12	8.19	7.37	8.10	7.91	7.86	8.50
01/01/40	01/31/40	Jan 2040	87.82	77.22	71.72	67.96	87.63	74.23	82.02	73.64	77.60	73.13	7.86	8.31	7.86	7.93	8.26	8.26	8.09	7.24	8.27	8.08	8.03	8.41
02/01/40	02/29/40	Feb 2040	78.82	76.39	68.78	66.37	78.21	72.08	75.92	70.72	73.25	71.23	7.79	8.12	7.79	7.83	8.23	8.26	8.33	7.43	8.16	7.97	7.93	8.65
03/01/40	03/31/40	Mar 2040	74.87	70.65	69.93	64.05	70.02	65.42	76.38	69.47	75.16	72.64	7.83	8.07	7.88	7.86	8.04	8.00	8.04	7.53	8.19	8.01	7.96	8.35
04/01/40	04/30/40	Apr 2040	71.39	66.90	72.83	68.46	66.29	61.92	76.76	68.37	76.75	72.68	7.79	7.98	7.79	7.78	7.83	7.78	7.78	7.43	8.10	7.91	7.87	8.05
05/01/40	05/31/40	May 2040	67.07	56.53	71.04	64.28	61.82	51.75	78.04	66.42	73.98	67.94	7.76	7.97	7.78	7.72	7.78	7.72	7.65	7.36	8.04	7.86	7.82	7.93
06/01/40	06/30/40	Jun 2040	69.61	59.59	69.53	63.09	64.28	54.67	74.73	66.90	72.91	67.11	7.79	7.97	7.67	7.59	7.74	7.62	7.53	7.00	7.91	7.72	7.68	7.81
07/01/40	07/31/40	Jul 2040	79.33	65.72	85.69	67.64	73.58	60.53	88.54	70.05	85.10	69.56	7.88	8.05	7.76	7.67	7.83	7.69	7.59	7.01	7.99	7.81	7.77	7.86
08/01/40	08/31/40	Aug 2040	84.32	69.69	84.28	67.09	78.90	64.38	90.82	70.86	87.58	70.69	7.95	8.28	8.00	7.93	8.00	7.90	7.88	7.45	8.26	8.07	8.03	8.16
09/01/40	09/30/40	Sep 2040	79.88	72.30	78.14	68.44	76.33	67.57	85.08	72.54	81.98	72.59	8.04	8.37	8.09	7.98	8.09	8.02	8.00	7.57	8.31	8.12	8.08	8.28
10/01/40	10/31/40	Oct 2040	79.84	73.88	77.90	68.51	78.43	69.66	84.07	72.54	82.42	73.37	7.98	8.37	8.04	7.95	8.24	8.23	8.23	7.55	8.27	8.09	8.05	8.51
11/01/40	11/30/40	Nov 2040	87.89	79.40	76.17	67.47	92.11	76.65	83.63	73.57	81.06	73.60	8.02	8.44	8.09	8.02	8.45	8.49	8.51	7.62	8.35	8.16	8.12	8.80
12/01/40	12/31/40	Dec 2040	87.07	80.02	73.72	69.07	91.51	77.83	81.70	74.07	79.52	74.31	8.04	8.44	8.09	8.04	8.47	8.49	8.54	7.65	8.37	8.18	8.14	8.85
01/01/41	01/31/41	Jan 2041	82.10	76.24	72.76	68.88	87.10	73.50	82.33	74.22	77.64	73.56	8.02	8.48	8.02	8.09	8.43	8.43	8.25	7.38	8.43	8.24	8.19	8.57
02/01/41	02/28/41	Feb 2041	77.00	75.43	69.66	67.05	81.09	74.19	77.14	71.85	74.12	71.88	7.95	8.29	7.95	7.98	8.39	8.43	8.50	7.58	8.32	8.13	8.08	8.82
03/01/41	03/31/41	Mar 2041	75.40	72.41	70.75	67.60	72.06	67.06	77.00	70.03	75.44	72.33	7.98	8.23	8.04	8.02	8.20	8.16	8.20	7.68	8.35	8.16	8.12	8.51
04/01/41	04/30/41	Apr 2041	73.49	68.69	75.81	70.76	68.69	63.61	78.14	69.38	79.18	74.39	7.95	8.14	7.95	7.93	7.98	7.93	7.93	7.58	8.25	8.07	8.03	8.20
05/01/41	05/31/41	May 2041	69.13	59.98	72.81	66.31	63.75	55.00	79.62	68.71	76.40	70.46	7.91	8.13	7.93	7.88	7.93	7.88	7.81	7.51	8.20	8.02	7.97	8.08
06/01/41	06/30/41	Jun 2041	68.21	60.87	67.90	64.88	63.00	55.86	73.14	68.20	71.80	68.87	7.95	8.13	7.83	7.74	7.90	7.77	7.68	7.14	8.06	7.88	7.83	7.96
07/01/41	07/31/41	Jul 2041	78.79	66.49	85.55	68.48	72.99	61.23	88.38	70.75	85.31	70.63	8.04	8.22	7.91	7.83	7.98	7.84	7.74	7.15	8.15	7.97	7.92	8.01
08/01/41	08/31/41	Aug 2041	86.27	70.99	85.98	68.48	80.66	65.62	93.35	72.47	89.71	72.21	8.11	8.45	8.16	8.09	8.16	8.06	8.04	7.60	8.41	8.23	8.19	8.32
09/01/41	09/30/41	Sep 2041	84.31	72.79	83.71	70.46	80.32	68.33	91.26	74.46	88.13	74.62	8.20	8.53	8.25	8.14	8.25	8.18	8.16	7.72	8.47	8.28	8.24	8.44
10/01/41	10/31/41	Oct 2041	79.16	73.25	79.36	69.77	77.31	68.91	85.72	73.84	84.17	74.70	8.14	8.53	8.20	8.11	8.41	8.39	8.39	7.70	8.43	8.25	8.21	8.67
11/01/41	11/30/41	Nov 2041	84.53	79.10	75.38	69.73	87.57	75.46	83.40	74.53	80.35	74.51	8.18	8.60	8.25	8.18	8.62	8.66	8.68	7.77	8.51	8.32	8.28	8.97
12/01/41	12/31/41	Dec 2041	86.70	79.95	75.89	70.49	92.25	78.33	82.90	75.07	80.80	75.16	8.20	8.60	8.25	8.20	8.64	8.66	8.71	7.81	8.53	8.34	8.30	9.02
01/01/42	01/31/42	Jan 2042	84.71	78.48	73.07	69.62	89.54	75.50	84.37	75.89	79.45	75.58	8.18	8.65	8.18	8.25	8.60	8.60	8.42	7.53	8.59	8.40	8.35	8.73
02/01/42	02/28/42	Feb 2042	79.71	78.52	70.98	68.39	82.50	75.74	79.30	73.41	75.69	73.63	8.11	8.45	8.11	8.14	8.56	8.60	8.67	7.73	8.48	8.29	8.24	8.99
03/01/42	03/31/42	Mar 2042	78.35	74.88	71.68	66.95	73.69	69.32	79.18	72.11	77.08	74.72	8.14	8.40	8.20	8.18	8.36	8.33	8.36	7.84	8.51	8.32	8.28	8.68
04/01/42	04/30/42	Apr 2042	74.95	70.54	76.13	71.43	69.59	65.23	79.51	70.61	79.93	75.60	8.11	8.31	8.11	8.09	8.14	8.09	8.09	7.73	8.41	8.23	8.19	8.36
05/01/42	05/31/42	May 2042	69.45	59.75	72.80	66.85	64.02	54.74	80.44	69.57	76.49	71.06	8.07	8.29	8.09	8.04	8.09	8.04	7.96	7.66	8.36	8.17	8.13	8.23
06/01/42	06/30/42	Jun 2042	69.88	63.26	69.37	66.08	64.55	58.09	74.91	69.89	73.34	70.26	8.11	8.29	7.98	7.89	8.05	7.93	7.84	7.28	8.21	8.03	7.99	8.11
07/01/42	07/31/42	Jul 2042	82.19	68.13	88.53	69.93	76.20	62.75	91.68	72.11	88.17	71.98	8.20	8.38	8.07	7.98	8.14	8.00	7.89	7.30	8.30	8.12	8.08	8.17
08/01/42	08/31/42	Aug 2042	86.90	73.00	87.21	70.34	81.23	67.55	94.07	74.37	90.53	73.93	8.27	8.61	8.33	8.25	8.33	8.22	8.20	7.75	8.58	8.39	8.35	8.48
09/01/42	09/30/42	Sep 2042	85.39	74.57	83.56	70.79	81.76	69.94	91.66	75.19	87.96	75.16	8.36	8.70	8.42	8.31	8.42	8.34	8.33	7.87	8.63	8.45	8.40	8.60
10/01/42	10/31/42	Oct 2042	81.71	75.68	81.57	71.68	80.60	71.54	87.92	75.59	85.87	76.43	8.31	8.70	8.36	8.27	8.58	8.56	8.56	7.86	8.59	8.41	8.37	8.84
11/01/42	11/30/42	Nov 2042	88.59	81.15	77.40	70.45	93.64	79.40	86.23	76.43	83.14	76.61	8.34	8.78	8.42	8.34	8.79	8.83	8.85	7.93	8.67	8.49	8.44	9.15
12/01/42	12/31/42	Dec 2042	90.00	81.16	75.85	70.55	95.75	79.37	85.09	76.20	82.65	76.18	8.36	8.78	8.42	8.36	8.81	8.83	8.89	7.96	8.70	8.51	8.46	9.20
01/01/43	01/31/43	Jan 2043	85.95	79.58	75.72	71.88	90.86	76.31	85.40	77.26	80.98	76.73	8.35	8.83	8.35	8.43	8.78	8.78	8.59	7.69	8.77	8.58	8.53	8.91
02/01/43	02/28/43	Feb 2043	79.99	78.74	71.85	69.57	82.92	76.64	79.99	74.79	76.60	74.44	8.28	8.63	8.28	8.32	8.74	8.78	8.85	7.89	8.65	8.46	8.41	9.17
03/01/43	03/31/43	Mar 2043	79.17	76.52	73.76	70.54	74.65	70.79	80.45	73.60	78.52	75.38	8.32	8.57	8.37	8.35	8.54	8.50	8.54	8.00	8.68	8.50	8.45	8.85
04/01/43	04/30/43	Apr 2043	75.58	72.08	76.67	71.95	70.34	66.55	81.23	72.32	81.14	76.42	8.28	8.48	8.28	8.26	8.32	8.26	8.26	7.89	8.58	8.40	8.36	8.53
05/01/43	05/31/43	May 2043	71.43	62.05	75.17	68.89	65.85	56.89	82.44	71.85	79.44	73.29	8.24	8.46	8.26	8.21	8.26	8.21	8.13	7.82	8.52	8.34	8.30	8.40
06/01/43	06/30/43	Jun 2043	71.16	64.34	70.99	67.40	65.75	59.09	76.43	71.61	75.09	71.79	8.28	8.46	8.15	8.06	8.22	8.09	8.00	7.43	8.38	8.20	8.15	8.27
07/01/43	07/31/43	Jul 2043	83.01	69.94	89.31	71.25	76.94	64.43	92.90	73.95	89.81	73.57	8.37	8.56	8.24	8.15	8.32	8.17	8.06	7.45	8.47	8.29	8.25	8.33
08/01/43	08/31/43	Aug 2043	88.38	74.23	88.70	71.75	82.47	68.66	95.60	76.03	92.52	75.56	8.44	8.80	8.50	8.43	8.50	8.39	8.37	7.91	8.75	8.57	8.52	8.65
09/01/43	09/30/43	Sep 2043	86.41	75.97	86.03	73.01	82.16	71.36	93.67	77.52	90.64	77.51	8.54	8.89	8.59	8.48	8.59	8.52	8.50	8.04	8.80	8.62	8.58	8.78
10/01/43	10/31/43	Oct 2043	82.08	77.12	82.10	73.18	80.26	72.86	88.64	77.37	87.00	77.98	8.48	8.89	8.54	8.44	8.76	8.74	8.74	8.02	8.77	8.59	8.54	9.02
11/01/43	11/30/43	Nov 2043	89.55	82.18	79.01	72.47	93.00	79.31	86.95	77.66	84.37	77.29	8.52	8.96	8.59	8.52	8.98	9.02	9.03	8.09	8.85	8.66	8.62	9.33
12/01/43	12/31/43	Dec 2043	91.52	82.49	79.86	72.74	97.43	81.28	86.76	77.76	84.88	77.49	8.54	8.96	8.59	8.54	9.00	9.02	9.07	8.13	8.87	8.68	8.64	9.38
01/01/44	01/31/44	Jan 2044	87.75	81.25	77.31	73.39	92.76	77.92	87.19	78.88	82.68	78.34	8.53	9.02	8.53	8.60	8.96	8.96	8.77	7.85	8.94	8.75	8.70	9.09
02/01/44	02/29/44	Feb 2044	81.67	80.39	73.36	71.03	84.66	78.25	81.67	76.36	78.21	76.00	8.45	8.81	8.45	8.49	8.92	8.96	9.04	8.06	8.82	8.64	8.59	9.36
03/01/44	03/31/44	Mar 2044	80.83	78.13	75.31	72.02	76.21	72.28	82.14	75.15	80.16	76.96	8.49	8.75	8.55	8.53	8.72	8.68	8.72	8.17	8.86	8.67	8.63	9.03
04/01/44	04/30/44	Apr 2044	77.17	73.59	78.28	73.46	71.82	67.95	82.93	73.83	82.85	78.02	8.45	8.66	8.45	8.43	8.49	8.43	8.43	8.06	8.75	8.57	8.53	8.70
05/01/44	05/31/44	May 2044	72.93	63.36	76.74	70.34	67.24	58.08	84.17	73.36	81.11	74.83	8.41	8.64	8.43	8.38	8.43	8.38	8.30	7.98	8.70	8.52	8.47	8.57
06/01/44	06/30/44	Jun 2044	72.66	65.69	72.48	68.82	67.13	60.33	78.03	73.12	76.66	73.30	8.45	8.64	8.32	8.23	8.40	8.26	8.17	7.59	8.55	8.37	8.32	8.44
07/01/44	07/31/44	Jul 2044	84.75	71.41	91.19	72.75	78.55	65.78	94.85	75.50	91.70	75.12	8.55	8.74	8.41	8.32	8.49	8.34	8.23	7.61	8.64	8.46	8.42	8.50

	08/01/44	08/31/44	Aug 2044	90.23	75.79	90.57	73.26	84.20	70.11	97.61	77.63	94.46	77.14	8.62	8.98	8.68	8.60	8.68	8.57	8.55	8.08	8.93	8.74	8.70	8.82
	09/01/44	09/30/44	Sep 2044	88.22	77.57	87.84	74.55	83.89	72.86	95.63	79.15	92.54	79.14	8.72	9.07	8.77	8.66	8.77	8.70	8.68	8.21	8.98	8.80	8.76	8.96
	10/01/44	10/31/44	Oct 2044	83.80	78.74	83.83	74.72	81.95	74.39	90.50	79.00	88.82	79.62	8.66	9.07	8.72	8.62	8.94	8.92	8.92	8.19	8.95	8.76	8.72	9.20
	11/01/44	11/30/44	Nov 2044	91.43	83.91	80.66	73.99	94.95	80.98	88.78	79.29	86.14	78.92	8.70	9.15	8.77	8.70	9.17	9.21	9.22	8.26	9.03	8.84	8.79	9.52
	12/01/44	12/31/44	Dec 2044	93.44	84.23	81.54	74.27	99.48	82.98	88.58	79.39	86.66	79.12	8.72	9.15	8.77	8.72	9.19	9.21	9.26	8.30	9.05	8.86	8.81	9.57

Quote Date		**Data Type:**	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur
11/10/2014		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN**
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/15	01/31/15	Jan 2015	42.80	37.18	39.64	33.28	39.32	34.78	48.93	41.60	49.40	41.20	4.35	4.52	4.37	4.38	4.42	4.38	4.46	3.94	4.72	4.51	4.47	4.78
02/01/15	02/28/15	Feb 2015	39.60	34.40	39.25	32.96	37.12	33.80	48.45	40.00	47.98	40.00	4.31	4.48	4.32	4.34	4.38	4.34	4.36	3.89	4.68	4.47	4.43	4.66
03/01/15	03/31/15	Mar 2015	37.60	32.67	38.86	29.76	33.81	28.93	45.13	38.40	45.13	38.80	4.20	4.29	4.12	4.09	4.21	4.18	4.01	3.77	4.42	4.21	4.18	4.30
04/01/15	04/30/15	Apr 2015	36.85	26.26	33.73	27.30	30.79	20.46	44.94	34.65	44.94	34.72	3.76	3.86	3.65	3.54	3.65	3.61	3.49	3.28	3.84	3.66	3.62	3.72
05/01/15	05/31/15	May 2015	33.17	21.36	35.86	25.71	28.53	16.01	41.16	32.01	41.16	31.44	3.71	3.80	3.56	3.48	3.59	3.56	3.23	3.19	3.78	3.59	3.56	3.44
06/01/15	06/30/15	Jun 2015	30.49	19.14	36.92	26.50	25.43	13.04	39.90	32.34	39.90	32.10	3.72	3.82	3.57	3.49	3.61	3.58	3.22	3.18	3.79	3.60	3.57	3.43
07/01/15	07/31/15	Jul 2015	44.19	26.32	44.10	32.81	35.49	23.22	48.67	38.38	49.47	38.25	3.75	3.97	3.64	3.54	3.64	3.61	3.37	3.19	3.84	3.65	3.62	3.59
08/01/15	08/31/15	Aug 2015	44.63	32.67	42.00	30.94	38.88	28.62	48.20	39.52	49.96	39.40	3.76	3.97	3.62	3.56	3.66	3.63	3.40	3.18	3.86	3.68	3.64	3.63
09/01/15	09/30/15	Sep 2015	42.44	31.76	39.90	30.00	38.88	29.16	44.89	36.10	46.08	37.10	3.76	3.91	3.62	3.55	3.66	3.63	3.43	3.19	3.85	3.67	3.63	3.66
10/01/15	10/31/15	Oct 2015	37.84	32.67	36.38	31.00	33.15	29.58	46.53	39.00	45.08	38.61	3.78	3.88	3.61	3.58	3.70	3.67	3.55	3.25	3.88	3.70	3.66	3.79
11/01/15	11/30/15	Nov 2015	39.85	34.06	36.75	30.69	36.88	31.85	46.53	38.22	46.00	38.22	3.86	4.02	3.77	3.76	3.89	3.86	4.10	3.47	4.08	3.89	3.85	4.40
12/01/15	12/31/15	Dec 2015	43.07	37.53	37.12	31.31	41.72	36.08	47.94	39.78	46.92	40.17	4.03	4.25	3.96	3.99	4.08	4.05	4.38	3.54	4.32	4.13	4.09	4.69
01/01/16	01/31/16	Jan 2016	42.90	36.75	38.38	33.92	41.53	35.04	48.83	42.12	48.10	41.46	4.13	4.31	4.07	4.04	4.12	4.08	4.31	3.60	4.38	4.18	4.14	4.62
02/01/16	02/29/16	Feb 2016	42.08	35.00	38.00	33.92	37.37	33.08	47.43	40.91	47.18	40.25	4.10	4.26	4.02	4.01	4.09	4.05	4.09	3.57	4.35	4.15	4.11	4.38
03/01/16	03/31/16	Mar 2016	38.78	33.25	37.62	31.92	34.35	30.13	43.25	38.48	43.48	39.04	4.03	4.18	3.94	3.95	4.02	3.99	4.00	3.48	4.28	4.08	4.04	4.28
04/01/16	04/30/16	Apr 2016	37.61	27.81	40.70	28.60	31.01	20.44	41.04	35.80	41.23	37.05	3.80	3.88	3.60	3.48	3.67	3.64	3.40	3.15	3.80	3.61	3.57	3.62
05/01/16	05/31/16	May 2016	32.78	18.91	37.00	26.95	29.25	15.91	42.32	29.99	42.08	30.23	3.79	3.88	3.63	3.47	3.65	3.61	3.28	3.12	3.78	3.60	3.56	3.50
06/01/16	06/30/16	Jun 2016	33.12	20.03	33.30	26.95	27.50	13.40	44.89	30.96	44.20	30.23	3.81	3.91	3.66	3.49	3.67	3.64	3.29	3.13	3.81	3.62	3.58	3.51
07/01/16	07/31/16	Jul 2016	42.44	23.70	45.32	28.44	35.65	20.06	47.75	36.62	49.73	36.62	3.84	4.15	3.73	3.63	3.76	3.73	3.55	3.19	3.95	3.76	3.72	3.78
08/01/16	08/31/16	Aug 2016	45.50	33.00	44.46	31.46	41.08	29.43	49.18	39.64	50.21	38.88	3.85	4.15	3.74	3.60	3.78	3.75	3.55	3.19	3.92	3.73	3.69	3.78
09/01/16	09/30/16	Sep 2016	43.31	33.30	38.48	30.86	39.53	30.76	46.32	37.00	46.31	37.75	3.84	3.96	3.68	3.53	3.77	3.74	3.51	3.16	3.85	3.66	3.62	3.75
10/01/16	10/31/16	Oct 2016	39.99	33.84	38.25	31.50	36.80	31.02	46.04	36.58	43.46	36.10	3.86	3.94	3.66	3.55	3.79	3.75	3.57	3.23	3.87	3.68	3.64	3.81
11/01/16	11/30/16	Nov 2016	42.57	34.55	36.38	30.87	39.20	32.67	46.04	37.73	45.75	36.86	3.93	4.15	3.97	3.84	3.95	3.92	4.15	3.40	4.17	3.97	3.94	4.45
12/01/16	12/31/16	Dec 2016	46.44	37.37	37.88	32.13	44.00	35.31	47.43	41.20	48.04	41.04	4.08	4.30	4.00	4.04	4.13	4.10	4.50	3.53	4.37	4.17	4.13	4.81
01/01/17	01/31/17	Jan 2017	45.65	38.65	41.38	35.17	44.03	37.29	49.58	42.87	48.85	42.21	4.21	4.44	4.13	4.16	4.18	4.15	4.44	3.66	4.49	4.30	4.26	4.75
02/01/17	02/28/17	Feb 2017	44.83	36.90	41.00	35.17	39.87	35.33	48.18	41.66	47.93	41.00	4.19	4.41	4.11	4.14	4.17	4.14	4.22	3.63	4.47	4.28	4.24	4.52
03/01/17	03/31/17	Mar 2017	41.53	35.15	40.62	33.17	36.85	32.38	44.00	39.23	44.23	39.79	4.12	4.36	4.03	4.08	4.11	4.07	4.18	3.59	4.41	4.22	4.18	4.48
04/01/17	04/30/17	Apr 2017	40.36	29.71	42.95	29.35	32.76	20.94	41.29	36.30	41.73	37.80	3.88	3.95	3.64	3.64	3.74	3.71	3.45	3.24	3.95	3.77	3.74	3.68
05/01/17	05/31/17	May 2017	35.53	20.81	39.25	27.70	31.00	16.41	42.57	30.49	42.58	30.98	3.88	4.00	3.71	3.57	3.74	3.71	3.43	3.21	3.88	3.70	3.67	3.66
06/01/17	06/30/17	Jun 2017	35.87	21.93	35.55	27.70	29.25	13.90	45.14	31.46	44.70	30.98	3.91	4.04	3.76	3.60	3.77	3.74	3.45	3.24	3.91	3.73	3.69	3.68
07/01/17	07/31/17	Jul 2017	45.19	25.60	48.07	29.69	39.65	23.66	48.75	37.62	50.98	37.12	3.94	4.28	3.83	3.66	3.86	3.82	3.65	3.25	3.97	3.79	3.75	3.89
08/01/17	08/31/17	Aug 2017	48.25	34.90	47.21	32.71	45.08	33.03	50.18	40.64	51.46	39.38	3.95	4.27	3.88	3.67	3.88	3.85	3.66	3.25	3.98	3.80	3.76	3.90
09/01/17	09/30/17	Sep 2017	46.06	35.20	41.23	32.11	43.53	34.36	47.32	38.00	47.56	38.25	3.94	4.09	3.77	3.66	3.88	3.84	3.66	3.26	3.97	3.79	3.75	3.90
10/01/17	10/31/17	Oct 2017	42.74	35.74	40.50	33.50	39.80	33.52	46.54	37.83	44.46	37.35	3.96	4.06	3.74	3.68	3.89	3.85	3.69	3.29	3.99	3.81	3.77	3.94
11/01/17	11/30/17	Nov 2017	45.32	36.45	38.63	32.87	42.20	35.17	46.54	38.98	46.75	38.11	4.04	4.25	4.10	3.98	4.11	4.07	4.34	3.58	4.30	4.11	4.07	4.64
12/01/17	12/31/17	Dec 2017	49.19	39.27	40.13	34.13	47.00	37.81	47.93	42.45	49.04	42.29	4.21	4.43	4.16	4.19	4.30	4.26	4.68	3.72	4.52	4.33	4.29	5.01

Quote Date		**Data Type:**	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur
11/3/2014		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN**
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/15	01/31/15	Jan 2015	41.46	34.24	37.88	31.20	38.07	32.10	46.35	40.04	46.80	39.40	4.15	4.25	4.11	4.09	4.16	4.12	4.21	3.69	4.43	4.22	4.18	4.51
02/01/15	02/28/15	Feb 2015	38.36	31.68	37.50	30.90	34.90	31.20	45.90	38.50	45.45	38.25	4.13	4.25	4.09	4.09	4.14	4.11	4.12	3.67	4.42	4.21	4.18	4.41
03/01/15	03/31/15	Mar 2015	36.43	30.08	37.13	27.90	32.78	26.70	42.75	36.96	42.75	37.10	4.06	4.09	3.92	3.89	4.01	3.97	3.86	3.55	4.22	4.02	3.98	4.14
04/01/15	04/30/15	Apr 2015	36.58	22.31	33.25	27.04	30.52	20.00	45.21	34.19	45.21	33.92	3.76	3.83	3.62	3.50	3.62	3.58	3.41	3.20	3.80	3.62	3.58	3.64
05/01/15	05/31/15	May 2015	32.92	18.00	35.35	25.46	28.28	15.52	41.41	31.28	41.41	30.72	3.74	3.79	3.55	3.48	3.59	3.56	3.19	3.14	3.77	3.59	3.56	3.40
06/01/15	06/30/15	Jun 2015	30.26	15.94	36.40	26.25	25.20	12.48	40.14	31.28	40.14	31.36	3.76	3.81	3.57	3.50	3.62	3.59	3.18	3.14	3.80	3.62	3.58	3.40
07/01/15	07/31/15	Jul 2015	43.18	25.88	44.36	32.03	35.25	23.01	48.93	37.88	49.73	37.50	3.79	4.00	3.66	3.56	3.67	3.63	3.34	3.16	3.86	3.68	3.64	3.56
08/01/15	08/31/15	Aug 2015	43.61	32.13	42.25	30.20	38.63	28.36	48.45	39.00	50.21	38.63	3.80	4.01	3.65	3.57	3.68	3.65	3.38	3.15	3.87	3.69	3.65	3.61
09/01/15	09/30/15	Sep 2015	41.47	31.24	40.14	29.28	38.63	28.89	45.13	35.63	46.31	36.38	3.80	3.94	3.64	3.56	3.68	3.65	3.41	3.16	3.86	3.68	3.64	3.64
10/01/15	10/31/15	Oct 2015	37.20	32.20	35.39	30.50	33.15	29.12	46.04	37.37	44.84	37.49	3.83	3.92	3.63	3.59	3.72	3.68	3.54	3.23	3.90	3.71	3.67	3.77
11/01/15	11/30/15	Nov 2015	39.60	33.57	35.75	30.20	36.88	32.00	46.04	37.00	45.75	37.49	3.91	4.07	3.80	3.79	3.94	3.90	4.10	3.45	4.12	3.93	3.89	4.39
12/01/15	12/31/15	Dec 2015	43.20	36.99	36.11	30.81	41.72	34.88	47.43	38.88	46.67	39.78	4.07	4.29	3.99	4.02	4.11	4.08	4.40	3.55	4.35	4.16	4.12	4.72
01/01/16	01/31/16	Jan 2016	42.38	36.23	37.88	33.02	40.98	34.24	48.04	40.82	47.32	39.91	4.18	4.35	4.09	4.07	4.15	4.12	4.34	3.64	4.41	4.21	4.17	4.64
02/01/16	02/29/16	Feb 2016	41.57	34.50	37.50	32.70	36.88	32.32	46.67	39.64	46.41	38.75	4.15	4.31	4.05	4.05	4.12	4.09	4.11	3.61	4.38	4.18	4.14	4.41
03/01/16	03/31/16	Mar 2016	38.31	32.78	37.13	30.16	33.90	29.44	42.55	37.29	42.77	37.59	4.08	4.23	3.97	3.98	4.06	4.03	4.03	3.53	4.32	4.12	4.08	4.32
04/01/16	04/30/16	Apr 2016	37.88	28.13	40.70	29.12	31.27	21.05	41.04	36.08	41.23	37.62	3.86	3.92	3.64	3.50	3.70	3.67	3.44	3.17	3.82	3.63	3.59	3.67
05/01/16	05/31/16	May 2016	33.01	19.13	37.00	27.44	29.50	16.39	42.32	30.23	42.08	30.69	3.86	3.93	3.66	3.50	3.69	3.65	3.33	3.15	3.82	3.63	3.59	3.55
06/01/16	06/30/16	Jun 2016	33.36	20.25	33.30	27.44	27.73	13.80	44.89	31.20	44.20	30.69	3.88	3.97	3.70	3.53	3.71	3.68	3.34	3.16	3.84	3.65	3.62	3.57
07/01/16	07/31/16	Jul 2016	41.95	23.31	45.85	29.14	35.19	20.25	48.25	37.35	50.24	37.35	3.91	4.20	3.78	3.66	3.80	3.77	3.60	3.23	3.98	3.79	3.76	3.84
08/01/16	08/31/16	Aug 2016	44.98	32.45	44.98	32.24	40.55	29.70	49.70	40.43	50.73	39.66	3.92	4.20	3.79	3.63	3.83	3.80	3.60	3.23	3.95	3.76	3.73	3.84
09/01/16	09/30/16	Sep 2016	42.82	32.75	38.93	31.62	39.02	31.05	46.80	37.73	46.79	38.50	3.90	4.01	3.72	3.56	3.82	3.78	3.56	3.19	3.88	3.69	3.65	3.80
10/01/16	10/31/16	Oct 2016	40.22	34.80	38.51	31.75	37.03	32.43	46.28	37.53	43.70	37.29	3.93	4.00	3.71	3.59	3.83	3.80	3.62	3.26	3.91	3.71	3.68	3.87
11/01/16	11/30/16	Nov 2016	42.82	35.53	36.62	31.12	39.45	34.16	46.28	38.71	46.00	38.07	4.00	4.21	4.00	3.90	4.00	3.97	4.19	3.43	4.23	4.04	4.00	4.49
12/01/16	12/31/16	Dec 2016	46.71	38.43	38.13	32.39	44.28	36.92	47.69	42.27	48.30	42.39	4.15	4.36	4.05	4.10	4.18	4.15	4.54	3.56	4.43	4.23	4.19	4.86
01/01/17	01/31/17	Jan 2017	45.13	38.13	40.88	34.27	43.98	36.74	49.44	41.82	48.32	40.66	4.28	4.50	4.18	4.22	4.23	4.20	4.49	3.69	4.55	4.36	4.32	4.81
02/01/17	02/28/17	Feb 2017	44.32	36.40	40.50	33.95	39.88	34.82	48.07	40.64	47.41	39.50	4.26	4.47	4.16	4.20	4.22	4.19	4.27	3.66	4.53	4.34	4.30	4.58
03/01/17	03/31/17	Mar 2017	41.06	34.68	40.13	31.41	36.90	31.94	43.95	38.29	43.77	38.34	4.19	4.42	4.08	4.14	4.16	4.13	4.23	3.62	4.47	4.28	4.24	4.53
04/01/17	04/30/17	Apr 2017	40.63	30.03	43.45	29.87	33.52	21.30	42.44	36.58	42.48	38.62	3.95	4.01	3.70	3.68	3.78	3.75	3.50	3.25	4.00	3.81	3.78	3.74
05/01/17	05/31/17	May 2017	35.76	21.03	39.75	28.19	31.75	16.64	43.72	30.73	43.33	31.69	3.96	4.07	3.76	3.62	3.79	3.75	3.50	3.24	3.93	3.75	3.71	3.73
06/01/17	06/30/17	Jun 2017	36.11	22.15	36.05	28.19	29.98	14.05	46.29	31.70	45.45	31.69	3.98	4.11	3.81	3.65	3.82	3.79	3.51	3.26	3.96	3.78	3.74	3.74
07/01/17	07/31/17	Jul 2017	44.70	25.21	49.10	30.89	39.44	23.00	49.65	38.85	51.99	38.35	4.02	4.35	3.88	3.70	3.90	3.87	3.71	3.27	4.02	3.83	3.80	3.96
08/01/17	08/31/17	Aug 2017	47.73	34.35	48.23	33.99	44.80	32.45	51.10	41.93	52.48	40.66	4.03	4.34	3.93	3.72	3.93	3.90	3.71	3.28	4.03	3.85	3.81	3.96
09/01/17	09/30/17	Sep 2017	45.57	34.65	42.18	33.37	43.27	33.80	48.20	39.23	48.54	39.50	4.02	4.16	3.82	3.71	3.92	3.89	3.72	3.28	4.02	3.84	3.80	3.97
10/01/17	10/31/17	Oct 2017	42.97	36.70	41.01	34.00	40.28	35.43	47.68	39.53	44.95	38.49	4.04	4.13	3.79	3.73	3.93	3.90	3.75	3.31	4.04	3.86	3.82	4.00
11/01/17	11/30/17	Nov 2017	45.57	37.43	39.12	33.37	42.70	37.16	47.68	40.71	47.25	39.27	4.12	4.30	4.15	4.04	4.16	4.13	4.41	3.60	4.37	4.18	4.14	4.72
12/01/17	12/31/17	Dec 2017	49.46	40.33	40.63	34.64	47.53	39.92	49.09	44.27	49.55	43.59	4.28	4.50	4.21	4.25	4.35	4.32	4.75	3.74	4.58	4.39	4.35	5.08

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
9/30/2014		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
0914 Official Forward Price Curve: *Blend of...* Final September 2014 Aurora forecast 09/30/2014 forward market curve			**COB**		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH												
10/01/14	10/31/14	Oct 2014	38.25	32.75	39.50	32.50	35.50	32.00	48.75	40.00	50.00	40.50	3.98	4.01	3.74	3.67	3.88	3.83	3.88	3.63	4.25	4.04	4.06	4.15
11/01/14	11/30/14	Nov 2014	40.25	34.25	38.50	32.25	38.75	33.00	48.75	40.00	48.00	39.75	4.12	4.31	4.03	4.06	4.22	4.18	4.28	3.87	4.39	4.18	4.15	4.58
12/01/14	12/31/14	Dec 2014	44.75	37.25	39.00	32.50	43.75	36.50	48.00	40.00	47.00	39.25	4.19	4.45	4.15	4.26	4.36	4.33	4.70	3.95	4.60	4.39	4.35	5.03
01/01/15	01/31/15	Jan 2015	43.60	36.38	38.38	31.31	41.53	34.78	47.12	40.04	48.36	40.17	4.25	4.47	4.24	4.31	4.38	4.34	4.60	4.00	4.66	4.44	4.41	4.92
02/01/15	02/28/15	Feb 2015	40.34	33.66	38.00	31.00	37.37	33.48	46.67	38.50	46.97	39.00	4.24	4.46	4.22	4.28	4.36	4.33	4.42	3.98	4.62	4.40	4.37	4.73
03/01/15	03/31/15	Mar 2015	38.31	31.96	37.62	30.69	34.35	29.25	43.46	36.96	44.18	37.83	4.16	4.34	4.11	4.08	4.25	4.21	4.18	3.84	4.42	4.21	4.17	4.48
04/01/15	04/30/15	Apr 2015	38.23	23.00	33.73	25.18	30.74	20.63	44.94	34.19	45.21	34.45	3.87	3.97	3.77	3.66	3.79	3.75	3.63	3.43	3.97	3.78	3.75	3.87
05/01/15	05/31/15	May 2015	34.40	19.20	35.86	24.35	29.29	16.01	41.16	31.28	41.41	31.20	3.85	3.91	3.70	3.64	3.76	3.72	3.44	3.36	3.94	3.75	3.72	3.67
06/01/15	06/30/15	Jun 2015	31.62	17.80	36.92	24.49	26.97	12.87	39.90	31.28	40.14	31.85	3.87	3.95	3.72	3.66	3.78	3.75	3.43	3.36	3.96	3.78	3.74	3.65
07/01/15	07/31/15	Jul 2015	45.20	26.35	45.15	32.67	37.60	24.08	50.70	39.27	51.26	38.50	3.89	4.16	3.81	3.71	3.86	3.82	3.59	3.38	4.02	3.83	3.79	3.83
08/01/15	08/31/15	Aug 2015	45.65	34.10	43.00	29.95	41.60	29.68	49.73	40.04	51.76	39.66	3.90	4.17	3.79	3.72	3.87	3.83	3.61	3.38	4.03	3.84	3.80	3.85
09/01/15	09/30/15	Sep 2015	43.41	32.55	40.85	28.13	40.80	30.24	45.83	36.19	47.74	37.35	3.89	4.09	3.78	3.70	3.86	3.83	3.68	3.39	4.01	3.82	3.78	3.92
10/01/15	10/31/15	Oct 2015	40.46	33.37	37.74	31.19	36.11	31.49	46.78	38.61	45.82	37.73	3.92	4.05	3.77	3.74	3.90	3.87	3.77	3.46	4.05	3.86	3.83	4.02
11/01/15	11/30/15	Nov 2015	43.07	34.79	35.89	31.50	38.47	32.83	46.78	38.22	46.75	37.73	4.01	4.19	3.90	3.92	4.07	4.04	4.33	3.66	4.25	4.06	4.02	4.64
12/01/15	12/31/15	Dec 2015	46.98	38.34	37.37	31.82	43.18	36.18	48.20	40.17	47.69	40.04	4.16	4.40	4.08	4.12	4.24	4.20	4.65	3.76	4.46	4.26	4.22	4.98
01/01/16	01/31/16	Jan 2016	44.46	37.28	39.14	33.02	43.73	36.38	49.61	41.86	48.88	40.94	4.27	4.47	4.19	4.21	4.28	4.25	4.55	3.83	4.56	4.35	4.31	4.87
02/01/16	02/29/16	Feb 2016	43.61	35.50	38.75	32.07	39.35	34.34	48.20	40.65	47.94	39.75	4.25	4.43	4.15	4.19	4.26	4.23	4.32	3.79	4.53	4.33	4.29	4.63
03/01/16	03/31/16	Mar 2016	40.19	33.73	38.36	30.16	36.17	31.28	43.94	38.24	44.18	38.56	4.18	4.35	4.07	4.12	4.19	4.16	4.24	3.71	4.46	4.26	4.22	4.54
04/01/16	04/30/16	Apr 2016	38.97	26.25	41.25	28.08	31.80	21.66	40.80	35.80	41.71	37.34	3.94	4.03	3.78	3.60	3.80	3.77	3.52	3.31	3.92	3.73	3.70	3.76
05/01/16	05/31/16	May 2016	33.96	17.85	37.50	26.46	30.00	16.86	42.08	29.99	42.57	30.46	3.94	4.04	3.79	3.60	3.79	3.76	3.50	3.28	3.92	3.73	3.70	3.73
06/01/16	06/30/16	Jun 2016	34.32	18.90	33.75	26.46	28.20	14.20	44.63	30.96	44.72	30.46	3.97	4.08	3.82	3.63	3.82	3.79	3.51	3.30	3.95	3.76	3.72	3.75
07/01/16	07/31/16	Jul 2016	46.08	25.68	47.70	28.91	39.33	22.13	49.75	38.07	52.02	37.83	3.99	4.31	3.91	3.77	3.91	3.87	3.77	3.36	4.09	3.90	3.86	4.02
08/01/16	08/31/16	Aug 2016	49.40	35.75	46.80	31.98	45.32	32.45	51.24	41.21	52.53	40.17	4.00	4.31	3.92	3.74	3.93	3.90	3.77	3.36	4.06	3.87	3.83	4.02
09/01/16	09/30/16	Sep 2016	47.03	36.08	40.50	31.37	43.61	33.93	48.26	38.47	48.45	39.00	3.99	4.13	3.86	3.67	3.92	3.89	3.73	3.32	3.99	3.80	3.76	3.97
10/01/16	10/31/16	Oct 2016	42.32	36.00	39.27	32.00	38.18	33.37	46.78	38.48	44.41	38.00	4.02	4.11	3.84	3.70	3.94	3.91	3.81	3.40	4.02	3.83	3.79	4.06
11/01/16	11/30/16	Nov 2016	45.05	36.75	37.35	31.36	40.67	35.15	46.78	39.69	46.75	38.80	4.10	4.30	4.11	4.01	4.10	4.07	4.36	3.55	4.34	4.14	4.10	4.67
12/01/16	12/31/16	Dec 2016	49.14	39.75	38.89	32.64	45.65	37.99	48.20	43.34	49.09	43.20	4.28	4.48	4.18	4.22	4.30	4.27	4.73	3.70	4.57	4.36	4.32	5.06
01/01/17	01/31/17	Jan 2017	47.21	39.18	42.29	35.22	46.48	38.28	51.01	43.06	50.23	42.14	4.41	4.63	4.32	4.35	4.36	4.32	4.69	3.83	4.69	4.49	4.45	5.02
02/01/17	02/28/17	Feb 2017	46.36	37.40	41.90	34.27	42.10	36.24	49.60	41.85	49.29	40.95	4.39	4.59	4.29	4.34	4.35	4.31	4.47	3.81	4.67	4.48	4.43	4.79
03/01/17	03/31/17	Mar 2017	42.94	35.63	41.51	32.36	38.92	33.18	45.34	39.44	45.53	39.76	4.33	4.54	4.21	4.27	4.29	4.25	4.43	3.77	4.61	4.41	4.37	4.74
04/01/17	04/30/17	Apr 2017	41.72	28.15	44.40	30.28	34.55	22.41	42.20	37.55	43.06	38.54	4.06	4.12	3.83	3.79	3.87	3.83	3.70	3.34	4.11	3.92	3.89	3.94
05/01/17	05/31/17	May 2017	36.71	19.75	40.65	28.66	32.75	17.61	43.48	31.74	43.92	31.66	4.07	4.18	3.91	3.73	3.87	3.84	3.69	3.33	4.04	3.86	3.82	3.94
06/01/17	06/30/17	Jun 2017	37.07	20.80	36.90	28.66	30.95	14.95	46.03	32.71	46.07	31.66	4.10	4.22	3.96	3.76	3.91	3.87	3.71	3.35	4.07	3.89	3.85	3.95
07/01/17	07/31/17	Jul 2017	48.83	27.58	50.85	31.11	42.08	24.03	51.15	38.57	53.37	39.03	4.14	4.46	4.05	3.82	4.00	3.96	3.91	3.37	4.14	3.95	3.91	4.17
08/01/17	08/31/17	Aug 2017	52.15	37.65	49.95	34.18	48.07	34.35	52.64	41.71	53.88	41.37	4.15	4.46	4.10	3.83	4.02	3.99	3.92	3.37	4.15	3.96	3.93	4.18
09/01/17	09/30/17	Sep 2017	49.78	37.98	43.65	33.57	46.36	35.83	49.66	38.97	49.80	40.20	4.14	4.28	3.99	3.82	4.02	3.98	3.92	3.38	4.14	3.96	3.92	4.18
10/01/17	10/31/17	Oct 2017	45.07	37.90	42.42	34.20	40.93	35.27	48.18	39.68	45.76	39.20	4.16	4.25	3.96	3.85	4.03	4.00	3.96	3.41	4.16	3.98	3.94	4.22
11/01/17	11/30/17	Nov 2017	47.80	38.65	40.50	33.56	43.42	37.05	48.18	40.89	48.10	40.00	4.25	4.44	4.32	4.17	4.27	4.23	4.58	3.72	4.50	4.31	4.26	4.91
12/01/17	12/31/17	Dec 2017	51.89	41.65	42.04	34.84	48.40	39.89	49.60	44.54	50.44	44.40	4.42	4.64	4.35	4.38	4.46	4.43	4.93	3.86	4.72	4.53	4.48	5.28
01/01/18	01/31/18	Jan 2018	50.31	41.43	45.79	37.52	49.58	40.53	52.41	44.26	51.58	43.34	4.54	4.79	4.45	4.51	4.52	4.48	4.82	3.92	4.84	4.65	4.60	5.16
02/01/18	02/28/18	Feb 2018	49.46	39.65	45.40	36.57	45.20	38.49	51.00	43.05	50.64	42.15	4.52	4.75	4.42	4.49	4.50	4.46	4.60	3.89	4.82	4.63	4.59	4.93
03/01/18	03/31/18	Mar 2018	46.04	37.88	45.01	34.66	42.02	35.43	46.74	40.64	46.88	40.96	4.46	4.71	4.34	4.43	4.44	4.40	4.54	3.82	4.76	4.57	4.52	4.86
04/01/18	04/30/18	Apr 2018	44.82	30.40	47.90	32.58	37.65	24.66	43.60	38.75	44.41	39.74	4.15	4.28	3.92	4.01	4.04	4.01	3.85	3.48	4.32	4.15	4.10	4.11
05/01/18	05/31/18	May 2018	39.81	22.00	44.15	30.96	35.85	19.86	44.88	32.94	45.27	32.86	4.16	4.31	4.01	3.95	4.05	4.02	3.82	3.44	4.26	4.09	4.04	4.07
06/01/18	06/30/18	Jun 2018	40.17	23.05	40.40	30.96	34.05	17.20	47.43	33.91	47.42	32.86	4.19	4.36	4.05	3.98	4.08	4.05	3.81	3.44	4.29	4.11	4.07	4.07
07/01/18	07/31/18	Jul 2018	51.93	29.83	54.35	33.41	45.18	26.28	52.55	39.77	54.72	40.23	4.22	4.61	4.14	4.03	4.17	4.13	4.02	3.45	4.35	4.17	4.13	4.28
08/01/18	08/31/18	Aug 2018	55.25	39.90	53.45	36.48	51.17	36.60	54.04	42.91	55.23	42.57	4.24	4.63	4.19	4.05	4.20	4.16	4.02	3.45	4.36	4.18	4.14	4.28
09/01/18	09/30/18	Sep 2018	52.88	40.23	47.15	35.87	49.46	38.08	51.06	40.17	51.15	41.40	4.23	4.43	4.08	4.04	4.19	4.16	4.05	3.49	4.36	4.18	4.14	4.32
10/01/18	10/31/18	Oct 2018	48.17	40.15	45.92	36.50	44.03	37.52	49.58	40.88	47.11	40.40	4.26	4.36	4.06	4.07	4.21	4.18	4.07	3.50	4.38	4.20	4.16	4.34
11/01/18	11/30/18	Nov 2018	50.90	40.90	44.00	35.86	46.52	39.30	49.58	42.09	49.45	41.20	4.34	4.61	4.42	4.29	4.37	4.34	4.70	3.82	4.61	4.43	4.38	5.03
12/01/18	12/31/18	Dec 2018	54.99	43.90	45.54	37.14	51.50	42.14	51.00	45.74	51.79	45.60	4.52	4.79	4.45	4.51	4.57	4.53	5.05	3.97	4.84	4.65	4.60	5.40
01/01/19	01/31/19	Jan 2019	53.41	43.43	48.19	39.72	52.68	42.53	53.81	43.66	52.93	44.54	4.63	4.92	4.54	4.61	4.62	4.58	4.94	4.02	4.95	4.76	4.71	5.28
02/01/19	02/28/19	Feb 2019	52.56	41.65	47.80	38.77	48.30	40.49	52.40	42.45	51.99	43.35	4.61	4.88	4.51	4.59	4.60	4.56	4.72	4.00	4.93	4.74	4.69	5.05
03/01/19	03/31/19	Mar 2019	49.14	39.88	47.41	36.86	45.12	37.43	48.14	40.04	48.23	42.16	4.55	4.84	4.43	4.53	4.54	4.50	4.66	3.94	4.86	4.68	4.63	4.98
04/01/19	04/30/19	Apr 2019	47.92	32.40	50.30	34.78	40.75	26.66	45.00	38.15	45.76	40.94	4.24	4.43	4.01	4.16	4.16	4.12	3.96	3.67	4.48	4.30	4.26	4.23
05/01/19	05/31/19	May 2019	42.91	24.00	46.55	33.16	38.95	21.86	46.28	32.34	46.62	34.06	4.25	4.47	4.10	4.11	4.16	4.13	3.93	3.64	4.42	4.24	4.20	4.19
06/01/19	06/30/19	Jun 2019	43.27	25.05	42.80	33.16	37.15	19.20	48.83	33.31	48.77	34.06	4.28	4.51	4.15	4.14	4.20	4.16	3.93	3.64	4.45	4.27	4.23	4.19
07/01/19	07/31/19	Jul 2019	55.03	31.83	56.75	35.61	48.28	28.28	53.95	39.17	56.07	41.43	4.32	4.75	4.23	4.19	4.29	4.25	4.11	3.63	4.51	4.33	4.29	4.39
08/01/19	08/31/19	Aug 2019	58.35	41.90	55.85	38.68	54.27	38.60	55.44	42.31	56.58	43.77	4.34	4.77	4.29	4.21	4.32	4.28	4.13	3.65	4.53	4.35	4.31	4.40
09/01/19	09/30/19	Sep 2019	55.98	42.23	49.55	38.07	52.56	40.08	52.46	39.57	52.50	42.60	4.33	4.58	4.18	4.21	4.32	4.28	4.16	3.68	4.53	4.35	4.30	4.43
10/01/19	10/31/19	Oct 2019	51.27	42.15	48.32	38.70	47.13	39.52	50.98	40.28	48.46	41.60	4.36	4.51	4.16	4.24	4.34	4.30	4.18	3.70	4.56	4.38	4.33	4.46
11/01/19	11/30/19	Nov 2019	54.00	42.90	46.40	38.06	49.62	41.30	50.98	41.49	50.80	42.40	4.46	4.78	4.53	4.42	4.50	4.46	4.71	4.01	4.75	4.57	4.52	5.04
12/01/19	12/31/19	Dec 2019	58.09	45.90	47.94	39.34	54.60	44.14	52.40	45.14	53.14	46.80	4.65	5.02	4.58	4.66	4.72	4.68	5.09	4.18	4.99	4.80	4.76	5.45

01/01/20	01/31/20	Jan 2020	56.16	45.43	50.69	41.92	55.43	44.53	55.56	45.16	54.68	46.04	4.76	5.13	4.67	4.76	4.77	4.74	4.99	4.24	5.10	4.91	4.86	5.33
02/01/20	02/29/20	Feb 2020	55.31	43.65	50.30	40.97	51.05	42.49	54.15	43.95	53.74	44.85	4.74	5.10	4.64	4.74	4.75	4.71	4.78	4.23	5.08	4.89	4.84	5.12
03/01/20	03/31/20	Mar 2020	51.89	41.88	49.91	39.06	47.87	39.43	49.89	41.54	49.98	43.66	4.68	5.05	4.56	4.68	4.69	4.65	4.74	4.19	5.02	4.83	4.78	5.07
04/01/20	04/30/20	Apr 2020	50.67	34.40	52.80	36.98	43.50	28.66	46.75	39.65	47.51	42.44	4.37	4.61	4.13	4.32	4.30	4.27	4.08	3.94	4.64	4.46	4.42	4.37
05/01/20	05/31/20	May 2020	45.66	26.00	49.05	35.36	41.70	23.86	48.03	33.84	48.37	35.56	4.38	4.72	4.23	4.27	4.32	4.28	4.04	3.90	4.59	4.41	4.36	4.33
06/01/20	06/30/20	Jun 2020	46.02	27.05	45.30	35.36	39.90	21.20	50.58	34.81	50.52	35.56	4.41	4.76	4.27	4.29	4.35	4.31	4.04	3.90	4.62	4.44	4.39	4.33
07/01/20	07/31/20	Jul 2020	57.78	33.83	59.25	37.81	51.03	30.28	55.70	40.67	57.82	42.93	4.45	4.94	4.36	4.35	4.44	4.40	4.25	3.92	4.68	4.49	4.45	4.55
08/01/20	08/31/20	Aug 2020	61.10	43.90	58.35	40.88	57.02	40.60	57.19	43.81	58.33	45.27	4.47	4.96	4.42	4.38	4.48	4.44	4.23	3.90	4.70	4.52	4.47	4.53
09/01/20	09/30/20	Sep 2020	58.73	44.23	52.05	40.27	55.31	42.08	54.21	41.07	54.25	44.10	4.47	4.77	4.32	4.37	4.48	4.44	4.28	3.95	4.70	4.52	4.47	4.59
10/01/20	10/31/20	Oct 2020	54.02	44.15	50.82	40.90	49.88	41.52	52.73	41.78	50.21	43.10	4.50	4.72	4.30	4.41	4.50	4.46	4.32	3.99	4.73	4.55	4.50	4.62
11/01/20	11/30/20	Nov 2020	58.69	46.98	46.72	41.67	55.16	44.62	54.01	45.91	53.57	46.31	5.05	5.29	5.00	5.08	5.21	5.14	5.38	4.55	5.41	5.22	5.17	5.71
12/01/20	12/31/20	Dec 2020	61.10	48.34	48.48	43.33	57.52	45.78	54.83	48.49	55.20	49.33	5.24	5.55	5.14	5.26	5.34	5.31	5.64	4.65	5.60	5.41	5.36	5.98
01/01/21	01/31/21	Jan 2021	59.76	48.39	50.37	45.08	57.28	46.21	56.86	48.85	56.42	49.29	5.41	5.67	5.27	5.29	5.32	5.33	5.54	4.82	5.63	5.44	5.39	5.88
02/01/21	02/28/21	Feb 2021	57.30	47.12	50.62	44.58	53.10	44.68	55.52	47.76	55.29	48.21	5.39	5.60	5.22	5.24	5.27	5.22	5.34	4.83	5.58	5.39	5.34	5.68
03/01/21	03/31/21	Mar 2021	50.75	42.06	47.98	40.88	46.87	39.12	49.78	43.60	49.83	44.66	5.05	5.27	4.90	5.08	5.21	5.16	5.28	4.77	5.42	5.23	5.18	5.62
04/01/21	04/30/21	Apr 2021	49.09	38.19	50.06	40.23	43.68	33.60	49.71	43.23	49.58	44.53	4.86	4.98	4.65	4.85	4.98	4.90	4.73	4.58	5.18	4.99	4.95	5.03
05/01/21	05/31/21	May 2021	43.89	31.58	48.16	38.93	40.19	28.91	48.38	39.26	48.87	40.21	4.88	5.12	4.73	4.71	4.84	4.77	4.57	4.42	5.04	4.85	4.81	4.87
06/01/21	06/30/21	Jun 2021	47.59	33.48	47.91	39.84	42.66	28.89	52.08	40.70	51.88	40.99	4.95	5.21	4.79	4.73	4.88	4.80	4.59	4.44	5.06	4.88	4.83	4.89
07/01/21	07/31/21	Jul 2021	60.77	39.68	61.56	42.74	55.20	36.11	61.32	45.37	62.27	46.43	5.00	5.36	4.86	4.77	4.94	4.78	4.69	4.45	5.11	4.92	4.87	5.00
08/01/21	08/31/21	Aug 2021	64.70	46.17	61.91	45.29	60.37	42.67	63.01	47.30	63.60	48.49	5.03	5.53	4.91	4.80	4.98	4.89	4.71	4.46	5.14	4.95	4.90	5.01
09/01/21	09/30/21	Sep 2021	59.16	46.53	52.79	43.29	55.72	43.74	56.21	44.95	56.14	46.45	4.99	5.31	4.84	4.82	5.00	4.91	4.75	4.51	5.16	4.97	4.92	5.06
10/01/21	10/31/21	Oct 2021	56.16	45.90	49.14	43.09	52.55	42.82	54.73	45.62	52.64	46.06	5.02	5.30	4.84	4.86	5.03	4.94	4.79	4.55	5.20	5.01	4.96	5.10
11/01/21	11/30/21	Nov 2021	63.39	51.06	47.05	45.28	60.70	47.95	57.04	50.33	56.33	50.22	5.64	5.81	5.48	5.73	5.92	5.81	6.06	5.10	6.06	5.87	5.83	6.38
12/01/21	12/31/21	Dec 2021	64.12	50.78	49.02	47.32	60.44	47.42	57.26	51.85	57.26	51.86	5.84	6.08	5.69	5.87	5.95	5.94	6.20	5.13	6.21	6.02	5.97	6.54
01/01/22	01/31/22	Jan 2022	63.36	51.36	50.05	48.23	59.14	47.89	58.15	52.54	58.15	52.54	6.06	6.21	5.86	5.81	5.87	5.93	6.09	5.39	6.16	5.96	5.91	6.44
02/01/22	02/28/22	Feb 2022	59.30	50.59	50.94	48.19	55.15	46.86	56.89	51.56	56.85	51.56	6.04	6.10	5.80	5.73	5.79	5.74	5.90	5.42	6.08	5.89	5.83	6.24
03/01/22	03/31/22	Mar 2022	49.62	42.25	46.05	42.70	45.87	38.82	49.67	45.67	49.67	45.66	5.43	5.48	5.24	5.47	5.73	5.67	5.83	5.36	5.82	5.62	5.57	6.17
04/01/22	04/30/22	Apr 2022	47.52	41.98	47.32	43.49	43.86	38.55	52.66	46.82	51.65	46.62	5.34	5.36	5.17	5.38	5.65	5.54	5.39	5.22	5.71	5.53	5.48	5.68
05/01/22	05/31/22	May 2022	42.11	37.17	47.26	42.50	38.68	33.96	48.74	44.68	49.38	44.87	5.39	5.52	5.23	5.15	5.37	5.26	5.10	4.94	5.48	5.30	5.25	5.40
06/01/22	06/30/22	Jun 2022	49.15	39.91	50.52	44.32	45.41	36.58	53.58	46.58	53.25	46.43	5.50	5.65	5.30	5.17	5.41	5.29	5.13	4.98	5.50	5.31	5.27	5.43
07/01/22	07/31/22	Jul 2022	63.76	45.53	63.88	47.67	59.38	41.95	66.93	50.08	66.72	49.93	5.55	5.78	5.36	5.20	5.45	5.16	5.14	4.99	5.53	5.34	5.30	5.45
08/01/22	08/31/22	Aug 2022	68.31	48.43	65.48	49.70	63.73	44.74	68.83	50.78	68.86	51.70	5.59	6.11	5.41	5.23	5.48	5.34	5.18	5.02	5.56	5.38	5.33	5.48
09/01/22	09/30/22	Sep 2022	59.60	48.84	53.52	46.31	56.13	45.41	58.21	48.83	58.04	48.80	5.50	5.85	5.35	5.27	5.52	5.38	5.22	5.06	5.60	5.42	5.37	5.52
10/01/22	10/31/22	Oct 2022	58.30	47.66	47.45	45.29	55.23	44.11	56.72	49.47	55.06	49.02	5.53	5.89	5.38	5.32	5.57	5.42	5.27	5.10	5.65	5.46	5.42	5.58
11/01/22	11/30/22	Nov 2022	65.86	52.98	48.99	47.32	62.44	49.55	59.52	52.62	58.40	52.46	5.95	6.08	5.80	6.05	6.28	6.17	6.34	5.36	6.38	6.20	6.15	6.66
12/01/22	12/31/22	Dec 2022	67.42	54.22	51.24	49.58	63.79	50.75	59.75	54.28	59.75	54.27	6.27	6.36	6.13	6.23	6.29	6.25	6.43	5.37	6.57	6.38	6.33	6.77
01/01/23	01/31/23	Jan 2023	64.72	52.77	50.23	48.28	60.43	49.15	58.63	52.87	58.63	52.87	6.06	6.18	5.91	5.87	5.99	5.95	6.24	5.35	6.21	6.02	5.97	6.59
02/01/23	02/28/23	Feb 2023	60.33	51.86	50.78	47.91	56.10	48.07	57.19	51.47	57.10	51.47	6.08	6.03	5.83	5.78	5.90	5.87	6.15	5.38	6.13	5.93	5.88	6.50
03/01/23	03/31/23	Mar 2023	50.30	43.20	48.41	44.16	46.48	39.69	51.78	47.01	51.73	47.04	5.68	5.67	5.56	5.60	5.71	5.67	5.60	5.45	5.94	5.74	5.70	5.94
04/01/23	04/30/23	Apr 2023	50.75	44.19	51.96	46.49	46.91	40.64	56.27	49.70	55.17	49.40	5.57	5.67	5.47	5.50	5.61	5.57	5.45	5.31	5.83	5.64	5.60	5.75
05/01/23	05/31/23	May 2023	45.24	39.15	49.50	44.62	41.64	35.82	50.89	46.56	51.48	46.64	5.61	5.72	5.41	5.33	5.50	5.44	5.41	5.28	5.66	5.48	5.43	5.71
06/01/23	06/30/23	Jun 2023	51.16	41.23	52.47	45.50	47.30	37.81	55.91	47.98	55.33	47.69	5.72	5.76	5.42	5.35	5.76	5.40	5.28	5.21	5.68	5.49	5.44	5.58
07/01/23	07/31/23	Jul 2023	67.71	47.81	67.70	49.54	63.13	44.10	70.81	52.12	70.57	51.81	5.77	5.97	5.46	5.39	5.80	5.43	5.38	5.24	5.72	5.54	5.49	5.68
08/01/23	08/31/23	Aug 2023	71.42	50.94	68.43	51.81	66.69	47.10	71.83	52.92	71.83	53.82	5.80	6.37	5.49	5.42	5.81	5.46	5.41	5.27	5.75	5.57	5.52	5.71
09/01/23	09/30/23	Sep 2023	61.82	50.86	53.56	47.08	58.19	47.30	58.91	49.90	58.82	49.92	5.73	6.05	5.53	5.46	5.56	5.50	5.44	5.31	5.79	5.61	5.56	5.75
10/01/23	10/31/23	Oct 2023	61.83	50.74	48.74	47.03	59.02	47.11	57.25	51.24	56.80	50.93	5.76	6.13	5.71	5.73	6.00	5.97	5.53	5.39	6.07	5.88	5.83	5.84
11/01/23	11/30/23	Nov 2023	70.26	56.60	52.86	51.13	66.62	53.05	63.28	56.23	62.37	56.06	6.20	6.60	6.21	6.37	6.62	6.59	6.35	5.61	6.70	6.51	6.46	6.67
12/01/23	12/31/23	Dec 2023	71.06	57.76	54.28	52.65	67.51	54.19	62.77	57.45	62.77	57.46	6.48	6.76	6.45	6.51	6.65	6.62	6.95	5.63	6.85	6.66	6.61	7.29
01/01/24	01/31/24	Jan 2024	70.56	57.77	54.56	52.29	66.35	53.95	62.95	56.92	62.95	56.93	6.44	6.71	6.37	6.38	6.62	6.50	7.20	6.07	6.72	6.53	6.48	7.54
02/01/24	02/29/24	Feb 2024	66.17	56.88	53.87	50.89	61.74	53.01	60.53	54.63	60.36	54.61	6.44	6.38	6.18	6.17	6.40	6.28	6.81	6.11	6.51	6.32	6.27	7.15
03/01/24	03/31/24	Mar 2024	53.61	46.16	49.65	45.85	49.62	42.49	52.97	48.89	52.97	48.88	5.80	5.80	5.71	5.78	6.00	5.88	6.14	6.10	6.12	5.93	5.88	6.48
04/01/24	04/30/24	Apr 2024	52.31	46.10	51.85	47.28	48.37	42.44	57.59	51.08	55.76	50.42	5.74	5.79	5.63	5.67	5.87	5.76	5.91	5.88	6.00	5.81	5.77	6.21
05/01/24	05/31/24	May 2024	45.69	39.58	49.84	45.13	42.04	36.20	51.20	47.18	51.94	47.49	5.78	5.85	5.53	5.49	5.68	5.55	5.69	5.66	5.82	5.63	5.59	5.99
06/01/24	06/30/24	Jun 2024	49.39	41.28	51.95	46.32	45.58	37.82	54.22	48.16	53.91	47.97	5.88	5.89	5.55	5.50	5.69	5.57	5.08	5.11	5.83	5.64	5.60	5.39
07/01/24	07/31/24	Jul 2024	68.75	48.42	69.25	50.25	64.09	44.65	71.49	51.84	71.36	52.13	5.96	6.11	5.64	5.56	5.75	5.62	5.19	5.14	5.89	5.70	5.65	5.50
08/01/24	08/31/24	Aug 2024	76.05	53.39	72.88	53.54	71.09	49.40	76.11	54.84	76.06	55.44	6.00	6.55	5.71	5.61	5.81	5.68	5.22	5.17	5.95	5.76	5.71	5.53
09/01/24	09/30/24	Sep 2024	65.09	53.18	59.09	50.17	60.95	49.32	64.42	53.21	63.75	52.86	5.95	6.24	5.68	5.63	5.83	5.70	5.23	5.18	5.97	5.78	5.73	5.54
10/01/24	10/31/24	Oct 2024	64.09	52.05	53.80	49.59	60.55	48.18	62.37	53.60	60.55	53.14	5.99	6.37	5.93	5.98	6.22	6.10	5.27	5.21	6.31	6.12	6.08	5.58
11/01/24	11/30/24	Nov 2024	71.88	58.89	53.89	52.14	67.65	54.99	66.68	58.02	63.81	57.59	6.34	6.70	6.32	6.45	6.74	6.63	6.20	5.53	6.79	6.60	6.55	6.53
12/01/24	12/31/24	Dec 2024	74.14	60.79	56.19	54.44	69.83	57.02	65.86	60.02	65.59	59.94	6.56	6.98	6.56	6.59	6.84	6.72	7.44	5.53	6.93	6.74	6.69	7.78
01/01/25	01/31/25	Jan 2025	72.91	58.55	57.19	54.64	68.16	54.52	66.16	59.65	66.00	59.61	6.66	7.00	6.57	6.57	6.80	6.68	7.08	5.73	6.92	6.72	6.67	7.43
02/01/25	02/28/25	Feb 2025	65.02	56.68	55.80	52.89	60.50	52.56	63.71	56.84	62.10	56.62	6.61	6.61	6.34	6.32	6.55	6.42	6.47	5.75	6.67	6.47	6.42	6.81
03/01/25	03/31/25	Mar 2025	52.09	46.54	50.57	46.90	48.13	42.82	54.55	50.10	54.08	50.01	5.95	6.00	5.82	5.93	6.14	6.01	5.88	5.80	6.27	6.08	6.03	6.22
04/01/25	04/30/25	Apr 2025	51.00	46.68	51.92	48.39	47.09	42.95	57.60	52.16	55.83	51.62	5.89	5.98	5.71	5.82	6.02	5.89	5.71	5.64	6.15	5.96	5.92	6.00
05/01/25	05/31/25	May 2025	46.53	41.31	51.76	47.10	42.81	37.81	52.92	49.21	53.68	49.54	5.94	6.04	5.70	5.65	5.84	5.70	5.68	5.62	5.98	5.80	5.75	5.98
06/01/25	06/30/25	Jun 2025	51.07	43.28	54.31	48.10	47.15	39.70	57.24	50.47	56.09	49.83	6.04	6.10	5.75	5.67	5.86	5.74	5.54	5.55	6.00	5.81	5.77	5.85
07/01/25	07/31/25	Jul 2025	74.05	50.61	74.88	52.10	69.12	46.71	78.67	54.71	77.33	54.29	6.10	6.28	5.82	5.72	5.91	5.77	5.64	5.57	6.05	5.86	5.82	5.94
08/01/25	08/31/25	Aug 2025	82.61	55.05	80.35	54.07	77.32	51.00	85.31	56.83	84.01	56.78	6.14	6.41	5.93	5.75	5.94	5.80	5.67	5.60	6.08	5.89	5.85	5.98
09/01/25	09/30/25	Sep 2025	68.87	55.45	62.99	51.72	64.40	51.68	72.38	55.40	68.38	54.69	6.08	6.44	5.97	5.82	6.01	5.88	5.71	5.64	6.15	5.96	5.92	6.01
10/01/25	10/31/25	Oct 2025	65.73	52.86	53.72	50.24	61.68	49.13	66.22	56.08	61.90	54.15	6.11	6.44	6.05	6.03	6.35	6.23	5.74	5.67	6.36	6.17	6.12	6.05
11/01/25	11/30/25	Nov 2025	73.34	59.06	55.15	53.33	68.77	55.25	70.01	61.19	65.53	59.15	6.42	6.82	6.37	6.52	6.84	6.72	6.56	5.91	6.85	6.66	6.62	6.88
12/01/25	12/31/25	Dec 2025	78.09	62.51	58.38	56.16	73.60	58.53	70.76	62.68	68.47	62.26	6.69	7.19	6.65	6.72	6.96	6.87	7.28	5.98	7.06	6.87	6.82	7.62
01/01/26	01/31/26	Jan 2026	75.06	60.18	57.60	55.18	70.31	56.24	68.90	60.89	66.63	60.67	6.77	7.05	6.61	6.54	6.49	6.47	6.47	5.94	6.89	6.69	6.64	6.82

02/01/26	02/28/26	Feb 2026	69.61	58.68	57.94	55.02	64.88	54.52	68.32	60.27	64.38	58.99	6.70	6.84	6.50	6.50	6.52	6.50	6.50	5.97	6.85	6.65	6.60	6.84
03/01/26	03/31/26	Mar 2026	59.48	51.20	54.64	50.57	55.18	47.25	59.68	53.40	58.34	53.68	6.21	6.37	6.03	6.21	6.46	6.44	6.42	5.98	6.55	6.36	6.31	6.76
04/01/26	04/30/26	Apr 2026	56.67	50.72	56.31	51.68	52.47	46.79	61.85	56.35	59.53	54.78	6.13	6.26	5.96	6.03	6.41	6.31	6.08	5.79	6.36	6.18	6.13	6.38
05/01/26	05/31/26	May 2026	49.94	44.65	53.63	50.27	46.04	40.98	56.44	52.06	57.14	53.00	6.18	6.43	6.02	6.00	6.23	6.01	6.00	5.73	6.33	6.15	6.10	6.30
06/01/26	06/30/26	Jun 2026	56.00	46.15	57.49	50.36	51.83	42.41	62.92	53.25	59.89	52.58	6.28	6.33	6.05	5.99	6.25	6.03	5.93	5.72	6.32	6.14	6.09	6.23
07/01/26	07/31/26	Jul 2026	82.15	53.69	82.65	54.90	76.83	49.62	88.78	58.05	85.95	57.56	6.34	6.55	6.16	6.08	6.30	6.07	5.98	5.75	6.41	6.22	6.17	6.29
08/01/26	08/31/26	Aug 2026	86.08	58.05	82.42	56.60	80.66	53.88	88.75	59.60	86.38	59.40	6.38	6.72	6.20	6.12	6.37	6.11	6.07	5.78	6.45	6.27	6.22	6.37
09/01/26	09/30/26	Sep 2026	70.96	57.87	63.07	52.99	66.52	54.33	73.52	57.09	69.18	56.11	6.33	6.68	6.16	6.15	6.44	6.17	6.11	5.82	6.48	6.29	6.25	6.41
10/01/26	10/31/26	Oct 2026	67.78	56.61	54.03	52.20	64.05	52.95	67.08	58.13	62.51	56.04	6.36	6.72	6.22	6.21	6.54	6.44	6.21	5.92	6.54	6.36	6.31	6.52
11/01/26	11/30/26	Nov 2026	77.19	61.18	54.98	53.13	73.19	58.35	70.22	62.40	65.49	59.13	6.51	6.78	6.41	6.48	6.79	6.69	6.69	6.13	6.81	6.62	6.58	7.02
12/01/26	12/31/26	Dec 2026	79.82	63.51	57.71	55.58	76.92	60.19	70.68	62.29	67.68	61.67	6.74	7.11	6.64	6.64	6.90	6.80	6.80	6.16	6.98	6.79	6.74	7.14
01/01/27	01/31/27	Jan 2027	80.48	64.74	61.54	58.89	75.56	60.86	73.59	64.86	70.51	64.39	7.29	7.50	7.16	7.18	7.26	7.32	7.32	6.77	7.52	7.33	7.28	7.67
02/01/27	02/28/27	Feb 2027	73.18	61.82	61.37	58.09	68.27	57.63	71.81	63.51	67.51	62.00	7.23	7.23	6.98	6.93	6.97	7.02	7.03	6.53	7.28	7.09	7.04	7.37
03/01/27	03/31/27	Mar 2027	59.99	51.56	55.42	51.28	55.61	47.55	61.40	54.57	59.04	54.36	6.37	6.42	6.17	6.25	6.56	6.51	6.49	6.05	6.60	6.40	6.35	6.83
04/01/27	04/30/27	Apr 2027	56.35	50.50	56.95	52.20	52.13	46.54	63.48	57.57	60.16	55.33	6.28	6.32	6.09	6.15	6.47	6.39	6.14	5.86	6.48	6.30	6.25	6.44
05/01/27	05/31/27	May 2027	50.06	44.66	56.37	52.24	46.12	40.96	57.72	52.62	58.91	54.58	6.34	6.66	6.15	6.15	6.42	6.16	6.08	5.81	6.48	6.29	6.24	6.38
06/01/27	06/30/27	Jun 2027	57.44	47.28	60.05	52.47	53.17	43.46	65.17	54.41	61.90	54.38	6.46	6.62	6.22	6.20	6.47	6.19	6.06	5.86	6.53	6.34	6.30	6.36
07/01/27	07/31/27	Jul 2027	82.66	55.02	84.12	56.43	77.28	50.86	89.86	59.53	86.59	58.92	6.51	6.74	6.34	6.24	6.50	6.24	6.16	5.88	6.57	6.39	6.34	6.46
08/01/27	08/31/27	Aug 2027	87.04	59.33	84.27	58.48	81.51	55.06	90.39	61.36	87.60	60.98	6.55	6.98	6.41	6.31	6.54	6.27	6.20	5.91	6.64	6.46	6.41	6.50
09/01/27	09/30/27	Sep 2027	71.79	59.19	64.94	55.00	67.15	55.40	74.46	58.63	69.97	57.63	6.48	6.90	6.38	6.31	6.60	6.47	6.22	5.94	6.64	6.45	6.41	6.52
10/01/27	10/31/27	Oct 2027	70.04	58.73	58.15	54.68	66.15	55.06	68.59	60.02	63.97	58.03	6.52	6.95	6.43	6.42	6.76	6.63	6.39	6.10	6.76	6.57	6.52	6.69
11/01/27	11/30/27	Nov 2027	81.94	65.32	58.25	56.44	77.99	63.29	73.45	64.88	68.56	62.09	6.80	7.23	6.71	6.77	7.02	6.90	6.91	6.36	7.10	6.91	6.86	7.24
12/01/27	12/31/27	Dec 2027	82.00	65.59	59.78	57.89	78.70	62.26	72.79	64.53	69.32	63.81	7.03	7.41	6.95	6.93	7.06	6.99	6.99	6.39	7.27	7.08	7.03	7.33
01/01/28	01/31/28	Jan 2028	82.32	65.21	62.25	59.59	77.26	61.14	74.89	65.82	71.15	65.11	7.42	7.60	7.30	7.37	7.43	7.47	7.49	6.94	7.71	7.52	7.47	7.84
02/01/28	02/29/28	Feb 2028	73.77	62.31	62.07	58.57	68.78	57.94	72.63	64.31	67.94	62.56	7.35	7.30	7.12	7.10	7.10	7.14	7.16	6.66	7.44	7.25	7.20	7.51
03/01/28	03/31/28	Mar 2028	58.87	51.85	55.72	51.80	54.51	47.80	62.38	55.80	59.35	55.11	6.58	6.59	6.39	6.44	6.76	6.69	6.62	6.18	6.78	6.59	6.54	6.96
04/01/28	04/30/28	Apr 2028	55.50	50.68	56.54	52.54	51.28	46.68	63.84	58.69	59.80	55.82	6.50	6.46	6.29	6.35	6.65	6.50	6.25	5.98	6.68	6.49	6.45	6.55
05/01/28	05/31/28	May 2028	51.57	46.14	57.95	53.61	47.53	42.34	59.96	54.49	60.18	55.89	6.55	6.88	6.34	6.36	6.63	6.34	6.26	6.00	6.69	6.51	6.46	6.56
06/01/28	06/30/28	Jun 2028	60.09	49.10	63.86	55.30	55.67	45.17	68.79	56.56	64.91	56.15	6.68	6.99	6.40	6.42	6.67	6.53	6.23	6.04	6.75	6.56	6.52	6.53
07/01/28	07/31/28	Jul 2028	85.80	57.20	88.72	59.89	80.25	52.91	94.09	62.29	90.41	61.40	6.73	7.15	6.49	6.43	6.69	6.40	6.32	6.05	6.76	6.58	6.53	6.62
08/01/28	08/31/28	Aug 2028	88.67	59.53	86.80	60.10	83.01	55.22	92.80	62.52	89.41	62.17	6.77	7.23	6.63	6.49	6.77	6.43	6.36	6.09	6.82	6.63	6.59	6.66
09/01/28	09/30/28	Sep 2028	72.38	59.64	65.84	56.78	67.70	55.76	74.89	60.15	70.28	59.01	6.69	7.13	6.61	6.54	6.82	6.66	6.41	6.14	6.87	6.68	6.64	6.71
10/01/28	10/31/28	Oct 2028	72.78	59.72	58.79	55.86	68.60	56.10	70.24	61.72	65.42	59.40	6.73	7.17	6.63	6.66	7.09	6.94	6.69	6.42	7.00	6.81	6.76	7.00
11/01/28	11/30/28	Nov 2028	86.50	68.36	61.58	59.73	81.98	65.20	77.31	68.97	72.26	65.60	7.22	7.65	7.17	7.23	7.49	7.35	7.38	6.81	7.57	7.38	7.33	7.70
12/01/28	12/31/28	Dec 2028	86.16	68.61	63.58	61.59	82.74	64.89	76.73	68.45	72.83	67.45	7.47	7.89	7.41	7.40	7.54	7.44	7.47	6.86	7.75	7.55	7.50	7.81
01/01/29	01/31/29	Jan 2029	83.83	65.39	63.78	61.02	78.77	61.13	76.39	67.00	72.46	66.33	7.61	7.80	7.51	7.52	7.50	7.57	7.54	6.99	7.86	7.67	7.62	7.88
02/01/29	02/28/29	Feb 2029	76.89	63.58	65.10	61.69	71.72	59.14	75.90	67.32	70.97	65.55	7.52	7.76	7.31	7.28	7.26	7.32	7.30	6.80	7.62	7.43	7.38	7.64
03/01/29	03/31/29	Mar 2029	62.49	54.83	59.29	55.26	57.95	50.63	66.08	58.65	62.94	58.18	6.89	7.04	6.75	6.79	7.12	7.07	7.05	6.51	7.13	6.94	6.89	7.39
04/01/29	04/30/29	Apr 2029	59.35	54.06	61.13	56.78	54.94	49.90	67.74	61.84	63.64	59.22	6.80	7.00	6.60	6.65	7.01	6.88	6.58	6.32	6.98	6.79	6.75	6.88
05/01/29	05/31/29	May 2029	54.23	48.81	60.70	56.50	50.04	44.85	62.26	57.01	62.10	58.22	6.86	7.20	6.67	6.67	6.95	6.68	6.55	6.31	7.00	6.82	6.77	6.85
06/01/29	06/30/29	Jun 2029	58.53	49.78	63.03	56.36	54.15	45.78	67.41	57.89	63.78	56.92	6.98	7.21	6.69	6.65	6.98	6.67	6.51	6.33	6.98	6.79	6.75	6.81
07/01/29	07/31/29	Jul 2029	87.78	58.59	89.77	61.79	82.11	54.21	96.19	64.28	92.09	63.23	7.09	7.42	6.83	6.79	7.02	6.75	6.58	6.37	7.12	6.93	6.89	6.88
08/01/29	08/31/29	Aug 2029	94.53	61.78	91.05	62.52	88.58	57.33	98.67	65.97	94.47	64.71	7.14	7.53	6.99	6.88	7.09	6.78	6.66	6.40	7.21	7.02	6.97	6.97
09/01/29	09/30/29	Sep 2029	77.52	62.09	70.89	59.93	72.50	58.34	81.26	64.43	76.20	62.50	7.07	7.45	6.98	6.87	7.15	7.01	6.71	6.45	7.21	7.02	6.97	7.02
10/01/29	10/31/29	Oct 2029	75.41	60.51	62.17	58.61	70.87	57.25	74.47	64.76	69.45	62.07	7.11	7.56	7.03	7.01	7.48	7.35	7.05	6.78	7.35	7.16	7.11	7.36
11/01/29	11/30/29	Nov 2029	85.97	65.61	62.02	60.33	81.18	62.31	77.92	69.77	72.78	65.93	7.38	7.75	7.36	7.43	7.74	7.66	7.63	7.09	7.77	7.58	7.53	7.96
12/01/29	12/31/29	Dec 2029	88.33	68.98	63.97	62.18	84.75	65.06	78.11	69.57	73.65	68.08	7.64	7.96	7.60	7.62	7.78	7.70	7.68	7.13	7.96	7.76	7.72	8.02
01/01/30	01/31/30	Jan 2030	85.97	66.95	65.74	63.11	80.78	62.56	78.65	69.18	74.41	68.41	7.77	8.05	7.70	7.71	7.63	7.64	7.57	7.03	8.06	7.86	7.81	7.91
02/01/30	02/28/30	Feb 2030	77.99	64.87	66.19	63.13	72.76	60.27	77.46	69.18	72.40	67.15	7.69	7.93	7.51	7.51	7.48	7.50	7.43	6.98	7.85	7.66	7.61	7.77
03/01/30	03/31/30	Mar 2030	63.35	56.82	61.01	57.19	58.74	52.52	68.33	60.78	64.82	60.29	7.13	7.27	6.99	7.04	7.37	7.38	7.31	6.81	7.38	7.19	7.14	7.65
04/01/30	04/30/30	Apr 2030	59.90	55.53	61.67	58.18	55.45	51.28	69.43	63.97	65.02	61.24	7.07	7.26	6.88	6.90	7.27	7.19	6.85	6.59	7.23	7.04	7.00	7.15
05/01/30	05/31/30	May 2030	55.89	49.89	61.54	58.29	51.59	45.85	64.34	58.61	63.95	60.22	7.13	7.47	6.94	6.93	7.25	6.97	6.89	6.64	7.26	7.07	7.02	7.19
06/01/30	06/30/30	Jun 2030	61.15	52.36	65.21	58.84	56.61	48.21	70.29	60.50	66.49	59.67	7.28	7.50	6.99	6.96	7.30	7.02	6.87	6.69	7.29	7.11	7.06	7.17
07/01/30	07/31/30	Jul 2030	90.28	60.02	92.12	63.32	84.47	55.53	99.15	65.99	94.92	64.97	7.39	7.73	7.14	7.06	7.36	7.05	6.98	6.72	7.39	7.20	7.15	7.28
08/01/30	08/31/30	Aug 2030	96.05	63.26	92.64	65.03	90.01	58.71	101.07	68.43	96.61	67.30	7.45	7.90	7.29	7.19	7.45	7.13	7.02	6.76	7.52	7.33	7.29	7.32
09/01/30	09/30/30	Sep 2030	80.66	63.09	73.31	62.09	75.40	59.54	83.96	66.55	78.75	64.68	7.36	7.75	7.24	7.14	7.57	7.40	7.06	6.80	7.48	7.29	7.24	7.36
10/01/30	10/31/30	Oct 2030	79.21	61.99	65.68	61.58	74.64	59.50	77.18	67.89	72.02	64.68	7.41	7.88	7.31	7.30	7.79	7.62	7.28	7.01	7.64	7.45	7.40	7.59
11/01/30	11/30/30	Nov 2030	90.92	69.89	65.54	63.82	86.36	66.87	81.26	73.20	75.98	69.31	7.78	8.20	7.74	7.78	8.07	7.94	7.86	7.33	8.11	7.92	7.87	8.19
12/01/30	12/31/30	Dec 2030	92.09	72.40	67.18	65.23	88.17	68.11	81.63	72.90	76.88	71.22	8.04	8.35	7.98	8.01	8.12	8.00	7.92	7.37	8.35	8.16	8.11	8.26
01/01/31	01/31/31	Jan 2031	87.90	68.93	67.52	64.67	82.63	64.40	80.36	70.65	75.85	69.75	7.91	8.21	7.84	7.86	7.77	7.79	7.71	7.17	8.20	8.01	7.96	8.06
02/01/31	02/28/31	Feb 2031	79.63	66.21	67.90	64.56	74.30	61.51	78.96	70.84	73.80	68.54	7.84	8.08	7.65	7.65	7.62	7.65	7.57	7.11	8.00	7.80	7.75	7.91
03/01/31	03/31/31	Mar 2031	63.92	58.39	61.85	58.26	59.25	54.01	69.37	62.01	65.67	61.43	7.27	7.41	7.12	7.18	7.51	7.52	7.45	6.94	7.52	7.33	7.28	7.79
04/01/31	04/30/31	Apr 2031	60.51	56.76	62.33	59.26	55.99	52.47	70.27	65.38	65.98	62.63	7.20	7.39	7.01	7.03	7.41	7.33	6.99	6.72	7.36	7.17	7.13	7.28
05/01/31	05/31/31	May 2031	57.16	51.04	62.91	59.65	52.77	46.92	65.90	59.94	65.25	61.52	7.26	7.62	7.07	7.06	7.39	7.10	7.02	6.77	7.39	7.20	7.15	7.32
06/01/31	06/30/31	Jun 2031	62.97	53.70	67.00	60.06	58.33	49.46	72.60	61.92	68.30	60.92	7.42	7.65	7.12	7.10	7.44	7.15	7.00	6.82	7.43	7.24	7.19	7.30
07/01/31	07/31/31	Jul 2031	94.05	61.32	96.31	64.64	88.04	56.74	103.33	67.55	98.80	66.42	7.53	7.88	7.27	7.19	7.50	7.19	7.11	6.85	7.52	7.34	7.29	7.41
08/01/31	08/31/31	Aug 2031	97.46	65.54	95.05	66.72	91.35	60.93	103.15	70.62	98.39	69.09	7.59	8.05	7.42	7.32	7.59	7.27	7.15	6.88	7.66	7.47	7.42	7.46
09/01/31	09/30/31	Sep 2031	81.47	63.36	74.75	62.74	76.08	60.01	85.08	67.16	79.74	65.22	7.50	7.90	7.38	7.28	7.72	7.54	7.19	6.93	7.61	7.43	7.38	7.50
10/01/31	10/31/31	Oct 2031	79.77	63.55	65.62	62.61	74.73	60.27	77.92	69.27	72.66	65.83	7.55	8.03	7.45	7.44	7.94	7.76	7.42	7.15	7.78	7.59	7.54	7.73
11/01/31	11/30/31	Nov 2031	91.48	71.08	66.69	65.22	86.31	67.14	82.31	75.01	76.93	70.73	7.92	8.36	7.89	7.92	8.22	8.09	8.01	7.47	8.26	8.07	8.02	8.34
12/01/31	12/31/31	Dec 2031	94.50	74.51	68.61	66.45	90.53	69.91	83.32	74.25	78.34	72.38	8.19	8.51	8.13	8.16	8.27	8.15	8.07	7.51	8.50	8.31	8.26	8.41
01/01/32	01/31/32	Jan 2032	89.76	70.51	68.36	65.85	84.52	66.01	81.25	71.48	76.77	70.76	8.07	8.36	7.99	8.01	7.92	7.94	7.86	7.30	8.35	8.16	8.11	8.20
02/01/32	02/29/32	Feb 2032	82.79	68.26	68.96	65.74	77.26	63.44	80.20	71.57	75.10	69.67	7.99	8.23	7.79	7.80	7.77	7.79	7.71	7.25	8.14	7.95	7.90	8.06

03/01/32	03/31/32	Mar 2032	65.87	59.81	63.08	59.48	61.06	55.35	70.66	62.95	66.91	62.61	7.41	7.55	7.26	7.31	7.65	7.67	7.59	7.07	7.65	7.46	7.41	7.93
04/01/32	04/30/32	Apr 2032	61.95	58.04	63.95	60.73	57.32	53.65	71.68	66.39	67.23	63.49	7.34	7.53	7.14	7.16	7.55	7.47	7.12	6.85	7.49	7.31	7.26	7.42
05/01/32	05/31/32	May 2032	58.71	52.96	63.77	60.93	54.21	48.72	66.84	61.18	66.18	62.78	7.40	7.76	7.21	7.19	7.53	7.24	7.15	6.90	7.52	7.33	7.29	7.45
06/01/32	06/30/32	Jun 2032	64.41	54.60	67.62	60.88	59.66	50.29	73.96	62.89	69.52	62.11	7.56	7.79	7.26	7.23	7.58	7.29	7.13	6.95	7.56	7.37	7.33	7.43
07/01/32	07/31/32	Jul 2032	93.50	62.06	94.37	65.33	87.48	57.41	102.38	68.28	97.79	67.35	7.68	8.03	7.41	7.33	7.65	7.32	7.24	6.98	7.66	7.47	7.42	7.55
08/01/32	08/31/32	Aug 2032	97.46	66.31	93.14	67.26	91.33	61.63	102.03	70.87	97.33	69.78	7.73	8.20	7.56	7.46	7.74	7.40	7.29	7.02	7.80	7.61	7.56	7.59
09/01/32	09/30/32	Sep 2032	81.64	64.37	71.69	63.10	76.21	61.18	83.77	67.95	78.37	66.07	7.65	8.05	7.52	7.42	7.86	7.68	7.33	7.06	7.75	7.56	7.52	7.63
10/01/32	10/31/32	Oct 2032	81.25	65.05	64.85	63.63	76.17	61.86	78.08	70.38	72.73	67.11	7.70	8.18	7.59	7.58	8.09	7.91	7.56	7.28	7.92	7.73	7.68	7.87
11/01/32	11/30/32	Nov 2032	94.74	73.78	67.95	66.38	89.62	70.00	83.80	75.52	78.29	71.57	8.08	8.51	8.04	8.07	8.37	8.25	8.16	7.61	8.41	8.22	8.17	8.49
12/01/32	12/31/32	Dec 2032	96.51	77.31	69.73	67.80	92.26	72.63	84.67	75.42	79.52	73.59	8.35	8.67	8.28	8.32	8.43	8.30	8.22	7.66	8.66	8.47	8.42	8.56
01/01/33	01/31/33	Jan 2033	90.93	72.64	69.48	67.09	85.55	68.27	82.10	72.52	77.62	71.92	8.23	8.53	8.15	8.17	8.08	8.10	8.02	7.45	8.51	8.32	8.27	8.36
02/01/33	02/28/33	Feb 2033	82.82	69.23	69.83	66.79	77.28	64.37	80.97	72.34	75.85	70.63	8.15	8.40	7.95	7.95	7.92	7.95	7.87	7.39	8.30	8.10	8.05	8.21
03/01/33	03/31/33	Mar 2033	66.98	61.44	63.94	60.65	62.09	56.86	71.38	64.25	67.78	63.92	7.56	7.70	7.40	7.46	7.80	7.82	7.74	7.21	7.80	7.61	7.56	8.08
04/01/33	04/30/33	Apr 2033	63.02	59.13	64.57	61.52	58.30	54.62	73.03	67.63	68.39	65.03	7.49	7.69	7.29	7.31	7.70	7.62	7.26	6.98	7.63	7.45	7.40	7.56
05/01/33	05/31/33	May 2033	59.49	53.29	64.28	61.88	54.92	49.00	67.96	62.09	67.63	64.08	7.55	7.92	7.35	7.33	7.68	7.38	7.29	7.03	7.66	7.48	7.43	7.59
06/01/33	06/30/33	Jun 2033	65.75	55.84	68.77	61.99	60.90	51.43	75.46	63.97	71.07	63.40	7.71	7.95	7.40	7.37	7.73	7.43	7.27	7.09	7.71	7.52	7.47	7.57
07/01/33	07/31/33	Jul 2033	93.36	63.83	93.87	66.89	87.28	59.07	102.20	69.92	97.59	69.04	7.83	8.19	7.56	7.47	7.80	7.47	7.39	7.12	7.81	7.62	7.57	7.69
08/01/33	08/31/33	Aug 2033	99.00	66.73	93.92	67.67	92.77	62.04	103.16	70.72	98.36	70.25	7.89	8.36	7.72	7.61	7.89	7.55	7.43	7.16	7.95	7.76	7.71	7.74
09/01/33	09/30/33	Sep 2033	82.18	65.51	72.09	64.22	76.67	62.30	83.77	68.71	78.34	67.19	7.80	8.21	7.67	7.57	8.02	7.83	7.48	7.20	7.90	7.71	7.66	7.78
10/01/33	10/31/33	Oct 2033	83.67	67.05	67.30	65.12	78.89	64.44	78.94	71.24	73.52	68.33	7.85	8.35	7.74	7.73	8.25	8.07	7.71	7.43	8.07	7.88	7.83	8.02
11/01/33	11/30/33	Nov 2033	97.41	77.73	69.42	67.75	93.02	76.33	85.32	76.70	79.70	72.86	8.24	8.68	8.20	8.24	8.54	8.41	8.33	7.76	8.57	8.38	8.33	8.66
12/01/33	12/31/33	Dec 2033	97.51	78.78	70.84	69.11	93.26	74.72	85.46	76.31	80.36	74.70	8.51	8.85	8.45	8.48	8.60	8.47	8.39	7.81	8.82	8.63	8.58	8.73
01/01/34	01/31/34	Jan 2034	93.46	74.92	70.78	68.39	88.15	70.62	82.97	73.68	78.19	72.79	8.38	8.69	8.31	8.32	8.23	8.25	8.17	7.59	8.67	8.47	8.42	8.51
02/01/34	02/28/34	Feb 2034	86.39	71.48	71.07	67.82	80.68	66.57	81.57	73.14	76.23	71.49	8.30	8.56	8.10	8.11	8.08	8.10	8.02	7.54	8.45	8.26	8.21	8.36
03/01/34	03/31/34	Mar 2034	68.92	63.14	64.82	61.58	63.92	58.45	72.33	65.32	68.80	65.08	7.70	7.85	7.54	7.60	7.95	7.97	7.89	7.35	7.94	7.75	7.70	8.23
04/01/34	04/30/34	Apr 2034	64.20	60.54	65.37	62.52	59.40	55.92	74.09	68.83	69.41	66.21	7.63	7.83	7.43	7.44	7.85	7.76	7.40	7.12	7.77	7.59	7.54	7.70
05/01/34	05/31/34	May 2034	61.04	54.34	65.38	62.99	56.36	49.97	69.06	63.15	68.92	65.22	7.69	8.07	7.49	7.47	7.82	7.52	7.43	7.17	7.80	7.62	7.57	7.73
06/01/34	06/30/34	Jun 2034	67.43	57.14	69.78	63.10	62.48	52.64	76.93	65.01	72.46	64.41	7.86	8.10	7.54	7.51	7.88	7.57	7.41	7.22	7.85	7.66	7.61	7.71
07/01/34	07/31/34	Jul 2034	96.93	65.32	96.68	67.99	90.68	60.46	105.35	70.85	100.78	69.96	7.98	8.34	7.70	7.62	7.95	7.61	7.53	7.25	7.95	7.76	7.71	7.83
08/01/34	08/31/34	Aug 2034	101.42	68.55	94.61	68.66	95.08	63.78	104.39	71.61	99.52	71.20	8.04	8.52	7.86	7.76	8.04	7.70	7.57	7.29	8.09	7.90	7.85	7.88
09/01/34	09/30/34	Sep 2034	83.15	67.02	72.18	65.30	77.69	63.81	83.77	69.66	78.37	68.20	7.95	8.36	7.81	7.71	8.17	7.98	7.62	7.34	8.04	7.86	7.81	7.92
10/01/34	10/31/34	Oct 2034	86.60	68.64	67.80	66.15	81.67	65.85	80.27	72.60	74.76	69.65	8.00	8.51	7.89	7.88	8.41	8.22	7.86	7.57	8.22	8.03	7.98	8.17
11/01/34	11/30/34	Nov 2034	98.28	79.02	70.46	68.82	93.59	76.19	85.98	77.85	80.23	73.85	8.39	8.85	8.35	8.39	8.70	8.57	8.49	7.91	8.73	8.54	8.49	8.81
12/01/34	12/31/34	Dec 2034	98.95	81.33	72.25	70.57	94.97	77.76	86.38	77.43	81.14	75.67	8.68	9.01	8.61	8.64	8.76	8.63	8.54	7.96	8.98	8.79	8.74	8.88
01/01/35	01/31/35	Jan 2035	95.48	76.59	71.84	69.64	90.52	72.21	84.14	74.71	79.57	74.20	8.55	8.87	8.47	8.49	8.39	8.42	8.33	7.74	8.83	8.64	8.59	8.68
02/01/35	02/28/35	Feb 2035	91.80	74.39	72.36	69.07	85.87	69.31	83.06	74.30	77.69	72.82	8.47	8.73	8.26	8.27	8.24	8.26	8.18	7.69	8.61	8.42	8.37	8.52
03/01/35	03/31/35	Mar 2035	72.41	65.17	65.94	62.90	67.26	60.36	73.34	66.48	70.03	66.37	7.85	8.01	7.69	7.75	8.11	8.13	8.05	7.49	8.09	7.90	7.85	8.39
04/01/35	04/30/35	Apr 2035	67.41	62.67	67.43	64.07	62.47	58.01	75.84	69.84	71.27	67.45	7.78	7.99	7.57	7.59	8.01	7.92	7.55	7.26	7.92	7.74	7.69	7.84
05/01/35	05/31/35	May 2035	62.86	56.50	66.45	64.29	58.07	51.98	69.40	64.37	70.21	66.60	7.85	8.23	7.64	7.62	7.98	7.67	7.58	7.31	7.95	7.77	7.72	7.88
06/01/35	06/30/35	Jun 2035	66.30	57.65	68.73	64.17	61.36	53.09	74.97	65.49	71.25	65.11	8.01	8.26	7.70	7.66	8.04	7.73	7.56	7.36	8.00	7.81	7.76	7.86
07/01/35	07/31/35	Jul 2035	99.80	66.76	98.83	69.12	93.38	61.80	107.66	71.61	103.04	71.08	8.14	8.51	7.86	7.77	8.11	7.76	7.68	7.40	8.10	7.91	7.87	7.98
08/01/35	08/31/35	Aug 2035	108.40	71.16	100.09	70.19	101.73	66.29	110.27	73.28	105.41	72.88	8.20	8.69	8.02	7.91	8.20	7.85	7.72	7.44	8.25	8.06	8.01	8.03
09/01/35	09/30/35	Sep 2035	87.46	69.68	76.63	67.55	81.66	66.08	89.24	72.26	83.61	70.52	8.11	8.53	7.97	7.86	8.33	8.14	7.77	7.49	8.20	8.01	7.96	8.08
10/01/35	10/31/35	Oct 2035	87.35	69.15	69.04	67.16	82.11	66.40	82.32	73.47	76.70	70.88	8.16	8.68	8.05	8.04	8.57	8.38	8.02	7.72	8.37	8.19	8.14	8.32
11/01/35	11/30/35	Nov 2035	98.73	78.68	71.39	70.06	93.38	74.83	86.66	78.15	80.90	75.01	8.56	9.03	8.52	8.56	8.88	8.74	8.66	8.07	8.89	8.71	8.66	8.98
12/01/35	12/31/35	Dec 2035	100.74	83.26	73.46	71.77	96.82	80.28	87.88	78.55	82.70	77.10	8.85	9.19	8.78	8.82	8.94	8.80	8.72	8.12	9.16	8.97	8.92	9.06
01/01/36	01/31/36	Jan 2036	96.08	78.31	72.82	70.77	92.93	74.78	85.76	76.23	81.66	75.98	8.72	9.04	8.64	8.66	8.56	8.58	8.50	7.90	9.00	8.81	8.76	8.84
02/01/36	02/29/36	Feb 2036	88.47	73.17	72.60	70.08	88.21	71.11	84.81	75.69	79.61	74.49	8.64	8.90	8.43	8.43	8.40	8.42	8.34	7.84	8.78	8.58	8.53	8.69
03/01/36	03/31/36	Mar 2036	72.19	66.72	67.03	64.19	68.94	61.94	74.14	67.80	71.29	67.73	8.01	8.17	7.85	7.91	8.27	8.29	8.21	7.64	8.25	8.06	8.01	8.55
04/01/36	04/30/36	Apr 2036	67.71	64.00	68.10	64.56	63.77	59.20	76.46	70.95	72.23	68.54	7.94	8.15	7.73	7.75	8.17	8.08	7.70	7.40	8.07	7.89	7.84	7.99
05/01/36	05/31/36	May 2036	63.48	56.62	66.97	65.49	58.61	52.06	69.52	65.32	70.90	67.90	8.00	8.39	7.79	7.78	8.14	7.83	7.73	7.46	8.11	7.92	7.87	8.03
06/01/36	06/30/36	Jun 2036	68.96	59.60	70.27	65.72	63.86	54.91	77.34	67.11	73.53	66.77	8.17	8.43	7.85	7.82	8.20	7.88	7.71	7.51	8.15	7.96	7.92	8.01
07/01/36	07/31/36	Jul 2036	101.45	68.18	98.88	69.96	94.93	63.11	108.96	72.21	104.41	72.08	8.30	8.68	8.01	7.92	8.27	7.92	7.83	7.55	8.26	8.07	8.02	8.14
08/01/36	08/31/36	Aug 2036	108.49	73.45	99.48	71.86	101.85	68.59	110.05	74.83	105.38	74.73	8.36	8.87	8.18	8.07	8.37	8.01	7.88	7.59	8.40	8.22	8.17	8.18
09/01/36	09/30/36	Sep 2036	87.00	70.49	76.55	67.85	83.74	67.30	90.98	72.58	85.29	71.27	8.27	8.70	8.13	8.02	8.50	8.31	7.93	7.64	8.35	8.17	8.12	8.23
10/01/36	10/31/36	Oct 2036	87.07	71.22	71.01	69.13	85.69	69.23	84.11	75.16	78.36	72.69	8.32	8.85	8.21	8.20	8.75	8.55	8.18	7.87	8.53	8.35	8.30	8.48
11/01/36	11/30/36	Nov 2036	101.64	83.21	73.05	71.70	97.52	81.75	89.09	79.81	83.20	76.72	8.73	9.21	8.69	8.73	9.06	8.92	8.83	8.23	9.07	8.88	8.83	9.16
12/01/36	12/31/36	Dec 2036	102.95	85.08	74.91	73.17	99.53	82.85	89.87	80.00	84.78	78.62	9.03	9.38	8.96	8.99	9.12	8.98	8.89	8.28	9.33	9.14	9.09	9.23
01/01/37	01/31/37	Jan 2037	95.86	77.87	74.06	72.19	96.06	77.47	86.62	77.56	82.83	77.33	8.90	9.22	8.81	8.83	8.73	8.76	8.67	8.05	9.18	8.98	8.93	9.01
02/01/37	02/28/37	Feb 2037	85.66	75.00	73.59	71.29	91.24	73.51	85.85	77.02	80.73	75.77	8.81	9.08	8.60	8.60	8.57	8.59	8.51	8.00	8.94	8.75	8.70	8.85
03/01/37	03/31/37	Mar 2037	73.31	68.43	67.91	65.18	71.78	63.69	75.21	69.01	72.28	68.88	8.17	8.33	8.00	8.07	8.44	8.46	8.37	7.80	8.41	8.22	8.17	8.71
04/01/37	04/30/37	Apr 2037	68.97	65.48	68.94	65.59	65.17	60.58	77.55	71.87	73.33	69.72	8.09	8.31	7.88	7.90	8.33	8.24	7.85	7.55	8.23	8.04	8.00	8.15
05/01/37	05/31/37	May 2037	64.85	58.35	68.10	66.84	59.89	53.68	70.05	66.65	71.99	69.25	8.16	8.56	7.95	7.93	8.30	7.98	7.89	7.61	8.26	8.08	8.03	8.19
06/01/37	06/30/37	Jun 2037	70.49	60.99	71.36	67.06	65.31	56.20	78.47	68.37	74.64	68.06	8.34	8.60	8.01	7.97	8.36	8.04	7.86	7.66	8.31	8.12	8.07	8.17
07/01/37	07/31/37	Jul 2037	102.92	70.11	100.13	71.22	97.17	65.09	110.87	73.27	105.96	73.01	8.47	8.85	8.17	8.08	8.43	8.08	7.99	7.70	8.41	8.23	8.18	8.29
08/01/37	08/31/37	Aug 2037	108.19	73.98	99.40	73.11	103.45	70.36	110.23	75.79	105.60	75.71	8.53	9.05	8.34	8.23	8.54	8.17	8.04	7.74	8.56	8.38	8.33	8.34
09/01/37	09/30/37	Sep 2037	86.91	71.54	76.65	69.06	86.84	69.62	91.29	73.59	85.60	72.37	8.43	8.88	8.29	8.18	8.67	8.47	8.08	7.79	8.52	8.33	8.28	8.39
10/01/37	10/31/37	Oct 2037	83.14	72.30	71.71	69.99	87.26	70.74	84.54	76.30	78.73	73.88	8.49	9.03	8.37	8.36	8.92	8.72	8.34	8.03	8.70	8.51	8.46	8.65
11/01/37	11/30/37	Nov 2037	95.66	80.93	74.33	72.94	99.19	82.42	90.51	81.76	84.52	78.12	8.91	9.39	8.87	8.91	9.24	9.10	9.01	8.39	9.24	9.05	9.00	9.33
12/01/37	12/31/37	Dec 2037	101.45	83.58	76.33	74.60	102.12	85.74	90.61	81.17	86.20	80.08	9.21	9.57	9.14	9.17	9.30	9.16	9.07	8.45	9.51	9.32	9.27	9.41
01/01/38	01/31/38	Jan 2038	98.55	82.14	75.41	73.67	98.43	82.10	88.11	79.23	84.27	79.03	9.07	9.41	8.99	9.01	8.91	8.93	8.84	8.22	9.35	9.16	9.11	9.19
02/01/38	02/28/38	Feb 2038	89.06	79.42	74.64	72.70	95.10	78.86	87.51	78.28	82.36	77.38	8.99	9.26	8.77	8.77	8.74	8.77	8.68	8.16	9.12	8.92	8.87	9.02
03/01/38	03/31/38	Mar 2038	77.16	71.04	69.26	66.66	75.94	66.12	76.31	70.18	73.59	70.32	8.33	8.50	8.16	8.23	8.61	8.63	8.54	7.95	8.57	8.38	8.33	8.88

04/01/38	04/30/38	Apr 2038	73.07	68.27	70.93	67.49	69.43	63.49	78.84	73.24	75.24	71.55	8.26	8.48	8.04	8.06	8.50	8.40	8.01	7.70	8.39	8.20	8.16	8.31
05/01/38	05/31/38	May 2038	67.25	61.11	69.80	68.26	62.14	56.27	70.94	68.07	73.74	70.76	8.33	8.73	8.11	8.09	8.47	8.14	8.05	7.76	8.42	8.23	8.19	8.35
06/01/38	06/30/38	Jun 2038	73.21	63.04	72.35	68.17	67.91	58.11	80.38	69.66	76.42	69.53	8.51	8.77	8.17	8.13	8.53	8.20	8.02	7.82	8.47	8.28	8.23	8.32
07/01/38	07/31/38	Jul 2038	105.10	73.56	101.12	72.53	99.13	68.45	112.13	74.56	107.31	74.64	8.64	9.03	8.34	8.24	8.60	8.24	8.15	7.85	8.58	8.39	8.34	8.45
08/01/38	08/31/38	Aug 2038	112.97	78.57	101.71	74.42	108.13	74.80	112.88	76.96	108.56	77.24	8.70	9.23	8.51	8.40	8.71	8.33	8.20	7.89	8.73	8.54	8.49	8.50
09/01/38	09/30/38	Sep 2038	88.89	75.98	76.20	70.26	89.91	73.58	91.35	74.67	85.72	73.77	8.60	9.05	8.46	8.35	8.84	8.64	8.25	7.94	8.68	8.49	8.44	8.55
10/01/38	10/31/38	Oct 2038	85.67	76.76	72.68	71.12	90.35	74.74	85.71	77.75	79.82	75.29	8.66	9.21	8.54	8.53	9.10	8.90	8.51	8.19	8.87	8.68	8.63	8.82
11/01/38	11/30/38	Nov 2038	99.12	84.56	76.19	74.43	102.04	87.32	92.68	82.76	86.56	79.68	9.09	9.58	9.04	9.08	9.42	9.28	9.19	8.56	9.42	9.23	9.18	9.51
12/01/38	12/31/38	Dec 2038	103.95	87.33	77.80	76.12	105.04	90.63	92.38	82.90	87.74	81.75	9.39	9.76	9.32	9.36	9.49	9.34	9.25	8.62	9.70	9.51	9.46	9.59
01/01/39	01/31/39	Jan 2039	101.71	84.61	77.28	75.22	101.57	84.26	90.68	81.06	86.46	80.78	9.26	9.60	9.17	9.19	9.09	9.11	9.02	8.38	9.53	9.34	9.29	9.36
02/01/39	02/28/39	Feb 2039	90.95	81.59	76.28	74.23	97.19	81.33	89.51	80.30	84.01	78.97	9.17	9.45	8.94	8.95	8.92	8.94	8.85	8.32	9.29	9.10	9.05	9.20
03/01/39	03/31/39	Mar 2039	79.62	73.07	70.69	68.05	78.23	68.14	78.26	71.76	75.13	71.84	8.50	8.67	8.33	8.39	8.78	8.80	8.71	8.11	8.73	8.54	8.49	9.05
04/01/39	04/30/39	Apr 2039	74.71	69.66	72.06	68.61	70.90	64.82	80.40	74.88	76.49	72.88	8.42	8.65	8.20	8.22	8.67	8.57	8.17	7.86	8.55	8.36	8.32	8.47
05/01/39	05/31/39	May 2039	68.35	61.57	71.19	69.55	63.15	56.66	73.28	69.42	75.32	72.17	8.49	8.91	8.27	8.25	8.64	8.30	8.21	7.91	8.58	8.40	8.35	8.51
06/01/39	06/30/39	Jun 2039	75.79	64.85	74.84	69.63	70.43	59.81	83.41	71.22	78.90	71.04	8.68	8.94	8.33	8.30	8.70	8.36	8.18	7.97	8.63	8.44	8.39	8.48
07/01/39	07/31/39	Jul 2039	111.25	76.37	107.73	74.97	104.85	71.16	118.86	77.46	114.02	77.24	8.81	9.21	8.50	8.41	8.77	8.40	8.31	8.01	8.74	8.55	8.51	8.62
08/01/39	08/31/39	Aug 2039	118.94	80.14	107.94	75.61	113.57	76.53	119.54	78.08	114.95	78.59	8.88	9.41	8.68	8.56	8.88	8.50	8.36	8.05	8.90	8.71	8.66	8.67
09/01/39	09/30/39	Sep 2039	91.33	77.82	77.64	71.79	92.60	75.44	92.91	76.36	87.11	75.37	8.78	9.23	8.63	8.51	9.02	8.81	8.41	8.10	8.85	8.66	8.61	8.72
10/01/39	10/31/39	Oct 2039	89.36	79.21	74.87	73.29	94.42	77.95	87.92	79.65	81.89	77.15	8.83	9.39	8.71	8.70	9.28	9.07	8.68	8.36	9.04	8.85	8.80	8.99
11/01/39	11/30/39	Nov 2039	104.31	87.87	78.21	76.09	108.16	92.07	95.70	85.12	89.40	81.54	9.27	9.77	9.22	9.27	9.61	9.46	9.37	8.73	9.60	9.41	9.36	9.70
12/01/39	12/31/39	Dec 2039	106.55	89.48	79.75	77.74	107.76	93.23	94.80	84.89	89.81	83.50	9.58	9.95	9.50	9.54	9.68	9.53	9.43	8.79	9.88	9.69	9.64	9.77
01/01/40	01/31/40	Jan 2040	96.09	85.89	78.71	76.64	102.75	85.84	91.67	82.24	87.37	81.96	9.44	9.79	9.35	9.37	9.27	9.29	9.20	8.55	9.72	9.52	9.47	9.54
02/01/40	02/29/40	Feb 2040	91.24	82.93	78.08	75.75	97.61	82.44	90.11	81.34	84.77	80.22	9.35	9.64	9.12	9.13	9.09	9.12	9.03	8.49	9.47	9.28	9.23	9.37
03/01/40	03/31/40	Mar 2040	81.23	74.35	71.71	69.35	78.75	69.12	79.34	73.17	76.13	73.21	8.67	8.84	8.49	8.56	8.95	8.97	8.88	8.27	8.90	8.71	8.66	9.23
04/01/40	04/30/40	Apr 2040	76.17	70.83	72.87	69.74	71.95	65.72	81.73	76.60	77.38	74.09	8.59	8.82	8.36	8.38	8.84	8.74	8.33	8.02	8.71	8.53	8.48	8.63
05/01/40	05/31/40	May 2040	69.99	62.83	72.95	71.22	64.67	57.83	74.77	70.79	76.90	73.64	8.66	9.08	8.43	8.42	8.81	8.47	8.37	8.07	8.75	8.56	8.51	8.67
06/01/40	06/30/40	Jun 2040	77.44	66.24	76.93	71.17	72.04	61.09	85.12	72.53	80.55	72.25	8.85	9.12	8.50	8.46	8.87	8.53	8.35	8.13	8.79	8.61	8.56	8.65
07/01/40	07/31/40	Jul 2040	109.95	77.96	107.65	76.18	104.30	72.61	118.51	78.48	113.53	78.14	8.99	9.39	8.67	8.58	8.95	8.57	8.48	8.17	8.91	8.72	8.67	8.78
08/01/40	08/31/40	Aug 2040	113.14	81.06	105.47	77.00	110.69	77.30	116.71	79.19	112.12	79.53	9.05	9.60	8.85	8.73	9.06	8.67	8.53	8.21	9.07	8.88	8.83	8.83
09/01/40	09/30/40	Sep 2040	88.28	79.20	78.15	73.72	91.78	76.95	90.79	77.55	85.32	76.42	8.95	9.42	8.80	8.68	9.20	8.99	8.58	8.27	9.02	8.83	8.78	8.88
10/01/40	10/31/40	Oct 2040	90.52	81.01	75.95	74.37	96.24	79.62	88.85	80.73	82.67	78.30	9.01	9.58	8.89	8.88	9.47	9.26	8.85	8.52	9.21	9.02	8.97	9.16
11/01/40	11/30/40	Nov 2040	101.55	88.19	79.12	77.42	107.13	91.93	95.96	86.88	89.62	82.77	9.45	9.97	9.41	9.45	9.80	9.65	9.56	8.91	9.79	9.60	9.55	9.88
12/01/40	12/31/40	Dec 2040	104.28	90.64	81.16	79.31	109.40	94.82	95.82	86.22	91.11	85.07	9.77	10.15	9.69	9.73	9.87	9.72	9.62	8.96	10.07	9.88	9.83	9.96
01/01/41	01/31/41	Jan 2041	99.50	88.55	80.33	78.11	106.34	88.16	93.47	83.72	89.48	83.47	9.63	9.98	9.54	9.56	9.45	9.48	9.38	8.72	9.90	9.71	9.66	9.73
02/01/41	02/28/41	Feb 2041	95.30	86.13	79.64	77.13	101.98	86.66	91.97	82.97	86.80	81.85	9.54	9.83	9.31	9.31	9.28	9.30	9.21	8.66	9.65	9.46	9.41	9.55
03/01/41	03/31/41	Mar 2041	84.96	77.49	72.95	70.79	83.63	72.27	80.30	74.73	77.32	74.67	8.84	9.02	8.66	8.73	9.13	9.15	9.06	8.44	9.07	8.88	8.83	9.40
04/01/41	04/30/41	Apr 2041	80.82	73.52	74.77	71.69	77.41	68.74	83.01	77.96	78.78	75.36	8.76	9.00	8.53	8.55	9.02	8.92	8.50	8.18	8.88	8.69	8.65	8.80
05/01/41	05/31/41	May 2041	72.35	65.90	74.08	72.57	66.98	60.71	75.21	72.30	78.33	75.19	8.84	9.27	8.60	8.59	8.99	8.64	8.54	8.23	8.92	8.73	8.68	8.84
06/01/41	06/30/41	Jun 2041	77.66	67.48	76.39	72.66	72.22	62.23	83.01	73.67	79.21	73.19	9.03	9.30	8.67	8.63	9.05	8.70	8.51	8.29	8.96	8.78	8.73	8.81
07/01/41	07/31/41	Jul 2041	115.08	80.01	111.77	77.12	109.26	74.48	122.59	79.07	117.92	78.92	9.17	9.58	8.85	8.75	9.13	8.74	8.65	8.33	9.08	8.89	8.85	8.95
08/01/41	08/31/41	Aug 2041	122.25	84.59	112.83	78.56	119.19	81.02	124.23	81.12	119.56	81.17	9.23	9.79	9.03	8.91	9.24	8.84	8.70	8.38	9.24	9.06	9.01	9.00
09/01/41	09/30/41	Sep 2041	96.32	81.99	83.74	75.71	99.44	79.89	99.27	80.30	93.26	79.04	9.13	9.61	8.97	8.86	9.39	9.17	8.75	8.43	9.19	9.00	8.95	9.06
10/01/41	10/31/41	Oct 2041	92.08	82.64	77.40	75.54	97.50	80.79	91.13	82.38	84.87	79.88	9.19	9.77	9.06	9.05	9.66	9.44	9.03	8.69	9.39	9.20	9.15	9.34
11/01/41	11/30/41	Nov 2041	102.03	89.48	80.26	78.80	106.72	92.01	96.71	87.53	90.25	84.13	9.64	10.16	9.60	9.64	10.00	9.85	9.75	9.08	9.97	9.79	9.74	10.08
12/01/41	12/31/41	Dec 2041	108.58	93.28	82.72	80.65	113.76	97.91	97.83	87.47	92.86	86.54	9.97	10.35	9.89	9.93	10.07	9.91	9.82	9.14	10.27	10.08	10.03	10.15
01/01/42	01/31/42	Jan 2042	102.83	91.36	82.17	79.81	109.61	90.93	95.17	85.57	91.19	85.17	9.83	10.19	9.74	9.76	9.65	9.68	9.58	8.90	10.10	9.91	9.86	9.93
02/01/42	02/28/42	Feb 2042	98.27	88.94	81.42	78.85	105.13	90.21	93.92	84.69	88.63	83.54	9.74	10.04	9.50	9.51	9.47	9.50	9.40	8.84	9.85	9.66	9.61	9.75
03/01/42	03/31/42	Mar 2042	87.93	79.69	74.59	72.38	86.70	74.43	82.14	76.39	78.92	76.20	9.03	9.21	8.85	8.91	9.32	9.35	9.25	8.62	9.26	9.06	9.01	9.59
04/01/42	04/30/42	Apr 2042	83.02	75.32	75.70	72.71	79.33	70.45	84.79	80.03	80.11	76.95	8.95	9.18	8.71	8.73	9.21	9.10	8.68	8.35	9.06	8.87	8.83	8.97
05/01/42	05/31/42	May 2042	73.11	66.10	75.42	74.15	67.60	60.86	76.38	73.82	79.67	76.81	9.02	9.46	8.78	8.77	9.17	8.82	8.72	8.41	9.10	8.91	8.86	9.02
06/01/42	06/30/42	Jun 2042	80.81	69.41	78.59	74.28	75.35	64.02	84.91	75.13	81.47	74.85	9.22	9.50	8.85	8.81	9.24	8.88	8.69	8.47	9.14	8.96	8.91	8.99
07/01/42	07/31/42	Jul 2042	118.29	82.64	114.47	78.85	112.36	76.92	125.65	80.95	120.46	80.74	9.36	9.78	9.03	8.93	9.32	8.93	8.83	8.51	9.26	9.08	9.03	9.13
08/01/42	08/31/42	Aug 2042	125.71	87.13	115.63	80.64	121.98	84.01	126.39	83.42	122.09	83.19	9.43	10.00	9.22	9.10	9.43	9.02	8.88	8.55	9.43	9.24	9.20	9.19
09/01/42	09/30/42	Sep 2042	98.45	83.87	85.35	76.89	102.06	82.48	100.19	81.21	94.01	80.09	9.32	9.81	9.16	9.04	9.58	9.36	8.93	8.61	9.38	9.19	9.14	9.24
10/01/42	10/31/42	Oct 2042	95.66	85.00	79.88	78.25	101.53	84.24	92.53	84.38	86.15	81.56	9.38	9.98	9.25	9.24	9.86	9.64	9.22	8.88	9.58	9.39	9.34	9.53
11/01/42	11/30/42	Nov 2042	107.01	93.31	82.31	80.60	113.28	97.55	99.23	89.86	92.58	86.11	9.84	10.38	9.80	9.84	10.21	10.05	9.95	9.27	10.18	9.99	9.94	10.28
12/01/42	12/31/42	Dec 2042	112.30	95.85	84.39	82.40	118.42	100.56	99.87	89.20	94.51	88.14	10.18	10.57	10.10	10.14	10.28	10.12	10.02	9.33	10.48	10.29	10.24	10.36
01/01/43	01/31/43	Jan 2043	104.26	93.18	83.78	81.44	110.90	92.23	96.41	87.08	92.50	86.80	10.04	10.41	9.95	9.97	9.85	9.88	9.78	9.09	10.31	10.12	10.07	10.13
02/01/43	02/28/43	Feb 2043	99.94	90.80	83.36	80.60	106.91	91.86	95.77	86.43	90.48	85.24	9.94	10.25	9.70	9.71	9.67	9.70	9.60	9.02	10.05	9.86	9.81	9.94
03/01/43	03/31/43	Mar 2043	89.73	81.45	75.96	73.77	88.12	75.98	83.99	77.95	80.50	77.77	9.22	9.40	9.03	9.10	9.52	9.54	9.45	8.80	9.44	9.25	9.20	9.79
04/01/43	04/30/43	Apr 2043	84.41	76.64	76.74	73.87	80.16	71.51	86.37	81.64	81.49	78.39	9.13	9.38	8.89	8.91	9.40	9.29	8.86	8.52	9.24	9.06	9.01	9.16
05/01/43	05/31/43	May 2043	74.43	67.87	77.23	75.73	68.79	62.51	77.68	75.34	81.47	78.56	9.21	9.66	8.97	8.95	9.37	9.01	8.90	8.58	9.28	9.09	9.05	9.20
06/01/43	06/30/43	Jun 2043	83.28	71.10	81.04	75.81	77.77	65.59	86.74	76.69	84.13	76.80	9.41	9.70	9.03	9.00	9.44	9.07	8.87	8.65	9.33	9.14	9.10	9.18
07/01/43	07/31/43	Jul 2043	120.53	84.37	117.14	80.42	114.24	78.41	127.86	82.27	122.82	82.58	9.55	9.99	9.22	9.12	9.52	9.11	9.01	8.68	9.45	9.26	9.22	9.32
08/01/43	08/31/43	Aug 2043	125.86	89.02	115.66	82.35	122.07	84.96	126.05	84.80	121.86	85.03	9.63	10.21	9.41	9.29	9.63	9.21	9.07	8.73	9.62	9.43	9.39	9.37
09/01/43	09/30/43	Sep 2043	99.75	85.67	87.63	78.55	103.61	83.82	101.59	82.94	95.45	81.97	9.52	10.01	9.36	9.23	9.78	9.56	9.12	8.79	9.57	9.38	9.33	9.43
10/01/43	10/31/43	Oct 2043	96.66	86.62	80.93	79.34	102.15	84.76	94.22	86.02	87.70	83.43	9.58	10.18	9.45	9.44	10.07	9.84	9.41	9.06	9.77	9.58	9.54	9.72
11/01/43	11/30/43	Nov 2043	108.70	95.00	83.80	82.12	113.08	97.64	100.84	91.48	94.10	87.66	10.05	10.60	10.00	10.05	10.42	10.26	10.16	9.47	10.38	10.20	10.15	10.49
12/01/43	12/31/43	Dec 2043	115.20	98.63	86.22	84.17	121.53	103.08	101.90	91.18	96.40	90.03	10.39	10.79	10.31	10.35	10.49	10.34	10.23	9.53	10.69	10.50	10.45	10.57
01/01/44	01/31/44	Jan 2044	106.45	95.14	85.54	83.15	113.23	94.17	98.44	88.90	94.44	88.63	10.25	10.63	10.15	10.17	10.06	10.09	9.99	9.28	10.52	10.33	10.28	10.33
02/01/44	02/29/44	Feb 2044	102.04	92.71	85.11	82.30	109.16	93.79	97.78	88.24	92.38	87.03	10.15	10.46	9.90	9.91	9.87	9.90	9.80	9.21	10.25	10.06	10.01	10.15
03/01/44	03/31/44	Mar 2044	91.62	83.16	77.56	75.32	89.97	77.57	85.76	79.59	82.19	79.40	9.41	9.60	9.22	9.29	9.72	9.74	9.65	8.98	9.63	9.44	9.39	9.99
04/01/44	04/30/44	Apr 2044	86.18	78.25	78.35	75.42	81.84	73.02	88.18	83.36	83.21	80.04	9.33	9.57	9.08	9.10	9.60	9.49	9.04	8.70	9.43	9.25	9.20	9.34

	05/01/44	05/31/44	May 2044	75.99	69.30	78.85	77.32	70.23	63.82	79.31	76.92	83.18	80.21	9.41	9.86	9.16	9.14	9.56	9.20	9.09	8.76	9.47	9.28	9.24	9.39
	06/01/44	06/30/44	Jun 2044	85.03	72.60	82.75	77.41	79.41	66.97	88.56	78.30	85.89	78.42	9.61	9.90	9.22	9.19	9.63	9.26	9.06	8.83	9.52	9.33	9.29	9.36
	07/01/44	07/31/44	Jul 2044	123.06	86.14	119.60	82.11	116.63	80.05	130.54	84.00	125.40	84.32	9.75	10.20	9.42	9.31	9.72	9.30	9.20	8.87	9.64	9.46	9.41	9.51
	08/01/44	08/31/44	Aug 2044	128.51	90.88	118.09	84.08	124.64	86.74	128.70	86.58	124.42	86.82	9.83	10.42	9.61	9.48	9.83	9.41	9.26	8.92	9.82	9.63	9.58	9.56
	09/01/44	09/30/44	Sep 2044	101.85	87.47	89.47	80.20	105.78	85.58	103.73	84.68	97.45	83.70	9.72	10.22	9.55	9.43	9.99	9.76	9.31	8.97	9.76	9.57	9.52	9.62

Quote Date		Data Type:	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur
6/30/2014		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB Forward Prices		Palo Verde Forward Prices		Mid-Columbia Forward Prices		NP 15 Forward Prices		SP 15 Forward Prices		Henry Hub Gas Fwd Price	SOCALBOR Fwd Price	SANJUAN Fwd Price	Opal Gas Fwd Price	Malin Gas Fwd Price	Stanfield Gas Fwd Price	SUMAS Fwd Price	AECO Fwd Price	GADSBY Fwd Price	Currant Creek Fwd Price	Lakeside Fwd Price	Z_CHEBRN Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
07/01/14	7/31/2014	Jul 2014	51.50	29.50	54.25	34.00	45.50	26.50	56.25	42.50	56.50	42.00	4.40	4.69	4.44	4.34	4.52	4.46	4.39	4.30	4.68	4.48	4.51	4.35
08/01/14	08/31/14	Aug 2014	57.25	37.25	54.25	36.50	52.25	34.50	58.50	45.75	58.50	45.50	4.46	4.76	4.44	4.40	4.53	4.49	4.38	4.18	4.73	4.53	4.49	4.67
09/01/14	09/30/14	Sep 2014	52.00	37.50	46.25	33.50	48.50	36.25	56.00	44.00	56.75	42.50	4.44	4.70	4.39	4.38	4.52	4.48	4.35	4.17	4.71	4.50	4.46	4.64
10/01/14	10/31/14	Oct 2014	47.98	39.01	42.84	34.85	43.70	37.13	52.27	43.61	52.02	43.31	4.43	4.64	4.35	4.38	4.52	4.49	4.46	4.20	4.71	4.50	4.46	4.75
11/01/14	11/30/14	Nov 2014	50.50	41.09	41.16	34.50	46.55	38.32	51.23	44.06	50.99	42.44	4.46	4.70	4.42	4.51	4.60	4.57	4.85	4.24	4.85	4.64	4.60	5.19
12/01/14	12/31/14	Dec 2014	53.03	44.41	42.00	34.16	52.25	43.06	51.75	45.84	51.50	45.50	4.53	4.77	4.48	4.58	4.67	4.63	5.05	4.30	4.92	4.71	4.66	5.40
01/01/15	01/31/15	Jan 2015	49.76	40.39	41.41	32.57	47.85	38.79	50.47	43.16	50.96	43.00	4.59	4.82	4.54	4.64	4.73	4.69	4.97	4.36	4.98	4.76	4.72	5.32
02/01/15	02/28/15	Feb 2015	46.04	37.37	41.00	32.25	43.07	36.61	49.98	41.50	49.49	41.75	4.56	4.79	4.51	4.61	4.70	4.66	4.85	4.33	4.95	4.74	4.69	5.19
03/01/15	03/31/15	Mar 2015	43.71	35.49	40.59	31.93	39.59	33.35	46.55	39.84	46.55	40.50	4.46	4.70	4.42	4.51	4.60	4.57	4.79	4.24	4.85	4.64	4.60	5.12
04/01/15	04/30/15	Apr 2015	41.90	28.26	39.96	29.14	33.92	20.77	45.63	35.15	45.74	35.43	4.07	4.19	3.93	3.85	4.00	3.96	3.65	3.56	4.16	3.97	3.93	3.89
05/01/15	05/31/15	May 2015	37.00	20.40	35.89	24.68	32.00	17.75	40.98	31.28	41.90	30.88	4.04	4.16	3.90	3.74	3.97	3.93	3.55	3.53	4.05	3.86	3.82	3.79
06/01/15	06/30/15	Jun 2015	34.35	15.51	35.15	24.94	30.08	14.73	40.14	30.96	40.61	31.20	4.07	4.18	3.92	3.94	3.99	3.96	3.54	3.55	4.25	4.06	4.02	3.78
07/01/15	07/31/15	Jul 2015	49.96	25.92	52.64	34.13	41.13	25.52	52.74	40.94	52.02	40.00	4.10	4.21	3.95	3.89	4.02	3.99	3.82	3.58	4.20	4.00	3.97	4.07
08/01/15	08/31/15	Aug 2015	50.44	34.56	47.00	30.75	45.50	30.74	51.24	41.74	52.53	41.20	4.10	4.22	3.96	3.90	4.02	3.99	3.82	3.58	4.21	4.01	3.98	4.07
09/01/15	09/30/15	Sep 2015	45.11	35.52	41.36	27.37	44.63	30.74	45.27	36.57	48.45	38.80	4.08	4.20	3.94	3.82	4.01	3.98	3.83	3.57	4.13	3.93	3.90	4.09
10/01/15	10/31/15	Oct 2015	43.25	36.00	39.40	30.25	38.87	33.73	46.78	39.60	46.06	39.20	4.10	4.22	3.96	3.88	4.03	3.99	4.11	3.59	4.20	4.00	3.96	4.38
11/01/15	11/30/15	Nov 2015	46.04	36.75	38.63	29.65	41.41	34.44	46.78	39.20	47.00	39.20	4.16	4.33	4.05	4.11	4.18	4.14	4.54	3.68	4.43	4.23	4.19	4.86
12/01/15	12/31/15	Dec 2015	50.22	39.75	36.72	30.86	46.48	38.34	48.20	41.20	47.94	41.60	4.30	4.48	4.20	4.26	4.33	4.29	4.71	3.83	4.58	4.38	4.34	5.04
01/01/16	01/31/16	Jan 2016	50.51	40.39	39.91	32.07	47.85	39.29	49.47	43.66	50.21	43.00	4.43	4.60	4.32	4.38	4.45	4.42	4.62	3.95	4.71	4.50	4.46	4.94
02/01/16	02/29/16	Feb 2016	46.79	37.37	39.50	31.75	43.07	37.11	48.98	42.00	48.74	41.75	4.41	4.58	4.30	4.36	4.43	4.40	4.61	3.94	4.69	4.48	4.44	4.93
03/01/16	03/31/16	Mar 2016	44.46	35.49	39.09	31.43	39.59	33.85	45.55	40.34	45.80	40.50	4.35	4.52	4.25	4.30	4.38	4.34	4.55	3.88	4.63	4.42	4.38	4.87
04/01/16	04/30/16	Apr 2016	42.65	28.26	39.96	28.64	33.92	20.77	45.88	34.90	45.74	35.43	4.10	4.23	3.94	3.77	3.93	3.90	3.78	3.41	4.08	3.88	3.84	4.04
05/01/16	05/31/16	May 2016	37.75	20.40	35.89	24.18	32.00	17.75	41.23	31.03	41.90	30.88	4.11	4.24	3.95	3.78	3.94	3.91	3.78	3.42	4.09	3.89	3.85	4.03
06/01/16	06/30/16	Jun 2016	35.10	15.51	35.15	24.44	30.08	14.73	40.39	30.71	40.61	31.20	4.14	4.27	3.98	3.81	3.97	3.94	3.80	3.45	4.12	3.92	3.88	4.05
07/01/16	07/31/16	Jul 2016	50.71	25.92	53.39	35.13	41.18	27.57	54.24	41.19	52.02	40.00	4.17	4.29	4.00	3.83	4.00	3.96	3.81	3.47	4.15	3.95	3.91	4.07
08/01/16	08/31/16	Aug 2016	51.19	34.56	47.75	31.75	45.55	32.79	52.74	41.99	52.53	41.20	4.17	4.30	4.01	3.84	4.00	3.97	3.82	3.48	4.15	3.95	3.92	4.07
09/01/16	09/30/16	Sep 2016	45.86	35.52	42.11	28.37	44.68	32.79	46.77	36.82	48.45	38.80	4.17	4.29	4.00	3.83	4.00	3.96	3.77	3.47	4.14	3.94	3.91	4.02
10/01/16	10/31/16	Oct 2016	44.00	36.00	39.40	31.25	38.87	34.73	46.78	41.10	46.06	39.20	4.19	4.31	4.02	3.85	4.02	3.98	3.86	3.49	4.17	3.97	3.93	4.12
11/01/16	11/30/16	Nov 2016	46.79	36.75	38.63	30.65	41.41	35.44	46.78	40.70	47.00	39.20	4.26	4.45	4.18	4.20	4.20	4.17	4.50	3.67	4.53	4.32	4.28	4.82
12/01/16	12/31/16	Dec 2016	50.97	39.75	36.72	31.86	46.48	39.34	48.20	42.70	47.94	41.60	4.43	4.62	4.35	4.37	4.37	4.33	4.66	3.84	4.70	4.49	4.45	4.99
01/01/17	01/31/17	Jan 2017	53.01	42.24	42.66	34.07	50.35	40.99	50.82	44.91	51.56	44.25	4.57	4.75	4.48	4.51	4.51	4.47	4.80	3.98	4.84	4.64	4.60	5.14
02/01/17	02/28/17	Feb 2017	49.29	39.22	42.25	33.75	45.57	38.81	50.33	43.25	50.09	43.00	4.55	4.73	4.46	4.50	4.49	4.45	4.78	3.96	4.82	4.62	4.58	5.12
03/01/17	03/31/17	Mar 2017	46.96	37.34	41.84	33.43	42.09	35.55	46.90	41.59	47.15	41.75	4.49	4.67	4.40	4.44	4.43	4.39	4.73	3.90	4.76	4.56	4.52	5.06
04/01/17	04/30/17	Apr 2017	45.15	30.11	42.71	30.64	36.42	22.47	47.23	36.15	47.09	36.68	4.24	4.38	4.08	3.91	4.02	3.99	3.95	3.44	4.21	4.02	3.98	4.21
05/01/17	05/31/17	May 2017	40.25	22.25	38.64	26.18	34.50	19.45	42.58	32.28	43.25	32.13	4.25	4.39	4.09	3.92	4.03	4.00	3.95	3.45	4.23	4.03	4.00	4.22
06/01/17	06/30/17	Jun 2017	37.60	17.36	37.90	26.44	32.58	16.43	41.74	31.96	41.96	32.45	4.28	4.42	4.12	3.95	4.06	4.03	3.97	3.48	4.26	4.07	4.03	4.24
07/01/17	07/31/17	Jul 2017	53.21	27.77	56.14	37.13	43.68	29.27	55.59	42.44	53.37	41.25	4.31	4.46	4.16	3.98	4.10	4.06	3.99	3.52	4.29	4.10	4.06	4.25
08/01/17	08/31/17	Aug 2017	53.69	36.41	50.50	33.75	48.05	34.49	54.09	43.24	53.88	42.45	4.33	4.47	4.17	4.00	4.11	4.08	4.00	3.53	4.31	4.11	4.08	4.26
09/01/17	09/30/17	Sep 2017	48.36	37.37	44.86	30.37	47.18	34.49	48.12	38.07	49.80	40.05	4.32	4.47	4.17	3.99	4.11	4.07	4.01	3.53	4.30	4.11	4.07	4.27
10/01/17	10/31/17	Oct 2017	46.50	37.85	42.15	33.25	41.37	36.43	48.13	42.35	47.41	40.45	4.35	4.49	4.19	4.02	4.14	4.10	4.04	3.56	4.33	4.14	4.10	4.31
11/01/17	11/30/17	Nov 2017	49.29	38.60	41.38	32.65	43.91	37.14	48.13	41.95	48.35	40.45	4.43	4.66	4.33	4.39	4.41	4.38	4.78	3.86	4.71	4.51	4.47	5.11
12/01/17	12/31/17	Dec 2017	53.47	41.60	39.47	33.86	48.98	41.04	49.55	43.95	49.29	42.85	4.61	4.84	4.51	4.57	4.59	4.55	4.94	4.04	4.90	4.69	4.65	5.28
01/01/18	01/31/18	Jan 2018	56.51	44.84	46.16	36.67	53.85	43.59	52.72	46.56	53.46	46.00	4.75	4.98	4.67	4.72	4.73	4.69	5.01	4.18	5.04	4.85	4.80	5.36
02/01/18	02/28/18	Feb 2018	52.79	41.82	45.75	36.35	49.07	41.41	52.23	44.90	51.99	44.75	4.73	4.96	4.65	4.70	4.71	4.67	4.99	4.16	5.02	4.83	4.78	5.34
03/01/18	03/31/18	Mar 2018	50.46	39.94	45.34	36.03	45.59	38.15	48.80	43.24	49.05	43.50	4.67	4.90	4.59	4.64	4.65	4.61	4.93	4.10	4.96	4.77	4.72	5.27
04/01/18	04/30/18	Apr 2018	48.65	32.71	46.21	33.24	39.92	25.07	49.13	37.80	48.99	38.43	4.42	4.62	4.26	4.24	4.30	4.27	4.21	3.76	4.55	4.36	4.32	4.49
05/01/18	05/31/18	May 2018	43.75	24.85	42.14	28.78	38.00	22.05	44.48	33.93	45.15	33.88	4.43	4.63	4.27	4.26	4.32	4.28	4.21	3.78	4.57	4.38	4.34	4.49
06/01/18	06/30/18	Jun 2018	41.10	19.96	41.40	29.04	36.08	19.03	43.64	33.61	43.86	34.20	4.46	4.65	4.30	4.28	4.34	4.30	4.23	3.80	4.59	4.40	4.36	4.51
07/01/18	07/31/18	Jul 2018	56.71	30.37	59.64	39.73	47.18	31.87	57.49	44.09	55.27	43.00	4.49	4.68	4.33	4.31	4.37	4.33	4.24	3.83	4.62	4.43	4.39	4.52
08/01/18	08/31/18	Aug 2018	57.19	39.01	54.00	36.35	51.55	37.09	55.99	44.89	55.78	44.20	4.51	4.70	4.35	4.33	4.39	4.35	4.26	3.85	4.64	4.45	4.41	4.54
09/01/18	09/30/18	Sep 2018	51.86	39.97	48.36	32.97	50.68	37.09	50.02	39.72	51.70	41.80	4.51	4.71	4.35	4.34	4.40	4.36	4.28	3.85	4.65	4.46	4.42	4.56
10/01/18	10/31/18	Oct 2018	50.00	40.45	45.65	35.85	44.87	39.03	50.03	44.00	49.31	42.20	4.54	4.74	4.39	4.37	4.43	4.39	4.32	3.89	4.68	4.49	4.45	4.60
11/01/18	11/30/18	Nov 2018	52.79	41.20	44.88	35.25	47.41	39.74	50.03	43.60	50.25	42.20	4.64	4.91	4.53	4.61	4.62	4.58	5.08	4.14	4.94	4.74	4.70	5.43
12/01/18	12/31/18	Dec 2018	56.97	44.20	42.97	36.46	52.48	43.64	51.45	45.60	51.19	44.60	4.82	5.09	4.71	4.79	4.80	4.76	5.23	4.32	5.12	4.92	4.88	5.60
01/01/19	01/31/19	Jan 2019	59.76	47.59	49.41	38.97	56.10	46.34	52.62	45.11	55.46	47.75	4.94	5.22	4.86	4.92	4.92	4.88	5.27	4.44	5.25	5.05	5.00	5.64
02/01/19	02/28/19	Feb 2019	56.04	44.57	49.00	38.65	51.32	44.16	52.13	43.45	53.99	46.50	4.92	5.20	4.84	4.90	4.90	4.86	5.25	4.42	5.23	5.03	4.98	5.61
03/01/19	03/31/19	Mar 2019	53.71	42.69	48.59	38.33	47.84	40.90	48.70	41.79	51.05	45.25	4.86	5.14	4.78	4.84	4.84	4.80	5.19	4.36	5.17	4.97	4.92	5.55
04/01/19	04/30/19	Apr 2019	51.90	35.46	49.46	35.54	42.17	27.82	49.03	36.35	50.99	40.18	4.60	4.87	4.44	4.47	4.50	4.46	4.34	4.01	4.79	4.60	4.55	4.63
05/01/19	05/31/19	May 2019	47.00	27.60	45.39	31.08	40.25	24.80	44.38	32.48	47.15	35.63	4.62	4.88	4.46	4.49	4.52	4.48	4.35	4.02	4.80	4.61	4.57	4.63
06/01/19	06/30/19	Jun 2019	44.35	22.71	44.65	31.34	38.33	21.78	43.54	32.16	45.86	35.95	4.64	4.90	4.48	4.51	4.54	4.50	4.36	4.05	4.83	4.63	4.59	4.65
07/01/19	07/31/19	Jul 2019	59.96	33.12	62.89	42.03	49.43	34.62	57.39	42.64	57.27	44.75	4.67	4.93	4.51	4.54	4.57	4.53	4.37	4.07	4.85	4.66	4.62	4.66
08/01/19	08/31/19	Aug 2019	60.44	41.76	57.25	38.65	53.80	39.84	55.89	43.44	57.78	45.95	4.69	4.95	4.53	4.56	4.59	4.55	4.38	4.10	4.88	4.68	4.64	4.67
09/01/19	09/30/19	Sep 2019	55.11	42.72	51.61	35.27	52.93	39.84	49.92	38.27	53.70	43.55	4.69	4.96	4.54	4.56	4.59	4.55	4.40	4.10	4.88	4.69	4.65	4.69

10/01/19	10/31/19	Oct 2019	53.25	43.20	48.90	38.15	47.12	41.78	49.93	42.55	51.31	43.95	4.73	4.99	4.57	4.60	4.63	4.59	4.45	4.13	4.92	4.72	4.68	4.74
11/01/19	11/30/19	Nov 2019	56.04	43.95	48.13	37.55	49.66	42.49	49.93	42.15	52.25	43.95	4.82	5.19	4.72	4.83	4.84	4.80	5.12	4.45	5.16	4.96	4.92	5.47
12/01/19	12/31/19	Dec 2019	60.22	46.95	46.22	38.76	54.73	46.39	51.35	44.15	53.19	46.35	5.02	5.38	4.91	5.02	5.03	4.99	5.30	4.64	5.36	5.16	5.11	5.66
01/01/20	01/31/20	Jan 2020	63.26	50.34	52.66	41.72	59.60	49.09	55.37	47.36	58.21	50.00	5.13	5.49	5.04	5.13	5.14	5.10	5.35	4.75	5.47	5.27	5.22	5.72
02/01/20	02/29/20	Feb 2020	59.54	47.32	52.25	41.40	54.82	46.91	54.88	45.70	56.74	48.75	5.10	5.47	5.02	5.11	5.12	5.08	5.32	4.73	5.45	5.25	5.20	5.69
03/01/20	03/31/20	Mar 2020	57.21	45.44	51.84	41.08	51.34	43.65	51.45	44.04	53.80	47.50	5.04	5.40	4.96	5.05	5.06	5.02	5.26	4.67	5.39	5.18	5.13	5.62
04/01/20	04/30/20	Apr 2020	55.40	38.21	52.71	38.29	45.67	30.57	51.78	38.60	53.74	42.43	4.77	5.10	4.61	4.67	4.68	4.64	4.52	4.32	4.99	4.80	4.75	4.84
05/01/20	05/31/20	May 2020	50.50	30.35	48.64	33.83	43.75	27.55	47.13	34.73	49.90	37.88	4.80	5.12	4.64	4.69	4.71	4.67	4.54	4.35	5.02	4.82	4.78	4.86
06/01/20	06/30/20	Jun 2020	47.85	25.46	47.90	34.09	41.83	24.53	46.29	34.41	48.61	38.20	4.83	5.15	4.67	4.72	4.74	4.70	4.56	4.38	5.05	4.85	4.81	4.88
07/01/20	07/31/20	Jul 2020	63.46	35.87	66.14	44.78	52.93	37.37	60.14	44.89	60.02	47.00	4.87	5.19	4.71	4.77	4.78	4.74	4.59	4.42	5.09	4.90	4.85	4.91
08/01/20	08/31/20	Aug 2020	57.59	43.57	56.48	43.79	52.30	40.85	59.36	48.47	59.80	49.61	5.05	5.33	4.81	4.76	4.89	4.78	4.60	4.41	5.09	4.89	4.85	4.92
09/01/20	09/30/20	Sep 2020	53.70	43.71	50.97	41.04	50.75	40.55	54.48	45.44	55.47	47.25	5.04	5.27	4.80	4.78	4.92	4.81	4.62	4.43	5.11	4.91	4.87	4.95
10/01/20	10/31/20	Oct 2020	52.65	43.85	48.10	41.58	47.77	41.39	53.20	47.51	52.82	46.85	5.06	5.25	4.82	4.83	4.98	4.86	4.67	4.49	5.16	4.96	4.91	5.00
11/01/20	11/30/20	Nov 2020	55.01	45.16	48.13	41.60	49.87	42.64	53.62	48.00	53.55	47.46	5.21	5.45	4.98	5.05	5.25	5.20	5.44	4.81	5.39	5.18	5.13	5.81
12/01/20	12/31/20	Dec 2020	58.69	47.34	47.86	43.19	54.01	45.26	54.92	49.30	54.58	49.51	5.40	5.64	5.19	5.26	5.36	5.38	5.70	4.99	5.61	5.40	5.35	6.08
01/01/21	01/31/21	Jan 2021	62.92	51.65	54.11	47.20	59.30	49.18	57.34	50.96	58.79	52.87	5.44	5.67	5.24	5.29	5.31	5.32	5.58	4.98	5.64	5.43	5.38	5.95
02/01/21	02/28/21	Feb 2021	60.16	49.55	53.77	47.12	55.91	47.43	56.46	49.63	57.51	51.90	5.42	5.60	5.18	5.24	5.25	5.27	5.46	4.98	5.59	5.38	5.33	5.84
03/01/21	03/31/21	Mar 2021	55.82	46.42	52.14	45.49	50.91	43.70	53.42	48.12	54.65	50.00	5.23	5.43	5.01	5.06	5.17	5.10	5.28	4.86	5.41	5.20	5.15	5.65
04/01/21	04/30/21	Apr 2021	52.81	41.95	52.54	43.95	46.06	36.34	53.27	45.18	54.52	47.22	5.07	5.27	4.82	4.85	4.99	4.88	4.73	4.60	5.19	4.99	4.94	5.06
05/01/21	05/31/21	May 2021	48.55	36.57	50.78	41.78	43.37	33.45	50.86	42.81	52.59	44.80	5.10	5.26	4.86	4.86	4.99	4.88	4.78	4.59	5.20	5.00	4.95	5.11
06/01/21	06/30/21	Jun 2021	49.92	35.09	52.28	43.05	44.99	32.86	53.04	43.59	54.23	45.92	5.16	5.37	4.92	4.89	5.02	4.91	4.78	4.62	5.23	5.03	4.98	5.12
07/01/21	07/31/21	Jul 2021	61.16	42.84	64.44	49.75	53.82	41.71	63.46	50.26	63.27	51.92	5.21	5.49	4.97	4.93	5.06	4.94	4.81	4.65	5.27	5.06	5.01	5.15
08/01/21	08/31/21	Aug 2021	54.74	45.39	55.71	48.93	50.79	41.85	62.83	53.49	61.82	53.27	5.42	5.71	5.08	4.97	5.19	5.01	4.81	4.72	5.30	5.10	5.05	5.13
09/01/21	09/30/21	Sep 2021	52.30	44.70	50.33	46.81	48.57	41.25	59.03	52.62	57.24	50.94	5.38	5.59	5.07	5.00	5.24	5.06	4.84	4.75	5.33	5.13	5.08	5.16
10/01/21	10/31/21	Oct 2021	52.05	44.50	47.29	45.00	48.42	41.01	56.48	52.47	54.32	49.76	5.40	5.51	5.07	5.06	5.33	5.14	4.89	4.84	5.39	5.19	5.14	5.22
11/01/21	11/30/21	Nov 2021	53.98	46.38	48.13	45.66	50.08	42.80	57.32	53.84	54.86	50.98	5.59	5.72	5.25	5.27	5.66	5.60	5.77	5.16	5.61	5.40	5.35	6.13
12/01/21	12/31/21	Dec 2021	57.16	47.72	49.50	47.62	53.29	44.12	58.50	54.46	55.97	52.67	5.78	5.90	5.47	5.50	5.70	5.76	6.11	5.34	5.85	5.64	5.59	6.48
01/01/22	01/31/22	Jan 2022	62.59	52.95	55.55	52.67	59.01	49.26	59.31	54.56	59.37	55.75	5.75	5.85	5.44	5.45	5.47	5.54	5.80	5.20	5.80	5.59	5.54	6.18
02/01/22	02/28/22	Feb 2022	60.79	51.78	55.29	52.85	57.01	47.95	58.03	53.55	58.27	55.05	5.73	5.74	5.34	5.38	5.38	5.46	5.60	5.23	5.73	5.52	5.46	5.98
03/01/22	03/31/22	Mar 2022	54.44	47.41	52.44	49.90	50.48	43.75	55.40	52.19	55.50	52.51	5.42	5.45	5.06	5.08	5.29	5.19	5.30	5.05	5.43	5.22	5.17	5.67
04/01/22	04/30/22	Apr 2022	50.22	45.68	52.37	49.61	46.45	42.11	54.77	51.75	55.30	52.01	5.36	5.44	5.03	5.04	5.29	5.12	4.93	4.87	5.37	5.17	5.13	5.26
05/01/22	05/31/22	May 2022	46.61	42.79	52.92	49.74	42.99	39.34	54.59	50.88	55.29	51.72	5.40	5.39	5.07	5.03	5.28	5.08	5.02	4.83	5.37	5.17	5.12	5.35
06/01/22	06/30/22	Jun 2022	51.99	44.72	56.66	52.02	48.14	41.19	59.80	52.78	59.84	53.64	5.50	5.58	5.17	5.06	5.30	5.11	5.01	4.86	5.40	5.20	5.15	5.34
07/01/22	07/31/22	Jul 2022	58.87	49.80	62.73	54.72	54.71	46.04	66.78	55.63	66.53	56.83	5.55	5.79	5.22	5.09	5.34	5.14	5.04	4.88	5.43	5.23	5.18	5.37
08/01/22	08/31/22	Aug 2022	63.07	51.18	64.79	55.87	58.73	47.36	69.14	56.62	69.17	58.07	5.59	5.93	5.27	5.13	5.39	5.17	5.02	4.90	5.46	5.26	5.21	5.35
09/01/22	09/30/22	Sep 2022	61.39	51.69	58.79	53.67	57.33	47.91	63.01	55.50	62.85	56.06	5.52	5.77	5.22	5.15	5.46	5.24	5.05	4.93	5.48	5.28	5.24	5.38
10/01/22	10/31/22	Oct 2022	60.33	50.50	55.44	51.48	56.24	46.71	60.11	55.01	59.74	54.60	5.55	5.66	5.21	5.21	5.54	5.31	5.11	5.02	5.54	5.34	5.29	5.44
11/01/22	11/30/22	Nov 2022	63.90	53.81	56.26	52.95	59.80	49.89	61.33	57.02	60.70	56.18	5.88	5.90	5.55	5.58	5.95	5.89	6.04	5.43	5.93	5.72	5.67	6.40
12/01/22	12/31/22	Dec 2022	66.92	56.43	59.22	55.98	64.21	52.74	63.86	58.97	63.53	59.21	6.20	6.37	5.89	5.84	6.07	6.08	6.41	5.69	6.18	5.97	5.92	6.79
01/01/23	01/31/23	Jan 2023	64.40	54.89	57.65	54.33	61.02	51.13	61.35	56.15	61.43	57.45	5.85	6.07	5.58	5.56	5.68	5.61	6.04	5.39	5.91	5.70	5.65	6.42
02/01/23	02/28/23	Feb 2023	62.76	53.54	57.40	54.53	59.06	49.65	60.12	55.43	60.28	56.61	5.88	5.93	5.54	5.56	5.72	5.64	5.80	5.42	5.91	5.70	5.65	6.17
03/01/23	03/31/23	Mar 2023	56.25	49.41	54.47	52.16	52.19	45.64	57.34	54.07	57.36	54.16	5.63	5.57	5.24	5.37	5.62	5.48	5.48	5.29	5.72	5.51	5.46	5.85
04/01/23	04/30/23	Apr 2023	52.68	47.86	54.59	52.21	48.77	44.16	57.37	54.14	57.63	54.09	5.58	5.58	5.22	5.28	5.54	5.34	5.20	5.09	5.61	5.41	5.36	5.53
05/01/23	05/31/23	May 2023	49.00	44.99	55.15	52.16	45.25	41.41	56.86	53.36	57.32	53.75	5.62	5.62	5.28	5.19	5.42	5.26	5.17	4.97	5.53	5.33	5.28	5.50
06/01/23	06/30/23	Jun 2023	53.85	46.41	58.83	53.58	49.88	42.78	61.96	54.58	61.93	55.10	5.72	5.72	5.38	5.22	5.39	5.29	5.15	5.00	5.56	5.36	5.31	5.48
07/01/23	07/31/23	Jul 2023	61.04	51.49	65.23	56.71	56.76	47.63	69.26	57.58	69.00	58.76	5.76	6.00	5.41	5.25	5.41	5.30	5.22	5.01	5.59	5.39	5.34	5.55
08/01/23	08/31/23	Aug 2023	64.93	53.05	67.06	57.92	60.48	49.12	71.39	58.56	71.40	60.04	5.79	6.15	5.44	5.28	5.43	5.32	5.16	5.03	5.61	5.41	5.37	5.48
09/01/23	09/30/23	Sep 2023	62.71	52.87	59.58	54.70	58.69	49.01	64.41	57.53	64.12	57.56	5.75	5.97	5.40	5.32	5.59	5.37	5.23	5.06	5.65	5.45	5.40	5.55
10/01/23	10/31/23	Oct 2023	62.63	52.24	57.25	53.17	58.61	48.35	61.80	56.90	61.27	56.41	5.77	5.87	5.43	5.39	5.67	5.44	5.28	5.14	5.72	5.52	5.48	5.61
11/01/23	11/30/23	Nov 2023	66.52	55.94	58.36	55.15	62.70	51.94	63.62	58.86	62.94	58.46	6.05	6.17	5.74	5.85	6.22	6.15	6.10	5.70	6.19	5.98	5.93	6.46
12/01/23	12/31/23	Dec 2023	69.13	59.81	60.57	57.52	67.44	56.22	64.97	60.39	64.70	60.70	6.28	6.47	5.97	6.05	6.26	6.30	6.69	5.92	6.40	6.19	6.14	7.07
01/01/24	01/31/24	Jan 2024	66.64	57.92	60.75	57.13	64.97	54.38	64.68	59.26	64.63	60.31	6.22	6.44	5.93	5.93	6.01	6.08	6.35	5.72	6.29	6.07	6.02	6.73
02/01/24	02/29/24	Feb 2024	65.75	57.36	60.49	57.67	63.13	53.72	63.20	58.03	63.44	59.58	6.22	6.28	5.86	5.90	5.91	5.88	6.05	5.75	6.25	6.04	5.98	6.43
03/01/24	03/31/24	Mar 2024	59.08	52.91	56.67	54.42	54.93	48.97	59.57	56.24	59.53	56.30	5.80	5.84	5.43	5.55	5.80	5.68	5.70	5.47	5.90	5.69	5.64	6.07
04/01/24	04/30/24	Apr 2024	55.49	50.02	56.23	53.15	51.42	46.20	59.17	55.66	59.28	55.47	5.73	5.72	5.38	5.48	5.73	5.55	5.42	5.27	5.82	5.62	5.57	5.75
05/01/24	05/31/24	May 2024	50.34	46.60	56.09	53.29	46.50	42.93	58.12	55.00	58.47	55.12	5.77	5.78	5.43	5.36	5.56	5.42	5.36	5.15	5.70	5.50	5.45	5.69
06/01/24	06/30/24	Jun 2024	54.53	48.39	59.55	54.98	50.51	44.64	62.37	56.47	62.37	56.60	5.86	5.86	5.51	5.37	5.60	5.45	5.35	5.18	5.71	5.50	5.46	5.68
07/01/24	07/31/24	Jul 2024	63.36	53.31	67.64	58.34	58.95	49.34	71.72	59.29	71.37	60.37	5.94	6.16	5.58	5.43	5.65	5.48	5.42	5.21	5.77	5.56	5.51	5.76
08/01/24	08/31/24	Aug 2024	68.01	55.37	70.04	60.07	63.40	51.31	74.57	61.26	74.44	62.25	5.97	6.34	5.65	5.46	5.72	5.51	5.38	5.24	5.79	5.59	5.54	5.70
09/01/24	09/30/24	Sep 2024	65.96	56.10	64.46	58.18	61.89	52.26	69.20	60.56	68.64	60.50	5.92	6.15	5.60	5.49	5.77	5.58	5.45	5.27	5.82	5.62	5.58	5.77
10/01/24	10/31/24	Oct 2024	63.83	54.31	60.70	56.05	59.86	50.31	65.32	59.42	64.69	58.92	5.95	6.11	5.61	5.62	5.84	5.66	5.54	5.36	5.95	5.75	5.70	5.86
11/01/24	11/30/24	Nov 2024	64.94	56.41	59.93	56.26	61.33	52.34	64.92	60.29	64.22	59.56	6.11	6.24	5.81	5.86	6.18	6.13	6.05	5.65	6.20	5.99	5.94	6.41
12/01/24	12/31/24	Dec 2024	69.16	60.69	61.80	58.48	68.54	57.34	67.27	61.83	66.38	61.90	6.34	6.53	6.05	6.09	6.28	6.33	6.66	5.92	6.44	6.23	6.18	7.04
01/01/25	01/31/25	Jan 2025	68.90	60.07	63.78	59.87	68.09	56.69	68.48	62.34	67.94	63.12	6.53	6.71	6.23	6.19	6.33	6.26	6.69	6.05	6.54	6.33	6.28	7.06
02/01/25	02/28/25	Feb 2025	66.37	59.06	62.70	60.03	65.31	55.55	65.55	60.30	65.71	62.19	6.42	6.49	6.08	6.09	6.03	6.03	6.23	5.93	6.44	6.23	6.18	6.61
03/01/25	03/31/25	Mar 2025	59.57	53.78	57.53	55.02	55.66	49.91	60.81	56.90	60.53	57.07	5.91	5.89	5.60	5.60	5.79	5.70	5.75	5.52	5.95	5.74	5.69	6.12
04/01/25	04/30/25	Apr 2025	56.43	50.68	57.76	54.66	52.64	47.10	60.26	56.65	60.67	56.83	5.84	5.86	5.53	5.52	5.77	5.59	5.47	5.31	5.85	5.65	5.60	5.80
05/01/25	05/31/25	May 2025	51.37	47.79	58.03	55.22	47.82	44.05	59.87	56.26	60.42	56.80	5.87	5.91	5.55	5.52	5.74	5.58	5.49	5.28	5.86	5.66	5.61	5.82
06/01/25	06/30/25	Jun 2025	56.52	49.52	61.87	56.69	52.65	45.90	65.35	57.89	65.08	58.30	5.96	6.00	5.58	5.53	5.74	5.58	5.48	5.31	5.87	5.67	5.62	5.82
07/01/25	07/31/25	Jul 2025	66.00	55.21	70.29	60.33	61.44	51.16	75.41	61.86	74.16	62.56	6.04	6.30	5.68	5.63	5.85	5.64	5.56	5.34	5.97	5.76	5.71	5.89
08/01/25	08/31/25	Aug 2025	69.74	57.21	71.95	61.82	65.08	53.20	77.81	63.92	76.53	64.37	6.08	6.37	5.71	5.66	5.89	5.67	5.51	5.37	5.99	5.79	5.74	5.83
09/01/25	09/30/25	Sep 2025	67.06	55.86	67.21	60.01	64.05	54.25	74.49	62.90	71.74	62.48	6.02	6.36	5.71	5.67	5.93	5.72	5.58	5.40	6.00	5.80	5.75	5.90
10/01/25	10/31/25	Oct 2025	62.72	54.73	62.10	57.27	61.90	52.01	69.64	61.21	66.81	60.40	6.04	6.24	5.75	5.71	5.98	5.78	5.67	5.49	6.04	5.84	5.80	6.00
11/01/25	11/30/25	Nov 2025	65.75	58.17	61.12	57.68	63.65	54.30	68.55	63.00	66.00	61.15	6.21	6.36	5.90	5.93	6.30	6.24	6.17	5.77	6.27	6.07	6.02	6.54

12/01/25	12/31/25	Dec 2025	70.53	61.71	63.85	60.27	70.93	58.46	70.35	63.81	68.61	63.58	6.49	6.72	6.20	6.15	6.41	6.46	6.82	6.05	6.50	6.29	6.24	7.19
01/01/26	01/31/26	Jan 2026	70.58	61.77	65.39	61.44	69.59	58.27	70.82	64.00	69.87	64.76	6.61	6.80	6.35	6.30	6.40	6.48	6.84	6.13	6.65	6.44	6.39	7.22
02/01/26	02/28/26	Feb 2026	68.80	61.33	64.80	61.84	67.34	57.61	68.74	62.60	68.21	64.16	6.55	6.63	6.23	6.22	6.29	6.23	6.59	6.09	6.57	6.36	6.31	6.97
03/01/26	03/31/26	Mar 2026	62.00	55.88	60.19	57.80	58.07	51.88	64.28	59.72	63.77	59.82	6.09	6.10	5.79	5.83	6.08	5.93	6.01	5.76	6.18	5.97	5.92	6.39
04/01/26	04/30/26	Apr 2026	58.54	52.84	60.35	57.63	54.57	49.12	63.42	58.95	63.46	59.26	6.03	6.05	5.75	5.76	5.97	5.79	5.68	5.54	6.09	5.89	5.84	6.01
05/01/26	05/31/26	May 2026	53.20	49.75	60.27	57.46	49.43	45.99	62.19	58.62	62.93	58.81	6.07	6.09	5.69	5.69	5.88	5.70	5.64	5.44	6.02	5.82	5.77	5.97
06/01/26	06/30/26	Jun 2026	59.16	51.27	64.62	58.53	55.03	47.46	68.81	60.03	68.21	60.33	6.17	6.15	5.74	5.72	5.91	5.73	5.63	5.48	6.05	5.85	5.80	5.97
07/01/26	07/31/26	Jul 2026	69.34	57.52	73.39	62.57	64.60	53.31	79.50	64.72	77.50	64.99	6.25	6.48	5.86	5.79	6.00	5.79	5.71	5.51	6.13	5.93	5.88	6.04
08/01/26	08/31/26	Aug 2026	72.23	59.28	74.85	64.08	67.45	55.16	81.56	66.71	79.60	66.79	6.29	6.58	5.89	5.82	6.04	5.82	5.66	5.54	6.15	5.96	5.91	5.98
09/01/26	09/30/26	Sep 2026	68.88	57.71	68.02	61.40	65.67	56.02	76.86	65.07	73.59	64.52	6.22	6.59	5.88	5.84	6.11	5.87	5.74	5.57	6.17	5.97	5.92	6.06
10/01/26	10/31/26	Oct 2026	64.88	56.85	63.40	58.95	63.32	53.84	71.74	63.44	68.67	62.40	6.25	6.42	5.97	5.97	6.18	6.08	5.79	5.66	6.30	6.10	6.05	6.12
11/01/26	11/30/26	Nov 2026	68.75	60.62	64.56	60.42	66.74	56.88	72.36	65.36	69.44	63.95	6.39	6.71	6.15	6.13	6.50	6.43	6.40	6.01	6.47	6.27	6.22	6.77
12/01/26	12/31/26	Dec 2026	72.99	64.18	66.26	62.88	73.71	60.83	72.84	66.61	71.27	66.13	6.66	6.95	6.43	6.38	6.69	6.68	7.11	6.28	6.73	6.52	6.47	7.49
01/01/27	01/31/27	Jan 2027	73.15	64.78	68.53	64.73	72.21	61.46	74.49	68.21	73.09	67.98	6.92	7.19	6.63	6.58	6.73	6.78	7.18	6.44	6.93	6.72	6.67	7.56
02/01/27	02/28/27	Feb 2027	71.22	63.80	68.91	65.36	69.15	59.75	72.81	65.68	72.10	67.15	6.89	7.12	6.44	6.41	6.46	6.43	6.82	6.32	6.76	6.55	6.50	7.20
03/01/27	03/31/27	Mar 2027	64.36	57.73	62.24	59.74	60.62	53.57	66.27	61.97	65.68	61.71	6.27	6.27	6.01	5.97	6.25	6.13	6.22	6.02	6.32	6.11	6.06	6.60
04/01/27	04/30/27	Apr 2027	60.60	54.63	61.89	59.00	56.46	50.83	65.83	61.01	65.46	60.99	6.21	6.25	5.94	5.90	6.15	6.07	5.78	5.67	6.23	6.03	5.98	6.11
05/01/27	05/31/27	May 2027	55.27	51.31	62.37	59.32	51.38	47.45	64.43	60.39	65.07	60.85	6.26	6.33	5.92	5.89	6.10	5.88	5.83	5.61	6.23	6.02	5.98	6.16
06/01/27	06/30/27	Jun 2027	61.88	52.98	67.68	61.09	57.55	49.10	71.81	61.85	71.22	62.85	6.38	6.44	6.00	5.93	6.13	5.92	5.82	5.65	6.26	6.06	6.01	6.15
07/01/27	07/31/27	Jul 2027	71.16	58.99	75.12	64.07	66.32	54.68	81.40	66.24	79.22	66.53	6.44	6.58	6.05	5.99	6.18	5.95	5.89	5.67	6.32	6.12	6.07	6.23
08/01/27	08/31/27	Aug 2027	74.61	61.22	77.48	66.23	69.66	56.96	84.25	68.89	82.17	68.81	6.48	6.79	6.10	6.02	6.24	5.98	5.84	5.70	6.35	6.15	6.10	6.16
09/01/27	09/30/27	Sep 2027	70.50	59.59	70.97	63.69	67.15	57.76	78.91	66.89	75.49	66.16	6.41	6.71	6.13	6.06	6.28	6.02	5.92	5.74	6.39	6.19	6.14	6.24
10/01/27	10/31/27	Oct 2027	67.43	59.08	66.72	61.95	65.35	55.87	74.35	65.67	71.25	64.83	6.44	6.69	6.16	6.14	6.40	6.29	5.99	5.84	6.47	6.27	6.23	6.31
11/01/27	11/30/27	Nov 2027	72.14	63.73	67.78	63.21	70.77	59.93	75.93	68.80	72.53	66.68	6.73	6.98	6.53	6.53	6.93	6.82	6.82	6.40	6.87	6.67	6.62	7.18
12/01/27	12/31/27	Dec 2027	76.08	67.28	69.00	65.36	77.61	64.05	76.41	70.06	74.15	68.81	6.99	7.25	6.76	6.78	7.01	7.03	7.51	6.64	7.13	6.92	6.87	7.88
01/01/28	01/31/28	Jan 2028	76.22	67.09	71.65	67.12	75.38	63.67	77.70	70.22	76.02	70.32	7.20	7.48	6.92	6.81	6.90	6.97	7.39	6.63	7.16	6.95	6.89	7.77
02/01/28	02/29/28	Feb 2028	73.60	66.52	71.43	68.03	71.10	62.25	75.63	68.48	74.47	69.60	7.14	7.39	6.70	6.69	6.71	6.62	7.04	6.52	7.04	6.83	6.78	7.41
03/01/28	03/31/28	Mar 2028	66.04	59.22	63.88	61.18	62.25	54.92	68.63	63.72	67.52	63.16	6.44	6.44	6.18	6.16	6.42	6.26	6.35	6.12	6.50	6.30	6.24	6.72
04/01/28	04/30/28	Apr 2028	62.58	56.52	63.56	60.81	58.28	52.46	67.79	62.73	67.24	62.74	6.39	6.44	6.10	6.07	6.31	6.23	5.93	5.84	6.40	6.20	6.15	6.26
05/01/28	05/31/28	May 2028	57.35	52.85	64.65	61.20	53.34	48.85	66.79	62.04	67.26	62.53	6.43	6.51	6.09	6.07	6.24	6.03	5.96	5.79	6.40	6.20	6.15	6.29
06/01/28	06/30/28	Jun 2028	64.69	54.70	70.51	63.01	60.16	50.68	74.88	63.80	73.98	64.66	6.54	6.61	6.15	6.08	6.29	6.07	5.94	5.82	6.41	6.21	6.16	6.28
07/01/28	07/31/28	Jul 2028	73.45	61.48	77.65	66.58	68.47	57.03	83.97	69.03	81.71	69.09	6.60	6.76	6.22	6.13	6.32	6.10	6.00	5.82	6.47	6.27	6.22	6.34
08/01/28	08/31/28	Aug 2028	76.96	62.90	79.85	67.97	71.88	58.50	87.05	70.80	84.59	70.53	6.63	6.97	6.25	6.17	6.41	6.13	5.99	5.86	6.49	6.30	6.25	6.31
09/01/28	09/30/28	Sep 2028	71.81	61.95	72.31	65.80	68.30	59.66	80.30	68.96	76.67	68.06	6.58	6.90	6.27	6.20	6.45	6.18	6.03	5.89	6.53	6.34	6.29	6.35
10/01/28	10/31/28	Oct 2028	70.49	61.62	68.14	63.41	68.13	58.61	76.95	67.77	73.16	66.58	6.61	6.87	6.39	6.33	6.56	6.47	6.11	6.02	6.66	6.46	6.41	6.44
11/01/28	11/30/28	Nov 2028	77.21	68.72	70.81	66.37	76.35	64.92	80.28	72.96	76.17	70.10	7.12	7.41	6.96	7.00	7.41	7.31	7.61	6.91	7.34	7.13	7.08	7.97
12/01/28	12/31/28	Dec 2028	81.32	72.15	73.33	70.29	83.32	69.17	81.06	75.00	78.37	73.47	7.49	7.77	7.29	7.35	7.56	7.61	8.12	7.30	7.69	7.48	7.43	8.50
01/01/29	01/31/29	Jan 2029	79.47	69.83	74.50	70.05	79.09	66.15	80.36	72.83	79.06	73.32	7.48	7.78	7.22	7.15	7.29	7.33	7.64	6.90	7.50	7.29	7.23	8.02
02/01/29	02/28/29	Feb 2029	77.70	70.57	74.41	70.86	75.72	66.63	78.47	70.77	77.58	72.58	7.43	7.67	7.04	6.98	7.13	7.22	7.40	6.94	7.33	7.12	7.07	7.78
03/01/29	03/31/29	Mar 2029	70.35	62.86	67.06	64.49	67.22	58.45	71.38	66.48	70.62	66.32	6.74	6.74	6.50	6.47	6.67	6.59	6.76	6.49	6.82	6.61	6.56	7.14
04/01/29	04/30/29	Apr 2029	65.94	59.66	67.27	64.27	61.54	55.51	70.34	65.44	70.40	65.41	6.68	6.73	6.43	6.40	6.57	6.38	6.25	6.14	6.73	6.53	6.48	6.58
05/01/29	05/31/29	May 2029	59.83	55.51	67.22	63.93	55.81	51.36	69.28	64.80	70.06	65.22	6.72	6.79	6.43	6.40	6.56	6.35	6.31	6.10	6.73	6.53	6.48	6.64
06/01/29	06/30/29	Jun 2029	65.06	56.87	71.75	65.32	60.63	52.92	75.24	66.01	75.16	66.87	6.83	6.90	6.42	6.39	6.60	6.38	6.26	6.13	6.73	6.52	6.48	6.59
07/01/29	07/31/29	Jul 2029	76.90	64.29	81.59	69.57	71.73	59.68	87.45	71.34	85.56	72.12	6.91	7.07	6.51	6.49	6.71	6.46	6.38	6.16	6.82	6.62	6.57	6.71
08/01/29	08/31/29	Aug 2029	81.61	66.68	84.66	71.77	76.27	62.03	91.64	74.17	89.41	74.39	6.97	7.33	6.64	6.55	6.76	6.51	6.37	6.19	6.88	6.68	6.63	6.70
09/01/29	09/30/29	Sep 2029	76.98	66.56	77.41	69.42	72.75	63.49	85.98	73.09	82.71	72.57	6.93	7.34	6.64	6.58	6.82	6.56	6.41	6.23	6.91	6.71	6.67	6.73
10/01/29	10/31/29	Oct 2029	73.35	63.86	72.22	66.43	69.94	60.86	80.86	70.95	77.43	70.01	6.96	7.29	6.73	6.64	6.92	6.65	6.47	6.33	6.97	6.77	6.72	6.80
11/01/29	11/30/29	Nov 2029	77.12	68.62	72.85	68.00	74.73	64.35	81.07	73.75	77.86	71.72	7.25	7.57	7.03	7.04	7.41	7.34	7.53	6.85	7.38	7.17	7.12	7.89
12/01/29	12/31/29	Dec 2029	82.99	73.55	75.21	71.00	84.64	70.36	82.71	75.55	80.46	74.44	7.61	7.87	7.35	7.37	7.61	7.65	8.13	7.23	7.72	7.51	7.46	8.51
01/01/30	01/31/30	Jan 2030	84.09	74.89	78.94	74.45	85.12	71.66	85.90	77.97	83.91	77.77	7.99	8.29	7.80	7.73	7.88	7.96	8.64	7.62	8.08	7.87	7.82	9.02
02/01/30	02/28/30	Feb 2030	80.64	74.27	78.24	75.32	79.01	70.44	82.78	75.20	81.70	76.40	7.92	8.16	7.53	7.51	7.54	7.62	7.88	7.38	7.86	7.65	7.60	8.26
03/01/30	03/31/30	Mar 2030	72.18	64.85	68.85	66.52	69.59	60.58	73.80	68.43	72.49	67.75	6.92	6.91	6.68	6.69	6.92	6.79	7.07	6.73	7.04	6.83	6.78	7.44
04/01/30	04/30/30	Apr 2030	67.19	60.90	68.80	65.51	63.18	56.85	72.34	66.87	72.09	66.96	6.87	6.88	6.63	6.58	6.75	6.66	6.35	6.26	6.92	6.71	6.67	6.68
05/01/30	05/31/30	May 2030	61.14	56.84	69.12	65.70	56.94	52.61	70.93	66.37	71.80	66.87	6.90	6.95	6.52	6.51	6.69	6.42	6.35	6.18	6.85	6.65	6.60	6.68
06/01/30	06/30/30	Jun 2030	66.59	58.43	74.24	67.54	61.97	54.35	77.33	67.93	77.42	69.03	7.03	7.07	6.60	6.55	6.73	6.46	6.32	6.21	6.89	6.68	6.64	6.66
07/01/30	07/31/30	Jul 2030	79.74	66.31	85.38	72.25	74.42	61.58	90.88	73.76	89.20	74.47	7.11	7.43	6.72	6.64	6.80	6.50	6.43	6.25	6.98	6.77	6.72	6.77
08/01/30	08/31/30	Aug 2030	82.97	68.53	86.80	73.88	77.56	63.76	93.71	76.42	91.48	76.50	7.16	7.51	6.75	6.70	6.91	6.58	6.43	6.28	7.03	6.83	6.78	6.75
09/01/30	09/30/30	Sep 2030	79.06	67.99	80.74	72.21	74.58	64.69	88.78	75.09	85.41	74.56	7.12	7.50	6.79	6.74	6.96	6.63	6.47	6.32	7.07	6.87	6.83	6.79
10/01/30	10/31/30	Oct 2030	75.50	66.19	74.97	69.59	71.65	62.69	83.54	73.18	79.90	72.37	7.16	7.48	6.94	6.87	7.07	6.92	6.58	6.46	7.20	7.00	6.96	6.91
11/01/30	11/30/30	Nov 2030	81.09	73.03	77.60	72.28	79.26	68.93	85.70	77.92	82.30	75.61	7.64	8.04	7.47	7.51	7.98	7.86	8.13	7.44	7.85	7.64	7.59	8.49
12/01/30	12/31/30	Dec 2030	87.05	77.63	79.11	75.06	89.94	75.42	87.59	80.15	84.76	78.64	8.08	8.33	7.87	7.91	8.20	8.22	8.80	7.86	8.26	8.05	8.00	9.17
01/01/31	01/31/31	Jan 2031	86.52	77.20	80.94	76.52	87.86	73.92	87.30	79.66	85.90	79.82	8.15	8.46	7.95	7.89	8.04	8.12	8.82	7.77	8.24	8.03	7.97	9.19
02/01/31	02/28/31	Feb 2031	82.56	76.37	80.63	77.21	80.81	72.37	84.60	76.33	83.81	78.14	8.08	8.32	7.68	7.66	7.70	7.77	8.04	7.53	8.01	7.80	7.75	8.42
03/01/31	03/31/31	Mar 2031	73.33	66.55	70.61	67.72	71.39	62.38	74.90	70.17	74.18	69.41	7.06	7.04	6.81	6.83	7.06	6.92	7.21	6.87	7.17	6.97	6.91	7.58
04/01/31	04/30/31	Apr 2031	68.37	62.29	70.75	67.02	64.82	58.30	74.00	68.54	74.11	68.57	7.01	7.02	6.76	6.71	6.88	6.79	6.47	6.38	7.05	6.85	6.80	6.80
05/01/31	05/31/31	May 2031	62.58	58.25	70.57	67.33	58.28	53.97	72.30	67.85	73.12	68.34	7.04	7.09	6.65	6.64	6.83	6.55	6.48	6.30	6.98	6.78	6.73	6.81
06/01/31	06/30/31	Jun 2031	68.94	60.05	76.89	69.43	64.14	55.83	79.94	69.51	80.17	70.80	7.17	7.22	6.73	6.68	6.86	6.59	6.45	6.34	7.02	6.82	6.77	6.78
07/01/31	07/31/31	Jul 2031	81.83	68.29	87.57	74.30	76.38	63.44	93.03	75.56	91.40	76.56	7.25	7.58	6.85	6.77	6.94	6.63	6.56	6.37	7.11	6.91	6.86	6.90
08/01/31	08/31/31	Aug 2031	84.76	70.88	88.90	76.17	79.21	66.02	95.61	78.41	93.62	78.91	7.31	7.66	6.88	6.83	7.05	6.71	6.56	6.41	7.16	6.96	6.92	6.88
09/01/31	09/30/31	Sep 2031	80.84	69.69	82.63	73.65	76.17	66.33	90.62	76.23	87.44	75.86	7.26	7.65	6.92	6.88	7.10	6.76	6.60	6.45	7.21	7.01	6.96	6.92
10/01/31	10/31/31	Oct 2031	77.11	68.20	76.27	70.91	73.04	64.50	84.86	74.63	81.48	74.04	7.31	7.63	7.08	7.01	7.21	7.06	6.71	6.59	7.34	7.14	7.10	7.04
11/01/31	11/30/31	Nov 2031	83.29	75.53	78.60	73.66	81.29	71.48	87.23	80.20	83.80	77.47	7.79	8.20	7.62	7.66	8.14	8.02	8.29	7.59	8.00	7.79	7.74	8.65
12/01/31	12/31/31	Dec 2031	89.23	79.32	81.06	76.57	92.26	77.09	89.42	81.54	86.78	80.21	8.24	8.49	8.03	8.07	8.36	8.39	8.97	8.02	8.42	8.21	8.16	9.35
01/01/32	01/31/32	Jan 2032	88.97	79.43	83.07	78.41	90.28	76.17	89.08	80.75	88.16	81.63	8.31	8.63	8.11	8.04	8.20	8.28	8.99	7.93	8.40	8.19	8.13	9.37

02/01/32	02/29/32	Feb 2032	84.39	78.67	82.54	79.24	82.26	74.31	85.48	78.37	85.74	80.48	8.24	8.49	7.84	7.82	7.85	7.93	8.20	7.68	8.17	7.96	7.90	8.58
03/01/32	03/31/32	Mar 2032	75.17	67.97	72.55	70.29	73.65	64.04	76.38	71.47	75.99	71.47	7.20	7.18	6.95	6.96	7.20	7.06	7.35	7.00	7.31	7.10	7.05	7.73
04/01/32	04/30/32	Apr 2032	69.68	64.13	72.06	70.08	66.18	60.06	75.04	70.08	75.59	70.68	7.15	7.16	6.90	6.85	7.02	6.93	6.60	6.51	7.18	6.98	6.93	6.93
05/01/32	05/31/32	May 2032	64.23	59.93	72.94	69.69	59.80	55.65	74.12	69.65	75.41	70.36	7.18	7.23	6.79	6.78	6.96	6.68	6.61	6.43	7.11	6.91	6.86	6.94
06/01/32	06/30/32	Jun 2032	71.56	61.73	79.66	71.41	66.59	57.37	82.54	71.10	83.09	72.74	7.32	7.36	6.87	6.82	7.00	6.72	6.58	6.46	7.15	6.95	6.90	6.91
07/01/32	07/31/32	Jul 2032	83.77	70.43	90.02	76.54	78.21	65.46	95.09	77.29	93.92	78.98	7.40	7.73	6.99	6.91	7.08	6.76	6.69	6.50	7.24	7.04	6.99	7.03
08/01/32	08/31/32	Aug 2032	86.69	72.82	91.33	78.31	81.01	67.84	97.63	79.84	96.14	81.07	7.45	7.81	7.02	6.97	7.19	6.85	6.69	6.54	7.30	7.10	7.05	7.01
09/01/32	09/30/32	Sep 2032	81.84	71.33	82.59	74.77	76.98	67.88	91.23	77.25	88.15	77.59	7.41	7.81	7.06	7.02	7.24	6.90	6.73	6.58	7.35	7.15	7.10	7.05
10/01/32	10/31/32	Oct 2032	78.48	70.31	77.42	72.53	74.30	66.38	85.58	76.27	83.00	75.84	7.45	7.79	7.22	7.15	7.35	7.20	6.84	6.72	7.48	7.28	7.24	7.17
11/01/32	11/30/32	Nov 2032	86.00	78.18	80.61	75.63	83.95	74.28	89.34	81.27	86.11	79.38	7.95	8.36	7.77	7.81	8.30	8.18	8.45	7.74	8.15	7.95	7.90	8.82
12/01/32	12/31/32	Dec 2032	91.36	81.77	82.64	79.20	94.27	79.43	90.25	83.42	88.51	82.69	8.41	8.66	8.19	8.23	8.53	8.55	9.15	8.18	8.58	8.37	8.32	9.53
01/01/33	01/31/33	Jan 2033	91.50	82.24	85.28	80.66	92.51	79.18	90.57	82.38	90.02	83.66	8.48	8.80	8.27	8.21	8.36	8.44	9.17	8.08	8.56	8.35	8.29	9.55
02/01/33	02/28/33	Feb 2033	86.58	80.69	84.51	81.19	84.04	76.25	86.82	79.63	87.42	82.24	8.41	8.66	7.99	7.97	8.01	8.09	8.36	7.83	8.32	8.11	8.06	8.74
03/01/33	03/31/33	Mar 2033	76.89	70.00	74.14	72.03	75.59	66.23	77.53	73.15	77.32	72.80	7.34	7.33	7.09	7.10	7.35	7.20	7.50	7.14	7.45	7.24	7.19	7.87
04/01/33	04/30/33	Apr 2033	71.20	65.72	73.63	71.08	67.86	61.70	76.16	71.71	76.99	72.00	7.29	7.31	7.04	6.99	7.16	7.07	6.73	6.64	7.32	7.12	7.07	7.06
05/01/33	05/31/33	May 2033	66.10	61.68	74.60	70.86	61.41	57.33	75.75	71.34	77.02	71.74	7.32	7.38	6.92	6.91	7.10	6.82	6.74	6.55	7.25	7.04	7.00	7.07
06/01/33	06/30/33	Jun 2033	73.51	63.48	82.46	73.29	68.40	59.02	84.71	72.72	85.52	74.36	7.46	7.51	7.00	6.95	7.14	6.86	6.71	6.59	7.29	7.09	7.04	7.04
07/01/33	07/31/33	Jul 2033	85.71	72.85	92.37	79.13	80.01	67.74	96.97	79.39	96.14	81.44	7.55	7.88	7.13	7.05	7.22	6.90	6.83	6.63	7.38	7.18	7.13	7.16
08/01/33	08/31/33	Aug 2033	88.81	74.42	93.87	79.91	83.01	69.37	99.74	80.53	98.47	82.63	7.60	7.97	7.16	7.11	7.34	6.98	6.82	6.67	7.44	7.24	7.19	7.15
09/01/33	09/30/33	Sep 2033	83.66	73.19	85.45	77.39	78.57	69.66	92.53	78.74	90.23	79.48	7.56	7.96	7.20	7.16	7.39	7.04	6.86	6.71	7.49	7.29	7.24	7.19
10/01/33	10/31/33	Oct 2033	80.55	72.60	80.18	75.63	76.21	68.63	86.89	77.81	85.00	77.75	7.60	7.94	7.37	7.29	7.50	7.34	6.98	6.85	7.63	7.43	7.38	7.31
11/01/33	11/30/33	Nov 2033	88.55	81.27	82.97	78.22	86.31	77.41	91.07	83.02	88.17	81.60	8.11	8.53	7.92	7.97	8.47	8.34	8.62	7.90	8.31	8.10	8.05	8.99
12/01/33	12/31/33	Dec 2033	93.85	84.29	84.76	81.04	96.37	81.91	91.76	84.91	90.26	84.42	8.58	8.84	8.35	8.39	8.70	8.72	9.33	8.34	8.74	8.53	8.48	9.71
01/01/34	01/31/34	Jan 2034	93.17	84.58	87.01	82.50	94.56	81.38	92.88	84.51	91.99	85.45	8.65	8.98	8.44	8.37	8.53	8.61	9.36	8.25	8.72	8.51	8.46	9.73
02/01/34	02/28/34	Feb 2034	88.31	82.37	86.30	83.05	85.34	77.81	89.19	81.59	89.21	83.87	8.58	8.83	8.15	8.13	8.17	8.25	8.53	7.99	8.48	8.27	8.22	8.91
03/01/34	03/31/34	Mar 2034	78.34	71.69	76.20	73.06	76.97	68.01	79.70	74.90	79.29	74.00	7.49	7.47	7.23	7.24	7.49	7.35	7.65	7.29	7.59	7.38	7.33	8.02
04/01/34	04/30/34	Apr 2034	72.94	67.31	75.45	72.73	69.80	63.31	78.36	73.59	78.68	73.46	7.44	7.45	7.18	7.12	7.30	7.21	6.87	6.77	7.46	7.26	7.21	7.20
05/01/34	05/31/34	May 2034	67.91	63.00	76.82	72.80	63.20	58.46	77.91	72.97	79.01	73.20	7.47	7.52	7.06	7.05	7.24	6.95	6.88	6.69	7.38	7.18	7.14	7.21
06/01/34	06/30/34	Jun 2034	75.78	65.12	85.15	75.54	70.51	60.58	87.38	74.73	88.04	76.25	7.61	7.66	7.14	7.09	7.28	6.99	6.85	6.73	7.43	7.22	7.18	7.18
07/01/34	07/31/34	Jul 2034	87.89	74.74	95.05	81.22	82.06	69.50	99.39	81.56	98.50	83.31	7.70	8.04	7.27	7.19	7.36	7.03	6.96	6.76	7.52	7.32	7.27	7.30
08/01/34	08/31/34	Aug 2034	90.80	76.53	96.22	82.28	84.86	71.35	102.07	82.90	100.62	84.74	7.76	8.13	7.30	7.25	7.48	7.12	6.96	6.80	7.58	7.38	7.34	7.28
09/01/34	09/30/34	Sep 2034	84.92	74.79	86.99	79.47	79.78	71.06	94.27	80.65	91.51	81.10	7.71	8.12	7.35	7.30	7.53	7.18	7.00	6.84	7.63	7.43	7.38	7.32
10/01/34	10/31/34	Oct 2034	82.77	74.72	81.76	77.14	78.34	70.64	89.41	79.85	86.79	79.49	7.75	8.10	7.51	7.44	7.65	7.49	7.12	6.99	7.77	7.57	7.52	7.45
11/01/34	11/30/34	Nov 2034	90.51	83.76	84.48	79.44	88.08	79.89	93.52	85.05	90.01	83.32	8.27	8.70	8.08	8.13	8.64	8.51	8.80	8.05	8.47	8.26	8.21	9.16
12/01/34	12/31/34	Dec 2034	95.32	86.87	86.68	83.28	98.02	84.62	94.08	87.36	92.20	86.47	8.75	9.01	8.52	8.56	8.87	8.90	9.52	8.51	8.91	8.70	8.65	9.90
01/01/35	01/31/35	Jan 2035	94.94	86.63	88.93	85.24	96.84	83.76	94.46	86.30	94.13	88.20	8.82	9.16	8.61	8.54	8.70	8.78	9.54	8.41	8.89	8.68	8.62	9.92
02/01/35	02/28/35	Feb 2035	90.20	82.07	88.80	85.42	88.83	80.13	91.53	83.35	91.90	86.22	8.75	9.01	8.32	8.30	8.33	8.41	8.70	8.15	8.64	8.44	8.38	9.08
03/01/35	03/31/35	Mar 2035	79.33	73.59	78.41	75.91	79.65	71.54	80.97	76.90	80.92	76.50	7.64	7.62	7.38	7.39	7.64	7.49	7.80	7.43	7.74	7.53	7.48	8.18
04/01/35	04/30/35	Apr 2035	74.12	69.16	78.28	75.25	72.53	65.71	79.89	75.22	81.03	75.19	7.58	7.60	7.32	7.27	7.45	7.35	7.01	6.91	7.60	7.40	7.35	7.34
05/01/35	05/31/35	May 2035	69.35	64.77	78.70	75.19	64.73	60.31	79.33	74.87	81.07	75.42	7.62	7.67	7.20	7.19	7.39	7.09	7.01	6.82	7.53	7.32	7.28	7.35
06/01/35	06/30/35	Jun 2035	74.79	66.03	85.45	76.96	69.59	61.57	86.15	75.83	87.85	77.35	7.76	7.81	7.29	7.23	7.43	7.13	6.98	6.86	7.57	7.37	7.32	7.31
07/01/35	07/31/35	Jul 2035	89.58	76.80	98.00	83.79	83.64	71.45	101.05	83.24	101.21	85.69	7.85	8.20	7.41	7.33	7.51	7.17	7.10	6.90	7.67	7.46	7.42	7.44
08/01/35	08/31/35	Aug 2035	93.83	78.99	99.77	84.98	87.72	73.67	105.22	85.19	103.91	87.40	7.91	8.29	7.45	7.40	7.63	7.27	7.10	6.94	7.73	7.53	7.48	7.42
09/01/35	09/30/35	Sep 2035	88.64	76.74	91.11	82.09	83.14	73.15	98.87	83.72	96.37	84.31	7.86	8.28	7.49	7.45	7.69	7.32	7.14	6.98	7.77	7.58	7.53	7.46
10/01/35	10/31/35	Oct 2035	82.48	74.67	84.32	79.34	79.56	72.06	92.06	81.42	89.85	81.52	7.91	8.26	7.66	7.59	7.80	7.64	7.26	7.13	7.92	7.72	7.67	7.59
11/01/35	11/30/35	Nov 2035	91.53	84.31	87.05	82.03	88.43	80.05	94.91	86.94	92.48	85.70	8.43	8.87	8.24	8.29	8.81	8.68	8.97	8.21	8.63	8.43	8.38	9.34
12/01/35	12/31/35	Dec 2035	97.04	89.26	89.43	84.77	99.72	87.30	96.59	89.09	95.25	88.46	8.92	9.19	8.69	8.73	9.05	9.08	9.71	8.68	9.08	8.87	8.82	10.09
01/01/36	01/31/36	Jan 2036	98.83	89.44	91.66	87.75	99.69	86.49	96.42	88.58	96.56	90.47	9.01	9.35	8.79	8.72	8.88	8.97	9.74	8.59	9.07	8.86	8.80	10.12
02/01/36	02/29/36	Feb 2036	92.77	84.45	91.41	87.70	91.20	82.23	93.04	85.60	93.95	88.16	8.93	9.20	8.49	8.47	8.50	8.59	8.89	8.32	8.82	8.61	8.56	9.26
03/01/36	03/31/36	Mar 2036	81.43	75.51	80.34	77.74	81.68	73.72	82.77	78.90	82.71	77.84	7.80	7.78	7.53	7.54	7.80	7.65	7.97	7.59	7.89	7.68	7.63	8.34
04/01/36	04/30/36	Apr 2036	76.05	71.22	79.74	76.85	74.17	67.46	81.46	77.08	82.68	76.89	7.74	7.76	7.47	7.42	7.61	7.51	7.15	7.05	7.75	7.55	7.50	7.48
05/01/36	05/31/36	May 2036	71.35	66.56	80.51	76.77	66.54	62.07	80.94	76.73	82.57	76.86	7.78	7.84	7.35	7.34	7.54	7.24	7.16	6.96	7.68	7.48	7.43	7.49
06/01/36	06/30/36	Jun 2036	77.43	68.44	89.04	79.97	72.02	63.79	89.12	78.19	91.13	79.88	7.93	7.97	7.44	7.38	7.59	7.28	7.13	7.00	7.72	7.52	7.47	7.46
07/01/36	07/31/36	Jul 2036	92.13	78.85	100.72	85.87	86.03	73.41	103.67	84.66	103.85	87.46	8.02	8.37	7.57	7.48	7.67	7.32	7.25	7.04	7.82	7.62	7.57	7.59
08/01/36	08/31/36	Aug 2036	95.64	81.62	102.44	87.75	89.42	76.24	107.07	87.65	106.18	90.02	8.08	8.47	7.61	7.55	7.79	7.42	7.25	7.08	7.88	7.68	7.64	7.57
09/01/36	09/30/36	Sep 2036	91.29	78.28	94.60	84.71	85.69	74.86	101.13	85.10	99.10	86.02	8.03	8.46	7.65	7.60	7.85	7.47	7.29	7.13	7.93	7.73	7.69	7.61
10/01/36	10/31/36	Oct 2036	84.82	76.84	87.84	82.46	81.83	74.19	93.84	83.61	92.11	83.71	8.07	8.44	7.82	7.75	7.97	7.80	7.42	7.28	8.08	7.88	7.83	7.74
11/01/36	11/30/36	Nov 2036	94.38	87.67	89.32	85.33	90.97	83.55	96.54	89.34	94.39	87.72	8.61	9.06	8.42	8.46	9.00	8.86	9.16	8.39	8.80	8.60	8.55	9.52
12/01/36	12/31/36	Dec 2036	99.89	92.10	91.27	87.48	102.45	90.35	98.21	91.13	97.07	90.73	9.11	9.39	8.87	8.92	9.24	9.27	9.92	8.86	9.26	9.06	9.00	10.29
01/01/37	01/31/37	Jan 2037	101.38	91.97	93.94	90.35	101.95	88.92	98.15	90.83	98.57	92.47	9.20	9.54	8.97	8.90	9.07	9.16	9.95	8.77	9.25	9.04	8.99	10.33
02/01/37	02/28/37	Feb 2037	94.99	86.59	93.12	89.93	92.90	83.97	94.65	87.59	95.63	89.83	9.12	9.39	8.67	8.65	8.68	8.77	9.07	8.49	9.00	8.79	8.73	9.45
03/01/37	03/31/37	Mar 2037	83.29	77.94	82.30	79.29	83.62	76.58	84.52	80.76	84.71	79.20	7.97	7.95	7.69	7.70	7.97	7.81	8.13	7.75	8.05	7.84	7.79	8.51
04/01/37	04/30/37	Apr 2037	78.16	73.39	82.07	78.64	75.65	69.28	83.35	79.10	84.72	78.53	7.91	7.92	7.63	7.58	7.77	7.67	7.30	7.20	7.91	7.71	7.66	7.63
05/01/37	05/31/37	May 2037	73.30	68.51	82.22	79.21	68.43	63.90	82.75	78.78	84.30	78.59	7.94	8.00	7.51	7.50	7.70	7.39	7.31	7.11	7.83	7.63	7.58	7.64
06/01/37	06/30/37	Jun 2037	79.79	70.24	92.12	82.42	74.24	65.49	91.48	80.26	93.80	81.92	8.09	8.14	7.60	7.54	7.75	7.44	7.28	7.15	7.87	7.67	7.62	7.61
07/01/37	07/31/37	Jul 2037	94.30	81.25	103.63	88.75	88.06	75.78	105.95	86.90	106.50	89.79	8.19	8.55	7.73	7.64	7.83	7.48	7.41	7.19	7.98	7.78	7.73	7.74
08/01/37	08/31/37	Aug 2037	97.74	83.69	105.16	90.34	91.39	78.31	109.16	89.68	108.65	92.22	8.25	8.65	7.77	7.71	7.96	7.57	7.40	7.23	8.04	7.84	7.79	7.72
09/01/37	09/30/37	Sep 2037	93.07	80.42	96.54	87.08	87.32	76.72	102.64	86.99	100.80	87.76	8.20	8.64	7.81	7.76	8.01	7.63	7.44	7.28	8.09	7.89	7.85	7.77
10/01/37	10/31/37	Oct 2037	86.25	78.79	89.77	83.85	83.56	76.04	94.84	85.39	93.43	85.00	8.24	8.61	7.99	7.91	8.13	7.97	7.57	7.43	8.24	8.04	8.00	7.90
11/01/37	11/30/37	Nov 2037	97.35	90.56	91.53	87.43	93.38	86.45	98.33	91.54	96.65	89.59	8.79	9.25	8.59	8.64	9.19	9.05	9.35	8.56	8.98	8.78	8.73	9.72
12/01/37	12/31/37	Dec 2037	102.98	94.98	93.34	90.04	104.87	93.57	99.91	93.38	98.98	92.92	9.30	9.58	9.06	9.10	9.43	9.46	10.12	9.05	9.45	9.24	9.19	10.50
01/01/38	01/31/38	Jan 2038	101.67	94.05	96.49	92.75	102.80	91.63	99.61	92.99	100.07	93.94	9.39	9.74	9.16	9.09	9.26	9.35	10.16	8.95	9.44	9.23	9.17	10.54
02/01/38	02/28/38	Feb 2038	95.52	88.81	96.07	92.14	93.41	85.70	96.09	89.73	97.10	91.43	9.31	9.59	8.85	8.83	8.87	8.96	9.26	8.67	9.18	8.97	8.92	9.64
03/01/38	03/31/38	Mar 2038	85.27	79.54	84.21	81.80	85.59	77.91	86.61	82.78	86.50	80.58	8.13	8.11	7.85	7.86	8.13	7.97	8.30	7.91	8.21	8.00	7.95	8.68

04/01/38	04/30/38	Apr 2038	79.08	75.37	84.08	81.64	76.86	70.85	85.00	81.15	86.28	80.22	8.07	8.09	7.79	7.73	7.93	7.83	7.46	7.35	8.07	7.87	7.82	7.79
05/01/38	05/31/38	May 2038	75.07	70.14	85.20	81.56	70.14	65.64	84.92	80.88	86.38	80.28	8.11	8.17	7.67	7.65	7.86	7.55	7.47	7.26	7.99	7.79	7.74	7.80
06/01/38	06/30/38	Jun 2038	81.60	72.09	95.31	84.56	75.91	67.20	93.52	82.26	96.09	83.78	8.26	8.31	7.75	7.70	7.91	7.59	7.43	7.30	8.03	7.83	7.78	7.76
07/01/38	07/31/38	Jul 2038	96.02	82.95	106.19	91.04	89.67	77.34	107.95	88.88	108.43	91.28	8.36	8.73	7.89	7.80	7.99	7.64	7.56	7.34	8.14	7.94	7.89	7.89
08/01/38	08/31/38	Aug 2038	99.62	85.56	107.49	92.96	93.15	79.99	111.19	91.41	110.74	93.54	8.42	8.83	7.93	7.87	8.12	7.73	7.55	7.38	8.20	8.00	7.96	7.88
09/01/38	09/30/38	Sep 2038	93.88	82.41	96.91	88.49	88.13	78.18	103.26	88.73	101.04	88.74	8.37	8.82	7.98	7.92	8.18	7.79	7.60	7.43	8.25	8.06	8.01	7.92
10/01/38	10/31/38	Oct 2038	87.60	81.21	91.28	86.07	85.55	78.05	95.38	87.49	94.08	86.42	8.42	8.79	8.16	8.08	8.30	8.13	7.73	7.59	8.41	8.21	8.16	8.06
11/01/38	11/30/38	Nov 2038	98.18	93.04	93.53	89.83	95.19	89.06	100.17	93.32	98.16	91.06	8.98	9.45	8.77	8.82	9.38	9.24	9.55	8.74	9.16	8.96	8.91	9.91
12/01/38	12/31/38	Dec 2038	104.70	97.66	95.76	92.47	106.87	96.07	101.74	95.59	100.56	94.69	9.50	9.79	9.25	9.30	9.63	9.66	10.34	9.24	9.64	9.43	9.38	10.71
01/01/39	01/31/39	Jan 2039	104.56	96.98	98.96	95.54	104.77	94.27	102.28	95.43	101.85	95.32	9.59	9.95	9.35	9.28	9.46	9.55	10.37	9.14	9.63	9.42	9.36	10.75
02/01/39	02/28/39	Feb 2039	97.67	91.21	98.21	94.68	94.57	87.63	98.57	92.32	98.71	92.94	9.51	9.79	9.04	9.01	9.05	9.14	9.46	8.85	9.36	9.15	9.10	9.83
03/01/39	03/31/39	Mar 2039	87.27	81.80	86.51	83.55	87.46	80.13	88.56	84.97	87.80	81.67	8.30	8.29	8.02	8.03	8.30	8.14	8.48	8.08	8.38	8.17	8.12	8.85
04/01/39	04/30/39	Apr 2039	81.14	77.51	85.77	83.36	77.98	72.77	87.27	83.42	87.32	81.20	8.24	8.26	7.95	7.90	8.10	7.99	7.61	7.51	8.23	8.03	7.98	7.94
05/01/39	05/31/39	May 2039	77.43	72.18	86.89	83.51	72.16	67.56	87.28	83.19	87.77	81.64	8.28	8.34	7.83	7.81	8.03	7.71	7.62	7.41	8.15	7.95	7.90	7.95
06/01/39	06/30/39	Jun 2039	83.77	74.18	98.61	86.97	77.93	69.14	96.33	84.43	98.49	85.30	8.44	8.49	7.92	7.86	8.07	7.75	7.59	7.45	8.19	7.99	7.94	7.92
07/01/39	07/31/39	Jul 2039	98.09	85.74	108.91	94.02	91.60	79.99	110.48	91.85	110.39	93.37	8.53	8.91	8.06	7.97	8.16	7.80	7.72	7.50	8.30	8.10	8.05	8.05
08/01/39	08/31/39	Aug 2039	102.01	87.39	110.02	94.66	95.38	81.68	114.07	93.22	113.05	94.55	8.60	9.01	8.09	8.04	8.29	7.90	7.71	7.54	8.37	8.17	8.12	8.04
09/01/39	09/30/39	Sep 2039	95.48	84.42	100.27	91.45	89.55	79.78	105.43	90.90	102.52	90.09	8.54	9.00	8.14	8.09	8.35	7.95	7.76	7.59	8.42	8.22	8.17	8.08
10/01/39	10/31/39	Oct 2039	90.48	83.63	94.50	89.10	87.53	80.00	98.22	90.13	96.00	88.08	8.59	8.98	8.33	8.25	8.48	8.30	7.89	7.75	8.58	8.38	8.33	8.22
11/01/39	11/30/39	Nov 2039	101.38	95.95	96.47	92.82	97.32	91.70	103.11	95.99	99.83	92.46	9.16	9.64	8.96	9.01	9.58	9.43	9.75	8.93	9.35	9.14	9.09	10.11
12/01/39	12/31/39	Dec 2039	107.48	100.38	98.23	95.31	108.56	99.00	104.03	98.03	102.13	95.93	9.70	9.99	9.44	9.49	9.83	9.86	10.55	9.43	9.84	9.63	9.58	10.93
01/01/40	01/31/40	Jan 2040	108.99	100.05	102.03	98.53	108.48	97.36	104.59	98.02	104.32	97.42	9.79	10.16	9.55	9.47	9.66	9.75	10.59	9.33	9.82	9.61	9.56	10.97
02/01/40	02/29/40	Feb 2040	100.59	93.78	100.71	97.35	97.18	89.91	100.07	94.63	100.48	94.96	9.71	10.00	9.23	9.20	9.24	9.34	9.66	9.04	9.55	9.34	9.29	10.03
03/01/40	03/31/40	Mar 2040	89.17	84.04	88.66	85.87	89.31	82.25	90.71	87.54	89.33	83.60	8.48	8.46	8.18	8.20	8.48	8.31	8.66	8.24	8.55	8.34	8.28	9.03
04/01/40	04/30/40	Apr 2040	83.39	79.97	87.67	85.43	80.04	75.08	89.44	85.75	89.34	83.02	8.42	8.43	8.12	8.06	8.27	8.16	7.77	7.67	8.40	8.20	8.15	8.10
05/01/40	05/31/40	May 2040	79.78	74.32	90.05	85.84	74.37	69.52	89.74	85.32	90.27	83.38	8.45	8.51	7.99	7.98	8.20	7.87	7.78	7.57	8.31	8.11	8.06	8.11
06/01/40	06/30/40	Jun 2040	86.58	76.54	102.43	89.55	80.57	71.34	99.27	86.77	101.60	87.31	8.61	8.67	8.08	8.02	8.24	7.91	7.75	7.61	8.36	8.16	8.11	8.08
07/01/40	07/31/40	Jul 2040	101.16	88.66	112.65	96.53	94.49	82.73	113.70	94.32	113.45	95.60	8.71	9.10	8.23	8.13	8.33	7.96	7.88	7.65	8.47	8.27	8.22	8.22
08/01/40	08/31/40	Aug 2040	104.73	89.66	112.91	97.52	97.93	83.78	116.73	95.48	115.42	96.98	8.78	9.20	8.26	8.21	8.47	8.06	7.87	7.70	8.54	8.34	8.29	8.20
09/01/40	09/30/40	Sep 2040	97.08	86.40	102.54	93.95	90.96	81.71	106.27	93.09	103.67	91.96	8.72	9.19	8.31	8.26	8.53	8.12	7.92	7.75	8.59	8.39	8.34	8.25
10/01/40	10/31/40	Oct 2040	94.30	86.22	96.94	90.64	90.88	82.35	100.25	92.10	98.42	89.55	8.77	9.17	8.50	8.42	8.66	8.48	8.06	7.91	8.75	8.55	8.50	8.39
11/01/40	11/30/40	Nov 2040	104.49	98.60	98.91	95.20	100.39	94.42	104.64	98.25	101.51	94.33	9.36	9.85	9.15	9.20	9.78	9.63	9.95	9.11	9.54	9.33	9.28	10.32
12/01/40	12/31/40	Dec 2040	111.29	103.41	101.53	98.08	111.58	102.08	106.53	100.60	104.38	98.00	9.90	10.20	9.64	9.69	10.04	10.07	10.77	9.63	10.04	9.83	9.78	11.15
01/01/41	01/31/41	Jan 2041	112.23	103.03	104.55	101.16	110.95	99.91	107.22	100.64	106.60	99.88	10.00	10.37	9.75	9.67	9.86	9.95	10.81	9.53	10.02	9.81	9.76	11.19
02/01/41	02/28/41	Feb 2041	104.10	97.10	103.07	99.93	100.42	92.46	103.39	97.02	102.86	97.48	9.91	10.21	9.42	9.40	9.44	9.53	9.86	9.23	9.75	9.54	9.48	10.24
03/01/41	03/31/41	Mar 2041	92.40	86.71	90.45	88.79	92.07	85.09	93.22	89.71	91.73	85.90	8.66	8.64	8.36	8.37	8.66	8.49	8.84	8.42	8.72	8.51	8.46	9.21
04/01/41	04/30/41	Apr 2041	85.80	82.45	90.82	88.25	82.55	77.40	91.83	88.03	91.25	85.08	8.59	8.61	8.29	8.23	8.44	8.33	7.94	7.83	8.57	8.36	8.32	8.27
05/01/41	05/31/41	May 2041	81.75	76.31	92.52	88.42	76.44	71.66	91.61	87.52	92.23	85.50	8.63	8.69	8.16	8.15	8.37	8.04	7.95	7.72	8.48	8.28	8.23	8.28
06/01/41	06/30/41	Jun 2041	86.03	78.36	102.48	91.70	80.02	73.26	98.71	88.86	100.52	88.88	8.79	8.85	8.25	8.19	8.42	8.08	7.91	7.77	8.53	8.33	8.28	8.24
07/01/41	07/31/41	Jul 2041	103.11	90.17	116.01	98.21	96.31	84.09	115.89	95.63	115.44	96.82	8.90	9.29	8.40	8.30	8.51	8.13	8.05	7.82	8.64	8.44	8.39	8.38
08/01/41	08/31/41	Aug 2041	107.96	92.25	116.65	100.16	100.95	86.20	120.22	98.08	118.27	99.15	8.96	9.39	8.44	8.38	8.64	8.23	8.04	7.86	8.71	8.51	8.46	8.36
09/01/41	09/30/41	Sep 2041	102.01	89.61	107.21	96.93	95.40	84.22	112.09	96.69	109.11	95.34	8.91	9.38	8.49	8.43	8.71	8.29	8.09	7.91	8.76	8.56	8.52	8.41
10/01/41	10/31/41	Oct 2041	96.38	88.23	99.82	93.44	91.82	83.74	103.74	94.75	101.59	92.01	8.96	9.36	8.68	8.60	8.84	8.66	8.23	8.08	8.93	8.73	8.68	8.56
11/01/41	11/30/41	Nov 2041	105.75	100.60	102.67	97.88	101.06	95.73	106.37	100.63	103.64	96.60	9.55	10.05	9.34	9.39	9.98	9.83	10.16	9.31	9.73	9.53	9.48	10.53
12/01/41	12/31/41	Dec 2041	114.85	106.43	104.31	100.99	114.26	105.17	109.49	103.27	107.28	100.31	10.11	10.42	9.84	9.89	10.25	10.28	11.00	9.83	10.24	10.03	9.98	11.38
01/01/42	01/31/42	Jan 2042	115.33	106.27	107.73	104.21	113.74	103.12	110.11	103.23	109.36	102.50	10.21	10.59	9.95	9.87	10.06	10.16	11.04	9.73	10.22	10.01	9.96	11.42
02/01/42	02/28/42	Feb 2042	107.63	99.88	106.72	102.52	103.49	94.88	106.44	99.56	106.02	100.15	10.12	10.42	9.62	9.59	9.63	9.73	10.07	9.42	9.94	9.73	9.68	10.44
03/01/42	03/31/42	Mar 2042	94.56	89.06	93.19	90.93	94.06	87.29	95.77	92.29	94.17	88.17	8.84	8.82	8.53	8.55	8.84	8.67	9.02	8.59	8.89	8.68	8.63	9.40
04/01/42	04/30/42	Apr 2042	88.01	84.83	92.72	90.08	84.33	79.61	93.76	90.31	93.46	87.41	8.77	8.79	8.47	8.41	8.62	8.51	8.10	7.99	8.74	8.54	8.49	8.43
05/01/42	05/31/42	May 2042	84.05	78.45	95.06	90.62	78.56	73.71	94.20	89.91	94.69	87.94	8.81	8.88	8.33	8.32	8.55	8.20	8.11	7.89	8.65	8.45	8.40	8.44
06/01/42	06/30/42	Jun 2042	89.00	80.99	106.66	94.67	82.79	75.58	102.11	91.46	104.38	91.63	8.98	9.03	8.43	8.37	8.59	8.25	8.08	7.93	8.70	8.50	8.45	8.41
07/01/42	07/31/42	Jul 2042	105.85	93.07	119.47	101.27	98.88	86.77	119.10	98.36	118.44	99.45	9.08	9.48	8.58	8.48	8.68	8.30	8.22	7.98	8.82	8.61	8.56	8.55
08/01/42	08/31/42	Aug 2042	110.45	95.17	120.48	103.29	103.29	88.96	122.98	101.31	121.04	102.22	9.15	9.59	8.62	8.56	8.83	8.40	8.21	8.02	8.88	8.69	8.64	8.53
09/01/42	09/30/42	Sep 2042	104.97	91.62	111.87	99.61	98.13	86.16	115.03	98.42	112.23	97.09	9.09	9.58	8.67	8.61	8.89	8.47	8.26	8.07	8.94	8.74	8.70	8.58
10/01/42	10/31/42	Oct 2042	99.44	90.81	103.63	96.72	94.32	86.05	106.22	97.24	104.30	94.62	9.15	9.56	8.86	8.78	9.02	8.84	8.40	8.25	9.11	8.91	8.86	8.73
11/01/42	11/30/42	Nov 2042	109.17	103.66	105.86	101.19	103.71	98.81	109.37	103.62	106.79	99.41	9.75	10.26	9.54	9.59	10.19	10.04	10.38	9.50	9.93	9.72	9.67	10.74
12/01/42	12/31/42	Dec 2042	118.35	109.38	107.28	103.63	117.09	108.35	112.09	105.77	110.15	103.02	10.32	10.63	10.05	10.10	10.47	10.50	11.23	10.04	10.45	10.24	10.19	11.61
01/01/43	01/31/43	Jan 2043	117.75	108.50	109.99	106.40	116.12	105.29	112.42	105.40	111.66	104.65	10.42	10.81	10.16	10.08	10.28	10.37	11.27	9.93	10.43	10.22	10.17	11.65
02/01/43	02/28/43	Feb 2043	109.89	101.97	108.96	104.68	105.67	96.88	108.67	101.65	108.25	102.25	10.33	10.64	9.82	9.80	9.84	9.94	10.28	9.62	10.15	9.94	9.88	10.65
03/01/43	03/31/43	Mar 2043	96.54	90.93	95.14	92.84	96.04	89.13	97.78	94.23	96.15	90.02	9.02	9.00	8.71	8.73	9.02	8.85	9.21	8.78	9.07	8.86	8.81	9.59
04/01/43	04/30/43	Apr 2043	89.86	86.62	94.67	91.98	86.11	81.28	95.73	92.20	95.42	89.24	8.96	8.98	8.64	8.58	8.80	8.68	8.27	8.16	8.91	8.71	8.67	8.60
05/01/43	05/31/43	May 2043	85.82	80.10	97.06	92.52	80.21	75.25	96.18	91.80	96.67	89.79	9.00	9.06	8.50	8.49	8.73	8.38	8.28	8.05	8.83	8.62	8.58	8.61
06/01/43	06/30/43	Jun 2043	90.87	82.69	108.90	96.66	84.53	77.16	104.26	93.38	106.58	93.55	9.17	9.22	8.60	8.54	8.77	8.42	8.25	8.10	8.88	8.67	8.63	8.58
07/01/43	07/31/43	Jul 2043	108.07	95.02	121.97	103.40	100.95	88.59	121.60	100.43	120.93	101.54	9.27	9.68	8.76	8.66	8.87	8.47	8.39	8.15	8.99	8.79	8.74	8.72
08/01/43	08/31/43	Aug 2043	112.77	97.17	123.01	105.46	105.46	90.83	125.56	103.44	123.58	104.37	9.34	9.79	8.80	8.73	9.01	8.58	8.38	8.19	9.06	8.87	8.82	8.71
09/01/43	09/30/43	Sep 2043	107.18	93.54	114.22	101.70	100.19	87.97	117.44	100.49	114.59	99.13	9.29	9.78	8.85	8.79	9.08	8.64	8.43	8.24	9.12	8.92	8.88	8.76
10/01/43	10/31/43	Oct 2043	101.52	92.72	105.81	98.75	96.30	87.85	108.45	99.28	106.49	96.61	9.34	9.76	9.05	8.96	9.21	9.02	8.58	8.42	9.29	9.09	9.05	8.91
11/01/43	11/30/43	Nov 2043	111.46	105.84	108.08	103.32	105.89	100.89	111.67	105.79	109.03	101.50	9.96	10.48	9.74	9.79	10.41	10.25	10.59	9.70	10.13	9.92	9.87	10.96
12/01/43	12/31/43	Dec 2043	120.83	111.68	109.54	105.81	119.55	110.63	114.44	107.99	112.46	105.18	10.54	10.86	10.26	10.31	10.69	10.72	11.47	10.25	10.66	10.45	10.40	11.84

			COBHLH	COBLLH	Palo Verde	Palo Verde	Mid-Colun	Mid-Colun	NP 15HLH	NP 15LLH	SP 15HLH	SP 15LLH	Henry Hub Ga	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Ga	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
Quote Date		**Data Type:**	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
3/31/2014		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
0314 Official Forward Price Curve: *Blend of...* Final March 2014 Aurora forecast 03/31/2014 forward market curve																								
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
04/01/14	04/30/14	Apr 2014	33.50	18.75	40.00	30.25	29.25	16.50	47.50	36.75	48.00	37.25	4.58	4.52	4.29	4.26	4.51	4.45	4.38	4.14	4.67	4.45	4.48	4.56
05/01/14	05/31/14	May 2014	29.25	8.25	40.50	28.50	24.25	5.75	45.75	33.75	47.00	34.50	4.37	4.52	4.26	4.30	4.42	4.38	4.15	4.16	4.62	4.42	4.38	4.42
06/01/14	06/30/14	Jun 2014	28.25	7.25	43.50	29.00	23.75	4.50	46.50	33.75	47.75	34.75	4.40	4.55	4.29	4.28	4.39	4.36	4.12	4.15	4.60	4.40	4.36	4.39
07/01/14	07/31/14	Jul 2014	43.94	20.16	51.76	35.45	39.13	16.96	53.11	41.65	55.29	43.07	4.44	4.67	4.37	4.37	4.52	4.48	4.24	4.14	4.70	4.49	4.45	4.52
08/01/14	08/31/14	Aug 2014	55.55	36.48	53.81	35.10	50.51	33.93	56.94	43.35	59.28	43.94	4.44	4.72	4.41	4.41	4.52	4.48	4.40	4.15	4.74	4.53	4.49	4.69
09/01/14	09/30/14	Sep 2014	52.02	39.36	48.18	33.71	46.87	35.36	54.20	42.50	56.43	43.50	4.42	4.67	4.39	4.35	4.51	4.47	4.45	4.17	4.68	4.47	4.43	4.74
10/01/14	10/31/14	Oct 2014	46.08	38.00	42.59	34.34	43.23	35.72	53.03	43.75	53.03	43.56	4.43	4.61	4.33	4.34	4.48	4.44	4.36	4.17	4.67	4.46	4.42	4.65
11/01/14	11/30/14	Nov 2014	48.50	39.20	41.33	34.00	43.68	36.86	51.98	43.31	51.98	42.68	4.48	4.72	4.45	4.53	4.65	4.61	4.95	4.27	4.87	4.66	4.62	5.30
12/01/14	12/31/14	Dec 2014	50.93	42.80	41.33	33.66	49.60	41.42	52.50	44.19	52.50	45.76	4.60	4.84	4.57	4.65	4.77	4.73	5.23	4.39	4.98	4.77	4.73	5.59
01/01/15	01/31/15	Jan 2015	47.97	39.11	42.17	33.84	45.21	37.18	51.76	43.94	54.08	44.81	4.68	4.92	4.65	4.73	4.85	4.81	5.15	4.47	5.08	4.86	4.82	5.50
02/01/15	02/28/15	Feb 2015	45.25	37.25	41.75	33.50	42.25	36.11	51.26	42.25	52.52	43.50	4.64	4.88	4.61	4.69	4.81	4.77	5.00	4.43	5.03	4.82	4.78	5.35
03/01/15	03/31/15	Mar 2015	42.54	35.39	41.33	33.17	39.29	33.96	47.74	40.56	49.40	42.20	4.53	4.77	4.50	4.59	4.70	4.66	4.93	4.32	4.92	4.71	4.67	5.27
04/01/15	04/30/15	Apr 2015	37.52	24.82	40.43	31.67	36.08	22.88	47.74	38.12	50.60	39.00	4.05	4.21	3.87	3.85	3.95	3.91	3.77	3.50	4.16	3.97	3.93	4.02
05/01/15	05/31/15	May 2015	31.83	15.51	36.75	24.21	24.98	9.62	40.98	30.24	44.00	30.88	4.01	4.17	3.83	3.74	3.91	3.88	3.69	3.47	4.05	3.85	3.82	3.93
06/01/15	06/30/15	Jun 2015	31.16	14.42	33.08	21.37	22.20	6.50	38.03	26.15	37.40	27.63	4.03	4.19	3.85	3.92	3.93	3.89	3.68	3.49	4.23	4.03	4.00	3.93
07/01/15	07/31/15	Jul 2015	46.56	24.10	49.29	30.50	40.66	20.63	50.00	37.83	53.30	38.32	4.06	4.22	3.88	3.87	3.96	3.92	3.88	3.52	4.18	3.99	3.95	4.13
08/01/15	08/31/15	Aug 2015	49.92	33.55	48.36	30.50	45.41	30.25	51.50	40.95	53.82	40.69	4.05	4.21	3.87	3.87	3.95	3.92	3.87	3.51	4.19	3.99	3.95	4.12
09/01/15	09/30/15	Sep 2015	47.52	33.86	41.85	30.50	43.68	31.63	48.50	38.22	49.64	39.50	4.02	4.18	3.84	3.79	3.92	3.89	3.86	3.48	4.10	3.90	3.87	4.11
10/01/15	10/31/15	Oct 2015	42.55	35.28	39.14	30.75	40.26	33.01	46.53	40.10	46.55	39.45	4.04	4.20	3.86	3.85	3.94	3.91	4.04	3.50	4.16	3.96	3.92	4.31
11/01/15	11/30/15	Nov 2015	45.29	36.02	38.38	30.14	41.09	33.71	46.53	39.69	47.50	39.45	4.08	4.26	3.93	4.02	4.21	4.17	4.66	3.67	4.33	4.14	4.10	4.99
12/01/15	12/31/15	Dec 2015	49.41	38.96	36.48	31.37	43.16	37.53	47.94	41.72	48.45	41.86	4.23	4.40	4.07	4.16	4.35	4.31	4.84	3.81	4.48	4.28	4.24	5.17
01/01/16	01/31/16	Jan 2016	48.72	39.11	40.67	33.34	43.21	36.43	50.26	43.19	51.58	43.31	4.36	4.54	4.21	4.29	4.49	4.45	4.65	3.94	4.62	4.41	4.37	4.98
02/01/16	02/29/16	Feb 2016	46.00	37.25	40.25	33.00	40.25	35.36	49.76	41.50	50.02	42.00	4.34	4.51	4.18	4.27	4.46	4.42	4.64	3.92	4.60	4.39	4.35	4.96
03/01/16	03/31/16	Mar 2016	43.29	35.39	39.83	32.67	37.29	33.21	46.24	39.81	46.90	40.70	4.28	4.45	4.12	4.21	4.40	4.36	4.57	3.86	4.53	4.33	4.29	4.90
04/01/16	04/30/16	Apr 2016	38.27	24.82	40.43	31.92	36.83	24.63	46.74	39.62	49.35	39.00	4.02	4.13	3.78	3.66	3.84	3.81	3.80	3.32	3.96	3.77	3.73	4.05
05/01/16	05/31/16	May 2016	32.58	15.51	36.75	24.46	25.73	11.37	39.98	31.74	42.75	30.88	4.03	4.14	3.78	3.66	3.85	3.82	3.79	3.33	3.97	3.77	3.74	4.04
06/01/16	06/30/16	Jun 2016	31.91	14.42	33.08	21.62	22.95	8.25	37.03	27.65	36.15	27.63	4.04	4.15	3.80	3.68	3.86	3.83	3.80	3.34	3.99	3.79	3.75	4.05
07/01/16	07/31/16	Jul 2016	47.31	24.10	49.29	30.75	40.41	21.63	49.50	37.83	52.02	38.07	4.06	4.17	3.82	3.70	3.88	3.85	3.81	3.36	4.01	3.81	3.77	4.06
08/01/16	08/31/16	Aug 2016	50.67	33.55	48.36	30.75	45.16	31.25	51.00	40.95	52.53	40.44	4.07	4.18	3.83	3.70	3.89	3.86	3.82	3.37	4.01	3.82	3.78	4.07
09/01/16	09/30/16	Sep 2016	48.27	33.86	41.85	30.75	43.43	32.63	48.00	38.22	48.45	39.25	4.06	4.17	3.82	3.70	3.88	3.85	3.78	3.36	4.01	3.81	3.77	4.03
10/01/16	10/31/16	Oct 2016	43.30	35.28	39.64	30.75	39.26	33.26	45.78	39.35	45.55	38.45	4.08	4.19	3.84	3.72	3.90	3.87	3.85	3.38	4.03	3.83	3.79	4.11
11/01/16	11/30/16	Nov 2016	46.04	36.02	38.88	30.14	40.09	33.96	45.78	38.94	46.50	38.45	4.15	4.25	3.94	3.96	4.11	4.08	4.50	3.65	4.28	4.07	4.04	4.82
12/01/16	12/31/16	Dec 2016	50.16	38.96	36.98	31.37	42.16	37.78	47.19	40.97	47.45	40.86	4.31	4.41	4.11	4.12	4.28	4.24	4.65	3.81	4.45	4.24	4.20	4.98
01/01/17	01/31/17	Jan 2017	50.72	40.86	42.67	35.09	45.21	38.18	51.26	44.19	52.33	44.31	4.45	4.55	4.25	4.28	4.42	4.38	4.80	3.95	4.60	4.40	4.36	5.14
02/01/17	02/28/17	Feb 2017	48.00	39.00	42.25	34.75	42.25	37.11	50.76	42.50	50.77	43.00	4.43	4.52	4.22	4.25	4.39	4.35	4.77	3.93	4.57	4.37	4.33	5.11
03/01/17	03/31/17	Mar 2017	45.29	37.14	41.83	34.42	39.29	34.96	47.24	40.81	47.65	41.70	4.37	4.46	4.16	4.19	4.33	4.29	4.73	3.87	4.51	4.31	4.27	5.06
04/01/17	04/30/17	Apr 2017	40.27	26.57	42.43	33.67	38.83	26.38	47.74	40.62	50.10	40.00	4.11	4.18	3.79	3.64	3.95	3.91	3.83	3.39	3.94	3.75	3.72	4.08
05/01/17	05/31/17	May 2017	34.58	17.26	38.75	26.21	27.73	13.12	40.98	32.74	43.50	31.88	4.12	4.19	3.80	3.65	3.96	3.92	3.82	3.40	3.95	3.76	3.73	4.08
06/01/17	06/30/17	Jun 2017	33.91	16.17	35.08	23.37	24.95	10.00	38.03	28.65	36.90	28.63	4.14	4.21	3.82	3.67	3.98	3.94	3.84	3.42	3.97	3.79	3.75	4.09
07/01/17	07/31/17	Jul 2017	49.31	25.85	51.29	32.50	42.41	23.38	50.50	38.83	52.77	39.07	4.16	4.24	3.85	3.70	4.00	3.97	3.84	3.45	4.00	3.81	3.78	4.10
08/01/17	08/31/17	Aug 2017	52.67	35.30	50.36	32.50	47.16	33.00	52.00	41.95	53.28	41.44	4.17	4.25	3.86	3.71	4.02	3.98	3.85	3.46	4.01	3.82	3.79	4.10
09/01/17	09/30/17	Sep 2017	50.27	35.61	43.85	32.50	45.43	34.38	49.00	39.22	49.20	40.25	4.17	4.24	3.85	3.70	4.01	3.98	3.85	3.46	4.00	3.82	3.78	4.11
10/01/17	10/31/17	Oct 2017	45.30	37.03	41.64	32.50	41.26	35.01	46.78	40.35	46.30	39.45	4.19	4.27	3.88	3.73	4.03	4.00	3.89	3.48	4.03	3.84	3.81	4.15
11/01/17	11/30/17	Nov 2017	48.04	37.77	40.88	31.89	42.09	35.71	46.78	39.94	47.25	39.45	4.27	4.40	4.08	4.08	4.22	4.18	4.69	3.84	4.39	4.20	4.16	5.02
12/01/17	12/31/17	Dec 2017	52.16	40.71	38.98	33.12	44.16	39.53	48.19	41.97	48.20	41.86	4.44	4.57	4.25	4.25	4.39	4.35	4.84	4.01	4.57	4.37	4.33	5.18
01/01/18	01/31/18	Jan 2018	53.22	42.86	45.17	37.09	47.71	40.18	52.61	45.69	53.58	45.56	4.56	4.69	4.36	4.38	4.51	4.47	4.88	4.13	4.69	4.50	4.46	5.22
02/01/18	02/28/18	Feb 2018	50.50	41.00	44.75	36.75	44.75	39.11	52.11	44.00	52.02	44.25	4.53	4.66	4.33	4.35	4.48	4.44	4.85	4.10	4.66	4.48	4.43	5.18
03/01/18	03/31/18	Mar 2018	47.79	39.14	44.33	36.42	41.79	36.96	48.59	42.31	48.90	42.95	4.47	4.59	4.26	4.29	4.41	4.38	4.78	4.03	4.60	4.41	4.37	5.11
04/01/18	04/30/18	Apr 2018	42.77	28.57	44.93	35.67	41.33	28.38	49.09	42.12	51.35	41.25	4.20	4.30	3.88	3.88	4.08	4.05	3.94	3.64	4.18	4.00	3.96	4.21
05/01/18	05/31/18	May 2018	37.08	19.26	41.25	28.21	30.23	15.12	42.33	34.24	44.75	33.13	4.21	4.31	3.90	3.90	4.09	4.06	3.95	3.66	4.19	4.01	3.97	4.21
06/01/18	06/30/18	Jun 2018	36.41	18.17	37.58	25.37	27.45	12.00	39.38	30.15	38.15	29.88	4.23	4.34	3.92	3.92	4.12	4.08	3.96	3.68	4.22	4.04	4.00	4.22
07/01/18	07/31/18	Jul 2018	51.81	27.85	53.79	34.50	44.91	25.38	51.85	40.33	54.02	40.32	4.26	4.36	3.95	3.95	4.14	4.11	3.97	3.71	4.25	4.06	4.03	4.23
08/01/18	08/31/18	Aug 2018	55.17	37.30	52.86	34.50	49.66	35.00	53.35	43.45	54.53	42.69	4.28	4.38	3.96	3.96	4.16	4.12	3.98	3.72	4.26	4.08	4.04	4.24
09/01/18	09/30/18	Sep 2018	52.77	37.61	46.35	34.50	47.93	36.38	50.35	40.72	50.45	41.50	4.28	4.38	3.97	3.97	4.16	4.13	4.00	3.73	4.26	4.08	4.04	4.26
10/01/18	10/31/18	Oct 2018	47.80	39.03	44.14	34.50	43.76	37.01	48.13	41.85	47.55	40.70	4.31	4.41	3.99	3.99	4.19	4.15	4.03	3.75	4.29	4.11	4.07	4.30
11/01/18	11/30/18	Nov 2018	50.54	39.77	43.38	33.89	44.59	37.71	48.13	41.44	48.50	40.70	4.40	4.59	4.21	4.26	4.37	4.33	4.87	3.96	4.56	4.38	4.34	5.21
12/01/18	12/31/18	Dec 2018	54.66	42.71	41.48	35.12	46.66	41.53	49.54	43.47	49.45	43.11	4.58	4.77	4.39	4.44	4.55	4.51	5.02	4.14	4.75	4.56	4.52	5.37
01/01/19	01/31/19	Jan 2019	55.47	45.11	47.17	39.09	49.96	42.43	54.36	45.44	55.33	47.31	4.68	4.87	4.48	4.54	4.65	4.61	5.03	4.25	4.86	4.66	4.62	5.38
02/01/19	02/28/19	Feb 2019	52.75	43.25	46.75	38.75	47.00	41.36	53.86	43.75	53.77	46.00	4.65	4.84	4.45	4.51	4.62	4.58	5.00	4.22	4.83	4.63	4.59	5.35
03/01/19	03/31/19	Mar 2019	50.04	41.39	46.33	38.42	44.04	39.21	50.34	42.06	50.65	44.70	4.59	4.78	4.38	4.44	4.55	4.51	4.93	4.15	4.76	4.57	4.52	5.28
04/01/19	04/30/19	Apr 2019	45.02	30.82	46.93	37.67	43.58	30.63	50.84	41.87	53.10	43.00	4.31	4.51	4.00	4.06	4.22	4.19	4.04	3.83	4.36	4.18	4.14	4.31
05/01/19	05/31/19	May 2019	39.33	21.51	43.25	30.21	32.48	17.37	44.08	33.99	46.50	34.88	4.33	4.52	4.01	4.08	4.24	4.20	4.04	3.84	4.38	4.20	4.16	4.31
06/01/19	06/30/19	Jun 2019	38.66	20.42	39.58	27.37	29.70	14.25	41.13	29.90	39.90	31.63	4.35	4.54	4.04	4.10	4.26	4.23	4.05	3.86	4.40	4.22	4.18	4.32

07/01/19	07/31/19	Jul 2019	54.06	30.10	55.79	36.50	47.16	27.63	53.60	40.08	55.77	42.07	4.38	4.57	4.07	4.13	4.29	4.26	4.07	3.89	4.44	4.25	4.21	4.33
08/01/19	08/31/19	Aug 2019	57.42	39.55	54.86	36.50	51.91	37.25	55.10	43.20	56.28	44.44	4.41	4.60	4.09	4.16	4.32	4.28	4.08	3.92	4.46	4.27	4.24	4.35
09/01/19	09/30/19	Sep 2019	55.02	39.86	48.35	36.50	50.18	38.63	52.10	40.47	52.20	43.25	4.41	4.61	4.10	4.16	4.33	4.29	4.11	3.93	4.47	4.28	4.24	4.38
10/01/19	10/31/19	Oct 2019	50.05	41.28	46.14	36.50	46.01	39.26	49.88	41.60	49.30	42.45	4.45	4.64	4.14	4.20	4.36	4.33	4.15	3.96	4.51	4.32	4.28	4.43
11/01/19	11/30/19	Nov 2019	52.79	42.02	45.38	35.89	46.84	39.96	49.88	41.19	50.25	42.45	4.56	4.82	4.36	4.44	4.56	4.52	4.83	4.19	4.76	4.56	4.52	5.17
12/01/19	12/31/19	Dec 2019	56.91	44.96	43.48	37.12	48.91	43.78	51.29	43.22	51.20	44.86	4.75	5.02	4.56	4.64	4.76	4.72	5.01	4.39	4.96	4.76	4.72	5.36
01/01/20	01/31/20	Jan 2020	58.72	47.11	50.17	41.09	53.21	44.43	56.86	47.19	57.83	49.06	4.87	5.13	4.66	4.77	4.87	4.83	5.07	4.50	5.10	4.90	4.86	5.42
02/01/20	02/29/20	Feb 2020	56.00	45.25	49.75	40.75	50.25	43.36	56.36	45.50	56.27	47.75	4.84	5.11	4.64	4.75	4.85	4.81	5.04	4.47	5.07	4.88	4.83	5.39
03/01/20	03/31/20	Mar 2020	53.29	43.39	49.33	40.42	47.29	41.21	52.84	43.81	53.15	46.45	4.78	5.04	4.57	4.68	4.78	4.74	4.98	4.41	5.01	4.81	4.77	5.32
04/01/20	04/30/20	Apr 2020	48.27	32.82	49.93	39.67	46.83	32.63	53.34	43.62	55.60	44.75	4.50	4.75	4.19	4.33	4.42	4.39	4.21	4.12	4.65	4.46	4.41	4.51
05/01/20	05/31/20	May 2020	40.07	28.36	43.61	35.97	34.97	24.75	47.12	39.98	47.74	39.91	4.79	4.88	4.46	4.49	4.66	4.57	4.45	4.27	4.80	4.61	4.57	4.75
06/01/20	06/30/20	Jun 2020	42.07	28.74	44.01	35.69	35.77	24.07	47.56	39.35	46.64	39.71	4.84	4.97	4.52	4.49	4.69	4.59	4.45	4.30	4.80	4.61	4.57	4.75
07/01/20	07/31/20	Jul 2020	53.03	37.06	55.15	41.98	47.67	34.09	57.15	46.19	57.70	46.87	4.88	5.08	4.56	4.54	4.73	4.62	4.44	4.29	4.86	4.66	4.62	4.75
08/01/20	08/31/20	Aug 2020	56.08	42.47	55.29	42.71	51.35	39.55	58.97	48.35	59.05	48.85	4.91	5.15	4.59	4.56	4.75	4.64	4.45	4.32	4.88	4.69	4.64	4.75
09/01/20	09/30/20	Sep 2020	53.66	42.28	49.34	41.66	49.38	39.94	55.57	46.54	54.72	47.10	4.90	5.10	4.58	4.58	4.78	4.68	4.47	4.34	4.90	4.71	4.66	4.78
10/01/20	10/31/20	Oct 2020	51.05	42.89	46.72	40.75	47.21	40.13	53.18	47.03	51.81	46.10	4.93	5.08	4.60	4.63	4.85	4.73	4.52	4.40	4.95	4.76	4.71	4.83
11/01/20	11/30/20	Nov 2020	53.39	44.20	46.75	40.77	48.46	41.38	53.60	47.52	52.55	46.71	5.07	5.27	4.81	4.85	5.11	5.06	5.30	4.68	5.18	4.98	4.94	5.64
12/01/20	12/31/20	Dec 2020	57.03	46.34	46.49	42.37	51.10	43.95	54.89	48.84	53.59	48.76	5.27	5.46	5.02	5.07	5.23	5.24	5.56	4.86	5.40	5.20	5.15	5.92
01/01/21	01/31/21	Jan 2021	60.65	50.03	52.86	46.88	56.11	46.85	58.08	50.88	58.60	52.40	5.31	5.49	5.05	5.11	5.17	5.19	5.44	4.85	5.45	5.25	5.20	5.80
02/01/21	02/28/21	Feb 2021	58.39	48.52	52.52	46.80	53.63	45.65	57.19	49.53	57.27	51.40	5.29	5.43	4.99	5.06	5.11	5.13	5.32	4.85	5.40	5.20	5.15	5.68
03/01/21	03/31/21	Mar 2021	53.86	45.40	50.88	45.16	48.89	42.48	54.12	48.00	54.32	49.48	5.10	5.24	4.82	4.88	5.03	4.96	5.14	4.73	5.22	5.01	4.97	5.49
04/01/21	04/30/21	Apr 2021	49.25	39.25	51.15	44.64	46.64	37.37	54.06	47.68	55.45	48.38	4.93	5.09	4.61	4.69	4.86	4.75	4.57	4.50	5.01	4.81	4.77	4.88
05/01/21	05/31/21	May 2021	40.81	35.21	43.97	41.74	37.46	32.12	50.15	45.97	48.99	44.95	5.26	5.24	4.91	4.90	5.09	4.94	4.87	4.70	5.22	5.03	4.99	5.17
06/01/21	06/30/21	Jun 2021	45.48	37.05	48.44	44.02	41.84	33.88	54.00	48.81	53.39	47.79	5.33	5.40	5.00	4.87	5.11	4.96	4.85	4.73	5.18	4.99	4.95	5.15
07/01/21	07/31/21	Jul 2021	52.00	44.02	54.52	47.47	48.18	40.55	60.70	52.30	59.64	51.67	5.39	5.59	5.05	4.95	5.16	4.98	4.82	4.70	5.27	5.07	5.03	5.12
08/01/21	08/31/21	Aug 2021	54.74	45.39	55.71	48.93	50.79	41.85	62.83	53.49	61.82	53.27	5.42	5.71	5.08	4.97	5.19	5.01	4.81	4.72	5.29	5.10	5.05	5.11
09/01/21	09/30/21	Sep 2021	52.30	44.70	50.33	46.81	48.57	41.25	59.03	52.62	57.24	50.94	5.38	5.59	5.07	5.00	5.24	5.06	4.84	4.75	5.32	5.13	5.08	5.14
10/01/21	10/31/21	Oct 2021	52.05	44.50	47.29	45.00	48.42	41.01	56.48	52.47	54.32	49.76	5.40	5.51	5.07	5.06	5.33	5.14	4.89	4.84	5.38	5.19	5.14	5.20
11/01/21	11/30/21	Nov 2021	53.98	46.38	48.13	45.66	50.08	42.80	57.32	53.84	54.86	50.98	5.59	5.72	5.25	5.27	5.66	5.60	5.77	5.16	5.59	5.40	5.35	6.11
12/01/21	12/31/21	Dec 2021	57.16	47.72	49.50	47.62	53.29	44.12	58.50	54.46	55.97	52.67	5.78	5.90	5.47	5.50	5.70	5.76	6.11	5.34	5.84	5.64	5.59	6.46
01/01/22	01/31/22	Jan 2022	62.59	52.95	55.55	52.67	59.01	49.26	59.31	54.56	59.37	55.75	5.75	5.85	5.44	5.45	5.47	5.54	5.80	5.20	5.79	5.59	5.54	6.16
02/01/22	02/28/22	Feb 2022	60.79	51.78	55.29	52.85	57.01	47.95	58.03	53.55	58.27	55.05	5.73	5.74	5.34	5.38	5.38	5.46	5.60	5.23	5.71	5.51	5.46	5.96
03/01/22	03/31/22	Mar 2022	54.44	47.41	52.44	49.90	50.48	43.75	55.40	52.19	55.50	52.51	5.42	5.45	5.06	5.08	5.29	5.19	5.30	5.05	5.41	5.21	5.16	5.65
04/01/22	04/30/22	Apr 2022	50.22	45.68	52.37	49.61	46.45	42.11	54.77	51.75	55.30	52.01	5.36	5.44	5.03	5.04	5.29	5.12	4.93	4.87	5.36	5.17	5.12	5.24
05/01/22	05/31/22	May 2022	46.61	42.79	52.92	49.74	42.99	39.34	54.59	50.88	55.29	51.72	5.40	5.39	5.07	5.03	5.28	5.08	5.02	4.83	5.35	5.16	5.11	5.32
06/01/22	06/30/22	Jun 2022	51.99	44.72	56.66	52.02	48.14	41.19	59.80	52.78	59.84	53.64	5.50	5.58	5.17	5.06	5.30	5.11	5.01	4.86	5.38	5.19	5.14	5.31
07/01/22	07/31/22	Jul 2022	58.87	49.80	62.73	54.72	54.71	46.04	66.78	55.63	66.53	56.83	5.55	5.79	5.22	5.09	5.34	5.14	5.04	4.88	5.41	5.22	5.17	5.34
08/01/22	08/31/22	Aug 2022	63.07	51.18	64.79	55.87	58.73	47.36	69.14	56.62	69.17	58.07	5.59	5.93	5.27	5.13	5.39	5.17	5.02	4.90	5.45	5.25	5.21	5.33
09/01/22	09/30/22	Sep 2022	61.39	51.69	58.79	53.67	57.33	47.91	63.01	55.50	62.85	56.06	5.52	5.77	5.22	5.15	5.46	5.24	5.05	4.93	5.47	5.28	5.23	5.36
10/01/22	10/31/22	Oct 2022	60.33	50.50	55.44	51.48	56.24	46.71	60.11	55.01	59.74	54.60	5.55	5.66	5.21	5.21	5.54	5.31	5.11	5.02	5.53	5.33	5.29	5.42
11/01/22	11/30/22	Nov 2022	63.90	53.81	56.26	52.95	59.80	49.89	61.33	57.02	60.70	56.18	5.88	5.90	5.55	5.58	5.95	5.89	6.04	5.43	5.91	5.71	5.67	6.38
12/01/22	12/31/22	Dec 2022	66.92	56.43	59.22	55.98	64.21	52.74	63.86	58.97	63.53	59.21	6.20	6.37	5.89	5.84	6.07	6.08	6.41	5.69	6.17	5.97	5.92	6.77
01/01/23	01/31/23	Jan 2023	64.40	54.89	57.65	54.33	61.02	51.13	61.35	56.15	61.43	57.45	5.85	6.07	5.58	5.56	5.68	5.61	6.04	5.39	5.90	5.70	5.65	6.40
02/01/23	02/28/23	Feb 2023	62.76	53.54	57.40	54.53	59.06	49.65	60.12	55.43	60.28	56.61	5.88	5.93	5.54	5.56	5.72	5.64	5.80	5.42	5.90	5.70	5.65	6.15
03/01/23	03/31/23	Mar 2023	56.25	49.41	54.47	52.16	52.19	45.64	57.34	54.07	57.36	54.16	5.63	5.57	5.24	5.37	5.62	5.48	5.48	5.29	5.71	5.51	5.46	5.83
04/01/23	04/30/23	Apr 2023	52.68	47.86	54.59	52.21	48.77	44.16	57.37	54.14	57.63	54.09	5.58	5.58	5.22	5.28	5.54	5.34	5.20	5.09	5.60	5.40	5.36	5.51
05/01/23	05/31/23	May 2023	49.00	44.99	55.15	52.16	45.25	41.41	56.86	53.36	57.32	53.75	5.62	5.62	5.28	5.19	5.42	5.26	5.17	4.97	5.51	5.32	5.28	5.47
06/01/23	06/30/23	Jun 2023	53.85	46.41	58.83	53.58	49.88	42.78	61.96	54.58	61.93	55.10	5.72	5.72	5.38	5.22	5.39	5.29	5.15	5.00	5.54	5.35	5.30	5.45
07/01/23	07/31/23	Jul 2023	61.04	51.49	65.23	56.71	56.76	47.63	69.26	57.58	69.00	58.76	5.76	6.00	5.41	5.25	5.41	5.30	5.22	5.01	5.57	5.38	5.34	5.52
08/01/23	08/31/23	Aug 2023	64.93	53.05	67.06	57.92	60.48	49.12	71.39	58.56	71.40	60.04	5.79	6.15	5.44	5.28	5.43	5.32	5.16	5.03	5.60	5.41	5.37	5.46
09/01/23	09/30/23	Sep 2023	62.71	52.87	59.58	54.70	58.69	49.01	64.41	57.53	64.12	57.56	5.75	5.97	5.40	5.32	5.59	5.37	5.23	5.06	5.63	5.44	5.40	5.53
10/01/23	10/31/23	Oct 2023	62.63	52.24	57.25	53.17	58.61	48.35	61.80	56.90	61.27	56.41	5.77	5.87	5.43	5.39	5.67	5.44	5.28	5.14	5.71	5.52	5.48	5.59
11/01/23	11/30/23	Nov 2023	66.52	55.94	58.36	55.15	62.70	51.94	63.62	58.86	62.94	58.46	6.05	6.17	5.74	5.85	6.22	6.15	6.10	5.70	6.17	5.98	5.93	6.44
12/01/23	12/31/23	Dec 2023	69.13	59.81	60.57	57.52	67.44	56.22	64.97	60.39	64.70	60.70	6.28	6.47	5.97	6.05	6.26	6.30	6.69	5.92	6.39	6.19	6.14	7.05
01/01/24	01/31/24	Jan 2024	66.64	57.92	60.75	57.13	64.97	54.38	64.68	59.26	64.63	60.31	6.22	6.44	5.93	5.93	6.01	6.08	6.35	5.72	6.27	6.07	6.02	6.71
02/01/24	02/29/24	Feb 2024	65.75	57.36	60.49	57.67	63.13	53.72	63.20	58.03	63.44	59.58	6.22	6.28	5.86	5.90	5.91	5.88	6.05	5.75	6.23	6.03	5.98	6.41
03/01/24	03/31/24	Mar 2024	59.08	52.91	56.67	54.42	54.93	48.97	59.57	56.24	59.53	56.30	5.80	5.84	5.43	5.55	5.80	5.68	5.70	5.47	5.89	5.69	5.64	6.05
04/01/24	04/30/24	Apr 2024	55.49	50.02	56.23	53.15	51.42	46.20	59.17	55.66	59.28	55.47	5.73	5.72	5.38	5.48	5.73	5.55	5.42	5.27	5.81	5.61	5.57	5.73
05/01/24	05/31/24	May 2024	50.34	46.60	56.09	53.29	46.50	42.93	58.12	55.00	58.47	55.12	5.77	5.78	5.43	5.36	5.56	5.42	5.36	5.15	5.68	5.49	5.45	5.66
06/01/24	06/30/24	Jun 2024	54.53	48.39	59.55	54.98	50.51	44.64	62.37	56.47	62.37	56.60	5.86	5.86	5.51	5.37	5.60	5.45	5.35	5.18	5.69	5.49	5.45	5.65
07/01/24	07/31/24	Jul 2024	63.36	53.31	67.64	58.34	58.95	49.34	71.72	59.29	71.37	60.37	5.94	6.16	5.58	5.43	5.65	5.48	5.42	5.21	5.74	5.55	5.51	5.73
08/01/24	08/31/24	Aug 2024	68.01	55.37	70.04	60.07	63.40	51.31	74.57	61.26	74.44	62.25	5.97	6.34	5.65	5.46	5.72	5.51	5.38	5.24	5.77	5.58	5.54	5.68
09/01/24	09/30/24	Sep 2024	65.96	56.10	64.46	58.18	61.89	52.26	69.20	60.56	68.64	60.50	5.92	6.15	5.60	5.49	5.77	5.58	5.45	5.27	5.81	5.62	5.57	5.76
10/01/24	10/31/24	Oct 2024	63.83	54.31	60.70	56.05	59.86	50.31	65.32	59.42	64.69	58.92	5.95	6.11	5.61	5.62	5.84	5.66	5.54	5.36	5.94	5.74	5.70	5.85
11/01/24	11/30/24	Nov 2024	64.94	56.41	59.93	56.26	61.33	52.34	64.92	60.29	64.22	59.56	6.11	6.24	5.81	5.86	6.18	6.13	6.05	5.65	6.18	5.99	5.94	6.39
12/01/24	12/31/24	Dec 2024	69.16	60.69	61.80	58.48	68.54	57.34	67.27	61.83	66.38	61.90	6.34	6.53	6.05	6.09	6.28	6.33	6.66	5.92	6.43	6.22	6.18	7.02
01/01/25	01/31/25	Jan 2025	68.90	60.07	63.78	59.87	68.09	56.69	68.48	62.34	67.94	63.12	6.53	6.71	6.23	6.19	6.33	6.26	6.69	6.05	6.53	6.33	6.28	7.05
02/01/25	02/28/25	Feb 2025	66.37	59.06	62.70	60.03	65.31	55.55	65.55	60.30	65.71	62.19	6.42	6.49	6.08	6.09	6.03	6.03	6.23	5.93	6.43	6.23	6.18	6.59
03/01/25	03/31/25	Mar 2025	59.57	53.78	57.53	55.02	55.66	49.91	60.81	56.90	60.53	57.07	5.91	5.89	5.60	5.60	5.79	5.70	5.75	5.52	5.94	5.73	5.69	6.10
04/01/25	04/30/25	Apr 2025	56.43	50.68	57.76	54.66	52.64	47.10	60.26	56.65	60.67	56.83	5.84	5.86	5.53	5.52	5.77	5.59	5.47	5.31	5.84	5.64	5.60	5.78
05/01/25	05/31/25	May 2025	51.37	47.79	58.03	55.22	47.82	44.05	59.87	56.26	60.42	56.80	5.87	5.91	5.55	5.52	5.74	5.58	5.49	5.28	5.84	5.65	5.60	5.79
06/01/25	06/30/25	Jun 2025	56.52	49.52	61.87	56.69	52.65	45.90	65.35	57.89	65.08	58.30	5.96	6.00	5.58	5.53	5.74	5.58	5.48	5.31	5.85	5.66	5.61	5.79
07/01/25	07/31/25	Jul 2025	66.00	55.21	70.29	60.33	61.44	51.16	75.41	61.86	74.16	62.56	6.04	6.30	5.68	5.63	5.85	5.64	5.56	5.34	5.95	5.75	5.71	5.86

08/01/25	08/31/25	Aug 2025	69.74	57.21	71.95	61.82	65.08	53.20	77.81	63.92	76.53	64.37	6.08	6.37	5.71	5.66	5.89	5.67	5.51	5.37	5.98	5.78	5.74	5.81
09/01/25	09/30/25	Sep 2025	67.06	55.86	67.21	60.01	64.05	54.25	74.49	62.90	71.74	62.48	6.02	6.36	5.71	5.67	5.93	5.72	5.58	5.40	5.99	5.79	5.75	5.89
10/01/25	10/31/25	Oct 2025	62.72	54.73	62.10	57.27	61.90	52.01	69.64	61.21	66.81	60.40	6.04	6.24	5.75	5.71	5.98	5.78	5.67	5.49	6.03	5.84	5.80	5.98
11/01/25	11/30/25	Nov 2025	65.75	58.17	61.12	57.68	63.65	54.30	68.55	63.00	66.00	61.15	6.21	6.36	5.90	5.93	6.30	6.24	6.17	5.77	6.26	6.06	6.02	6.52
12/01/25	12/31/25	Dec 2025	70.53	61.71	63.85	60.27	70.93	58.46	70.35	63.81	68.61	63.58	6.49	6.72	6.20	6.15	6.41	6.46	6.82	6.05	6.48	6.28	6.24	7.18
01/01/26	01/31/26	Jan 2026	70.58	61.77	65.39	61.44	69.59	58.27	70.82	64.00	69.87	64.76	6.61	6.80	6.35	6.30	6.40	6.48	6.84	6.13	6.64	6.44	6.39	7.20
02/01/26	02/28/26	Feb 2026	68.80	61.33	64.80	61.84	67.34	57.61	68.74	62.60	68.21	64.16	6.55	6.63	6.23	6.22	6.29	6.23	6.59	6.09	6.56	6.36	6.31	6.95
03/01/26	03/31/26	Mar 2026	62.00	55.88	60.19	57.80	58.07	51.88	64.28	59.72	63.77	59.82	6.09	6.10	5.79	5.83	6.08	5.93	6.01	5.76	6.16	5.96	5.91	6.37
04/01/26	04/30/26	Apr 2026	58.54	52.84	60.35	57.63	54.57	49.12	63.42	58.95	63.46	59.26	6.03	6.05	5.75	5.76	5.97	5.79	5.68	5.54	6.08	5.88	5.84	5.99
05/01/26	05/31/26	May 2026	53.20	49.75	60.27	57.46	49.43	45.99	62.19	58.62	62.93	58.81	6.07	6.09	5.69	5.69	5.88	5.70	5.64	5.44	6.00	5.81	5.77	5.94
06/01/26	06/30/26	Jun 2026	59.16	51.27	64.62	58.53	55.03	47.46	68.81	60.03	68.21	60.33	6.17	6.15	5.74	5.72	5.91	5.73	5.63	5.48	6.03	5.84	5.80	5.94
07/01/26	07/31/26	Jul 2026	69.34	57.52	73.39	62.57	64.60	53.31	79.50	64.72	77.50	64.99	6.25	6.48	5.86	5.79	6.00	5.79	5.71	5.51	6.11	5.92	5.87	6.01
08/01/26	08/31/26	Aug 2026	72.23	59.28	74.85	64.08	67.45	55.16	81.56	66.71	79.60	66.79	6.29	6.58	5.89	5.82	6.04	5.82	5.66	5.54	6.14	5.95	5.91	5.97
09/01/26	09/30/26	Sep 2026	68.88	57.71	68.02	61.40	65.67	56.02	76.86	65.07	73.59	64.52	6.22	6.59	5.88	5.84	6.11	5.87	5.74	5.57	6.15	5.96	5.92	6.04
10/01/26	10/31/26	Oct 2026	64.88	56.85	63.40	58.95	63.32	53.84	71.74	63.44	68.67	62.40	6.25	6.42	5.97	5.97	6.18	6.08	5.79	5.66	6.28	6.09	6.05	6.10
11/01/26	11/30/26	Nov 2026	68.75	60.62	64.56	60.42	66.74	56.88	72.36	65.36	69.44	63.95	6.39	6.71	6.15	6.13	6.50	6.43	6.40	6.01	6.46	6.26	6.21	6.75
12/01/26	12/31/26	Dec 2026	72.99	64.18	66.26	62.88	73.71	60.83	72.84	66.61	71.27	66.13	6.66	6.95	6.43	6.38	6.69	6.68	7.11	6.28	6.72	6.52	6.47	7.47
01/01/27	01/31/27	Jan 2027	73.15	64.78	68.53	64.73	72.21	61.46	74.49	68.21	73.09	67.98	6.92	7.19	6.63	6.58	6.73	6.78	7.18	6.44	6.92	6.72	6.67	7.54
02/01/27	02/28/27	Feb 2027	71.22	63.80	68.91	65.36	69.15	59.75	72.81	65.68	72.10	67.15	6.89	7.12	6.44	6.41	6.46	6.43	6.82	6.32	6.75	6.55	6.50	7.18
03/01/27	03/31/27	Mar 2027	64.36	57.73	62.24	59.74	60.62	53.57	66.27	61.97	65.68	61.71	6.27	6.27	6.01	5.97	6.25	6.13	6.22	6.02	6.31	6.11	6.06	6.58
04/01/27	04/30/27	Apr 2027	60.60	54.63	61.89	59.00	56.46	50.83	65.83	61.01	65.46	60.99	6.21	6.25	5.94	5.90	6.15	6.07	5.78	5.67	6.22	6.03	5.98	6.09
05/01/27	05/31/27	May 2027	55.27	51.31	62.37	59.32	51.38	47.45	64.43	60.39	65.07	60.85	6.26	6.33	5.92	5.89	6.10	5.88	5.83	5.61	6.20	6.01	5.97	6.13
06/01/27	06/30/27	Jun 2027	61.88	52.98	67.68	61.09	57.55	49.10	71.81	61.85	71.22	62.85	6.38	6.44	6.00	5.93	6.13	5.92	5.82	5.65	6.24	6.05	6.01	6.12
07/01/27	07/31/27	Jul 2027	71.16	58.99	75.12	64.07	66.32	54.68	81.40	66.24	79.22	66.53	6.44	6.58	6.05	5.99	6.18	5.95	5.89	5.67	6.30	6.11	6.07	6.20
08/01/27	08/31/27	Aug 2027	74.61	61.22	77.48	66.23	69.66	56.96	84.25	68.89	82.17	68.81	6.48	6.79	6.10	6.02	6.24	5.98	5.84	5.70	6.34	6.14	6.10	6.14
09/01/27	09/30/27	Sep 2027	70.50	59.59	70.97	63.69	67.15	57.76	78.91	66.89	75.49	66.16	6.41	6.71	6.13	6.06	6.28	6.02	5.92	5.74	6.37	6.18	6.14	6.23
10/01/27	10/31/27	Oct 2027	67.43	59.08	66.72	61.95	65.35	55.87	74.35	65.67	71.25	64.83	6.44	6.69	6.16	6.14	6.40	6.29	5.99	5.84	6.46	6.27	6.23	6.29
11/01/27	11/30/27	Nov 2027	72.14	63.73	67.78	63.21	70.77	59.93	75.93	68.80	72.53	66.68	6.73	6.98	6.53	6.53	6.93	6.82	6.82	6.40	6.86	6.66	6.62	7.16
12/01/27	12/31/27	Dec 2027	76.08	67.28	69.00	65.36	77.61	64.05	76.41	70.06	74.15	68.81	6.99	7.25	6.76	6.78	7.01	7.03	7.51	6.64	7.12	6.92	6.87	7.86
01/01/28	01/31/28	Jan 2028	76.22	67.09	71.65	67.12	75.38	63.67	77.70	70.22	76.02	70.32	7.20	7.48	6.92	6.81	6.90	6.97	7.39	6.63	7.14	6.94	6.89	7.75
02/01/28	02/29/28	Feb 2028	73.60	66.52	71.43	68.03	71.10	62.25	75.63	68.48	74.47	69.60	7.14	7.39	6.70	6.69	6.71	6.62	7.04	6.52	7.03	6.83	6.78	7.39
03/01/28	03/31/28	Mar 2028	66.04	59.22	63.88	61.18	62.25	54.92	68.63	63.72	67.52	63.16	6.44	6.44	6.18	6.16	6.42	6.26	6.35	6.12	6.49	6.29	6.24	6.70
04/01/28	04/30/28	Apr 2028	62.58	56.52	63.56	60.81	58.28	52.46	67.79	62.73	67.24	62.74	6.39	6.44	6.10	6.07	6.31	6.23	5.93	5.84	6.39	6.19	6.15	6.24
05/01/28	05/31/28	May 2028	57.35	52.85	64.65	61.20	53.34	48.85	66.79	62.04	67.26	62.53	6.43	6.51	6.09	6.07	6.24	6.03	5.96	5.79	6.38	6.19	6.15	6.26
06/01/28	06/30/28	Jun 2028	64.69	54.70	70.51	63.01	60.16	50.68	74.88	63.80	73.98	64.66	6.54	6.61	6.15	6.08	6.29	6.07	5.94	5.82	6.39	6.20	6.16	6.25
07/01/28	07/31/28	Jul 2028	73.45	61.48	77.65	66.58	68.47	57.03	83.97	69.03	81.71	69.09	6.60	6.76	6.22	6.13	6.32	6.10	6.00	5.82	6.45	6.26	6.22	6.31
08/01/28	08/31/28	Aug 2028	76.96	62.90	79.85	67.97	71.88	58.50	87.05	70.80	84.59	70.53	6.63	6.97	6.25	6.17	6.41	6.13	5.99	5.86	6.48	6.29	6.25	6.30
09/01/28	09/30/28	Sep 2028	71.81	61.95	72.31	65.80	68.30	59.66	80.30	68.96	76.67	68.06	6.58	6.90	6.27	6.20	6.45	6.18	6.03	5.89	6.52	6.33	6.29	6.33
10/01/28	10/31/28	Oct 2028	70.49	61.62	68.14	63.41	68.13	58.61	76.95	67.77	73.16	66.58	6.61	6.87	6.39	6.33	6.56	6.47	6.11	6.02	6.65	6.45	6.41	6.42
11/01/28	11/30/28	Nov 2028	77.21	68.72	70.81	66.37	76.35	64.92	80.28	72.96	76.17	70.10	7.12	7.41	6.96	7.00	7.41	7.31	7.61	6.91	7.33	7.13	7.08	7.95
12/01/28	12/31/28	Dec 2028	81.32	72.15	73.33	70.29	83.32	69.17	81.06	75.00	78.37	73.47	7.49	7.77	7.29	7.35	7.56	7.61	8.12	7.30	7.68	7.48	7.43	8.48
01/01/29	01/31/29	Jan 2029	79.47	69.83	74.50	70.05	79.09	66.15	80.36	72.83	79.06	73.32	7.48	7.78	7.22	7.15	7.29	7.33	7.64	6.90	7.48	7.28	7.23	8.00
02/01/29	02/28/29	Feb 2029	77.70	70.57	74.41	70.86	75.72	66.63	78.47	70.77	77.58	72.58	7.43	7.67	7.04	6.98	7.13	7.22	7.40	6.94	7.32	7.12	7.07	7.76
03/01/29	03/31/29	Mar 2029	70.35	62.86	67.06	64.49	67.22	58.45	71.38	66.48	70.62	66.32	6.74	6.74	6.50	6.47	6.67	6.59	6.76	6.49	6.81	6.61	6.56	7.12
04/01/29	04/30/29	Apr 2029	65.94	59.66	67.27	64.27	61.54	55.51	70.34	65.44	70.40	65.41	6.68	6.73	6.43	6.40	6.57	6.38	6.25	6.14	6.72	6.53	6.48	6.56
05/01/29	05/31/29	May 2029	59.83	55.51	67.22	63.93	55.81	51.36	69.28	64.80	70.06	65.22	6.72	6.79	6.43	6.40	6.56	6.35	6.31	6.10	6.71	6.52	6.48	6.61
06/01/29	06/30/29	Jun 2029	65.06	56.87	71.75	65.32	60.63	52.92	75.24	66.01	75.16	66.87	6.83	6.90	6.42	6.39	6.60	6.38	6.26	6.13	6.71	6.51	6.47	6.56
07/01/29	07/31/29	Jul 2029	76.90	64.29	81.59	69.57	71.73	59.68	87.45	71.34	85.56	72.12	6.91	7.07	6.51	6.49	6.71	6.46	6.38	6.16	6.80	6.61	6.57	6.68
08/01/29	08/31/29	Aug 2029	81.61	66.68	84.66	71.77	76.27	62.03	91.64	74.17	89.41	74.39	6.97	7.33	6.64	6.55	6.76	6.51	6.37	6.19	6.86	6.67	6.63	6.68
09/01/29	09/30/29	Sep 2029	76.98	66.56	77.41	69.42	72.75	63.49	85.98	73.09	82.71	72.57	6.93	7.34	6.64	6.58	6.82	6.56	6.41	6.23	6.90	6.71	6.67	6.71
10/01/29	10/31/29	Oct 2029	73.35	63.86	72.22	66.43	69.94	60.86	80.86	70.95	77.43	70.01	6.96	7.29	6.73	6.64	6.92	6.65	6.47	6.33	6.95	6.76	6.72	6.78
11/01/29	11/30/29	Nov 2029	77.12	68.62	72.85	68.00	74.73	64.35	81.07	73.75	77.86	71.72	7.25	7.57	7.03	7.04	7.41	7.34	7.53	6.85	7.36	7.16	7.12	7.87
12/01/29	12/31/29	Dec 2029	82.99	73.55	75.21	71.00	84.64	70.36	82.71	75.55	80.46	74.44	7.61	7.87	7.35	7.37	7.61	7.65	8.13	7.23	7.71	7.51	7.46	8.49
01/01/30	01/31/30	Jan 2030	84.09	74.89	78.94	74.45	85.12	71.66	85.90	77.97	83.91	77.77	7.99	8.29	7.80	7.73	7.88	7.96	8.64	7.62	8.07	7.87	7.82	9.00
02/01/30	02/28/30	Feb 2030	80.64	74.27	78.24	75.32	79.01	70.44	82.78	75.20	81.70	76.40	7.92	8.16	7.53	7.51	7.54	7.62	7.88	7.38	7.85	7.65	7.60	8.24
03/01/30	03/31/30	Mar 2030	72.18	64.85	68.85	66.52	69.59	60.58	73.80	68.43	72.49	67.75	6.92	6.91	6.68	6.69	6.92	6.79	7.07	6.73	7.03	6.83	6.78	7.42
04/01/30	04/30/30	Apr 2030	67.19	60.90	68.80	65.51	63.18	56.85	72.34	66.87	72.09	66.96	6.87	6.88	6.63	6.58	6.75	6.66	6.35	6.26	6.90	6.71	6.67	6.65
05/01/30	05/31/30	May 2030	61.14	56.84	69.12	65.70	56.94	52.61	70.93	66.37	71.80	66.87	6.90	6.95	6.52	6.51	6.69	6.42	6.35	6.18	6.83	6.64	6.60	6.65
06/01/30	06/30/30	Jun 2030	66.59	58.43	74.24	67.54	61.97	54.35	77.33	67.93	77.42	69.03	7.03	7.07	6.60	6.55	6.73	6.46	6.32	6.21	6.87	6.67	6.63	6.63
07/01/30	07/31/30	Jul 2030	79.74	66.31	85.38	72.25	74.42	61.58	90.88	73.76	89.20	74.47	7.11	7.43	6.72	6.64	6.80	6.50	6.43	6.25	6.96	6.76	6.72	6.74
08/01/30	08/31/30	Aug 2030	82.97	68.53	86.80	73.88	77.56	63.76	93.71	76.42	91.48	76.50	7.16	7.51	6.75	6.70	6.91	6.58	6.43	6.28	7.02	6.82	6.78	6.73
09/01/30	09/30/30	Sep 2030	79.06	67.99	80.74	72.21	74.58	64.69	88.78	75.09	85.41	74.56	7.12	7.50	6.79	6.74	6.96	6.63	6.47	6.32	7.06	6.87	6.83	6.77
10/01/30	10/31/30	Oct 2030	75.50	66.19	74.97	69.59	71.65	62.69	83.54	73.18	79.90	72.37	7.16	7.48	6.94	6.87	7.07	6.92	6.58	6.46	7.19	7.00	6.96	6.89
11/01/30	11/30/30	Nov 2030	81.09	73.03	77.60	72.28	79.26	68.93	85.70	77.92	82.30	75.61	7.64	8.04	7.47	7.51	7.98	7.86	8.13	7.44	7.84	7.64	7.59	8.47
12/01/30	12/31/30	Dec 2030	87.05	77.63	79.11	75.06	89.94	75.42	87.59	80.15	84.76	78.64	8.08	8.33	7.87	7.91	8.20	8.22	8.80	7.86	8.24	8.04	8.00	9.15
01/01/31	01/31/31	Jan 2031	86.52	77.20	80.94	76.52	87.86	73.92	87.30	79.66	85.90	79.82	8.15	8.46	7.95	7.89	8.04	8.12	8.82	7.77	8.23	8.02	7.97	9.18
02/01/31	02/28/31	Feb 2031	82.56	76.37	80.63	77.21	80.81	72.37	84.60	76.33	83.81	78.14	8.08	8.32	7.68	7.66	7.70	7.77	8.04	7.53	8.00	7.80	7.75	8.40
03/01/31	03/31/31	Mar 2031	73.33	66.55	70.61	67.72	71.39	62.38	74.90	70.17	74.18	69.41	7.06	7.04	6.81	6.83	7.06	6.92	7.21	6.87	7.16	6.96	6.91	7.56
04/01/31	04/30/31	Apr 2031	68.37	62.29	70.75	67.02	64.82	58.30	74.00	68.54	74.11	68.57	7.01	7.02	6.76	6.71	6.88	6.79	6.47	6.38	7.04	6.84	6.80	6.78
05/01/31	05/31/31	May 2031	62.58	58.25	70.57	67.33	58.28	53.97	72.30	67.85	73.12	68.34	7.04	7.09	6.65	6.64	6.83	6.55	6.48	6.30	6.96	6.77	6.73	6.78
06/01/31	06/30/31	Jun 2031	68.94	60.05	76.89	69.43	64.14	55.83	79.94	69.51	80.17	70.80	7.17	7.22	6.73	6.68	6.86	6.59	6.45	6.34	7.00	6.81	6.76	6.75
07/01/31	07/31/31	Jul 2031	81.83	68.29	87.57	74.30	76.38	63.44	93.03	75.56	91.40	76.56	7.25	7.58	6.85	6.77	6.94	6.63	6.56	6.37	7.09	6.90	6.85	6.87
08/01/31	08/31/31	Aug 2031	84.76	70.88	88.90	76.17	79.21	66.02	95.61	78.41	93.62	78.91	7.31	7.66	6.88	6.83	7.05	6.71	6.56	6.41	7.15	6.96	6.92	6.86

09/01/31	09/30/31	Sep 2031	80.84	69.69	82.63	73.65	76.17	66.33	90.62	76.23	87.44	75.86	7.26	7.65	6.92	6.88	7.10	6.76	6.60	6.45	7.20	7.00	6.96	6.90
10/01/31	10/31/31	Oct 2031	77.11	68.20	76.27	70.91	73.04	64.50	84.86	74.63	81.48	74.04	7.31	7.63	7.08	7.01	7.21	7.06	6.71	6.59	7.33	7.14	7.09	7.02
11/01/31	11/30/31	Nov 2031	83.29	75.53	78.60	73.66	81.29	71.48	87.23	80.20	83.80	77.47	7.79	8.20	7.62	7.66	8.14	8.02	8.29	7.59	7.99	7.79	7.74	8.63
12/01/31	12/31/31	Dec 2031	89.23	79.32	81.06	76.57	92.26	77.09	89.42	81.54	86.78	80.21	8.24	8.49	8.03	8.07	8.36	8.39	8.97	8.02	8.40	8.20	8.15	9.33
01/01/32	01/31/32	Jan 2032	88.97	79.43	83.07	78.41	90.28	76.17	89.08	80.75	88.16	81.63	8.31	8.63	8.11	8.04	8.20	8.28	8.99	7.93	8.38	8.18	8.13	9.35
02/01/32	02/29/32	Feb 2032	84.39	78.67	82.54	79.24	82.26	74.31	85.48	78.37	85.74	80.48	8.24	8.49	7.84	7.82	7.85	7.93	8.20	7.68	8.15	7.95	7.90	8.56
03/01/32	03/31/32	Mar 2032	75.17	67.97	72.55	70.29	73.65	64.04	76.38	71.47	75.99	71.47	7.20	7.18	6.95	6.96	7.20	7.06	7.35	7.00	7.30	7.10	7.05	7.71
04/01/32	04/30/32	Apr 2032	69.68	64.13	72.06	70.08	66.18	60.06	75.04	70.08	75.59	70.68	7.15	7.16	6.90	6.85	7.02	6.93	6.60	6.51	7.17	6.98	6.93	6.91
05/01/32	05/31/32	May 2032	64.23	59.93	72.94	69.69	59.80	55.65	74.12	69.65	75.41	70.36	7.18	7.23	6.79	6.78	6.96	6.68	6.61	6.43	7.09	6.90	6.86	6.91
06/01/32	06/30/32	Jun 2032	71.56	61.73	79.66	71.41	66.59	57.37	82.54	71.10	83.09	72.74	7.32	7.36	6.87	6.82	7.00	6.72	6.58	6.46	7.13	6.94	6.90	6.88
07/01/32	07/31/32	Jul 2032	83.77	70.43	90.02	76.54	78.21	65.46	95.09	77.29	93.92	78.98	7.40	7.73	6.99	6.91	7.08	6.76	6.69	6.50	7.22	7.03	6.99	7.00
08/01/32	08/31/32	Aug 2032	86.69	72.82	91.33	78.31	81.01	67.84	97.63	79.84	96.14	81.07	7.45	7.81	7.02	6.97	7.19	6.85	6.69	6.54	7.29	7.10	7.05	6.99
09/01/32	09/30/32	Sep 2032	81.84	71.33	82.59	74.77	76.98	67.88	91.23	77.25	88.15	77.59	7.41	7.81	7.06	7.02	7.24	6.90	6.73	6.58	7.33	7.14	7.10	7.03
10/01/32	10/31/32	Oct 2032	78.48	70.31	77.42	72.53	74.30	66.38	85.58	76.27	83.00	75.84	7.45	7.79	7.22	7.15	7.35	7.20	6.84	6.72	7.47	7.28	7.23	7.15
11/01/32	11/30/32	Nov 2032	86.00	78.18	80.61	75.63	83.95	74.28	89.34	81.27	86.11	79.38	7.95	8.36	7.77	7.81	8.30	8.18	8.45	7.74	8.14	7.94	7.90	8.80
12/01/32	12/31/32	Dec 2032	91.36	81.77	82.64	79.20	94.27	79.43	90.25	83.42	88.51	82.69	8.41	8.66	8.19	8.23	8.53	8.55	9.15	8.18	8.56	8.36	8.31	9.51
01/01/33	01/31/33	Jan 2033	91.50	82.24	85.28	80.66	92.51	79.18	90.57	82.38	90.02	83.66	8.48	8.80	8.27	8.21	8.36	8.44	9.17	8.08	8.54	8.34	8.29	9.53
02/01/33	02/28/33	Feb 2033	86.58	80.69	84.51	81.19	84.04	76.25	86.82	79.63	87.42	82.24	8.41	8.66	7.99	7.97	8.01	8.09	8.36	7.83	8.31	8.11	8.06	8.72
03/01/33	03/31/33	Mar 2033	76.89	70.00	74.14	72.03	75.59	66.23	77.53	73.15	77.32	72.80	7.34	7.33	7.09	7.10	7.35	7.20	7.50	7.14	7.44	7.24	7.19	7.85
04/01/33	04/30/33	Apr 2033	71.20	65.72	73.63	71.08	67.86	61.70	76.16	71.71	76.99	72.00	7.29	7.31	7.04	6.99	7.16	7.07	6.73	6.64	7.31	7.11	7.07	7.04
05/01/33	05/31/33	May 2033	66.10	61.68	74.60	70.86	61.41	57.33	75.75	71.34	77.02	71.74	7.32	7.38	6.92	6.91	7.10	6.82	6.74	6.55	7.23	7.04	6.99	7.04
06/01/33	06/30/33	Jun 2033	73.51	63.48	82.46	73.29	68.40	59.02	84.71	72.72	85.52	74.36	7.46	7.51	7.00	6.95	7.14	6.86	6.71	6.59	7.27	7.08	7.03	7.01
07/01/33	07/31/33	Jul 2033	85.71	72.85	92.37	79.13	80.01	67.74	96.97	79.39	96.14	81.44	7.55	7.88	7.13	7.05	7.22	6.90	6.83	6.63	7.36	7.17	7.13	7.13
08/01/33	08/31/33	Aug 2033	88.81	74.42	93.87	79.91	83.01	69.37	99.74	80.53	98.47	82.63	7.60	7.97	7.16	7.11	7.34	6.98	6.82	6.67	7.43	7.23	7.19	7.13
09/01/33	09/30/33	Sep 2033	83.66	73.19	85.45	77.39	78.57	69.66	92.53	78.74	90.23	79.48	7.56	7.96	7.20	7.16	7.39	7.04	6.86	6.71	7.47	7.28	7.24	7.17
10/01/33	10/31/33	Oct 2033	80.55	72.60	80.18	75.63	76.21	68.63	86.89	77.81	85.00	77.75	7.60	7.94	7.37	7.29	7.50	7.34	6.98	6.85	7.61	7.42	7.38	7.29
11/01/33	11/30/33	Nov 2033	88.55	81.27	82.97	78.22	86.31	77.41	91.07	83.02	88.17	81.60	8.11	8.53	7.92	7.97	8.47	8.34	8.62	7.90	8.29	8.10	8.05	8.97
12/01/33	12/31/33	Dec 2033	93.85	84.29	84.76	81.04	96.37	81.91	91.76	84.91	90.26	84.42	8.58	8.84	8.35	8.39	8.70	8.72	9.33	8.34	8.73	8.53	8.48	9.69
01/01/34	01/31/34	Jan 2034	93.17	84.58	87.01	82.50	94.56	81.38	92.88	84.51	91.99	85.45	8.65	8.98	8.44	8.37	8.53	8.61	9.36	8.25	8.71	8.51	8.46	9.72
02/01/34	02/28/34	Feb 2034	88.31	82.37	86.30	83.05	85.34	77.81	89.19	81.59	89.21	83.87	8.58	8.83	8.15	8.13	8.17	8.25	8.53	7.99	8.47	8.27	8.22	8.89
03/01/34	03/31/34	Mar 2034	78.34	71.69	76.20	73.06	76.97	68.01	79.70	74.90	79.29	74.00	7.49	7.47	7.23	7.24	7.49	7.35	7.65	7.29	7.58	7.38	7.33	8.00
04/01/34	04/30/34	Apr 2034	72.94	67.31	75.45	72.73	69.80	63.31	78.36	73.59	78.68	73.46	7.44	7.45	7.18	7.12	7.30	7.21	6.87	6.77	7.45	7.25	7.21	7.18
05/01/34	05/31/34	May 2034	67.91	63.00	76.82	72.80	63.20	58.46	77.91	72.97	79.01	73.20	7.47	7.52	7.06	7.05	7.24	6.95	6.88	6.69	7.36	7.17	7.13	7.18
06/01/34	06/30/34	Jun 2034	75.78	65.12	85.15	75.54	70.51	60.58	87.38	74.73	88.04	76.25	7.61	7.66	7.14	7.09	7.28	6.99	6.85	6.73	7.41	7.21	7.17	7.15
07/01/34	07/31/34	Jul 2034	87.89	74.74	95.05	81.22	82.06	69.50	99.39	81.56	98.50	83.31	7.70	8.04	7.27	7.19	7.36	7.03	6.96	6.76	7.50	7.31	7.27	7.27
08/01/34	08/31/34	Aug 2034	90.80	76.53	96.22	82.28	84.86	71.35	102.07	82.90	100.62	84.74	7.76	8.13	7.30	7.25	7.48	7.12	6.96	6.80	7.57	7.38	7.33	7.26
09/01/34	09/30/34	Sep 2034	84.92	74.79	86.99	79.47	79.78	71.06	94.27	80.65	91.51	81.10	7.71	8.12	7.35	7.30	7.53	7.18	7.00	6.84	7.62	7.42	7.38	7.31
10/01/34	10/31/34	Oct 2034	82.77	74.72	81.76	77.14	78.34	70.64	89.41	79.85	86.79	79.49	7.75	8.10	7.51	7.44	7.65	7.49	7.12	6.99	7.76	7.57	7.52	7.43
11/01/34	11/30/34	Nov 2034	90.51	83.76	84.48	79.44	88.08	79.89	93.52	85.05	90.01	83.32	8.27	8.70	8.08	8.13	8.64	8.51	8.80	8.05	8.45	8.26	8.21	9.14
12/01/34	12/31/34	Dec 2034	95.32	86.87	86.68	83.28	98.02	84.62	94.08	87.36	92.20	86.47	8.75	9.01	8.52	8.56	8.87	8.90	9.52	8.51	8.90	8.70	8.65	9.88
01/01/35	01/31/35	Jan 2035	94.94	86.63	88.93	85.24	96.84	83.76	94.46	86.30	94.13	88.20	8.82	9.16	8.61	8.54	8.70	8.78	9.54	8.41	8.88	8.67	8.62	9.90
02/01/35	02/28/35	Feb 2035	90.20	82.07	88.80	85.42	88.83	80.13	91.53	83.35	91.90	86.22	8.75	9.01	8.32	8.30	8.33	8.41	8.70	8.15	8.63	8.43	8.38	9.06
03/01/35	03/31/35	Mar 2035	79.33	73.59	78.41	75.91	79.65	71.54	80.97	76.90	80.92	76.50	7.64	7.62	7.38	7.39	7.64	7.49	7.80	7.43	7.72	7.52	7.47	8.16
04/01/35	04/30/35	Apr 2035	74.12	69.16	78.28	75.25	72.53	65.71	79.89	75.22	81.03	75.19	7.58	7.60	7.32	7.27	7.45	7.35	7.01	6.91	7.59	7.39	7.35	7.31
05/01/35	05/31/35	May 2035	69.35	64.77	78.70	75.19	64.73	60.31	79.33	74.87	81.07	75.42	7.62	7.67	7.20	7.19	7.39	7.09	7.01	6.82	7.50	7.31	7.27	7.32
06/01/35	06/30/35	Jun 2035	74.79	66.03	85.45	76.96	69.59	61.57	86.15	75.83	87.85	77.35	7.76	7.81	7.29	7.23	7.43	7.13	6.98	6.86	7.55	7.36	7.31	7.28
07/01/35	07/31/35	Jul 2035	89.58	76.80	98.00	83.79	83.64	71.45	101.05	83.24	101.21	85.69	7.85	8.20	7.41	7.33	7.51	7.17	7.10	6.90	7.65	7.46	7.41	7.41
08/01/35	08/31/35	Aug 2035	93.83	78.99	99.77	84.98	87.72	73.67	105.22	85.19	103.91	87.40	7.91	8.29	7.45	7.40	7.63	7.27	7.10	6.94	7.71	7.52	7.48	7.40
09/01/35	09/30/35	Sep 2035	88.64	76.74	91.11	82.09	83.14	73.15	98.87	83.72	96.37	84.31	7.86	8.28	7.49	7.45	7.69	7.32	7.14	6.98	7.76	7.57	7.53	7.45
10/01/35	10/31/35	Oct 2035	82.48	74.67	84.32	79.34	79.56	72.06	92.06	81.42	89.85	81.52	7.91	8.26	7.66	7.59	7.80	7.64	7.26	7.13	7.91	7.72	7.67	7.57
11/01/35	11/30/35	Nov 2035	91.53	84.31	87.05	82.03	88.43	80.05	94.91	86.94	92.48	85.70	8.43	8.87	8.24	8.29	8.81	8.68	8.97	8.21	8.62	8.42	8.37	9.32
12/01/35	12/31/35	Dec 2035	97.04	89.26	89.43	84.77	99.72	87.30	96.59	89.09	95.25	88.46	8.92	9.19	8.69	8.73	9.05	9.08	9.71	8.68	9.07	8.87	8.82	10.07
01/01/36	01/31/36	Jan 2036	98.83	89.44	91.66	87.75	99.69	86.49	96.42	88.58	96.56	90.47	9.01	9.35	8.79	8.72	8.88	8.97	9.74	8.59	9.05	8.85	8.80	10.10
02/01/36	02/29/36	Feb 2036	92.77	84.45	91.41	87.70	91.20	82.23	93.04	85.60	93.95	88.16	8.93	9.20	8.49	8.47	8.50	8.59	8.89	8.32	8.81	8.60	8.55	9.24
03/01/36	03/31/36	Mar 2036	81.43	75.51	80.34	77.74	81.68	73.72	82.77	78.90	82.71	77.84	7.80	7.78	7.53	7.54	7.80	7.65	7.97	7.59	7.88	7.68	7.63	8.32
04/01/36	04/30/36	Apr 2036	76.05	71.22	79.74	76.85	74.17	67.46	81.46	77.08	82.68	76.89	7.74	7.76	7.47	7.42	7.61	7.51	7.15	7.05	7.74	7.55	7.50	7.46
05/01/36	05/31/36	May 2036	71.35	66.56	80.51	76.77	66.54	62.07	80.94	76.73	82.57	76.86	7.78	7.84	7.35	7.34	7.54	7.24	7.16	6.96	7.66	7.47	7.42	7.46
06/01/36	06/30/36	Jun 2036	77.43	68.44	89.04	79.97	72.02	63.79	89.12	78.19	91.13	79.88	7.93	7.97	7.44	7.38	7.59	7.28	7.13	7.00	7.70	7.51	7.47	7.43
07/01/36	07/31/36	Jul 2036	92.13	78.85	100.72	85.87	86.03	73.41	103.67	84.66	103.85	87.46	8.02	8.37	7.57	7.48	7.67	7.32	7.25	7.04	7.80	7.61	7.57	7.56
08/01/36	08/31/36	Aug 2036	95.64	81.62	102.44	87.75	89.42	76.24	107.07	87.65	106.18	90.02	8.08	8.47	7.61	7.55	7.79	7.42	7.25	7.08	7.87	7.68	7.63	7.55
09/01/36	09/30/36	Sep 2036	91.29	78.28	94.60	84.71	85.69	74.86	101.13	85.10	99.10	86.02	8.03	8.46	7.65	7.60	7.85	7.47	7.29	7.13	7.92	7.73	7.68	7.60
10/01/36	10/31/36	Oct 2036	84.82	76.84	87.84	82.46	81.83	74.19	93.84	83.61	92.11	83.71	8.07	8.44	7.82	7.75	7.97	7.80	7.42	7.28	8.07	7.87	7.83	7.73
11/01/36	11/30/36	Nov 2036	94.38	87.67	89.32	85.33	90.97	83.55	96.54	89.34	94.39	87.72	8.61	9.06	8.42	8.46	9.00	8.86	9.16	8.39	8.79	8.59	8.55	9.51
12/01/36	12/31/36	Dec 2036	99.89	92.10	91.27	87.48	102.45	90.35	98.21	91.13	97.07	90.73	9.11	9.39	8.87	8.92	9.24	9.27	9.92	8.86	9.25	9.05	9.00	10.27
01/01/37	01/31/37	Jan 2037	101.38	91.97	93.94	90.35	101.95	88.92	98.15	90.83	98.57	92.47	9.20	9.54	8.97	8.90	9.07	9.16	9.95	8.77	9.24	9.03	8.99	10.31
02/01/37	02/28/37	Feb 2037	94.99	86.59	93.12	89.93	92.90	83.97	94.65	87.59	95.63	89.83	9.12	9.39	8.67	8.65	8.68	8.77	9.07	8.49	8.98	8.78	8.73	9.43
03/01/37	03/31/37	Mar 2037	83.29	77.94	82.30	79.29	83.62	76.58	84.52	80.76	84.71	79.20	7.97	7.95	7.69	7.70	7.97	7.81	8.13	7.75	8.04	7.84	7.79	8.49
04/01/37	04/30/37	Apr 2037	78.16	73.39	82.07	78.64	75.65	69.28	83.35	79.10	84.72	78.53	7.91	7.92	7.63	7.58	7.77	7.67	7.30	7.20	7.90	7.70	7.66	7.61
05/01/37	05/31/37	May 2037	73.30	68.51	82.22	79.21	68.43	63.90	82.75	78.78	84.30	78.59	7.94	8.00	7.51	7.50	7.70	7.39	7.31	7.11	7.81	7.62	7.58	7.61
06/01/37	06/30/37	Jun 2037	79.79	70.24	92.12	82.42	74.24	65.49	91.48	80.26	93.80	81.92	8.09	8.14	7.60	7.54	7.75	7.44	7.28	7.15	7.85	7.66	7.62	7.58
07/01/37	07/31/37	Jul 2037	94.30	81.25	103.63	88.75	88.06	75.78	105.95	86.90	106.50	89.79	8.19	8.55	7.73	7.64	7.83	7.48	7.41	7.19	7.96	7.77	7.72	7.71
08/01/37	08/31/37	Aug 2037	97.74	83.69	105.16	90.34	91.39	78.31	109.16	89.68	108.65	92.22	8.25	8.65	7.77	7.71	7.96	7.57	7.40	7.23	8.03	7.84	7.79	7.70
09/01/37	09/30/37	Sep 2037	93.07	80.42	96.54	87.08	87.32	76.72	102.64	86.99	100.80	87.76	8.20	8.64	7.81	7.76	8.01	7.63	7.44	7.28	8.08	7.89	7.84	7.75

10/01/37	10/31/37	Oct 2037	86.25	78.79	89.77	83.85	83.56	76.04	94.84	85.39	93.43	85.00	8.24	8.61	7.99	7.91	8.13	7.97	7.57	7.43	8.23	8.04	7.99	7.88
11/01/37	11/30/37	Nov 2037	97.35	90.56	91.53	87.43	93.38	86.45	98.33	91.54	96.65	89.59	8.79	9.25	8.59	8.64	9.19	9.05	9.35	8.56	8.97	8.77	8.73	9.70
12/01/37	12/31/37	Dec 2037	102.98	94.98	93.34	90.04	104.87	93.57	99.91	93.38	98.98	92.92	9.30	9.58	9.06	9.10	9.43	9.46	10.12	9.05	9.44	9.24	9.19	10.48
01/01/38	01/31/38	Jan 2038	101.67	94.05	96.49	92.75	102.80	91.63	99.61	92.99	100.07	93.94	9.39	9.74	9.16	9.09	9.26	9.35	10.16	8.95	9.42	9.22	9.17	10.52
02/01/38	02/28/38	Feb 2038	95.52	88.81	96.07	92.14	93.41	85.70	96.09	89.73	97.10	91.43	9.31	9.59	8.85	8.83	8.87	8.96	9.26	8.67	9.17	8.96	8.91	9.62
03/01/38	03/31/38	Mar 2038	85.27	79.54	84.21	81.80	85.59	77.91	86.61	82.78	86.50	80.58	8.13	8.11	7.85	7.86	8.13	7.97	8.30	7.91	8.20	8.00	7.95	8.66
04/01/38	04/30/38	Apr 2038	79.08	75.37	84.08	81.64	76.86	70.85	85.00	81.15	86.28	80.22	8.07	8.09	7.79	7.73	7.93	7.83	7.46	7.35	8.06	7.86	7.82	7.77
05/01/38	05/31/38	May 2038	75.07	70.14	85.20	81.56	70.14	65.64	84.92	80.88	86.38	80.28	8.11	8.17	7.67	7.65	7.86	7.55	7.47	7.26	7.97	7.78	7.74	7.77
06/01/38	06/30/38	Jun 2038	81.60	72.09	95.31	84.56	75.91	67.20	93.52	82.26	96.09	83.78	8.26	8.31	7.75	7.70	7.91	7.59	7.43	7.30	8.01	7.82	7.78	7.73
07/01/38	07/31/38	Jul 2038	96.02	82.95	106.19	91.04	89.67	77.34	107.95	88.88	108.43	91.28	8.36	8.73	7.89	7.80	7.99	7.64	7.56	7.34	8.12	7.93	7.88	7.86
08/01/38	08/31/38	Aug 2038	99.62	85.56	107.49	92.96	93.15	79.99	111.19	91.41	110.74	93.54	8.42	8.83	7.93	7.87	8.12	7.73	7.55	7.38	8.19	8.00	7.95	7.86
09/01/38	09/30/38	Sep 2038	93.88	82.41	96.91	88.49	88.13	78.18	103.26	88.73	101.04	88.74	8.37	8.82	7.98	7.92	8.18	7.79	7.60	7.43	8.24	8.05	8.01	7.90
10/01/38	10/31/38	Oct 2038	87.60	81.21	91.28	86.07	85.55	78.05	95.38	87.49	94.08	86.42	8.42	8.79	8.16	8.08	8.30	8.13	7.73	7.59	8.40	8.20	8.16	8.04
11/01/38	11/30/38	Nov 2038	98.18	93.04	93.53	89.83	95.19	89.06	100.17	93.32	98.16	91.06	8.98	9.45	8.77	8.82	9.38	9.24	9.55	8.74	9.15	8.95	8.91	9.89
12/01/38	12/31/38	Dec 2038	104.70	97.66	95.76	92.47	106.87	96.07	101.74	95.59	100.56	94.69	9.50	9.79	9.25	9.30	9.63	9.66	10.34	9.24	9.63	9.43	9.38	10.69
01/01/39	01/31/39	Jan 2039	104.56	96.98	98.96	95.54	104.77	94.27	102.28	95.43	101.85	95.32	9.59	9.95	9.35	9.28	9.46	9.55	10.37	9.14	9.62	9.41	9.36	10.73
02/01/39	02/28/39	Feb 2039	97.67	91.21	98.21	94.68	94.57	87.63	98.57	92.32	98.71	92.94	9.51	9.79	9.04	9.01	9.05	9.14	9.46	8.85	9.35	9.15	9.10	9.82
03/01/39	03/31/39	Mar 2039	87.27	81.80	86.51	83.55	87.46	80.13	88.56	84.97	87.80	81.67	8.30	8.29	8.02	8.03	8.30	8.14	8.48	8.08	8.36	8.16	8.11	8.83
04/01/39	04/30/39	Apr 2039	81.14	77.51	85.77	83.36	77.98	72.77	87.27	83.42	87.32	81.20	8.24	8.26	7.95	7.90	8.10	7.99	7.61	7.51	8.22	8.02	7.98	7.92
05/01/39	05/31/39	May 2039	77.43	72.18	86.89	83.51	72.16	67.56	87.28	83.19	87.77	81.64	8.28	8.34	7.83	7.81	8.03	7.71	7.62	7.41	8.13	7.94	7.90	7.92
06/01/39	06/30/39	Jun 2039	83.77	74.18	98.61	86.97	77.93	69.14	96.33	84.43	98.49	85.30	8.44	8.49	7.92	7.86	8.07	7.75	7.59	7.45	8.17	7.98	7.94	7.89
07/01/39	07/31/39	Jul 2039	98.09	85.74	108.91	94.02	91.60	79.99	110.48	91.85	110.39	93.37	8.53	8.91	8.06	7.97	8.16	7.80	7.72	7.50	8.28	8.09	8.05	8.02
08/01/39	08/31/39	Aug 2039	102.01	87.39	110.02	94.66	95.38	81.68	114.07	93.22	113.05	94.55	8.60	9.01	8.09	8.04	8.29	7.90	7.71	7.54	8.36	8.16	8.12	8.02
09/01/39	09/30/39	Sep 2039	95.48	84.42	100.27	91.45	89.55	79.78	105.43	90.90	102.52	90.09	8.54	9.00	8.14	8.09	8.35	7.95	7.76	7.59	8.41	8.22	8.17	8.06
10/01/39	10/31/39	Oct 2039	90.48	83.63	94.50	89.10	87.53	80.00	98.22	90.13	96.00	88.08	8.59	8.98	8.33	8.25	8.48	8.30	7.89	7.75	8.57	8.37	8.33	8.20
11/01/39	11/30/39	Nov 2039	101.38	95.95	96.47	92.82	97.32	91.70	103.11	95.99	99.83	92.46	9.16	9.64	8.96	9.01	9.58	9.43	9.75	8.93	9.34	9.14	9.09	10.09
12/01/39	12/31/39	Dec 2039	107.48	100.38	98.23	95.31	108.56	99.00	104.03	98.03	102.13	95.93	9.70	9.99	9.44	9.49	9.83	9.86	10.55	9.43	9.82	9.62	9.58	10.91
01/01/40	01/31/40	Jan 2040	108.99	100.05	102.03	98.53	108.48	97.36	104.59	98.02	104.32	97.42	9.79	10.16	9.55	9.47	9.66	9.75	10.59	9.33	9.81	9.61	9.56	10.95
02/01/40	02/29/40	Feb 2040	100.59	93.78	100.71	97.35	97.18	89.91	100.07	94.63	100.48	94.96	9.71	10.00	9.23	9.20	9.24	9.34	9.66	9.04	9.54	9.34	9.29	10.01
03/01/40	03/31/40	Mar 2040	89.17	84.04	88.66	85.87	89.31	82.25	90.71	87.54	89.33	83.60	8.48	8.46	8.18	8.20	8.48	8.31	8.66	8.24	8.53	8.33	8.28	9.01
04/01/40	04/30/40	Apr 2040	83.39	79.97	87.67	85.43	80.04	75.08	89.44	85.75	89.34	83.02	8.42	8.43	8.12	8.06	8.27	8.16	7.77	7.67	8.39	8.19	8.15	8.08
05/01/40	05/31/40	May 2040	79.78	74.32	90.05	85.84	74.37	69.52	89.74	85.32	90.27	83.38	8.45	8.51	7.99	7.98	8.20	7.87	7.78	7.57	8.29	8.10	8.06	8.08
06/01/40	06/30/40	Jun 2040	86.58	76.54	102.43	89.55	80.57	71.34	99.27	86.77	101.60	87.31	8.61	8.67	8.08	8.02	8.24	7.91	7.75	7.61	8.34	8.15	8.11	8.05
07/01/40	07/31/40	Jul 2040	101.16	88.66	112.65	96.53	94.49	82.73	113.70	94.32	113.45	95.60	8.71	9.10	8.23	8.13	8.33	7.96	7.88	7.65	8.45	8.26	8.22	8.19
08/01/40	08/31/40	Aug 2040	104.73	89.66	112.91	97.52	97.93	83.78	116.73	95.48	115.42	96.98	8.78	9.20	8.26	8.21	8.47	8.06	7.87	7.70	8.52	8.33	8.29	8.18
09/01/40	09/30/40	Sep 2040	97.08	86.40	102.54	93.95	90.96	81.71	106.27	93.09	103.67	91.96	8.72	9.19	8.31	8.26	8.53	8.12	7.92	7.75	8.58	8.39	8.34	8.23
10/01/40	10/31/40	Oct 2040	94.30	86.22	96.94	90.64	90.88	82.35	100.25	92.10	98.42	89.55	8.77	9.17	8.50	8.42	8.66	8.48	8.06	7.91	8.74	8.55	8.50	8.37
11/01/40	11/30/40	Nov 2040	104.49	98.60	98.91	95.20	100.39	94.42	104.64	98.25	101.51	94.33	9.36	9.85	9.15	9.20	9.78	9.63	9.95	9.11	9.52	9.33	9.28	10.30
12/01/40	12/31/40	Dec 2040	111.29	103.41	101.53	98.08	111.58	102.08	106.53	100.60	104.38	98.00	9.90	10.20	9.64	9.69	10.04	10.07	10.77	9.63	10.02	9.82	9.77	11.13
01/01/41	01/31/41	Jan 2041	112.23	103.03	104.55	101.16	110.95	99.91	107.22	100.64	106.60	99.88	10.00	10.37	9.75	9.67	9.86	9.95	10.81	9.53	10.01	9.81	9.76	11.17
02/01/41	02/28/41	Feb 2041	104.10	97.10	103.07	99.93	100.42	92.46	103.39	97.02	102.86	97.48	9.91	10.21	9.42	9.40	9.44	9.53	9.86	9.23	9.73	9.53	9.48	10.22
03/01/41	03/31/41	Mar 2041	92.40	86.71	90.45	88.79	92.07	85.09	93.22	89.71	91.73	85.90	8.66	8.64	8.36	8.37	8.66	8.49	8.84	8.42	8.71	8.50	8.46	9.19
04/01/41	04/30/41	Apr 2041	85.80	82.45	90.82	88.25	82.55	77.40	91.83	88.03	91.25	85.08	8.59	8.61	8.29	8.23	8.44	8.33	7.94	7.83	8.55	8.36	8.32	8.25
05/01/41	05/31/41	May 2041	81.75	76.31	92.52	88.42	76.44	71.66	91.61	87.52	92.23	85.50	8.63	8.69	8.16	8.15	8.37	8.04	7.95	7.72	8.46	8.27	8.23	8.25
06/01/41	06/30/41	Jun 2041	86.03	78.36	102.48	91.70	80.02	73.26	98.71	88.86	100.52	88.88	8.79	8.85	8.25	8.19	8.42	8.08	7.91	7.77	8.51	8.32	8.28	8.21
07/01/41	07/31/41	Jul 2041	103.11	90.17	116.01	98.21	96.31	84.09	115.89	95.63	115.44	96.82	8.90	9.29	8.40	8.30	8.51	8.13	8.05	7.82	8.62	8.43	8.39	8.35
08/01/41	08/31/41	Aug 2041	107.96	92.25	116.65	100.16	100.95	86.20	120.22	98.08	118.27	99.15	8.96	9.39	8.44	8.38	8.64	8.23	8.04	7.86	8.70	8.50	8.46	8.34
09/01/41	09/30/41	Sep 2041	102.01	89.61	107.21	96.93	95.40	84.22	112.09	96.69	109.11	95.34	8.91	9.38	8.49	8.43	8.71	8.29	8.09	7.91	8.75	8.56	8.52	8.39
10/01/41	10/31/41	Oct 2041	96.38	88.23	99.82	93.44	91.82	83.74	103.74	94.75	101.59	92.01	8.96	9.36	8.68	8.60	8.84	8.66	8.23	8.08	8.92	8.72	8.68	8.54
11/01/41	11/30/41	Nov 2041	105.75	100.60	102.67	97.88	101.06	95.73	106.37	100.63	103.64	96.60	9.55	10.05	9.34	9.39	9.98	9.83	10.16	9.31	9.72	9.52	9.47	10.51
12/01/41	12/31/41	Dec 2041	114.85	106.43	104.31	100.99	114.26	105.17	109.49	103.27	107.28	100.31	10.11	10.42	9.84	9.89	10.25	10.28	11.00	9.83	10.23	10.03	9.98	11.36
01/01/42	01/31/42	Jan 2042	115.33	106.27	107.73	104.21	113.74	103.12	110.11	103.23	109.36	102.50	10.21	10.59	9.95	9.87	10.06	10.16	11.04	9.73	10.21	10.01	9.96	11.40
02/01/42	02/28/42	Feb 2042	107.63	99.88	106.72	102.52	103.49	94.88	106.44	99.56	106.02	100.15	10.12	10.42	9.62	9.59	9.63	9.73	10.07	9.42	9.93	9.73	9.68	10.42
03/01/42	03/31/42	Mar 2042	94.56	89.06	93.19	90.93	94.06	87.29	95.77	92.29	94.17	88.17	8.84	8.82	8.53	8.55	8.84	8.67	9.02	8.59	8.88	8.68	8.63	9.38
04/01/42	04/30/42	Apr 2042	88.01	84.83	92.72	90.08	84.33	79.61	93.76	90.31	93.46	87.41	8.77	8.79	8.47	8.41	8.62	8.51	8.10	7.99	8.73	8.53	8.49	8.41
05/01/42	05/31/42	May 2042	84.05	78.45	95.06	90.62	78.56	73.71	94.20	89.91	94.69	87.94	8.81	8.88	8.33	8.32	8.55	8.20	8.11	7.89	8.63	8.44	8.40	8.41
06/01/42	06/30/42	Jun 2042	89.00	80.99	106.66	94.67	82.79	75.58	102.11	91.46	104.38	91.63	8.98	9.03	8.43	8.37	8.59	8.25	8.08	7.93	8.68	8.49	8.45	8.38
07/01/42	07/31/42	Jul 2042	105.85	93.07	119.47	101.27	98.88	86.77	119.10	98.36	118.44	99.45	9.08	9.48	8.58	8.48	8.68	8.30	8.22	7.98	8.79	8.60	8.56	8.52
08/01/42	08/31/42	Aug 2042	110.45	95.17	120.48	103.29	103.29	88.96	122.98	101.31	121.04	102.22	9.15	9.59	8.62	8.56	8.83	8.40	8.21	8.02	8.87	8.68	8.64	8.51
09/01/42	09/30/42	Sep 2042	104.97	91.62	111.87	99.61	98.13	86.16	115.03	98.42	112.23	97.09	9.09	9.58	8.67	8.61	8.89	8.47	8.26	8.07	8.93	8.74	8.69	8.56
10/01/42	10/31/42	Oct 2042	99.44	90.81	103.63	96.72	94.32	86.05	106.22	97.24	104.30	94.62	9.15	9.56	8.86	8.78	9.02	8.84	8.40	8.25	9.10	8.90	8.86	8.71
11/01/42	11/30/42	Nov 2042	109.17	103.66	105.86	101.19	103.71	98.81	109.37	103.62	106.79	99.41	9.75	10.26	9.54	9.59	10.19	10.04	10.38	9.50	9.91	9.72	9.67	10.72
12/01/42	12/31/42	Dec 2042	118.35	109.38	107.28	103.63	117.09	108.35	112.09	105.77	110.15	103.02	10.32	10.63	10.05	10.10	10.47	10.50	11.23	10.04	10.44	10.23	10.19	11.59
01/01/43	01/31/43	Jan 2043	117.75	108.50	109.99	106.40	116.12	105.29	112.42	105.40	111.66	104.65	10.42	10.81	10.16	10.08	10.28	10.37	11.27	9.93	10.42	10.22	10.17	11.63
02/01/43	02/28/43	Feb 2043	109.89	101.97	108.96	104.68	105.67	96.88	108.67	101.65	108.25	102.25	10.33	10.64	9.82	9.80	9.84	9.94	10.28	9.62	10.13	9.93	9.88	10.63
03/01/43	03/31/43	Mar 2043	96.54	90.93	95.14	92.84	96.04	89.13	97.78	94.23	96.15	90.02	9.02	9.00	8.71	8.73	9.02	8.85	9.21	8.78	9.06	8.86	8.81	9.57
04/01/43	04/30/43	Apr 2043	89.86	86.62	94.67	91.98	86.11	81.28	95.73	92.20	95.42	89.24	8.96	8.98	8.64	8.58	8.80	8.68	8.27	8.16	8.90	8.71	8.66	8.58
05/01/43	05/31/43	May 2043	85.82	80.10	97.06	92.52	80.21	75.25	96.18	91.80	96.67	89.79	9.00	9.06	8.50	8.49	8.73	8.38	8.28	8.05	8.81	8.62	8.57	8.58
06/01/43	06/30/43	Jun 2043	90.87	82.69	108.90	96.66	84.53	77.16	104.26	93.38	106.58	93.55	9.17	9.22	8.60	8.54	8.77	8.42	8.25	8.10	8.86	8.66	8.62	8.55
07/01/43	07/31/43	Jul 2043	108.07	95.02	121.97	103.40	100.95	88.59	121.60	100.43	120.93	101.54	9.27	9.68	8.76	8.66	8.87	8.47	8.39	8.15	8.97	8.78	8.74	8.69
08/01/43	08/31/43	Aug 2043	112.77	97.17	123.01	105.46	105.46	90.83	125.56	103.44	123.58	104.37	9.34	9.79	8.80	8.73	9.01	8.58	8.38	8.19	9.05	8.86	8.82	8.69
09/01/43	09/30/43	Sep 2043	107.18	93.54	114.22	101.70	100.19	87.97	117.44	100.49	114.59	99.13	9.29	9.78	8.85	8.79	9.08	8.64	8.43	8.24	9.11	8.92	8.87	8.74
10/01/43	10/31/43	Oct 2043	101.52	92.72	105.81	98.75	96.30	87.85	108.45	99.28	106.49	96.61	9.34	9.76	9.05	8.96	9.21	9.02	8.58	8.42	9.28	9.09	9.04	8.89

	11/01/43	11/30/43	Nov 2043	111.46	105.84	108.08	103.32	105.89	100.89	111.67	105.79	109.03	101.50	9.96	10.48	9.74	9.79	10.41	10.25	10.59	9.70	10.12	9.92	9.87	10.94
	12/01/43	12/31/43	Dec 2043	120.83	111.68	109.54	105.81	119.55	110.63	114.44	107.99	112.46	105.18	10.54	10.86	10.26	10.31	10.69	10.72	11.47	10.25	10.65	10.45	10.40	11.82
	01/01/44	01/31/44	Jan 2044	120.23	110.78	112.30	108.63	118.56	107.50	114.79	107.61	114.00	106.85	10.64	11.04	10.38	10.29	10.49	10.59	11.51	10.14	10.63	10.43	10.38	11.87
	02/01/44	02/29/44	Feb 2044	112.19	104.11	111.25	106.88	107.89	98.91	110.95	103.79	110.52	104.40	10.55	10.86	10.03	10.00	10.04	10.15	10.49	9.82	10.34	10.14	10.09	10.85
	03/01/44	03/31/44	Mar 2044	98.57	92.84	97.14	94.78	98.05	91.00	99.83	96.21	98.16	91.92	9.21	9.19	8.89	8.91	9.21	9.03	9.41	8.96	9.24	9.04	8.99	9.76

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
12/31/2013		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
1213 Official Forward Price Curve: *Blend of...* 1213 E Midas forecast 12/31/2013 forward market curve																								
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/14	01/31/14	Jan 2014	46.50	37.25	40.25	33.50	45.00	37.00	48.25	41.50	48.25	41.50	4.40	4.57	4.33	4.28	4.42	4.42	4.87	3.65	4.57	4.33	4.37	4.86
02/01/14	02/28/14	Feb 2014	42.25	34.50	38.50	32.25	40.75	34.00	45.50	40.75	47.00	40.75	4.23	4.33	4.13	4.15	4.20	4.16	4.40	3.68	4.49	4.25	4.27	4.70
03/01/14	03/31/14	Mar 2014	41.00	34.00	39.00	31.25	39.00	33.00	46.50	40.25	49.00	40.50	4.19	4.27	4.01	4.03	4.08	4.04	4.25	3.65	4.37	4.13	4.15	4.54
04/01/14	04/30/14	Apr 2014	41.97	28.28	38.25	28.79	36.63	25.16	43.10	37.18	46.09	38.25	4.11	4.19	3.94	3.90	4.01	3.97	3.98	3.64	4.23	4.01	3.98	4.24
05/01/14	05/31/14	May 2014	36.96	21.75	37.49	27.93	32.01	17.02	41.83	33.36	43.86	33.61	4.10	4.16	3.87	3.86	3.98	3.95	3.73	3.62	4.19	3.97	3.93	3.97
06/01/14	06/30/14	Jun 2014	36.58	15.23	39.02	28.79	30.36	13.51	42.67	33.71	44.30	35.39	4.11	4.19	3.91	3.87	3.97	3.93	3.74	3.62	4.19	3.98	3.94	3.98
07/01/14	07/31/14	Jul 2014	47.04	26.27	47.90	30.00	43.17	23.37	47.78	38.56	52.02	39.53	4.15	4.27	3.95	3.93	4.10	4.07	3.93	3.61	4.26	4.04	4.01	4.18
08/01/14	08/31/14	Aug 2014	51.45	36.91	46.97	32.50	47.17	33.83	50.70	41.74	53.05	41.97	4.16	4.25	3.95	3.94	4.09	4.06	4.02	3.64	4.26	4.05	4.01	4.28
09/01/14	09/30/14	Sep 2014	48.51	36.58	44.18	31.25	43.17	35.06	47.78	38.96	49.44	40.75	4.15	4.24	3.94	3.92	4.08	4.05	4.02	3.67	4.25	4.03	4.00	4.28
10/01/14	10/31/14	Oct 2014	43.25	36.10	40.69	31.25	40.89	34.08	47.27	39.53	47.53	40.59	4.16	4.25	3.96	3.94	4.10	4.06	4.05	3.69	4.27	4.05	4.02	4.31
11/01/14	11/30/14	Nov 2014	46.04	37.24	39.90	30.63	43.50	35.53	47.27	40.75	48.02	39.77	4.20	4.29	3.99	4.06	4.20	4.16	4.55	3.67	4.41	4.18	4.14	4.87
12/01/14	12/31/14	Dec 2014	50.22	40.66	37.92	31.88	46.11	39.15	48.71	41.97	49.96	42.64	4.31	4.40	4.10	4.19	4.31	4.27	4.77	3.77	4.54	4.31	4.27	5.10
01/01/15	01/31/15	Jan 2015	43.94	36.23	38.88	31.98	41.21	34.32	48.30	41.60	48.88	40.94	4.40	4.49	4.18	4.31	4.39	4.36	4.61	3.86	4.66	4.44	4.39	4.93
02/01/15	02/28/15	Feb 2015	43.10	34.50	38.51	31.06	40.04	33.33	46.92	40.40	47.94	39.75	4.37	4.46	4.15	4.26	4.36	4.32	4.58	3.81	4.61	4.38	4.34	4.90
03/01/15	03/31/15	Mar 2015	39.72	32.78	35.86	29.21	36.50	31.35	42.78	38.00	44.18	38.56	4.31	4.40	4.09	4.17	4.30	4.26	4.54	3.77	4.52	4.29	4.25	4.85
04/01/15	04/30/15	Apr 2015	37.33	22.81	35.53	27.30	30.16	15.71	39.69	34.06	40.98	33.99	4.03	4.13	3.73	3.70	3.90	3.86	3.80	3.39	4.02	3.80	3.77	4.05
05/01/15	05/31/15	May 2015	32.54	15.51	35.53	25.73	29.00	14.95	40.10	32.10	41.83	32.34	4.01	4.11	3.71	3.68	3.88	3.84	3.65	3.37	4.00	3.79	3.75	3.89
06/01/15	06/30/15	Jun 2015	32.88	16.43	37.70	25.73	27.84	15.10	41.72	32.10	43.94	32.67	4.03	4.13	3.72	3.69	3.89	3.86	3.57	3.38	4.01	3.80	3.77	3.80
07/01/15	07/31/15	Jul 2015	45.59	25.08	47.44	30.00	38.48	22.33	48.25	37.59	51.26	37.83	4.05	4.15	3.74	3.71	3.91	3.88	3.65	3.40	4.03	3.82	3.79	3.89
08/01/15	08/31/15	Aug 2015	48.88	34.93	46.54	30.00	46.17	29.00	49.70	40.69	51.76	40.17	4.06	4.16	3.76	3.73	3.93	3.89	3.82	3.42	4.05	3.83	3.80	4.07
09/01/15	09/30/15	Sep 2015	46.53	35.24	40.28	30.00	43.61	35.67	46.80	37.98	47.74	39.00	4.05	4.15	3.75	3.72	3.92	3.89	3.79	3.41	4.04	3.83	3.79	4.04
10/01/15	10/31/15	Oct 2015	41.62	34.80	38.88	30.25	40.26	33.71	45.54	38.86	45.33	38.47	4.08	4.18	3.77	3.74	3.94	3.91	3.79	3.43	4.06	3.85	3.82	4.04
11/01/15	11/30/15	Nov 2015	44.30	35.53	38.13	29.65	41.09	34.40	45.54	38.47	46.25	38.47	4.12	4.20	3.88	3.85	4.06	4.02	4.28	3.46	4.18	3.96	3.92	4.58
12/01/15	12/31/15	Dec 2015	48.33	38.43	36.24	30.86	43.16	36.14	46.92	40.43	47.18	40.82	4.23	4.31	4.00	4.05	4.17	4.14	4.37	3.57	4.39	4.17	4.13	4.68
01/01/16	01/31/16	Jan 2016	45.54	37.73	38.13	31.98	41.21	34.32	47.05	41.10	47.63	40.19	4.33	4.41	4.09	4.13	4.27	4.23	4.45	3.67	4.48	4.25	4.21	4.77
02/01/16	02/29/16	Feb 2016	44.70	36.00	37.76	31.06	40.04	33.33	45.67	39.90	46.69	39.00	4.30	4.38	4.06	4.09	4.24	4.20	4.42	3.64	4.44	4.21	4.17	4.73
03/01/16	03/31/16	Mar 2016	41.32	34.28	35.11	29.21	36.50	31.35	41.53	37.50	42.93	37.81	4.24	4.32	4.01	4.01	4.18	4.15	4.37	3.58	4.35	4.12	4.08	4.68
04/01/16	04/30/16	Apr 2016	38.93	24.31	35.78	27.30	30.66	16.21	38.94	34.06	39.98	33.49	4.00	4.07	3.65	3.58	3.73	3.70	3.71	3.18	3.90	3.69	3.66	3.95
05/01/16	05/31/16	May 2016	34.14	17.01	35.78	25.73	29.50	15.45	39.35	32.10	40.83	31.84	4.01	4.07	3.66	3.59	3.74	3.70	3.63	3.19	3.91	3.69	3.66	3.86
06/01/16	06/30/16	Jun 2016	34.48	17.93	37.95	25.73	28.34	15.60	40.97	32.10	42.94	32.17	4.03	4.09	3.68	3.61	3.76	3.72	3.59	3.20	3.93	3.71	3.68	3.82
07/01/16	07/31/16	Jul 2016	47.19	26.58	48.19	30.25	38.98	22.58	48.25	37.59	52.02	37.83	4.05	4.11	3.70	3.63	3.78	3.74	3.57	3.23	3.95	3.73	3.70	3.81
08/01/16	08/31/16	Aug 2016	50.48	36.43	47.29	30.25	46.67	29.25	49.70	40.69	52.53	40.17	4.06	4.12	3.71	3.64	3.79	3.75	3.55	3.24	3.96	3.74	3.71	3.78
09/01/16	09/30/16	Sep 2016	48.13	36.74	41.03	30.25	44.11	35.92	46.80	37.98	48.45	39.00	4.06	4.12	3.71	3.64	3.79	3.75	3.61	3.23	3.96	3.74	3.71	3.84
10/01/16	10/31/16	Oct 2016	43.22	36.30	38.88	31.00	40.26	34.21	44.04	38.36	44.08	37.47	4.08	4.14	3.73	3.66	3.81	3.77	3.65	3.26	3.98	3.76	3.73	3.88
11/01/16	11/30/16	Nov 2016	45.90	37.03	38.13	30.40	41.09	34.90	44.04	37.97	45.00	37.47	4.13	4.19	3.91	3.92	4.03	4.00	4.24	3.43	4.26	4.03	3.99	4.54
12/01/16	12/31/16	Dec 2016	49.93	39.93	36.24	31.61	43.16	36.64	45.42	39.93	45.93	39.82	4.26	4.32	4.03	4.05	4.16	4.12	4.37	3.56	4.39	4.16	4.12	4.68
01/01/17	01/31/17	Jan 2017	46.54	38.73	39.38	33.13	42.21	35.32	47.30	41.60	47.88	40.69	4.34	4.40	4.12	4.14	4.24	4.21	4.45	3.64	4.48	4.26	4.22	4.76
02/01/17	02/28/17	Feb 2017	45.70	37.00	39.01	32.21	41.04	34.33	45.92	40.40	46.94	39.50	4.32	4.38	4.09	4.12	4.22	4.18	4.42	3.62	4.46	4.24	4.20	4.73
03/01/17	03/31/17	Mar 2017	42.32	35.28	36.36	30.36	37.50	32.35	41.78	38.00	43.18	38.31	4.26	4.32	4.03	4.06	4.16	4.12	4.35	3.55	4.39	4.17	4.13	4.66
04/01/17	04/30/17	Apr 2017	39.93	25.31	37.03	28.45	31.66	17.21	39.19	34.56	40.23	33.99	4.00	4.06	3.72	3.54	3.74	3.70	3.71	3.17	3.85	3.64	3.61	3.95
05/01/17	05/31/17	May 2017	35.14	18.01	37.03	26.88	30.50	16.45	39.60	32.60	41.08	32.34	4.02	4.07	3.73	3.55	3.75	3.72	3.64	3.19	3.86	3.66	3.62	3.88
06/01/17	06/30/17	Jun 2017	35.48	18.93	39.20	26.88	29.34	16.60	41.22	32.60	43.19	32.67	4.04	4.10	3.75	3.57	3.77	3.74	3.60	3.21	3.88	3.68	3.65	3.84
07/01/17	07/31/17	Jul 2017	48.19	27.58	49.44	31.40	39.98	23.58	48.50	38.09	52.27	38.33	4.07	4.12	3.78	3.60	3.80	3.77	3.60	3.24	3.91	3.71	3.67	3.83
08/01/17	08/31/17	Aug 2017	51.48	37.43	48.54	31.40	47.67	30.25	49.95	41.19	52.78	40.67	4.08	4.14	3.80	3.62	3.81	3.78	3.58	3.25	3.93	3.72	3.69	3.81
09/01/17	09/30/17	Sep 2017	49.13	37.74	42.28	31.40	45.11	36.92	47.05	38.48	48.70	39.50	4.08	4.14	3.80	3.62	3.81	3.78	3.63	3.25	3.93	3.72	3.69	3.87
10/01/17	10/31/17	Oct 2017	44.22	37.30	40.13	32.15	41.26	35.21	44.29	38.86	44.33	37.97	4.11	4.17	3.82	3.64	3.84	3.81	3.68	3.28	3.96	3.75	3.72	3.92
11/01/17	11/30/17	Nov 2017	46.90	38.03	39.38	31.55	42.09	35.90	44.29	38.47	45.25	37.97	4.18	4.28	3.98	3.97	4.08	4.04	4.24	3.46	4.30	4.08	4.04	4.54
12/01/17	12/31/17	Dec 2017	50.93	40.93	37.49	32.76	44.16	37.64	45.67	40.43	46.18	40.32	4.35	4.45	4.15	4.14	4.25	4.21	4.41	3.63	4.48	4.26	4.22	4.72
01/01/18	01/31/18	Jan 2018	48.04	40.23	41.13	34.63	43.71	36.82	48.30	41.35	48.88	41.94	4.43	4.53	4.20	4.23	4.33	4.29	4.49	3.71	4.57	4.35	4.31	4.80
02/01/18	02/28/18	Feb 2018	47.20	38.50	40.76	33.71	42.54	35.83	46.92	40.15	47.94	40.75	4.40	4.50	4.17	4.20	4.30	4.26	4.46	3.68	4.54	4.32	4.28	4.77
03/01/18	03/31/18	Mar 2018	43.82	36.78	38.11	31.86	39.00	33.85	42.78	37.75	44.18	39.56	4.33	4.43	4.10	4.14	4.23	4.19	4.38	3.61	4.46	4.25	4.21	4.69
04/01/18	04/30/18	Apr 2018	41.43	26.81	38.78	29.95	33.16	18.71	40.19	34.31	41.23	35.24	4.06	4.17	3.77	3.76	3.85	3.81	3.68	3.22	4.06	3.87	3.83	3.92
05/01/18	05/31/18	May 2018	36.64	19.51	38.78	28.38	32.00	17.95	40.60	32.35	42.08	33.59	4.07	4.18	3.78	3.77	3.86	3.82	3.58	3.23	4.07	3.88	3.84	3.82
06/01/18	06/30/18	Jun 2018	36.98	20.43	40.95	28.38	30.84	18.10	42.22	32.35	44.19	33.92	4.09	4.20	3.80	3.79	3.88	3.85	3.53	3.25	4.09	3.90	3.86	3.76
07/01/18	07/31/18	Jul 2018	49.69	29.08	51.19	32.90	41.48	25.08	49.50	37.84	53.27	39.58	4.12	4.23	3.83	3.82	3.91	3.88	3.51	3.28	4.12	3.93	3.89	3.74
08/01/18	08/31/18	Aug 2018	52.98	38.93	50.29	32.90	49.17	31.75	50.95	40.94	53.78	41.92	4.13	4.24	3.85	3.83	3.92	3.89	3.48	3.29	4.14	3.94	3.90	3.71
09/01/18	09/30/18	Sep 2018	50.63	39.24	44.03	32.90	46.61	38.42	48.05	38.23	49.70	40.75	4.13	4.24	3.84	3.83	3.92	3.89	3.56	3.29	4.14	3.94	3.90	3.79
10/01/18	10/31/18	Oct 2018	45.72	38.80	41.88	33.65	42.76	36.71	45.29	38.61	45.33	39.22	4.16	4.27	3.88	3.86	3.95	3.92	3.61	3.32	4.17	3.97	3.94	3.85
11/01/18	11/30/18	Nov 2018	48.40	39.53	41.13	33.05	43.59	37.40	45.29	38.22	46.25	39.22	4.24	4.40	4.04	4.09	4.18	4.14	4.38	3.57	4.41	4.20	4.16	4.69
12/01/18	12/31/18	Dec 2018	52.43	42.43	39.24	34.26	45.66	39.14	46.67	40.18	47.18	41.57	4.41	4.57	4.21	4.26	4.35	4.31	4.55	3.74	4.59	4.38	4.33	4.87
01/01/19	01/31/19	Jan 2019	50.44	42.23	43.38	36.48	46.11	39.57	49.95	43.20	50.53	43.79	4.50	4.66	4.27	4.34	4.43	4.39	4.63	3.82	4.68	4.46	4.42	4.95
02/01/19	02/28/19	Feb 2019	49.60	40.50	43.01	35.56	44.94	38.58	48.57	42.00	49.59	42.60	4.47	4.63	4.24	4.31	4.40	4.37	4.60	3.79	4.65	4.44	4.39	4.92
03/01/19	03/31/19	Mar 2019	46.22	38.78	40.36	33.71	41.40	36.60	44.43	39.60	45.83	41.41	4.40	4.56	4.17	4.24	4.33	4.30	4.52	3.72	4.58	4.36	4.32	4.84

04/01/19	04/30/19	Apr 2019	43.83	28.81	41.03	31.80	35.56	21.46	41.84	36.16	42.88	37.09	4.13	4.32	3.85	3.92	3.95	3.91	3.76	3.45	4.23	4.03	4.00	4.00
05/01/19	05/31/19	May 2019	39.04	21.51	41.03	30.23	34.40	20.70	42.25	34.20	43.73	35.44	4.15	4.34	3.87	3.94	3.97	3.93	3.67	3.47	4.25	4.05	4.02	3.91
06/01/19	06/30/19	Jun 2019	39.38	22.43	43.20	30.23	33.24	20.85	43.87	34.20	45.84	35.77	4.18	4.37	3.89	3.97	3.99	3.96	3.62	3.49	4.28	4.08	4.04	3.85
07/01/19	07/31/19	Jul 2019	52.09	31.08	53.44	34.75	43.88	27.83	51.15	39.69	54.92	41.43	4.21	4.40	3.93	4.00	4.03	3.99	3.61	3.53	4.32	4.12	4.08	3.85
08/01/19	08/31/19	Aug 2019	55.38	40.93	52.54	34.75	51.57	34.50	52.60	42.79	55.43	43.77	4.24	4.43	3.95	4.02	4.05	4.02	3.59	3.55	4.34	4.14	4.10	3.82
09/01/19	09/30/19	Sep 2019	53.03	41.24	46.28	34.75	49.01	41.17	49.70	40.08	51.35	42.60	4.24	4.43	3.95	4.02	4.05	4.02	3.66	3.55	4.34	4.14	4.10	3.90
10/01/19	10/31/19	Oct 2019	48.12	40.80	44.13	35.50	45.16	39.46	46.94	40.46	46.98	41.07	4.27	4.46	3.99	4.06	4.09	4.05	3.72	3.59	4.37	4.17	4.13	3.96
11/01/19	11/30/19	Nov 2019	50.80	41.53	43.38	34.90	45.99	40.15	46.94	40.07	47.90	41.07	4.36	4.58	4.15	4.22	4.33	4.29	4.49	3.80	4.55	4.34	4.30	4.81
12/01/19	12/31/19	Dec 2019	54.83	44.43	41.49	36.11	48.06	41.89	48.32	42.03	48.83	43.42	4.54	4.77	4.34	4.41	4.51	4.47	4.68	3.98	4.74	4.53	4.49	5.00
01/01/20	01/31/20	Jan 2020	53.09	44.73	45.88	38.83	48.76	42.07	52.10	45.55	52.68	46.14	4.63	4.86	4.40	4.53	4.60	4.56	4.76	4.07	4.87	4.65	4.61	5.09
02/01/20	02/29/20	Feb 2020	49.20	41.74	45.59	39.41	46.59	40.28	52.03	46.79	52.82	47.05	5.05	5.11	4.76	4.80	4.83	4.81	5.10	4.42	5.14	4.93	4.88	5.43
03/01/20	03/31/20	Mar 2020	46.25	40.28	41.60	37.74	42.38	37.97	48.92	44.86	49.27	45.44	4.83	4.91	4.56	4.62	4.75	4.72	4.90	4.33	4.96	4.74	4.70	5.22
04/01/20	04/30/20	Apr 2020	43.76	35.02	43.93	36.40	38.10	30.75	47.30	42.91	47.77	43.45	4.67	4.79	4.38	4.40	4.57	4.48	4.31	4.10	4.72	4.52	4.48	4.59
05/01/20	05/31/20	May 2020	41.33	30.46	43.46	35.85	37.53	28.17	47.65	42.14	48.66	42.55	4.70	4.77	4.41	4.43	4.52	4.44	4.31	4.09	4.75	4.55	4.51	4.58
06/01/20	06/30/20	Jun 2020	41.77	31.94	45.91	36.03	38.92	30.23	48.24	42.36	50.27	43.56	4.75	4.87	4.47	4.42	4.54	4.47	4.27	4.11	4.74	4.54	4.50	4.54
07/01/20	07/31/20	Jul 2020	53.39	37.51	57.25	40.31	50.68	35.47	57.38	46.76	59.64	47.91	4.80	4.98	4.51	4.48	4.58	4.49	4.25	4.11	4.80	4.60	4.56	4.52
08/01/20	08/31/20	Aug 2020	56.87	43.07	57.22	40.60	55.90	39.92	59.37	48.55	61.00	49.38	4.83	5.05	4.53	4.50	4.61	4.52	4.23	4.14	4.82	4.62	4.58	4.50
09/01/20	09/30/20	Sep 2020	53.28	42.49	50.33	39.16	52.03	42.34	55.23	46.24	56.03	47.81	4.81	4.99	4.53	4.52	4.64	4.55	4.29	4.15	4.84	4.64	4.60	4.56
10/01/20	10/31/20	Oct 2020	48.94	41.71	46.11	38.86	46.59	40.80	51.23	45.96	50.99	46.38	4.84	4.97	4.54	4.56	4.70	4.60	4.34	4.21	4.89	4.69	4.64	4.62
11/01/20	11/30/20	Nov 2020	54.97	45.12	47.02	39.91	52.73	44.29	52.32	47.12	52.29	47.10	4.97	5.13	4.72	4.75	4.98	4.95	5.18	4.48	5.09	4.88	4.83	5.50
12/01/20	12/31/20	Dec 2020	57.46	46.53	44.13	40.75	54.81	45.21	53.22	48.54	53.01	48.95	5.16	5.32	4.92	4.96	5.09	5.12	5.44	4.66	5.31	5.09	5.04	5.78
01/01/21	01/31/21	Jan 2021	57.70	47.55	50.88	45.34	54.51	46.15	55.99	50.01	56.10	50.50	5.19	5.34	4.94	4.99	5.02	5.06	5.32	4.64	5.34	5.13	5.08	5.66
02/01/21	02/28/21	Feb 2021	48.81	42.97	48.17	43.27	48.24	41.97	55.48	51.58	56.05	51.50	5.62	5.59	5.29	5.28	5.27	5.25	5.60	5.05	5.62	5.41	5.36	5.93
03/01/21	03/31/21	Mar 2021	46.29	41.79	42.83	41.76	43.35	39.34	53.41	50.11	52.70	49.48	5.27	5.26	4.95	4.99	5.17	5.14	5.27	4.93	5.33	5.12	5.07	5.60
04/01/21	04/30/21	Apr 2021	43.68	41.23	46.84	41.00	40.63	40.04	52.76	49.66	52.65	49.81	5.22	5.25	4.91	4.88	5.20	5.05	4.86	4.76	5.20	5.00	4.96	5.14
05/01/21	05/31/21	May 2021	43.63	39.41	45.90	41.47	40.66	35.65	53.05	50.08	53.59	49.65	5.26	5.20	4.95	4.92	5.06	4.95	4.94	4.70	5.24	5.04	4.99	5.22
06/01/21	06/30/21	Jun 2021	44.15	41.45	48.61	41.84	44.60	39.62	52.61	50.53	54.70	51.34	5.33	5.37	5.04	4.88	5.09	4.97	4.93	4.73	5.20	5.00	4.96	5.20
07/01/21	07/31/21	Jul 2021	54.68	43.93	61.07	45.86	57.48	43.11	63.60	53.84	64.35	54.39	5.39	5.55	5.09	4.96	5.14	4.99	4.90	4.70	5.28	5.08	5.04	5.17
08/01/21	08/31/21	Aug 2021	58.36	45.22	61.89	46.45	60.23	45.33	66.14	54.32	66.57	54.98	5.42	5.67	5.12	4.98	5.16	5.02	4.88	4.72	5.30	5.10	5.06	5.15
09/01/21	09/30/21	Sep 2021	53.53	43.73	54.39	43.56	55.06	43.51	60.75	52.41	60.70	53.01	5.38	5.55	5.10	5.01	5.22	5.07	4.91	4.75	5.33	5.13	5.09	5.19
10/01/21	10/31/21	Oct 2021	49.76	42.61	48.09	42.21	48.03	42.14	55.51	51.46	55.01	51.70	5.40	5.48	5.10	5.07	5.31	5.15	4.97	4.84	5.39	5.19	5.15	5.24
11/01/21	11/30/21	Nov 2021	59.13	48.71	50.66	44.92	59.47	48.42	57.70	54.18	56.67	53.14	5.59	5.68	5.28	5.28	5.64	5.61	5.86	5.16	5.62	5.40	5.36	6.18
12/01/21	12/31/21	Dec 2021	60.08	48.64	46.76	45.40	61.56	48.53	58.12	55.05	57.20	54.47	5.78	5.86	5.51	5.52	5.67	5.77	6.21	5.34	5.86	5.65	5.60	6.54
01/01/22	01/31/22	Jan 2022	62.30	50.38	55.87	51.84	60.25	50.23	59.88	54.46	59.51	54.86	5.75	5.81	5.48	5.46	5.43	5.55	5.88	5.20	5.81	5.60	5.55	6.22
02/01/22	02/28/22	Feb 2022	56.06	48.78	57.07	51.58	54.88	47.71	57.97	53.56	58.72	54.06	5.73	5.71	5.37	5.39	5.35	5.47	5.67	5.23	5.73	5.52	5.47	6.00
03/01/22	03/31/22	Mar 2022	53.68	47.68	50.53	49.06	54.88	47.57	55.75	52.45	55.16	52.10	5.42	5.41	5.10	5.09	5.25	5.20	5.37	5.05	5.43	5.22	5.17	5.69
04/01/22	04/30/22	Apr 2022	52.42	48.45	54.09	50.02	49.97	46.05	57.31	53.15	57.55	52.90	5.36	5.41	5.06	5.05	5.25	5.13	5.00	4.87	5.37	5.17	5.13	5.28
05/01/22	05/31/22	May 2022	51.00	46.42	53.68	49.15	49.49	44.99	56.50	52.14	56.83	52.15	5.40	5.36	5.11	5.04	5.24	5.09	5.09	4.83	5.36	5.16	5.12	5.36
06/01/22	06/30/22	Jun 2022	50.78	47.99	57.79	50.68	50.70	44.60	55.37	53.11	57.47	53.21	5.50	5.55	5.20	5.07	5.27	5.12	5.07	4.86	5.39	5.19	5.15	5.34
07/01/22	07/31/22	Jul 2022	61.99	51.44	69.87	54.89	62.40	50.64	67.71	56.80	68.44	57.45	5.55	5.76	5.26	5.10	5.30	5.15	5.10	4.88	5.42	5.22	5.18	5.37
08/01/22	08/31/22	Aug 2022	66.82	53.05	70.81	55.03	65.20	51.70	70.09	57.43	70.41	57.72	5.59	5.89	5.30	5.14	5.36	5.18	5.09	4.90	5.46	5.26	5.22	5.36
09/01/22	09/30/22	Sep 2022	60.89	51.06	60.98	52.31	59.52	48.95	64.19	55.52	64.24	55.20	5.52	5.74	5.26	5.16	5.42	5.25	5.12	4.93	5.49	5.29	5.24	5.39
10/01/22	10/31/22	Oct 2022	56.75	50.43	55.59	50.58	54.83	47.94	59.66	54.54	59.14	53.66	5.55	5.62	5.25	5.22	5.50	5.33	5.17	5.02	5.54	5.34	5.30	5.45
11/01/22	11/30/22	Nov 2022	68.71	55.60	58.27	52.73	67.96	57.60	62.77	56.80	61.91	55.78	5.88	5.87	5.59	5.60	5.91	5.90	6.12	5.43	5.94	5.72	5.68	6.44
12/01/22	12/31/22	Dec 2022	70.12	57.25	58.55	55.80	69.65	59.73	63.42	59.13	62.50	58.84	6.20	6.33	5.93	5.85	6.03	6.10	6.50	5.69	6.19	5.98	5.93	6.83
01/01/23	01/31/23	Jan 2023	64.01	52.07	57.34	53.53	62.52	50.46	61.20	55.82	60.80	56.45	5.85	6.03	5.61	5.56	5.64	5.62	6.12	5.39	5.91	5.69	5.64	6.46
02/01/23	02/28/23	Feb 2023	58.09	51.57	58.68	52.94	56.37	49.36	59.69	55.53	60.31	55.57	5.88	5.89	5.56	5.56	5.68	5.66	5.87	5.42	5.90	5.69	5.64	6.20
03/01/23	03/31/23	Mar 2023	56.18	50.54	51.92	50.43	57.57	49.42	56.53	54.42	55.67	53.46	5.63	5.54	5.27	5.37	5.59	5.49	5.55	5.29	5.71	5.50	5.46	5.88
04/01/23	04/30/23	Apr 2023	53.08	50.62	54.51	51.25	51.46	47.94	57.48	55.06	57.68	54.27	5.58	5.55	5.24	5.28	5.50	5.36	5.27	5.09	5.60	5.40	5.35	5.55
05/01/23	05/31/23	May 2023	53.19	49.51	55.31	50.95	52.30	47.86	58.31	53.70	58.54	53.92	5.62	5.59	5.30	5.19	5.39	5.27	5.24	4.97	5.51	5.31	5.27	5.51
06/01/23	06/30/23	Jun 2023	52.32	48.99	58.92	52.04	52.08	45.25	57.06	54.60	58.76	54.59	5.72	5.68	5.40	5.22	5.35	5.30	5.21	5.00	5.54	5.34	5.30	5.48
07/01/23	07/31/23	Jul 2023	64.01	53.14	70.91	56.57	64.46	52.67	69.82	58.41	70.56	59.17	5.76	5.96	5.44	5.25	5.38	5.31	5.28	5.01	5.58	5.37	5.33	5.56
08/01/23	08/31/23	Aug 2023	69.33	54.99	72.30	56.63	67.79	53.61	71.74	59.14	72.20	59.45	5.79	6.11	5.46	5.28	5.39	5.33	5.22	5.03	5.61	5.40	5.36	5.49
09/01/23	09/30/23	Sep 2023	63.82	53.08	62.66	54.17	62.35	51.02	66.55	57.84	66.30	57.35	5.75	5.94	5.42	5.32	5.56	5.38	5.29	5.06	5.64	5.44	5.40	5.57
10/01/23	10/31/23	Oct 2023	57.65	51.62	56.46	52.38	54.78	48.97	60.60	56.46	59.94	55.63	5.77	5.84	5.45	5.39	5.63	5.45	5.35	5.14	5.72	5.52	5.47	5.63
11/01/23	11/30/23	Nov 2023	69.93	57.85	59.31	54.55	69.50	59.49	63.72	58.73	62.78	57.77	6.05	6.14	5.77	5.85	6.18	6.16	6.18	5.70	6.19	5.97	5.93	6.50
12/01/23	12/31/23	Dec 2023	71.44	59.15	59.07	56.58	71.45	62.00	64.98	60.21	63.99	59.78	6.28	6.43	6.00	6.05	6.22	6.32	6.78	5.92	6.40	6.18	6.14	7.11
01/01/24	01/31/24	Jan 2024	68.49	54.85	60.20	56.49	66.25	54.35	64.11	58.71	63.64	59.37	6.22	6.40	5.96	5.92	5.98	6.09	6.43	5.72	6.27	6.05	6.00	6.77
02/01/24	02/29/24	Feb 2024	61.14	53.48	61.39	55.66	63.27	51.42	62.31	57.82	62.94	58.25	6.22	6.24	5.89	5.88	5.88	5.90	6.13	5.75	6.22	6.01	5.96	6.46
03/01/24	03/31/24	Mar 2024	58.62	52.40	54.45	52.69	58.02	51.45	58.97	56.53	58.24	55.75	5.80	5.80	5.45	5.54	5.78	5.69	5.77	5.47	5.88	5.67	5.62	6.10
04/01/24	04/30/24	Apr 2024	54.97	52.26	56.27	52.51	53.56	50.05	58.75	56.50	59.24	55.53	5.73	5.69	5.40	5.47	5.71	5.56	5.49	5.27	5.79	5.59	5.55	5.77
05/01/24	05/31/24	May 2024	53.87	50.58	56.69	52.33	52.75	48.93	59.27	55.07	59.86	55.31	5.77	5.74	5.45	5.35	5.54	5.43	5.43	5.15	5.67	5.47	5.43	5.70
06/01/24	06/30/24	Jun 2024	53.92	50.83	59.96	53.58	53.31	47.44	58.68	56.17	60.01	56.01	5.86	5.83	5.54	5.36	5.57	5.46	5.42	5.18	5.68	5.48	5.44	5.69
07/01/24	07/31/24	Jul 2024	66.34	54.91	73.55	58.15	66.83	54.27	72.02	59.81	72.68	60.48	5.94	6.13	5.61	5.42	5.63	5.49	5.49	5.21	5.74	5.54	5.50	5.76
08/01/24	08/31/24	Aug 2024	71.65	57.00	74.03	58.61	70.13	55.45	74.19	60.89	74.45	61.24	5.97	6.30	5.67	5.45	5.69	5.52	5.45	5.24	5.77	5.57	5.52	5.72
09/01/24	09/30/24	Sep 2024	65.86	54.73	64.31	55.80	64.13	52.27	68.28	59.43	67.93	58.86	5.92	6.11	5.63	5.48	5.74	5.59	5.52	5.27	5.80	5.60	5.56	5.79
10/01/24	10/31/24	Oct 2024	58.87	53.39	57.92	54.04	55.86	50.30	62.27	58.44	61.44	57.52	5.95	6.07	5.64	5.61	5.81	5.67	5.61	5.36	5.93	5.73	5.69	5.88
11/01/24	11/30/24	Nov 2024	70.23	58.18	59.65	55.13	69.35	59.74	64.02	59.31	63.09	58.31	6.11	6.20	5.83	5.84	6.15	6.14	6.12	5.65	6.18	5.97	5.92	6.45
12/01/24	12/31/24	Dec 2024	72.19	59.63	59.76	57.27	71.75	62.89	65.51	61.00	64.50	60.47	6.34	6.50	6.07	6.08	6.26	6.34	6.75	5.92	6.42	6.21	6.16	7.08
01/01/25	01/31/25	Jan 2025	70.15	57.08	62.76	58.74	68.25	56.58	66.59	61.36	66.03	61.86	6.53	6.66	6.25	6.17	6.29	6.29	6.77	6.05	6.52	6.30	6.25	7.11
02/01/25	02/28/25	Feb 2025	62.56	54.84	63.23	57.63	63.58	52.86	63.80	59.25	64.58	59.97	6.42	6.44	6.09	6.07	5.99	6.06	6.31	5.93	6.41	6.20	6.15	6.64
03/01/25	03/31/25	Mar 2025	59.29	52.69	55.51	53.39	59.88	51.96	59.82	57.08	59.21	56.33	5.91	5.84	5.61	5.58	5.76	5.73	5.82	5.52	5.92	5.70	5.66	6.15
04/01/25	04/30/25	Apr 2025	56.34	53.22	56.89	53.60	54.71	51.03	60.40	57.40	60.42	56.60	5.84	5.82	5.54	5.49	5.74	5.61	5.54	5.31	5.81	5.61	5.57	5.82

05/01/25	05/31/25	May 2025	56.06	52.88	58.51	53.83	55.49	50.89	60.74	55.94	61.34	56.32	5.87	5.87	5.56	5.50	5.70	5.61	5.56	5.28	5.82	5.62	5.58	5.84
06/01/25	06/30/25	Jun 2025	55.48	52.25	61.88	55.09	54.36	48.42	59.98	57.62	61.54	57.41	5.96	5.95	5.60	5.51	5.70	5.61	5.55	5.31	5.83	5.63	5.59	5.83
07/01/25	07/31/25	Jul 2025	67.64	55.92	74.72	59.40	68.29	55.00	73.44	61.28	74.10	61.70	6.04	6.25	5.69	5.60	5.82	5.67	5.63	5.34	5.93	5.73	5.68	5.90
08/01/25	08/31/25	Aug 2025	70.33	57.15	74.94	59.54	69.82	55.26	75.03	62.24	75.20	62.14	6.08	6.32	5.72	5.63	5.85	5.70	5.58	5.37	5.96	5.76	5.71	5.85
09/01/25	09/30/25	Sep 2025	65.42	55.83	65.78	57.50	64.74	53.38	69.47	60.89	69.32	60.40	6.02	6.31	5.72	5.64	5.90	5.74	5.65	5.40	5.97	5.77	5.72	5.92
10/01/25	10/31/25	Oct 2025	60.40	54.80	59.41	55.77	57.15	51.91	63.50	59.55	62.86	58.88	6.04	6.19	5.76	5.69	5.94	5.81	5.74	5.49	6.01	5.81	5.77	6.02
11/01/25	11/30/25	Nov 2025	70.97	59.01	61.15	56.54	70.99	60.53	65.38	60.74	64.47	59.79	6.21	6.31	5.92	5.91	6.26	6.27	6.25	5.77	6.25	6.03	5.99	6.57
12/01/25	12/31/25	Dec 2025	72.65	60.09	61.02	58.74	73.70	63.10	66.63	62.46	65.61	61.99	6.49	6.66	6.21	6.12	6.37	6.49	6.91	6.05	6.47	6.25	6.21	7.24
01/01/26	01/31/26	Jan 2026	68.75	58.17	63.07	59.49	68.18	58.15	67.08	62.03	66.50	62.67	6.61	6.75	6.37	6.27	6.36	6.50	6.91	6.13	6.62	6.41	6.36	7.25
02/01/26	02/28/26	Feb 2026	62.78	56.63	64.20	58.99	61.29	53.88	65.04	60.87	65.64	61.29	6.55	6.58	6.25	6.19	6.25	6.26	6.66	6.09	6.54	6.32	6.27	6.99
03/01/26	03/31/26	Mar 2026	59.63	55.12	56.96	55.12	57.99	53.71	61.64	59.12	60.75	58.22	6.09	6.05	5.81	5.80	6.04	5.96	6.07	5.76	6.14	5.93	5.88	6.40
04/01/26	04/30/26	Apr 2026	58.17	54.84	58.28	55.47	56.02	52.54	61.45	59.38	61.73	58.45	6.03	6.00	5.76	5.73	5.94	5.81	5.74	5.54	6.05	5.85	5.81	6.02
05/01/26	05/31/26	May 2026	56.57	53.21	59.86	55.36	55.51	51.41	61.71	57.84	62.25	58.04	6.07	6.04	5.70	5.66	5.84	5.72	5.70	5.44	5.98	5.78	5.74	5.98
06/01/26	06/30/26	Jun 2026	56.85	54.36	63.43	56.51	55.71	50.39	61.66	59.05	62.63	58.66	6.17	6.10	5.75	5.69	5.87	5.75	5.69	5.48	6.01	5.81	5.77	5.96
07/01/26	07/31/26	Jul 2026	69.96	57.59	77.20	61.44	70.35	56.40	75.73	63.03	76.33	63.36	6.25	6.43	5.87	5.77	5.96	5.81	5.77	5.51	6.09	5.89	5.84	6.04
08/01/26	08/31/26	Aug 2026	73.38	59.29	77.32	61.61	72.55	57.65	77.42	63.74	77.68	63.92	6.29	6.53	5.91	5.80	6.01	5.84	5.72	5.54	6.12	5.92	5.88	5.99
09/01/26	09/30/26	Sep 2026	68.26	57.54	68.47	59.27	67.49	54.93	72.29	62.70	72.11	62.27	6.22	6.54	5.90	5.81	6.07	5.90	5.80	5.57	6.13	5.93	5.89	6.07
10/01/26	10/31/26	Oct 2026	62.60	56.64	61.53	57.54	58.92	53.94	65.78	61.29	65.02	60.55	6.25	6.37	5.99	5.94	6.14	6.11	5.86	5.66	6.26	6.06	6.02	6.13
11/01/26	11/30/26	Nov 2026	74.25	61.07	63.69	58.91	75.22	62.66	68.18	63.00	67.19	62.01	6.39	6.66	6.17	6.10	6.45	6.46	6.47	6.01	6.44	6.23	6.18	6.79
12/01/26	12/31/26	Dec 2026	75.06	62.70	63.36	60.64	75.32	65.70	68.96	64.58	67.95	64.07	6.66	6.90	6.45	6.36	6.65	6.71	7.19	6.28	6.70	6.49	6.44	7.52
01/01/27	01/31/27	Jan 2027	72.62	60.95	66.54	62.53	72.31	60.91	70.30	65.42	69.71	65.68	6.92	7.14	6.63	6.55	6.69	6.81	7.26	6.44	6.90	6.69	6.64	7.59
02/01/27	02/28/27	Feb 2027	66.03	58.79	67.21	62.21	64.72	56.48	69.04	63.92	69.61	64.57	6.89	7.07	6.44	6.39	6.42	6.45	6.89	6.32	6.73	6.51	6.47	7.22
03/01/27	03/31/27	Mar 2027	62.66	56.72	58.72	56.93	61.15	55.62	63.24	60.51	62.48	59.86	6.27	6.22	6.01	5.95	6.21	6.16	6.29	6.02	6.29	6.07	6.03	6.61
04/01/27	04/30/27	Apr 2027	59.77	56.52	60.67	57.13	58.24	54.35	63.55	61.11	63.92	60.22	6.21	6.20	5.94	5.87	6.12	6.09	5.84	5.67	6.19	5.99	5.95	6.12
05/01/27	05/31/27	May 2027	58.99	56.07	62.40	57.66	57.84	54.15	63.91	59.88	64.73	60.34	6.26	6.28	5.92	5.87	6.06	5.91	5.89	5.61	6.19	5.99	5.94	6.16
06/01/27	06/30/27	Jun 2027	59.72	56.44	65.80	58.76	58.20	52.45	64.68	60.93	65.44	60.81	6.38	6.39	6.00	5.90	6.10	5.94	5.88	5.65	6.22	6.02	5.98	6.15
07/01/27	07/31/27	Jul 2027	71.36	59.57	78.61	62.77	71.74	57.58	77.15	64.70	77.63	64.60	6.44	6.53	6.05	5.96	6.14	5.97	5.95	5.67	6.28	6.08	6.04	6.22
08/01/27	08/31/27	Aug 2027	76.04	60.82	79.70	63.26	75.03	58.56	79.78	65.75	80.01	65.55	6.48	6.73	6.10	5.99	6.20	6.01	5.90	5.70	6.31	6.11	6.07	6.17
09/01/27	09/30/27	Sep 2027	69.54	59.33	69.26	60.73	68.74	56.72	73.10	64.03	72.83	63.57	6.41	6.66	6.13	6.03	6.24	6.04	5.98	5.74	6.35	6.15	6.11	6.25
10/01/27	10/31/27	Oct 2027	64.27	58.49	63.57	59.18	61.21	56.09	67.74	63.49	67.02	62.57	6.44	6.64	6.16	6.12	6.36	6.32	6.05	5.84	6.44	6.24	6.20	6.32
11/01/27	11/30/27	Nov 2027	76.64	64.44	66.22	61.67	76.11	66.11	70.73	66.10	69.62	65.09	6.73	6.92	6.53	6.51	6.89	6.85	6.89	6.40	6.85	6.63	6.59	7.21
12/01/27	12/31/27	Dec 2027	77.92	65.91	66.25	63.22	75.87	68.70	71.79	67.70	70.73	66.76	6.99	7.19	6.76	6.75	6.97	7.06	7.59	6.64	7.10	6.88	6.84	7.92
01/01/28	01/31/28	Jan 2028	77.36	63.05	69.00	64.80	76.40	63.48	72.56	67.42	72.01	67.87	7.20	7.42	6.91	6.76	6.88	7.01	7.47	6.63	7.11	6.90	6.85	7.81
02/01/28	02/29/28	Feb 2028	69.47	61.23	70.11	64.34	68.75	58.82	71.72	66.17	72.33	66.80	7.14	7.33	6.68	6.65	6.68	6.67	7.11	6.52	6.99	6.78	6.73	7.44
03/01/28	03/31/28	Mar 2028	66.13	58.60	60.29	58.39	67.16	57.61	64.79	62.37	63.88	61.61	6.44	6.39	6.17	6.12	6.40	6.30	6.41	6.12	6.46	6.24	6.20	6.74
04/01/28	04/30/28	Apr 2028	61.44	58.45	62.30	59.24	60.21	56.24	65.21	63.23	65.60	62.21	6.39	6.39	6.09	6.03	6.29	6.27	5.99	5.84	6.35	6.15	6.11	6.27
05/01/28	05/31/28	May 2028	60.35	56.60	63.76	58.99	59.84	55.36	64.97	60.84	65.60	61.07	6.43	6.46	6.08	6.03	6.21	6.07	6.02	5.79	6.35	6.15	6.11	6.29
06/01/28	06/30/28	Jun 2028	61.38	57.88	68.01	60.59	59.92	53.96	66.28	62.39	67.33	62.14	6.54	6.56	6.13	6.04	6.26	6.10	6.00	5.82	6.36	6.16	6.12	6.28
07/01/28	07/31/28	Jul 2028	73.48	61.19	80.55	64.94	73.71	59.05	79.27	66.47	79.72	66.22	6.60	6.71	6.21	6.10	6.30	6.14	6.06	5.82	6.42	6.22	6.17	6.33
08/01/28	08/31/28	Aug 2028	78.96	62.50	81.53	64.92	77.59	59.81	82.03	67.24	82.11	66.90	6.63	6.92	6.24	6.13	6.38	6.17	6.05	5.86	6.45	6.25	6.21	6.32
09/01/28	09/30/28	Sep 2028	71.48	61.53	71.05	62.62	70.54	58.55	75.02	66.33	74.64	65.62	6.58	6.85	6.26	6.17	6.43	6.22	6.09	5.89	6.49	6.29	6.24	6.36
10/01/28	10/31/28	Oct 2028	66.64	60.60	65.83	61.78	63.38	58.18	70.16	64.26	69.38	64.08	6.61	6.82	6.38	6.29	6.54	6.51	6.17	6.02	6.61	6.41	6.37	6.45
11/01/28	11/30/28	Nov 2028	81.72	68.13	70.48	65.28	80.55	70.64	75.25	69.54	74.22	68.78	7.12	7.35	6.95	6.96	7.38	7.36	7.69	6.91	7.30	7.08	7.04	8.01
12/01/28	12/31/28	Dec 2028	82.16	70.72	70.22	67.53	80.51	73.31	76.34	71.87	75.18	71.01	7.49	7.71	7.27	7.30	7.53	7.66	8.21	7.30	7.65	7.43	7.38	8.54
01/01/29	01/31/29	Jan 2029	79.82	65.78	71.79	67.46	80.41	65.97	75.07	70.74	74.33	70.35	7.48	7.73	7.21	7.09	7.25	7.36	7.70	6.90	7.44	7.22	7.17	8.04
02/01/29	02/28/29	Feb 2029	71.58	64.79	72.50	66.98	70.34	62.73	74.05	69.12	74.51	69.67	7.43	7.62	7.02	6.93	7.09	7.25	7.46	6.94	7.27	7.05	7.01	7.79
03/01/29	03/31/29	Mar 2029	67.64	60.83	62.48	61.66	68.72	60.06	67.18	63.97	66.24	63.92	6.74	6.69	6.49	6.42	6.63	6.62	6.82	6.49	6.76	6.55	6.50	7.14
04/01/29	04/30/29	Apr 2029	63.32	60.49	64.42	61.23	61.82	58.63	66.84	65.04	67.26	64.16	6.68	6.68	6.42	6.35	6.53	6.41	6.30	6.14	6.66	6.46	6.42	6.58
05/01/29	05/31/29	May 2029	62.89	60.22	66.73	61.52	62.85	57.96	67.29	63.05	68.38	63.12	6.72	6.74	6.41	6.35	6.52	6.37	6.36	6.10	6.67	6.47	6.43	6.63
06/01/29	06/30/29	Jun 2029	63.57	60.63	70.00	63.30	62.00	56.66	68.56	65.13	69.25	64.55	6.83	6.85	6.41	6.34	6.56	6.40	6.31	6.13	6.66	6.46	6.42	6.58
07/01/29	07/31/29	Jul 2029	77.21	64.12	83.86	67.72	77.25	62.09	82.48	68.89	82.83	68.60	6.91	7.02	6.50	6.43	6.68	6.49	6.43	6.16	6.76	6.56	6.51	6.70
08/01/29	08/31/29	Aug 2029	81.25	65.50	85.10	68.06	80.47	63.03	84.81	70.19	85.05	69.76	6.97	7.28	6.63	6.49	6.72	6.53	6.42	6.19	6.82	6.62	6.57	6.69
09/01/29	09/30/29	Sep 2029	75.69	64.82	75.02	66.31	74.44	62.18	78.80	69.66	78.66	69.05	6.93	7.29	6.63	6.53	6.78	6.59	6.46	6.23	6.85	6.65	6.61	6.73
10/01/29	10/31/29	Oct 2029	68.60	63.20	67.66	64.34	65.16	59.90	72.40	68.20	71.46	67.20	6.96	7.24	6.71	6.58	6.88	6.68	6.52	6.33	6.91	6.71	6.66	6.80
11/01/29	11/30/29	Nov 2029	82.04	68.81	71.04	67.04	80.44	71.19	75.91	68.89	74.73	69.09	7.25	7.52	7.01	6.98	7.37	7.37	7.59	6.85	7.32	7.10	7.06	7.91
12/01/29	12/31/29	Dec 2029	83.39	71.55	71.52	68.93	82.00	74.19	77.47	71.91	76.43	71.66	7.61	7.81	7.34	7.31	7.57	7.68	8.19	7.23	7.66	7.44	7.40	8.53
01/01/30	01/31/30	Jan 2030	85.42	70.48	76.22	71.50	85.75	71.21	78.92	74.98	78.27	74.17	7.99	8.23	7.76	7.66	7.84	8.00	8.69	7.62	8.01	7.79	7.74	9.03
02/01/30	02/28/30	Feb 2030	74.98	68.15	76.38	70.58	74.89	66.17	77.78	72.57	78.28	72.75	7.92	8.10	7.50	7.44	7.50	7.67	7.93	7.38	7.78	7.57	7.52	8.26
03/01/30	03/31/30	Mar 2030	70.62	63.14	64.36	62.52	71.13	62.45	69.03	66.40	68.04	65.73	6.92	6.86	6.65	6.63	6.88	6.83	7.11	6.73	6.97	6.75	6.71	7.43
04/01/30	04/30/30	Apr 2030	65.53	61.98	66.67	63.24	63.85	60.35	69.05	66.56	69.37	65.70	6.87	6.83	6.60	6.52	6.71	6.70	6.38	6.26	6.84	6.64	6.60	6.66
05/01/30	05/31/30	May 2030	64.31	60.41	68.47	63.22	63.82	58.91	68.63	64.72	69.51	64.99	6.90	6.90	6.50	6.45	6.65	6.46	6.39	6.18	6.77	6.57	6.53	6.66
06/01/30	06/30/30	Jun 2030	64.59	61.64	72.20	65.34	63.45	58.32	69.54	66.30	70.56	66.06	7.03	7.02	6.57	6.49	6.69	6.50	6.36	6.21	6.81	6.61	6.56	6.63
07/01/30	07/31/30	Jul 2030	79.62	65.60	87.14	70.66	79.57	64.44	85.24	70.80	85.86	71.20	7.11	7.37	6.69	6.57	6.76	6.54	6.47	6.25	6.90	6.70	6.65	6.74
08/01/30	08/31/30	Aug 2030	82.04	66.66	87.41	70.12	81.48	64.18	86.38	71.90	86.73	71.51	7.16	7.46	6.72	6.63	6.87	6.62	6.47	6.28	6.96	6.76	6.71	6.73
09/01/30	09/30/30	Sep 2030	75.97	66.35	76.45	67.87	74.82	63.17	79.81	71.01	79.79	70.37	7.12	7.45	6.76	6.68	6.92	6.67	6.50	6.32	7.00	6.80	6.76	6.78
10/01/30	10/31/30	Oct 2030	70.27	65.01	69.26	66.32	66.55	62.33	73.62	69.58	72.74	68.58	7.16	7.43	6.91	6.81	7.03	6.96	6.62	6.46	7.13	6.93	6.89	6.89
11/01/30	11/30/30	Nov 2030	86.12	73.29	75.14	70.33	83.84	75.70	79.89	74.38	78.76	73.64	7.64	7.98	7.44	7.43	7.94	7.91	8.17	7.44	7.77	7.56	7.52	8.50
12/01/30	12/31/30	Dec 2030	87.78	75.22	75.22	72.40	85.95	78.37	81.41	75.97	80.37	75.54	8.08	8.27	7.84	7.83	8.15	8.27	8.85	7.86	8.18	7.96	7.92	9.18
01/01/31	01/31/31	Jan 2031	86.41	72.12	78.09	73.16	86.97	72.93	80.59	76.52	79.77	75.66	8.15	8.40	7.92	7.81	7.99	8.16	8.87	7.77	8.16	7.94	7.89	9.21
02/01/31	02/28/31	Feb 2031	76.10	69.83	77.58	72.39	74.43	68.56	78.42	74.17	78.93	73.67	8.08	8.26	7.65	7.59	7.65	7.82	8.09	7.53	7.93	7.72	7.67	8.42
03/01/31	03/31/31	Mar 2031	71.26	64.68	65.78	64.33	70.39	63.46	70.68	68.74	69.67	67.80	7.06	6.99	6.79	6.76	7.02	6.96	7.25	6.87	7.10	6.89	6.84	7.57
04/01/31	04/30/31	Apr 2031	66.95	63.72	68.26	64.36	65.90	61.18	70.44	68.11	71.01	67.25	7.01	6.97	6.74	6.65	6.84	6.83	6.51	6.38	6.97	6.77	6.73	6.79
05/01/31	05/31/31	May 2031	65.87	62.99	70.23	64.63	65.30	61.01	70.30	65.71	71.25	65.92	7.04	7.04	6.63	6.58	6.79	6.59	6.52	6.30	6.90	6.70	6.66	6.79

06/01/31	06/30/31	Jun 2031	66.35	63.01	73.82	66.59	65.57	59.42	71.51	68.07	72.42	67.75	7.17	7.16	6.70	6.62	6.83	6.63	6.49	6.34	6.94	6.74	6.69	6.76
07/01/31	07/31/31	Jul 2031	80.91	66.85	88.24	71.56	81.20	65.14	86.64	72.22	87.30	72.53	7.25	7.52	6.82	6.71	6.90	6.67	6.60	6.37	7.03	6.83	6.78	6.87
08/01/31	08/31/31	Aug 2031	83.38	67.41	88.85	71.37	83.02	65.12	88.11	73.54	88.40	73.10	7.31	7.61	6.85	6.77	7.01	6.75	6.59	6.41	7.09	6.89	6.85	6.86
09/01/31	09/30/31	Sep 2031	76.78	67.29	77.37	68.94	75.54	64.23	80.84	72.50	80.78	71.80	7.26	7.60	6.90	6.81	7.06	6.80	6.63	6.45	7.13	6.93	6.89	6.91
10/01/31	10/31/31	Oct 2031	71.87	66.50	70.65	67.68	68.38	63.89	75.09	71.33	74.32	70.32	7.31	7.58	7.05	6.94	7.17	7.10	6.75	6.59	7.27	7.06	7.02	7.03
11/01/31	11/30/31	Nov 2031	87.55	75.00	76.32	71.67	85.08	76.52	81.49	75.81	80.42	75.03	7.79	8.14	7.59	7.58	8.09	8.06	8.34	7.59	7.92	7.71	7.66	8.66
12/01/31	12/31/31	Dec 2031	89.31	76.73	76.48	73.74	86.68	79.83	82.68	77.66	81.69	76.77	8.24	8.43	8.00	7.99	8.31	8.43	9.02	8.02	8.34	8.12	8.07	9.36
01/01/32	01/31/32	Jan 2032	86.32	73.88	78.99	74.37	87.80	73.94	82.20	78.17	81.35	77.22	8.31	8.56	8.08	7.97	8.15	8.33	9.04	7.93	8.31	8.10	8.05	9.38
02/01/32	02/29/32	Feb 2032	77.64	70.94	78.84	73.11	75.59	68.95	80.19	75.66	80.68	75.04	8.24	8.43	7.81	7.74	7.80	7.98	8.25	7.68	8.08	7.87	7.82	8.58
03/01/32	03/31/32	Mar 2032	73.31	66.24	67.07	65.20	71.24	64.58	72.04	69.66	71.03	68.69	7.20	7.13	6.92	6.89	7.16	7.10	7.39	7.00	7.23	7.02	6.97	7.72
04/01/32	04/30/32	Apr 2032	66.82	65.29	69.20	65.56	66.20	62.18	70.87	69.28	71.36	68.27	7.15	7.11	6.87	6.78	6.98	6.97	6.64	6.51	7.10	6.90	6.86	6.92
05/01/32	05/31/32	May 2032	66.14	63.65	71.31	66.32	65.28	61.09	71.32	67.40	72.02	67.51	7.18	7.18	6.76	6.71	6.92	6.72	6.65	6.43	7.03	6.83	6.79	6.92
06/01/32	06/30/32	Jun 2032	67.64	64.45	75.60	68.20	66.79	61.82	72.75	68.37	73.74	68.57	7.32	7.31	6.84	6.75	6.96	6.76	6.62	6.46	7.07	6.87	6.83	6.89
07/01/32	07/31/32	Jul 2032	82.11	67.98	90.23	73.23	82.49	66.85	88.07	73.80	88.74	74.08	7.40	7.67	6.96	6.84	7.03	6.80	6.73	6.50	7.16	6.96	6.92	7.00
08/01/32	08/31/32	Aug 2032	85.82	69.05	91.35	72.88	85.32	67.28	90.40	74.81	90.50	74.52	7.45	7.76	6.99	6.90	7.15	6.89	6.73	6.54	7.22	7.02	6.98	7.00
09/01/32	09/30/32	Sep 2032	79.41	68.92	79.56	70.65	77.04	65.63	82.98	74.06	82.93	73.41	7.41	7.75	7.03	6.95	7.20	6.94	6.77	6.58	7.27	7.07	7.03	7.04
10/01/32	10/31/32	Oct 2032	73.85	68.13	73.03	69.14	69.82	65.16	77.39	72.95	76.71	71.98	7.45	7.73	7.19	7.08	7.31	7.24	6.88	6.72	7.40	7.20	7.16	7.16
11/01/32	11/30/32	Nov 2032	89.03	76.47	77.75	73.40	86.43	78.51	82.59	77.29	81.56	76.48	7.95	8.30	7.74	7.73	8.26	8.23	8.50	7.74	8.07	7.86	7.82	8.83
12/01/32	12/31/32	Dec 2032	91.19	78.48	78.22	75.52	88.57	81.48	84.58	79.16	83.51	78.46	8.41	8.60	8.16	8.15	8.48	8.60	9.20	8.18	8.50	8.28	8.23	9.54
01/01/33	01/31/33	Jan 2033	89.01	75.78	80.53	75.68	90.38	75.50	84.13	79.84	83.20	78.90	8.48	8.74	8.24	8.13	8.32	8.49	9.23	8.08	8.47	8.26	8.21	9.56
02/01/33	02/28/33	Feb 2033	79.96	72.80	81.23	74.93	78.00	70.49	82.65	77.80	83.03	77.34	8.41	8.60	7.96	7.89	7.96	8.14	8.41	7.83	8.24	8.02	7.98	8.74
03/01/33	03/31/33	Mar 2033	75.45	67.88	68.94	66.89	73.62	66.37	73.86	71.26	72.86	70.26	7.34	7.27	7.06	7.03	7.30	7.24	7.54	7.14	7.37	7.16	7.11	7.87
04/01/33	04/30/33	Apr 2033	68.61	66.69	71.09	67.46	68.07	64.06	72.98	70.93	73.45	69.93	7.29	7.25	7.01	6.92	7.12	7.11	6.77	6.64	7.24	7.04	6.99	7.05
05/01/33	05/31/33	May 2033	68.92	66.23	73.28	67.92	68.80	63.88	72.95	68.77	74.01	69.00	7.32	7.32	6.89	6.84	7.06	6.86	6.78	6.55	7.16	6.96	6.92	7.05
06/01/33	06/30/33	Jun 2033	69.91	66.18	77.92	69.65	69.71	62.59	74.95	71.07	75.78	70.62	7.46	7.45	6.98	6.88	7.10	6.90	6.75	6.59	7.20	7.00	6.96	7.02
07/01/33	07/31/33	Jul 2033	84.55	69.63	92.57	74.95	84.83	68.44	90.58	76.14	91.20	76.03	7.55	7.82	7.10	6.98	7.18	6.94	6.87	6.63	7.30	7.10	7.06	7.14
08/01/33	08/31/33	Aug 2033	88.15	70.15	92.95	74.32	87.47	68.40	92.53	76.63	92.51	76.16	7.60	7.91	7.13	7.04	7.29	7.02	6.86	6.67	7.36	7.16	7.12	7.13
09/01/33	09/30/33	Sep 2033	80.95	70.55	80.63	72.27	78.70	67.24	84.28	75.55	84.06	74.91	7.56	7.90	7.17	7.09	7.34	7.08	6.90	6.71	7.41	7.21	7.16	7.18
10/01/33	10/31/33	Oct 2033	75.82	69.69	74.45	70.80	72.16	67.04	78.72	74.27	78.02	73.27	7.60	7.88	7.34	7.22	7.46	7.39	7.02	6.85	7.55	7.35	7.30	7.30
11/01/33	11/30/33	Nov 2033	90.90	78.63	79.42	74.90	88.09	80.83	84.34	78.97	83.35	78.01	8.11	8.47	7.89	7.89	8.42	8.39	8.67	7.90	8.23	8.02	7.97	9.00
12/01/33	12/31/33	Dec 2033	92.68	80.82	79.85	77.23	90.26	83.52	86.27	81.10	85.24	80.32	8.58	8.77	8.32	8.31	8.65	8.78	9.39	8.34	8.66	8.44	8.39	9.72
01/01/34	01/31/34	Jan 2034	91.77	77.55	82.20	77.69	91.92	77.48	86.16	81.80	85.17	80.85	8.65	8.91	8.40	8.29	8.48	8.66	9.41	8.25	8.64	8.42	8.37	9.75
02/01/34	02/28/34	Feb 2034	81.53	74.72	82.35	76.49	80.26	72.02	83.96	79.46	84.41	78.75	8.58	8.77	8.12	8.05	8.12	8.30	8.58	7.99	8.39	8.18	8.13	8.91
03/01/34	03/31/34	Mar 2034	77.42	69.65	70.67	68.90	75.43	68.17	75.47	73.00	74.48	71.99	7.49	7.42	7.20	7.17	7.45	7.39	7.69	7.29	7.51	7.30	7.25	8.02
04/01/34	04/30/34	Apr 2034	70.10	68.40	72.77	69.18	69.76	65.27	74.50	73.22	75.04	72.22	7.44	7.40	7.15	7.05	7.26	7.25	6.91	6.77	7.37	7.17	7.13	7.19
05/01/34	05/31/34	May 2034	69.62	66.97	74.74	69.76	68.65	64.30	74.21	69.84	75.16	70.12	7.47	7.47	7.03	6.98	7.20	7.00	6.92	6.69	7.30	7.10	7.06	7.19
06/01/34	06/30/34	Jun 2034	70.32	67.28	78.98	71.25	70.60	65.52	75.09	70.97	76.46	71.26	7.61	7.60	7.12	7.02	7.24	7.03	6.88	6.73	7.34	7.14	7.10	7.16
07/01/34	07/31/34	Jul 2034	86.02	71.12	94.01	76.44	86.44	70.06	91.85	77.50	92.53	77.53	7.70	7.98	7.24	7.12	7.32	7.07	7.01	6.76	7.44	7.24	7.19	7.28
08/01/34	08/31/34	Aug 2034	90.13	72.72	94.48	75.77	89.35	70.49	94.13	78.17	94.21	77.89	7.76	8.07	7.27	7.18	7.44	7.16	7.00	6.80	7.50	7.30	7.26	7.27
09/01/34	09/30/34	Sep 2034	82.57	72.26	82.61	73.95	78.86	69.51	86.01	77.09	85.81	76.51	7.71	8.06	7.32	7.23	7.49	7.22	7.04	6.84	7.55	7.35	7.31	7.31
10/01/34	10/31/34	Oct 2034	77.37	71.46	75.66	72.25	73.59	68.78	80.09	75.83	79.32	74.85	7.75	8.04	7.48	7.37	7.61	7.54	7.16	6.99	7.69	7.49	7.45	7.44
11/01/34	11/30/34	Nov 2034	92.62	79.98	81.07	76.26	89.76	82.18	86.24	80.45	85.22	79.47	8.27	8.64	8.05	8.05	8.59	8.56	8.85	8.05	8.39	8.17	8.13	9.17
12/01/34	12/31/34	Dec 2034	94.20	82.55	81.61	78.53	92.21	85.52	88.09	82.46	87.11	81.64	8.75	8.95	8.49	8.48	8.82	8.95	9.58	8.51	8.82	8.61	8.56	9.91
01/01/35	01/31/35	Jan 2035	92.39	79.44	84.50	79.00	93.61	79.03	87.36	83.01	86.65	82.06	8.82	9.09	8.57	8.45	8.65	8.84	9.60	8.41	8.80	8.59	8.54	9.94
02/01/35	02/28/35	Feb 2035	83.85	76.62	85.02	78.18	83.04	73.89	85.94	81.17	86.53	80.52	8.75	8.94	8.28	8.21	8.28	8.46	8.75	8.15	8.55	8.34	8.29	9.08
03/01/35	03/31/35	Mar 2035	78.85	71.46	72.19	70.33	76.51	70.00	77.07	74.43	76.08	73.43	7.64	7.57	7.35	7.32	7.60	7.54	7.85	7.43	7.66	7.44	7.40	8.17
04/01/35	04/30/35	Apr 2035	72.52	70.29	74.41	70.89	70.99	66.80	75.61	74.02	76.11	73.01	7.58	7.55	7.29	7.20	7.41	7.40	7.05	6.91	7.51	7.31	7.27	7.33
05/01/35	05/31/35	May 2035	70.86	68.42	76.87	71.50	70.86	66.41	75.85	71.37	76.88	71.69	7.62	7.62	7.17	7.12	7.35	7.13	7.06	6.82	7.44	7.24	7.20	7.33
06/01/35	06/30/35	Jun 2035	71.83	69.08	80.87	72.95	72.13	66.70	76.89	73.34	78.20	73.33	7.76	7.75	7.26	7.16	7.39	7.17	7.02	6.86	7.48	7.28	7.24	7.29
07/01/35	07/31/35	Jul 2035	87.76	72.06	95.81	77.81	87.99	69.79	93.45	79.53	94.19	79.27	7.85	8.14	7.39	7.26	7.47	7.22	7.15	6.90	7.58	7.38	7.34	7.42
08/01/35	08/31/35	Aug 2035	90.95	74.08	96.62	77.37	90.29	71.73	95.90	79.51	95.99	79.41	7.91	8.23	7.42	7.32	7.59	7.31	7.14	6.94	7.65	7.45	7.40	7.41
09/01/35	09/30/35	Sep 2035	84.90	74.02	84.38	75.75	80.12	71.24	88.01	78.81	87.83	78.44	7.86	8.22	7.46	7.37	7.64	7.36	7.18	6.98	7.69	7.49	7.45	7.45
10/01/35	10/31/35	Oct 2035	78.73	73.09	77.49	73.68	75.22	70.25	81.76	77.18	81.04	76.28	7.91	8.20	7.63	7.51	7.76	7.69	7.31	7.13	7.84	7.64	7.59	7.58
11/01/35	11/30/35	Nov 2035	93.81	81.29	81.92	77.48	91.43	83.12	87.15	81.66	86.11	80.64	8.43	8.81	8.21	8.21	8.76	8.73	9.02	8.21	8.55	8.33	8.29	9.35
12/01/35	12/31/35	Dec 2035	95.95	84.33	83.35	79.91	93.43	87.01	89.88	83.97	88.79	83.01	8.92	9.13	8.66	8.65	9.00	9.13	9.77	8.68	8.99	8.78	8.73	10.10
01/01/36	01/31/36	Jan 2036	93.40	81.60	85.39	80.81	95.12	80.40	89.36	84.89	88.52	83.91	9.01	9.28	8.75	8.63	8.83	9.02	9.80	8.59	8.98	8.76	8.71	10.14
02/01/36	02/29/36	Feb 2036	83.18	78.72	86.66	80.17	82.74	75.98	87.74	83.15	88.39	82.45	8.93	9.13	8.46	8.39	8.46	8.64	8.94	8.32	8.73	8.51	8.47	9.27
03/01/36	03/31/36	Mar 2036	80.32	73.33	74.47	72.07	78.82	71.96	78.91	76.17	78.07	75.18	7.80	7.73	7.50	7.47	7.76	7.69	8.01	7.59	7.81	7.60	7.55	8.34
04/01/36	04/30/36	Apr 2036	74.56	71.70	77.55	73.07	73.26	68.23	78.15	75.83	78.72	75.09	7.74	7.70	7.44	7.35	7.56	7.55	7.20	7.05	7.67	7.47	7.42	7.47
05/01/36	05/31/36	May 2036	72.46	70.31	79.09	73.43	72.00	67.18	77.70	73.68	78.94	74.04	7.78	7.78	7.32	7.27	7.50	7.28	7.20	6.96	7.59	7.39	7.35	7.48
06/01/36	06/30/36	Jun 2036	73.87	69.72	83.39	75.34	74.36	69.57	78.84	74.50	80.39	74.97	7.93	7.92	7.41	7.31	7.54	7.33	7.17	7.00	7.63	7.43	7.39	7.44
07/01/36	07/31/36	Jul 2036	90.61	73.91	99.24	80.11	90.83	72.12	96.26	81.60	97.00	81.23	8.02	8.31	7.54	7.41	7.62	7.37	7.30	7.04	7.73	7.53	7.49	7.57
08/01/36	08/31/36	Aug 2036	93.04	75.61	99.84	79.97	92.65	73.22	98.36	82.38	98.58	81.97	8.08	8.41	7.58	7.48	7.75	7.46	7.29	7.08	7.80	7.60	7.56	7.56
09/01/36	09/30/36	Sep 2036	87.34	75.63	86.81	77.58	82.80	72.78	90.10	80.42	89.92	79.91	8.03	8.40	7.62	7.53	7.80	7.52	7.33	7.13	7.85	7.65	7.61	7.60
10/01/36	10/31/36	Oct 2036	81.51	74.93	79.13	75.76	78.01	72.19	83.43	78.64	82.67	77.67	8.07	8.37	7.79	7.67	7.92	7.85	7.46	7.28	8.00	7.79	7.75	7.74
11/01/36	11/30/36	Nov 2036	95.46	84.12	84.71	79.80	92.68	86.04	89.62	83.85	88.56	82.88	8.61	8.99	8.38	8.38	8.94	8.91	9.21	8.39	8.72	8.51	8.46	9.54
12/01/36	12/31/36	Dec 2036	98.70	86.16	85.81	82.35	96.06	89.27	92.25	86.25	91.12	85.29	9.11	9.32	8.84	8.83	9.19	9.32	9.97	8.86	9.18	8.96	8.91	10.31
01/01/37	01/31/37	Jan 2037	96.73	83.73	88.11	82.99	98.24	83.71	91.94	87.00	91.12	86.03	9.20	9.47	8.94	8.81	9.02	9.21	10.01	8.77	9.16	8.95	8.90	10.34
02/01/37	02/28/37	Feb 2037	87.67	80.67	89.07	82.29	87.07	79.39	90.13	85.27	90.69	84.54	9.12	9.32	8.64	8.56	8.63	8.82	9.12	8.49	8.90	8.69	8.64	9.45
03/01/37	03/31/37	Mar 2037	83.43	75.22	76.48	74.24	82.48	73.83	81.39	78.34	80.37	77.33	7.97	7.89	7.66	7.63	7.92	7.86	8.18	7.75	7.97	7.75	7.71	8.51
04/01/37	04/30/37	Apr 2037	75.01	73.47	79.17	74.61	75.06	69.74	80.11	77.87	80.68	77.17	7.91	7.87	7.60	7.50	7.72	7.71	7.35	7.20	7.82	7.62	7.58	7.63
05/01/37	05/31/37	May 2037	74.31	70.83	81.20	75.61	73.79	68.10	79.57	75.13	80.57	75.07	7.94	7.94	7.48	7.42	7.66	7.44	7.35	7.11	7.74	7.54	7.50	7.63
06/01/37	06/30/37	Jun 2037	75.58	71.30	84.99	77.24	75.82	70.58	80.68	75.77	81.83	76.20	8.09	8.08	7.57	7.47	7.70	7.48	7.32	7.15	7.79	7.59	7.54	7.59

07/01/37	07/31/37	Jul 2037	92.25	75.46	100.16	81.63	92.22	73.13	97.54	82.51	98.28	82.16	8.19	8.49	7.70	7.57	7.78	7.52	7.45	7.19	7.89	7.69	7.65	7.72
08/01/37	08/31/37	Aug 2037	94.26	77.22	101.15	81.67	94.31	74.65	99.73	83.62	100.04	83.24	8.25	8.58	7.73	7.64	7.91	7.62	7.44	7.23	7.96	7.76	7.71	7.71
09/01/37	09/30/37	Sep 2037	86.98	77.24	88.27	79.20	86.14	73.81	90.79	81.56	90.98	80.83	8.20	8.57	7.78	7.69	7.97	7.68	7.49	7.28	8.01	7.81	7.76	7.76
10/01/37	10/31/37	Oct 2037	82.93	76.67	81.29	77.84	79.87	73.49	85.45	79.96	84.69	79.03	8.24	8.55	7.96	7.83	8.09	8.01	7.62	7.43	8.16	7.96	7.91	7.89
11/01/37	11/30/37	Nov 2037	98.34	86.07	86.24	81.37	95.32	86.37	91.69	85.59	90.66	84.58	8.79	9.18	8.56	8.56	9.13	9.10	9.41	8.56	8.90	8.68	8.64	9.73
12/01/37	12/31/37	Dec 2037	100.62	88.30	87.65	83.88	97.53	90.50	93.99	87.86	92.83	86.86	9.30	9.51	9.02	9.02	9.38	9.52	10.18	9.05	9.36	9.15	9.10	10.52
01/01/38	01/31/38	Jan 2038	101.16	86.14	90.86	84.78	101.29	86.27	94.31	88.58	93.33	87.57	9.39	9.67	9.12	9.00	9.21	9.40	10.22	8.95	9.35	9.13	9.08	10.55
02/01/38	02/28/38	Feb 2038	90.25	82.72	90.94	84.07	93.36	82.08	91.61	86.92	92.18	86.04	9.31	9.52	8.82	8.74	8.81	9.01	9.32	8.67	9.08	8.87	8.82	9.65
03/01/38	03/31/38	Mar 2038	82.86	77.11	78.27	75.77	85.80	76.24	83.02	79.43	82.02	78.39	8.13	8.06	7.82	7.79	8.09	8.02	8.35	7.91	8.13	7.91	7.87	8.68
04/01/38	04/30/38	Apr 2038	75.96	74.19	81.83	76.72	75.60	70.49	80.75	77.81	81.27	77.16	8.07	8.03	7.76	7.66	7.88	7.87	7.50	7.35	7.98	7.78	7.74	7.78
05/01/38	05/31/38	May 2038	75.33	72.74	83.61	77.70	74.26	68.97	81.27	76.64	82.22	76.49	8.11	8.11	7.64	7.58	7.82	7.59	7.51	7.26	7.90	7.70	7.66	7.78
06/01/38	06/30/38	Jun 2038	77.80	72.99	87.81	79.20	77.04	71.85	82.87	77.51	83.91	77.91	8.26	8.25	7.72	7.62	7.86	7.64	7.47	7.30	7.94	7.74	7.70	7.74
07/01/38	07/31/38	Jul 2038	94.67	77.73	103.11	84.18	94.60	75.98	99.88	84.65	100.53	84.32	8.36	8.66	7.86	7.73	7.95	7.68	7.61	7.34	8.05	7.85	7.80	7.88
08/01/38	08/31/38	Aug 2038	99.13	79.23	104.83	83.88	98.48	77.89	103.40	85.43	103.53	85.06	8.42	8.76	7.90	7.80	8.08	7.78	7.60	7.38	8.12	7.92	7.87	7.87
09/01/38	09/30/38	Sep 2038	91.56	79.05	91.24	81.47	89.83	76.93	94.46	84.05	94.25	83.32	8.37	8.75	7.95	7.85	8.13	7.84	7.64	7.43	8.17	7.97	7.93	7.92
10/01/38	10/31/38	Oct 2038	88.75	78.89	83.92	80.05	86.21	76.45	87.94	81.98	87.14	81.04	8.42	8.73	8.12	8.00	8.26	8.18	7.78	7.59	8.32	8.12	8.08	8.05
11/01/38	11/30/38	Nov 2038	100.12	88.19	88.46	83.17	98.56	89.86	93.45	87.35	92.40	86.32	8.98	9.38	8.74	8.74	9.32	9.29	9.60	8.74	9.08	8.86	8.82	9.93
12/01/38	12/31/38	Dec 2038	102.70	90.39	90.34	85.79	100.13	93.26	96.03	89.80	94.89	88.77	9.50	9.71	9.21	9.20	9.58	9.72	10.40	9.24	9.55	9.33	9.29	10.73
01/01/39	01/31/39	Jan 2039	102.31	88.62	92.56	86.63	101.96	88.37	95.95	90.31	95.07	89.32	9.59	9.88	9.32	9.19	9.40	9.60	10.43	9.14	9.54	9.32	9.27	10.77
02/01/39	02/28/39	Feb 2039	91.32	84.85	93.79	85.92	93.16	82.90	93.85	88.77	94.43	87.91	9.51	9.72	9.00	8.93	9.00	9.20	9.51	8.85	9.27	9.05	9.01	9.84
03/01/39	03/31/39	Mar 2039	84.66	79.17	80.51	77.51	86.75	78.18	85.00	81.30	84.12	80.26	8.30	8.22	7.98	7.95	8.26	8.19	8.53	8.08	8.29	8.08	8.03	8.85
04/01/39	04/30/39	Apr 2039	78.31	76.45	83.58	78.86	77.93	72.41	83.11	80.09	83.65	79.20	8.24	8.20	7.92	7.82	8.05	8.04	7.66	7.51	8.14	7.94	7.90	7.94
05/01/39	05/31/39	May 2039	78.52	74.66	85.67	79.62	77.80	72.42	84.18	78.87	85.09	79.30	8.28	8.28	7.80	7.74	7.98	7.75	7.67	7.41	8.06	7.86	7.82	7.94
06/01/39	06/30/39	Jun 2039	80.52	75.87	90.31	81.45	81.00	74.19	85.66	80.21	86.74	80.16	8.44	8.43	7.89	7.78	8.03	7.80	7.63	7.45	8.10	7.90	7.86	7.90
07/01/39	07/31/39	Jul 2039	97.01	79.82	106.09	86.62	97.54	78.10	102.63	86.79	103.29	86.53	8.53	8.85	8.03	7.89	8.11	7.84	7.76	7.50	8.21	8.01	7.97	8.04
08/01/39	08/31/39	Aug 2039	102.27	82.07	107.21	85.89	102.09	80.23	106.22	87.06	106.23	86.83	8.60	8.95	8.06	7.96	8.25	7.94	7.76	7.54	8.28	8.08	8.04	8.03
09/01/39	09/30/39	Sep 2039	93.11	80.72	92.90	83.58	91.27	79.21	95.71	85.70	95.61	85.01	8.54	8.94	8.11	8.01	8.30	8.00	7.80	7.59	8.33	8.13	8.09	8.08
10/01/39	10/31/39	Oct 2039	88.56	80.62	85.52	82.16	86.44	78.17	89.40	83.41	88.57	82.45	8.59	8.91	8.30	8.17	8.43	8.35	7.94	7.75	8.49	8.29	8.25	8.22
11/01/39	11/30/39	Nov 2039	102.43	90.20	90.59	85.13	100.58	92.04	95.53	89.40	94.47	88.31	9.16	9.57	8.92	8.92	9.52	9.49	9.81	8.93	9.26	9.05	9.00	10.13
12/01/39	12/31/39	Dec 2039	104.57	92.80	91.99	87.95	102.10	96.03	97.98	91.80	96.77	90.81	9.70	9.92	9.41	9.40	9.78	9.92	10.61	9.43	9.74	9.53	9.48	10.95
01/01/40	01/31/40	Jan 2040	105.76	90.73	95.29	88.72	102.98	90.94	98.92	92.53	97.88	91.52	9.79	10.08	9.51	9.38	9.60	9.80	10.65	9.33	9.73	9.51	9.46	10.99
02/01/40	02/29/40	Feb 2040	93.98	87.11	95.93	87.69	96.51	85.98	95.84	90.69	96.33	89.75	9.71	9.92	9.19	9.11	9.19	9.39	9.71	9.04	9.45	9.24	9.19	10.04
03/01/40	03/31/40	Mar 2040	86.91	81.40	82.59	79.83	87.86	80.13	87.18	83.93	86.32	82.95	8.48	8.40	8.15	8.12	8.43	8.36	8.71	8.24	8.46	8.24	8.20	9.03
04/01/40	04/30/40	Apr 2040	80.43	77.83	85.05	80.62	80.57	75.67	85.18	81.69	85.89	81.84	8.42	8.37	8.09	7.98	8.22	8.21	7.82	7.67	8.30	8.10	8.06	8.10
05/01/40	05/31/40	May 2040	79.63	75.75	87.87	81.62	77.87	72.18	85.69	80.55	86.47	80.11	8.45	8.45	7.96	7.90	8.15	7.92	7.83	7.57	8.22	8.02	7.98	8.10
06/01/40	06/30/40	Jun 2040	81.56	76.86	92.34	83.61	81.18	75.76	86.75	81.55	88.07	81.92	8.61	8.60	8.05	7.95	8.20	7.96	7.79	7.61	8.27	8.07	8.02	8.06
07/01/40	07/31/40	Jul 2040	100.38	81.79	108.58	88.88	100.43	80.38	105.39	88.90	106.03	88.67	8.71	9.03	8.19	8.05	8.28	8.01	7.93	7.65	8.37	8.17	8.13	8.20
08/01/40	08/31/40	Aug 2040	105.05	84.06	109.82	88.19	104.65	82.43	108.75	89.62	108.76	89.23	8.78	9.13	8.23	8.13	8.42	8.11	7.92	7.70	8.45	8.25	8.20	8.19
09/01/40	09/30/40	Sep 2040	95.16	83.26	95.19	86.13	93.52	81.90	98.41	87.90	98.17	87.25	8.72	9.12	8.28	8.18	8.48	8.17	7.97	7.75	8.50	8.30	8.26	8.24
10/01/40	10/31/40	Oct 2040	92.19	82.64	87.71	84.40	90.17	80.28	91.59	85.86	90.73	84.96	8.77	9.10	8.47	8.34	8.61	8.53	8.11	7.91	8.66	8.46	8.42	8.38
11/01/40	11/30/40	Nov 2040	104.80	92.60	93.35	87.40	102.79	94.22	98.22	91.87	97.15	90.87	9.36	9.77	9.11	9.11	9.72	9.69	10.01	9.11	9.45	9.23	9.19	10.34
12/01/40	12/31/40	Dec 2040	106.68	95.27	94.38	89.95	104.55	98.39	100.43	94.06	99.28	93.06	9.90	10.13	9.60	9.60	9.98	10.13	10.84	9.63	9.94	9.73	9.68	11.17
01/01/41	01/31/41	Jan 2041	107.82	93.39	97.59	90.79	105.14	93.21	101.15	94.39	100.11	93.38	10.00	10.30	9.71	9.58	9.80	10.01	10.87	9.53	9.93	9.71	9.66	11.21
02/01/41	02/28/41	Feb 2041	96.00	89.38	98.42	90.38	98.02	87.71	98.32	93.01	98.78	92.07	9.91	10.13	9.39	9.30	9.38	9.59	9.92	9.23	9.65	9.43	9.39	10.25
03/01/41	03/31/41	Mar 2041	88.97	83.56	84.58	81.36	91.29	82.03	89.00	85.19	88.20	84.20	8.66	8.57	8.32	8.29	8.61	8.54	8.89	8.42	8.63	8.41	8.37	9.21
04/01/41	04/30/41	Apr 2041	82.43	79.88	88.51	83.84	82.19	76.80	87.09	83.72	87.73	83.30	8.59	8.55	8.26	8.15	8.39	8.38	7.98	7.83	8.47	8.27	8.23	8.26
05/01/41	05/31/41	May 2041	82.22	78.17	90.60	84.03	80.54	74.82	88.10	82.79	89.03	83.05	8.63	8.63	8.13	8.07	8.32	8.08	7.99	7.72	8.39	8.19	8.14	8.27
06/01/41	06/30/41	Jun 2041	83.52	78.90	93.65	85.71	83.11	77.32	88.61	83.69	89.78	83.74	8.79	8.78	8.22	8.11	8.37	8.13	7.96	7.77	8.43	8.23	8.19	8.23
07/01/41	07/31/41	Jul 2041	101.74	83.75	109.86	90.92	102.06	82.68	106.64	89.70	107.28	89.77	8.90	9.22	8.37	8.22	8.46	8.17	8.09	7.82	8.54	8.34	8.30	8.36
08/01/41	08/31/41	Aug 2041	105.12	85.46	110.98	90.49	105.31	83.48	109.81	91.45	110.11	90.97	8.96	9.33	8.41	8.30	8.60	8.28	8.09	7.86	8.62	8.42	8.38	8.36
09/01/41	09/30/41	Sep 2041	97.39	85.25	97.75	88.31	95.90	82.94	100.60	89.89	100.48	89.12	8.91	9.32	8.46	8.35	8.66	8.34	8.13	7.91	8.67	8.47	8.43	8.41
10/01/41	10/31/41	Oct 2041	93.16	84.23	89.68	86.48	92.59	81.60	93.40	87.73	92.48	86.72	8.96	9.29	8.65	8.51	8.79	8.71	8.28	8.08	8.84	8.64	8.59	8.55
11/01/41	11/30/41	Nov 2041	105.81	94.96	94.42	89.18	104.23	95.83	99.49	93.08	98.31	91.95	9.55	9.98	9.30	9.30	9.92	9.89	10.22	9.31	9.64	9.42	9.38	10.55
12/01/41	12/31/41	Dec 2041	109.24	97.29	96.56	91.99	106.57	99.44	102.44	96.01	101.20	95.00	10.11	10.34	9.81	9.80	10.19	10.34	11.06	9.83	10.14	9.93	9.88	11.40
01/01/42	01/31/42	Jan 2042	109.14	96.04	99.87	93.37	106.77	95.61	102.88	96.30	101.85	95.28	10.21	10.51	9.92	9.78	10.01	10.22	11.10	9.73	10.13	9.91	9.86	11.44
02/01/42	02/28/42	Feb 2042	98.32	91.72	99.18	93.11	99.50	89.46	99.65	94.74	100.04	93.77	10.12	10.35	9.58	9.50	9.58	9.79	10.12	9.42	9.84	9.63	9.58	10.45
03/01/42	03/31/42	Mar 2042	90.63	85.72	86.98	83.69	93.03	84.27	91.30	86.64	90.37	85.62	8.84	8.75	8.50	8.46	8.79	8.72	9.08	8.59	8.80	8.59	8.54	9.40
04/01/42	04/30/42	Apr 2042	84.27	81.85	89.32	84.18	83.97	78.32	89.00	85.24	89.53	84.39	8.77	8.73	8.43	8.32	8.57	8.56	8.15	7.99	8.64	8.44	8.40	8.43
05/01/42	05/31/42	May 2042	83.78	80.29	91.94	85.64	82.22	77.24	89.81	84.62	90.54	83.97	8.81	8.81	8.30	8.24	8.50	8.25	8.16	7.89	8.56	8.36	8.31	8.43
06/01/42	06/30/42	Jun 2042	86.07	80.81	96.88	88.19	85.26	79.10	91.13	85.67	92.43	85.90	8.98	8.97	8.39	8.28	8.54	8.30	8.12	7.93	8.60	8.40	8.36	8.39
07/01/42	07/31/42	Jul 2042	104.72	85.96	113.68	93.71	105.04	84.73	109.75	92.24	110.45	92.25	9.08	9.42	8.54	8.40	8.63	8.35	8.26	7.98	8.72	8.52	8.47	8.53
08/01/42	08/31/42	Aug 2042	108.95	88.26	114.68	93.66	109.27	86.47	113.02	94.11	113.21	93.64	9.15	9.52	8.58	8.47	8.78	8.45	8.26	8.02	8.79	8.59	8.55	8.53
09/01/42	09/30/42	Sep 2042	99.53	87.13	100.11	90.88	97.68	85.25	102.54	91.53	102.39	90.78	9.09	9.51	8.63	8.53	8.84	8.52	8.30	8.07	8.85	8.65	8.61	8.58
10/01/42	10/31/42	Oct 2042	95.43	86.02	92.37	89.10	93.70	83.58	95.57	89.80	94.56	88.70	9.15	9.49	8.83	8.69	8.97	8.89	8.45	8.25	9.02	8.81	8.77	8.73
11/01/42	11/30/42	Nov 2042	108.37	97.57	97.22	92.47	106.94	98.84	101.97	95.94	100.84	94.51	9.75	10.19	9.50	9.49	10.13	10.10	10.44	9.50	9.83	9.62	9.57	10.76
12/01/42	12/31/42	Dec 2042	111.73	99.73	99.24	94.49	109.25	102.61	105.12	98.46	103.86	97.43	10.32	10.56	10.01	10.00	10.41	10.56	11.30	10.04	10.35	10.13	10.08	11.63
01/01/43	01/31/43	Jan 2043	111.43	98.06	101.97	95.33	109.01	97.62	105.04	98.32	103.99	97.28	10.42	10.73	10.12	9.98	10.22	10.43	11.33	9.93	10.33	10.12	10.07	11.67
02/01/43	02/28/43	Feb 2043	100.38	93.65	101.26	95.07	101.59	91.34	101.74	96.73	102.14	95.74	10.33	10.56	9.78	9.70	9.78	9.99	10.34	9.62	10.04	9.83	9.78	10.67
03/01/43	03/31/43	Mar 2043	92.53	87.52	88.81	85.45	94.98	86.04	93.22	88.46	92.27	87.42	9.02	8.94	8.68	8.64	8.97	8.90	9.27	8.78	8.98	8.77	8.72	9.59
04/01/43	04/30/43	Apr 2043	86.04	83.57	91.20	85.95	85.73	79.96	90.87	87.03	91.41	86.16	8.96	8.91	8.61	8.50	8.75	8.73	8.32	8.16	8.82	8.62	8.58	8.60
05/01/43	05/31/43	May 2043	85.54	81.98	93.87	87.44	83.95	78.86	91.70	86.40	92.44	85.73	9.00	9.00	8.47	8.41	8.68	8.43	8.33	8.05	8.73	8.53	8.49	8.61
06/01/43	06/30/43	Jun 2043	87.88	82.51	98.91	90.04	87.05	80.76	93.04	87.47	94.37	87.70	9.17	9.16	8.57	8.46	8.72	8.47	8.29	8.10	8.78	8.58	8.54	8.56
07/01/43	07/31/43	Jul 2043	106.92	87.77	116.07	95.68	107.25	86.51	112.05	94.18	112.77	94.19	9.27	9.61	8.72	8.57	8.82	8.52	8.44	8.15	8.89	8.69	8.65	8.71

	08/01/43	08/31/43	Aug 2043	111.24	90.11	117.09	95.63	111.56	88.29	115.39	96.09	115.59	95.61	9.34	9.72	8.76	8.65	8.96	8.63	8.43	8.19	8.97	8.77	8.73	8.70
	09/01/43	09/30/43	Sep 2043	101.62	88.96	102.21	92.79	99.73	87.04	104.69	93.45	104.54	92.69	9.29	9.71	8.82	8.71	9.02	8.69	8.48	8.24	9.03	8.83	8.78	8.75
	10/01/43	10/31/43	Oct 2043	97.43	87.83	94.31	90.97	95.67	85.34	97.58	91.69	96.55	90.56	9.34	9.68	9.01	8.87	9.16	9.08	8.63	8.42	9.20	9.00	8.95	8.90
	11/01/43	11/30/43	Nov 2043	110.65	99.62	99.26	94.41	109.19	100.92	104.11	97.95	102.96	96.49	9.96	10.40	9.70	9.69	10.35	10.31	10.66	9.70	10.03	9.82	9.77	10.98
	12/01/43	12/31/43	Dec 2043	114.08	101.82	101.32	96.47	111.54	104.76	107.33	100.53	106.04	99.48	10.54	10.78	10.22	10.21	10.63	10.78	11.53	10.25	10.56	10.34	10.29	11.87

Quote Date		**Data Type:**	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur
11/8/2013		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN**
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/14	01/31/14	Jan 2014	38.96	31.24	32.59	26.51	35.70	30.23	40.91	35.54	42.67	35.25	3.62	3.70	3.50	3.54	3.60	3.57	3.86	3.19	3.86	3.63	3.65	4.12
02/01/14	02/28/14	Feb 2014	37.12	30.05	33.25	26.25	34.00	28.53	40.91	34.85	43.10	35.25	3.62	3.70	3.52	3.54	3.60	3.57	3.73	3.18	3.86	3.63	3.65	3.99
03/01/14	03/31/14	Mar 2014	34.18	27.97	33.92	25.99	32.30	25.99	39.69	33.12	40.98	35.25	3.62	3.67	3.45	3.46	3.56	3.52	3.66	3.17	3.78	3.55	3.57	3.91
04/01/14	04/30/14	Apr 2014	34.88	21.48	34.25	22.73	29.14	18.12	37.49	30.50	40.69	31.30	3.60	3.62	3.40	3.33	3.44	3.41	3.34	3.07	3.63	3.43	3.39	3.56
05/01/14	05/31/14	May 2014	30.72	14.68	33.57	22.05	25.46	10.80	36.38	27.36	38.71	27.50	3.63	3.64	3.42	3.35	3.47	3.44	3.35	3.08	3.66	3.45	3.42	3.57
06/01/14	06/30/14	Jun 2014	30.40	10.20	34.94	22.73	24.15	7.08	37.12	27.65	39.11	28.96	3.66	3.68	3.46	3.38	3.50	3.47	3.33	3.10	3.69	3.48	3.45	3.55
07/01/14	07/31/14	Jul 2014	42.48	21.92	44.29	25.68	38.56	18.94	43.86	33.47	48.23	34.92	3.70	3.72	3.49	3.43	3.54	3.51	3.38	3.13	3.74	3.53	3.50	3.60
08/01/14	08/31/14	Aug 2014	46.46	30.80	43.43	27.55	42.14	28.03	46.54	36.23	49.18	37.08	3.72	3.73	3.51	3.45	3.56	3.53	3.54	3.15	3.75	3.55	3.51	3.77
09/01/14	09/30/14	Sep 2014	43.81	30.53	40.85	27.02	38.56	28.79	43.86	33.81	45.84	36.00	3.71	3.73	3.50	3.44	3.55	3.52	3.54	3.19	3.75	3.54	3.51	3.78
10/01/14	10/31/14	Oct 2014	38.36	31.83	36.05	27.50	35.96	29.85	41.33	35.16	42.00	36.38	3.72	3.74	3.52	3.45	3.56	3.53	3.57	3.21	3.76	3.55	3.52	3.81
11/01/14	11/30/14	Nov 2014	40.84	32.83	35.35	26.95	38.25	31.12	41.33	36.25	43.75	35.65	3.79	3.83	3.61	3.60	3.73	3.69	4.03	3.25	3.93	3.71	3.67	4.32
12/01/14	12/31/14	Dec 2014	44.55	35.85	33.60	28.05	40.55	34.29	42.59	37.34	45.50	38.22	3.93	3.97	3.74	3.77	3.86	3.83	4.24	3.38	4.10	3.88	3.84	4.54
01/01/15	01/31/15	Jan 2015	41.86	34.39	36.82	30.16	39.11	32.50	44.36	38.74	45.50	38.37	4.01	4.05	3.82	3.89	3.94	3.91	4.15	3.46	4.22	4.00	3.96	4.45
02/01/15	02/28/15	Feb 2015	41.06	32.75	36.47	29.29	38.00	31.56	43.10	37.62	44.63	37.25	4.00	4.04	3.82	3.85	3.94	3.90	4.15	3.44	4.19	3.96	3.93	4.44
03/01/15	03/31/15	Mar 2015	37.84	31.11	33.96	27.55	34.64	29.69	39.29	35.39	41.13	36.13	3.96	4.00	3.78	3.78	3.90	3.86	4.12	3.41	4.11	3.89	3.85	4.41
04/01/15	04/30/15	Apr 2015	35.70	21.88	35.53	24.70	28.60	14.94	37.00	31.98	39.29	32.19	3.81	3.85	3.57	3.47	3.60	3.57	3.58	3.12	3.77	3.57	3.53	3.82
05/01/15	05/31/15	May 2015	31.11	14.88	35.53	23.28	27.50	14.21	37.37	30.14	40.10	30.63	3.82	3.86	3.58	3.48	3.61	3.58	3.46	3.13	3.79	3.58	3.55	3.69
06/01/15	06/30/15	Jun 2015	31.44	15.75	37.70	23.28	26.40	14.36	38.88	30.14	42.12	30.94	3.85	3.88	3.60	3.50	3.64	3.61	3.39	3.16	3.81	3.60	3.57	3.62
07/01/15	07/31/15	Jul 2015	44.88	24.29	46.11	29.50	38.25	21.56	45.50	35.65	49.47	36.38	3.87	3.91	3.63	3.53	3.66	3.63	3.48	3.18	3.84	3.63	3.60	3.71
08/01/15	08/31/15	Aug 2015	48.86	33.83	45.24	29.50	45.90	28.00	46.87	38.59	49.96	38.63	3.88	3.92	3.64	3.54	3.67	3.64	3.65	3.19	3.85	3.64	3.61	3.88
09/01/15	09/30/15	Sep 2015	46.21	34.13	39.15	29.50	43.35	34.44	44.14	36.02	46.08	37.50	3.88	3.92	3.64	3.54	3.67	3.64	3.62	3.19	3.85	3.64	3.61	3.86
10/01/15	10/31/15	Oct 2015	39.99	33.60	38.11	30.00	38.56	32.50	43.07	37.13	43.37	37.24	3.90	3.94	3.66	3.56	3.69	3.66	3.62	3.21	3.87	3.66	3.63	3.86
11/01/15	11/30/15	Nov 2015	42.57	34.30	37.37	29.40	39.35	33.17	43.07	36.75	44.25	37.24	3.97	4.01	3.77	3.73	3.84	3.81	4.03	3.29	4.06	3.84	3.80	4.31
12/01/15	12/31/15	Dec 2015	46.44	37.10	35.52	30.60	41.34	34.84	44.37	38.63	45.14	39.52	4.11	4.15	3.92	3.95	3.99	3.95	4.16	3.43	4.29	4.06	4.02	4.46
01/01/16	01/31/16	Jan 2016	43.46	35.89	38.07	31.66	40.61	34.00	45.11	39.74	45.75	39.12	4.20	4.24	4.00	4.02	4.07	4.04	4.24	3.52	4.36	4.13	4.09	4.54
02/01/16	02/29/16	Feb 2016	42.66	34.25	37.72	30.79	39.50	33.06	43.85	38.62	44.88	38.00	4.18	4.22	3.99	4.00	4.06	4.02	4.23	3.50	4.34	4.11	4.07	4.53
03/01/16	03/31/16	Mar 2016	39.44	32.61	35.21	29.05	36.14	31.19	40.04	36.39	41.38	36.88	4.12	4.16	3.93	3.91	4.00	3.96	4.17	3.44	4.25	4.03	3.99	4.47
04/01/16	04/30/16	Apr 2016	37.30	23.38	36.03	25.95	29.85	15.69	38.10	32.73	39.54	32.69	3.93	3.97	3.69	3.55	3.67	3.64	3.73	3.15	3.87	3.65	3.62	3.97
05/01/16	05/31/16	May 2016	32.71	16.38	36.03	24.53	28.75	14.96	38.47	30.89	40.35	31.13	3.94	3.98	3.70	3.56	3.68	3.65	3.68	3.16	3.88	3.67	3.63	3.92
06/01/16	06/30/16	Jun 2016	33.04	17.25	38.20	24.53	27.65	15.11	39.98	30.89	42.37	31.44	3.96	4.00	3.73	3.59	3.70	3.67	3.67	3.18	3.90	3.69	3.66	3.91
07/01/16	07/31/16	Jul 2016	46.48	25.79	48.61	31.25	41.00	23.31	47.00	37.15	52.02	37.63	3.99	4.03	3.76	3.62	3.73	3.70	3.67	3.21	3.93	3.72	3.69	3.91
08/01/16	08/31/16	Aug 2016	50.46	35.33	47.74	31.25	48.65	29.75	48.37	40.09	52.53	39.88	4.00	4.04	3.77	3.63	3.75	3.71	3.66	3.22	3.95	3.73	3.70	3.90
09/01/16	09/30/16	Sep 2016	47.81	35.63	41.65	31.25	46.10	36.19	45.64	37.52	48.45	38.75	4.00	4.04	3.77	3.63	3.74	3.71	3.70	3.22	3.95	3.73	3.70	3.94
10/01/16	10/31/16	Oct 2016	41.59	35.10	39.86	32.00	40.06	35.75	43.82	39.13	43.87	39.24	4.03	4.07	3.79	3.65	3.77	3.74	3.74	3.25	3.97	3.76	3.72	3.98
11/01/16	11/30/16	Nov 2016	44.17	35.80	39.12	31.40	40.85	36.42	43.82	38.75	44.75	39.24	4.09	4.16	3.93	3.90	3.93	3.90	4.20	3.40	4.24	4.01	3.97	4.49
12/01/16	12/31/16	Dec 2016	48.04	38.60	37.27	32.60	42.84	38.09	45.12	40.63	45.64	41.52	4.26	4.32	4.09	4.07	4.10	4.06	4.36	3.57	4.41	4.18	4.14	4.67

Quote Date		**Data Type:**	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur	Endur
10/31/2013		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN**
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/14	01/31/14	Jan 2014	40.02	32.29	33.32	27.78	37.10	31.30	40.91	36.05	42.67	35.75	3.66	3.78	3.56	3.62	3.69	3.66	3.98	3.32	3.94	3.71	3.73	4.26
02/01/14	02/28/14	Feb 2014	38.13	31.06	34.00	27.50	35.35	29.54	40.91	35.35	43.10	35.75	3.67	3.78	3.59	3.61	3.69	3.66	3.87	3.31	3.94	3.71	3.73	4.14
03/01/14	03/31/14	Mar 2014	35.11	28.91	34.68	27.23	32.55	26.91	39.69	33.60	40.98	35.75	3.66	3.76	3.53	3.56	3.67	3.64	3.78	3.29	3.88	3.65	3.68	4.04
04/01/14	04/30/14	Apr 2014	35.43	21.42	34.75	23.23	29.69	18.62	37.25	29.95	40.65	31.57	3.64	3.70	3.48	3.43	3.54	3.51	3.45	3.18	3.73	3.53	3.50	3.67
05/01/14	05/31/14	May 2014	31.20	15.59	34.06	22.54	26.22	10.66	36.88	27.12	39.45	27.73	3.66	3.73	3.50	3.45	3.56	3.53	3.46	3.20	3.76	3.55	3.52	3.68
06/01/14	06/30/14	Jun 2014	30.88	10.24	35.45	23.23	24.34	7.47	37.62	27.69	40.65	29.21	3.70	3.76	3.54	3.48	3.60	3.57	3.45	3.21	3.79	3.59	3.55	3.68
07/01/14	07/31/14	Jul 2014	43.65	22.52	45.06	26.40	39.29	20.02	44.10	33.95	48.73	35.41	3.73	3.80	3.58	3.53	3.64	3.61	3.49	3.25	3.84	3.63	3.60	3.72
08/01/14	08/31/14	Aug 2014	46.80	31.35	44.19	28.33	42.93	28.86	46.80	36.75	49.70	37.60	3.75	3.81	3.59	3.54	3.65	3.62	3.62	3.27	3.85	3.64	3.61	3.85
09/01/14	09/30/14	Sep 2014	44.55	31.64	41.56	27.78	39.29	29.12	44.10	34.30	46.32	36.50	3.74	3.80	3.58	3.53	3.64	3.61	3.62	3.29	3.84	3.63	3.60	3.85
10/01/14	10/31/14	Oct 2014	38.36	32.88	36.57	28.00	35.96	30.55	41.83	34.92	42.00	36.63	3.75	3.82	3.60	3.55	3.66	3.63	3.64	3.31	3.86	3.65	3.62	3.88
11/01/14	11/30/14	Nov 2014	40.84	33.57	35.86	27.44	38.25	31.85	41.83	35.64	43.75	35.89	3.82	3.89	3.67	3.68	3.81	3.77	4.12	3.35	4.00	3.78	3.75	4.42
12/01/14	12/31/14	Dec 2014	44.55	36.31	34.08	28.56	40.55	35.10	43.10	37.44	45.50	38.48	3.96	4.03	3.81	3.84	3.95	3.92	4.36	3.49	4.18	3.95	3.92	4.67
01/01/15	01/31/15	Jan 2015	42.38	35.18	38.37	30.16	39.64	33.28	44.89	38.74	46.02	38.88	4.05	4.12	3.89	3.96	4.03	4.00	4.23	3.57	4.30	4.07	4.04	4.53
02/01/15	02/28/15	Feb 2015	41.57	33.50	38.00	29.29	38.51	32.32	43.61	37.62	45.14	37.75	4.04	4.11	3.88	3.93	4.02	3.99	4.22	3.55	4.26	4.04	4.00	4.52
03/01/15	03/31/15	Mar 2015	38.31	31.83	35.39	27.55	35.11	30.40	39.76	35.39	41.60	36.62	3.99	4.06	3.83	3.85	3.97	3.94	4.19	3.51	4.19	3.96	3.93	4.49
04/01/15	04/30/15	Apr 2015	37.33	22.19	36.02	23.66	30.16	15.19	37.98	30.94	40.26	32.45	3.82	3.89	3.63	3.55	3.67	3.64	3.65	3.20	3.86	3.65	3.62	3.88
05/01/15	05/31/15	May 2015	32.54	15.09	36.02	22.30	29.00	14.46	38.36	29.16	41.09	30.87	3.84	3.90	3.64	3.56	3.68	3.65	3.56	3.21	3.87	3.66	3.63	3.79
06/01/15	06/30/15	Jun 2015	32.88	15.98	38.22	22.30	27.84	14.60	39.91	29.16	43.16	31.19	3.86	3.93	3.66	3.58	3.71	3.67	3.51	3.24	3.90	3.69	3.65	3.74
07/01/15	07/31/15	Jul 2015	45.65	24.69	46.91	29.75	38.48	21.95	46.00	35.65	49.98	36.38	3.89	3.95	3.69	3.61	3.73	3.70	3.58	3.26	3.92	3.71	3.68	3.82
08/01/15	08/31/15	Aug 2015	48.80	34.38	46.02	29.75	46.17	28.50	47.38	38.59	50.47	38.63	3.90	3.97	3.70	3.62	3.74	3.71	3.71	3.28	3.94	3.72	3.69	3.95
09/01/15	09/30/15	Sep 2015	46.55	34.69	39.83	29.75	43.61	35.06	44.62	36.02	46.55	37.50	3.90	3.96	3.70	3.62	3.74	3.71	3.70	3.27	3.93	3.72	3.69	3.94
10/01/15	10/31/15	Oct 2015	39.99	34.08	38.37	29.75	38.56	32.98	43.56	37.13	43.86	37.24	3.92	3.99	3.72	3.64	3.77	3.73	3.70	3.30	3.96	3.75	3.71	3.94
11/01/15	11/30/15	Nov 2015	42.57	34.79	37.62	29.16	39.35	33.66	43.56	36.75	44.75	37.24	3.99	4.06	3.81	3.81	3.92	3.89	4.20	3.36	4.14	3.92	3.88	4.49
12/01/15	12/31/15	Dec 2015	46.44	37.63	35.76	30.35	41.34	35.36	44.88	38.63	45.65	39.52	4.14	4.21	3.97	4.02	4.08	4.04	4.32	3.52	4.36	4.14	4.10	4.63
01/01/16	01/31/16	Jan 2016	43.98	36.68	38.87	31.16	41.14	34.28	45.64	39.74	46.52	39.88	4.23	4.30	4.05	4.10	4.17	4.13	4.39	3.60	4.44	4.21	4.17	4.70
02/01/16	02/29/16	Feb 2016	43.17	35.00	38.50	30.29	40.01	33.32	44.36	38.62	45.64	38.75	4.21	4.28	4.04	4.07	4.15	4.11	4.38	3.59	4.42	4.19	4.15	4.68
03/01/16	03/31/16	Mar 2016	39.91	33.33	35.89	28.55	36.61	31.40	40.51	36.39	42.10	37.62	4.15	4.22	3.97	3.99	4.09	4.05	4.32	3.52	4.33	4.11	4.07	4.62
04/01/16	04/30/16	Apr 2016	38.93	23.69	35.42	27.66	31.16	15.59	39.08	31.69	40.51	34.95	3.93	4.00	3.73	3.60	3.72	3.69	3.74	3.19	3.92	3.70	3.67	3.98
05/01/16	05/31/16	May 2016	34.14	16.59	35.42	26.30	30.00	14.86	39.46	29.91	41.34	33.37	3.94	4.01	3.74	3.61	3.73	3.70	3.69	3.20	3.93	3.71	3.68	3.94
06/01/16	06/30/16	Jun 2016	34.48	17.48	37.62	26.30	28.84	15.00	41.01	29.91	43.41	33.69	3.96	4.03	3.76	3.63	3.75	3.72	3.68	3.22	3.95	3.74	3.70	3.92
07/01/16	07/31/16	Jul 2016	47.25	26.19	44.91	28.15	40.48	23.20	45.75	36.00	52.02	34.29	4.00	4.07	3.79	3.67	3.79	3.75	3.69	3.26	3.99	3.77	3.74	3.93
08/01/16	08/31/16	Aug 2016	50.40	35.88	44.02	28.15	48.17	29.75	47.13	38.94	52.53	36.54	4.01	4.08	3.81	3.68	3.80	3.77	3.68	3.27	4.00	3.79	3.75	3.92
09/01/16	09/30/16	Sep 2016	48.15	36.19	37.83	28.15	45.61	36.31	44.37	36.37	48.45	35.41	4.01	4.08	3.81	3.68	3.80	3.77	3.72	3.27	4.00	3.79	3.75	3.96
10/01/16	10/31/16	Oct 2016	41.59	35.58	39.87	31.50	39.56	35.48	44.56	38.88	44.61	38.49	4.04	4.11	3.83	3.71	3.83	3.79	3.76	3.30	4.03	3.81	3.78	4.00
11/01/16	11/30/16	Nov 2016	44.17	36.29	39.12	30.91	40.35	36.16	44.56	38.50	45.50	38.49	4.11	4.20	3.95	3.95	3.98	3.95	4.28	3.46	4.29	4.06	4.02	4.58
12/01/16	12/31/16	Dec 2016	48.04	39.13	37.26	32.10	42.34	37.86	45.88	40.38	46.40	40.77	4.29	4.38	4.13	4.13	4.16	4.13	4.46	3.64	4.47	4.24	4.20	4.77

0913 Official Forward Price Curve:
Blend of...
0913 E Midas forecast
09/30/2013 forward market curve

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
9/30/2013		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
10/01/13	10/31/13	Oct 2013	34.00	27.50	34.00	26.00	30.50	26.00	41.00	34.50	41.25	34.00	3.50	3.53	3.34	3.32	3.40	3.30	3.25	2.51	3.65	3.43	3.46	3.52
11/01/13	11/30/13	Nov 2013	38.25	30.75	32.50	26.00	35.50	29.50	41.00	34.75	42.00	34.75	3.56	3.61	3.42	3.45	3.58	3.55	3.90	3.26	3.76	3.55	3.57	4.15
12/01/13	12/31/13	Dec 2013	41.00	33.50	34.00	27.00	39.50	33.00	41.25	35.50	41.75	35.25	3.73	3.84	3.61	3.66	3.78	3.74	4.19	3.41	3.97	3.76	3.79	4.46
01/01/14	01/31/14	Jan 2014	40.02	33.60	34.06	27.52	37.10	32.64	41.16	35.79	43.61	35.50	3.83	3.92	3.72	3.76	3.83	3.80	4.09	3.45	4.07	3.86	3.88	4.35
02/01/14	02/28/14	Feb 2014	38.13	32.32	34.75	27.25	35.70	30.81	41.16	35.10	43.61	35.50	3.84	3.92	3.71	3.77	3.83	3.80	3.97	3.45	4.08	3.87	3.89	4.23
03/01/14	03/31/14	Mar 2014	35.11	30.08	35.45	26.98	32.20	28.06	39.94	33.36	41.04	35.50	3.81	3.90	3.68	3.72	3.82	3.78	3.88	3.44	4.03	3.82	3.84	4.13
04/01/14	04/30/14	Apr 2014	35.70	20.15	34.44	25.38	29.42	17.75	37.87	30.74	41.66	32.90	3.76	3.84	3.61	3.56	3.69	3.66	3.58	3.32	3.87	3.66	3.63	3.80
05/01/14	05/31/14	May 2014	31.44	15.66	34.79	22.09	25.97	11.88	37.87	27.84	40.43	28.91	3.78	3.86	3.63	3.58	3.71	3.68	3.59	3.33	3.89	3.68	3.65	3.81
06/01/14	06/30/14	Jun 2014	31.11	10.70	37.28	23.03	24.12	7.88	39.02	28.42	41.66	30.44	3.81	3.89	3.66	3.61	3.74	3.71	3.58	3.34	3.91	3.71	3.68	3.80
07/01/14	07/31/14	Jul 2014	44.86	23.50	44.03	27.12	40.01	21.40	45.50	34.44	49.73	35.65	3.84	3.92	3.70	3.65	3.77	3.74	3.62	3.37	3.96	3.75	3.72	3.84
08/01/14	08/31/14	Aug 2014	48.10	32.73	43.18	29.10	43.73	29.43	46.87	37.28	50.21	37.85	3.86	3.94	3.71	3.66	3.79	3.76	3.74	3.40	3.97	3.76	3.73	3.97
09/01/14	09/30/14	Sep 2014	45.79	33.02	40.61	28.53	40.01	29.43	44.14	34.79	46.31	36.75	3.86	3.94	3.71	3.66	3.79	3.75	3.74	3.42	3.97	3.76	3.73	3.97
10/01/14	10/31/14	Oct 2014	39.29	33.60	37.34	28.50	36.66	31.26	43.56	34.91	42.99	35.39	3.87	3.95	3.73	3.68	3.80	3.77	3.77	3.45	3.99	3.78	3.74	4.00
11/01/14	11/30/14	Nov 2014	41.83	34.30	36.61	27.93	39.00	32.59	43.56	36.02	45.25	36.13	3.94	4.03	3.80	3.81	3.91	3.88	4.23	3.49	4.13	3.92	3.88	4.52
12/01/14	12/31/14	Dec 2014	45.63	37.10	34.80	29.07	41.34	35.91	44.88	39.32	47.51	40.23	4.10	4.19	3.96	3.99	4.07	4.04	4.48	3.64	4.31	4.10	4.06	4.78
01/01/15	01/31/15	Jan 2015	43.94	35.96	38.63	30.68	40.69	34.06	45.94	39.52	47.06	39.14	4.19	4.27	4.04	4.11	4.16	4.13	4.37	3.73	4.44	4.23	4.19	4.66
02/01/15	02/28/15	Feb 2015	43.10	34.25	38.25	29.80	39.53	33.08	44.63	38.38	46.16	38.00	4.18	4.26	4.03	4.07	4.15	4.11	4.35	3.70	4.40	4.19	4.15	4.64
03/01/15	03/31/15	Mar 2015	39.72	32.54	35.63	28.03	36.04	31.11	40.69	36.10	42.54	36.86	4.12	4.20	3.97	3.99	4.09	4.05	4.31	3.66	4.31	4.10	4.06	4.60
04/01/15	04/30/15	Apr 2015	34.88	21.88	36.51	24.18	29.64	16.48	39.20	30.68	40.98	33.48	3.93	4.01	3.72	3.62	3.74	3.71	3.74	3.24	3.93	3.72	3.69	3.97
05/01/15	05/31/15	May 2015	30.40	14.88	36.51	22.79	28.50	15.68	39.60	28.91	41.83	31.85	3.94	4.02	3.73	3.63	3.75	3.72	3.64	3.25	3.94	3.73	3.70	3.86
06/01/15	06/30/15	Jun 2015	30.72	15.75	38.74	22.79	27.36	15.84	41.20	28.91	43.94	32.18	3.96	4.04	3.75	3.66	3.77	3.74	3.59	3.27	3.96	3.76	3.72	3.81
07/01/15	07/31/15	Jul 2015	45.11	23.90	46.38	29.50	38.70	22.14	46.25	36.13	50.75	36.62	3.99	4.07	3.78	3.68	3.80	3.77	3.66	3.30	3.99	3.79	3.75	3.89
08/01/15	08/31/15	Aug 2015	48.36	33.28	45.50	29.50	46.44	28.75	47.64	39.11	51.24	38.88	4.00	4.08	3.79	3.70	3.81	3.78	3.80	3.31	4.01	3.80	3.76	4.04
09/01/15	09/30/15	Sep 2015	46.04	33.58	39.38	29.50	43.86	35.36	44.86	36.51	47.26	37.75	4.00	4.08	3.79	3.70	3.81	3.78	3.79	3.31	4.00	3.80	3.76	4.02
10/01/15	10/31/15	Oct 2015	41.39	34.80	39.40	30.50	39.77	33.71	44.80	38.61	45.33	37.73	4.02	4.10	3.82	3.72	3.83	3.80	3.79	3.34	4.03	3.82	3.79	4.03
11/01/15	11/30/15	Nov 2015	44.06	35.53	38.63	29.89	40.59	34.40	44.80	38.22	46.25	37.73	4.10	4.17	3.94	3.91	3.98	3.95	4.22	3.47	4.23	4.02	3.98	4.50
12/01/15	12/31/15	Dec 2015	48.06	38.43	36.72	31.11	42.64	36.14	46.16	40.17	47.18	40.04	4.26	4.34	4.10	4.14	4.15	4.11	4.37	3.64	4.46	4.25	4.21	4.66
01/01/16	01/31/16	Jan 2016	45.54	37.46	39.88	31.93	42.29	35.56	46.94	40.52	47.91	40.14	4.34	4.42	4.18	4.21	4.23	4.19	4.44	3.72	4.54	4.32	4.28	4.74
02/01/16	02/29/16	Feb 2016	44.70	35.75	39.50	31.05	41.13	34.58	45.63	39.38	47.01	39.00	4.32	4.40	4.16	4.18	4.21	4.17	4.42	3.70	4.51	4.29	4.25	4.72
03/01/16	03/31/16	Mar 2016	41.32	34.04	36.88	29.28	37.64	32.61	41.69	37.10	43.39	37.86	4.25	4.33	4.09	4.09	4.14	4.10	4.35	3.63	4.41	4.20	4.16	4.64
04/01/16	04/30/16	Apr 2016	36.48	23.38	37.76	27.18	31.24	16.23	40.20	31.68	41.83	35.48	4.02	4.09	3.80	3.67	3.78	3.75	3.78	3.22	3.98	3.77	3.73	4.01
05/01/16	05/31/16	May 2016	32.00	16.38	37.76	25.79	30.10	15.43	40.60	29.91	42.68	33.85	4.03	4.10	3.81	3.68	3.79	3.76	3.72	3.23	3.99	3.78	3.74	3.95
06/01/16	06/30/16	Jun 2016	32.32	17.25	39.99	25.79	28.96	15.59	42.20	29.91	44.79	34.18	4.05	4.12	3.83	3.70	3.82	3.78	3.69	3.25	4.01	3.80	3.77	3.92
07/01/16	07/31/16	Jul 2016	46.71	25.40	47.38	28.50	40.30	23.64	47.25	37.13	51.60	35.62	4.08	4.15	3.87	3.73	3.85	3.82	3.70	3.28	4.05	3.84	3.80	3.93
08/01/16	08/31/16	Aug 2016	49.96	34.78	46.50	28.50	48.04	30.25	48.64	40.11	52.09	37.88	4.10	4.17	3.88	3.75	3.86	3.83	3.68	3.30	4.06	3.85	3.81	3.91
09/01/16	09/30/16	Sep 2016	47.64	35.08	40.38	28.50	45.46	36.86	45.86	37.51	48.11	36.75	4.10	4.17	3.88	3.75	3.86	3.83	3.73	3.30	4.06	3.85	3.81	3.96
10/01/16	10/31/16	Oct 2016	42.99	36.30	40.65	31.75	41.37	35.21	45.80	39.61	46.18	38.73	4.12	4.19	3.91	3.77	3.89	3.85	3.77	3.32	4.09	3.88	3.84	4.00
11/01/16	11/30/16	Nov 2016	45.66	37.03	39.88	31.14	42.19	35.90	45.80	39.22	47.10	38.73	4.20	4.33	4.05	4.04	4.05	4.02	4.35	3.56	4.36	4.15	4.11	4.64
12/01/16	12/31/16	Dec 2016	49.66	39.93	37.97	32.36	44.24	37.64	47.16	41.17	48.03	41.04	4.38	4.51	4.23	4.22	4.24	4.20	4.53	3.74	4.55	4.34	4.29	4.83
01/01/17	01/31/17	Jan 2017	47.54	39.21	41.88	33.68	44.29	37.31	48.44	42.27	49.41	41.64	4.48	4.60	4.33	4.33	4.33	4.29	4.62	3.84	4.65	4.45	4.40	4.92
02/01/17	02/28/17	Feb 2017	46.70	37.50	41.50	32.80	43.13	36.33	47.13	41.13	48.51	40.50	4.46	4.58	4.31	4.31	4.31	4.27	4.59	3.82	4.63	4.43	4.38	4.90
03/01/17	03/31/17	Mar 2017	43.32	35.79	38.88	31.03	39.64	34.36	43.19	38.85	44.89	39.36	4.39	4.51	4.24	4.24	4.24	4.20	4.52	3.75	4.56	4.35	4.31	4.82
04/01/17	04/30/17	Apr 2017	38.48	25.13	39.76	28.93	33.24	17.98	41.70	33.43	43.33	36.98	4.15	4.25	3.95	3.79	3.93	3.90	3.89	3.37	4.10	3.90	3.86	4.13
05/01/17	05/31/17	May 2017	34.00	18.13	39.76	27.54	32.10	17.18	42.10	31.66	44.18	35.35	4.16	4.26	3.96	3.81	3.95	3.91	3.84	3.38	4.11	3.91	3.88	4.07
06/01/17	06/30/17	Jun 2017	34.32	19.00	41.99	27.54	30.96	17.34	43.70	31.66	46.29	35.68	4.18	4.28	3.99	3.83	3.97	3.94	3.81	3.41	4.14	3.94	3.90	4.05
07/01/17	07/31/17	Jul 2017	48.71	27.15	49.38	30.25	42.30	25.39	48.75	38.88	53.10	37.12	4.22	4.32	4.02	3.86	4.00	3.97	3.82	3.44	4.17	3.97	3.93	4.05
08/01/17	08/31/17	Aug 2017	51.96	36.53	48.50	30.25	50.04	32.00	50.14	41.86	53.59	39.38	4.23	4.33	4.03	3.88	4.02	3.99	3.80	3.46	4.19	3.99	3.95	4.04
09/01/17	09/30/17	Sep 2017	49.64	36.83	42.38	30.25	47.46	38.61	47.36	39.26	49.61	38.25	4.23	4.33	4.03	3.88	4.02	3.99	3.85	3.46	4.19	3.99	3.95	4.09
10/01/17	10/31/17	Oct 2017	44.99	38.05	42.65	33.50	43.37	36.96	47.30	41.36	47.68	40.23	4.26	4.36	4.06	3.91	4.05	4.01	3.90	3.48	4.22	4.02	3.98	4.14
11/01/17	11/30/17	Nov 2017	47.66	38.78	41.88	32.89	44.19	37.65	47.30	40.97	48.60	40.23	4.35	4.50	4.20	4.20	4.21	4.18	4.48	3.67	4.52	4.32	4.28	4.78
12/01/17	12/31/17	Dec 2017	51.66	41.68	39.97	34.11	46.24	39.39	48.66	42.92	49.53	42.54	4.53	4.68	4.38	4.38	4.39	4.36	4.66	3.85	4.71	4.50	4.46	4.97
01/01/18	01/31/18	Jan 2018	49.54	40.96	43.63	35.68	46.29	39.06	49.94	44.02	50.91	43.39	4.62	4.77	4.47	4.49	4.49	4.45	4.76	3.94	4.81	4.61	4.57	5.08
02/01/18	02/28/18	Feb 2018	48.70	39.25	43.25	34.80	45.13	38.08	48.63	42.88	50.01	42.25	4.60	4.75	4.45	4.47	4.46	4.43	4.74	3.92	4.79	4.59	4.54	5.05
03/01/18	03/31/18	Mar 2018	45.32	37.54	40.63	33.03	41.64	36.11	44.69	40.60	46.39	41.11	4.53	4.68	4.38	4.40	4.39	4.36	4.66	3.85	4.72	4.52	4.47	4.97
04/01/18	04/30/18	Apr 2018	40.48	26.88	41.51	30.93	35.24	19.73	43.20	35.18	44.83	38.73	4.28	4.43	4.08	4.03	4.11	4.07	4.02	3.55	4.34	4.14	4.10	4.27
05/01/18	05/31/18	May 2018	36.00	19.88	41.51	29.54	34.10	18.93	43.60	33.41	45.68	37.10	4.29	4.45	4.10	4.05	4.12	4.09	3.97	3.56	4.35	4.16	4.12	4.22
06/01/18	06/30/18	Jun 2018	36.32	20.75	43.74	29.54	32.96	19.09	45.20	33.41	47.79	37.43	4.32	4.47	4.12	4.07	4.15	4.11	3.95	3.59	4.38	4.19	4.15	4.19
07/01/18	07/31/18	Jul 2018	50.71	28.90	51.13	32.25	44.30	27.14	50.25	40.63	54.60	38.87	4.35	4.51	4.15	4.11	4.18	4.14	3.95	3.62	4.41	4.22	4.18	4.20
08/01/18	08/31/18	Aug 2018	53.96	38.28	50.25	32.25	52.04	33.75	51.64	43.61	55.09	41.13	4.37	4.53	4.17	4.13	4.20	4.16	3.94	3.64	4.43	4.24	4.20	4.18
09/01/18	09/30/18	Sep 2018	51.64	38.58	44.13	32.25	49.46	40.36	48.86	41.01	51.11	40.00	4.37	4.53	4.17	4.13	4.20	4.16	3.99	3.64	4.43	4.24	4.20	4.24
10/01/18	10/31/18	Oct 2018	46.99	39.80	44.40	35.50	45.37	38.71	48.80	43.11	49.18	41.98	4.40	4.56	4.21	4.16	4.23	4.19	4.04	3.67	4.47	4.27	4.23	4.29
11/01/18	11/30/18	Nov 2018	49.66	40.53	43.63	34.89	46.19	39.40	48.80	42.72	50.10	41.98	4.52	4.71	4.37	4.41	4.43	4.39	4.65	3.86	4.73	4.53	4.49	4.96
12/01/18	12/31/18	Dec 2018	53.66	43.43	41.72	36.11	48.24	41.14	50.16	44.67	51.03	44.29	4.72	4.91	4.58	4.62	4.63	4.59	4.85	4.06	4.94	4.74	4.69	5.17

01/01/19	01/31/19	Jan 2019	52.04	42.96	46.13	37.68	48.79	41.06	52.19	45.92	53.16	45.29	4.84	5.03	4.69	4.74	4.75	4.71	4.98	4.18	5.06	4.86	4.81	5.31
02/01/19	02/28/19	Feb 2019	51.20	41.25	45.75	36.80	47.63	40.08	50.88	44.78	52.26	44.15	4.82	5.01	4.67	4.71	4.73	4.69	4.96	4.16	5.04	4.84	4.79	5.28
03/01/19	03/31/19	Mar 2019	47.82	39.54	43.13	35.03	44.14	38.11	46.94	42.50	48.64	43.01	4.75	4.94	4.60	4.64	4.66	4.62	4.88	4.09	4.97	4.77	4.72	5.20
04/01/19	04/30/19	Apr 2019	42.98	28.88	44.01	32.93	37.74	21.73	45.45	37.08	47.08	40.63	4.50	4.72	4.31	4.33	4.36	4.32	4.25	3.83	4.65	4.45	4.40	4.51
05/01/19	05/31/19	May 2019	38.50	21.88	44.01	31.54	36.60	20.93	45.85	35.31	47.93	39.00	4.52	4.74	4.33	4.35	4.38	4.34	4.20	3.85	4.67	4.47	4.43	4.46
06/01/19	06/30/19	Jun 2019	38.82	22.75	46.24	31.54	35.46	21.09	47.45	35.31	50.04	39.33	4.55	4.77	4.36	4.38	4.41	4.37	4.18	3.88	4.70	4.50	4.46	4.44
07/01/19	07/31/19	Jul 2019	53.21	30.90	53.63	34.25	46.80	29.14	52.50	42.53	56.85	40.77	4.59	4.81	4.40	4.42	4.45	4.41	4.19	3.92	4.74	4.54	4.50	4.45
08/01/19	08/31/19	Aug 2019	56.46	40.28	52.75	34.25	54.54	35.75	53.89	45.51	57.34	43.03	4.62	4.84	4.42	4.45	4.48	4.44	4.19	3.95	4.76	4.57	4.52	4.45
09/01/19	09/30/19	Sep 2019	54.14	40.58	46.63	34.25	51.96	42.36	51.11	42.91	53.36	41.90	4.62	4.84	4.42	4.45	4.48	4.44	4.24	3.95	4.77	4.57	4.53	4.50
10/01/19	10/31/19	Oct 2019	49.49	41.80	46.90	37.50	47.87	40.71	51.05	45.01	51.43	43.88	4.66	4.88	4.46	4.49	4.52	4.48	4.30	3.99	4.81	4.61	4.56	4.56
11/01/19	11/30/19	Nov 2019	51.51	43.22	47.92	39.93	50.81	41.62	55.04	48.74	55.91	48.06	5.15	5.24	4.95	4.98	5.01	4.95	5.07	4.55	5.31	5.11	5.06	5.39
12/01/19	12/31/19	Dec 2019	56.07	45.69	46.32	41.21	52.09	44.01	57.15	50.51	57.02	49.87	5.35	5.45	5.15	5.19	5.22	5.17	5.27	4.75	5.53	5.32	5.27	5.61
01/01/20	01/31/20	Jan 2020	50.86	43.80	48.11	40.97	49.06	42.12	55.11	49.69	55.61	49.37	5.31	5.37	5.11	5.16	5.19	5.14	5.25	4.72	5.50	5.29	5.24	5.59
02/01/20	02/29/20	Feb 2020	49.60	42.76	47.08	40.46	47.11	41.57	53.59	48.97	54.72	48.63	5.31	5.37	5.11	5.15	5.19	5.13	5.24	4.71	5.49	5.29	5.23	5.58
03/01/20	03/31/20	Mar 2020	46.41	40.79	44.44	38.84	44.65	38.79	49.69	46.70	50.82	46.67	5.11	5.17	4.91	4.95	4.98	4.93	5.05	4.52	5.29	5.09	5.03	5.39
04/01/20	04/30/20	Apr 2020	43.75	34.99	44.54	36.95	41.75	30.45	49.06	43.14	50.32	44.94	4.97	4.96	4.68	4.70	4.74	4.68	4.64	4.31	5.03	4.83	4.78	4.94
05/01/20	05/31/20	May 2020	40.96	30.53	45.46	36.00	39.34	28.88	49.70	42.52	51.28	44.74	5.00	4.95	4.68	4.69	4.73	4.69	4.61	4.35	5.02	4.82	4.77	4.91
06/01/20	06/30/20	Jun 2020	40.92	31.66	48.21	36.15	39.81	30.32	49.22	42.51	51.84	45.05	5.05	4.99	4.72	4.71	4.77	4.73	4.62	4.40	5.04	4.84	4.79	4.92
07/01/20	07/31/20	Jul 2020	54.45	37.04	58.56	39.13	52.39	36.18	58.22	47.23	61.87	46.90	5.09	5.03	4.76	4.79	4.81	4.76	4.64	4.43	5.12	4.92	4.87	4.94
08/01/20	08/31/20	Aug 2020	57.37	42.60	58.23	39.26	57.25	40.59	60.01	49.08	63.30	48.19	5.12	5.09	4.80	4.80	4.85	4.79	4.66	4.46	5.13	4.93	4.88	4.96
09/01/20	09/30/20	Sep 2020	53.07	41.79	49.62	38.30	53.03	42.26	55.32	47.23	56.66	46.97	5.11	5.10	4.81	4.83	4.88	4.82	4.71	4.47	5.16	4.96	4.91	5.02
10/01/20	10/31/20	Oct 2020	49.95	42.20	49.53	40.01	50.37	41.37	54.71	48.12	55.40	48.02	5.14	5.16	4.87	4.89	4.93	4.87	4.78	4.50	5.22	5.02	4.97	5.08
11/01/20	11/30/20	Nov 2020	53.36	45.91	52.21	44.96	55.43	43.83	61.29	54.76	61.72	54.14	5.78	5.77	5.52	5.55	5.60	5.52	5.49	5.25	5.88	5.68	5.63	5.81
12/01/20	12/31/20	Dec 2020	58.47	47.95	50.91	46.30	55.94	46.88	64.15	56.35	63.02	55.44	5.97	5.98	5.72	5.77	5.81	5.74	5.69	5.44	6.10	5.90	5.85	6.03
01/01/21	01/31/21	Jan 2021	49.67	44.64	50.10	44.26	49.33	43.17	58.03	53.45	58.05	53.44	5.78	5.70	5.53	5.58	5.63	5.56	5.52	5.26	5.92	5.72	5.66	5.86
02/01/21	02/28/21	Feb 2021	48.01	44.27	48.41	44.13	46.59	43.06	56.31	53.16	57.19	53.11	5.79	5.72	5.55	5.59	5.65	5.58	5.53	5.26	5.93	5.73	5.67	5.87
03/01/21	03/31/21	Mar 2021	45.01	42.04	45.75	42.65	45.16	39.47	52.45	50.89	53.00	50.32	5.48	5.40	5.22	5.26	5.31	5.23	5.22	4.95	5.60	5.40	5.34	5.56
04/01/21	04/30/21	Apr 2021	44.52	41.11	45.08	40.96	45.76	39.16	52.66	49.20	53.55	49.26	5.43	5.20	5.05	5.08	5.11	5.03	5.03	4.78	5.40	5.20	5.15	5.33
05/01/21	05/31/21	May 2021	43.42	39.18	46.91	40.46	42.08	36.82	53.54	49.72	54.64	50.48	5.48	5.16	5.03	5.04	5.08	5.03	5.01	4.85	5.36	5.16	5.11	5.31
06/01/21	06/30/21	Jun 2021	43.01	40.56	50.18	40.77	44.16	39.54	50.99	49.71	53.64	50.77	5.55	5.20	5.09	5.04	5.13	5.08	5.07	4.91	5.37	5.17	5.12	5.37
07/01/21	07/31/21	Jul 2021	55.70	43.19	63.50	44.00	57.97	43.22	63.94	51.93	66.89	53.04	5.59	5.25	5.13	5.17	5.17	5.12	5.09	4.94	5.50	5.30	5.25	5.39
08/01/21	08/31/21	Aug 2021	58.27	44.92	63.70	44.27	59.96	45.42	66.13	52.65	69.25	53.34	5.63	5.34	5.18	5.16	5.22	5.14	5.13	4.97	5.49	5.29	5.24	5.43
09/01/21	09/30/21	Sep 2021	52.00	43.01	52.62	42.34	54.09	42.16	59.53	51.55	59.96	52.04	5.60	5.37	5.20	5.22	5.27	5.20	5.18	4.99	5.55	5.35	5.30	5.49
10/01/21	10/31/21	Oct 2021	50.42	42.59	52.16	42.51	52.87	42.03	58.38	51.22	59.37	52.15	5.63	5.44	5.28	5.30	5.35	5.26	5.26	5.01	5.63	5.43	5.38	5.56
11/01/21	11/30/21	Nov 2021	52.64	44.30	52.29	43.86	53.65	43.33	60.26	52.96	60.46	52.40	5.68	5.61	5.41	5.44	5.50	5.42	5.39	5.12	5.76	5.56	5.52	5.71
12/01/21	12/31/21	Dec 2021	59.36	47.06	49.99	45.25	57.97	46.62	61.69	54.48	60.98	53.92	5.85	5.79	5.59	5.66	5.74	5.67	5.67	5.35	6.00	5.80	5.74	6.00
01/01/22	01/31/22	Jan 2022	57.19	51.34	59.73	52.73	55.96	49.81	61.34	54.27	61.30	54.73	5.86	5.79	5.60	5.67	5.76	5.68	5.63	5.36	6.01	5.80	5.75	5.98
02/01/22	02/28/22	Feb 2022	56.81	51.35	58.07	52.37	54.50	48.38	59.23	54.11	59.53	54.78	5.89	5.82	5.62	5.68	5.77	5.70	5.65	5.38	6.02	5.82	5.76	6.00
03/01/22	03/31/22	Mar 2022	52.83	49.60	52.85	50.34	50.67	48.08	56.85	52.75	56.26	53.17	5.69	5.61	5.41	5.46	5.52	5.45	5.42	5.15	5.80	5.60	5.55	5.76
04/01/22	04/30/22	Apr 2022	53.32	48.69	54.97	49.90	52.53	46.83	57.06	52.95	57.70	52.83	5.65	5.42	5.25	5.28	5.32	5.24	5.24	4.98	5.60	5.40	5.35	5.54
05/01/22	05/31/22	May 2022	50.19	44.05	56.09	49.10	50.53	46.01	55.10	50.37	56.51	51.61	5.70	5.38	5.22	5.24	5.28	5.23	5.20	5.04	5.56	5.36	5.32	5.50
06/01/22	06/30/22	Jun 2022	50.57	47.22	58.76	50.09	50.50	45.80	55.41	51.50	56.83	52.33	5.78	5.46	5.30	5.31	5.36	5.30	5.29	5.12	5.63	5.43	5.38	5.59
07/01/22	07/31/22	Jul 2022	63.57	52.36	73.76	54.20	63.16	49.41	68.16	56.28	71.44	55.91	5.83	5.52	5.37	5.37	5.43	5.35	5.34	5.17	5.70	5.50	5.45	5.64
08/01/22	08/31/22	Aug 2022	64.90	52.95	73.35	53.58	65.05	50.79	69.84	56.53	74.09	56.04	5.87	5.59	5.43	5.44	5.50	5.40	5.38	5.21	5.77	5.57	5.52	5.68
09/01/22	09/30/22	Sep 2022	59.93	51.18	61.05	51.79	59.68	49.23	64.18	54.46	64.63	54.58	5.83	5.64	5.46	5.49	5.55	5.47	5.43	5.24	5.82	5.62	5.57	5.73
10/01/22	10/31/22	Oct 2022	58.99	50.67	63.45	51.85	58.60	48.46	63.43	53.39	64.10	53.87	5.85	5.68	5.51	5.53	5.59	5.50	5.50	5.24	5.86	5.66	5.61	5.80
11/01/22	11/30/22	Nov 2022	62.80	53.22	62.58	53.19	62.40	54.95	65.87	56.04	65.54	55.93	6.01	5.95	5.75	5.81	5.90	5.82	5.78	5.51	6.14	5.94	5.89	6.10
12/01/22	12/31/22	Dec 2022	71.53	57.94	62.67	56.00	70.71	59.41	66.67	59.15	65.87	59.07	6.43	6.37	6.18	6.28	6.37	6.29	6.24	5.91	6.61	6.41	6.36	6.57
01/01/23	01/31/23	Jan 2023	61.44	55.26	63.47	56.24	60.19	53.46	64.18	58.31	63.70	58.39	6.35	6.29	6.08	6.19	6.28	6.20	6.13	5.84	6.53	6.33	6.27	6.48
02/01/23	02/28/23	Feb 2023	59.48	54.93	61.62	55.56	58.69	51.91	61.96	58.10	62.67	58.43	6.38	6.32	6.12	6.21	6.31	6.22	6.14	5.86	6.55	6.35	6.30	6.48
03/01/23	03/31/23	Mar 2023	58.10	54.40	56.79	54.65	55.09	52.00	61.23	57.57	60.43	57.68	6.27	6.19	5.98	6.05	6.13	6.05	6.00	5.73	6.38	6.18	6.13	6.34
04/01/23	04/30/23	Apr 2023	57.34	53.50	59.03	54.24	56.20	51.09	61.21	57.39	61.63	57.28	6.24	6.04	5.86	5.88	5.94	5.85	5.85	5.59	6.21	6.01	5.96	6.15
05/01/23	05/31/23	May 2023	56.71	51.30	61.04	53.69	56.39	51.02	60.87	55.62	61.87	56.34	6.29	6.00	5.84	5.86	5.91	5.84	5.83	5.65	6.18	5.98	5.93	6.13
06/01/23	06/30/23	Jun 2023	55.80	52.05	64.00	54.93	55.29	50.46	60.29	57.11	61.77	57.12	6.39	6.09	5.92	5.94	5.99	5.93	5.92	5.75	6.27	6.06	6.02	6.22
07/01/23	07/31/23	Jul 2023	69.64	56.91	79.65	59.42	69.19	54.54	74.38	61.64	77.48	61.35	6.44	6.16	5.99	6.00	6.06	5.97	5.96	5.79	6.33	6.13	6.08	6.26
08/01/23	08/31/23	Aug 2023	71.44	58.15	79.40	59.09	70.90	55.82	76.40	61.75	79.81	61.47	6.48	6.25	6.06	6.09	6.15	6.07	6.05	5.83	6.42	6.22	6.17	6.35
09/01/23	09/30/23	Sep 2023	65.78	56.40	67.10	56.97	65.26	54.28	69.76	59.83	70.50	59.93	6.43	6.27	6.07	6.15	6.21	6.12	6.09	5.86	6.48	6.28	6.23	6.39
10/01/23	10/31/23	Oct 2023	63.66	55.23	66.91	56.52	63.25	52.34	68.25	58.52	68.76	58.89	6.46	6.30	6.10	6.16	6.22	6.12	6.11	5.84	6.49	6.29	6.24	6.42
11/01/23	11/30/23	Nov 2023	67.07	57.66	66.51	57.20	67.23	58.96	69.93	60.19	69.50	59.88	6.52	6.48	6.26	6.37	6.48	6.40	6.33	6.05	6.70	6.50	6.45	6.65
12/01/23	12/31/23	Dec 2023	74.84	60.36	65.65	58.54	74.43	61.75	69.88	61.97	69.21	61.67	6.70	6.69	6.46	6.59	6.68	6.60	6.57	6.19	6.93	6.72	6.67	6.90
01/01/24	01/31/24	Jan 2024	66.22	59.69	67.64	60.38	65.68	57.90	69.09	62.85	68.58	62.99	6.91	6.88	6.65	6.80	6.89	6.81	6.81	6.42	7.13	6.93	6.88	7.15
02/01/24	02/29/24	Feb 2024	62.88	58.33	66.11	59.75	63.04	55.92	66.79	62.68	67.41	62.71	6.90	6.86	6.63	6.76	6.85	6.77	6.77	6.40	7.10	6.90	6.84	7.11
03/01/24	03/31/24	Mar 2024	58.89	55.89	58.04	55.72	56.77	53.27	62.43	58.57	61.72	58.95	6.36	6.31	6.08	6.19	6.28	6.20	6.20	5.88	6.53	6.33	6.27	6.54
04/01/24	04/30/24	Apr 2024	58.46	54.77	59.84	54.97	57.96	52.25	62.29	58.35	62.81	58.01	6.30	6.14	5.94	6.01	6.07	5.98	5.98	5.70	6.33	6.13	6.09	6.28
05/01/24	05/31/24	May 2024	56.35	50.22	61.71	54.70	56.02	50.74	61.42	56.43	62.55	57.90	6.34	6.13	5.93	5.99	6.06	5.97	5.95	5.77	6.32	6.12	6.07	6.25
06/01/24	06/30/24	Jun 2024	56.35	52.49	64.36	56.18	55.64	51.43	60.87	57.64	62.42	58.21	6.45	6.22	6.02	6.08	6.14	6.07	6.04	5.86	6.41	6.21	6.16	6.34
07/01/24	07/31/24	Jul 2024	70.57	57.62	80.33	59.77	70.02	55.07	75.37	62.20	78.02	61.83	6.50	6.28	6.08	6.12	6.18	6.09	6.08	5.90	6.45	6.25	6.20	6.38
08/01/24	08/31/24	Aug 2024	72.12	58.65	79.99	59.73	71.59	56.75	77.01	62.34	80.41	62.06	6.55	6.35	6.15	6.22	6.28	6.17	6.17	5.93	6.55	6.35	6.30	6.47
09/01/24	09/30/24	Sep 2024	66.40	57.43	66.76	57.43	65.60	55.13	69.82	60.56	70.18	60.36	6.50	6.35	6.15	6.23	6.30	6.21	6.20	5.95	6.56	6.36	6.31	6.50
10/01/24	10/31/24	Oct 2024	63.63	56.31	66.90	57.01	63.23	53.68	68.11	59.30	68.61	59.41	6.53	6.39	6.19	6.27	6.34	6.23	6.23	5.95	6.60	6.40	6.35	6.53
11/01/24	11/30/24	Nov 2024	67.71	58.91	66.59	58.48	68.06	60.34	70.54	61.43	70.00	61.18	6.62	6.60	6.36	6.49	6.60	6.51	6.51	6.16	6.82	6.62	6.57	6.84
12/01/24	12/31/24	Dec 2024	75.42	61.80	65.38	59.37	74.06	62.82	70.92	63.19	70.07	62.59	6.80	6.81	6.56	6.72	6.83	6.74	6.74	6.30	7.05	6.85	6.80	7.07
01/01/25	01/31/25	Jan 2025	66.08	60.20	67.24	60.47	64.60	57.74	68.82	63.34	68.27	63.11	6.86	6.86	6.59	6.76	6.88	6.79	6.79	6.36	7.10	6.89	6.84	7.13

02/01/25	02/28/25	Feb 2025	63.31	58.57	65.45	59.93	62.23	55.89	66.98	63.20	67.54	63.15	6.86	6.86	6.59	6.75	6.88	6.79	6.79	6.36	7.09	6.89	6.84	7.13
03/01/25	03/31/25	Mar 2025	59.62	57.10	59.33	57.18	56.64	54.43	63.61	59.78	63.02	60.16	6.43	6.42	6.17	6.29	6.39	6.29	6.29	5.95	6.63	6.42	6.37	6.63
04/01/25	04/30/25	Apr 2025	59.64	55.94	61.09	56.48	58.79	53.06	63.32	59.82	63.90	59.49	6.37	6.24	6.03	6.11	6.17	6.08	6.08	5.79	6.43	6.23	6.18	6.38
05/01/25	05/31/25	May 2025	58.19	52.84	62.88	55.95	57.41	52.57	62.47	57.43	63.51	58.27	6.41	6.20	6.00	6.07	6.13	6.05	6.02	5.84	6.39	6.19	6.15	6.32
06/01/25	06/30/25	Jun 2025	57.96	53.63	65.82	57.32	57.33	52.22	62.47	58.72	63.70	59.25	6.51	6.29	6.08	6.15	6.22	6.12	6.11	5.94	6.48	6.28	6.23	6.41
07/01/25	07/31/25	Jul 2025	72.32	58.78	82.25	61.26	71.83	56.33	77.15	63.43	79.80	63.05	6.58	6.41	6.21	6.26	6.32	6.23	6.17	6.00	6.59	6.39	6.34	6.47
08/01/25	08/31/25	Aug 2025	73.77	60.06	81.79	61.40	73.22	58.08	78.67	63.80	82.03	63.54	6.62	6.48	6.27	6.33	6.40	6.30	6.29	6.03	6.66	6.46	6.41	6.59
09/01/25	09/30/25	Sep 2025	67.37	58.37	68.33	58.83	66.94	56.03	71.54	61.82	71.89	61.48	6.56	6.48	6.26	6.33	6.42	6.30	6.30	6.04	6.66	6.46	6.41	6.61
10/01/25	10/31/25	Oct 2025	64.79	57.51	68.46	58.32	64.14	54.55	69.23	60.79	69.74	60.95	6.59	6.52	6.29	6.37	6.46	6.36	6.34	6.05	6.70	6.50	6.45	6.65
11/01/25	11/30/25	Nov 2025	68.65	59.56	67.59	59.13	69.13	60.90	71.53	62.29	70.99	62.04	6.64	6.66	6.39	6.51	6.64	6.55	6.55	6.16	6.84	6.64	6.59	6.87
12/01/25	12/31/25	Dec 2025	76.39	62.60	65.74	60.08	75.17	63.54	71.64	63.88	70.72	63.47	6.85	6.88	6.61	6.75	6.87	6.78	6.81	6.33	7.08	6.88	6.83	7.14
01/01/26	01/31/26	Jan 2026	66.35	60.60	67.48	61.09	65.63	58.35	69.17	63.63	68.50	63.51	6.85	6.85	6.58	6.73	6.86	6.77	6.84	6.34	7.07	6.87	6.82	7.19
02/01/26	02/28/26	Feb 2026	64.59	59.34	66.63	60.29	63.14	57.33	67.16	63.36	67.69	63.51	6.84	6.85	6.58	6.72	6.87	6.77	6.77	6.33	7.06	6.85	6.80	7.12
03/01/26	03/31/26	Mar 2026	59.47	57.37	59.09	57.00	57.24	54.64	63.58	59.94	62.84	60.28	6.40	6.39	6.12	6.25	6.37	6.28	6.28	5.91	6.59	6.39	6.34	6.62
04/01/26	04/30/26	Apr 2026	59.25	55.93	60.30	56.02	58.06	53.46	62.82	59.31	63.17	58.85	6.34	6.19	5.98	6.07	6.13	6.04	6.04	5.75	6.39	6.19	6.14	6.34
05/01/26	05/31/26	May 2026	57.17	51.22	63.32	56.30	57.22	52.19	62.38	57.57	63.34	58.56	6.38	6.19	5.98	6.05	6.11	6.02	6.02	5.82	6.38	6.18	6.13	6.32
06/01/26	06/30/26	Jun 2026	57.87	54.47	66.06	57.55	57.25	53.63	62.34	58.99	63.93	59.34	6.49	6.29	6.07	6.15	6.21	6.13	6.10	5.92	6.47	6.27	6.22	6.40
07/01/26	07/31/26	Jul 2026	72.98	59.49	83.10	61.54	72.62	56.69	77.78	63.75	80.61	63.28	6.55	6.39	6.17	6.24	6.31	6.19	6.19	5.96	6.57	6.37	6.32	6.49
08/01/26	08/31/26	Aug 2026	74.74	60.77	82.53	61.65	74.18	58.24	79.11	64.24	82.56	63.85	6.59	6.46	6.24	6.30	6.38	6.28	6.26	6.00	6.63	6.43	6.38	6.56
09/01/26	09/30/26	Sep 2026	68.32	58.58	69.53	59.13	68.06	56.59	72.64	62.17	73.07	62.06	6.54	6.48	6.23	6.33	6.43	6.31	6.31	6.03	6.66	6.46	6.41	6.61
10/01/26	10/31/26	Oct 2026	65.39	58.33	69.02	58.75	64.65	55.63	69.84	61.13	70.22	61.23	6.57	6.51	6.26	6.35	6.46	6.34	6.34	6.01	6.68	6.48	6.43	6.64
11/01/26	11/30/26	Nov 2026	70.07	60.40	68.29	59.51	70.16	61.61	72.09	62.65	71.50	62.05	6.63	6.67	6.40	6.51	6.67	6.58	6.58	6.15	6.83	6.63	6.58	6.90
12/01/26	12/31/26	Dec 2026	76.96	62.94	66.50	60.61	76.41	64.83	72.21	64.55	71.29	64.08	6.83	6.91	6.62	6.77	6.91	6.82	6.82	6.31	7.10	6.90	6.85	7.16
01/01/27	01/31/27	Jan 2027	67.81	62.33	69.09	62.33	67.52	59.89	70.35	65.04	69.76	64.78	6.91	6.96	6.67	6.84	7.01	6.92	6.92	6.41	7.18	6.97	6.92	7.27
02/01/27	02/28/27	Feb 2027	66.48	61.31	67.64	61.80	64.56	58.45	68.56	64.98	69.06	64.88	6.94	6.99	6.69	6.86	7.04	6.94	6.94	6.44	7.20	6.99	6.94	7.28
03/01/27	03/31/27	Mar 2027	62.54	58.83	60.61	58.15	58.89	56.10	65.24	61.68	64.32	61.41	6.48	6.51	6.23	6.38	6.51	6.42	6.42	6.02	6.72	6.52	6.46	6.76
04/01/27	04/30/27	Apr 2027	61.34	57.51	62.45	57.87	60.12	55.06	64.93	61.15	65.40	60.79	6.42	6.33	6.10	6.19	6.27	6.18	6.18	5.86	6.51	6.31	6.26	6.48
05/01/27	05/31/27	May 2027	60.01	54.09	64.96	57.96	59.78	54.82	64.45	59.27	65.47	59.98	6.47	6.31	6.09	6.17	6.23	6.14	6.13	5.90	6.49	6.29	6.25	6.43
06/01/27	06/30/27	Jun 2027	59.68	56.71	68.02	58.87	59.19	54.14	64.41	61.06	65.65	60.71	6.59	6.40	6.18	6.26	6.32	6.24	6.21	6.02	6.58	6.38	6.33	6.50
07/01/27	07/31/27	Jul 2027	74.01	60.73	84.55	63.00	73.57	57.91	78.89	64.90	81.83	64.39	6.65	6.47	6.27	6.35	6.41	6.31	6.24	6.05	6.68	6.48	6.43	6.54
08/01/27	08/31/27	Aug 2027	76.78	61.82	84.69	62.91	75.83	59.20	80.99	65.19	84.52	64.78	6.69	6.58	6.35	6.39	6.49	6.37	6.37	6.09	6.72	6.52	6.47	6.67
09/01/27	09/30/27	Sep 2027	68.64	60.04	69.70	60.31	68.20	57.92	72.93	63.60	73.27	63.25	6.62	6.61	6.37	6.44	6.56	6.45	6.43	6.13	6.77	6.57	6.52	6.73
10/01/27	10/31/27	Oct 2027	67.19	59.67	71.41	60.22	66.50	57.18	71.51	62.33	71.89	61.93	6.66	6.65	6.39	6.47	6.59	6.47	6.46	6.12	6.80	6.60	6.55	6.77
11/01/27	11/30/27	Nov 2027	71.49	61.39	69.41	60.55	70.83	63.09	72.92	63.93	72.30	63.17	6.75	6.79	6.52	6.60	6.78	6.68	6.68	6.26	6.93	6.73	6.68	7.00
12/01/27	12/31/27	Dec 2027	78.81	64.44	67.89	61.89	77.72	66.35	73.51	66.00	72.63	65.50	6.94	7.05	6.76	6.87	7.05	6.94	6.94	6.41	7.20	7.00	6.95	7.28
01/01/28	01/31/28	Jan 2028	69.43	63.66	70.59	63.63	69.69	61.42	71.55	66.45	70.97	65.92	6.99	7.06	6.76	6.91	7.14	7.04	7.04	6.53	7.24	7.04	6.99	7.38
02/01/28	02/29/28	Feb 2028	68.14	62.76	69.87	63.16	66.55	60.25	70.14	66.19	70.67	65.87	7.01	7.08	6.77	6.93	7.12	7.02	7.02	6.56	7.27	7.06	7.01	7.36
03/01/28	03/31/28	Mar 2028	60.90	59.68	61.03	58.85	59.75	57.06	65.66	62.25	64.87	62.27	6.51	6.56	6.27	6.40	6.55	6.45	6.45	6.03	6.73	6.53	6.48	6.79
04/01/28	04/30/28	Apr 2028	62.16	58.37	62.85	58.48	60.65	56.08	65.49	61.84	65.78	61.48	6.44	6.37	6.14	6.22	6.31	6.22	6.22	5.88	6.54	6.34	6.29	6.52
05/01/28	05/31/28	May 2028	59.15	53.54	65.50	58.41	59.28	54.72	64.28	59.39	65.35	60.01	6.49	6.36	6.13	6.21	6.28	6.18	6.18	5.93	6.54	6.34	6.29	6.48
06/01/28	06/30/28	Jun 2028	59.86	57.30	68.47	59.52	59.58	54.52	64.36	61.46	66.35	61.26	6.59	6.45	6.22	6.29	6.36	6.26	6.23	6.03	6.62	6.42	6.37	6.53
07/01/28	07/31/28	Jul 2028	74.99	61.50	85.21	63.65	74.65	58.97	79.88	65.29	82.83	65.13	6.66	6.52	6.32	6.38	6.46	6.33	6.26	6.07	6.71	6.51	6.46	6.56
08/01/28	08/31/28	Aug 2028	77.46	62.81	84.98	63.14	76.73	60.16	81.95	65.44	85.12	65.24	6.70	6.63	6.39	6.43	6.54	6.41	6.41	6.10	6.76	6.56	6.51	6.71
09/01/28	09/30/28	Sep 2028	69.83	61.14	70.53	61.11	69.16	59.37	73.91	64.48	74.04	64.03	6.64	6.66	6.39	6.48	6.60	6.47	6.47	6.16	6.81	6.61	6.56	6.77
10/01/28	10/31/28	Oct 2028	68.86	60.64	73.36	60.81	68.28	58.59	73.16	63.30	73.49	63.15	6.67	6.69	6.42	6.51	6.64	6.50	6.50	6.14	6.84	6.64	6.59	6.80
11/01/28	11/30/28	Nov 2028	73.70	62.99	70.97	61.95	73.29	63.92	74.51	65.62	73.93	65.00	6.80	6.88	6.57	6.71	6.95	6.82	6.82	6.37	7.03	6.83	6.79	7.15
12/01/28	12/31/28	Dec 2028	79.32	66.20	68.84	63.42	78.49	67.65	74.49	67.63	73.56	66.97	7.00	7.17	6.85	6.92	7.23	7.11	7.11	6.51	7.25	7.05	7.00	7.45
01/01/29	01/31/29	Jan 2029	71.95	66.77	72.54	65.97	70.77	64.39	74.15	69.06	73.53	68.29	7.29	7.35	7.04	7.19	7.50	7.38	7.38	6.82	7.53	7.33	7.27	7.73
02/01/29	02/28/29	Feb 2029	70.59	66.53	72.74	66.02	68.81	63.33	73.06	69.42	72.98	68.76	7.29	7.40	7.08	7.21	7.52	7.40	7.40	6.84	7.55	7.35	7.29	7.74
03/01/29	03/31/29	Mar 2029	66.54	63.41	64.63	62.46	63.66	60.57	69.10	66.28	68.30	65.76	6.93	6.99	6.68	6.81	7.01	6.90	6.90	6.45	7.15	6.95	6.90	7.23
04/01/29	04/30/29	Apr 2029	65.41	61.63	66.59	61.82	64.03	59.61	68.81	64.94	69.10	64.70	6.87	6.81	6.57	6.66	6.75	6.66	6.66	6.32	6.99	6.79	6.74	6.96
05/01/29	05/31/29	May 2029	63.63	58.47	69.14	61.86	63.11	58.61	68.14	62.91	69.07	63.62	6.91	6.78	6.55	6.62	6.70	6.61	6.61	6.36	6.95	6.75	6.70	6.91
06/01/29	06/30/29	Jun 2029	63.87	61.37	72.16	63.16	62.94	58.05	68.27	65.24	69.82	64.74	7.01	6.87	6.63	6.70	6.78	6.67	6.66	6.45	7.03	6.83	6.78	6.95
07/01/29	07/31/29	Jul 2029	79.47	64.88	90.74	67.52	79.23	62.30	84.28	69.14	87.41	68.76	7.09	6.96	6.75	6.80	6.90	6.77	6.68	6.48	7.13	6.93	6.88	6.98
08/01/29	08/31/29	Aug 2029	81.75	65.87	89.40	66.82	81.03	63.64	86.36	69.33	89.02	68.81	7.14	7.05	6.81	6.86	6.98	6.86	6.85	6.53	7.19	6.99	6.94	7.15
09/01/29	09/30/29	Sep 2029	74.04	65.14	74.97	65.15	73.47	63.15	78.07	68.13	78.60	68.07	7.09	7.11	6.82	6.92	7.05	6.91	6.91	6.59	7.25	7.05	7.00	7.21
10/01/29	10/31/29	Oct 2029	71.42	64.16	74.83	64.24	70.83	61.68	75.57	66.73	76.01	66.42	7.12	7.14	6.84	6.95	7.08	6.95	6.94	6.58	7.28	7.08	7.03	7.24
11/01/29	11/30/29	Nov 2029	76.81	66.55	73.87	65.45	76.13	66.97	77.55	68.82	76.86	67.87	7.19	7.33	7.01	7.08	7.40	7.25	7.25	6.78	7.41	7.21	7.16	7.58
12/01/29	12/31/29	Dec 2029	84.67	71.16	73.78	68.07	84.44	72.33	79.92	72.47	79.01	71.58	7.43	7.80	7.26	7.33	7.82	7.71	7.71	6.90	7.66	7.46	7.41	8.05
01/01/30	01/31/30	Jan 2030	74.69	69.21	75.73	68.36	74.02	66.65	76.66	71.34	76.04	70.68	7.58	7.62	7.30	7.47	7.72	7.60	7.60	7.03	7.81	7.61	7.55	7.94
02/01/30	02/28/30	Feb 2030	72.96	68.47	73.91	67.82	70.90	65.08	74.90	70.86	74.95	70.21	7.56	7.60	7.27	7.43	7.68	7.56	7.56	7.00	7.77	7.57	7.52	7.90
03/01/30	03/31/30	Mar 2030	65.87	64.54	65.87	63.70	64.97	62.25	70.43	67.17	69.62	66.92	7.09	7.10	6.80	6.94	7.09	6.97	6.97	6.50	7.27	7.07	7.02	7.30
04/01/30	04/30/30	Apr 2030	67.77	63.35	68.17	63.01	66.06	61.37	70.82	66.63	71.16	65.93	7.02	6.95	6.71	6.81	6.89	6.80	6.80	6.45	7.13	6.93	6.89	7.10
05/01/30	05/31/30	May 2030	64.59	58.90	70.77	63.37	63.78	59.01	69.18	64.27	70.59	65.43	7.07	6.93	6.69	6.78	6.85	6.73	6.73	6.43	7.11	6.91	6.86	7.03
06/01/30	06/30/30	Jun 2030	65.11	63.13	73.54	64.81	64.37	59.85	69.37	66.85	70.66	65.86	7.17	7.01	6.78	6.87	6.94	6.82	6.80	6.54	7.20	7.00	6.95	7.10
07/01/30	07/31/30	Jul 2030	81.55	66.53	92.23	68.78	81.01	64.30	85.88	70.10	88.77	70.00	7.27	7.10	6.88	6.96	7.04	6.93	6.92	6.60	7.29	7.09	7.04	7.22
08/01/30	08/31/30	Aug 2030	83.49	67.57	91.03	68.54	82.67	65.37	87.77	70.83	90.41	70.43	7.32	7.20	6.95	7.02	7.11	6.97	6.97	6.64	7.35	7.15	7.10	7.27
09/01/30	09/30/30	Sep 2030	75.10	66.35	75.79	66.19	74.30	64.50	78.93	69.31	79.34	68.76	7.26	7.23	6.97	7.05	7.17	7.05	7.03	6.68	7.38	7.18	7.12	7.33
10/01/30	10/31/30	Oct 2030	72.63	65.57	75.66	65.53	71.80	63.40	76.65	67.91	77.00	67.23	7.29	7.26	7.00	7.08	7.21	7.08	7.08	6.69	7.41	7.21	7.16	7.39
11/01/30	11/30/30	Nov 2030	77.98	67.70	74.50	66.31	77.53	68.33	78.20	69.75	77.53	68.84	7.40	7.43	7.11	7.24	7.45	7.33	7.33	6.86	7.57	7.37	7.32	7.65
12/01/30	12/31/30	Dec 2030	85.44	71.33	73.75	68.00	85.78	72.86	79.71	72.02	78.76	71.19	7.63	7.69	7.36	7.54	7.79	7.68	7.68	7.03	7.87	7.67	7.62	8.01
01/01/31	01/31/31	Jan 2031	75.21	70.31	76.58	69.08	74.88	68.03	77.01	72.23	76.55	71.47	7.63	7.67	7.33	7.53	7.79	7.68	7.68	7.03	7.87	7.67	7.61	8.02
02/01/31	02/28/31	Feb 2031	73.75	68.94	75.05	68.57	71.04	66.19	75.53	71.70	75.31	70.97	7.61	7.65	7.31	7.48	7.72	7.58	7.58	7.00	7.82	7.62	7.56	7.92

03/01/31	03/31/31	Mar 2031	66.22	65.16	66.51	64.38	65.20	63.02	71.01	67.80	70.30	67.44	7.15	7.13	6.83	6.95	7.10	6.97	6.97	6.48	7.29	7.09	7.03	7.30
04/01/31	04/30/31	Apr 2031	68.28	64.12	69.25	64.04	66.88	62.26	71.85	67.52	72.17	66.90	7.09	7.02	6.77	6.85	6.93	6.83	6.83	6.45	7.18	6.98	6.93	7.14
05/01/31	05/31/31	May 2031	66.75	61.53	72.18	64.61	65.88	61.25	70.94	65.49	72.07	66.05	7.12	6.99	6.74	6.83	6.90	6.80	6.80	6.48	7.16	6.96	6.91	7.10
06/01/31	06/30/31	Jun 2031	66.92	63.94	75.13	65.73	65.64	61.05	71.16	67.46	72.38	66.96	7.24	7.07	6.84	6.92	6.99	6.90	6.90	6.57	7.25	7.05	7.00	7.20
07/01/31	07/31/31	Jul 2031	83.01	67.34	93.58	69.74	82.59	65.38	87.34	71.05	90.35	70.97	7.33	7.17	6.95	7.03	7.11	6.99	6.97	6.65	7.36	7.16	7.11	7.27
08/01/31	08/31/31	Aug 2031	84.51	68.29	92.36	69.50	83.77	66.43	88.79	71.66	91.71	71.37	7.37	7.24	6.98	7.04	7.15	7.01	6.99	6.66	7.37	7.17	7.12	7.29
09/01/31	09/30/31	Sep 2031	76.02	67.36	76.73	66.99	75.33	65.49	79.78	70.15	80.18	69.57	7.32	7.29	7.03	7.09	7.23	7.09	7.05	6.72	7.43	7.22	7.17	7.35
10/01/31	10/31/31	Oct 2031	73.56	66.61	76.93	66.58	72.55	64.07	77.70	69.09	78.05	68.40	7.36	7.34	7.06	7.14	7.28	7.13	7.13	6.73	7.47	7.27	7.22	7.43
11/01/31	11/30/31	Nov 2031	80.23	69.98	77.06	68.52	79.76	70.63	80.63	71.94	79.99	71.06	7.57	7.61	7.27	7.42	7.68	7.54	7.54	7.04	7.74	7.54	7.49	7.86
12/01/31	12/31/31	Dec 2031	92.75	78.41	80.41	74.88	94.12	79.75	86.81	78.22	85.88	77.59	8.42	8.60	8.19	8.37	8.70	8.59	8.59	7.80	8.70	8.50	8.45	8.93
01/01/32	01/31/32	Jan 2032	76.70	72.13	77.70	70.79	76.60	69.79	78.64	73.71	77.93	72.96	7.78	7.82	7.48	7.68	7.95	7.83	7.83	7.17	8.02	7.82	7.76	8.17
02/01/32	02/29/32	Feb 2032	75.69	70.40	76.27	70.25	72.85	67.47	77.02	73.25	77.05	72.45	7.76	7.80	7.46	7.63	7.87	7.73	7.73	7.15	7.97	7.77	7.71	8.08
03/01/32	03/31/32	Mar 2032	67.86	66.75	67.65	65.07	66.32	64.34	71.95	69.14	71.18	68.25	7.29	7.28	6.96	7.09	7.24	7.11	7.11	6.61	7.43	7.23	7.17	7.44
04/01/32	04/30/32	Apr 2032	69.34	65.59	70.05	65.51	67.08	64.10	72.85	68.81	72.90	68.14	7.23	7.16	6.91	6.99	7.07	6.97	6.97	6.58	7.31	7.11	7.06	7.27
05/01/32	05/31/32	May 2032	67.46	61.64	73.08	66.23	66.62	62.06	71.15	66.41	72.16	66.81	7.26	7.13	6.88	6.97	7.04	6.94	6.94	6.61	7.30	7.10	7.05	7.24
06/01/32	06/30/32	Jun 2032	68.34	64.83	76.07	67.02	66.89	62.45	72.26	68.40	73.38	67.92	7.38	7.21	6.97	7.06	7.13	7.04	7.04	6.70	7.39	7.19	7.14	7.34
07/01/32	07/31/32	Jul 2032	84.27	68.83	93.81	71.00	83.63	66.86	88.50	72.44	91.04	72.17	7.48	7.31	7.09	7.17	7.25	7.12	7.11	6.78	7.50	7.30	7.25	7.41
08/01/32	08/31/32	Aug 2032	86.34	69.37	93.60	70.53	85.51	67.54	90.71	72.75	93.16	72.35	7.52	7.38	7.12	7.18	7.29	7.15	7.13	6.80	7.51	7.31	7.26	7.43
09/01/32	09/30/32	Sep 2032	76.94	68.59	77.61	68.29	76.27	66.66	80.80	71.53	81.15	70.91	7.46	7.44	7.17	7.24	7.38	7.23	7.19	6.85	7.57	7.37	7.32	7.49
10/01/32	10/31/32	Oct 2032	75.88	68.30	79.64	68.24	75.24	66.18	79.91	70.55	80.24	69.86	7.50	7.48	7.21	7.28	7.42	7.28	7.27	6.87	7.61	7.41	7.36	7.58
11/01/32	11/30/32	Nov 2032	82.22	71.54	78.34	69.42	80.38	71.45	81.68	73.10	81.03	72.09	7.72	7.76	7.42	7.56	7.83	7.69	7.69	7.18	7.89	7.69	7.64	8.01
12/01/32	12/31/32	Dec 2032	94.07	80.17	81.53	76.55	95.51	81.04	88.34	80.51	87.39	79.60	8.59	8.78	8.35	8.53	8.88	8.76	8.76	7.95	8.87	8.67	8.61	9.10
01/01/33	01/31/33	Jan 2033	77.81	73.57	79.39	72.41	76.49	71.50	80.24	75.23	79.53	74.42	7.94	7.98	7.63	7.83	8.11	7.99	7.99	7.31	8.17	7.97	7.92	8.33
02/01/33	02/28/33	Feb 2033	77.00	72.25	77.74	71.61	74.34	69.30	78.02	74.85	78.34	74.05	7.92	7.95	7.61	7.79	8.03	7.89	7.89	7.29	8.12	7.92	7.87	8.23
03/01/33	03/31/33	Mar 2033	69.00	68.45	69.31	67.16	68.33	65.84	72.95	70.87	72.77	70.01	7.44	7.42	7.10	7.23	7.39	7.25	7.25	6.74	7.57	7.37	7.32	7.59
04/01/33	04/30/33	Apr 2033	70.49	67.19	71.48	67.16	68.34	65.50	74.28	70.05	74.27	69.19	7.38	7.31	7.05	7.13	7.21	7.11	7.11	6.71	7.45	7.25	7.20	7.41
05/01/33	05/31/33	May 2033	69.17	64.66	75.33	67.99	68.77	64.12	73.35	68.48	74.75	69.14	7.41	7.27	7.01	7.11	7.18	7.08	7.08	6.74	7.44	7.24	7.19	7.38
06/01/33	06/30/33	Jun 2033	70.28	67.36	78.79	69.01	68.64	64.07	74.25	70.18	75.72	69.79	7.53	7.36	7.11	7.20	7.28	7.18	7.18	6.84	7.53	7.33	7.28	7.48
07/01/33	07/31/33	Jul 2033	85.54	69.94	96.82	73.11	84.90	68.54	89.93	74.10	93.18	73.63	7.63	7.46	7.23	7.31	7.40	7.27	7.25	6.91	7.64	7.44	7.39	7.55
08/01/33	08/31/33	Aug 2033	87.85	70.45	96.16	72.20	87.21	68.97	92.20	73.83	94.72	73.53	7.67	7.53	7.27	7.33	7.43	7.30	7.27	6.93	7.66	7.45	7.40	7.57
09/01/33	09/30/33	Sep 2033	77.25	70.10	78.70	70.03	76.92	68.36	81.37	72.84	81.91	72.13	7.61	7.58	7.31	7.38	7.52	7.38	7.34	6.99	7.71	7.51	7.46	7.64
10/01/33	10/31/33	Oct 2033	76.56	69.99	80.18	70.00	75.91	67.76	80.44	71.59	80.71	70.80	7.65	7.63	7.35	7.43	7.57	7.42	7.42	7.01	7.76	7.56	7.51	7.72
11/01/33	11/30/33	Nov 2033	81.19	73.14	79.66	71.20	80.13	72.34	82.48	74.51	82.30	73.54	7.87	7.91	7.57	7.72	7.99	7.84	7.84	7.32	8.04	7.84	7.79	8.17
12/01/33	12/31/33	Dec 2033	94.42	81.80	82.56	78.04	96.34	82.73	89.23	81.72	88.29	80.84	8.76	8.95	8.52	8.71	9.06	8.94	8.94	8.11	9.04	8.84	8.79	9.27
01/01/34	01/31/34	Jan 2034	79.90	75.63	81.25	74.02	77.97	72.93	81.45	76.77	81.12	76.03	8.10	8.14	7.78	7.99	8.27	8.15	8.15	7.46	8.33	8.13	8.07	8.49
02/01/34	02/28/34	Feb 2034	78.20	74.38	79.11	73.47	75.19	70.96	79.47	76.62	79.87	75.78	8.07	8.11	7.76	7.94	8.19	8.04	8.04	7.43	8.28	8.08	8.02	8.39
03/01/34	03/31/34	Mar 2034	70.93	70.10	71.24	69.25	70.23	67.76	74.85	72.56	74.85	72.17	7.58	7.57	7.24	7.38	7.54	7.39	7.39	6.88	7.72	7.51	7.46	7.73
04/01/34	04/30/34	Apr 2034	72.00	68.88	73.40	68.99	70.16	66.95	75.74	71.77	75.87	71.03	7.53	7.45	7.19	7.27	7.36	7.25	7.25	6.84	7.60	7.40	7.35	7.55
05/01/34	05/31/34	May 2034	69.21	63.34	76.66	69.69	68.47	64.42	73.51	68.45	74.70	69.28	7.56	7.42	7.15	7.25	7.32	7.22	7.22	6.87	7.58	7.38	7.33	7.52
06/01/34	06/30/34	Jun 2034	70.54	68.80	79.08	70.66	69.33	65.20	74.70	71.54	75.87	70.76	7.68	7.50	7.25	7.35	7.42	7.32	7.32	6.97	7.68	7.48	7.43	7.62
07/01/34	07/31/34	Jul 2034	87.15	71.90	97.98	74.59	86.82	70.51	91.52	75.43	94.27	75.00	7.78	7.61	7.38	7.46	7.55	7.41	7.40	7.05	7.79	7.59	7.54	7.70
08/01/34	08/31/34	Aug 2034	89.70	72.35	96.89	73.54	89.01	71.10	93.99	75.52	95.83	75.08	7.83	7.68	7.41	7.47	7.58	7.44	7.42	7.07	7.80	7.60	7.55	7.72
09/01/34	09/30/34	Sep 2034	79.76	72.30	80.89	71.92	79.20	70.67	83.48	74.47	83.96	73.74	7.77	7.74	7.46	7.53	7.68	7.52	7.48	7.13	7.86	7.66	7.61	7.78
10/01/34	10/31/34	Oct 2034	78.08	71.76	81.65	71.47	77.77	69.58	82.50	73.32	82.85	72.62	7.81	7.78	7.50	7.58	7.72	7.57	7.56	7.15	7.91	7.71	7.66	7.87
11/01/34	11/30/34	Nov 2034	82.88	74.69	81.10	72.41	82.57	74.14	84.53	75.82	84.07	74.87	8.03	8.07	7.72	7.87	8.15	8.00	8.00	7.47	8.20	8.00	7.95	8.32
12/01/34	12/31/34	Dec 2034	97.71	84.32	84.53	79.29	98.53	85.10	91.55	83.28	90.55	82.38	8.94	9.13	8.69	8.88	9.24	9.12	9.12	8.27	9.21	9.01	8.96	9.45
01/01/35	01/31/35	Jan 2035	82.50	77.53	83.39	75.19	80.26	75.11	82.90	78.11	82.44	77.16	8.26	8.30	7.94	8.15	8.44	8.31	8.31	7.61	8.49	8.29	8.23	8.65
02/01/35	02/28/35	Feb 2035	80.37	76.70	81.02	74.81	77.43	73.60	81.20	77.83	81.45	76.87	8.24	8.28	7.91	8.10	8.36	8.21	8.21	7.58	8.44	8.23	8.18	8.55
03/01/35	03/31/35	Mar 2035	72.38	71.93	72.11	70.08	71.82	69.61	76.03	74.06	75.77	73.12	7.74	7.72	7.39	7.53	7.69	7.54	7.54	7.02	7.86	7.66	7.61	7.88
04/01/35	04/30/35	Apr 2035	73.35	70.65	74.83	70.62	71.47	68.69	77.23	73.15	77.39	72.24	7.68	7.60	7.33	7.41	7.50	7.40	7.40	6.98	7.74	7.54	7.49	7.70
05/01/35	05/31/35	May 2035	72.17	67.62	79.08	71.46	71.69	66.39	76.04	70.51	77.28	71.18	7.71	7.57	7.30	7.40	7.47	7.36	7.36	7.01	7.72	7.52	7.47	7.66
06/01/35	06/30/35	Jun 2035	72.71	69.92	81.60	72.47	70.87	66.50	76.89	73.31	77.87	72.74	7.83	7.65	7.40	7.50	7.57	7.47	7.47	7.11	7.82	7.62	7.57	7.77
07/01/35	07/31/35	Jul 2035	89.28	73.35	100.94	76.41	89.12	71.70	93.70	77.31	96.56	76.70	7.93	7.76	7.52	7.61	7.70	7.56	7.55	7.19	7.94	7.74	7.69	7.85
08/01/35	08/31/35	Aug 2035	91.58	73.93	99.70	75.51	91.25	72.58	95.84	77.20	97.84	76.73	7.98	7.84	7.56	7.62	7.73	7.59	7.57	7.21	7.95	7.75	7.70	7.87
09/01/35	09/30/35	Sep 2035	82.15	74.01	83.26	73.79	81.19	72.19	85.65	76.76	86.23	76.02	7.92	7.89	7.61	7.68	7.83	7.68	7.63	7.27	8.01	7.81	7.76	7.93
10/01/35	10/31/35	Oct 2035	80.02	73.42	83.67	73.19	79.51	70.97	84.31	74.78	84.67	73.99	7.96	7.94	7.65	7.73	7.88	7.72	7.72	7.29	8.06	7.86	7.81	8.02
11/01/35	11/30/35	Nov 2035	84.77	76.72	83.18	74.15	84.29	76.44	85.80	77.46	85.36	76.46	8.19	8.23	7.87	8.03	8.31	8.16	8.16	7.62	8.35	8.15	8.11	8.48
12/01/35	12/31/35	Dec 2035	99.46	85.87	86.32	81.10	100.84	86.68	93.45	84.99	92.44	84.14	9.11	9.31	8.86	9.06	9.42	9.30	9.30	8.44	9.39	9.19	9.14	9.64
01/01/36	01/31/36	Jan 2036	83.99	79.19	85.21	77.03	82.50	76.84	84.69	79.81	84.24	78.85	8.42	8.46	8.10	8.31	8.60	8.48	8.48	7.76	8.65	8.45	8.40	8.82
02/01/36	02/29/36	Feb 2036	82.31	78.70	83.13	76.92	79.38	75.45	83.22	79.54	83.53	78.85	8.40	8.44	8.07	8.26	8.52	8.37	8.37	7.73	8.60	8.40	8.34	8.71
03/01/36	03/31/36	Mar 2036	74.05	73.72	74.29	72.41	73.12	71.41	78.07	75.95	77.94	75.03	7.89	7.88	7.54	7.68	7.84	7.69	7.69	7.16	8.01	7.81	7.76	8.03
04/01/36	04/30/36	Apr 2036	75.10	72.39	77.05	72.33	73.85	70.09	78.93	74.70	79.21	73.75	7.83	7.75	7.48	7.56	7.65	7.54	7.54	7.12	7.89	7.69	7.64	7.85
05/01/36	05/31/36	May 2036	73.30	67.52	80.33	73.31	72.72	67.31	77.37	71.91	78.78	72.73	7.86	7.72	7.44	7.54	7.62	7.51	7.51	7.15	7.87	7.67	7.62	7.81
06/01/36	06/30/36	Jun 2036	74.29	71.20	83.20	74.30	72.63	67.58	78.46	75.08	79.71	74.37	7.99	7.81	7.55	7.65	7.72	7.62	7.62	7.25	7.97	7.77	7.72	7.92
07/01/36	07/31/36	Jul 2036	91.19	74.97	102.66	78.01	91.00	73.10	95.55	78.60	98.26	78.06	8.09	7.91	7.67	7.76	7.85	7.71	7.70	7.34	8.09	7.89	7.84	8.00
08/01/36	08/31/36	Aug 2036	93.34	75.81	101.09	77.60	92.98	74.41	97.46	79.06	99.51	78.54	8.14	7.99	7.71	7.77	7.89	7.74	7.72	7.36	8.10	7.90	7.85	8.02
09/01/36	09/30/36	Sep 2036	83.59	75.56	84.65	75.38	82.52	73.56	86.99	77.82	87.55	76.95	8.08	8.05	7.76	7.83	7.99	7.83	7.78	7.42	8.16	7.96	7.91	8.09
10/01/36	10/31/36	Oct 2036	81.51	75.22	84.92	74.99	81.17	72.75	85.63	76.10	85.98	75.15	8.12	8.10	7.80	7.88	8.04	7.88	7.87	7.44	8.21	8.01	7.96	8.18
11/01/36	11/30/36	Nov 2036	87.22	78.61	84.89	76.43	86.05	78.41	87.93	79.16	87.31	78.17	8.36	8.40	8.03	8.19	8.47	8.32	8.32	7.77	8.51	8.31	8.27	8.65
12/01/36	12/31/36	Dec 2036	102.26	87.73	88.32	82.95	103.39	88.25	95.48	86.88	94.47	86.01	9.30	9.50	9.04	9.24	9.61	9.49	9.49	8.61	9.57	9.37	9.32	9.82
01/01/37	01/31/37	Jan 2037	87.35	81.43	87.09	79.13	85.47	79.19	86.79	81.51	86.34	80.53	8.59	8.63	8.26	8.48	8.78	8.65	8.65	7.92	8.82	8.62	8.56	8.99
02/01/37	02/28/37	Feb 2037	84.22	80.55	85.46	78.63	81.62	77.38	85.23	81.69	85.52	80.70	8.57	8.61	8.23	8.43	8.69	8.54	8.54	7.89	8.77	8.56	8.51	8.88
03/01/37	03/31/37	Mar 2037	76.15	75.62	76.25	74.25	75.13	72.96	80.64	77.90	80.03	77.00	8.05	8.03	7.69	7.83	8.00	7.84	7.84	7.30	8.17	7.96	7.91	8.18

04/01/37	04/30/37	Apr 2037	77.01	74.19	79.59	74.68	75.16	71.48	80.73	76.24	80.97	75.25	7.99	7.91	7.63	7.71	7.81	7.69	7.69	7.26	8.04	7.84	7.79	8.00
05/01/37	05/31/37	May 2037	76.32	71.85	83.05	75.44	75.79	69.74	80.13	74.12	81.21	74.49	8.02	7.87	7.59	7.69	7.77	7.66	7.66	7.29	8.02	7.82	7.77	7.96
06/01/37	06/30/37	Jun 2037	76.56	73.04	86.10	76.43	74.80	69.26	80.83	76.76	81.76	76.23	8.15	7.96	7.70	7.80	7.88	7.77	7.77	7.40	8.13	7.93	7.88	8.07
07/01/37	07/31/37	Jul 2037	93.74	76.52	105.70	80.51	93.66	74.97	97.99	80.52	100.88	80.00	8.26	8.07	7.83	7.92	8.01	7.87	7.85	7.48	8.25	8.04	7.99	8.15
08/01/37	08/31/37	Aug 2037	95.83	77.83	104.30	79.94	95.46	76.49	100.05	80.96	102.36	80.44	8.30	8.15	7.86	7.93	8.05	7.90	7.87	7.50	8.26	8.06	8.01	8.17
09/01/37	09/30/37	Sep 2037	85.79	77.26	86.95	77.34	84.98	75.28	89.37	79.47	89.86	78.58	8.24	8.21	7.91	7.99	8.15	7.99	7.94	7.57	8.32	8.12	8.07	8.24
10/01/37	10/31/37	Oct 2037	84.44	77.18	87.54	77.24	83.79	74.54	88.34	77.88	88.65	76.95	8.29	8.26	7.95	8.04	8.20	8.03	8.03	7.58	8.37	8.17	8.12	8.33
11/01/37	11/30/37	Nov 2037	89.25	80.75	87.30	78.41	87.19	80.23	90.50	81.61	89.81	80.59	8.52	8.57	8.19	8.35	8.64	8.49	8.49	7.93	8.68	8.48	8.43	8.81
12/01/37	12/31/37	Dec 2037	103.00	89.80	90.20	84.78	104.10	89.15	96.92	88.82	95.92	87.82	9.48	9.69	9.22	9.42	9.80	9.68	9.68	8.78	9.76	9.55	9.50	10.01
01/01/38	01/31/38	Jan 2038	91.74	83.64	89.85	81.67	89.72	81.87	88.72	83.42	88.32	82.45	8.76	8.81	8.42	8.65	8.95	8.82	8.82	8.07	8.99	8.79	8.73	9.16
02/01/38	02/28/38	Feb 2038	87.11	82.78	87.79	80.71	84.84	79.66	87.35	83.42	87.61	82.46	8.74	8.78	8.40	8.60	8.87	8.71	8.71	8.05	8.93	8.73	8.68	9.05
03/01/38	03/31/38	Mar 2038	77.97	77.55	78.11	76.12	78.18	75.16	81.80	78.68	81.68	77.71	8.21	8.20	7.84	7.99	8.16	8.00	8.00	7.45	8.32	8.12	8.07	8.34
04/01/38	04/30/38	Apr 2038	77.69	75.94	82.05	76.22	76.79	72.82	81.81	78.24	82.22	77.24	8.15	8.07	7.78	7.87	7.96	7.85	7.85	7.41	8.19	8.00	7.95	8.15
05/01/38	05/31/38	May 2038	76.93	70.64	85.19	77.40	76.28	70.62	80.69	75.14	81.69	75.72	8.18	8.03	7.74	7.85	7.93	7.81	7.81	7.44	8.17	7.98	7.93	8.11
06/01/38	06/30/38	Jun 2038	78.17	74.47	88.42	78.44	76.56	70.99	82.55	78.01	83.66	77.59	8.31	8.12	7.85	7.95	8.03	7.92	7.92	7.55	8.28	8.08	8.03	8.22
07/01/38	07/31/38	Jul 2038	95.74	78.65	108.11	82.68	95.24	76.90	99.85	82.26	102.91	81.81	8.42	8.23	7.98	8.07	8.17	8.02	8.01	7.63	8.40	8.20	8.15	8.31
08/01/38	08/31/38	Aug 2038	98.72	79.65	107.77	81.92	98.59	78.61	103.04	82.66	105.61	82.17	8.47	8.32	8.02	8.09	8.21	8.06	8.03	7.65	8.42	8.22	8.17	8.33
09/01/38	09/30/38	Sep 2038	88.44	79.57	89.25	79.36	87.21	77.95	91.75	81.53	92.22	80.72	8.41	8.37	8.07	8.15	8.31	8.15	8.10	7.72	8.48	8.28	8.23	8.40
10/01/38	10/31/38	Oct 2038	88.80	79.25	91.02	79.10	87.32	76.98	92.01	79.73	92.03	78.84	8.45	8.43	8.11	8.20	8.36	8.19	8.19	7.74	8.53	8.33	8.28	8.49
11/01/38	11/30/38	Nov 2038	93.42	83.08	89.29	80.21	91.84	84.21	91.47	82.78	91.27	81.77	8.69	8.74	8.35	8.52	8.82	8.66	8.66	8.09	8.85	8.65	8.60	8.98
12/01/38	12/31/38	Dec 2038	105.00	91.83	92.77	86.72	105.21	93.03	99.51	90.68	98.51	89.68	9.67	9.88	9.40	9.61	10.00	9.87	9.87	8.95	9.95	9.74	9.69	10.21
01/01/39	01/31/39	Jan 2039	92.16	85.64	91.32	83.85	89.47	83.28	90.23	84.94	89.97	84.01	8.94	8.98	8.59	8.82	9.13	9.00	9.00	8.24	9.16	8.96	8.90	9.34
02/01/39	02/28/39	Feb 2039	89.03	84.53	89.47	82.55	85.42	81.44	89.03	85.26	89.29	84.27	8.92	8.96	8.57	8.77	9.04	8.88	8.88	8.21	9.11	8.90	8.85	9.22
03/01/39	03/31/39	Mar 2039	79.95	79.51	79.98	77.75	79.74	77.21	83.72	79.98	83.53	79.08	8.37	8.36	8.00	8.15	8.32	8.16	8.16	7.59	8.48	8.28	8.23	8.50
04/01/39	04/30/39	Apr 2039	79.75	77.64	83.67	78.13	78.47	74.26	84.06	79.42	84.36	78.46	8.31	8.23	7.93	8.03	8.12	8.00	8.00	7.56	8.35	8.15	8.10	8.31
05/01/39	05/31/39	May 2039	78.49	75.21	87.43	79.04	78.65	72.67	82.67	78.50	85.62	78.73	8.34	8.19	7.90	8.00	8.09	7.97	7.97	7.59	8.33	8.13	8.08	8.27
06/01/39	06/30/39	Jun 2039	80.76	76.60	90.89	80.43	79.16	72.53	84.96	80.04	86.14	79.55	8.48	8.28	8.01	8.11	8.20	8.08	8.08	7.70	8.44	8.24	8.19	8.38
07/01/39	07/31/39	Jul 2039	98.00	80.59	110.80	84.85	97.57	78.55	102.19	84.25	105.55	83.78	8.59	8.40	8.14	8.24	8.33	8.18	8.17	7.79	8.57	8.36	8.31	8.47
08/01/39	08/31/39	Aug 2039	100.81	81.15	110.05	83.63	100.63	80.11	105.21	84.44	107.52	83.89	8.64	8.48	8.18	8.25	8.37	8.22	8.19	7.81	8.58	8.38	8.33	8.49
09/01/39	09/30/39	Sep 2039	89.56	81.45	90.61	81.24	88.28	79.47	92.89	83.04	93.25	82.14	8.57	8.54	8.23	8.31	8.47	8.31	8.26	7.87	8.64	8.44	8.39	8.56
10/01/39	10/31/39	Oct 2039	88.79	81.06	92.18	81.02	87.99	78.60	92.44	80.98	92.65	79.98	8.62	8.59	8.28	8.36	8.53	8.36	8.35	7.89	8.70	8.50	8.44	8.66
11/01/39	11/30/39	Nov 2039	94.55	85.04	91.27	82.12	92.97	85.08	93.35	84.46	93.15	83.45	8.87	8.91	8.52	8.69	8.99	8.83	8.83	8.25	9.02	8.82	8.77	9.15
12/01/39	12/31/39	Dec 2039	106.34	93.75	94.44	88.54	106.90	95.04	100.57	92.39	99.58	91.39	9.87	10.08	9.59	9.80	10.20	10.07	10.07	9.13	10.14	9.94	9.88	10.40
01/01/40	01/31/40	Jan 2040	94.37	87.66	94.16	85.74	92.27	85.03	92.41	86.82	91.94	85.85	9.12	9.16	8.77	9.00	9.31	9.18	9.18	8.40	9.34	9.14	9.08	9.52
02/01/40	02/29/40	Feb 2040	89.48	86.62	91.25	84.28	87.31	83.47	91.14	86.75	91.22	85.74	9.09	9.14	8.74	8.94	9.23	9.06	9.06	8.37	9.28	9.08	9.02	9.40
03/01/40	03/31/40	Mar 2040	82.02	81.59	81.78	79.24	82.38	79.38	85.66	82.59	85.42	81.71	8.54	8.53	8.16	8.31	8.49	8.32	8.32	7.75	8.65	8.44	8.39	8.66
04/01/40	04/30/40	Apr 2040	82.77	79.64	86.31	80.01	81.40	76.23	87.07	82.05	87.44	81.12	8.48	8.39	8.09	8.19	8.28	8.16	8.16	7.71	8.51	8.31	8.26	8.47
05/01/40	05/31/40	May 2040	80.20	75.65	89.12	80.99	79.97	74.29	83.92	78.64	86.35	79.26	8.51	8.36	8.06	8.17	8.25	8.13	8.13	7.74	8.49	8.29	8.24	8.43
06/01/40	06/30/40	Jun 2040	82.11	78.31	92.25	82.44	81.08	74.90	86.29	81.82	87.43	81.35	8.65	8.45	8.17	8.28	8.36	8.24	8.24	7.85	8.60	8.40	8.35	8.54
07/01/40	07/31/40	Jul 2040	101.08	82.54	113.71	86.94	100.88	80.81	105.13	86.33	108.37	85.85	8.76	8.57	8.31	8.40	8.50	8.35	8.33	7.94	8.73	8.53	8.48	8.63
08/01/40	08/31/40	Aug 2040	103.30	83.39	112.45	85.80	103.48	82.64	107.77	86.63	109.96	86.03	8.81	8.65	8.35	8.41	8.54	8.38	8.35	7.96	8.74	8.54	8.49	8.65
09/01/40	09/30/40	Sep 2040	93.06	83.82	93.55	83.85	91.53	82.29	96.01	85.32	96.31	84.43	8.75	8.71	8.40	8.48	8.64	8.47	8.43	8.03	8.81	8.61	8.56	8.73
10/01/40	10/31/40	Oct 2040	90.69	83.13	93.27	82.70	90.18	80.57	94.66	83.17	94.94	82.23	8.79	8.77	8.44	8.53	8.70	8.53	8.52	8.05	8.86	8.66	8.61	8.82
11/01/40	11/30/40	Nov 2040	97.97	87.19	93.72	84.12	96.25	87.56	96.53	87.23	95.95	86.22	9.05	9.09	8.69	8.86	9.17	9.01	9.01	8.41	9.19	8.99	8.94	9.33
12/01/40	12/31/40	Dec 2040	109.44	96.43	96.88	90.48	109.02	97.85	103.78	94.50	102.78	93.47	10.06	10.28	9.78	10.00	10.40	10.27	10.27	9.32	10.33	10.13	10.08	10.60
01/01/41	01/31/41	Jan 2041	97.01	89.95	96.38	87.47	94.71	87.25	94.88	88.95	94.32	87.96	9.31	9.35	8.95	9.19	9.51	9.37	9.37	8.58	9.53	9.32	9.27	9.71
02/01/41	02/28/41	Feb 2041	91.96	88.08	93.62	86.37	89.68	85.76	93.65	89.18	93.93	88.20	9.28	9.33	8.92	9.13	9.42	9.25	9.25	8.55	9.47	9.27	9.21	9.59
03/01/41	03/31/41	Mar 2041	84.14	83.72	84.07	81.11	84.15	81.15	87.71	84.22	87.54	83.33	8.72	8.71	8.33	8.49	8.67	8.50	8.50	7.91	8.82	8.62	8.57	8.84
04/01/41	04/30/41	Apr 2041	83.95	81.64	89.13	82.87	81.55	78.07	88.08	82.23	88.22	81.36	8.65	8.57	8.26	8.36	8.46	8.34	8.34	7.87	8.68	8.48	8.44	8.64
05/01/41	05/31/41	May 2041	83.64	79.02	92.34	83.56	83.25	76.40	87.93	82.16	89.07	82.37	8.69	8.53	8.23	8.34	8.42	8.30	8.30	7.90	8.66	8.46	8.41	8.60
06/01/41	06/30/41	Jun 2041	84.30	80.46	94.62	84.85	83.01	77.04	88.38	83.56	89.59	83.07	8.83	8.63	8.34	8.45	8.53	8.42	8.42	8.02	8.78	8.58	8.53	8.72
07/01/41	07/31/41	Jul 2041	102.13	84.48	115.68	88.92	101.91	82.33	106.23	87.92	109.86	87.48	8.94	8.75	8.48	8.58	8.68	8.52	8.51	8.11	8.91	8.71	8.66	8.81
08/01/41	08/31/41	Aug 2041	104.60	85.50	114.37	88.28	104.71	84.73	109.19	88.59	111.41	88.02	9.00	8.83	8.52	8.59	8.72	8.56	8.53	8.13	8.92	8.72	8.67	8.83
09/01/41	09/30/41	Sep 2041	94.15	85.89	96.22	86.08	93.67	83.90	98.14	87.33	98.69	86.51	8.93	8.89	8.57	8.66	8.83	8.65	8.60	8.20	8.99	8.79	8.74	8.91
10/01/41	10/31/41	Oct 2041	92.31	85.30	95.17	85.07	91.73	82.78	96.38	85.01	96.76	84.09	8.98	8.95	8.62	8.71	8.88	8.70	8.70	8.22	9.04	8.84	8.79	9.00
11/01/41	11/30/41	Nov 2041	98.89	89.46	95.34	86.05	96.65	89.50	97.24	88.40	97.15	87.38	9.24	9.28	8.87	9.05	9.37	9.20	9.20	8.59	9.38	9.18	9.13	9.52
12/01/41	12/31/41	Dec 2041	111.44	98.54	99.07	92.43	111.42	99.48	104.92	96.41	103.97	95.39	10.27	10.50	9.99	10.21	10.62	10.48	10.48	9.51	10.54	10.34	10.29	10.82
01/01/42	01/31/42	Jan 2042	97.68	92.13	98.88	89.71	95.20	89.20	96.27	90.50	96.02	89.49	9.51	9.55	9.14	9.38	9.71	9.56	9.56	8.76	9.72	9.52	9.46	9.91
02/01/42	02/28/42	Feb 2042	95.19	91.24	95.81	88.72	91.50	87.80	95.77	91.24	95.85	90.17	9.48	9.52	9.11	9.32	9.62	9.44	9.44	8.73	9.66	9.46	9.40	9.79
03/01/42	03/31/42	Mar 2042	86.13	85.97	86.21	83.37	86.16	82.75	89.79	85.63	89.71	84.70	8.90	8.89	8.50	8.66	8.85	8.68	8.68	8.07	9.00	8.80	8.74	9.02
04/01/42	04/30/42	Apr 2042	85.31	83.06	88.70	82.67	82.45	78.75	89.48	84.12	89.56	83.15	8.84	8.75	8.44	8.53	8.64	8.51	8.51	8.03	8.86	8.66	8.61	8.81
05/01/42	05/31/42	May 2042	83.63	79.91	92.85	84.71	83.17	77.94	87.90	82.74	89.60	83.12	8.87	8.71	8.40	8.51	8.60	8.48	8.48	8.07	8.84	8.64	8.59	8.78
06/01/42	06/30/42	Jun 2042	86.02	82.33	96.80	86.85	85.00	79.04	90.24	85.28	91.37	84.84	9.02	8.81	8.52	8.63	8.71	8.59	8.59	8.19	8.95	8.75	8.70	8.89
07/01/42	07/31/42	Jul 2042	104.96	86.37	117.72	91.08	104.73	83.87	108.93	90.00	112.00	89.44	9.13	8.93	8.66	8.76	8.86	8.70	8.69	8.28	9.09	8.89	8.84	8.99
08/01/42	08/31/42	Aug 2042	107.37	88.13	116.51	90.54	107.38	86.93	111.57	90.94	113.82	90.34	9.19	9.02	8.70	8.77	8.90	8.74	8.71	8.30	9.10	8.90	8.85	9.01
09/01/42	09/30/42	Sep 2042	96.00	87.98	97.90	88.04	95.43	85.94	99.82	88.69	100.25	87.74	9.12	9.08	8.75	8.84	9.01	8.83	8.78	8.37	9.17	8.97	8.92	9.09
10/01/42	10/31/42	Oct 2042	94.31	87.60	96.83	86.95	93.21	84.82	98.14	86.71	98.36	85.72	9.17	9.14	8.80	8.89	9.07	8.89	8.88	8.39	9.23	9.02	8.97	9.19
11/01/42	11/30/42	Nov 2042	101.08	91.53	97.38	88.33	98.99	91.65	99.40	90.60	99.31	89.58	9.43	9.48	9.06	9.24	9.56	9.39	9.39	8.77	9.57	9.37	9.32	9.71
12/01/42	12/31/42	Dec 2042	113.19	101.11	101.38	94.31	113.89	101.79	106.74	98.51	105.82	97.49	10.49	10.72	10.20	10.42	10.84	10.70	10.70	9.71	10.76	10.56	10.50	11.04
01/01/43	01/31/43	Jan 2043	99.73	94.06	100.96	91.59	97.20	91.07	98.29	92.40	98.04	91.37	9.71	9.75	9.33	9.58	9.91	9.77	9.77	8.94	9.92	9.71	9.66	10.11
02/01/43	02/28/43	Feb 2043	97.19	93.16	97.82	90.58	93.42	89.64	97.78	93.16	97.86	92.06	9.68	9.72	9.30	9.52	9.82	9.64	9.64	8.91	9.86	9.65	9.60	9.99
03/01/43	03/31/43	Mar 2043	87.94	87.78	88.02	85.12	87.97	84.49	91.68	87.43	91.59	86.48	9.09	9.07	8.68	8.85	9.03	8.86	8.86	8.24	9.18	8.98	8.93	9.20
04/01/43	04/30/43	Apr 2043	87.10	84.80	90.56	84.41	84.18	80.40	91.36	85.89	91.44	84.90	9.02	8.93	8.61	8.71	8.82	8.69	8.69	8.20	9.04	8.84	8.79	8.99

	05/01/43	05/31/43	May 2043	85.39	81.59	94.80	86.49	84.92	79.58	89.75	84.48	91.48	84.87	9.06	8.89	8.58	8.69	8.78	8.65	8.65	8.24	9.02	8.82	8.77	8.95
	06/01/43	06/30/43	Jun 2043	87.83	84.06	98.83	88.67	86.79	80.70	92.14	87.07	93.29	86.62	9.21	8.99	8.69	8.81	8.90	8.77	8.77	8.36	9.14	8.94	8.89	9.07
	07/01/43	07/31/43	Jul 2043	107.16	88.18	120.19	92.99	106.93	85.63	111.22	91.89	114.35	91.32	9.32	9.12	8.84	8.94	9.05	8.88	8.87	8.45	9.27	9.07	9.02	9.17
	08/01/43	08/31/43	Aug 2043	109.62	89.98	118.96	92.44	109.64	88.76	113.91	92.85	116.21	92.24	9.38	9.21	8.88	8.96	9.09	8.92	8.89	8.48	9.29	9.08	9.03	9.19
	09/01/43	09/30/43	Sep 2043	98.02	89.83	99.96	89.89	97.43	87.74	101.92	90.55	102.36	89.58	9.31	9.27	8.94	9.02	9.20	9.02	8.97	8.55	9.36	9.15	9.10	9.27

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
6/28/2013		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
0613 Official Forward Price Curve: *Blend of...* 0613 N Midas forecast completed 6/28/2013 forward market curve																								
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
07/01/13	07/31/13	Jul 2013	43.25	27.25	45.75	27.75	41.00	25.00	50.50	36.00	53.75	37.50	3.71	3.73	3.52	3.52	3.57	3.50	3.47	3.08	3.65	3.41	3.44	3.55
08/01/13	08/31/13	Aug 2013	47.25	33.50	44.75	27.75	43.75	31.50	50.00	35.75	55.00	37.50	3.57	3.61	3.39	3.35	3.41	3.38	3.34	2.90	3.67	3.44	3.47	3.55
09/01/13	09/30/13	Sep 2013	41.50	32.75	38.00	27.50	38.00	30.50	46.25	36.50	51.00	37.75	3.56	3.59	3.35	3.34	3.40	3.37	3.34	2.91	3.66	3.44	3.46	3.55
10/01/13	10/31/13	Oct 2013	35.88	31.44	35.54	26.22	34.68	29.76	43.10	35.89	46.67	37.00	3.57	3.59	3.35	3.35	3.40	3.37	3.39	2.98	3.67	3.45	3.47	3.61
11/01/13	11/30/13	Nov 2013	39.39	32.10	33.47	27.29	35.04	31.00	41.41	35.89	45.29	37.00	3.65	3.69	3.47	3.46	3.56	3.53	3.78	3.16	3.79	3.57	3.59	4.03
12/01/13	12/31/13	Dec 2013	41.73	34.72	34.50	26.75	37.54	32.24	42.25	36.98	45.29	37.00	3.81	3.86	3.64	3.68	3.72	3.69	4.06	3.28	4.02	3.79	3.82	4.33
01/01/14	01/31/14	Jan 2014	39.22	32.29	35.96	26.75	35.62	31.01	42.42	35.79	47.43	36.50	3.90	3.94	3.72	3.77	3.81	3.78	3.97	3.33	4.10	3.88	3.90	4.23
02/01/14	02/28/14	Feb 2014	37.37	31.06	35.60	26.75	34.59	29.25	42.42	35.10	47.43	36.50	3.90	3.95	3.73	3.76	3.81	3.78	3.90	3.34	4.09	3.87	3.89	4.15
03/01/14	03/31/14	Mar 2014	34.41	28.91	34.19	26.75	32.54	27.50	41.16	33.36	44.64	36.50	3.87	3.92	3.70	3.72	3.78	3.75	3.77	3.33	4.05	3.82	3.85	4.02
04/01/14	04/30/14	Apr 2014	35.15	21.18	35.16	26.46	29.70	16.56	41.33	31.01	46.71	34.88	3.79	3.84	3.59	3.48	3.64	3.61	3.56	3.19	3.81	3.59	3.56	3.78
05/01/14	05/31/14	May 2014	30.96	17.68	35.53	23.03	26.46	13.25	41.33	28.08	45.33	30.08	3.81	3.86	3.61	3.53	3.66	3.62	3.56	3.20	3.85	3.63	3.61	3.78
06/01/14	06/30/14	Jun 2014	30.64	13.65	38.06	24.01	24.84	10.20	42.59	28.67	46.71	31.04	3.85	3.89	3.65	3.59	3.69	3.66	3.56	3.21	3.91	3.69	3.67	3.79
07/01/14	07/31/14	Jul 2014	43.41	24.10	46.64	27.26	37.37	21.18	48.50	35.41	55.34	37.35	3.88	3.93	3.68	3.69	3.73	3.70	3.60	3.24	4.02	3.79	3.77	3.83
08/01/14	08/31/14	Aug 2014	46.54	33.55	45.76	30.16	42.93	27.50	49.96	38.33	55.88	39.66	3.90	3.94	3.70	3.70	3.74	3.71	3.71	3.27	4.03	3.81	3.78	3.94
09/01/14	09/30/14	Sep 2014	44.30	33.86	39.60	29.58	38.96	33.83	47.05	35.77	51.54	38.50	3.90	3.95	3.70	3.70	3.75	3.71	3.71	3.31	4.03	3.81	3.78	3.94
10/01/14	10/31/14	Oct 2014	38.60	33.12	38.63	29.00	35.96	32.42	45.54	36.81	46.55	37.05	3.92	3.97	3.72	3.72	3.77	3.73	3.76	3.34	4.05	3.83	3.80	4.00
11/01/14	11/30/14	Nov 2014	41.09	33.81	37.88	28.42	38.25	32.75	45.54	37.98	49.00	37.83	4.01	4.09	3.84	3.83	3.88	3.85	4.14	3.43	4.17	3.94	3.91	4.42
12/01/14	12/31/14	Dec 2014	44.82	36.57	36.00	29.58	40.55	33.08	46.92	41.46	51.45	42.12	4.17	4.26	4.01	4.05	4.05	4.02	4.40	3.58	4.39	4.16	4.13	4.70
01/01/15	01/31/15	Jan 2015	41.47	34.19	38.21	29.25	39.92	33.26	44.42	39.04	48.93	38.50	4.26	4.35	4.10	4.13	4.17	4.13	4.34	3.67	4.47	4.24	4.21	4.63
02/01/15	02/28/15	Feb 2015	39.62	32.96	37.85	29.25	38.89	31.50	44.42	38.35	48.93	38.50	4.25	4.34	4.09	4.11	4.16	4.12	4.33	3.64	4.46	4.23	4.20	4.62
03/01/15	03/31/15	Mar 2015	36.66	30.81	36.44	29.25	36.84	29.75	43.16	36.61	46.14	38.50	4.19	4.28	4.03	4.04	4.10	4.06	4.27	3.60	4.38	4.16	4.12	4.56
04/01/15	04/30/15	Apr 2015	37.40	23.08	35.66	26.71	30.95	18.31	41.58	32.76	47.71	36.13	3.99	4.12	3.83	3.67	3.84	3.80	3.78	3.37	4.00	3.78	3.75	4.01
05/01/15	05/31/15	May 2015	33.21	19.58	36.03	23.28	27.71	15.00	41.58	29.83	46.33	31.33	4.01	4.14	3.84	3.71	3.85	3.82	3.78	3.39	4.04	3.82	3.80	4.01
06/01/15	06/30/15	Jun 2015	32.89	15.55	38.56	24.26	26.09	11.95	42.84	30.42	47.71	32.29	4.04	4.17	3.87	3.77	3.88	3.85	3.75	3.42	4.10	3.88	3.85	3.99
07/01/15	07/31/15	Jul 2015	45.66	26.00	50.14	29.51	40.87	23.43	51.25	37.66	57.84	39.10	4.07	4.20	3.91	3.87	3.92	3.88	3.78	3.45	4.20	3.98	3.95	4.02
08/01/15	08/31/15	Aug 2015	48.79	35.45	49.26	32.41	46.43	29.75	52.71	40.58	58.38	41.41	4.09	4.22	3.93	3.89	3.94	3.90	3.92	3.47	4.22	4.00	3.97	4.17
09/01/15	09/30/15	Sep 2015	46.55	35.76	43.10	31.83	42.46	36.08	49.80	38.02	54.04	40.25	4.09	4.22	3.92	3.88	3.93	3.90	3.93	3.47	4.22	4.00	3.97	4.17
10/01/15	10/31/15	Oct 2015	40.85	35.02	41.13	31.75	38.71	34.67	47.54	39.81	48.30	39.30	4.11	4.24	3.95	3.91	3.96	3.92	3.94	3.50	4.25	4.02	3.99	4.18
11/01/15	11/30/15	Nov 2015	43.34	35.71	40.38	31.17	41.00	35.00	47.54	40.98	50.75	40.08	4.20	4.32	4.05	4.04	4.08	4.04	4.37	3.59	4.38	4.15	4.12	4.67
12/01/15	12/31/15	Dec 2015	47.07	38.47	38.50	32.33	43.30	35.33	48.92	44.46	53.20	44.37	4.38	4.50	4.24	4.25	4.26	4.22	4.55	3.77	4.60	4.37	4.34	4.85
01/01/16	01/31/16	Jan 2016	43.72	36.44	40.71	31.25	41.17	35.51	46.67	41.04	50.68	40.25	4.49	4.60	4.34	4.35	4.40	4.36	4.63	3.88	4.71	4.47	4.44	4.94
02/01/16	02/29/16	Feb 2016	41.87	35.21	40.35	31.25	40.14	33.75	46.67	40.35	50.68	40.25	4.47	4.59	4.33	4.33	4.38	4.35	4.61	3.87	4.68	4.45	4.41	4.92
03/01/16	03/31/16	Mar 2016	38.91	33.06	38.94	31.25	38.09	32.00	45.41	38.61	47.89	40.25	4.40	4.52	4.26	4.25	4.31	4.28	4.54	3.80	4.61	4.37	4.34	4.85
04/01/16	04/30/16	Apr 2016	39.65	25.33	38.16	28.71	32.20	20.56	43.83	34.76	49.46	37.88	4.15	4.34	3.99	3.92	4.00	3.97	3.99	3.51	4.27	4.04	4.01	4.24
05/01/16	05/31/16	May 2016	35.46	21.83	38.53	25.28	28.96	17.25	43.83	31.83	48.08	33.08	4.17	4.35	4.01	3.94	4.02	3.98	3.96	3.53	4.28	4.05	4.02	4.20
06/01/16	06/30/16	Jun 2016	35.14	17.80	41.06	26.26	27.34	14.20	45.09	32.42	49.46	34.04	4.20	4.38	4.04	3.97	4.05	4.01	3.95	3.56	4.31	4.08	4.05	4.20
07/01/16	07/31/16	Jul 2016	47.91	28.25	52.64	31.51	42.12	25.68	53.50	39.66	59.59	40.85	4.24	4.42	4.08	4.01	4.08	4.05	3.97	3.59	4.35	4.12	4.09	4.22
08/01/16	08/31/16	Aug 2016	51.04	37.70	51.76	34.41	47.68	32.00	54.96	42.58	60.13	43.16	4.26	4.44	4.10	4.03	4.11	4.07	3.97	3.62	4.38	4.14	4.11	4.22
09/01/16	09/30/16	Sep 2016	48.80	38.01	45.60	33.83	43.71	38.33	52.05	40.02	55.79	42.00	4.26	4.44	4.10	4.03	4.11	4.07	4.01	3.62	4.38	4.15	4.12	4.26
10/01/16	10/31/16	Oct 2016	43.10	37.27	43.63	33.75	39.96	36.92	49.79	41.81	50.05	41.05	4.29	4.48	4.13	4.06	4.14	4.10	4.05	3.65	4.41	4.18	4.15	4.30
11/01/16	11/30/16	Nov 2016	45.59	37.96	42.88	33.17	42.25	37.25	49.79	42.98	52.50	41.83	4.40	4.57	4.26	4.24	4.28	4.24	4.61	3.81	4.59	4.35	4.32	4.92
12/01/16	12/31/16	Dec 2016	49.32	40.72	41.00	34.33	44.55	37.58	51.17	46.46	54.95	46.12	4.60	4.77	4.47	4.44	4.48	4.44	4.81	4.01	4.80	4.56	4.52	5.13
01/01/17	01/31/17	Jan 2017	46.47	38.69	43.21	33.25	43.92	36.76	48.92	43.04	52.68	42.00	4.72	4.88	4.58	4.57	4.63	4.59	4.92	4.13	4.93	4.69	4.66	5.25
02/01/17	02/28/17	Feb 2017	44.62	37.46	42.85	33.25	42.89	35.00	48.92	42.35	52.68	42.00	4.70	4.87	4.57	4.56	4.61	4.57	4.91	4.11	4.91	4.68	4.64	5.23
03/01/17	03/31/17	Mar 2017	41.66	35.31	41.44	33.25	40.84	33.25	47.66	40.61	49.89	42.00	4.63	4.80	4.50	4.49	4.54	4.51	4.82	4.04	4.84	4.61	4.57	5.14
04/01/17	04/30/17	Apr 2017	42.40	27.58	40.66	30.71	34.95	21.81	46.08	36.76	51.46	39.63	4.39	4.59	4.23	4.19	4.23	4.20	4.21	3.74	4.53	4.31	4.27	4.47
05/01/17	05/31/17	May 2017	38.21	24.08	41.03	27.28	31.71	18.50	46.08	33.83	50.08	34.83	4.40	4.60	4.24	4.20	4.25	4.21	4.18	3.75	4.55	4.32	4.29	4.44
06/01/17	06/30/17	Jun 2017	37.89	20.05	43.56	28.26	30.09	15.45	47.34	34.42	51.46	35.79	4.43	4.63	4.27	4.23	4.28	4.24	4.17	3.78	4.58	4.35	4.32	4.43
07/01/17	07/31/17	Jul 2017	50.66	30.50	55.14	33.51	44.87	26.93	55.75	41.66	61.59	42.60	4.47	4.67	4.31	4.27	4.32	4.28	4.20	3.82	4.62	4.39	4.36	4.45
08/01/17	08/31/17	Aug 2017	53.79	39.95	54.26	36.41	50.43	33.25	57.21	44.58	62.13	44.91	4.50	4.70	4.33	4.30	4.34	4.30	4.20	3.85	4.65	4.42	4.38	4.45
09/01/17	09/30/17	Sep 2017	51.55	40.26	48.10	35.83	46.46	39.58	54.30	42.02	57.79	43.75	4.50	4.70	4.34	4.30	4.35	4.31	4.24	3.85	4.65	4.42	4.39	4.50
10/01/17	10/31/17	Oct 2017	45.85	39.52	46.13	35.75	42.71	38.17	52.04	43.81	52.05	42.80	4.54	4.74	4.38	4.34	4.38	4.35	4.28	3.89	4.69	4.46	4.42	4.55
11/01/17	11/30/17	Nov 2017	48.34	40.21	45.38	35.17	45.00	38.50	52.04	44.98	54.50	43.58	4.66	4.84	4.53	4.53	4.54	4.50	4.86	4.09	4.89	4.65	4.61	5.19
12/01/17	12/31/17	Dec 2017	52.07	42.97	43.50	36.33	47.30	38.83	53.42	48.46	56.95	47.87	4.88	5.06	4.75	4.75	4.76	4.72	5.08	4.31	5.11	4.88	4.84	5.42
01/01/18	01/31/18	Jan 2018	49.22	40.89	45.71	35.25	46.67	38.51	51.42	45.04	54.93	43.75	5.01	5.18	4.87	4.88	4.92	4.88	5.21	4.43	5.24	5.01	4.97	5.55
02/01/18	02/28/18	Feb 2018	47.37	39.66	45.35	35.25	45.64	36.75	51.42	44.35	54.93	43.75	5.00	5.17	4.86	4.87	4.91	4.87	5.20	4.42	5.23	5.00	4.96	5.54
03/01/18	03/31/18	Mar 2018	44.41	37.51	43.94	35.25	43.59	35.00	50.16	42.61	52.14	43.75	4.93	5.10	4.79	4.80	4.84	4.80	5.12	4.35	5.16	4.92	4.88	5.45
04/01/18	04/30/18	Apr 2018	45.15	29.78	43.16	32.71	37.70	23.56	48.58	38.76	53.71	41.38	4.69	4.93	4.53	4.55	4.54	4.50	4.52	4.09	4.90	4.67	4.64	4.79
05/01/18	05/31/18	May 2018	40.96	26.28	43.53	29.28	34.46	20.25	48.58	35.83	52.33	36.58	4.71	4.94	4.54	4.57	4.55	4.51	4.48	4.10	4.92	4.69	4.65	4.76
06/01/18	06/30/18	Jun 2018	40.64	22.25	46.06	30.26	32.84	17.20	49.84	36.42	53.71	37.54	4.74	4.97	4.57	4.60	4.58	4.54	4.48	4.13	4.95	4.72	4.68	4.75
07/01/18	07/31/18	Jul 2018	53.41	32.70	57.64	35.51	47.62	28.68	58.25	43.66	63.84	44.35	4.78	5.01	4.61	4.64	4.62	4.58	4.50	4.17	4.99	4.76	4.72	4.77
08/01/18	08/31/18	Aug 2018	56.54	42.15	56.76	38.41	53.18	35.00	59.71	46.58	64.38	46.66	4.80	5.04	4.64	4.66	4.65	4.61	4.50	4.20	5.02	4.79	4.75	4.77
09/01/18	09/30/18	Sep 2018	54.30	42.46	50.60	37.83	49.21	41.33	56.80	44.02	60.04	45.50	4.81	5.04	4.64	4.67	4.65	4.61	4.54	4.20	5.02	4.79	4.75	4.82

10/01/18	10/31/18	Oct 2018	48.60	41.72	48.63	37.75	45.46	39.92	54.54	45.81	54.30	44.55	4.85	5.08	4.69	4.71	4.69	4.65	4.59	4.24	5.07	4.83	4.80	4.87
11/01/18	11/30/18	Nov 2018	51.09	42.41	47.88	37.17	47.75	40.25	54.54	46.98	56.75	45.33	4.98	5.17	4.85	4.88	4.86	4.82	5.18	4.44	5.24	5.01	4.97	5.52
12/01/18	12/31/18	Dec 2018	54.82	45.17	46.00	38.33	50.05	40.58	55.92	50.46	59.20	49.62	5.21	5.40	5.08	5.11	5.09	5.04	5.41	4.67	5.48	5.24	5.20	5.76
01/01/19	01/31/19	Jan 2019	51.97	43.14	48.46	37.50	49.42	40.76	54.42	47.29	57.68	46.00	5.34	5.53	5.21	5.28	5.25	5.21	5.55	4.81	5.65	5.42	5.37	5.91
02/01/19	02/28/19	Feb 2019	50.12	41.91	48.10	37.50	48.39	39.00	54.42	46.60	57.68	46.00	5.33	5.52	5.20	5.27	5.24	5.20	5.54	4.80	5.64	5.41	5.36	5.90
03/01/19	03/31/19	Mar 2019	47.16	39.76	46.69	37.50	46.34	37.25	53.16	44.86	54.89	46.00	5.26	5.45	5.13	5.20	5.17	5.13	5.45	4.73	5.56	5.33	5.29	5.81
04/01/19	04/30/19	Apr 2019	47.90	32.03	45.91	34.96	40.45	25.81	51.58	41.01	56.46	43.63	5.05	5.33	4.89	4.97	4.89	4.85	4.87	4.57	5.33	5.10	5.06	5.17
05/01/19	05/31/19	May 2019	43.71	28.53	46.28	31.53	37.21	22.50	51.58	38.08	55.08	38.83	5.07	5.35	4.91	5.00	4.92	4.88	4.85	4.59	5.36	5.13	5.09	5.14
06/01/19	06/30/19	Jun 2019	43.39	24.50	48.81	32.51	35.59	19.45	52.84	38.67	56.46	39.79	5.11	5.39	4.95	5.03	4.95	4.91	4.85	4.63	5.39	5.17	5.12	5.14
07/01/19	07/31/19	Jul 2019	56.16	34.95	60.39	37.76	50.37	30.93	61.25	45.91	66.59	46.60	5.15	5.43	4.99	5.08	5.00	4.96	4.87	4.67	5.44	5.21	5.17	5.17
08/01/19	08/31/19	Aug 2019	59.61	45.20	62.74	43.43	58.98	41.86	65.08	51.91	69.45	52.51	5.43	5.48	5.20	5.15	5.21	5.15	5.09	4.93	5.52	5.28	5.24	5.39
09/01/19	09/30/19	Sep 2019	58.54	45.41	58.19	42.10	56.85	44.71	62.99	50.31	67.28	51.80	5.42	5.51	5.22	5.18	5.23	5.18	5.13	4.88	5.55	5.31	5.27	5.43
10/01/19	10/31/19	Oct 2019	53.45	44.73	53.30	42.38	51.26	43.43	60.01	51.52	60.38	51.71	5.45	5.68	5.28	5.24	5.28	5.23	5.20	4.88	5.61	5.37	5.33	5.50
11/01/19	11/30/19	Nov 2019	54.55	45.29	51.34	41.00	53.18	43.65	59.64	51.72	60.85	51.26	5.53	5.55	5.33	5.30	5.40	5.36	5.57	5.06	5.68	5.44	5.40	5.94
12/01/19	12/31/19	Dec 2019	58.37	47.90	51.41	42.54	54.88	45.19	60.23	54.68	61.48	54.71	5.74	5.84	5.57	5.53	5.63	5.57	5.88	5.23	5.92	5.67	5.63	6.26
01/01/20	01/31/20	Jan 2020	53.10	45.28	50.63	41.63	51.03	43.73	57.94	51.56	59.61	51.36	5.71	5.77	5.52	5.49	5.61	5.56	5.80	5.21	5.88	5.64	5.59	6.18
02/01/20	02/29/20	Feb 2020	49.53	44.52	47.14	41.04	47.17	41.92	55.64	51.09	57.66	51.36	5.71	5.77	5.52	5.49	5.61	5.56	5.73	5.21	5.87	5.64	5.59	6.12
03/01/20	03/31/20	Mar 2020	47.00	42.00	46.21	39.47	45.22	39.34	53.62	48.79	54.50	49.82	5.51	5.50	5.26	5.23	5.35	5.30	5.49	4.96	5.61	5.37	5.32	5.87
04/01/20	04/30/20	Apr 2020	47.79	38.46	46.19	38.84	43.17	34.05	53.67	47.16	56.27	48.86	5.38	5.47	5.15	5.13	5.23	5.18	5.22	4.91	5.50	5.27	5.22	5.56
05/01/20	05/31/20	May 2020	45.76	35.83	48.24	37.04	42.44	31.93	54.49	45.20	56.64	46.03	5.41	5.43	5.14	5.12	5.20	5.15	5.13	4.90	5.49	5.26	5.21	5.47
06/01/20	06/30/20	Jun 2020	45.33	34.22	52.33	38.02	41.98	30.72	53.91	45.50	56.56	46.56	5.47	5.47	5.20	5.18	5.24	5.20	5.15	4.94	5.55	5.32	5.27	5.49
07/01/20	07/31/20	Jul 2020	58.26	40.96	64.34	42.51	56.41	39.06	64.76	50.76	68.97	51.64	5.51	5.59	5.28	5.27	5.29	5.23	5.18	4.98	5.64	5.41	5.36	5.53
08/01/20	08/31/20	Aug 2020	62.67	48.24	68.72	48.44	64.78	48.72	70.46	57.24	74.52	58.36	6.06	5.93	5.77	5.64	5.77	5.70	5.69	5.67	6.01	5.77	5.73	5.98
09/01/20	09/30/20	Sep 2020	62.77	48.37	65.78	46.37	64.50	48.10	69.19	56.59	74.52	58.10	6.03	5.98	5.80	5.69	5.81	5.74	5.72	5.56	6.06	5.82	5.78	6.02
10/01/20	10/31/20	Oct 2020	58.30	47.74	57.98	47.01	57.07	46.94	65.48	57.23	66.45	58.86	6.06	6.28	5.88	5.77	5.88	5.80	5.80	5.52	6.14	5.90	5.86	6.10
11/01/20	11/30/20	Nov 2020	58.01	48.16	54.80	44.83	58.60	47.04	64.74	56.47	64.94	57.18	6.08	5.94	5.81	5.73	5.95	5.91	5.97	5.68	6.11	5.86	5.82	6.33
12/01/20	12/31/20	Dec 2020	61.91	50.63	56.81	46.75	59.71	49.81	64.54	58.89	63.76	59.79	6.28	6.29	6.07	5.96	6.17	6.10	6.36	5.79	6.34	6.10	6.05	6.73
01/01/21	01/31/21	Jan 2021	54.23	47.42	52.80	45.75	52.64	46.71	61.46	55.82	61.53	56.71	6.07	6.01	5.83	5.71	5.97	5.90	6.04	5.61	6.09	5.86	5.81	6.43
02/01/21	02/28/21	Feb 2021	48.94	47.13	46.17	44.57	45.95	44.83	56.85	55.59	57.64	56.71	6.09	6.02	5.84	5.71	5.98	5.91	5.93	5.62	6.09	5.86	5.81	6.32
03/01/21	03/31/21	Mar 2021	46.84	44.25	45.72	41.44	44.11	41.44	54.08	52.71	54.11	53.64	5.76	5.55	5.38	5.25	5.52	5.46	5.52	5.20	5.63	5.40	5.35	5.90
04/01/21	04/30/21	Apr 2021	47.67	44.89	46.46	42.72	45.88	42.28	55.75	53.31	56.08	54.09	5.71	5.62	5.42	5.29	5.57	5.51	5.56	5.26	5.66	5.43	5.38	5.90
05/01/21	05/31/21	May 2021	47.81	43.13	50.20	42.54	47.67	41.35	57.40	52.31	58.21	53.23	5.75	5.50	5.37	5.24	5.47	5.43	5.41	5.20	5.61	5.38	5.33	5.75
06/01/21	06/30/21	Jun 2021	47.28	43.94	55.85	43.53	48.36	41.99	54.99	52.34	56.65	53.33	5.83	5.56	5.45	5.32	5.53	5.48	5.45	5.25	5.69	5.46	5.41	5.79
07/01/21	07/31/21	Jul 2021	60.36	46.97	68.29	47.25	62.45	47.20	68.27	55.62	71.36	56.69	5.88	5.74	5.57	5.45	5.58	5.51	5.49	5.29	5.83	5.59	5.55	5.84
08/01/21	08/31/21	Aug 2021	62.71	48.47	68.00	47.10	64.76	50.49	69.82	55.87	73.87	56.54	5.91	5.80	5.63	5.50	5.64	5.57	5.54	5.33	5.87	5.63	5.59	5.84
09/01/21	09/30/21	Sep 2021	61.92	47.37	63.13	45.33	64.33	47.02	68.13	55.42	71.71	56.38	5.88	5.84	5.65	5.53	5.68	5.61	5.59	5.37	5.90	5.67	5.62	5.89
10/01/21	10/31/21	Oct 2021	58.70	47.23	58.31	47.19	59.68	46.70	65.60	56.73	66.96	58.58	5.91	6.34	5.72	5.59	5.77	5.69	5.69	5.41	5.96	5.72	5.68	5.99
11/01/21	11/30/21	Nov 2021	58.32	47.29	54.61	43.96	57.43	47.92	63.71	55.30	63.40	55.47	5.97	5.85	5.72	5.61	5.86	5.82	5.92	5.59	5.99	5.75	5.70	6.28
12/01/21	12/31/21	Dec 2021	62.74	50.70	55.53	46.06	63.01	49.82	62.65	57.33	61.97	57.86	6.14	6.14	5.92	5.80	6.06	6.00	5.85	5.72	6.19	5.94	5.89	6.23
01/01/22	01/31/22	Jan 2022	60.79	53.92	61.54	54.52	59.33	52.12	62.70	56.76	62.21	56.75	6.21	6.17	5.98	5.86	6.12	6.07	5.97	5.78	6.24	6.00	5.95	6.35
02/01/22	02/28/22	Feb 2022	56.25	53.53	54.23	53.34	52.59	50.16	57.93	56.23	58.16	56.53	6.24	6.20	6.01	5.89	6.15	6.10	6.04	5.82	6.27	6.03	5.98	6.42
03/01/22	03/31/22	Mar 2022	54.97	51.75	53.68	51.63	51.87	49.71	57.82	54.31	57.08	54.64	6.03	5.85	5.68	5.55	5.82	5.76	5.83	5.50	5.93	5.69	5.64	6.21
04/01/22	04/30/22	Apr 2022	55.41	52.69	56.13	52.26	52.89	50.09	58.15	56.01	58.49	55.33	5.99	5.90	5.69	5.56	5.85	5.79	5.84	5.54	5.93	5.70	5.65	6.18
05/01/22	05/31/22	May 2022	53.81	47.42	59.78	51.90	53.08	48.58	58.16	53.48	59.17	54.37	6.04	5.81	5.66	5.52	5.78	5.74	5.72	5.50	5.90	5.66	5.62	6.06
06/01/22	06/30/22	Jun 2022	54.30	49.47	63.09	52.88	54.22	49.61	59.02	54.65	60.16	54.78	6.13	5.85	5.74	5.61	5.84	5.79	5.77	5.56	5.99	5.75	5.70	6.12
07/01/22	07/31/22	Jul 2022	67.40	55.10	78.93	57.10	66.74	52.40	72.19	59.37	75.65	59.00	6.18	6.06	5.88	5.74	5.91	5.84	5.82	5.60	6.11	5.88	5.83	6.16
08/01/22	08/31/22	Aug 2022	69.18	55.52	78.44	56.55	68.87	53.29	73.86	59.08	77.44	58.69	6.22	6.11	5.93	5.78	5.95	5.86	5.86	5.64	6.15	5.91	5.87	6.16
09/01/22	09/30/22	Sep 2022	68.56	54.43	72.99	55.48	68.29	52.55	73.12	58.36	75.87	58.43	6.17	6.16	5.95	5.82	5.99	5.92	5.90	5.69	6.19	5.95	5.91	6.20
10/01/22	10/31/22	Oct 2022	65.46	54.55	66.97	56.49	65.26	51.92	69.97	59.18	70.83	59.67	6.20	6.61	6.03	5.87	6.11	6.03	6.05	5.74	6.24	6.00	5.96	6.35
11/01/22	11/30/22	Nov 2022	66.65	55.96	64.25	54.55	67.07	57.31	67.45	58.21	67.12	57.56	6.37	6.27	6.14	6.02	6.28	6.24	6.14	6.00	6.39	6.15	6.11	6.50
12/01/22	12/31/22	Dec 2022	74.36	60.87	64.84	58.50	74.55	61.16	68.76	62.09	68.10	62.23	6.81	6.88	6.59	6.47	6.78	6.71	6.68	6.40	6.86	6.61	6.56	7.06
01/01/23	01/31/23	Jan 2023	66.80	59.59	67.47	60.16	65.71	57.70	68.92	62.88	68.41	62.89	7.00	6.97	6.75	6.63	6.90	6.85	6.97	6.57	7.01	6.78	6.73	7.35
02/01/23	02/28/23	Feb 2023	62.41	57.37	60.58	59.19	58.96	57.76	64.21	61.85	64.41	62.22	7.04	7.01	6.79	6.66	6.95	6.89	6.89	6.60	7.05	6.81	6.76	7.27
03/01/23	03/31/23	Mar 2023	62.11	58.21	60.01	57.98	58.48	55.37	64.48	61.35	63.60	61.43	6.92	6.77	6.58	6.42	6.72	6.65	6.70	6.37	6.80	6.57	6.52	7.08
04/01/23	04/30/23	Apr 2023	62.39	58.89	62.83	58.55	59.83	56.71	64.98	62.36	65.43	61.79	6.88	6.82	6.59	6.46	6.78	6.72	6.77	6.45	6.83	6.60	6.55	7.12
05/01/23	05/31/23	May 2023	62.80	57.16	67.88	58.66	62.69	56.34	67.23	60.92	68.17	61.62	6.93	6.75	6.58	6.44	6.71	6.67	6.65	6.43	6.81	6.58	6.53	7.00
06/01/23	06/30/23	Jun 2023	63.15	56.87	71.64	59.61	62.59	54.66	67.48	62.72	68.41	62.20	7.04	6.82	6.68	6.54	6.78	6.74	6.72	6.50	6.91	6.68	6.63	7.06
07/01/23	07/31/23	Jul 2023	75.95	62.19	87.09	64.40	75.78	60.23	80.97	67.03	84.26	66.81	7.10	6.99	6.79	6.58	6.83	6.77	6.75	6.52	6.96	6.72	6.68	7.10
08/01/23	08/31/23	Aug 2023	78.37	63.37	86.82	63.84	78.31	60.86	82.98	66.57	85.93	66.38	7.14	7.07	6.85	6.66	6.88	6.81	6.79	6.57	7.03	6.79	6.75	7.09
09/01/23	09/30/23	Sep 2023	76.62	61.88	81.42	62.72	75.87	60.34	80.69	65.74	84.51	66.04	7.09	7.09	6.85	6.71	6.92	6.85	6.83	6.60	7.08	6.85	6.80	7.13
10/01/23	10/31/23	Oct 2023	74.92	62.77	76.00	66.23	74.97	60.70	79.75	68.66	79.89	69.01	7.12	8.09	7.06	6.78	7.05	6.97	6.97	6.66	7.15	6.91	6.87	7.27
11/01/23	11/30/23	Nov 2023	74.99	62.46	71.66	61.00	75.62	64.09	74.53	64.73	74.25	64.15	7.19	7.12	6.94	6.79	7.10	7.05	7.15	6.81	7.17	6.93	6.88	7.51
12/01/23	12/31/23	Dec 2023	80.23	65.83	71.11	63.48	80.88	66.41	74.67	66.89	74.08	67.05	7.39	7.51	7.17	7.04	7.37	7.30	7.32	6.98	7.42	7.18	7.13	7.69
01/01/24	01/31/24	Jan 2024	70.90	64.00	72.22	64.32	71.46	61.64	73.52	66.98	73.03	67.15	7.51	7.51	7.27	7.13	7.42	7.37	7.43	7.09	7.51	7.27	7.22	7.81
02/01/24	02/29/24	Feb 2024	66.17	60.82	64.75	62.86	62.81	61.56	68.58	65.86	68.40	66.11	7.49	7.47	7.24	7.11	7.39	7.34	7.41	7.06	7.49	7.25	7.20	7.79
03/01/24	03/31/24	Mar 2024	62.69	58.77	60.88	58.43	59.24	55.91	64.69	61.77	64.04	61.77	6.91	6.76	6.57	6.42	6.71	6.66	6.73	6.39	6.80	6.56	6.51	7.11
04/01/24	04/30/24	Apr 2024	61.83	59.19	63.32	58.76	59.75	56.25	65.00	62.82	65.44	62.33	6.84	6.77	6.55	6.41	6.75	6.70	6.76	6.44	6.78	6.54	6.50	7.10
05/01/24	05/31/24	May 2024	61.06	55.39	67.28	58.48	60.64	55.51	65.81	60.63	66.93	61.53	6.89	6.72	6.54	6.40	6.69	6.63	6.63	6.40	6.77	6.54	6.49	6.97
06/01/24	06/30/24	Jun 2024	62.40	57.18	70.88	60.27	62.10	55.98	66.86	62.14	68.00	62.47	7.00	6.83	6.65	6.52	6.80	6.75	6.74	6.51	6.89	6.66	6.61	7.08
07/01/24	07/31/24	Jul 2024	76.68	62.72	87.74	64.25	76.28	60.29	81.41	66.98	84.64	66.63	7.06	6.99	6.76	6.61	6.91	6.83	6.80	6.57	6.98	6.75	6.70	7.14
08/01/24	08/31/24	Aug 2024	78.23	63.53	86.36	64.08	78.02	61.36	82.80	66.79	86.00	66.51	7.11	7.05	6.82	6.66	6.97	6.86	6.85	6.62	7.03	6.79	6.75	7.15
09/01/24	09/30/24	Sep 2024	76.67	62.42	81.24	62.62	76.40	60.22	81.11	65.96	84.18	65.89	7.06	7.07	6.83	6.69	6.98	6.92	6.90	6.67	7.06	6.82	6.78	7.20
10/01/24	10/31/24	Oct 2024	72.70	62.16	73.30	62.74	72.84	59.98	77.17	66.13	77.24	66.02	7.09	7.43	6.97	6.75	7.25	7.09	7.07	6.73	7.12	6.89	6.84	7.38

11/01/24	11/30/24	Nov 2024	75.28	62.82	70.42	61.23	75.09	64.88	73.96	64.57	73.51	64.04	7.19	7.13	6.93	6.79	7.08	7.07	7.18	6.83	7.17	6.93	6.88	7.54
12/01/24	12/31/24	Dec 2024	80.71	65.49	71.57	64.08	80.48	66.74	74.91	67.14	74.26	67.44	7.38	7.56	7.16	7.02	7.35	7.28	7.32	6.98	7.40	7.16	7.11	7.69
01/01/25	01/31/25	Jan 2025	70.78	64.72	71.80	64.19	71.43	62.25	73.69	67.39	73.16	67.30	7.50	7.50	7.25	7.11	7.43	7.38	7.44	7.08	7.50	7.26	7.21	7.82
02/01/25	02/28/25	Feb 2025	65.73	61.75	64.91	63.40	63.14	61.95	69.00	66.52	68.83	66.62	7.49	7.49	7.24	7.10	7.42	7.36	7.42	7.06	7.48	7.24	7.19	7.81
03/01/25	03/31/25	Mar 2025	63.92	60.42	62.29	59.95	60.27	57.59	66.52	63.41	65.85	63.32	7.03	6.93	6.71	6.50	6.86	6.80	6.86	6.51	6.88	6.65	6.60	7.24
04/01/25	04/30/25	Apr 2025	63.66	61.07	64.48	60.31	61.71	57.81	66.79	64.64	67.27	64.01	6.96	6.90	6.68	6.52	6.96	6.89	6.95	6.61	6.89	6.66	6.61	7.30
05/01/25	05/31/25	May 2025	63.36	57.42	68.99	60.56	62.97	57.39	67.91	62.14	68.81	62.84	7.01	6.88	6.67	6.51	6.82	6.77	6.76	6.53	6.88	6.65	6.60	7.11
06/01/25	06/30/25	Jun 2025	64.29	58.29	73.12	62.03	63.72	56.50	68.84	63.51	69.84	63.88	7.11	6.98	6.79	6.63	6.94	6.86	6.83	6.63	7.00	6.77	6.72	7.17
07/01/25	07/31/25	Jul 2025	78.16	63.49	89.40	65.87	77.84	61.39	83.06	68.32	86.44	67.90	7.20	7.13	6.90	6.67	7.05	6.97	6.93	6.70	7.04	6.81	6.76	7.28
08/01/25	08/31/25	Aug 2025	79.77	64.77	88.43	66.11	79.52	62.65	84.45	68.68	87.82	68.39	7.24	7.24	6.95	6.71	7.10	7.01	6.98	6.75	7.09	6.85	6.81	7.27
09/01/25	09/30/25	Sep 2025	78.46	63.76	83.02	64.24	78.27	61.37	83.02	67.36	86.02	67.43	7.17	7.26	6.94	6.78	7.13	7.06	7.04	6.79	7.16	6.92	6.87	7.34
10/01/25	10/31/25	Oct 2025	74.71	63.79	74.83	64.66	74.60	61.25	78.91	67.84	79.03	67.83	7.20	7.62	7.13	6.85	7.39	7.22	7.20	6.85	7.22	6.98	6.94	7.51
11/01/25	11/30/25	Nov 2025	76.26	64.29	72.59	63.06	76.85	66.08	76.00	66.25	75.55	65.85	7.26	7.25	7.01	6.85	7.22	7.17	7.28	6.92	7.22	6.98	6.94	7.64
12/01/25	12/31/25	Dec 2025	82.90	67.18	72.61	65.99	82.28	67.86	76.87	68.94	76.09	69.20	7.48	7.83	7.33	7.15	7.54	7.46	7.47	7.11	7.54	7.29	7.24	7.85
01/01/26	01/31/26	Jan 2026	73.05	65.63	73.24	65.72	75.26	63.94	75.02	68.70	74.49	68.62	7.57	7.65	7.37	7.23	7.55	7.50	7.56	7.20	7.61	7.37	7.32	7.95
02/01/26	02/28/26	Feb 2026	66.18	64.03	66.21	64.36	65.01	61.84	69.49	67.93	69.92	67.47	7.56	7.60	7.34	7.20	7.54	7.47	7.53	7.17	7.58	7.34	7.29	7.91
03/01/26	03/31/26	Mar 2026	64.28	61.30	62.68	60.57	61.47	59.06	67.39	63.73	66.54	63.49	7.07	7.00	6.76	6.50	6.92	6.85	6.92	6.55	6.88	6.65	6.60	7.29
04/01/26	04/30/26	Apr 2026	65.22	62.06	65.25	61.44	63.50	59.58	68.04	65.49	68.38	64.61	7.01	6.97	6.70	6.45	7.02	6.95	7.01	6.65	6.82	6.59	6.54	7.35
05/01/26	05/31/26	May 2026	63.41	57.60	69.75	61.42	62.95	55.92	68.62	62.93	69.46	63.51	7.05	6.93	6.72	6.47	6.87	6.81	6.81	6.57	6.84	6.61	6.56	7.15
06/01/26	06/30/26	Jun 2026	65.11	58.88	74.18	63.05	64.47	57.50	69.54	64.10	70.52	64.44	7.17	7.05	6.86	6.61	7.01	6.94	6.89	6.69	6.98	6.75	6.70	7.23
07/01/26	07/31/26	Jul 2026	80.46	64.97	91.48	67.37	79.67	62.67	84.81	69.57	88.32	69.12	7.24	7.27	6.95	6.68	7.11	7.03	6.99	6.75	7.06	6.82	6.78	7.33
08/01/26	08/31/26	Aug 2026	81.28	66.14	90.86	67.79	81.27	64.34	86.09	70.27	90.05	69.88	7.29	7.41	7.00	6.74	7.16	7.07	7.05	6.80	7.11	6.87	6.83	7.35
09/01/26	09/30/26	Sep 2026	80.60	64.83	85.55	65.57	80.22	62.91	85.07	68.54	88.55	68.70	7.22	7.42	6.99	6.75	7.22	7.14	7.12	6.87	7.12	6.88	6.84	7.42
10/01/26	10/31/26	Oct 2026	78.37	66.11	77.86	68.05	78.03	63.16	82.87	71.20	83.31	71.13	7.26	8.13	7.31	6.85	7.55	7.36	7.33	6.97	7.23	6.99	6.95	7.63
11/01/26	11/30/26	Nov 2026	78.79	65.68	73.84	63.94	79.33	68.29	77.31	67.29	76.70	66.52	7.33	7.33	7.05	6.85	7.38	7.33	7.44	7.07	7.23	6.99	6.94	7.80
12/01/26	12/31/26	Dec 2026	85.99	69.60	75.08	68.03	85.72	71.65	79.48	71.08	78.60	71.10	7.55	8.09	7.48	7.20	7.72	7.63	7.63	7.24	7.58	7.34	7.29	8.01
01/01/27	01/31/27	Jan 2027	75.11	67.36	74.61	67.48	76.95	65.45	77.11	70.19	76.53	70.29	7.63	7.88	7.47	7.25	7.70	7.64	7.70	7.32	7.64	7.40	7.35	8.08
02/01/27	02/28/27	Feb 2027	68.57	65.83	68.24	66.53	66.76	63.82	71.96	69.85	72.21	69.66	7.66	7.86	7.49	7.27	7.73	7.65	7.69	7.31	7.65	7.42	7.37	8.07
03/01/27	03/31/27	Mar 2027	65.13	62.63	63.97	61.64	62.92	60.50	68.69	65.07	67.86	64.66	7.15	7.06	6.82	6.55	7.04	6.99	7.06	6.69	6.93	6.69	6.64	7.44
04/01/27	04/30/27	Apr 2027	66.49	63.37	66.34	62.68	64.49	60.56	69.15	66.72	69.50	65.75	7.09	7.09	6.77	6.51	7.15	7.07	7.13	6.76	6.88	6.65	6.60	7.47
05/01/27	05/31/27	May 2027	66.78	59.56	71.34	62.86	66.36	59.53	71.07	64.42	71.83	64.82	7.14	7.06	6.81	6.53	7.00	6.95	6.94	6.69	6.90	6.67	6.62	7.29
06/01/27	06/30/27	Jun 2027	66.85	59.43	76.07	64.63	66.35	59.03	71.52	65.52	72.29	65.43	7.27	7.20	6.97	6.69	7.12	7.06	7.01	6.79	7.07	6.83	6.79	7.35
07/01/27	07/31/27	Jul 2027	81.01	66.25	92.61	69.22	80.68	64.04	85.88	70.96	89.48	70.61	7.33	7.48	7.05	6.78	7.21	7.11	7.09	6.86	7.15	6.92	6.87	7.44
08/01/27	08/31/27	Aug 2027	83.21	67.08	93.10	69.12	83.11	65.12	87.92	71.32	91.84	70.98	7.38	7.59	7.11	6.84	7.28	7.20	7.16	6.90	7.21	6.97	6.93	7.46
09/01/27	09/30/27	Sep 2027	81.66	66.15	86.18	67.41	81.23	64.20	86.32	70.03	88.51	69.82	7.31	7.64	7.15	6.87	7.37	7.27	7.27	6.98	7.24	7.01	6.96	7.57
10/01/27	10/31/27	Oct 2027	78.94	67.93	79.18	68.98	78.40	64.85	83.42	70.25	83.94	70.82	7.34	8.22	7.57	6.95	7.76	7.55	7.47	7.09	7.32	7.08	7.04	7.77
11/01/27	11/30/27	Nov 2027	80.77	67.56	74.56	65.59	80.33	69.95	77.83	69.11	77.13	68.24	7.44	7.60	7.21	6.96	7.59	7.52	7.64	7.26	7.33	7.09	7.05	8.00
12/01/27	12/31/27	Dec 2027	88.24	72.13	77.87	71.25	87.97	73.92	82.14	74.22	81.38	74.12	7.66	8.59	7.73	7.33	7.96	7.85	7.85	7.39	7.71	7.47	7.42	8.23
01/01/28	01/31/28	Jan 2028	76.16	68.40	74.95	67.68	78.47	67.16	76.56	70.75	75.97	70.21	7.66	7.77	7.48	7.32	7.76	7.70	7.78	7.39	7.70	7.46	7.41	8.16
02/01/28	02/29/28	Feb 2028	70.79	67.06	67.99	66.20	67.52	63.87	72.40	70.08	72.17	69.29	7.69	7.76	7.49	7.32	7.70	7.65	7.72	7.33	7.71	7.47	7.42	8.10
03/01/28	03/31/28	Mar 2028	65.21	62.69	63.84	61.87	63.26	60.81	68.66	65.10	67.70	64.95	7.13	7.04	6.79	6.60	6.98	6.93	7.02	6.65	6.98	6.74	6.69	7.40
04/01/28	04/30/28	Apr 2028	66.58	63.93	66.04	62.23	64.13	61.60	68.92	66.55	69.03	65.56	7.06	6.99	6.75	6.57	7.12	7.03	7.11	6.73	6.94	6.71	6.66	7.45
05/01/28	05/31/28	May 2028	65.40	59.45	70.79	62.89	64.73	59.31	69.68	63.95	70.56	64.56	7.12	7.03	6.78	6.58	6.97	6.92	6.91	6.65	6.95	6.72	6.67	7.25
06/01/28	06/30/28	Jun 2028	66.80	61.00	76.15	64.74	66.55	59.67	71.31	65.75	72.48	65.54	7.23	7.15	6.93	6.65	7.09	7.01	6.97	6.76	7.03	6.79	6.75	7.31
07/01/28	07/31/28	Jul 2028	80.98	66.46	92.43	68.77	80.45	63.83	85.83	70.72	89.63	70.25	7.30	7.31	7.01	6.73	7.17	7.09	7.05	6.82	7.11	6.88	6.83	7.39
08/01/28	08/31/28	Aug 2028	83.06	67.14	93.15	68.48	83.07	64.91	87.82	71.14	91.84	70.59	7.35	7.46	7.06	6.79	7.22	7.14	7.12	6.85	7.16	6.92	6.88	7.42
09/01/28	09/30/28	Sep 2028	81.39	66.40	85.88	66.90	81.16	64.53	85.90	69.94	87.95	69.52	7.28	7.44	7.09	6.84	7.36	7.27	7.25	6.97	7.21	6.97	6.93	7.54
10/01/28	10/31/28	Oct 2028	78.66	67.66	77.61	66.02	78.12	64.15	82.60	70.01	82.91	69.12	7.31	7.57	7.37	6.92	7.71	7.49	7.43	7.05	7.29	7.05	7.01	7.74
11/01/28	11/30/28	Nov 2028	81.99	68.28	75.22	65.87	81.96	70.61	78.53	69.72	77.78	68.75	7.46	7.48	7.21	7.01	7.66	7.61	7.72	7.33	7.39	7.15	7.10	8.08
12/01/28	12/31/28	Dec 2028	84.14	70.54	73.35	66.45	83.12	73.62	78.11	70.56	77.06	69.63	7.68	7.66	7.68	7.33	7.71	7.70	7.70	7.65	7.72	7.47	7.43	8.07
01/01/29	01/31/29	Jan 2029	77.85	69.85	76.31	69.20	79.10	68.16	78.41	71.76	77.75	71.66	7.87	7.96	7.85	7.53	7.87	7.87	7.88	7.84	7.92	7.68	7.63	8.26
02/01/29	02/28/29	Feb 2029	71.20	68.88	69.65	67.56	69.03	65.93	73.26	71.54	73.61	70.76	7.87	7.94	7.66	7.51	7.84	7.78	7.89	7.50	7.90	7.66	7.61	8.27
03/01/29	03/31/29	Mar 2029	69.08	65.85	66.85	64.49	66.28	63.83	71.67	68.34	70.69	67.64	7.48	7.44	7.17	7.03	7.34	7.29	7.41	7.02	7.41	7.17	7.12	7.78
04/01/29	04/30/29	Apr 2029	69.76	66.31	69.24	65.50	67.53	64.65	72.58	69.59	72.69	68.60	7.41	7.42	7.16	6.99	7.38	7.32	7.43	7.04	7.37	7.13	7.09	7.78
05/01/29	05/31/29	May 2029	69.45	63.78	74.04	65.51	68.57	62.29	73.52	66.86	74.18	67.17	7.46	7.36	7.11	6.95	7.28	7.23	7.22	6.95	7.33	7.09	7.05	7.56
06/01/29	06/30/29	Jun 2029	69.07	64.39	78.57	67.38	68.71	62.40	73.80	68.81	75.05	68.40	7.57	7.45	7.23	6.99	7.36	7.31	7.26	7.04	7.36	7.13	7.08	7.60
07/01/29	07/31/29	Jul 2029	85.04	69.20	96.81	71.47	84.37	66.67	89.46	73.43	93.69	72.93	7.65	7.62	7.32	7.08	7.43	7.35	7.32	7.10	7.46	7.22	7.17	7.67
08/01/29	08/31/29	Aug 2029	86.36	69.77	96.47	71.17	86.42	67.82	91.07	73.94	95.00	73.48	7.71	7.78	7.39	7.15	7.49	7.44	7.38	7.16	7.52	7.28	7.24	7.68
09/01/29	09/30/29	Sep 2029	84.54	69.24	89.51	69.93	84.20	67.62	88.84	72.81	92.08	72.67	7.65	7.73	7.43	7.21	7.60	7.54	7.54	7.26	7.58	7.35	7.30	7.84
10/01/29	10/31/29	Oct 2029	80.40	69.20	80.05	69.34	79.97	66.53	84.56	72.23	84.82	72.08	7.69	8.09	7.61	7.29	7.79	7.70	7.73	7.34	7.67	7.43	7.38	8.03
11/01/29	11/30/29	Nov 2029	84.38	69.86	77.32	67.89	84.47	72.36	79.75	70.29	79.09	69.90	7.76	7.76	7.48	7.31	7.66	7.93	8.04	7.65	7.69	7.45	7.40	8.40
12/01/29	12/31/29	Dec 2029	88.87	74.72	78.40	70.51	88.05	77.09	83.03	74.62	82.01	73.70	8.01	8.31	7.94	7.67	8.13	8.06	8.14	7.74	8.05	7.81	7.76	8.51
01/01/30	01/31/30	Jan 2030	82.48	72.92	80.26	72.34	83.54	71.21	82.19	74.89	81.56	74.72	8.21	8.41	8.20	7.88	8.22	8.21	8.22	8.18	8.26	8.02	7.97	8.61
02/01/30	02/28/30	Feb 2030	75.22	71.87	73.17	71.00	72.44	68.34	76.97	74.51	77.23	73.95	8.19	8.35	8.17	7.84	8.19	8.19	8.21	8.15	8.22	7.98	7.93	8.59
03/01/30	03/31/30	Mar 2030	69.96	67.64	68.67	66.12	67.62	64.72	73.41	70.07	72.54	69.28	7.68	7.63	7.36	7.24	7.53	7.48	7.57	7.17	7.61	7.38	7.33	7.95
04/01/30	04/30/30	Apr 2030	71.29	68.17	70.97	67.08	68.18	65.87	74.29	71.09	73.98	70.12	7.61	7.65	7.36	7.19	7.54	7.49	7.60	7.20	7.56	7.33	7.28	7.94
05/01/30	05/31/30	May 2030	69.89	63.44	75.26	66.96	69.30	63.22	74.44	68.65	75.35	69.48	7.66	7.58	7.31	7.15	7.50	7.44	7.43	7.16	7.52	7.29	7.24	7.77
06/01/30	06/30/30	Jun 2030	70.73	66.34	79.25	69.30	69.97	63.77	74.89	70.34	76.06	69.85	7.77	7.69	7.46	7.19	7.56	7.50	7.44	7.22	7.57	7.33	7.29	7.78
07/01/30	07/31/30	Jul 2030	86.81	71.13	97.79	72.91	86.14	68.47	91.29	75.09	94.78	74.54	7.88	7.89	7.60	7.31	7.65	7.60	7.55	7.32	7.68	7.45	7.40	7.90
08/01/30	08/31/30	Aug 2030	88.18	71.20	96.57	73.01	88.03	69.46	92.95	75.49	96.23	75.10	7.93	8.03	7.66	7.37	7.72	7.65	7.60	7.38	7.74	7.50	7.46	7.90
09/01/30	09/30/30	Sep 2030	86.38	71.13	90.51	71.72	86.09	69.10	90.66	74.51	93.39	74.14	7.87	8.07	7.68	7.43	7.85	7.74	7.74	7.48	7.80	7.56	7.52	8.04
10/01/30	10/31/30	Oct 2030	82.71	71.85	81.93	72.52	82.07	68.90	86.96	75.20	87.46	74.78	7.91	8.57	7.97	7.51	8.05	7.93	7.93	7.53	7.88	7.64	7.60	8.23
11/01/30	11/30/30	Nov 2030	84.92	72.02	78.97	69.94	85.22	74.56	82.38	73.48	81.65	72.73	8.02	8.11	7.83	7.57	8.01	8.06	8.17	7.76	7.95	7.71	7.66	8.53

12/01/30	12/31/30	Dec 2030	90.56	75.61	79.05	71.66	88.57	77.61	84.27	75.71	83.20	74.80	8.26	8.43	8.26	7.92	8.28	8.27	8.27	8.23	8.30	8.06	8.01	8.65
01/01/31	01/31/31	Jan 2031	83.59	74.95	82.54	74.36	82.28	73.47	84.32	76.90	83.68	76.48	8.42	8.67	8.41	8.26	8.43	8.43	8.44	8.39	8.64	8.40	8.35	8.82
02/01/31	02/28/31	Feb 2031	77.47	74.19	74.98	73.17	74.39	70.83	79.11	76.39	78.98	75.87	8.40	8.64	8.39	8.21	8.41	8.41	8.42	8.36	8.59	8.36	8.31	8.80
03/01/31	03/31/31	Mar 2031	70.97	70.02	70.94	68.47	70.12	67.94	74.80	72.37	74.91	71.75	7.89	7.88	7.59	7.55	7.77	7.71	7.80	7.40	7.93	7.69	7.64	8.18
04/01/31	04/30/31	Apr 2031	73.47	70.37	72.69	68.96	70.20	67.59	76.25	72.93	75.81	71.92	7.82	7.91	7.61	7.54	7.79	7.73	7.86	7.45	7.91	7.68	7.63	8.20
05/01/31	05/31/31	May 2031	73.84	67.48	78.21	69.67	72.93	66.19	77.64	70.60	78.36	70.73	7.86	7.83	7.55	7.53	7.73	7.67	7.66	7.39	7.91	7.67	7.62	8.01
06/01/31	06/30/31	Jun 2031	73.05	68.31	82.43	71.64	72.28	65.82	77.47	72.42	78.82	72.03	7.99	7.92	7.68	7.61	7.77	7.69	7.66	7.44	7.98	7.75	7.70	8.00
07/01/31	07/31/31	Jul 2031	89.55	72.65	101.67	75.96	88.88	70.94	94.16	77.31	98.13	76.97	8.09	8.24	7.83	7.72	7.88	7.82	7.77	7.54	8.10	7.86	7.81	8.12
08/01/31	08/31/31	Aug 2031	90.90	73.35	100.88	76.40	90.81	72.05	95.65	77.76	99.47	77.65	8.14	8.39	7.90	7.78	7.95	7.86	7.85	7.60	8.15	7.91	7.87	8.15
09/01/31	09/30/31	Sep 2031	89.03	73.13	93.46	74.38	88.43	71.61	92.92	76.50	95.82	76.20	8.07	8.39	7.92	7.86	8.11	8.02	8.00	7.72	8.23	7.99	7.95	8.30
10/01/31	10/31/31	Oct 2031	84.52	74.07	83.49	74.83	83.83	71.07	88.67	77.08	89.56	76.70	8.12	8.82	8.20	7.95	8.30	8.18	8.18	7.77	8.33	8.09	8.05	8.48
11/01/31	11/30/31	Nov 2031	88.72	75.71	82.75	74.09	88.80	77.68	86.08	76.83	85.36	76.35	8.35	8.56	8.25	8.18	8.43	8.48	8.61	8.19	8.56	8.31	8.27	8.97
12/01/31	12/31/31	Dec 2031	96.18	82.89	84.66	77.41	93.85	85.39	90.10	81.44	88.97	80.55	9.29	9.07	9.29	9.21	9.32	9.31	9.32	9.27	9.59	9.35	9.30	9.69
01/01/32	01/31/32	Jan 2032	85.74	76.72	83.59	76.21	83.92	75.08	84.37	78.23	84.82	77.74	8.59	8.85	8.58	8.42	8.60	8.60	8.61	8.56	8.80	8.57	8.52	8.99
02/01/32	02/29/32	Feb 2032	79.27	75.72	76.68	74.94	76.28	72.56	80.41	77.97	80.43	77.13	8.56	8.81	8.55	8.38	8.57	8.57	8.58	8.53	8.76	8.52	8.47	8.97
03/01/32	03/31/32	Mar 2032	72.40	71.69	72.11	69.63	72.05	69.73	76.75	73.62	75.99	72.69	8.04	8.03	7.74	7.70	7.93	7.87	7.96	7.54	8.08	7.84	7.79	8.34
04/01/32	04/30/32	Apr 2032	74.86	71.90	74.63	70.91	72.22	69.81	77.93	74.58	77.76	73.57	7.98	8.06	7.76	7.69	7.95	7.89	8.01	7.60	8.06	7.83	7.78	8.36
05/01/32	05/31/32	May 2032	72.33	66.48	79.25	71.57	72.08	67.07	77.22	71.36	78.11	71.94	8.02	7.98	7.70	7.68	7.88	7.83	7.82	7.54	8.06	7.82	7.78	8.16
06/01/32	06/30/32	Jun 2032	74.95	69.08	84.60	73.45	73.85	67.00	79.17	73.77	80.16	73.38	8.15	8.08	7.83	7.76	7.93	7.84	7.81	7.58	8.14	7.90	7.85	8.16
07/01/32	07/31/32	Jul 2032	91.49	74.58	103.79	78.19	90.86	72.76	96.04	78.99	100.03	78.65	8.25	8.41	7.99	7.88	8.04	7.98	7.93	7.69	8.25	8.02	7.97	8.27
08/01/32	08/31/32	Aug 2032	93.76	75.22	104.03	78.33	93.84	73.63	98.37	79.46	102.28	79.23	8.30	8.56	8.06	7.94	8.11	8.02	8.01	7.75	8.31	8.07	8.03	8.30
09/01/32	09/30/32	Sep 2032	91.58	74.78	95.81	76.30	91.04	73.38	95.45	78.51	98.13	78.20	8.24	8.56	8.08	8.02	8.27	8.18	8.16	7.87	8.39	8.15	8.11	8.46
10/01/32	10/31/32	Oct 2032	87.79	75.92	86.52	76.69	86.63	72.82	91.63	78.95	93.37	78.61	8.28	9.00	8.36	8.11	8.47	8.34	8.34	7.93	8.49	8.25	8.20	8.64
11/01/32	11/30/32	Nov 2032	90.78	77.52	84.96	75.27	90.68	79.88	87.55	78.03	86.92	77.42	8.52	8.74	8.41	8.34	8.60	8.65	8.78	8.35	8.72	8.48	8.43	9.14
12/01/32	12/31/32	Dec 2032	98.45	85.22	86.99	79.48	95.90	86.99	92.23	83.47	91.03	82.54	9.48	9.25	9.48	9.39	9.51	9.50	9.51	9.45	9.78	9.53	9.49	9.88
01/01/33	01/31/33	Jan 2033	88.81	78.55	85.66	78.15	87.06	77.08	86.44	80.10	86.72	79.61	8.76	9.02	8.75	8.59	8.77	8.77	8.78	8.73	8.97	8.73	8.68	9.16
02/01/33	02/28/33	Feb 2033	80.98	77.61	78.94	76.81	78.46	74.54	82.92	80.06	82.73	79.45	8.73	8.99	8.72	8.54	8.75	8.75	8.76	8.70	8.93	8.69	8.64	9.14
03/01/33	03/31/33	Mar 2033	76.03	73.39	74.05	71.31	73.47	70.97	78.90	75.41	77.96	74.45	8.20	8.19	7.90	7.85	8.09	8.02	8.12	7.70	8.23	8.00	7.95	8.50
04/01/33	04/30/33	Apr 2033	76.71	73.59	75.89	72.40	73.43	71.42	79.55	76.07	79.13	75.08	8.14	8.23	7.92	7.84	8.11	8.05	8.17	7.75	8.22	7.98	7.94	8.52
05/01/33	05/31/33	May 2033	75.11	70.62	81.00	73.14	74.37	69.28	79.31	73.80	80.31	74.28	8.18	8.14	7.86	7.84	8.04	7.98	7.97	7.69	8.21	7.98	7.93	8.32
06/01/33	06/30/33	Jun 2033	77.17	71.81	86.41	75.03	75.89	68.29	81.44	75.71	82.55	75.24	8.31	8.24	7.99	7.92	8.09	8.00	7.97	7.74	8.29	8.06	8.01	8.31
07/01/33	07/31/33	Jul 2033	93.17	76.21	105.73	79.61	92.82	74.55	97.93	80.56	102.17	80.16	8.42	8.57	8.15	8.03	8.20	8.14	8.09	7.84	8.41	8.17	8.13	8.43
08/01/33	08/31/33	Aug 2033	95.65	76.62	105.36	79.50	95.56	74.80	100.07	80.75	103.85	80.45	8.47	8.73	8.22	8.09	8.27	8.18	8.17	7.90	8.47	8.23	8.18	8.46
09/01/33	09/30/33	Sep 2033	92.53	76.53	95.63	77.51	91.87	74.70	96.27	79.99	98.30	79.47	8.40	8.73	8.24	8.18	8.43	8.35	8.33	8.03	8.55	8.31	8.27	8.63
10/01/33	10/31/33	Oct 2033	89.16	77.41	87.44	78.11	88.06	74.21	93.07	80.61	94.76	80.17	8.45	9.18	8.53	8.28	8.64	8.51	8.51	8.08	8.65	8.41	8.37	8.81
11/01/33	11/30/33	Nov 2033	91.96	79.17	85.97	76.52	91.50	81.44	89.09	79.69	88.30	78.98	8.69	8.91	8.58	8.51	8.77	8.83	8.95	8.52	8.89	8.65	8.60	9.31
12/01/33	12/31/33	Dec 2033	99.14	87.16	87.64	81.12	97.04	88.78	93.27	84.80	92.12	83.99	9.67	9.43	9.67	9.58	9.70	9.69	9.70	9.64	9.97	9.72	9.67	10.07
01/01/34	01/31/34	Jan 2034	89.92	80.38	86.92	79.28	87.62	78.70	87.90	81.89	88.32	81.21	8.93	9.20	8.92	8.76	8.95	8.95	8.96	8.90	9.14	8.91	8.86	9.34
02/01/34	02/28/34	Feb 2034	82.43	79.53	80.11	78.19	79.41	75.77	83.69	81.38	83.82	80.46	8.91	9.17	8.90	8.71	8.92	8.92	8.93	8.88	9.10	8.86	8.81	9.31
03/01/34	03/31/34	Mar 2034	76.01	75.26	76.03	73.43	75.45	73.05	80.06	77.57	79.82	76.71	8.37	8.36	8.06	8.01	8.25	8.18	8.28	7.85	8.39	8.16	8.11	8.66
04/01/34	04/30/34	Apr 2034	78.36	75.38	78.05	74.66	75.49	72.98	81.32	78.62	81.17	77.63	8.30	8.39	8.08	8.00	8.27	8.21	8.34	7.90	8.37	8.14	8.09	8.68
05/01/34	05/31/34	May 2034	76.28	71.15	82.86	74.70	75.36	70.63	80.79	74.78	81.59	75.38	8.34	8.31	8.01	7.99	8.20	8.14	8.13	7.84	8.37	8.13	8.09	8.48
06/01/34	06/30/34	Jun 2034	77.85	73.32	87.70	76.52	77.20	69.94	82.20	77.49	83.32	76.75	8.47	8.41	8.15	8.07	8.25	8.16	8.13	7.89	8.45	8.22	8.17	8.47
07/01/34	07/31/34	Jul 2034	95.88	78.24	108.28	81.58	95.32	76.46	100.37	82.67	104.55	82.29	8.58	8.75	8.31	8.19	8.37	8.30	8.25	8.00	8.57	8.34	8.29	8.59
08/01/34	08/31/34	Aug 2034	97.83	78.57	107.55	81.35	98.15	76.76	102.54	82.76	105.93	82.47	8.63	8.90	8.39	8.26	8.44	8.34	8.33	8.06	8.63	8.39	8.35	8.63
09/01/34	09/30/34	Sep 2034	94.49	78.93	98.62	79.79	93.89	77.15	98.38	82.07	101.59	81.65	8.57	8.90	8.41	8.34	8.60	8.51	8.49	8.19	8.71	8.48	8.43	8.79
10/01/34	10/31/34	Oct 2034	90.66	79.47	89.17	79.80	89.73	76.20	94.63	82.70	95.65	82.16	8.61	9.36	8.70	8.44	8.81	8.68	8.68	8.25	8.81	8.58	8.53	8.98
11/01/34	11/30/34	Nov 2034	94.75	81.35	88.20	78.70	94.54	83.39	91.80	81.33	91.03	80.99	8.86	9.09	8.75	8.68	8.95	9.00	9.13	8.69	9.06	8.82	8.77	9.49
12/01/34	12/31/34	Dec 2034	102.11	89.04	90.80	82.72	99.91	90.72	96.12	86.72	95.03	85.76	9.86	9.62	9.86	9.77	9.89	9.88	9.89	9.84	10.16	9.91	9.87	10.27
01/01/35	01/31/35	Jan 2035	92.90	82.32	90.53	81.49	91.10	80.63	89.91	83.85	90.30	83.09	9.11	9.39	9.10	8.94	9.12	9.12	9.14	9.08	9.32	9.08	9.03	9.52
02/01/35	02/28/35	Feb 2035	84.50	81.74	82.16	80.01	81.94	78.20	85.75	83.39	85.60	82.48	9.09	9.35	9.08	8.89	9.10	9.10	9.11	9.05	9.27	9.03	8.98	9.49
03/01/35	03/31/35	Mar 2035	77.74	77.16	77.13	74.79	77.22	74.65	81.20	78.80	81.13	77.89	8.54	8.53	8.22	8.17	8.41	8.35	8.45	8.01	8.55	8.32	8.27	8.83
04/01/35	04/30/35	Apr 2035	80.21	77.54	79.17	75.67	77.20	74.75	82.60	79.64	82.64	78.61	8.47	8.56	8.24	8.16	8.44	8.37	8.50	8.06	8.53	8.30	8.25	8.85
05/01/35	05/31/35	May 2035	78.77	74.32	85.18	76.30	78.44	72.06	82.94	77.20	83.68	76.76	8.51	8.47	8.18	8.15	8.36	8.31	8.30	8.00	8.53	8.29	8.25	8.64
06/01/35	06/30/35	Jun 2035	80.09	75.37	89.50	78.25	78.93	72.05	84.42	78.85	85.14	78.34	8.64	8.58	8.31	8.24	8.41	8.32	8.29	8.05	8.61	8.38	8.33	8.63
07/01/35	07/31/35	Jul 2035	97.36	79.91	109.76	83.13	97.09	77.27	101.68	83.88	105.42	83.40	8.76	8.92	8.48	8.36	8.53	8.47	8.41	8.16	8.73	8.50	8.45	8.76
08/01/35	08/31/35	Aug 2035	99.35	80.28	109.08	83.24	99.54	78.08	103.83	84.07	106.87	83.60	8.81	9.08	8.55	8.42	8.61	8.51	8.50	8.22	8.79	8.55	8.51	8.79
09/01/35	09/30/35	Sep 2035	96.12	80.87	99.62	81.51	95.28	78.71	99.77	83.98	102.50	83.46	8.74	9.08	8.57	8.51	8.77	8.69	8.66	8.35	8.88	8.64	8.60	8.96
10/01/35	10/31/35	Oct 2035	92.17	81.07	90.30	81.79	91.37	77.82	96.27	84.28	97.34	83.74	8.79	9.55	8.87	8.61	8.99	8.85	8.85	8.41	8.98	8.74	8.70	9.15
11/01/35	11/30/35	Nov 2035	95.62	82.85	89.49	79.81	95.46	85.20	92.33	82.37	91.38	81.66	9.04	9.27	8.93	8.85	9.13	9.18	9.31	8.86	9.23	8.99	8.94	9.68
12/01/35	12/31/35	Dec 2035	103.81	91.19	92.03	84.92	101.53	92.59	97.52	87.96	96.53	87.44	10.06	9.81	10.06	9.97	10.09	10.08	10.09	10.03	10.35	10.11	10.06	10.46
01/01/36	01/31/36	Jan 2036	94.71	84.41	92.18	83.63	92.52	82.61	93.36	86.05	93.56	85.48	9.30	9.58	9.28	9.12	9.31	9.31	9.32	9.26	9.50	9.26	9.21	9.70
02/01/36	02/29/36	Feb 2036	86.37	82.94	84.15	81.94	83.26	79.00	88.07	85.54	88.47	84.68	9.27	9.54	9.26	9.07	9.28	9.28	9.29	9.24	9.45	9.21	9.16	9.67
03/01/36	03/31/36	Mar 2036	79.63	79.02	79.45	76.70	78.90	75.96	83.25	80.69	83.32	79.89	8.71	8.70	8.38	8.34	8.58	8.52	8.62	8.17	8.72	8.48	8.43	8.99
04/01/36	04/30/36	Apr 2036	81.98	79.20	81.95	77.75	79.01	76.70	85.05	80.52	84.82	79.53	8.64	8.73	8.40	8.32	8.61	8.54	8.67	8.22	8.70	8.46	8.42	9.02
05/01/36	05/31/36	May 2036	81.18	76.26	87.42	78.35	80.44	74.16	85.45	78.42	86.59	79.10	8.68	8.64	8.34	8.32	8.53	8.47	8.46	8.16	8.69	8.46	8.41	8.81
06/01/36	06/30/36	Jun 2036	82.16	76.89	92.33	80.55	81.27	73.86	86.11	80.91	87.66	80.38	8.82	8.75	8.48	8.40	8.58	8.49	8.46	8.21	8.77	8.54	8.49	8.80
07/01/36	07/31/36	Jul 2036	99.23	80.79	112.41	85.38	99.11	79.06	103.86	85.66	107.74	85.41	8.93	9.10	8.65	8.53	8.71	8.64	8.58	8.32	8.90	8.67	8.62	8.93
08/01/36	08/31/36	Aug 2036	101.09	82.59	111.73	85.87	101.00	80.09	105.52	86.46	109.15	86.15	8.98	9.26	8.72	8.59	8.78	8.68	8.67	8.39	8.96	8.72	8.68	8.96
09/01/36	09/30/36	Sep 2036	97.75	82.21	102.24	83.45	96.83	79.92	101.23	85.37	104.02	84.85	8.91	9.26	8.75	8.68	8.95	8.86	8.84	8.52	9.05	8.81	8.77	9.14
10/01/36	10/31/36	Oct 2036	93.20	82.76	91.99	83.91	92.62	79.62	97.36	86.01	98.29	85.54	8.96	9.74	9.05	8.78	9.16	9.03	9.03	8.58	9.16	8.92	8.87	9.33
11/01/36	11/30/36	Nov 2036	96.45	84.86	91.53	82.43	95.95	87.23	94.38	85.24	93.67	84.40	9.22	9.46	9.11	9.03	9.31	9.37	9.50	9.04	9.41	9.17	9.12	9.86
12/01/36	12/31/36	Dec 2036	105.76	92.77	93.58	86.91	103.92	93.95	99.18	89.75	98.15	89.24	10.26	10.01	10.26	10.17	10.29	10.28	10.29	10.23	10.55	10.31	10.26	10.67

01/01/37	01/31/37	Jan 2037	95.27	86.46	94.92	85.77	93.73	84.20	94.02	87.53	94.53	87.03	9.48	9.77	9.47	9.30	9.49	9.49	9.50	9.45	9.68	9.44	9.39	9.89
02/01/37	02/28/37	Feb 2037	87.93	85.24	86.02	83.93	85.79	81.40	89.83	87.35	90.18	86.44	9.45	9.73	9.44	9.25	9.47	9.47	9.48	9.42	9.63	9.39	9.34	9.86
03/01/37	03/31/37	Mar 2037	81.52	80.80	81.49	78.54	80.16	77.72	85.37	82.65	85.42	81.85	8.88	8.87	8.55	8.50	8.75	8.69	8.79	8.33	8.88	8.65	8.60	9.17
04/01/37	04/30/37	Apr 2037	83.38	81.09	83.35	79.27	80.91	78.77	86.07	82.51	86.26	81.51	8.81	8.90	8.57	8.49	8.78	8.71	8.85	8.39	8.86	8.63	8.58	9.19
05/01/37	05/31/37	May 2037	83.02	77.42	89.57	80.38	82.86	75.59	87.35	80.65	88.48	80.59	8.85	8.82	8.51	8.48	8.70	8.64	8.63	8.32	8.86	8.62	8.58	8.97
06/01/37	06/30/37	Jun 2037	83.90	78.76	94.04	82.30	82.66	75.55	88.10	82.56	89.22	82.06	8.99	8.92	8.65	8.57	8.75	8.66	8.63	8.37	8.94	8.71	8.66	8.97
07/01/37	07/31/37	Jul 2037	101.29	82.64	114.10	87.10	101.14	81.06	105.82	87.33	109.33	86.97	9.11	9.28	8.82	8.70	8.88	8.81	8.75	8.49	9.07	8.84	8.79	9.10
08/01/37	08/31/37	Aug 2037	103.27	84.38	113.42	87.63	103.09	81.95	107.64	88.15	110.96	87.84	9.16	9.45	8.90	8.76	8.96	8.85	8.84	8.55	9.13	8.89	8.85	9.14
09/01/37	09/30/37	Sep 2037	99.76	84.04	103.24	84.84	98.80	81.44	103.21	87.22	105.72	86.51	9.09	9.45	8.92	8.85	9.13	9.04	9.01	8.69	9.22	8.99	8.94	9.31
10/01/37	10/31/37	Oct 2037	96.08	84.71	94.31	85.50	94.78	81.82	99.77	88.00	100.69	87.64	9.14	9.93	9.23	8.96	9.35	9.21	9.21	8.75	9.33	9.09	9.05	9.51
11/01/37	11/30/37	Nov 2037	98.84	86.81	93.87	84.15	98.30	88.41	97.12	87.87	96.40	86.90	9.40	9.65	9.29	9.21	9.50	9.55	9.69	9.22	9.59	9.35	9.30	10.05
12/01/37	12/31/37	Dec 2037	107.49	95.00	95.21	88.25	105.16	95.56	101.08	92.18	100.04	91.17	10.46	10.21	10.46	10.37	10.50	10.48	10.50	10.44	10.76	10.51	10.46	10.87
01/01/38	01/31/38	Jan 2038	100.21	88.78	96.76	87.51	99.61	87.48	96.08	89.44	96.49	88.65	9.67	9.96	9.66	9.48	9.68	9.68	9.69	9.64	9.87	9.63	9.58	10.08
02/01/38	02/28/38	Feb 2038	88.60	88.08	88.22	85.97	88.39	85.31	91.81	89.39	92.04	88.46	9.64	9.92	9.63	9.43	9.66	9.66	9.67	9.61	9.81	9.58	9.53	10.05
03/01/38	03/31/38	Mar 2038	83.81	83.06	83.32	80.33	83.16	80.72	87.16	83.42	87.17	82.46	9.06	9.05	8.72	8.67	8.93	8.86	8.96	8.50	9.05	8.82	8.77	9.34
04/01/38	04/30/38	Apr 2038	84.58	83.25	84.83	81.12	82.93	80.80	87.65	84.07	88.03	83.09	8.99	9.08	8.74	8.66	8.95	8.88	9.02	8.56	9.03	8.80	8.75	9.37
05/01/38	05/31/38	May 2038	84.71	79.39	91.25	82.52	83.82	77.36	88.42	81.73	89.29	82.21	9.03	8.99	8.68	8.65	8.87	8.82	8.80	8.49	9.03	8.79	8.74	9.15
06/01/38	06/30/38	Jun 2038	86.37	80.61	96.87	84.26	85.66	77.30	90.46	84.45	91.48	83.88	9.17	9.10	8.82	8.74	8.93	8.83	8.80	8.54	9.11	8.88	8.83	9.14
07/01/38	07/31/38	Jul 2038	103.63	84.74	116.89	89.47	103.77	83.30	108.48	89.76	112.35	89.33	9.29	9.47	9.00	8.87	9.06	8.99	8.93	8.66	9.25	9.01	8.96	9.27
08/01/38	08/31/38	Aug 2038	106.53	86.20	117.36	89.69	106.71	84.48	111.18	90.29	114.84	89.94	9.35	9.64	9.08	8.94	9.14	9.03	9.02	8.73	9.31	9.07	9.03	9.31
09/01/38	09/30/38	Sep 2038	102.80	86.24	106.08	87.18	102.26	84.21	106.51	89.63	108.62	89.05	9.28	9.64	9.10	9.03	9.31	9.22	9.19	8.87	9.40	9.16	9.12	9.49
10/01/38	10/31/38	Oct 2038	99.83	87.35	98.06	87.41	98.81	84.20	103.91	90.44	105.09	89.86	9.32	10.13	9.42	9.14	9.54	9.39	9.39	8.93	9.51	9.27	9.23	9.70
11/01/38	11/30/38	Nov 2038	99.83	88.98	95.97	85.69	101.74	91.85	98.35	88.96	97.66	87.97	9.59	9.84	9.48	9.39	9.69	9.74	9.89	9.41	9.77	9.53	9.49	10.25
12/01/38	12/31/38	Dec 2038	110.18	97.01	97.86	90.60	108.21	98.07	103.41	94.19	102.37	93.32	10.67	10.41	10.67	10.58	10.71	10.69	10.71	10.65	10.96	10.72	10.67	11.08
01/01/39	01/31/39	Jan 2039	95.94	90.72	98.50	89.53	97.69	89.11	97.96	91.64	98.44	90.79	9.86	10.16	9.85	9.67	9.88	9.88	9.89	9.83	10.06	9.82	9.77	10.27
02/01/39	02/28/39	Feb 2039	92.45	90.11	90.34	87.63	89.74	86.81	94.24	91.19	94.23	90.46	9.84	10.12	9.82	9.62	9.85	9.85	9.86	9.80	10.00	9.77	9.72	10.24
03/01/39	03/31/39	Mar 2039	85.44	85.17	85.52	82.39	84.57	82.43	88.83	85.36	88.91	84.34	9.24	9.23	8.89	8.85	9.11	9.04	9.14	8.67	9.23	8.99	8.94	9.52
04/01/39	04/30/39	Apr 2039	86.33	84.94	87.11	83.11	83.81	82.12	89.79	85.68	89.91	84.70	9.17	9.26	8.92	8.83	9.13	9.06	9.20	8.73	9.21	8.97	8.93	9.55
05/01/39	05/31/39	May 2039	86.84	81.41	93.37	84.47	86.43	79.23	91.14	85.14	92.19	85.13	9.21	9.17	8.85	8.83	9.05	8.99	8.98	8.66	9.20	8.97	8.92	9.32
06/01/39	06/30/39	Jun 2039	88.36	82.65	98.60	86.09	87.57	79.16	92.33	85.93	93.55	85.38	9.36	9.29	9.00	8.91	9.11	9.01	8.97	8.71	9.29	9.06	9.01	9.32
07/01/39	07/31/39	Jul 2039	105.29	86.30	118.63	91.30	105.09	84.80	109.69	91.32	113.98	91.07	9.48	9.66	9.18	9.05	9.24	9.17	9.11	8.83	9.42	9.19	9.14	9.45
08/01/39	08/31/39	Aug 2039	107.87	87.90	118.31	91.22	108.00	85.91	112.07	91.73	115.99	91.33	9.53	9.83	9.26	9.12	9.32	9.21	9.20	8.90	9.49	9.25	9.21	9.50
09/01/39	09/30/39	Sep 2039	102.96	88.29	106.18	88.79	102.20	86.15	106.51	91.16	108.75	90.59	9.46	9.83	9.28	9.21	9.50	9.40	9.38	9.04	9.58	9.34	9.30	9.68
10/01/39	10/31/39	Oct 2039	99.88	89.25	98.24	88.86	98.44	86.28	103.36	92.00	104.95	91.38	9.51	10.33	9.61	9.32	9.73	9.58	9.58	9.10	9.69	9.45	9.41	9.88
11/01/39	11/30/39	Nov 2039	99.80	90.85	97.06	87.23	101.72	93.04	99.41	90.48	99.29	89.49	9.78	10.04	9.66	9.58	9.88	9.94	10.08	9.59	9.96	9.72	9.67	10.44
12/01/39	12/31/39	Dec 2039	111.09	99.04	98.81	92.47	110.19	100.20	104.19	95.61	103.15	94.86	10.88	10.62	10.88	10.79	10.92	10.91	10.92	10.86	11.17	10.93	10.88	11.29
01/01/40	01/31/40	Jan 2040	98.46	92.95	100.95	91.30	99.96	91.04	99.39	93.33	99.96	92.41	10.06	10.37	10.05	9.87	10.07	10.07	10.09	10.03	10.25	10.01	9.96	10.47
02/01/40	02/29/40	Feb 2040	94.65	92.23	92.06	89.15	91.57	88.56	96.40	93.09	95.88	92.09	10.03	10.33	10.02	9.81	10.05	10.05	10.06	10.00	10.20	9.96	9.91	10.44
03/01/40	03/31/40	Mar 2040	87.69	87.32	87.35	84.57	87.17	85.16	90.85	87.81	90.96	86.82	9.42	9.41	9.07	9.02	9.29	9.22	9.33	8.84	9.40	9.17	9.12	9.70
04/01/40	04/30/40	Apr 2040	88.44	87.05	89.75	85.38	85.13	83.91	92.38	88.18	92.47	87.23	9.35	9.45	9.10	9.01	9.32	9.24	9.39	8.90	9.38	9.15	9.10	9.73
05/01/40	05/31/40	May 2040	86.92	82.36	95.35	86.27	86.91	80.90	91.05	85.32	93.56	85.80	9.39	9.35	9.03	9.00	9.23	9.17	9.16	8.83	9.37	9.14	9.09	9.50
06/01/40	06/30/40	Jun 2040	89.17	84.49	100.21	88.33	88.30	81.14	93.35	88.03	94.79	87.48	9.54	9.47	9.18	9.09	9.29	9.19	9.15	8.89	9.47	9.23	9.19	9.50
07/01/40	07/31/40	Jul 2040	108.44	88.78	122.13	93.51	108.32	87.12	112.99	93.67	117.31	93.42	9.67	9.85	9.36	9.23	9.42	9.35	9.29	9.01	9.60	9.37	9.32	9.63
08/01/40	08/31/40	Aug 2040	110.89	90.26	121.13	93.49	110.80	88.65	114.81	94.11	118.74	93.71	9.72	10.03	9.44	9.30	9.50	9.39	9.38	9.08	9.67	9.43	9.39	9.68
09/01/40	09/30/40	Sep 2040	106.01	90.73	109.59	91.48	105.09	88.94	109.60	93.58	112.18	93.07	9.65	10.03	9.47	9.39	9.69	9.59	9.56	9.22	9.77	9.53	9.48	9.86
10/01/40	10/31/40	Oct 2040	102.07	91.54	100.57	91.12	101.40	88.46	106.15	94.36	107.22	93.75	9.70	10.54	9.80	9.51	9.92	9.77	9.77	9.29	9.88	9.64	9.60	10.08
11/01/40	11/30/40	Nov 2040	102.63	93.27	99.40	89.41	104.89	95.40	102.20	92.96	101.97	91.97	9.98	10.24	9.86	9.77	10.08	10.14	10.28	9.79	10.15	9.91	9.86	10.65
12/01/40	12/31/40	Dec 2040	113.78	101.76	101.82	94.53	112.10	102.97	107.28	98.31	106.30	97.29	11.10	10.83	11.10	11.00	11.14	11.13	11.14	11.08	11.39	11.15	11.10	11.51
01/01/41	01/31/41	Jan 2041	101.37	95.35	103.56	93.58	103.72	93.44	101.90	95.60	102.48	94.68	10.27	10.58	10.26	10.07	10.29	10.29	10.30	10.24	10.46	10.22	10.17	10.68
02/01/41	02/28/41	Feb 2041	97.18	94.76	94.32	91.29	94.20	91.08	98.65	95.25	98.23	94.25	10.24	10.54	10.23	10.02	10.26	10.26	10.27	10.21	10.40	10.17	10.11	10.65
03/01/41	03/31/41	Mar 2041	90.54	89.57	89.57	86.45	88.98	86.59	93.27	89.73	93.24	88.76	9.62	9.61	9.26	9.21	9.49	9.41	9.52	9.03	9.59	9.36	9.31	9.90
04/01/41	04/30/41	Apr 2041	90.69	89.42	91.37	87.61	87.45	86.20	94.35	89.59	94.21	88.56	9.55	9.65	9.29	9.20	9.51	9.44	9.59	9.09	9.57	9.34	9.29	9.93
05/01/41	05/31/41	May 2041	88.95	85.63	97.86	88.41	88.42	82.91	93.26	88.41	96.21	88.27	9.59	9.55	9.22	9.19	9.43	9.36	9.35	9.02	9.56	9.33	9.28	9.69
06/01/41	06/30/41	Jun 2041	91.97	86.81	102.63	90.78	91.19	83.34	95.95	90.28	97.35	89.73	9.74	9.67	9.37	9.28	9.48	9.38	9.35	9.07	9.66	9.42	9.38	9.69
07/01/41	07/31/41	Jul 2041	110.75	90.73	123.83	95.41	110.71	88.92	115.11	95.63	119.31	95.33	9.87	10.06	9.56	9.42	9.62	9.55	9.48	9.20	9.80	9.56	9.51	9.83
08/01/41	08/31/41	Aug 2041	112.66	92.50	122.81	95.65	112.80	90.75	117.14	96.47	120.57	96.06	9.93	10.24	9.64	9.49	9.70	9.59	9.58	9.27	9.86	9.63	9.58	9.88
09/01/41	09/30/41	Sep 2041	109.22	93.11	112.83	93.36	108.47	91.06	113.01	96.03	115.63	95.43	9.85	10.24	9.67	9.59	9.89	9.79	9.77	9.42	9.96	9.73	9.68	10.06
10/01/41	10/31/41	Oct 2041	103.89	93.49	102.50	93.22	103.18	90.60	107.96	96.45	109.07	95.84	9.90	10.76	10.00	9.71	10.13	9.98	9.98	9.48	10.08	9.84	9.80	10.28
11/01/41	11/30/41	Nov 2041	104.99	95.62	101.03	91.41	106.66	97.64	103.95	94.92	103.60	93.91	10.19	10.45	10.07	9.98	10.29	10.35	10.50	9.99	10.36	10.12	10.07	10.86
12/01/41	12/31/41	Dec 2041	116.83	104.10	104.12	96.62	114.54	105.06	109.79	100.23	108.65	99.35	11.34	11.06	11.34	11.24	11.37	11.36	11.37	11.31	11.62	11.38	11.33	11.75
01/01/42	01/31/42	Jan 2042	103.45	97.87	105.77	95.66	105.39	95.88	104.10	97.77	104.61	96.80	10.49	10.81	10.48	10.29	10.50	10.50	10.51	10.45	10.67	10.43	10.38	10.90
02/01/42	02/28/42	Feb 2042	99.34	96.92	96.54	93.51	96.98	93.26	100.93	97.43	100.40	96.42	10.46	10.76	10.45	10.23	10.47	10.47	10.48	10.42	10.61	10.38	10.33	10.87
03/01/42	03/31/42	Mar 2042	92.84	91.89	92.07	88.79	90.27	88.50	95.96	91.78	95.78	90.82	9.82	9.81	9.46	9.41	9.68	9.61	9.72	9.22	9.79	9.55	9.50	10.10
04/01/42	04/30/42	Apr 2042	92.32	91.36	93.17	88.90	89.06	87.64	96.00	91.47	95.93	90.44	9.75	9.85	9.48	9.39	9.71	9.63	9.79	9.28	9.77	9.53	9.49	10.13
05/01/42	05/31/42	May 2042	92.20	87.83	99.84	90.43	90.75	84.96	96.32	90.57	98.07	90.69	9.79	9.75	9.41	9.38	9.62	9.56	9.55	9.21	9.76	9.52	9.48	9.89
06/01/42	06/30/42	Jun 2042	93.94	88.97	105.31	92.97	93.18	85.80	97.89	92.14	99.72	91.75	9.95	9.87	9.57	9.48	9.68	9.58	9.54	9.26	9.85	9.62	9.57	9.89
07/01/42	07/31/42	Jul 2042	113.43	92.96	127.03	97.90	113.40	90.91	117.70	97.98	122.24	97.54	10.08	10.27	9.76	9.62	9.82	9.75	9.68	9.39	10.00	9.76	9.71	10.03
08/01/42	08/31/42	Aug 2042	115.48	94.72	126.31	98.33	115.42	92.98	119.66	98.95	123.75	98.60	10.14	10.45	9.84	9.69	9.91	9.79	9.78	9.46	10.06	9.83	9.78	10.08
09/01/42	09/30/42	Sep 2042	111.03	95.30	114.96	95.55	110.24	92.94	114.44	97.72	117.25	97.02	10.06	10.45	9.87	9.79	10.10	10.00	9.97	9.61	10.16	9.93	9.88	10.27
10/01/42	10/31/42	Oct 2042	105.18	95.67	104.52	95.02	104.91	92.72	109.48	98.55	110.37	97.85	10.11	10.99	10.21	9.91	10.34	10.19	10.19	9.68	10.28	10.04	10.00	10.49
11/01/42	11/30/42	Nov 2042	106.36	98.02	103.35	93.88	108.28	99.77	106.71	97.40	106.16	96.43	10.40	10.67	10.28	10.19	10.51	10.57	10.72	10.20	10.57	10.33	10.28	11.08
12/01/42	12/31/42	Dec 2042	119.00	106.08	106.16	98.60	118.16	107.10	111.62	102.46	110.57	101.52	11.57	11.29	11.57	11.47	11.61	11.60	11.61	11.55	11.86	11.61	11.57	11.99
01/01/43	01/31/43	Jan 2043	105.62	99.93	107.99	97.67	107.60	97.89	106.29	99.82	106.81	98.83	10.71	11.03	10.70	10.50	10.72	10.72	10.73	10.67	10.88	10.65	10.60	11.12

	02/01/43	02/28/43	Feb 2043	101.43	98.96	98.57	95.47	99.02	95.22	103.05	99.48	102.51	98.44	10.68	10.99	10.67	10.45	10.69	10.69	10.70	10.64	10.83	10.59	10.54	11.09
	03/01/43	03/31/43	Mar 2043	94.79	93.82	94.00	90.65	92.17	90.36	97.98	93.71	97.79	92.73	10.03	10.02	9.65	9.60	9.89	9.81	9.93	9.41	9.98	9.75	9.70	10.30
	04/01/43	04/30/43	Apr 2043	94.26	93.28	95.13	90.77	90.93	89.48	98.02	93.39	97.94	92.34	9.95	10.06	9.68	9.59	9.91	9.84	9.99	9.47	9.96	9.73	9.68	10.34
	05/01/43	05/31/43	May 2043	94.14	89.67	101.94	92.33	92.66	86.74	98.34	92.47	100.13	92.59	10.00	9.96	9.61	9.58	9.83	9.76	9.75	9.40	9.95	9.72	9.67	10.09
	06/01/43	06/30/43	Jun 2043	95.91	90.84	107.52	94.92	95.14	87.60	99.95	94.07	101.81	93.68	10.16	10.08	9.77	9.68	9.89	9.78	9.74	9.46	10.05	9.82	9.77	10.09

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
3/29/2013		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
0313 Official Forward Price Curve:		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
Blend of...																								
0313 D Midas forecast completed 3/29/2013 forward market curve			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
04/01/13	04/30/13	Apr 2013	34.90	26.04	36.82	26.89	29 08	23.08	44.09	35.29	51.72	38.91	3.98	4.13	3.77	3.77	3.85	3.77	3.93	3.70	4.23	3.99	4.02	4.14
05/01/13	05/31/13	May 2013	30.00	18.00	38.00	26.50	24.00	13.25	43.50	33.50	51.25	38.75	4.02	4.10	3.80	3.82	3.87	3.84	3.78	3.48	4.17	3.93	3.96	4.01
06/01/13	06/30/13	Jun 2013	29.00	11.50	41.25	26.00	22.25	8.25	42.25	30.75	49.00	35.75	4.07	4.12	3.85	3.86	3.90	3.87	3.81	3.53	4.20	3.97	3.99	4.05
07/01/13	07/31/13	Jul 2013	43.95	26.47	49.61	29.95	39.29	25.01	50.99	37.50	58.50	39.53	4.11	4.22	3.97	3.90	4.01	3.97	3.90	3.57	4.24	4.01	4.03	4.14
08/01/13	08/31/13	Aug 2013	49.56	35.85	50.09	30.86	44.79	32.94	53.05	38.25	60.26	41.16	4.13	4.27	4.00	3.94	4.04	4.01	3.94	3.59	4.29	4.05	4.07	4.19
09/01/13	09/30/13	Sep 2013	46.75	38.19	42.05	29.95	42.67	33.55	50.47	36.75	56.75	41.57	4.12	4.24	3.98	3.93	4.03	4.00	3.95	3.58	4.28	4.04	4.07	4.20
10/01/13	10/31/13	Oct 2013	37.72	34.32	40.16	28.86	36.66	32.64	47.69	38.12	51.50	39.94	4.13	4.23	3.96	3.93	4.04	4.00	4.03	3.59	4.27	4.04	4.06	4.28
11/01/13	11/30/13	Nov 2013	41.41	35.04	36.34	29.75	39.00	34.34	46.28	38.12	49.50	41.16	4.20	4.30	4.05	4.05	4.13	4.10	4.37	3.74	4.40	4.16	4.18	4.65
12/01/13	12/31/13	Dec 2013	43.87	37.90	38.25	30.64	41.34	35.02	46.28	39.27	49.00	41.16	4.34	4.45	4.20	4.24	4.28	4.24	4.65	3.84	4.59	4.35	4.38	4.95
01/01/14	01/31/14	Jan 2014	44.55	38.07	39.53	31.31	40.43	34.76	47.43	40.04	52.02	41.57	4.42	4.53	4.28	4.31	4.36	4.32	4.68	3.88	4.67	4.43	4.45	4.98
02/01/14	02/28/14	Feb 2014	41.66	35.25	39.14	31.31	38.89	33.75	47.43	39.64	51.51	40.75	4.39	4.50	4.25	4.27	4.33	4.29	4.55	3.87	4.63	4.39	4.41	4.84
03/01/14	03/31/14	Mar 2014	37.54	32.43	37.59	30.38	36.19	32.74	44.64	38.07	47.98	39.94	4.34	4.44	4.19	4.20	4.27	4.24	4.39	3.82	4.56	4.32	4.34	4.67
04/01/14	04/30/14	Apr 2014	36.52	23.44	39.25	29.12	32.75	20.89	41.28	33.08	46.08	37.01	4.08	4.20	3.92	3.82	3.96	3.93	3.88	3.51	4.17	3.93	3.90	4.12
05/01/14	05/31/14	May 2014	31.83	15.94	38.47	24.18	26.92	12.96	42.57	32.42	47.03	33.49	4.09	4.20	3.93	3.85	3.97	3.93	3.81	3.51	4.19	3.96	3.93	4.04
06/01/14	06/30/14	Jun 2014	32.16	16.88	40.04	24.70	23.59	11.90	45.15	32.75	49.40	35.25	4.11	4.22	3.95	3.89	3.99	3.95	3.81	3.51	4.23	4.00	3.97	4.04
07/01/14	07/31/14	Jul 2014	46.80	25.28	49.82	29.61	37.77	22.91	52.00	37.59	58.91	39.77	4.14	4.26	3.98	3.97	4.02	3.99	3.97	3.54	4.32	4.08	4.05	4.22
08/01/14	08/31/14	Aug 2014	50.18	35.20	48.88	32.76	44.41	29.75	53.56	40.69	59.48	42.23	4.16	4.27	4.00	3.99	4.04	4.00	4.06	3.56	4.34	4.10	4.07	4.31
09/01/14	09/30/14	Sep 2014	47.77	35.52	42.30	32.13	44.41	36.59	50.44	37.98	54.86	41.00	4.16	4.28	4.00	3.99	4.04	4.01	4.05	3.61	4.34	4.10	4.07	4.30
10/01/14	10/31/14	Oct 2014	40.46	35.28	39.66	31.25	37.26	34.65	47.27	38.00	48.21	38.71	4.19	4.31	4.03	4.02	4.07	4.04	3.94	3.64	4.37	4.14	4.10	4.18
11/01/14	11/30/14	Nov 2014	43.07	36.02	38.89	30.63	40.91	35.00	47.27	39.20	50.75	39.53	4.27	4.40	4.11	4.10	4.20	4.16	4.52	3.74	4.45	4.22	4.19	4.83
12/01/14	12/31/14	Dec 2014	46.98	38.96	36.96	31.88	43.34	35.35	48.71	42.80	53.29	44.01	4.45	4.58	4.30	4.33	4.38	4.34	4.70	3.91	4.69	4.45	4.41	5.01
01/01/15	01/31/15	Jan 2015	46.80	39.97	41.78	32.56	44.18	35.26	49.43	42.29	53.27	42.82	4.54	4.67	4.39	4.40	4.48	4.44	4.79	4.00	4.77	4.52	4.49	5.11
02/01/15	02/28/15	Feb 2015	43.91	37.15	41.39	32.56	42.64	34.25	49.43	41.89	52.76	42.00	4.52	4.66	4.37	4.38	4.46	4.42	4.77	3.97	4.75	4.51	4.47	5.09
03/01/15	03/31/15	Mar 2015	39.79	34.33	39.84	31.63	39.94	33.24	46.64	40.32	49.23	41.19	4.44	4.58	4.29	4.29	4.38	4.34	4.70	3.91	4.65	4.41	4.37	5.01
04/01/15	04/30/15	Apr 2015	38.77	25.34	40.75	29.37	34.00	21.89	42.53	32.83	46.83	38.01	4.13	4.30	3.99	3.89	4.01	3.98	4.03	3.57	4.23	4.00	3.97	4.28
05/01/15	05/31/15	May 2015	34.08	17.84	39.97	24.43	28.17	13.96	43.82	32.17	47.78	34.49	4.14	4.31	4.00	3.92	4.02	3.99	4.07	3.57	4.26	4.03	4.00	4.32
06/01/15	06/30/15	Jun 2015	34.41	18.78	41.54	24.95	24.84	12.90	46.40	32.50	50.15	36.25	4.16	4.33	4.02	3.96	4.04	4.01	3.97	3.57	4.31	4.07	4.04	4.22
07/01/15	07/31/15	Jul 2015	49.05	27.18	51.82	31.86	40.27	24.16	55.25	40.84	61.41	42.02	4.20	4.37	4.05	4.04	4.08	4.04	3.95	3.60	4.39	4.15	4.12	4.19
08/01/15	08/31/15	Aug 2015	52.43	37.10	50.88	35.01	46.91	31.00	56.81	43.94	61.98	44.48	4.21	4.38	4.07	4.05	4.09	4.06	3.97	3.63	4.41	4.17	4.14	4.21
09/01/15	09/30/15	Sep 2015	50.02	37.42	44.30	34.38	46.91	37.84	53.69	41.23	57.36	43.25	4.22	4.39	4.07	4.06	4.10	4.06	4.02	3.67	4.41	4.17	4.14	4.27
10/01/15	10/31/15	Oct 2015	42.71	37.18	42.91	33.75	40.76	36.40	50.77	41.75	50.96	41.21	4.25	4.42	4.11	4.09	4.13	4.09	4.07	3.71	4.44	4.20	4.17	4.32
11/01/15	11/30/15	Nov 2015	45.32	37.92	42.14	33.13	44.41	36.75	50.77	42.95	53.50	42.03	4.33	4.50	4.18	4.20	4.26	4.22	4.57	3.81	4.56	4.32	4.28	4.88
12/01/15	12/31/15	Dec 2015	49.23	40.86	40.21	34.38	46.84	37.10	52.21	46.55	56.04	46.51	4.51	4.68	4.36	4.41	4.44	4.40	4.73	3.98	4.77	4.53	4.49	5.04
01/01/16	01/31/16	Jan 2016	48.80	41.77	43.53	33.56	46.18	37.06	51.68	42.29	55.02	43.82	4.61	4.80	4.49	4.49	4.54	4.51	4.83	4.05	4.86	4.62	4.58	5.15
02/01/16	02/29/16	Feb 2016	45.91	38.95	43.14	33.56	44.64	36.05	51.68	41.89	54.51	43.00	4.58	4.78	4.47	4.47	4.52	4.48	4.80	4.01	4.83	4.59	4.55	5.12
03/01/16	03/31/16	Mar 2016	41.79	36.13	41.59	32.63	41.94	35.04	48.89	40.32	50.98	42.19	4.50	4.70	4.39	4.38	4.44	4.40	4.73	3.95	4.74	4.50	4.46	5.04
04/01/16	04/30/16	Apr 2016	40.77	27.14	42.50	30.37	36.00	23.69	44.78	32.83	48.58	39.01	4.20	4.41	4.02	3.99	4.08	4.04	4.18	3.62	4.34	4.11	4.08	4.44
05/01/16	05/31/16	May 2016	36.08	19.64	41.72	25.43	30.17	15.76	46.07	32.17	49.53	35.49	4.21	4.42	4.04	4.02	4.09	4.06	4.13	3.62	4.37	4.13	4.10	4.39
06/01/16	06/30/16	Jun 2016	36.41	20.58	43.29	25.95	26.84	14.70	48.65	32.50	51.90	37.25	4.24	4.45	4.06	4.05	4.12	4.08	4.06	3.63	4.40	4.17	4.14	4.31
07/01/16	07/31/16	Jul 2016	51.05	28.98	53.57	32.86	42.27	25.96	57.50	40.84	63.16	43.02	4.28	4.49	4.10	4.11	4.16	4.12	4.06	3.66	4.47	4.23	4.20	4.31
08/01/16	08/31/16	Aug 2016	54.43	38.90	52.63	36.01	48.91	32.80	59.06	43.94	63.73	45.48	4.30	4.51	4.12	4.13	4.18	4.14	4.04	3.69	4.49	4.25	4.22	4.28
09/01/16	09/30/16	Sep 2016	52.02	39.22	46.05	35.38	48.91	39.64	55.94	41.23	59.11	44.25	4.30	4.51	4.12	4.14	4.18	4.14	4.11	3.73	4.49	4.25	4.22	4.36
10/01/16	10/31/16	Oct 2016	44.71	38.98	44.66	34.75	42.76	38.20	53.02	41.75	52.71	42.21	4.33	4.54	4.16	4.17	4.21	4.18	4.16	3.77	4.53	4.29	4.25	4.41
11/01/16	11/30/16	Nov 2016	47.32	39.72	43.89	34.13	46.41	38.55	53.02	42.95	55.25	43.03	4.43	4.60	4.28	4.29	4.36	4.33	4.72	3.90	4.65	4.41	4.38	5.03
12/01/16	12/31/16	Dec 2016	51.23	42.66	41.96	35.38	48.84	38.90	54.46	46.55	57.79	47.51	4.63	4.80	4.48	4.51	4.56	4.52	4.92	4.08	4.88	4.64	4.60	5.24
01/01/17	01/31/17	Jan 2017	50.95	43.77	45.53	35.56	48.83	39.06	53.93	44.29	57.02	45.07	4.73	4.90	4.59	4.61	4.67	4.63	5.03	4.26	4.98	4.73	4.69	5.36
02/01/17	02/28/17	Feb 2017	48.06	40.95	45.14	35.56	47.29	38.05	53.93	43.89	56.51	44.25	4.71	4.88	4.56	4.58	4.65	4.61	5.00	4.22	4.95	4.71	4.67	5.33
03/01/17	03/31/17	Mar 2017	43.94	38.13	43.59	34.63	44.59	37.04	51.14	42.32	52.98	43.44	4.63	4.80	4.48	4.49	4.57	4.53	4.93	4.16	4.86	4.62	4.58	5.26
04/01/17	04/30/17	Apr 2017	42.92	29.14	44.50	32.37	38.65	25.69	47.03	34.83	50.58	40.26	4.34	4.47	4.11	4.14	4.22	4.18	4.31	3.84	4.50	4.26	4.23	4.57
05/01/17	05/31/17	May 2017	38.23	21.64	43.72	27.43	32.82	17.76	48.32	34.17	51.53	36.74	4.35	4.48	4.12	4.17	4.23	4.20	4.26	3.84	4.52	4.29	4.25	4.52
06/01/17	06/30/17	Jun 2017	38.56	22.58	45.29	27.95	29.49	16.70	50.90	34.50	53.90	38.50	4.38	4.51	4.15	4.20	4.26	4.22	4.18	3.85	4.56	4.32	4.29	4.44
07/01/17	07/31/17	Jul 2017	53.20	30.98	55.57	34.86	44.92	27.96	59.75	42.84	65.16	44.27	4.42	4.54	4.19	4.27	4.30	4.26	4.19	3.88	4.63	4.39	4.35	4.44
08/01/17	08/31/17	Aug 2017	56.58	40.90	54.63	38.01	51.56	34.80	61.31	45.94	65.73	46.73	4.44	4.56	4.20	4.28	4.32	4.28	4.16	3.91	4.64	4.40	4.37	4.42
09/01/17	09/30/17	Sep 2017	54.17	41.22	48.05	37.38	51.56	41.64	58.19	43.23	61.11	45.50	4.44	4.57	4.21	4.29	4.32	4.28	4.23	3.95	4.65	4.41	4.37	4.49
10/01/17	10/31/17	Oct 2017	46.86	40.98	46.66	36.75	45.41	40.20	55.27	43.75	54.71	43.46	4.47	4.60	4.24	4.32	4.35	4.32	4.28	3.99	4.68	4.44	4.41	4.55
11/01/17	11/30/17	Nov 2017	49.47	41.72	45.89	36.13	49.06	40.55	55.27	44.95	57.25	44.28	4.58	4.74	4.36	4.45	4.52	4.48	4.86	4.13	4.82	4.58	4.54	5.18
12/01/17	12/31/17	Dec 2017	53.38	44.66	43.96	37.38	51.49	40.90	56.71	48.55	59.79	48.76	4.78	4.94	4.56	4.67	4.72	4.68	5.06	4.32	5.05	4.80	4.76	5.39
01/01/18	01/31/18	Jan 2018	53.45	45.92	47.78	37.56	51.33	41.21	56.18	46.29	59.27	46.32	4.89	5.03	4.75	4.77	4.83	4.79	5.19	4.54	5.14	4.90	4.86	5.53
02/01/18	02/28/18	Feb 2018	50.56	43.10	47.39	37.56	49.79	40.20	56.18	45.89	58.76	45.50	4.87	5.00	4.73	4.74	4.81	4.77	5.16	4.50	5.12	4.87	4.83	5.50
03/01/18	03/31/18	Mar 2018	46.44	40.28	45.84	36.63	47.09	39.19	53.39	44.32	55.23	44.69	4.79	4.92	4.64	4.66	4.73	4.69	5.09	4.44	5.03	4.78	4.74	5.43
04/01/18	04/30/18	Apr 2018	45.42	31.29	46.75	34.37	41.15	27.84	49.28	36.83	52.83	41.51	4.51	4.59	4.27	4.30	4.39	4.35	4.48	4.13	4.66	4.42	4.39	4.75
05/01/18	05/31/18	May 2018	40.73	23.79	45.97	29.43	35.32	19.91	50.57	36.17	53.78	37.99	4.52	4.61	4.29	4.33	4.40	4.37	4.43	4.13	4.69	4.45	4.41	4.70
06/01/18	06/30/18	Jun 2018	41.06	24.73	47.54	29.95	31.99	18.85	53.15	36.50	56.15	39.75	4.55	4.64	4.32	4.37	4.43	4.39	4.36	4.14	4.73	4.49	4.45	4.62
07/01/18	07/31/18	Jul 2018	55.70	33.13	57.82	36.86	47.42	30.11	62.00	44.84	67.41	45.52	4.59	4.68	4.36	4.43	4.47	4.43	4.36	4.17	4.79	4.55	4.51	4.63

08/01/18	08/31/18	Aug 2018	59.08	43.05	56.88	40.01	54.06	36.95	63.56	47.94	67.98	47.98	4.61	4.70	4.38	4.45	4.49	4.45	4.34	4.20	4.81	4.57	4.53	4.60
09/01/18	09/30/18	Sep 2018	56.67	43.37	50.30	39.38	54.06	43.79	60.44	45.23	63.36	46.75	4.62	4.70	4.38	4.45	4.50	4.46	4.41	4.25	4.82	4.58	4.54	4.68
10/01/18	10/31/18	Oct 2018	49.36	43.13	48.91	38.75	47.91	42.35	57.52	45.75	56.96	44.71	4.65	4.74	4.42	4.49	4.53	4.49	4.46	4.29	4.86	4.61	4.58	4.73
11/01/18	11/30/18	Nov 2018	51.97	43.87	48.14	38.13	51.56	42.70	57.52	46.95	59.50	45.53	4.77	4.88	4.54	4.63	4.70	4.66	5.04	4.44	5.00	4.75	4.72	5.37
12/01/18	12/31/18	Dec 2018	55.88	46.81	46.21	39.38	53.99	43.05	58.96	50.55	62.04	50.01	4.99	5.10	4.76	4.86	4.92	4.88	5.26	4.64	5.24	4.99	4.95	5.61
01/01/19	01/31/19	Jan 2019	55.95	48.07	50.28	39.56	53.83	43.36	58.68	48.29	61.77	48.32	5.10	5.19	4.95	4.96	5.03	4.99	5.39	4.81	5.34	5.09	5.05	5.74
02/01/19	02/28/19	Feb 2019	53.06	45.25	49.89	39.56	52.29	42.35	58.68	47.89	61.26	47.50	5.08	5.17	4.93	4.94	5.01	4.97	5.37	4.78	5.32	5.07	5.03	5.72
03/01/19	03/31/19	Mar 2019	48.94	42.43	48.34	38.63	49.59	41.34	55.89	46.32	57.73	46.69	5.00	5.09	4.85	4.85	4.93	4.89	5.30	4.71	5.23	4.98	4.94	5.64
04/01/19	04/30/19	Apr 2019	47.92	33.44	49.25	36.37	43.65	29.99	51.78	38.83	55.33	43.51	4.72	4.77	4.49	4.51	4.60	4.56	4.69	4.41	4.87	4.63	4.59	4.98
05/01/19	05/31/19	May 2019	41.78	30.18	48.71	36.88	37.35	28.65	52.83	44.23	56.04	45.96	5.15	5.23	4.93	4.80	4.98	4.91	4.89	4.60	5.17	4.93	4.89	5.17
06/01/19	06/30/19	Jun 2019	43.15	33.70	52.00	37.73	37.83	29.78	53.54	44.60	56.70	46.73	5.20	5.26	4.97	4.84	5.02	4.95	4.85	4.63	5.21	4.96	4.93	5.13
07/01/19	07/31/19	Jul 2019	56.60	39.54	63.69	42.40	53.37	37.39	63.78	49.86	67.42	50.85	5.25	5.32	5.03	4.88	5.06	4.99	4.90	4.67	5.25	5.01	4.97	5.18
08/01/19	08/31/19	Aug 2019	60.77	45.30	64.61	44.55	58.98	41.71	66.86	51.78	70.24	52.75	5.27	5.42	5.06	4.90	5.08	5.01	4.90	4.69	5.27	5.03	4.99	5.18
09/01/19	09/30/19	Sep 2019	58.45	45.39	55.56	42.93	57.75	44.91	63.40	50.11	66.29	51.64	5.26	5.39	5.04	4.92	5.10	4.99	4.96	4.69	5.29	5.05	5.01	5.24
10/01/19	10/31/19	Oct 2019	52.69	44.76	52.41	42.31	51.42	43.47	60.01	50.41	60.14	50.30	5.29	5.42	5.07	4.97	5.15	5.05	5.03	4.72	5.34	5.09	5.06	5.31
11/01/19	11/30/19	Nov 2019	53.48	45.93	50.97	42.12	53.95	44.33	60.03	51.61	61.44	51.15	5.40	5.54	5.21	5.13	5.31	5.29	5.45	4.86	5.51	5.26	5.22	5.79
12/01/19	12/31/19	Dec 2019	56.70	48.07	50.67	43.31	56.21	44.76	60.32	54.02	61.67	54.01	5.61	5.72	5.41	5.28	5.47	5.45	5.61	4.98	5.66	5.41	5.37	5.96
01/01/20	01/31/20	Jan 2020	53.78	47.88	51.31	43.16	52.32	45.46	59.09	52.39	61.09	52.86	5.67	5.71	5.48	5.33	5.51	5.49	5.74	5.13	5.72	5.47	5.43	6.11
02/01/20	02/29/20	Feb 2020	51.72	46.75	49.46	42.81	51.37	44.28	58.57	52.18	60.35	52.47	5.67	5.71	5.47	5.34	5.52	5.50	5.75	5.13	5.73	5.47	5.43	6.11
03/01/20	03/31/20	Mar 2020	49.51	45.18	49.19	42.21	48.97	43.48	56.63	51.29	58.46	51.81	5.49	5.65	5.34	5.19	5.49	5.47	5.66	5.11	5.58	5.32	5.28	6.02
04/01/20	04/30/20	Apr 2020	50.29	40.39	52.15	41.28	49.01	38.28	55.74	47.26	58.07	50.16	5.33	5.46	5.12	4.99	5.24	5.22	5.23	4.89	5.36	5.12	5.08	5.55
05/01/20	05/31/20	May 2020	42.84	36.57	51.45	44.32	39.39	37.38	55.09	52.29	58.30	53.94	5.77	5.85	5.56	5.28	5.55	5.46	5.35	5.07	5.65	5.40	5.37	5.63
06/01/20	06/30/20	Jun 2020	45.24	42.68	56.46	45.50	43.67	40.72	53.93	52.70	57.25	53.70	5.86	5.89	5.61	5.31	5.60	5.50	5.35	5.12	5.68	5.43	5.40	5.63
07/01/20	07/31/20	Jul 2020	57.49	45.94	69.56	47.94	59.32	44.67	65.56	54.88	67.43	56.17	5.90	5.97	5.70	5.33	5.65	5.55	5.44	5.16	5.70	5.46	5.42	5.71
08/01/20	08/31/20	Aug 2020	62.45	47.54	72.34	49.08	63.91	46.47	70.16	55.63	72.49	57.51	5.94	6.14	5.73	5.35	5.67	5.56	5.47	5.17	5.73	5.48	5.44	5.75
09/01/20	09/30/20	Sep 2020	60.23	47.41	60.81	46.47	61.45	46.03	66.36	55.00	69.21	56.53	5.90	6.08	5.69	5.39	5.71	5.53	5.50	5.13	5.76	5.52	5.48	5.78
10/01/20	10/31/20	Oct 2020	56.03	46.38	55.91	45.87	54.92	44.58	62.50	55.07	63.31	55.89	5.93	6.11	5.73	5.45	5.77	5.61	5.60	5.15	5.82	5.57	5.53	5.88
11/01/20	11/30/20	Nov 2020	55.00	47.99	53.81	46.11	56.35	45.96	62.53	56.26	63.38	56.78	6.03	6.19	5.87	5.64	5.92	5.92	5.85	5.29	6.01	5.76	5.72	6.19
12/01/20	12/31/20	Dec 2020	57.52	49.34	55.13	47.25	58.44	46.46	61.69	57.48	61.30	58.00	6.23	6.34	6.07	5.69	6.02	6.02	5.95	5.32	6.08	5.83	5.78	6.31
01/01/21	01/31/21	Jan 2021	51.61	47.69	52.35	46.75	50.82	47.56	59.49	56.50	60.41	57.40	6.24	6.24	6.01	5.71	5.99	5.98	6.09	5.45	6.10	5.84	5.80	6.46
02/01/21	02/28/21	Feb 2021	50.38	48.24	49.04	46.05	50.45	46.21	58.46	56.47	59.43	57.43	6.26	6.26	6.01	5.74	6.02	6.02	6.13	5.48	6.13	5.88	5.83	6.49
03/01/21	03/31/21	Mar 2021	50.09	47.93	50.04	45.78	48.34	45.62	57.37	56.26	59.19	56.94	5.99	6.20	5.82	5.53	6.05	6.05	6.03	5.51	5.92	5.66	5.62	6.39
04/01/21	04/30/21	Apr 2021	52.67	47.35	55.04	46.19	54.38	46.57	59.69	55.70	60.81	56.81	5.94	6.16	5.76	5.47	5.88	5.88	5.76	5.36	5.85	5.60	5.56	6.09
05/01/21	05/31/21	May 2021	48.42	44.53	53.79	46.61	47.39	42.90	57.29	55.76	61.35	57.05	5.98	6.19	5.77	5.47	5.90	5.80	5.72	5.40	5.84	5.60	5.56	6.00
06/01/21	06/30/21	Jun 2021	49.77	46.87	59.82	47.68	49.61	45.10	57.30	55.45	60.29	56.16	6.08	6.22	5.85	5.50	5.94	5.83	5.73	5.44	5.87	5.62	5.58	6.01
07/01/21	07/31/21	Jul 2021	61.30	49.73	72.35	50.60	63.44	48.64	69.63	57.70	71.13	59.20	6.12	6.28	5.92	5.53	5.98	5.87	5.76	5.47	5.90	5.66	5.62	6.03
08/01/21	08/31/21	Aug 2021	67.11	50.21	76.67	51.27	67.96	50.83	74.40	58.55	76.76	60.18	6.16	6.46	5.95	5.55	6.01	5.90	5.79	5.49	5.93	5.68	5.64	6.07
09/01/21	09/30/21	Sep 2021	63.05	49.63	63.12	48.75	64.46	49.93	69.58	57.68	71.00	59.03	6.12	6.39	5.91	5.57	6.01	5.90	5.83	5.49	5.94	5.70	5.66	6.11
10/01/21	10/31/21	Oct 2021	59.54	49.79	59.53	47.85	61.02	47.93	66.59	57.82	67.79	58.90	6.15	6.42	5.94	5.60	6.08	5.92	5.90	5.51	5.97	5.72	5.69	6.19
11/01/21	11/30/21	Nov 2021	58.76	50.79	56.69	47.78	59.42	49.61	65.83	59.03	66.03	59.57	6.26	6.52	6.10	5.78	6.24	6.24	6.21	5.57	6.16	5.91	5.87	6.55
12/01/21	12/31/21	Dec 2021	61.90	52.10	57.52	49.23	63.83	50.83	64.48	60.23	63.77	60.91	6.46	6.66	6.30	5.91	6.33	6.33	6.34	5.60	6.29	6.04	6.00	6.70
01/01/22	01/31/22	Jan 2022	56.38	54.14	61.01	55.46	57.39	51.24	61.11	58.00	61.68	58.18	6.41	6.42	6.16	5.77	6.15	6.15	6.33	5.60	6.16	5.90	5.86	6.69
02/01/22	02/28/22	Feb 2022	55.75	53.29	59.34	54.88	54.18	50.54	60.45	58.19	61.04	58.16	6.45	6.43	6.17	5.80	6.19	6.19	6.36	5.63	6.19	5.94	5.89	6.72
03/01/22	03/31/22	Mar 2022	56.23	54.12	58.83	54.27	53.91	50.95	60.13	57.46	60.69	57.64	6.15	6.27	5.96	5.60	6.15	6.15	6.14	5.60	5.99	5.73	5.69	6.50
04/01/22	04/30/22	Apr 2022	57.29	53.19	63.44	54.84	55.74	50.02	61.23	57.68	62.64	57.94	6.12	6.27	5.89	5.54	6.01	6.01	5.89	5.48	5.92	5.67	5.63	6.22
05/01/22	05/31/22	May 2022	53.06	48.03	61.80	54.31	52.59	47.41	58.48	56.67	60.80	57.24	6.16	6.32	5.93	5.52	6.03	5.92	5.85	5.52	5.89	5.64	5.61	6.13
06/01/22	06/30/22	Jun 2022	55.16	52.19	66.04	55.56	53.65	50.32	59.31	57.06	62.44	57.65	6.26	6.37	6.00	5.59	6.08	5.98	5.87	5.58	5.96	5.71	5.68	6.15
07/01/22	07/31/22	Jul 2022	67.61	54.88	78.52	58.64	67.59	52.17	72.68	60.37	74.19	60.65	6.30	6.45	6.03	5.62	6.12	6.02	5.92	5.61	5.99	5.74	5.70	6.20
08/01/22	08/31/22	Aug 2022	72.58	55.62	83.22	58.88	71.65	53.29	77.99	61.02	79.57	61.44	6.35	6.65	6.12	5.64	6.16	6.05	5.95	5.64	6.01	5.76	5.73	6.23
09/01/22	09/30/22	Sep 2022	68.71	55.25	71.36	57.36	67.17	52.54	73.35	60.64	74.12	60.79	6.30	6.59	6.06	5.65	6.20	6.06	5.99	5.65	6.02	5.77	5.73	6.27
10/01/22	10/31/22	Oct 2022	65.19	55.14	66.82	56.46	64.32	51.74	69.71	60.19	70.52	59.80	6.33	6.63	6.10	5.70	6.24	6.07	6.06	5.66	6.07	5.82	5.79	6.34
11/01/22	11/30/22	Nov 2022	64.75	56.70	65.27	57.52	65.00	58.06	69.11	61.16	68.97	60.66	6.48	6.78	6.30	5.88	6.49	6.49	6.51	5.81	6.26	6.01	5.97	6.85
12/01/22	12/31/22	Dec 2022	68.65	58.09	63.67	58.38	69.76	59.22	67.35	61.95	67.01	61.59	6.77	6.91	6.62	6.10	6.59	6.59	6.62	5.84	6.49	6.24	6.19	6.97
01/01/23	01/31/23	Jan 2023	61.82	58.01	64.17	59.34	61.04	56.80	65.82	61.98	66.47	62.33	6.95	7.04	6.73	6.15	6.67	6.67	6.65	5.99	6.54	6.28	6.24	7.01
02/01/23	02/28/23	Feb 2023	60.55	57.35	63.12	59.26	59.18	57.44	64.80	61.71	65.59	62.26	7.00	7.08	6.77	6.18	6.70	6.70	6.69	6.02	6.57	6.32	6.28	7.05
03/01/23	03/31/23	Mar 2023	59.52	57.70	63.00	58.57	57.83	56.68	64.17	61.16	64.87	61.50	6.80	6.94	6.51	6.07	6.65	6.65	6.60	6.08	6.46	6.21	6.16	6.96
04/01/23	04/30/23	Apr 2023	63.47	57.36	68.39	59.95	62.47	55.07	67.98	62.05	68.84	62.57	6.76	6.94	6.48	5.98	6.54	6.55	6.43	6.00	6.35	6.10	6.06	6.75
05/01/23	05/31/23	May 2023	59.04	55.54	67.27	58.93	58.67	52.64	64.32	61.98	66.89	62.04	6.82	6.99	6.54	6.02	6.59	6.45	6.38	6.04	6.39	6.15	6.11	6.66
06/01/23	06/30/23	Jun 2023	60.44	57.85	71.47	60.26	59.69	55.93	64.41	61.95	67.59	62.68	6.91	7.05	6.58	6.06	6.65	6.54	6.43	6.12	6.43	6.18	6.14	6.71
07/01/23	07/31/23	Jul 2023	73.98	59.97	84.99	64.47	74.18	58.34	79.30	65.69	80.96	66.84	6.96	7.24	6.70	6.10	6.72	6.60	6.48	6.18	6.47	6.23	6.19	6.76
08/01/23	08/31/23	Aug 2023	78.72	60.50	89.19	64.27	78.14	58.03	84.35	66.17	85.81	67.07	7.01	7.35	6.73	6.12	6.76	6.62	6.50	6.20	6.49	6.25	6.21	6.78
09/01/23	09/30/23	Sep 2023	73.80	60.06	76.63	62.18	72.78	57.11	78.52	65.43	80.20	65.51	6.96	7.20	6.68	6.16	6.80	6.59	6.54	6.11	6.53	6.28	6.25	6.82
10/01/23	10/31/23	Oct 2023	69.83	59.43	70.30	60.81	69.08	56.23	73.92	64.48	74.07	64.22	7.00	7.23	6.72	6.20	6.84	6.64	6.62	6.10	6.57	6.32	6.29	6.90
11/01/23	11/30/23	Nov 2023	69.61	60.74	70.08	62.01	69.19	61.64	73.86	65.86	73.56	65.33	7.10	7.38	6.86	6.42	6.98	6.96	6.84	6.19	6.80	6.55	6.51	7.18
12/01/23	12/31/23	Dec 2023	73.31	62.04	70.17	63.82	74.95	63.25	73.77	67.04	73.46	66.95	7.30	7.68	7.14	6.53	7.08	7.05	6.96	6.22	6.92	6.67	6.62	7.32
01/01/24	01/31/24	Jan 2024	63.89	60.80	67.71	62.35	63.54	59.41	69.09	64.31	69.83	65.11	7.35	7.45	7.03	6.42	6.92	6.93	6.90	6.18	6.81	6.55	6.51	7.27
02/01/24	02/29/24	Feb 2024	61.26	58.92	65.01	60.32	60.90	58.07	66.27	63.25	67.02	63.29	7.31	7.16	6.88	6.42	6.87	6.87	6.85	6.18	6.80	6.55	6.51	7.21
03/01/24	03/31/24	Mar 2024	60.27	58.19	63.11	59.81	58.68	54.42	64.35	63.15	65.56	62.95	6.80	6.96	6.50	6.04	6.66	6.66	6.57	6.04	6.43	6.18	6.13	6.93
04/01/24	04/30/24	Apr 2024	63.06	57.77	69.11	59.84	62.68	54.16	67.52	63.09	68.34	62.87	6.77	6.93	6.46	5.96	6.52	6.53	6.41	5.92	6.34	6.09	6.05	6.73
05/01/24	05/31/24	May 2024	58.18	52.90	66.96	58.85	56.81	51.76	63.62	61.34	67.22	62.06	6.82	6.90	6.45	5.89	6.49	6.37	6.25	5.95	6.25	6.01	5.97	6.54
06/01/24	06/30/24	Jun 2024	59.31	56.68	70.90	60.30	58.25	54.15	63.75	61.89	67.06	62.54	6.91	6.93	6.55	5.90	6.53	6.41	6.31	5.99	6.27	6.03	5.99	6.59
07/01/24	07/31/24	Jul 2024	73.81	59.27	85.40	63.91	74.17	58.46	78.80	64.96	80.77	66.29	6.97	7.15	6.65	5.95	6.60	6.48	6.36	6.06	6.32	6.08	6.04	6.64
08/01/24	08/31/24	Aug 2024	78.79	61.06	90.19	65.39	78.06	59.88	84.74	66.64	86.69	67.75	7.02	7.48	6.73	5.99	6.78	6.57	6.44	6.09	6.36	6.12	6.08	6.72
09/01/24	09/30/24	Sep 2024	74.86	60.58	77.64	62.83	73.44	57.83	79.36	65.91	80.88	66.01	6.97	7.34	6.71	6.03	6.78	6.54	6.48	6.00	6.40	6.15	6.12	6.77

10/01/24	10/31/24	Oct 2024	70.76	60.16	71.17	61.45	70.11	56.98	74.76	64.95	74.99	64.79	7.01	7.29	6.74	6.18	6.86	6.62	6.63	6.03	6.56	6.31	6.27	6.91
11/01/24	11/30/24	Nov 2024	69.83	61.48	70.35	62.42	69.06	61.79	74.39	66.65	74.04	66.00	7.12	7.44	6.88	6.39	7.04	6.98	6.85	6.15	6.76	6.52	6.48	7.20
12/01/24	12/31/24	Dec 2024	74.15	62.90	70.89	64.96	75.77	63.12	74.49	68.00	74.38	68.09	7.35	7.86	7.17	6.47	7.08	7.03	6.95	6.18	6.85	6.60	6.56	7.31
01/01/25	01/31/25	Jan 2025	64.52	60.27	68.70	62.92	63.71	56.65	69.53	65.62	69.92	65.93	7.39	7.48	7.04	6.29	6.90	6.90	6.90	6.12	6.68	6.42	6.38	7.26
02/01/25	02/28/25	Feb 2025	61.97	59.32	65.68	61.82	60.69	56.50	66.72	64.26	67.40	64.59	7.39	7.23	6.93	6.32	6.88	6.88	6.93	6.15	6.71	6.46	6.42	7.30
03/01/25	03/31/25	Mar 2025	61.31	59.44	64.27	60.75	58.44	55.74	66.08	64.32	66.55	63.85	6.96	7.05	6.60	6.00	6.73	6.73	6.60	6.05	6.39	6.14	6.09	6.96
04/01/25	04/30/25	Apr 2025	62.59	58.82	69.99	61.15	61.95	55.03	67.42	64.04	68.53	64.46	6.91	7.03	6.59	5.94	6.62	6.45	6.46	5.92	6.31	6.06	6.03	6.78
05/01/25	05/31/25	May 2025	59.52	56.52	68.03	59.99	58.91	53.98	64.80	61.92	68.08	62.49	6.95	7.00	6.56	5.93	6.58	6.39	6.32	5.96	6.29	6.05	6.01	6.60
06/01/25	06/30/25	Jun 2025	60.62	58.63	72.35	61.28	59.60	55.03	65.00	63.19	67.99	63.43	7.04	7.04	6.67	5.96	6.62	6.48	6.36	6.05	6.33	6.08	6.05	6.64
07/01/25	07/31/25	Jul 2025	73.85	60.15	85.88	64.68	74.09	57.85	78.85	65.90	80.95	66.89	7.10	7.25	6.75	6.00	6.66	6.52	6.39	6.08	6.37	6.13	6.09	6.67
08/01/25	08/31/25	Aug 2025	79.39	61.61	90.51	66.40	78.71	61.11	84.98	66.91	86.90	68.39	7.14	7.59	6.83	6.03	6.85	6.63	6.50	6.12	6.41	6.16	6.12	6.78
09/01/25	09/30/25	Sep 2025	74.31	61.14	78.61	64.35	73.36	58.98	79.04	66.24	81.27	67.07	7.11	7.56	6.81	6.06	6.83	6.59	6.55	6.04	6.43	6.19	6.15	6.83
10/01/25	10/31/25	Oct 2025	69.94	61.27	70.95	62.52	69.35	58.78	74.07	64.23	74.71	64.93	7.14	7.42	6.83	6.20	6.93	6.68	6.69	6.07	6.58	6.33	6.29	6.97
11/01/25	11/30/25	Nov 2025	69.64	62.38	71.03	63.36	70.46	62.72	74.64	67.38	74.65	66.87	7.24	7.51	6.94	6.38	7.10	7.04	6.91	6.19	6.76	6.51	6.47	7.26
12/01/25	12/31/25	Dec 2025	75.28	63.70	71.33	66.00	75.76	63.70	75.34	68.90	74.77	69.00	7.49	8.00	7.29	6.52	7.15	7.09	7.01	6.23	6.90	6.65	6.61	7.37
01/01/26	01/31/26	Jan 2026	67.31	62.57	70.00	65.19	65.48	59.40	71.95	67.74	72.38	68.11	7.62	7.85	7.26	6.48	7.08	7.08	7.07	6.27	6.87	6.61	6.57	7.44
02/01/26	02/28/26	Feb 2026	64.73	61.87	67.83	63.69	63.02	59.64	69.25	66.71	69.82	66.69	7.62	7.58	7.19	6.52	7.09	7.09	7.11	6.31	6.91	6.65	6.61	7.47
03/01/26	03/31/26	Mar 2026	63.09	61.59	66.33	62.32	61.04	58.11	68.03	66.35	68.56	65.81	7.24	7.33	6.87	6.22	6.96	6.96	6.83	6.27	6.60	6.35	6.31	7.19
04/01/26	04/30/26	Apr 2026	64.70	60.50	72.01	63.09	64.24	57.18	69.79	65.56	70.63	65.96	7.17	7.30	6.84	6.10	6.88	6.69	6.69	6.14	6.48	6.23	6.19	7.01
05/01/26	05/31/26	May 2026	60.08	56.01	70.37	62.53	60.17	53.80	66.98	63.98	69.71	65.10	7.22	7.31	6.82	6.15	6.87	6.66	6.53	6.18	6.52	6.27	6.24	6.81
06/01/26	06/30/26	Jun 2026	62.32	59.02	74.91	63.60	61.93	56.90	67.26	64.88	70.40	65.50	7.31	7.35	6.93	6.19	6.91	6.70	6.58	6.26	6.55	6.31	6.27	6.86
07/01/26	07/31/26	Jul 2026	77.47	62.70	89.38	67.45	77.57	61.58	82.62	68.19	84.57	69.47	7.37	7.60	7.01	6.22	6.95	6.74	6.61	6.29	6.59	6.34	6.30	6.89
08/01/26	08/31/26	Aug 2026	82.64	64.00	93.71	69.26	82.14	63.75	88.19	69.48	90.06	71.16	7.42	7.92	7.11	6.25	7.08	6.85	6.72	6.31	6.62	6.37	6.34	7.00
09/01/26	09/30/26	Sep 2026	77.64	63.20	81.40	66.58	76.12	61.03	82.50	68.97	84.72	69.67	7.39	7.85	7.07	6.29	7.05	6.78	6.76	6.22	6.66	6.41	6.38	7.04
10/01/26	10/31/26	Oct 2026	73.33	63.29	74.22	65.17	72.48	59.72	77.36	68.61	78.03	68.30	7.42	7.76	7.08	6.33	7.13	6.88	6.89	6.26	6.70	6.45	6.42	7.17
11/01/26	11/30/26	Nov 2026	72.32	64.62	73.46	66.13	73.67	65.57	77.01	69.82	77.09	69.37	7.53	7.92	7.23	6.60	7.36	7.28	7.15	6.40	6.98	6.73	6.69	7.50
12/01/26	12/31/26	Dec 2026	77.53	66.21	74.11	68.44	77.70	66.65	78.29	71.30	77.68	71.32	7.78	8.37	7.56	6.66	7.39	7.32	7.27	6.44	7.04	6.79	6.75	7.63
01/01/27	01/31/27	Jan 2027	69.06	63.99	71.87	66.87	67.44	60.78	73.56	69.10	74.00	69.60	7.77	8.02	7.42	6.60	7.23	7.23	7.20	6.39	6.99	6.73	6.69	7.57
02/01/27	02/28/27	Feb 2027	66.31	63.16	69.17	65.04	64.63	60.87	70.83	68.30	71.43	67.96	7.80	7.73	7.32	6.57	7.21	7.21	7.24	6.43	6.95	6.70	6.66	7.60
03/01/27	03/31/27	Mar 2027	64.54	62.65	67.62	63.70	62.31	59.03	69.53	67.42	70.06	66.88	7.31	7.47	6.93	6.21	7.05	7.05	6.91	6.32	6.60	6.34	6.30	7.27
04/01/27	04/30/27	Apr 2027	65.95	62.19	73.42	64.33	65.59	58.39	70.89	67.25	71.71	67.24	7.22	7.42	6.87	6.12	6.99	6.78	6.79	6.20	6.50	6.25	6.21	7.11
05/01/27	05/31/27	May 2027	62.58	59.05	71.58	63.57	62.82	57.45	68.24	65.47	70.76	66.21	7.28	7.39	6.86	6.09	6.96	6.74	6.71	6.24	6.46	6.21	6.18	6.99
06/01/27	06/30/27	Jun 2027	64.59	61.56	76.77	65.07	64.28	58.61	69.10	66.35	72.52	66.85	7.38	7.50	6.98	6.13	7.00	6.78	6.66	6.34	6.49	6.25	6.21	6.94
07/01/27	07/31/27	Jul 2027	79.25	64.36	91.33	69.46	79.55	63.63	84.59	69.67	86.84	71.11	7.43	7.84	7.07	6.16	7.04	6.82	6.78	6.37	6.53	6.28	6.24	7.06
08/01/27	08/31/27	Aug 2027	86.01	66.30	97.96	72.56	84.96	65.87	91.22	71.85	93.94	73.52	7.47	8.38	7.16	6.19	7.21	6.96	6.82	6.38	6.56	6.31	6.28	7.10
09/01/27	09/30/27	Sep 2027	78.63	64.87	82.08	68.23	77.38	62.98	83.58	69.77	85.26	70.69	7.44	8.04	7.11	6.23	7.13	6.88	6.87	6.31	6.60	6.35	6.31	7.15
10/01/27	10/31/27	Oct 2027	75.02	64.34	77.03	66.48	74.09	61.43	79.25	69.96	80.72	69.65	7.48	7.88	7.15	6.36	7.23	6.98	6.99	6.34	6.73	6.48	6.44	7.27
11/01/27	11/30/27	Nov 2027	73.82	66.03	74.48	67.11	75.42	66.94	78.06	70.48	78.18	70.09	7.66	8.05	7.35	6.57	7.49	7.41	7.30	6.52	6.95	6.70	6.66	7.64
12/01/27	12/31/27	Dec 2027	79.91	68.08	76.05	70.26	81.16	68.55	79.96	73.05	79.55	73.22	7.89	8.59	7.77	6.73	7.54	7.45	7.42	6.56	7.11	6.86	6.82	7.78
01/01/28	01/31/28	Jan 2028	69.88	65.47	74.36	68.21	69.43	62.61	74.83	70.46	75.42	70.86	7.90	8.10	7.28	6.80	7.36	7.36	7.33	6.50	7.19	6.94	6.90	7.69
02/01/28	02/29/28	Feb 2028	67.54	64.58	70.99	66.39	65.78	61.98	72.29	69.53	72.93	69.28	7.90	7.86	7.23	6.79	7.34	7.34	7.36	6.53	7.18	6.92	6.88	7.73
03/01/28	03/31/28	Mar 2028	65.27	63.48	68.15	64.57	62.52	60.07	70.32	68.50	70.95	68.03	7.38	7.53	6.83	6.39	7.10	6.96	6.97	6.38	6.78	6.52	6.48	7.33
04/01/28	04/30/28	Apr 2028	67.59	62.92	73.79	65.45	66.84	59.59	72.46	68.43	73.20	68.38	7.31	7.45	6.77	6.33	7.01	6.81	6.81	6.24	6.70	6.45	6.42	7.14
05/01/28	05/31/28	May 2028	63.64	60.46	71.56	64.29	62.73	57.36	68.56	65.39	71.11	66.40	7.35	7.44	6.76	6.30	7.00	6.80	6.77	6.29	6.67	6.43	6.39	7.05
06/01/28	06/30/28	Jun 2028	65.18	62.34	76.75	65.49	64.57	59.50	69.53	66.48	73.00	66.96	7.44	7.48	6.80	6.34	7.04	6.84	6.72	6.39	6.71	6.47	6.43	7.00
07/01/28	07/31/28	Jul 2028	79.90	65.08	91.57	69.67	79.86	62.96	84.98	70.80	87.15	71.67	7.49	7.76	6.85	6.39	7.09	6.94	6.84	6.43	6.76	6.51	6.47	7.12
08/01/28	08/31/28	Aug 2028	86.97	66.82	97.80	72.02	85.96	65.77	91.91	72.29	94.34	73.61	7.53	8.24	6.90	6.44	7.30	7.04	6.91	6.46	6.81	6.56	6.53	7.19
09/01/28	09/30/28	Sep 2028	80.23	66.38	84.09	70.43	79.37	64.64	85.09	71.43	86.79	72.48	7.50	8.29	6.92	6.46	7.27	7.00	6.96	6.42	6.83	6.59	6.55	7.24
10/01/28	10/31/28	Oct 2028	77.08	66.26	78.73	68.11	75.64	63.00	80.37	71.19	82.46	70.96	7.55	8.06	7.01	6.58	7.38	7.10	7.11	6.46	6.95	6.71	6.67	7.39
11/01/28	11/30/28	Nov 2028	76.67	67.76	76.96	69.19	77.77	68.87	80.83	72.62	80.81	72.13	7.79	8.27	7.29	6.85	7.65	7.57	7.50	6.66	7.23	6.98	6.94	7.84
12/01/28	12/31/28	Dec 2028	82.41	70.09	76.55	71.34	82.14	70.88	80.82	74.26	80.28	74.36	8.00	8.63	7.49	7.01	7.70	7.61	7.62	6.70	7.40	7.15	7.10	7.98
01/01/29	01/31/29	Jan 2029	72.59	68.27	76.31	71.59	71.16	64.84	77.64	73.69	78.25	74.04	8.19	8.52	7.59	7.05	7.66	7.63	7.56	6.71	7.44	7.19	7.15	7.93
02/01/29	02/28/29	Feb 2029	69.98	67.01	73.70	69.18	68.26	64.23	75.06	72.05	75.86	72.00	8.16	8.24	7.47	6.99	7.59	7.59	7.56	6.71	7.38	7.12	7.08	7.93
03/01/29	03/31/29	Mar 2029	67.85	66.39	70.61	66.73	65.40	63.20	72.93	70.67	73.41	70.22	7.67	7.81	7.09	6.61	7.43	7.43	7.30	6.65	7.00	6.75	6.70	7.66
04/01/29	04/30/29	Apr 2029	70.18	65.77	75.88	67.60	69.29	61.89	75.35	70.94	75.87	70.43	7.58	7.78	7.02	6.55	7.34	7.13	7.14	6.52	6.92	6.67	6.64	7.46
05/01/29	05/31/29	May 2029	66.01	63.81	74.53	66.66	66.23	61.44	71.68	68.23	73.64	69.09	7.64	7.73	6.98	6.50	7.28	7.07	7.04	6.56	6.87	6.63	6.59	7.32
06/01/29	06/30/29	Jun 2029	67.59	65.08	79.17	68.04	67.36	61.80	72.26	69.84	75.24	69.95	7.72	7.77	7.02	6.54	7.32	7.11	6.99	6.65	6.91	6.67	6.63	7.27
07/01/29	07/31/29	Jul 2029	83.85	67.76	95.59	72.90	84.10	65.97	88.94	73.82	91.14	74.88	7.77	8.17	7.05	6.58	7.41	7.25	7.12	6.73	6.95	6.71	6.67	7.40
08/01/29	08/31/29	Aug 2029	90.58	69.79	100.90	74.50	89.86	69.20	95.55	75.15	97.23	76.20	7.84	8.50	7.08	6.61	7.64	7.36	7.22	6.76	6.98	6.73	6.70	7.50
09/01/29	09/30/29	Sep 2029	82.69	69.34	86.86	71.81	81.26	67.40	87.58	74.53	89.37	74.63	7.81	8.26	7.12	6.65	7.59	7.31	7.28	6.70	7.02	6.78	6.74	7.56
10/01/29	10/31/29	Oct 2029	79.23	69.14	80.60	71.82	78.38	66.96	83.34	73.29	84.36	73.76	7.85	8.54	7.28	6.80	7.66	7.39	7.40	6.73	7.17	6.93	6.89	7.69
11/01/29	11/30/29	Nov 2029	78.69	70.44	78.89	71.67	80.00	71.13	82.71	74.88	82.68	74.50	7.98	8.59	7.45	7.00	7.95	7.84	7.70	6.90	7.37	7.13	7.09	8.05
12/01/29	12/31/29	Dec 2029	85.45	72.54	78.33	72.82	85.16	72.90	83.00	76.64	82.18	75.95	8.22	8.75	7.70	7.21	8.05	7.94	7.83	6.94	7.60	7.34	7.30	8.19
01/01/30	01/31/30	Jan 2030	76.21	70.57	81.33	74.64	74.25	67.21	81.05	75.94	81.57	76.39	8.36	8.94	7.72	7.14	7.91	7.88	7.81	6.94	7.53	7.27	7.23	8.18
02/01/30	02/28/30	Feb 2030	72.28	69.84	76.48	71.44	70.51	66.19	77.54	74.50	78.21	74.28	8.33	8.50	7.62	7.13	7.86	7.86	7.85	6.98	7.51	7.26	7.22	8.21
03/01/30	03/31/30	Mar 2030	70.16	68.27	72.72	68.95	67.10	65.02	75.20	72.37	75.83	72.05	7.72	8.14	7.08	6.60	7.62	7.62	7.48	6.80	6.98	6.73	6.69	7.84
04/01/30	04/30/30	Apr 2030	71.61	67.73	77.76	69.22	71.42	63.78	76.57	72.54	77.38	71.82	7.64	7.99	7.01	6.53	7.54	7.33	7.34	6.70	6.91	6.66	6.62	7.66
05/01/30	05/31/30	May 2030	67.08	64.36	75.79	67.99	66.24	61.40	72.80	69.48	75.54	70.60	7.69	7.84	7.02	6.55	7.38	7.23	7.14	6.70	6.91	6.67	6.63	7.42
06/01/30	06/30/30	Jun 2030	68.21	65.84	80.12	69.50	67.66	62.80	72.92	70.59	76.02	70.64	7.80	7.88	7.10	6.59	7.43	7.25	7.12	6.78	6.96	6.71	6.67	7.40
07/01/30	07/31/30	Jul 2030	86.05	70.06	98.38	75.73	86.13	69.02	91.11	75.33	93.59	76.64	7.86	8.53	7.15	6.62	7.64	7.42	7.28	6.89	6.99	6.74	6.71	7.56
08/01/30	08/31/30	Aug 2030	92.51	71.79	102.00	76.66	91.81	69.61	97.55	78.36	98.51	78.66	7.93	8.63	7.13	6.65	7.82	7.53	7.39	6.93	7.03	6.78	6.74	7.67
09/01/30	09/30/30	Sep 2030	84.64	70.83	88.98	73.50	83.20	68.27	89.40	76.97	90.97	76.67	7.87	8.41	7.18	6.70	7.78	7.49	7.46	6.86	7.07	6.82	6.78	7.74
10/01/30	10/31/30	Oct 2030	80.39	70.75	81.27	71.70	79.32	67.25	84.31	75.95	85.05	75.22	7.92	8.29	7.28	6.80	7.88	7.59	7.60	6.90	7.17	6.92	6.89	7.89
11/01/30	11/30/30	Nov 2030	81.61	74.98	81.86	74.31	80.55	74.21	85.43	78.07	85.49	77.20	8.20	8.88	7.57	7.11	8.23	8.12	8.00	7.16	7.49	7.24	7.20	8.34

12/01/30	12/31/30	Dec 2030	87.02	75.24	80.40	75.17	87.35	74.71	84.71	79.11	84.23	78.31	8.40	9.02	7.79	7.30	8.35	8.24	8.13	7.20	7.68	7.43	7.39	8.49
01/01/31	01/31/31	Jan 2031	78.00	72.06	84.04	76.04	75.70	69.15	82.54	77.23	82.93	77.45	8.54	9.15	7.83	7.22	8.04	8.04	7.99	7.11	7.61	7.36	7.31	8.36
02/01/31	02/28/31	Feb 2031	73.89	71.67	77.62	73.02	72.78	68.34	78.98	76.32	79.68	75.82	8.50	8.71	7.75	7.20	8.05	8.06	8.04	7.15	7.59	7.33	7.29	8.40
03/01/31	03/31/31	Mar 2031	72.13	70.28	74.96	71.14	69.13	66.97	77.50	74.81	78.09	74.20	7.89	8.34	7.21	6.70	7.81	7.81	7.67	6.98	7.08	6.83	6.79	8.03
04/01/31	04/30/31	Apr 2031	73.38	69.43	79.61	71.09	73.72	66.10	78.42	73.97	79.28	73.50	7.81	8.17	7.14	6.60	7.71	7.49	7.50	6.84	6.98	6.73	6.69	7.83
05/01/31	05/31/31	May 2031	69.93	68.43	78.83	71.12	69.93	65.46	75.98	72.18	78.61	72.96	7.85	8.23	7.15	6.63	7.72	7.48	7.45	6.88	6.99	6.75	6.71	7.73
06/01/31	06/30/31	Jun 2031	71.50	68.94	84.01	72.44	71.15	65.98	76.36	73.45	80.01	73.81	7.95	8.28	7.24	6.67	7.77	7.53	7.35	6.99	7.04	6.79	6.76	7.62
07/01/31	07/31/31	Jul 2031	89.67	72.50	102.15	78.63	89.62	72.44	94.46	77.92	97.57	79.45	8.02	8.95	7.29	6.72	7.84	7.66	7.54	7.11	7.09	6.85	6.81	7.82
08/01/31	08/31/31	Aug 2031	94.68	74.07	104.05	78.35	94.16	72.01	99.64	80.53	100.60	80.74	8.07	8.76	7.24	6.74	8.06	7.77	7.63	7.15	7.11	6.87	6.83	7.91
09/01/31	09/30/31	Sep 2031	87.02	72.82	91.38	76.18	85.06	70.31	91.61	78.96	93.38	78.85	8.03	8.72	7.28	6.78	7.93	7.64	7.63	7.02	7.16	6.91	6.87	7.92
10/01/31	10/31/31	Oct 2031	81.43	72.34	83.14	73.79	80.64	69.00	85.57	78.42	86.63	77.50	8.07	8.57	7.41	6.84	8.02	7.74	7.76	7.06	7.21	6.96	6.92	8.04
11/01/31	11/30/31	Nov 2031	81.73	75.25	81.35	74.37	80.18	74.45	85.40	78.87	85.02	77.79	8.25	8.54	7.51	7.01	8.40	8.28	8.17	7.28	7.39	7.14	7.10	8.52
12/01/31	12/31/31	Dec 2031	87.05	76.34	81.40	76.63	89.36	76.39	86.38	80.28	85.47	79.53	8.54	9.15	7.90	7.30	8.42	8.34	8.31	7.32	7.68	7.43	7.39	8.67
01/01/32	01/31/32	Jan 2032	79.83	73.74	86.45	78.51	77.48	70.92	84.28	79.05	84.77	79.25	8.70	9.32	7.97	7.36	8.19	8.20	8.15	7.24	7.75	7.50	7.45	8.51
02/01/32	02/29/32	Feb 2032	75.46	72.91	80.63	75.10	74.57	70.09	80.68	77.58	81.42	77.52	8.66	8.88	7.90	7.33	8.21	8.21	8.19	7.28	7.72	7.47	7.43	8.55
03/01/32	03/31/32	Mar 2032	74.06	71.91	76.79	72.64	71.32	68.87	79.49	76.50	79.99	75.69	8.04	8.50	7.34	6.83	7.96	7.96	7.82	7.11	7.21	6.96	6.92	8.18
04/01/32	04/30/32	Apr 2032	74.46	70.92	81.00	72.71	74.72	67.37	79.60	75.47	80.35	75.23	7.95	8.33	7.28	6.73	7.86	7.63	7.65	6.97	7.10	6.86	6.82	7.97
05/01/32	05/31/32	May 2032	71.07	67.64	80.24	72.89	70.31	65.14	77.44	74.40	80.15	74.85	8.00	8.39	7.28	6.75	7.87	7.63	7.59	7.01	7.12	6.87	6.84	7.87
06/01/32	06/30/32	Jun 2032	73.24	69.78	85.95	74.04	72.81	66.73	77.95	74.93	81.98	75.57	8.10	8.44	7.37	6.79	7.91	7.67	7.48	7.12	7.16	6.92	6.88	7.76
07/01/32	07/31/32	Jul 2032	91.25	74.40	103.99	80.89	91.20	73.70	96.69	80.30	99.64	81.37	8.17	9.12	7.43	6.85	7.99	7.80	7.68	7.25	7.22	6.98	6.94	7.96
08/01/32	08/31/32	Aug 2032	97.86	75.77	107.49	80.09	97.58	73.31	102.57	82.65	103.55	82.60	8.22	8.92	7.38	6.87	8.22	7.92	7.78	7.29	7.24	6.99	6.96	8.05
09/01/32	09/30/32	Sep 2032	89.65	74.70	93.90	77.80	88.14	72.26	94.20	81.19	95.48	80.87	8.19	8.89	7.42	6.91	8.08	7.78	7.78	7.16	7.28	7.04	7.00	8.06
10/01/32	10/31/32	Oct 2032	84.13	74.27	86.85	75.72	82.80	71.05	87.87	79.55	89.72	79.21	8.23	8.74	7.55	6.97	8.18	7.89	7.90	7.19	7.34	7.09	7.05	8.19
11/01/32	11/30/32	Nov 2032	83.90	76.81	83.30	75.87	82.93	76.08	87.28	80.33	86.92	79.19	8.40	8.70	7.66	7.15	8.56	8.44	8.33	7.42	7.52	7.28	7.24	8.67
12/01/32	12/31/32	Dec 2032	89.73	78.34	83.06	78.43	90.62	78.48	88.16	82.08	87.39	81.32	8.70	9.33	8.05	7.44	8.58	8.49	8.47	7.46	7.82	7.57	7.53	8.83
01/01/33	01/31/33	Jan 2033	82.08	75.59	88.26	80.30	79.66	72.70	86.46	81.17	87.00	81.25	8.87	9.50	8.13	7.50	8.35	8.35	8.30	7.38	7.89	7.64	7.59	8.67
02/01/33	02/28/33	Feb 2033	77.39	74.82	83.21	77.18	75.94	71.41	82.66	79.55	83.37	79.39	8.82	9.05	8.05	7.47	8.36	8.37	8.35	7.42	7.86	7.61	7.57	8.71
03/01/33	03/31/33	Mar 2033	75.87	73.49	78.82	74.34	73.01	70.44	81.25	78.07	81.76	77.27	8.19	8.66	7.48	6.96	8.11	8.11	7.97	7.24	7.34	7.09	7.05	8.33
04/01/33	04/30/33	Apr 2033	76.42	72.53	82.28	74.15	76.17	69.46	81.42	76.62	82.05	76.15	8.10	8.49	7.41	6.86	8.01	7.77	7.79	7.10	7.23	6.98	6.94	8.12
05/01/33	05/31/33	May 2033	74.63	72.07	82.89	74.79	73.88	69.15	79.84	76.92	82.80	77.33	8.15	8.55	7.42	6.88	8.02	7.77	7.73	7.14	7.25	7.00	6.97	8.02
06/01/33	06/30/33	Jun 2033	75.67	72.12	88.63	75.96	75.24	69.04	80.58	77.20	84.47	77.53	8.25	8.60	7.51	6.92	8.06	7.82	7.63	7.26	7.29	7.05	7.01	7.91
07/01/33	07/31/33	Jul 2033	93.70	76.00	106.42	82.95	93.51	75.91	98.75	81.94	102.24	83.11	8.32	9.29	7.57	6.98	8.15	7.95	7.83	7.39	7.35	7.11	7.07	8.11
08/01/33	08/31/33	Aug 2033	99.98	77.20	109.57	81.75	99.69	74.18	104.47	84.73	105.62	84.37	8.38	9.09	7.52	7.00	8.37	8.07	7.92	7.43	7.37	7.12	7.09	8.20
09/01/33	09/30/33	Sep 2033	90.69	76.97	95.38	79.39	88.95	73.99	95.30	82.77	96.39	82.38	8.34	9.06	7.56	7.04	8.23	7.93	7.93	7.29	7.42	7.17	7.13	8.21
10/01/33	10/31/33	Oct 2033	86.11	76.05	89.89	77.47	84.47	72.58	89.69	81.58	92.11	81.08	8.38	8.90	7.69	7.10	8.33	8.04	8.05	7.33	7.47	7.22	7.19	8.34
11/01/33	11/30/33	Nov 2033	85.36	79.64	85.07	77.70	84.63	77.55	88.75	82.39	88.46	81.06	8.56	8.87	7.80	7.28	8.72	8.60	8.49	7.56	7.66	7.41	7.37	8.83
12/01/33	12/31/33	Dec 2033	90.48	80.28	84.64	80.29	89.62	80.28	90.07	83.99	89.28	83.11	8.87	9.51	8.21	7.58	8.74	8.66	8.63	7.60	7.96	7.71	7.67	8.99
01/01/34	01/31/34	Jan 2034	84.21	77.31	90.33	82.39	81.49	74.69	88.47	82.80	88.89	83.09	9.04	9.68	8.28	7.64	8.51	8.51	8.46	7.52	8.03	7.78	7.73	8.82
02/01/34	02/28/34	Feb 2034	80.61	76.12	85.69	78.69	76.87	73.49	84.80	80.79	85.49	80.81	8.99	9.22	8.20	7.62	8.52	8.52	8.50	7.56	8.00	7.75	7.71	8.87
03/01/34	03/31/34	Mar 2034	77.80	75.44	81.07	76.60	74.96	72.44	83.20	80.41	83.71	79.59	8.35	8.83	7.63	7.09	8.27	8.27	8.12	7.38	7.47	7.22	7.18	8.48
04/01/34	04/30/34	Apr 2034	78.73	74.49	84.67	76.53	77.99	71.04	83.57	79.00	84.24	78.75	8.26	8.65	7.55	6.99	8.16	7.92	7.94	7.24	7.36	7.11	7.07	8.26
05/01/34	05/31/34	May 2034	74.79	71.65	84.80	76.26	73.85	69.32	80.79	77.17	83.56	77.82	8.31	8.71	7.56	7.01	8.17	7.92	7.88	7.28	7.38	7.13	7.10	8.16
06/01/34	06/30/34	Jun 2034	76.20	73.15	90.03	77.51	75.57	70.10	81.36	78.18	85.37	78.58	8.41	8.76	7.66	7.06	8.22	7.97	7.77	7.40	7.42	7.18	7.14	8.05
07/01/34	07/31/34	Jul 2034	95.53	78.29	108.47	84.75	95.50	77.94	100.49	83.46	104.03	84.85	8.48	9.47	7.71	7.11	8.30	8.10	7.98	7.53	7.49	7.24	7.20	8.26
08/01/34	08/31/34	Aug 2034	101.58	79.49	111.15	83.49	101.01	76.88	106.14	85.98	107.39	85.73	8.54	9.27	7.66	7.13	8.53	8.22	8.07	7.57	7.50	7.26	7.22	8.35
09/01/34	09/30/34	Sep 2034	92.17	78.78	97.90	81.24	90.35	76.22	96.95	84.37	99.04	84.04	8.50	9.23	7.70	7.18	8.39	8.08	8.08	7.43	7.55	7.30	7.26	8.36
10/01/34	10/31/34	Oct 2034	86.84	77.62	89.10	79.26	85.77	74.29	90.80	82.75	92.52	82.45	8.54	9.07	7.84	7.23	8.49	8.19	8.21	7.47	7.61	7.36	7.32	8.49
11/01/34	11/30/34	Nov 2034	86.92	80.44	86.60	79.45	86.72	79.70	90.27	84.26	90.03	82.84	8.73	9.03	7.95	7.42	8.89	8.77	8.65	7.70	7.80	7.55	7.51	8.99
12/01/34	12/31/34	Dec 2034	92.27	82.52	86.71	82.05	92.27	82.49	92.19	85.33	91.44	84.55	9.04	9.69	8.36	7.72	8.91	8.82	8.79	7.75	8.11	7.86	7.81	9.15
01/01/35	01/31/35	Jan 2035	85.40	79.06	92.41	84.05	83.34	76.71	90.15	84.28	90.62	84.57	9.21	9.86	8.44	7.79	8.67	8.67	8.62	7.66	8.18	7.92	7.88	8.99
02/01/35	02/28/35	Feb 2035	82.04	78.56	87.48	80.49	79.73	75.39	86.76	82.83	87.33	82.72	9.16	9.39	8.36	7.76	8.68	8.69	8.67	7.71	8.15	7.90	7.85	9.03
03/01/35	03/31/35	Mar 2035	79.18	77.10	82.57	78.04	76.19	74.05	84.36	81.81	84.96	80.95	8.51	9.00	7.77	7.22	8.42	8.42	8.27	7.52	7.61	7.36	7.31	8.63
04/01/35	04/30/35	Apr 2035	80.76	76.08	87.48	77.96	80.27	72.80	85.72	80.40	86.56	80.06	8.42	8.81	7.70	7.12	8.32	8.07	8.09	7.38	7.49	7.25	7.21	8.42
05/01/35	05/31/35	May 2035	78.14	74.05	86.64	78.05	77.55	72.66	83.46	78.94	86.00	79.69	8.47	8.88	7.71	7.14	8.32	8.07	8.03	7.42	7.51	7.27	7.23	8.31
06/01/35	06/30/35	Jun 2035	78.80	75.97	91.58	79.40	77.96	72.79	83.77	80.50	87.65	80.83	8.57	8.93	7.80	7.19	8.37	8.12	7.92	7.54	7.56	7.31	7.28	8.20
07/01/35	07/31/35	Jul 2035	97.52	79.85	111.22	86.53	97.65	78.27	102.69	85.97	106.38	87.16	8.64	9.65	7.86	7.25	8.46	8.26	8.13	7.67	7.62	7.37	7.34	8.41
08/01/35	08/31/35	Aug 2035	103.81	81.13	113.76	85.35	103.00	79.06	108.53	87.36	109.69	87.48	8.70	9.44	7.81	7.27	8.69	8.38	8.23	7.71	7.64	7.39	7.36	8.50
09/01/35	09/30/35	Sep 2035	94.46	80.66	99.81	83.40	93.19	78.35	99.61	86.26	101.57	86.22	8.66	9.41	7.85	7.31	8.55	8.24	8.23	7.57	7.69	7.44	7.40	8.51
10/01/35	10/31/35	Oct 2035	88.22	79.48	90.49	80.86	86.44	76.35	92.12	84.68	94.27	84.02	8.70	9.24	7.99	7.37	8.65	8.35	8.36	7.61	7.74	7.50	7.46	8.65
11/01/35	11/30/35	Nov 2035	88.51	81.97	88.60	81.12	87.09	81.25	92.35	86.02	92.11	84.39	8.89	9.21	8.10	7.56	9.06	8.93	8.81	7.85	7.94	7.69	7.65	9.16
12/01/35	12/31/35	Dec 2035	95.41	83.75	88.74	83.94	96.30	84.05	94.13	87.45	93.35	86.57	9.21	9.87	8.52	7.87	9.07	8.99	8.96	7.89	8.25	8.00	7.96	9.32
01/01/36	01/31/36	Jan 2036	87.71	81.16	95.43	85.61	85.06	78.60	92.92	86.86	93.73	87.09	9.38	10.05	8.60	7.94	8.83	8.84	8.78	7.81	8.33	8.07	8.03	9.15
02/01/36	02/29/36	Feb 2036	83.70	80.75	88.89	82.80	81.44	77.05	88.92	85.61	89.92	85.37	9.34	9.57	8.52	7.91	8.85	8.85	8.83	7.85	8.30	8.04	8.00	9.19
03/01/36	03/31/36	Mar 2036	81.26	79.09	84.75	80.19	78.86	75.82	86.64	83.96	87.19	83.24	8.67	9.17	7.92	7.36	8.58	8.58	8.43	7.67	7.75	7.49	7.45	8.79
04/01/36	04/30/36	Apr 2036	82.76	77.63	88.55	79.52	82.57	74.29	87.66	81.94	88.38	81.61	8.58	8.98	7.84	7.25	8.47	8.22	8.24	7.52	7.63	7.38	7.34	8.57
05/01/36	05/31/36	May 2036	79.77	74.44	88.42	79.77	78.13	72.28	84.93	81.85	89.02	82.24	8.63	9.05	7.85	7.28	8.48	8.22	8.18	7.56	7.65	7.40	7.37	8.47
06/01/36	06/30/36	Jun 2036	80.84	77.89	94.03	81.37	80.19	75.07	85.29	81.77	90.27	82.50	8.73	9.10	7.95	7.33	8.53	8.27	8.07	7.68	7.70	7.45	7.41	8.35
07/01/36	07/31/36	Jul 2036	100.74	81.95	113.10	88.42	100.70	79.59	106.05	88.45	108.37	89.34	8.81	9.83	8.01	7.39	8.62	8.41	8.28	7.82	7.76	7.51	7.47	8.56
08/01/36	08/31/36	Aug 2036	105.87	83.13	115.13	87.64	105.15	80.86	111.03	89.74	111.63	89.78	8.87	9.62	7.96	7.41	8.86	8.54	8.38	7.86	7.78	7.53	7.49	8.66
09/01/36	09/30/36	Sep 2036	96.40	81.71	101.01	84.80	94.95	79.40	101.21	88.05	102.44	87.69	8.83	9.58	8.00	7.45	8.71	8.39	8.39	7.72	7.82	7.58	7.54	8.67
10/01/36	10/31/36	Oct 2036	90.49	81.27	91.28	82.93	89.00	77.83	94.55	87.08	95.02	86.22	8.87	9.42	8.14	7.51	8.82	8.51	8.52	7.75	7.88	7.64	7.60	8.81
11/01/36	11/30/36	Nov 2036	90.53	84.27	90.49	83.29	89.82	83.60	94.52	88.28	94.24	86.94	9.06	9.38	8.25	7.71	9.23	9.10	8.98	8.00	8.08	7.83	7.79	9.33
12/01/36	12/31/36	Dec 2036	98.71	85.86	90.33	85.56	101.21	86.66	96.30	89.16	95.45	88.48	9.38	10.06	8.68	8.02	9.25	9.16	9.13	8.04	8.40	8.15	8.11	9.49
01/01/37	01/31/37	Jan 2037	89.49	83.00	96.92	87.44	87.10	80.51	94.61	88.47	95.29	88.83	9.56	10.24	8.76	8.09	9.00	9.00	8.95	7.96	8.48	8.22	8.18	9.32

02/01/37	02/28/37	Feb 2037	85.95	82.60	90.81	84.43	83.24	79.15	91.10	86.19	91.71	86.42	9.51	9.75	8.68	8.06	9.01	9.02	9.00	8.00	8.45	8.19	8.15	9.36
03/01/37	03/31/37	Mar 2037	82.88	80.67	86.40	81.37	80.91	77.35	88.23	84.70	89.06	84.26	8.83	9.34	8.07	7.50	8.75	8.75	8.59	7.81	7.89	7.63	7.59	8.95
04/01/37	04/30/37	Apr 2037	84.56	79.18	90.65	81.40	84.06	76.08	89.52	82.94	90.70	83.26	8.74	9.15	7.99	7.39	8.64	8.38	8.40	7.66	7.77	7.52	7.48	8.73
05/01/37	05/31/37	May 2037	81.67	76.90	90.26	81.73	80.63	75.08	86.90	82.52	90.51	83.11	8.79	9.22	8.00	7.42	8.64	8.38	8.34	7.70	7.79	7.54	7.50	8.62
06/01/37	06/30/37	Jun 2037	83.20	79.47	95.89	82.96	83.13	77.01	87.55	83.39	92.31	84.11	8.90	9.27	8.10	7.47	8.69	8.43	8.22	7.83	7.83	7.59	7.55	8.50
07/01/37	07/31/37	Jul 2037	102.90	83.24	115.12	90.19	102.70	81.64	107.77	89.66	110.71	90.90	8.97	10.02	8.16	7.53	8.78	8.57	8.44	7.97	7.90	7.65	7.61	8.72
08/01/37	08/31/37	Aug 2037	107.93	84.90	117.47	89.70	107.55	82.97	113.03	91.71	113.79	91.73	9.04	9.81	8.11	7.55	9.03	8.70	8.54	8.01	7.92	7.67	7.63	8.82
09/01/37	09/30/37	Sep 2037	98.10	83.31	102.71	86.56	97.17	81.01	103.05	89.54	104.64	89.32	8.99	9.77	8.15	7.59	8.88	8.55	8.55	7.86	7.97	7.72	7.68	8.83
10/01/37	10/31/37	Oct 2037	92.26	83.09	93.20	84.42	91.52	79.96	96.53	88.37	96.96	87.63	9.04	9.60	8.29	7.65	8.98	8.67	8.68	7.90	8.03	7.78	7.74	8.97
11/01/37	11/30/37	Nov 2037	93.31	86.05	93.13	84.96	92.66	85.22	97.20	89.76	96.87	88.68	9.23	9.56	8.41	7.85	9.41	9.27	9.15	8.15	8.23	7.98	7.94	9.50
12/01/37	12/31/37	Dec 2037	100.50	87.63	92.36	87.69	102.43	88.51	98.17	91.48	97.36	90.66	9.56	10.25	8.85	8.17	9.42	9.33	9.30	8.20	8.56	8.30	8.26	9.66
01/01/38	01/31/38	Jan 2038	92.80	85.12	99.09	89.91	90.98	83.44	97.57	90.62	98.23	90.94	9.75	10.45	8.94	8.25	9.18	9.18	9.13	8.11	8.64	8.38	8.34	9.49
02/01/38	02/28/38	Feb 2038	88.66	84.79	92.33	86.43	86.34	82.11	93.66	89.77	94.16	89.29	9.70	9.95	8.85	8.22	9.20	9.20	9.18	8.16	8.61	8.35	8.31	9.54
03/01/38	03/31/38	Mar 2038	85.49	82.88	88.57	82.35	82.28	79.52	90.82	86.29	91.21	85.31	9.01	9.53	8.23	7.65	8.92	8.92	8.76	7.97	8.04	7.78	7.74	9.12
04/01/38	04/30/38	Apr 2038	87.08	81.68	92.86	83.52	87.10	78.07	91.72	86.31	92.62	86.02	8.91	9.33	8.15	7.54	8.81	8.55	8.57	7.81	7.91	7.67	7.63	8.89
05/01/38	05/31/38	May 2038	83.42	79.80	92.19	83.96	82.34	77.53	88.99	85.41	93.45	85.75	8.97	9.40	8.16	7.57	8.82	8.55	8.50	7.86	7.93	7.69	7.65	8.79
06/01/38	06/30/38	Jun 2038	85.16	80.26	98.31	85.06	85.36	79.96	89.95	85.12	94.83	85.94	9.08	9.46	8.26	7.61	8.87	8.60	8.39	7.98	7.98	7.74	7.70	8.67
07/01/38	07/31/38	Jul 2038	105.06	85.76	117.24	92.75	105.25	84.53	110.11	91.84	113.01	93.08	9.15	10.22	8.33	7.68	8.96	8.75	8.61	8.12	8.05	7.80	7.77	8.89
08/01/38	08/31/38	Aug 2038	111.22	87.08	121.29	91.84	110.73	84.97	115.91	94.61	117.19	94.15	9.22	10.00	8.27	7.70	9.21	8.88	8.71	8.17	8.07	7.82	7.79	8.99
09/01/38	09/30/38	Sep 2038	101.41	85.69	105.64	88.93	101.42	83.78	105.93	92.32	107.27	91.84	9.17	9.96	8.32	7.75	9.05	8.72	8.72	8.02	8.12	7.87	7.83	9.00
10/01/38	10/31/38	Oct 2038	97.34	86.35	97.62	86.71	95.85	82.11	101.12	90.91	101.55	90.03	9.22	9.79	8.46	7.81	9.16	8.84	8.86	8.06	8.18	7.93	7.89	9.14
11/01/38	11/30/38	Nov 2038	96.21	88.41	94.89	87.18	95.36	87.85	99.02	92.15	98.48	90.32	9.42	9.75	8.58	8.01	9.59	9.46	9.34	8.31	8.39	8.14	8.10	9.68
12/01/38	12/31/38	Dec 2038	101.14	90.16	95.25	89.92	98.85	89.73	101.02	93.73	100.29	92.95	9.75	10.45	9.02	8.33	9.61	9.52	9.49	8.36	8.72	8.47	8.42	9.85
01/01/39	01/31/39	Jan 2039	94.37	87.24	101.10	91.88	92.04	85.13	99.27	92.67	99.93	93.16	9.95	10.65	9.12	8.41	9.36	9.37	9.31	8.28	8.80	8.55	8.51	9.68
02/01/39	02/28/39	Feb 2039	90.96	86.91	95.59	88.74	88.06	83.74	95.86	91.68	96.24	91.18	9.90	10.15	9.03	8.38	9.38	9.38	9.36	8.32	8.77	8.52	8.48	9.72
03/01/39	03/31/39	Mar 2039	87.79	84.75	91.07	84.56	84.34	80.90	93.24	88.50	93.67	87.51	9.19	9.72	8.39	7.80	9.10	9.10	8.94	8.13	8.19	7.94	7.89	9.30
04/01/39	04/30/39	Apr 2039	89.46	83.64	95.01	85.46	89.23	80.10	94.49	87.98	95.27	87.66	9.09	9.52	8.32	7.69	8.98	8.72	8.74	7.97	8.07	7.82	7.78	9.07
05/01/39	05/31/39	May 2039	86.23	81.30	94.67	85.76	86.08	80.05	91.46	86.76	94.95	87.43	9.15	9.59	8.32	7.72	8.99	8.72	8.67	8.01	8.08	7.84	7.80	8.96
06/01/39	06/30/39	Jun 2039	87.90	84.02	101.23	87.22	88.08	81.60	92.02	87.58	97.69	88.24	9.26	9.65	8.43	7.77	9.04	8.77	8.56	8.14	8.14	7.89	7.85	8.83
07/01/39	07/31/39	Jul 2039	107.75	87.89	120.31	95.32	107.48	86.83	112.79	93.94	116.15	95.29	9.34	10.42	8.49	7.83	9.14	8.92	8.78	8.29	8.20	7.96	7.92	9.06
08/01/39	08/31/39	Aug 2039	114.07	89.03	123.63	93.89	113.30	86.84	118.53	96.25	119.64	96.14	9.40	10.20	8.44	7.85	9.39	9.05	8.89	8.33	8.22	7.98	7.94	9.17
09/01/39	09/30/39	Sep 2039	102.65	87.67	107.40	91.20	102.65	85.69	107.29	94.72	108.44	94.09	9.36	10.16	8.48	7.90	9.24	8.90	8.89	8.18	8.27	8.03	7.99	9.17
10/01/39	10/31/39	Oct 2039	97.50	87.38	98.84	88.58	96.08	83.70	101.25	92.63	102.43	91.77	9.40	9.99	8.63	7.96	9.35	9.02	9.03	8.22	8.34	8.09	8.05	9.32
11/01/39	11/30/39	Nov 2039	97.96	90.86	97.25	89.16	96.67	89.37	101.38	94.54	100.78	93.09	9.61	9.95	8.75	8.17	9.79	9.65	9.52	8.48	8.55	8.30	8.26	9.87
12/01/39	12/31/39	Dec 2039	102.71	92.39	96.51	92.19	100.50	91.93	103.01	95.92	102.44	95.06	9.95	10.66	9.20	8.50	9.80	9.71	9.68	8.53	8.89	8.63	8.59	10.04
01/01/40	01/31/40	Jan 2040	96.76	89.47	103.86	94.85	94.29	87.45	101.82	94.92	102.59	95.39	10.15	10.87	9.30	8.58	9.55	9.56	9.50	8.44	8.97	8.72	8.67	9.86
02/01/40	02/29/40	Feb 2040	93.20	89.16	98.36	90.27	90.47	86.01	97.98	93.48	98.51	92.77	10.10	10.35	9.21	8.55	9.57	9.57	9.55	8.49	8.94	8.69	8.64	9.91
03/01/40	03/31/40	Mar 2040	89.33	86.89	93.68	88.07	87.97	82.97	94.60	91.48	95.49	90.84	9.37	9.91	8.56	7.96	9.28	9.28	9.12	8.29	8.34	8.09	8.05	9.48
04/01/40	04/30/40	Apr 2040	91.68	85.70	97.99	87.85	90.94	82.81	96.86	89.84	97.71	89.82	9.27	9.71	8.48	7.84	9.16	8.89	8.91	8.13	8.22	7.97	7.93	9.24
05/01/40	05/31/40	May 2040	87.53	83.50	97.46	87.79	85.31	80.34	93.42	89.15	97.36	89.60	9.33	9.78	8.49	7.87	9.17	8.89	8.85	8.17	8.24	7.99	7.96	9.13
06/01/40	06/30/40	Jun 2040	89.21	84.19	102.45	89.16	88.97	83.71	93.63	89.10	98.77	89.98	9.45	9.84	8.60	7.92	9.23	8.94	8.73	8.31	8.29	8.05	8.01	9.01
07/01/40	07/31/40	Jul 2040	110.99	90.11	123.41	97.41	110.91	89.25	115.90	96.05	119.45	97.39	9.52	10.63	8.66	7.99	9.32	9.10	8.96	8.45	8.36	8.11	8.08	9.24
08/01/40	08/31/40	Aug 2040	116.78	91.40	126.48	96.29	116.08	88.90	121.45	99.27	122.70	98.73	9.59	10.41	8.60	8.01	9.58	9.23	9.07	8.50	8.38	8.13	8.10	9.34
09/01/40	09/30/40	Sep 2040	105.15	90.22	110.42	93.76	104.82	88.54	109.96	96.95	111.69	96.58	9.54	10.36	8.65	8.06	9.42	9.08	9.07	8.34	8.43	8.18	8.15	9.35
10/01/40	10/31/40	Oct 2040	99.07	89.82	99.85	90.63	97.34	86.07	102.91	94.49	103.53	93.74	9.59	10.19	8.80	8.12	9.53	9.20	9.21	8.38	8.49	8.25	8.21	9.50
11/01/40	11/30/40	Nov 2040	100.42	93.05	99.71	91.25	99.43	91.76	103.76	96.85	103.18	95.57	9.80	10.14	8.93	8.33	9.98	9.84	9.71	8.65	8.71	8.46	8.42	10.06
12/01/40	12/31/40	Dec 2040	105.84	95.13	99.41	94.15	104.18	94.66	106.04	98.16	105.45	97.32	10.15	10.88	9.39	8.67	10.00	9.90	9.87	8.70	9.06	8.80	8.76	10.23
01/01/41	01/31/41	Jan 2041	98.99	91.68	106.37	96.60	96.62	89.23	104.20	97.31	105.03	97.68	10.35	11.08	9.48	8.75	9.74	9.75	9.69	8.61	9.14	8.89	8.85	10.05
02/01/41	02/28/41	Feb 2041	95.21	91.03	99.89	92.55	91.88	87.64	100.37	95.51	100.97	95.17	10.30	10.56	9.39	8.72	9.76	9.76	9.74	8.66	9.11	8.86	8.81	10.10
03/01/41	03/31/41	Mar 2041	91.50	88.92	95.85	90.07	90.60	85.41	96.39	93.25	97.55	92.73	9.56	10.11	8.73	8.12	9.47	9.47	9.30	8.45	8.50	8.25	8.21	9.66
04/01/41	04/30/41	Apr 2041	93.95	88.13	100.75	90.12	92.95	84.38	99.06	92.52	100.12	92.42	9.46	9.90	8.65	8.00	9.35	9.07	9.09	8.29	8.38	8.13	8.09	9.42
05/01/41	05/31/41	May 2041	91.16	85.35	100.44	90.01	89.48	83.60	96.17	90.75	101.05	91.37	9.52	9.98	8.66	8.03	9.36	9.07	9.03	8.34	8.40	8.15	8.12	9.31
06/01/41	06/30/41	Jun 2041	92.26	87.61	105.65	91.85	92.17	86.15	96.34	91.71	102.22	92.68	9.63	10.04	8.77	8.08	9.41	9.12	8.90	8.47	8.45	8.21	8.17	9.18
07/01/41	07/31/41	Jul 2041	112.56	92.26	126.67	99.76	112.67	91.65	117.34	97.49	122.41	99.47	9.71	10.84	8.84	8.15	9.51	9.28	9.14	8.62	8.52	8.27	8.24	9.42
08/01/41	08/31/41	Aug 2041	118.53	94.06	128.68	98.98	118.36	91.81	123.40	101.30	124.89	101.05	9.78	10.61	8.78	8.17	9.77	9.42	9.25	8.67	8.54	8.29	8.26	9.52
09/01/41	09/30/41	Sep 2041	108.78	92.85	114.39	96.12	108.67	90.42	113.43	99.61	115.56	99.19	9.73	10.57	8.82	8.22	9.61	9.26	9.25	8.51	8.59	8.35	8.31	9.53
10/01/41	10/31/41	Oct 2041	101.01	92.19	102.32	92.81	99.86	88.56	105.02	96.58	105.93	95.93	9.78	10.39	8.98	8.28	9.72	9.39	9.40	8.55	8.66	8.41	8.37	9.68
11/01/41	11/30/41	Nov 2041	101.94	94.77	101.47	93.31	101.04	93.37	105.85	98.63	105.08	97.51	9.99	10.35	9.10	8.50	10.18	10.04	9.91	8.82	8.88	8.63	8.59	10.25
12/01/41	12/31/41	Dec 2041	108.41	97.46	102.07	96.52	109.19	96.81	107.88	100.43	107.37	99.59	10.35	11.09	9.58	8.84	10.20	10.10	10.07	8.87	9.23	8.98	8.93	10.43
01/01/42	01/31/42	Jan 2042	100.97	93.51	108.50	98.53	98.55	91.01	106.28	99.26	107.13	99.63	10.56	11.31	9.67	8.93	9.94	9.94	9.88	8.78	9.32	9.06	9.02	10.25
02/01/42	02/28/42	Feb 2042	97.11	92.85	101.89	94.40	93.72	89.39	102.38	97.42	102.99	97.07	10.50	10.77	9.58	8.90	9.95	9.96	9.93	8.83	9.29	9.03	8.99	10.30
03/01/42	03/31/42	Mar 2042	93.33	90.70	97.77	91.87	92.41	87.12	98.32	95.12	99.50	94.58	9.75	10.31	8.91	8.28	9.66	9.66	9.48	8.62	8.67	8.41	8.37	9.84
04/01/42	04/30/42	Apr 2042	95.83	89.89	102.77	91.92	94.81	86.07	101.04	94.37	102.12	94.27	9.65	10.10	8.83	8.16	9.53	9.25	9.27	8.46	8.54	8.29	8.25	9.60
05/01/42	05/31/42	May 2042	92.98	87.06	102.45	91.81	91.27	85.27	98.09	92.57	103.07	93.20	9.71	10.18	8.83	8.19	9.54	9.25	9.21	8.50	8.56	8.31	8.28	9.49
06/01/42	06/30/42	Jun 2042	94.11	89.36	107.76	93.69	94.01	87.87	98.27	93.54	104.26	94.53	9.83	10.24	8.94	8.24	9.60	9.31	9.08	8.64	8.61	8.37	8.33	9.36
07/01/42	07/31/42	Jul 2042	114.81	94.11	129.20	101.76	114.92	93.48	119.69	99.44	124.86	101.46	9.91	11.06	9.01	8.31	9.70	9.47	9.32	8.79	8.68	8.44	8.40	9.60
08/01/42	08/31/42	Aug 2042	120.90	95.94	131.25	100.96	120.73	93.65	125.87	103.33	127.39	103.07	9.98	10.83	8.95	8.33	9.97	9.61	9.43	8.84	8.70	8.46	8.42	9.71
09/01/42	09/30/42	Sep 2042	110.96	94.71	116.68	98.04	110.84	92.23	115.70	101.60	117.87	101.17	9.93	10.78	9.00	8.38	9.80	9.44	9.44	8.68	8.76	8.51	8.47	9.72
10/01/42	10/31/42	Oct 2042	103.03	94.03	104.37	94.67	101.86	90.33	107.12	98.51	108.05	97.85	9.98	10.60	9.16	8.45	9.92	9.57	9.59	8.72	8.82	8.58	8.54	9.87
11/01/42	11/30/42	Nov 2042	103.98	96.67	103.50	95.18	103.06	95.24	107.97	100.60	107.18	99.46	10.19	10.55	9.29	8.67	10.38	10.24	10.10	9.00	9.05	8.80	8.76	10.45
12/01/42	12/31/42	Dec 2042	110.58	99.41	104.11	98.45	111.37	98.75	110.04	102.44	109.52	101.58	10.56	11.32	9.77	9.02	10.40	10.30	10.27	9.05	9.41	9.15	9.11	10.63
01/01/43	01/31/43	Jan 2043	102.99	95.38	110.67	100.50	100.52	92.83	108.41	101.24	109.27	101.63	10.77	11.53	9.87	9.11	10.13	10.14	10.08	8.96	9.50	9.24	9.20	10.45
02/01/43	02/28/43	Feb 2043	99.06	94.71	103.93	96.29	95.59	91.18	104.42	99.37	105.05	99.01	10.71	10.99	9.77	9.08	10.15	10.16	10.13	9.01	9.46	9.21	9.17	10.50
03/01/43	03/31/43	Mar 2043	95.20	92.51	99.72	93.71	94.26	88.86	100.28	97.02	101.49	96.48	9.95	10.52	9.09	8.45	9.85	9.85	9.67	8.80	8.83	8.58	8.54	10.03

1212 Official Forward Price Curve:
Blend of...
1212 G Midas forecast completed
12/31/12 forward market curve

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
12/31/2012		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/13	01/31/13	Jan 2013	32.49	26.10	29.94	24.25	28.90	25.07	39.03	30.35	42.72	32.28	3.35	3.53	3.24	3.28	3.41	3.35	3.58	3.11	3.59	3.38	3.41	3.70
02/01/13	02/28/13	Feb 2013	31.25	24.75	30.50	24.00	27.75	23.50	39.50	30.00	43.75	32.50	3.35	3.47	3.22	3.28	3.38	3.35	3.39	3.04	3.55	3.37	3.40	3.62
03/01/13	03/31/13	Mar 2013	29.00	21.00	30.00	23.00	25.50	19.50	39.50	29.00	42.75	31.50	3.37	3.46	3.21	3.23	3.36	3.33	3.29	3.05	3.51	3.32	3.35	3.52
04/01/13	04/30/13	Apr 2013	33.55	18.63	32.34	20.54	24.86	15.08	37.75	24.57	43.43	29.95	3.40	3.51	3.24	3.17	3.32	3.29	3.26	3.02	3.44	3.24	3.28	3.47
05/01/13	05/31/13	May 2013	29.28	11.63	31.68	19.16	22.00	8.60	37.37	22.52	43.00	27.12	3.45	3.56	3.29	3.23	3.37	3.34	3.18	3.03	3.51	3.31	3.35	3.38
06/01/13	06/30/13	Jun 2013	28.67	7.25	34.98	19.55	19.14	4.07	38.13	21.16	42.57	27.69	3.51	3.61	3.34	3.31	3.43	3.40	3.18	3.04	3.59	3.39	3.42	3.38
07/01/13	07/31/13	Jul 2013	37.67	20.98	45.68	25.99	33.48	17.44	45.05	32.50	51.50	35.41	3.56	3.66	3.40	3.41	3.48	3.45	3.40	3.07	3.69	3.49	3.52	3.61
08/01/13	08/31/13	Aug 2013	42.53	29.16	46.11	26.78	38.16	24.41	46.87	33.15	53.05	36.87	3.59	3.69	3.43	3.43	3.51	3.48	3.42	3.11	3.72	3.52	3.55	3.63
09/01/13	09/30/13	Sep 2013	41.31	31.61	38.72	25.99	36.36	27.90	44.59	31.85	49.96	37.23	3.60	3.70	3.43	3.44	3.52	3.49	3.43	3.14	3.72	3.53	3.56	3.64
10/01/13	10/31/13	Oct 2013	34.96	30.72	36.23	26.68	33.84	29.04	44.37	33.91	47.64	35.28	3.63	3.73	3.47	3.47	3.55	3.52	3.51	3.20	3.76	3.56	3.59	3.73
11/01/13	11/30/13	Nov 2013	38.38	31.36	32.78	27.50	36.00	30.55	43.07	33.91	45.79	36.36	3.75	3.87	3.61	3.64	3.73	3.70	4.03	3.40	3.92	3.72	3.76	4.29
12/01/13	12/31/13	Dec 2013	40.66	33.92	34.50	28.33	38.16	31.16	43.07	34.94	45.33	36.36	3.95	4.07	3.81	3.87	3.94	3.90	4.46	3.57	4.17	3.96	4.00	4.74
01/01/14	01/31/14	Jan 2014	42.12	35.20	36.98	29.38	38.43	32.33	45.90	37.18	47.90	36.47	4.05	4.18	3.91	3.97	4.04	4.00	4.47	3.64	4.27	4.06	4.10	4.76
02/01/14	02/28/14	Feb 2014	39.39	32.00	36.61	28.53	36.61	30.50	45.90	36.11	47.43	35.75	4.05	4.17	3.91	3.96	4.03	4.00	4.30	3.64	4.25	4.05	4.09	4.58
03/01/14	03/31/14	Mar 2014	35.49	28.80	35.16	26.84	33.71	28.67	43.20	33.96	44.18	35.04	4.00	4.13	3.86	3.90	3.99	3.95	4.08	3.61	4.20	4.00	4.03	4.35
04/01/14	04/30/14	Apr 2014	37.61	22.19	36.10	27.97	31.86	17.81	41.52	32.19	44.38	33.92	3.91	4.05	3.76	3.72	3.85	3.82	3.80	3.49	4.01	3.81	3.84	4.03
05/01/14	05/31/14	May 2014	32.78	15.09	37.24	22.77	26.19	11.05	42.82	26.97	45.29	27.67	3.93	4.07	3.78	3.75	3.87	3.84	3.77	3.50	4.04	3.84	3.88	4.00
06/01/14	06/30/14	Jun 2014	33.12	15.98	40.66	23.51	22.95	10.14	45.41	27.84	47.58	27.67	3.95	4.09	3.80	3.79	3.89	3.86	3.78	3.51	4.08	3.88	3.94	4.02
07/01/14	07/31/14	Jul 2014	46.08	24.49	49.56	29.61	37.08	22.14	51.25	34.92	56.61	35.41	3.99	4.13	3.84	3.86	3.93	3.89	3.89	3.54	4.16	3.95	4.02	4.13
08/01/14	08/31/14	Aug 2014	49.40	34.10	48.62	32.76	43.60	28.75	52.79	37.80	57.17	37.60	4.01	4.15	3.86	3.88	3.95	3.91	3.95	3.57	4.18	3.97	4.04	4.19
09/01/14	09/30/14	Sep 2014	47.03	34.41	42.08	32.13	43.60	35.36	49.71	35.28	52.73	36.50	4.01	4.15	3.86	3.89	3.95	3.92	3.95	3.60	4.18	3.98	4.04	4.19
10/01/14	10/31/14	Oct 2014	40.92	35.28	40.43	30.50	37.72	34.65	48.26	35.15	46.79	35.15	4.05	4.19	3.90	3.92	3.99	3.95	3.90	3.64	4.22	4.01	4.08	4.14
11/01/14	11/30/14	Nov 2014	43.56	36.02	39.64	29.89	41.41	35.00	48.26	36.26	49.25	35.89	4.13	4.28	4.00	4.05	4.10	4.07	4.50	3.76	4.35	4.14	4.20	4.80
12/01/14	12/31/14	Dec 2014	47.52	38.96	37.68	31.11	43.87	35.35	49.73	39.59	51.71	39.96	4.31	4.46	4.18	4.25	4.29	4.25	4.67	3.93	4.55	4.35	4.41	4.98
01/01/15	01/31/15	Jan 2015	44.37	37.10	39.98	31.13	42.43	36.08	48.90	39.18	49.65	38.22	4.41	4.56	4.28	4.33	4.39	4.36	4.77	4.03	4.64	4.43	4.50	5.08
02/01/15	02/28/15	Feb 2015	41.64	33.90	39.61	30.28	40.61	34.25	48.90	38.11	49.18	37.50	4.38	4.53	4.25	4.31	4.37	4.33	4.73	3.99	4.61	4.40	4.47	5.05
03/01/15	03/31/15	Mar 2015	37.74	30.70	38.16	28.59	37.71	32.42	46.20	35.96	45.93	36.79	4.30	4.45	4.17	4.22	4.29	4.25	4.66	3.92	4.52	4.31	4.38	4.97
04/01/15	04/30/15	Apr 2015	39.86	24.09	38.60	28.72	34.61	20.96	43.52	32.94	45.63	34.42	4.07	4.24	3.93	3.90	4.01	3.98	4.02	3.66	4.20	3.99	4.06	4.27
05/01/15	05/31/15	May 2015	35.03	16.99	39.74	23.52	28.94	14.20	44.82	27.72	46.54	28.17	4.08	4.25	3.94	3.92	4.02	3.99	4.05	3.67	4.22	4.02	4.08	4.30
06/01/15	06/30/15	Jun 2015	35.37	17.88	43.16	24.26	25.70	13.29	47.41	28.59	48.83	28.17	4.10	4.27	3.96	3.96	4.04	4.01	4.01	3.67	4.25	4.05	4.11	4.26
07/01/15	07/31/15	Jul 2015	48.33	26.39	53.31	31.86	41.83	25.39	54.00	36.92	59.86	37.16	4.14	4.30	4.00	4.02	4.08	4.05	4.02	3.70	4.32	4.12	4.18	4.27
08/01/15	08/31/15	Aug 2015	51.65	36.00	52.37	35.01	48.35	32.00	55.54	39.80	60.42	39.35	4.15	4.32	4.02	4.04	4.10	4.06	4.03	3.73	4.34	4.13	4.20	4.28
09/01/15	09/30/15	Sep 2015	49.28	36.31	45.83	34.38	48.35	38.61	52.46	37.28	55.98	38.25	4.16	4.32	4.02	4.04	4.10	4.06	4.06	3.76	4.34	4.14	4.20	4.31
10/01/15	10/31/15	Oct 2015	43.17	37.18	44.43	33.00	42.72	38.15	51.26	37.40	50.29	37.15	4.19	4.36	4.05	4.08	4.13	4.10	4.11	3.80	4.38	4.17	4.24	4.36
11/01/15	11/30/15	Nov 2015	45.81	37.92	43.64	32.39	46.41	38.50	51.26	38.51	52.75	37.89	4.28	4.42	4.13	4.20	4.26	4.22	4.74	3.92	4.50	4.29	4.36	5.05
12/01/15	12/31/15	Dec 2015	49.77	40.86	41.68	33.61	48.87	38.85	52.73	41.84	55.21	41.96	4.48	4.61	4.32	4.41	4.45	4.42	4.89	4.11	4.72	4.51	4.58	5.21
01/01/16	01/31/16	Jan 2016	47.12	39.10	42.98	32.88	45.18	36.83	51.65	40.93	52.15	39.97	4.58	4.71	4.42	4.50	4.57	4.53	4.99	4.18	4.81	4.60	4.67	5.32
02/01/16	02/29/16	Feb 2016	44.39	35.90	42.61	32.03	43.36	35.00	51.65	39.86	51.68	39.25	4.56	4.69	4.40	4.47	4.54	4.51	4.96	4.15	4.78	4.57	4.64	5.29
03/01/16	03/31/16	Mar 2016	40.49	32.70	41.16	30.34	40.46	33.17	48.95	37.71	48.43	38.54	4.48	4.61	4.32	4.39	4.46	4.43	4.89	4.08	4.70	4.49	4.56	5.21
04/01/16	04/30/16	Apr 2016	42.61	26.09	41.60	30.47	37.36	21.71	46.27	34.69	48.13	36.17	4.25	4.44	4.07	4.08	4.19	4.15	4.24	3.82	4.38	4.17	4.24	4.50
05/01/16	05/31/16	May 2016	37.78	18.99	42.74	25.27	31.69	14.95	47.57	29.47	49.04	29.92	4.26	4.46	4.08	4.10	4.20	4.17	4.22	3.83	4.40	4.20	4.26	4.48
06/01/16	06/30/16	Jun 2016	38.12	19.88	46.16	26.01	28.45	14.04	50.16	30.34	51.33	29.92	4.29	4.48	4.10	4.13	4.23	4.19	4.19	3.83	4.43	4.23	4.29	4.45
07/01/16	07/31/16	Jul 2016	51.08	28.39	56.31	33.61	44.58	26.14	56.75	38.67	62.36	38.91	4.33	4.52	4.14	4.19	4.27	4.23	4.22	3.87	4.49	4.28	4.35	4.48
08/01/16	08/31/16	Aug 2016	54.40	38.00	55.37	36.76	51.10	32.75	58.29	41.55	62.92	41.10	4.35	4.54	4.16	4.21	4.29	4.25	4.22	3.90	4.51	4.30	4.37	4.47
09/01/16	09/30/16	Sep 2016	52.03	38.31	48.83	36.13	51.10	39.36	55.21	39.03	58.48	40.00	4.35	4.54	4.17	4.21	4.29	4.25	4.25	3.93	4.52	4.31	4.37	4.51
10/01/16	10/31/16	Oct 2016	45.92	39.18	47.43	34.75	45.47	38.90	54.01	39.15	52.79	38.90	4.39	4.58	4.20	4.25	4.33	4.29	4.30	3.97	4.55	4.34	4.41	4.56
11/01/16	11/30/16	Nov 2016	48.56	39.92	46.64	34.14	49.16	39.25	54.01	40.26	55.25	39.64	4.49	4.66	4.34	4.39	4.46	4.43	4.78	4.11	4.70	4.49	4.56	5.10
12/01/16	12/31/16	Dec 2016	52.52	42.86	44.68	35.36	51.62	39.60	55.48	43.59	57.71	43.71	4.69	4.86	4.54	4.60	4.66	4.62	4.99	4.30	4.92	4.70	4.77	5.32
01/01/17	01/31/17	Jan 2017	49.87	41.10	45.58	34.63	47.93	40.08	54.15	42.68	54.65	41.72	4.79	4.96	4.64	4.69	4.78	4.74	5.10	4.47	5.01	4.80	4.87	5.43
02/01/17	02/28/17	Feb 2017	47.14	37.90	45.21	33.78	46.11	38.25	54.15	41.61	54.18	41.00	4.76	4.94	4.62	4.67	4.75	4.71	5.07	4.43	4.99	4.77	4.84	5.40
03/01/17	03/31/17	Mar 2017	43.24	34.70	43.76	32.09	43.21	36.42	51.45	39.46	50.93	40.29	4.68	4.86	4.54	4.58	4.67	4.63	5.00	4.37	4.90	4.69	4.76	5.33
04/01/17	04/30/17	Apr 2017	45.36	28.09	44.20	32.22	40.11	24.96	48.77	36.44	50.63	37.92	4.45	4.63	4.26	4.30	4.40	4.36	4.43	4.11	4.60	4.39	4.46	4.70
05/01/17	05/31/17	May 2017	40.53	20.99	45.34	27.02	34.44	18.20	50.07	31.22	51.54	31.67	4.47	4.65	4.27	4.32	4.41	4.37	4.42	4.11	4.63	4.41	4.48	4.69
06/01/17	06/30/17	Jun 2017	40.87	21.88	48.76	27.76	31.20	17.29	52.66	32.09	53.83	31.67	4.49	4.67	4.30	4.35	4.44	4.40	4.39	4.12	4.66	4.45	4.52	4.66
07/01/17	07/31/17	Jul 2017	53.83	30.39	58.91	35.36	47.33	29.39	59.25	40.42	64.86	40.66	4.53	4.71	4.34	4.41	4.48	4.44	4.41	4.16	4.72	4.50	4.57	4.68
08/01/17	08/31/17	Aug 2017	57.15	40.00	57.97	38.51	53.85	36.00	60.79	43.30	65.42	42.85	4.55	4.73	4.36	4.43	4.50	4.46	4.41	4.19	4.74	4.53	4.59	4.68
09/01/17	09/30/17	Sep 2017	54.78	40.31	51.43	37.88	53.85	42.61	57.71	40.78	60.98	41.75	4.56	4.73	4.36	4.43	4.50	4.46	4.45	4.22	4.74	4.53	4.60	4.72
10/01/17	10/31/17	Oct 2017	48.67	41.18	50.03	36.50	48.22	42.15	56.51	40.90	55.29	40.65	4.60	4.77	4.40	4.47	4.54	4.50	4.49	4.26	4.78	4.57	4.64	4.77
11/01/17	11/30/17	Nov 2017	51.31	41.92	49.24	35.89	51.91	42.50	56.51	42.01	57.75	41.39	4.72	4.89	4.55	4.63	4.69	4.65	5.00	4.41	4.94	4.73	4.80	5.33
12/01/17	12/31/17	Dec 2017	55.27	44.86	47.28	37.11	54.37	42.85	57.98	45.34	60.21	45.46	4.93	5.10	4.76	4.85	4.90	4.86	5.21	4.62	5.17	4.95	5.02	5.55
01/01/18	01/31/18	Jan 2018	52.62	43.10	48.18	36.63	50.68	42.08	56.65	44.68	57.15	43.72	5.04	5.25	4.89	4.94	5.02	4.98	5.34	4.84	5.27	5.05	5.12	5.69
02/01/18	02/28/18	Feb 2018	49.89	39.90	47.81	35.78	48.86	40.25	56.65	43.61	56.68	43.00	5.01	5.22	4.86	4.92	5.00	4.96	5.31	4.80	5.24	5.02	5.10	5.66
03/01/18	03/31/18	Mar 2018	45.99	36.70	46.36	34.09	45.96	38.42	53.95	41.46	53.43	42.29	4.93	5.14	4.78	4.83	4.92	4.88	5.24	4.73	5.16	4.94	5.01	5.59

04/01/18	04/30/18	Apr 2018	48.11	30.09	46.80	34.22	42.86	26.96	51.27	38.44	53.13	39.92	4.70	4.88	4.50	4.53	4.64	4.60	4.68	4.47	4.85	4.63	4.70	4.96
05/01/18	05/31/18	May 2018	43.28	22.99	47.94	29.02	37.19	20.20	52.57	33.22	54.04	33.67	4.72	4.90	4.52	4.56	4.66	4.62	4.67	4.49	4.87	4.66	4.73	4.95
06/01/18	06/30/18	Jun 2018	43.62	23.88	51.36	29.76	33.95	19.29	55.16	34.09	56.33	33.67	4.75	4.93	4.55	4.59	4.69	4.65	4.64	4.50	4.91	4.69	4.76	4.93
07/01/18	07/31/18	Jul 2018	56.58	32.39	61.51	37.36	50.08	31.39	61.75	42.42	67.36	42.66	4.79	4.97	4.59	4.65	4.73	4.69	4.67	4.54	4.97	4.75	4.82	4.95
08/01/18	08/31/18	Aug 2018	59.90	42.00	60.57	40.51	56.60	38.00	63.29	45.30	67.92	44.85	4.81	4.99	4.61	4.67	4.75	4.71	4.67	4.56	4.99	4.78	4.85	4.95
09/01/18	09/30/18	Sep 2018	57.53	42.31	54.03	39.88	56.60	44.61	60.21	42.78	63.48	43.75	4.82	5.00	4.62	4.68	4.76	4.72	4.71	4.60	5.00	4.78	4.85	4.99
10/01/18	10/31/18	Oct 2018	51.42	43.18	52.63	38.50	50.97	44.15	59.01	42.90	57.79	42.65	4.85	5.04	4.66	4.72	4.80	4.76	4.75	4.64	5.04	4.82	4.89	5.04
11/01/18	11/30/18	Nov 2018	54.06	43.92	51.84	37.89	54.66	44.50	59.01	44.01	60.25	43.39	4.97	5.16	4.81	4.87	4.95	4.91	5.26	4.79	5.20	4.98	5.05	5.60
12/01/18	12/31/18	Dec 2018	58.02	46.86	49.88	39.11	57.12	44.85	60.48	47.34	62.71	47.46	5.19	5.37	5.03	5.10	5.16	5.12	5.48	5.00	5.43	5.21	5.28	5.83
01/01/19	01/31/19	Jan 2019	55.37	45.10	50.78	38.63	53.43	44.08	59.15	46.68	59.65	45.72	5.30	5.52	5.16	5.20	5.29	5.25	5.61	5.17	5.53	5.31	5.39	5.98
02/01/19	02/28/19	Feb 2019	48.92	42.53	47.00	39.42	48.15	41.65	56.33	48.77	56.74	48.93	5.48	5.58	5.29	5.18	5.36	5.34	5.46	4.95	5.52	5.29	5.37	5.82
03/01/19	03/31/19	Mar 2019	46.11	40.65	46.74	38.56	45.38	40.55	54.14	47.44	54.90	48.30	5.35	5.48	5.17	5.10	5.29	5.26	5.40	4.93	5.43	5.21	5.28	5.76
04/01/19	04/30/19	Apr 2019	48.78	37.14	49.70	38.80	47.13	34.96	54.04	45.82	55.53	47.04	5.21	5.35	5.01	4.92	5.09	5.07	5.05	4.76	5.24	5.02	5.10	5.35
05/01/19	05/31/19	May 2019	44.14	30.23	49.71	36.52	39.98	30.09	54.28	43.03	56.57	43.82	5.25	5.38	5.04	4.92	5.11	5.04	5.01	4.78	5.24	5.02	5.10	5.31
06/01/19	06/30/19	Jun 2019	45.15	33.44	54.00	37.26	39.81	29.93	54.79	43.77	57.01	44.09	5.30	5.41	5.08	4.95	5.15	5.08	4.99	4.81	5.28	5.06	5.13	5.29
07/01/19	07/31/19	Jul 2019	57.60	39.37	65.74	42.59	55.48	38.13	64.40	49.05	68.24	49.68	5.35	5.47	5.14	4.99	5.19	5.12	5.05	4.85	5.32	5.10	5.17	5.35
08/01/19	08/31/19	Aug 2019	61.53	44.75	66.85	44.61	60.34	42.40	67.42	50.97	71.09	51.47	5.37	5.57	5.17	5.01	5.21	5.14	5.07	4.86	5.34	5.12	5.19	5.37
09/01/19	09/30/19	Sep 2019	59.33	44.62	58.46	43.06	59.46	45.53	63.88	49.12	66.98	50.55	5.36	5.54	5.16	5.03	5.23	5.12	5.10	4.87	5.36	5.14	5.21	5.41
10/01/19	10/31/19	Oct 2019	53.94	44.79	53.83	41.81	53.68	44.54	60.96	49.18	60.70	49.52	5.39	5.57	5.19	5.08	5.28	5.18	5.17	4.89	5.41	5.19	5.26	5.48
11/01/19	11/30/19	Nov 2019	54.84	45.92	53.25	41.64	55.75	45.16	61.05	50.33	61.82	50.30	5.50	5.67	5.34	5.25	5.43	5.41	5.55	5.04	5.59	5.37	5.44	5.91
12/01/19	12/31/19	Dec 2019	57.99	48.01	52.89	42.92	57.88	45.73	61.51	52.59	62.17	53.01	5.71	5.86	5.55	5.40	5.59	5.57	5.71	5.16	5.74	5.51	5.59	6.09
01/01/20	01/31/20	Jan 2020	53.87	46.68	51.75	42.47	52.47	45.49	60.02	51.86	60.61	51.77	5.77	5.88	5.58	5.45	5.64	5.62	5.85	5.31	5.80	5.57	5.65	6.23
02/01/20	02/29/20	Feb 2020	47.94	45.15	46.19	43.05	47.44	43.05	56.00	53.94	56.80	54.85	5.96	5.95	5.72	5.45	5.73	5.72	5.61	5.10	5.78	5.56	5.64	5.97
03/01/20	03/31/20	Mar 2020	46.23	44.60	47.12	43.04	44.79	42.68	54.32	53.42	56.37	54.31	5.77	5.83	5.56	5.37	5.65	5.65	5.55	5.13	5.70	5.48	5.55	5.91
04/01/20	04/30/20	Apr 2020	49.45	44.19	52.60	43.38	51.40	42.96	56.80	53.20	57.93	54.17	5.73	5.81	5.52	5.31	5.54	5.54	5.43	5.04	5.63	5.41	5.48	5.73
05/01/20	05/31/20	May 2020	45.01	37.47	51.48	44.02	42.76	39.97	55.99	52.84	59.10	53.98	5.77	5.85	5.56	5.28	5.55	5.46	5.35	5.07	5.60	5.39	5.46	5.65
06/01/20	06/30/20	Jun 2020	46.68	43.01	56.63	44.75	45.67	40.57	54.41	53.45	57.69	54.51	5.86	5.89	5.61	5.31	5.60	5.50	5.35	5.12	5.63	5.42	5.49	5.65
07/01/20	07/31/20	Jul 2020	58.62	46.34	69.98	47.81	60.88	44.87	67.04	55.68	69.11	56.71	5.90	5.97	5.70	5.33	5.65	5.55	5.44	5.16	5.66	5.44	5.51	5.74
08/01/20	08/31/20	Aug 2020	63.16	47.49	73.12	48.70	64.08	46.80	71.56	56.63	74.26	58.10	5.94	6.14	5.73	5.35	5.67	5.56	5.47	5.17	5.68	5.46	5.54	5.77
09/01/20	09/30/20	Sep 2020	61.13	46.92	62.90	46.24	62.32	46.45	67.55	55.46	70.48	57.35	5.90	6.08	5.69	5.39	5.71	5.53	5.50	5.13	5.72	5.50	5.57	5.80
10/01/20	10/31/20	Oct 2020	56.46	46.40	55.03	45.12	56.39	44.92	62.90	55.45	63.62	56.39	5.93	6.11	5.73	5.45	5.77	5.61	5.60	5.15	5.77	5.55	5.63	5.90
11/01/20	11/30/20	Nov 2020	55.61	47.92	54.65	45.38	56.84	45.81	63.08	56.65	63.38	57.20	6.03	6.19	5.87	5.64	5.92	5.92	5.85	5.29	5.97	5.75	5.82	6.21
12/01/20	12/31/20	Dec 2020	57.96	49.16	55.89	46.72	58.64	46.61	62.54	57.84	61.63	58.56	6.23	6.34	6.07	5.69	6.02	6.02	5.95	5.32	6.03	5.81	5.88	6.32
01/01/21	01/31/21	Jan 2021	52.36	48.25	52.73	46.30	51.51	46.90	60.88	57.03	61.58	57.83	6.24	6.24	6.01	5.71	5.99	5.98	6.09	5.45	6.05	5.83	5.90	6.47
02/01/21	02/28/21	Feb 2021	51.01	48.33	48.65	45.60	49.68	45.94	59.01	56.93	60.09	57.76	6.26	6.26	6.01	5.74	6.02	6.02	6.13	5.48	6.07	5.85	5.93	6.49
03/01/21	03/31/21	Mar 2021	51.23	48.27	49.79	45.68	49.25	45.46	58.48	57.13	60.01	57.88	5.99	6.20	5.82	5.53	6.05	6.05	6.03	5.51	5.86	5.64	5.72	6.39
04/01/21	04/30/21	Apr 2021	53.27	47.27	55.83	45.69	55.26	46.30	60.51	56.06	61.56	57.16	5.94	6.16	5.76	5.47	5.88	5.88	5.76	5.36	5.79	5.58	5.65	6.06
05/01/21	05/31/21	May 2021	50.67	46.93	54.49	46.55	49.70	43.67	58.90	56.98	63.06	57.77	5.98	6.19	5.77	5.47	5.90	5.80	5.72	5.40	5.80	5.58	5.65	6.02
06/01/21	06/30/21	Jun 2021	50.70	47.26	60.50	47.21	51.85	45.35	59.19	56.50	61.02	57.55	6.08	6.22	5.85	5.50	5.94	5.83	5.73	5.44	5.82	5.60	5.68	6.03
07/01/21	07/31/21	Jul 2021	62.17	49.47	73.15	50.55	64.56	48.24	70.73	58.69	72.46	59.52	6.12	6.28	5.92	5.53	5.98	5.87	5.76	5.47	5.86	5.64	5.71	6.06
08/01/21	08/31/21	Aug 2021	67.83	50.83	77.53	51.03	67.85	51.49	75.88	59.67	78.29	60.51	6.16	6.46	5.95	5.55	6.01	5.90	5.79	5.49	5.88	5.66	5.74	6.09
09/01/21	09/30/21	Sep 2021	63.99	50.58	65.16	48.73	65.60	50.59	71.10	58.43	72.43	59.39	6.12	6.39	5.91	5.57	6.01	5.90	5.83	5.49	5.90	5.68	5.75	6.13
10/01/21	10/31/21	Oct 2021	60.44	48.69	59.09	47.15	61.83	47.80	67.05	58.22	68.47	59.23	6.15	6.42	5.94	5.60	6.08	5.92	5.90	5.51	5.93	5.71	5.78	6.21
11/01/21	11/30/21	Nov 2021	60.59	50.63	58.46	47.18	60.71	49.84	67.06	59.47	66.48	59.82	6.26	6.52	6.10	5.78	6.24	6.24	6.21	5.57	6.12	5.89	5.97	6.57
12/01/21	12/31/21	Dec 2021	62.47	52.33	57.95	48.84	64.71	51.32	65.04	60.66	64.35	61.28	6.46	6.66	6.30	5.91	6.33	6.33	6.34	5.60	6.25	6.02	6.10	6.72
01/01/22	01/31/22	Jan 2022	56.62	54.13	61.34	55.24	57.34	52.67	61.39	58.21	61.96	58.04	6.41	6.42	6.16	5.77	6.15	6.15	6.33	5.60	6.11	5.88	5.96	6.71
02/01/22	02/28/22	Feb 2022	55.93	54.33	58.96	54.81	56.35	50.92	60.62	58.33	61.20	57.92	6.45	6.43	6.17	5.80	6.19	6.19	6.36	5.63	6.14	5.91	5.99	6.72
03/01/22	03/31/22	Mar 2022	56.61	54.13	58.73	54.18	55.11	52.67	60.71	57.59	61.45	57.12	6.15	6.27	5.96	5.60	6.15	6.15	6.14	5.60	5.93	5.71	5.78	6.50
04/01/22	04/30/22	Apr 2022	58.61	53.25	63.71	54.88	57.75	50.61	62.66	57.91	63.31	57.50	6.12	6.27	5.89	5.54	6.01	6.01	5.89	5.48	5.86	5.65	5.72	6.19
05/01/22	05/31/22	May 2022	54.72	52.09	62.03	54.46	54.30	50.31	59.23	57.28	61.38	57.26	6.16	6.32	5.93	5.52	6.03	5.92	5.85	5.52	5.84	5.63	5.70	6.15
06/01/22	06/30/22	Jun 2022	56.29	53.44	66.75	55.53	54.38	50.18	59.85	58.20	63.09	58.19	6.26	6.37	6.00	5.59	6.08	5.98	5.87	5.58	5.91	5.69	5.77	6.17
07/01/22	07/31/22	Jul 2022	68.39	55.26	79.17	58.65	68.11	52.80	73.18	60.54	74.94	60.73	6.30	6.45	6.03	5.62	6.12	6.02	5.92	5.61	5.94	5.72	5.80	6.22
08/01/22	08/31/22	Aug 2022	73.15	55.80	84.56	58.88	71.84	53.89	78.18	61.37	80.65	61.66	6.35	6.65	6.12	5.64	6.16	6.05	5.95	5.64	5.97	5.75	5.82	6.25
09/01/22	09/30/22	Sep 2022	69.58	55.46	71.93	57.47	67.73	53.57	74.14	60.80	75.12	60.60	6.30	6.59	6.06	5.65	6.20	6.06	5.99	5.65	5.97	5.75	5.83	6.29
10/01/22	10/31/22	Oct 2022	65.59	54.93	67.02	56.56	64.48	52.27	69.84	60.10	70.48	59.62	6.33	6.63	6.10	5.70	6.24	6.07	6.06	5.66	6.03	5.81	5.88	6.36
11/01/22	11/30/22	Nov 2022	65.63	56.60	65.50	57.54	66.81	57.96	69.25	61.17	68.93	60.57	6.48	6.78	6.30	5.88	6.49	6.49	6.51	5.81	6.21	5.99	6.07	6.87
12/01/22	12/31/22	Dec 2022	66.50	57.93	63.41	58.40	70.08	59.22	67.14	61.94	66.79	61.36	6.77	6.91	6.62	6.10	6.59	6.59	6.62	5.84	6.44	6.22	6.29	6.99
01/01/23	01/31/23	Jan 2023	61.62	58.18	65.25	59.42	61.16	57.12	65.95	62.75	66.61	62.45	6.95	7.04	6.73	6.15	6.67	6.67	6.65	5.99	6.49	6.27	6.34	7.03
02/01/23	02/28/23	Feb 2023	61.73	58.34	62.69	59.36	59.81	56.03	65.06	62.57	65.67	62.33	7.00	7.08	6.77	6.18	6.70	6.70	6.69	6.02	6.52	6.30	6.37	7.05
03/01/23	03/31/23	Mar 2023	59.68	58.18	62.18	58.33	59.03	56.46	64.11	62.42	64.94	61.68	6.80	6.94	6.51	6.07	6.65	6.65	6.60	6.08	6.40	6.18	6.26	6.96
04/01/23	04/30/23	Apr 2023	62.65	57.38	68.17	59.80	61.78	54.75	67.37	62.55	68.07	62.70	6.76	6.94	6.48	5.98	6.54	6.55	6.43	6.00	6.30	6.08	6.15	6.73
05/01/23	05/31/23	May 2023	60.15	57.94	66.98	59.16	59.98	55.54	64.52	62.12	67.43	62.02	6.82	6.99	6.54	6.02	6.59	6.45	6.38	6.04	6.35	6.13	6.20	6.68
06/01/23	06/30/23	Jun 2023	60.54	58.07	71.32	60.36	59.72	54.90	64.80	62.64	67.96	62.96	6.91	7.05	6.58	6.06	6.65	6.54	6.43	6.12	6.38	6.16	6.24	6.73
07/01/23	07/31/23	Jul 2023	73.92	59.64	85.18	64.26	74.02	58.37	79.04	65.63	80.95	66.62	6.96	7.24	6.70	6.10	6.72	6.60	6.48	6.18	6.43	6.21	6.28	6.78
08/01/23	08/31/23	Aug 2023	78.52	60.34	88.93	63.93	78.11	58.22	83.85	66.20	85.70	67.05	7.01	7.35	6.73	6.12	6.76	6.62	6.50	6.20	6.45	6.23	6.30	6.80
09/01/23	09/30/23	Sep 2023	73.33	59.80	76.39	62.13	72.35	57.09	77.91	65.20	79.80	65.16	6.96	7.20	6.68	6.16	6.80	6.59	6.54	6.11	6.48	6.27	6.34	6.84
10/01/23	10/31/23	Oct 2023	69.21	59.51	70.65	60.85	68.15	56.22	73.72	64.60	74.11	64.16	7.00	7.23	6.72	6.20	6.84	6.64	6.62	6.10	6.53	6.31	6.38	6.92
11/01/23	11/30/23	Nov 2023	68.44	60.62	69.52	61.55	69.04	61.24	73.05	65.73	72.92	64.99	7.10	7.38	6.86	6.42	6.98	6.96	6.84	6.19	6.75	6.53	6.61	7.20
12/01/23	12/31/23	Dec 2023	71.40	61.54	68.97	63.49	74.38	62.66	72.45	66.73	72.32	66.29	7.30	7.68	7.14	6.53	7.08	7.05	6.96	6.22	6.87	6.65	6.72	7.34
01/01/24	01/31/24	Jan 2024	64.25	60.60	67.13	62.20	63.00	58.38	68.64	65.34	69.24	65.00	7.35	7.45	7.03	6.42	6.92	6.93	6.90	6.18	6.76	6.53	6.61	7.28
02/01/24	02/29/24	Feb 2024	61.18	58.58	63.62	60.13	59.44	55.54	65.84	63.35	66.41	63.02	7.31	7.16	6.88	6.42	6.87	6.87	6.85	6.18	6.75	6.53	6.60	7.21
03/01/24	03/31/24	Mar 2024	60.11	58.58	62.52	58.98	58.88	56.59	64.54	62.98	65.39	62.46	6.80	6.96	6.50	6.04	6.66	6.66	6.57	6.04	6.37	6.15	6.23	6.92
04/01/24	04/30/24	Apr 2024	63.75	57.72	68.11	59.41	61.70	54.52	68.04	62.80	68.42	62.44	6.77	6.93	6.46	5.96	6.52	6.53	6.41	5.92	6.28	6.07	6.14	6.71

05/01/24	05/31/24	May 2024	58.36	56.51	66.38	58.87	58.28	53.98	63.82	62.14	67.27	62.01	6.82	6.90	6.45	5.89	6.49	6.37	6.25	5.95	6.21	5.99	6.07	6.55
06/01/24	06/30/24	Jun 2024	59.87	57.67	70.86	60.15	58.35	53.75	64.09	62.52	67.40	62.76	6.91	6.93	6.55	5.90	6.53	6.41	6.31	5.99	6.23	6.01	6.08	6.61
07/01/24	07/31/24	Jul 2024	73.52	59.43	85.59	63.63	73.96	57.53	78.57	65.32	80.65	66.27	6.97	7.15	6.65	5.95	6.60	6.48	6.36	6.06	6.28	6.06	6.13	6.66
08/01/24	08/31/24	Aug 2024	78.76	61.28	89.73	65.16	78.28	59.37	84.18	66.66	86.35	67.76	7.02	7.48	6.73	5.99	6.78	6.57	6.44	6.09	6.32	6.10	6.17	6.74
09/01/24	09/30/24	Sep 2024	74.13	60.38	77.24	62.70	73.44	57.64	78.59	65.65	80.54	65.80	6.97	7.34	6.71	6.03	6.78	6.54	6.48	6.00	6.36	6.14	6.21	6.79
10/01/24	10/31/24	Oct 2024	68.65	59.95	70.71	61.37	68.34	56.46	72.90	64.81	73.76	64.49	7.01	7.29	6.74	6.18	6.86	6.62	6.63	6.03	6.51	6.29	6.37	6.93
11/01/24	11/30/24	Nov 2024	68.47	61.36	69.68	62.21	70.04	61.98	73.34	66.42	73.18	65.65	7.12	7.44	6.88	6.39	7.04	6.98	6.85	6.15	6.72	6.50	6.57	7.21
12/01/24	12/31/24	Dec 2024	72.63	62.03	70.06	64.68	75.71	62.91	73.89	67.62	73.43	67.49	7.35	7.86	7.17	6.47	7.08	7.03	6.95	6.18	6.81	6.58	6.66	7.32
01/01/25	01/31/25	Jan 2025	64.74	60.73	67.29	62.69	63.26	58.68	69.17	65.40	69.71	65.46	7.39	7.48	7.04	6.29	6.90	6.90	6.90	6.12	6.63	6.40	6.48	7.28
02/01/25	02/28/25	Feb 2025	61.81	60.35	64.54	60.89	59.62	57.23	66.46	64.70	67.07	64.00	7.39	7.23	6.93	6.32	6.88	6.88	6.93	6.15	6.66	6.44	6.51	7.30
03/01/25	03/31/25	Mar 2025	61.42	59.60	64.01	60.30	59.54	57.47	65.67	64.11	66.26	63.54	6.96	7.05	6.60	6.00	6.73	6.73	6.60	6.05	6.33	6.11	6.19	6.96
04/01/25	04/30/25	Apr 2025	63.93	58.89	69.72	61.27	62.89	55.32	68.73	64.19	69.56	64.43	6.91	7.03	6.59	5.94	6.62	6.45	6.46	5.92	6.26	6.04	6.11	6.76
05/01/25	05/31/25	May 2025	60.40	58.04	67.76	59.94	60.00	56.26	64.95	62.36	67.70	62.62	6.95	7.00	6.56	5.93	6.58	6.39	6.32	5.96	6.25	6.03	6.10	6.62
06/01/25	06/30/25	Jun 2025	61.55	59.51	72.44	61.35	60.09	55.05	65.60	64.07	68.91	64.05	7.04	7.04	6.67	5.96	6.62	6.48	6.36	6.05	6.28	6.07	6.14	6.66
07/01/25	07/31/25	Jul 2025	74.66	60.39	86.71	64.67	74.86	57.86	79.84	66.22	82.02	67.27	7.10	7.25	6.75	6.00	6.66	6.52	6.39	6.08	6.33	6.11	6.18	6.69
08/01/25	08/31/25	Aug 2025	79.89	62.26	91.23	66.32	79.39	60.28	85.19	67.66	87.85	68.83	7.14	7.59	6.83	6.03	6.85	6.63	6.50	6.12	6.36	6.14	6.22	6.80
09/01/25	09/30/25	Sep 2025	75.22	61.43	78.99	64.30	74.66	58.47	79.98	66.91	82.27	67.04	7.11	7.56	6.81	6.06	6.83	6.59	6.55	6.04	6.39	6.17	6.24	6.85
10/01/25	10/31/25	Oct 2025	69.27	61.28	71.22	62.49	68.80	57.61	73.35	65.88	74.58	65.45	7.14	7.42	6.83	6.20	6.93	6.68	6.69	6.07	6.53	6.31	6.39	6.99
11/01/25	11/30/25	Nov 2025	69.72	62.24	70.74	63.23	71.58	63.04	74.52	67.34	74.44	66.64	7.24	7.51	6.94	6.38	7.10	7.04	6.91	6.19	6.72	6.50	6.57	7.27
12/01/25	12/31/25	Dec 2025	73.51	63.24	71.05	65.85	76.34	63.87	75.07	68.71	74.41	68.53	7.49	8.00	7.29	6.52	7.15	7.09	7.01	6.23	6.86	6.63	6.71	7.38
01/01/26	01/31/26	Jan 2026	67.42	62.58	69.50	65.19	65.34	59.88	71.97	67.80	72.42	67.84	7.62	7.85	7.26	6.48	7.08	7.08	7.07	6.27	6.82	6.59	6.67	7.45
02/01/26	02/28/26	Feb 2026	65.17	62.22	66.95	63.54	63.64	58.84	69.58	67.00	70.03	66.35	7.62	7.58	7.19	6.52	7.09	7.09	7.11	6.31	6.85	6.63	6.70	7.47
03/01/26	03/31/26	Mar 2026	63.38	61.61	66.39	62.16	62.03	58.44	68.23	66.13	68.75	65.45	7.24	7.33	6.87	6.22	6.96	6.96	6.83	6.27	6.55	6.33	6.40	7.19
04/01/26	04/30/26	Apr 2026	65.15	61.05	71.18	62.85	64.69	57.52	70.02	66.09	70.87	65.66	7.17	7.30	6.84	6.10	6.88	6.69	6.69	6.14	6.43	6.21	6.28	6.99
05/01/26	05/31/26	May 2026	62.18	60.14	69.96	62.40	61.65	57.70	67.38	65.01	70.07	65.24	7.22	7.31	6.82	6.15	6.87	6.66	6.53	6.18	6.47	6.26	6.33	6.83
06/01/26	06/30/26	Jun 2026	63.53	60.99	74.87	63.53	62.71	57.34	67.95	66.07	71.35	66.18	7.31	7.35	6.93	6.19	6.91	6.70	6.58	6.26	6.51	6.29	6.36	6.88
07/01/26	07/31/26	Jul 2026	77.86	62.84	89.42	67.21	77.95	60.83	83.11	68.60	85.16	69.80	7.37	7.60	7.01	6.22	6.95	6.74	6.61	6.29	6.54	6.32	6.40	6.91
08/01/26	08/31/26	Aug 2026	82.80	64.42	93.34	68.98	82.31	62.47	87.79	70.25	90.31	71.32	7.42	7.92	7.11	6.25	7.08	6.85	6.72	6.31	6.58	6.36	6.43	7.02
09/01/26	09/30/26	Sep 2026	77.51	63.20	81.51	66.51	76.80	60.49	82.08	68.99	84.65	69.18	7.39	7.85	7.07	6.29	7.05	6.78	6.76	6.22	6.62	6.40	6.47	7.06
10/01/26	10/31/26	Oct 2026	72.09	63.17	73.78	65.02	71.31	59.59	76.03	68.35	77.05	67.84	7.42	7.76	7.08	6.33	7.13	6.88	6.89	6.26	6.66	6.44	6.51	7.19
11/01/26	11/30/26	Nov 2026	72.13	64.54	73.51	66.08	72.86	65.48	76.93	69.76	77.11	69.04	7.53	7.92	7.23	6.60	7.36	7.28	7.15	6.40	6.94	6.71	6.79	7.51
12/01/26	12/31/26	Dec 2026	76.93	66.37	73.57	67.76	79.26	66.98	77.60	70.93	76.97	70.50	7.78	8.37	7.56	6.66	7.39	7.32	7.27	6.44	7.00	6.77	6.85	7.64
01/01/27	01/31/27	Jan 2027	68.79	64.06	70.84	66.46	66.62	61.61	73.51	69.07	73.92	69.16	7.77	8.02	7.42	6.60	7.23	7.23	7.20	6.39	6.94	6.72	6.79	7.58
02/01/27	02/28/27	Feb 2027	67.22	63.76	67.93	64.84	64.73	61.73	70.65	68.24	71.30	67.61	7.80	7.73	7.32	6.57	7.21	7.21	7.24	6.43	6.90	6.68	6.75	7.60
03/01/27	03/31/27	Mar 2027	64.42	62.62	66.97	63.39	62.73	60.63	69.36	66.87	69.87	66.32	7.31	7.47	6.93	6.21	7.05	7.05	6.91	6.32	6.54	6.32	6.39	7.27
04/01/27	04/30/27	Apr 2027	66.62	62.35	72.09	63.99	66.34	58.61	71.37	67.25	72.25	66.85	7.22	7.42	6.87	6.12	6.99	6.78	6.79	6.20	6.45	6.23	6.30	7.09
05/01/27	05/31/27	May 2027	63.63	61.10	70.82	63.37	63.47	59.78	68.49	65.54	71.19	65.94	7.28	7.39	6.86	6.09	6.96	6.74	6.71	6.24	6.41	6.20	6.27	7.01
06/01/27	06/30/27	Jun 2027	65.47	62.24	75.92	64.63	64.52	58.67	70.08	66.99	72.65	67.01	7.38	7.50	6.98	6.13	7.00	6.78	6.66	6.34	6.45	6.23	6.30	6.96
07/01/27	07/31/27	Jul 2027	79.10	64.44	90.54	68.96	79.22	62.49	84.29	70.17	86.50	71.15	7.43	7.84	7.07	6.16	7.04	6.82	6.78	6.37	6.48	6.26	6.34	7.09
08/01/27	08/31/27	Aug 2027	85.60	66.60	96.93	71.76	85.02	65.67	90.55	71.57	93.37	72.94	7.47	8.38	7.16	6.19	7.21	6.96	6.82	6.38	6.51	6.30	6.37	7.12
09/01/27	09/30/27	Sep 2027	78.02	64.98	81.22	67.87	77.05	61.56	82.47	70.34	84.34	70.42	7.44	8.04	7.11	6.23	7.13	6.88	6.87	6.31	6.55	6.33	6.41	7.17
10/01/27	10/31/27	Oct 2027	74.38	64.31	75.69	66.35	72.87	61.04	77.91	69.82	79.14	69.23	7.48	7.88	7.15	6.36	7.23	6.98	6.99	6.34	6.68	6.46	6.54	7.29
11/01/27	11/30/27	Nov 2027	73.25	65.92	73.88	66.57	74.21	66.65	77.48	70.35	77.46	69.42	7.66	8.05	7.35	6.57	7.49	7.41	7.30	6.52	6.90	6.68	6.76	7.66
12/01/27	12/31/27	Dec 2027	78.39	67.91	74.81	69.21	80.30	68.67	79.00	72.57	78.23	71.98	7.89	8.59	7.77	6.73	7.54	7.45	7.42	6.56	7.07	6.84	6.92	7.79
01/01/28	01/31/28	Jan 2028	69.46	65.37	72.79	67.65	68.07	62.77	74.24	70.22	74.86	70.08	7.90	8.10	7.28	6.80	7.36	7.36	7.33	6.50	7.15	6.92	7.00	7.71
02/01/28	02/29/28	Feb 2028	68.41	65.17	69.91	66.27	66.06	61.91	72.37	69.65	72.97	69.05	7.90	7.86	7.23	6.79	7.34	7.34	7.36	6.53	7.12	6.90	6.97	7.73
03/01/28	03/31/28	Mar 2028	65.43	63.49	67.58	64.34	63.70	60.78	70.38	68.19	70.79	67.33	7.38	7.53	6.83	6.39	7.10	6.96	6.97	6.38	6.72	6.50	6.58	7.32
04/01/28	04/30/28	Apr 2028	66.46	62.83	71.81	64.55	65.68	59.24	71.30	67.79	72.03	67.29	7.31	7.45	6.77	6.33	7.01	6.81	6.81	6.24	6.65	6.43	6.50	7.11
05/01/28	05/31/28	May 2028	63.96	61.72	70.89	64.07	63.43	59.76	68.89	65.76	71.18	66.39	7.35	7.44	6.76	6.30	7.00	6.80	6.77	6.29	6.63	6.41	6.48	7.07
06/01/28	06/30/28	Jun 2028	65.98	62.80	76.73	65.13	64.97	59.67	70.35	67.21	73.27	67.29	7.44	7.48	6.80	6.34	7.04	6.84	6.72	6.39	6.67	6.45	6.52	7.02
07/01/28	07/31/28	Jul 2028	80.27	65.10	91.30	69.15	80.42	63.22	85.59	70.97	87.52	71.63	7.49	7.76	6.85	6.39	7.09	6.94	6.84	6.43	6.71	6.49	6.57	7.14
08/01/28	08/31/28	Aug 2028	87.10	67.24	97.56	71.55	86.47	65.46	91.80	72.42	94.30	73.46	7.53	8.24	6.90	6.44	7.30	7.04	6.91	6.46	6.76	6.55	6.62	7.21
09/01/28	09/30/28	Sep 2028	80.48	66.63	83.56	70.09	79.36	64.30	85.06	71.19	86.70	71.97	7.50	8.29	6.92	6.46	7.27	7.00	6.96	6.42	6.79	6.57	6.64	7.26
10/01/28	10/31/28	Oct 2028	76.40	66.05	77.68	67.83	75.05	62.57	79.78	70.96	81.18	70.32	7.55	8.06	7.01	6.58	7.38	7.10	7.11	6.46	6.91	6.69	6.76	7.41
11/01/28	11/30/28	Nov 2028	75.89	67.63	76.34	68.62	77.06	68.52	79.90	72.23	80.01	71.45	7.79	8.27	7.29	6.85	7.65	7.57	7.50	6.66	7.18	6.96	7.03	7.86
12/01/28	12/31/28	Dec 2028	80.01	69.87	75.48	70.76	81.83	71.23	79.71	73.86	78.99	73.49	8.00	8.63	7.49	7.01	7.70	7.61	7.62	6.70	7.35	7.13	7.20	8.00
01/01/29	01/31/29	Jan 2029	72.52	68.20	75.50	70.53	70.28	65.27	77.46	73.50	77.94	73.09	8.19	8.52	7.59	7.05	7.66	7.63	7.56	6.71	7.40	7.17	7.25	7.94
02/01/29	02/28/29	Feb 2029	70.47	67.53	71.98	68.35	68.45	64.55	74.82	71.80	75.21	71.13	8.16	8.24	7.47	6.99	7.59	7.59	7.56	6.71	7.32	7.10	7.17	7.92
03/01/29	03/31/29	Mar 2029	67.89	66.39	70.05	66.51	66.81	63.91	72.80	70.32	72.85	69.39	7.67	7.81	7.09	6.61	7.43	7.43	7.30	6.65	6.94	6.72	6.80	7.66
04/01/29	04/30/29	Apr 2029	69.83	65.87	74.56	67.42	69.36	62.07	74.78	70.75	75.61	70.21	7.58	7.78	7.02	6.55	7.34	7.13	7.14	6.52	6.87	6.65	6.72	7.44
05/01/29	05/31/29	May 2029	67.56	65.05	73.62	66.47	67.44	63.29	72.05	68.30	74.06	68.91	7.64	7.73	6.98	6.50	7.28	7.07	7.04	6.56	6.83	6.61	6.68	7.34
06/01/29	06/30/29	Jun 2029	68.19	65.43	78.36	67.73	67.31	61.68	72.92	70.34	75.36	70.19	7.72	7.77	7.02	6.54	7.32	7.11	6.99	6.65	6.87	6.65	6.72	7.29
07/01/29	07/31/29	Jul 2029	83.80	67.81	94.70	72.22	83.76	65.38	88.76	73.98	90.74	74.59	7.77	8.17	7.05	6.58	7.41	7.25	7.12	6.73	6.91	6.69	6.76	7.42
08/01/29	08/31/29	Aug 2029	90.39	70.27	99.78	73.96	89.58	68.56	95.21	75.19	96.65	75.95	7.84	8.50	7.08	6.61	7.64	7.36	7.22	6.76	6.94	6.72	6.79	7.52
09/01/29	09/30/29	Sep 2029	81.91	69.29	85.46	71.39	80.49	66.39	86.64	74.19	88.41	74.03	7.81	8.26	7.12	6.65	7.59	7.31	7.28	6.70	6.98	6.76	6.83	7.58
10/01/29	10/31/29	Oct 2029	77.84	69.25	79.58	71.02	77.17	66.43	81.81	72.87	82.82	72.92	7.85	8.54	7.28	6.80	7.66	7.39	7.40	6.73	7.13	6.91	6.98	7.71
11/01/29	11/30/29	Nov 2029	78.25	70.34	78.69	70.65	79.08	70.72	82.27	74.39	82.23	73.49	7.98	8.59	7.45	7.00	7.95	7.84	7.70	6.90	7.33	7.11	7.18	8.06
12/01/29	12/31/29	Dec 2029	82.70	72.30	77.41	72.34	84.83	72.70	82.00	76.19	81.07	75.27	8.22	8.75	7.70	7.21	8.05	7.94	7.83	6.94	7.55	7.33	7.40	8.20
01/01/30	01/31/30	Jan 2030	75.70	70.52	79.18	72.69	73.35	67.26	80.51	75.63	80.69	75.22	8.36	8.94	7.72	7.14	7.91	7.88	7.81	6.94	7.48	7.25	7.33	8.19
02/01/30	02/28/30	Feb 2030	72.04	69.98	74.31	70.74	70.65	66.63	77.06	74.31	77.55	73.55	8.33	8.50	7.62	7.13	7.86	7.86	7.85	6.98	7.46	7.24	7.31	8.21
03/01/30	03/31/30	Mar 2030	70.01	68.30	72.28	68.60	68.08	65.69	74.93	72.33	75.51	71.41	7.72	8.14	7.08	6.60	7.62	7.62	7.48	6.80	6.93	6.71	6.78	7.84
04/01/30	04/30/30	Apr 2030	71.72	67.83	76.30	68.76	70.61	63.75	76.80	72.38	77.37	71.45	7.64	7.99	7.01	6.53	7.54	7.33	7.34	6.70	6.85	6.64	6.71	7.64
05/01/30	05/31/30	May 2030	67.70	65.40	74.46	67.68	67.12	63.39	72.84	69.64	75.20	70.87	7.69	7.84	7.02	6.55	7.38	7.23	7.14	6.70	6.87	6.65	6.73	7.44

06/01/30	06/30/30	Jun 2030	69.41	66.86	79.36	69.01	67.84	63.16	73.86	71.16	76.44	70.98	7.80	7.88	7.10	6.59	7.43	7.25	7.12	6.78	6.91	6.69	6.77	7.42
07/01/30	07/31/30	Jul 2030	86.55	70.38	97.86	75.18	86.62	68.30	91.61	75.70	93.88	76.75	7.86	8.53	7.15	6.62	7.64	7.42	7.28	6.89	6.95	6.73	6.80	7.58
08/01/30	08/31/30	Aug 2030	92.81	72.21	101.52	75.93	92.24	70.15	98.14	78.25	98.82	78.38	7.93	8.63	7.13	6.65	7.82	7.53	7.39	6.93	6.98	6.76	6.83	7.69
09/01/30	09/30/30	Sep 2030	84.99	70.94	87.82	73.30	83.33	67.93	89.28	76.75	90.61	76.24	7.87	8.41	7.18	6.70	7.78	7.49	7.46	6.86	7.02	6.80	6.88	7.76
10/01/30	10/31/30	Oct 2030	79.74	70.77	80.81	71.68	78.69	67.00	83.79	75.68	84.27	74.72	7.92	8.29	7.28	6.80	7.88	7.59	7.60	6.90	7.13	6.91	6.98	7.91
11/01/30	11/30/30	Nov 2030	81.27	74.40	81.62	73.97	81.91	73.20	85.18	78.11	85.03	77.08	8.20	8.88	7.57	7.11	8.23	8.12	8.00	7.16	7.44	7.22	7.30	8.36
12/01/30	12/31/30	Dec 2030	86.41	75.15	79.63	74.47	88.01	75.59	83.90	78.35	83.42	77.46	8.40	9.02	7.79	7.30	8.35	8.24	8.13	7.20	7.64	7.41	7.49	8.50
01/01/31	01/31/31	Jan 2031	77.53	72.00	81.04	74.51	75.20	69.27	82.35	77.03	82.57	76.93	8.54	9.15	7.83	7.22	8.04	8.04	7.99	7.11	7.57	7.34	7.42	8.38
02/01/31	02/28/31	Feb 2031	74.04	71.90	76.21	72.92	72.50	68.47	79.18	76.42	79.70	75.67	8.50	8.71	7.75	7.20	8.05	8.06	8.04	7.15	7.53	7.31	7.38	8.40
03/01/31	03/31/31	Mar 2031	72.29	70.30	74.64	70.77	70.43	67.61	77.19	74.55	77.94	73.69	7.89	8.34	7.21	6.70	7.81	7.81	7.67	6.98	7.03	6.81	6.88	8.03
04/01/31	04/30/31	Apr 2031	73.28	69.53	78.40	70.64	72.97	65.85	78.37	73.94	79.07	73.14	7.81	8.17	7.14	6.60	7.71	7.49	7.50	6.84	6.93	6.71	6.78	7.80
05/01/31	05/31/31	May 2031	71.11	68.83	77.52	70.55	70.70	66.91	76.26	71.93	78.70	72.68	7.85	8.23	7.15	6.63	7.72	7.48	7.45	6.88	6.95	6.73	6.80	7.75
06/01/31	06/30/31	Jun 2031	72.29	69.46	82.83	71.87	71.81	66.09	76.97	73.94	79.85	74.05	7.95	8.28	7.24	6.67	7.77	7.53	7.35	6.99	6.99	6.77	6.85	7.64
07/01/31	07/31/31	Jul 2031	90.03	72.91	101.40	78.17	90.03	71.47	94.78	78.30	97.62	79.46	8.02	8.95	7.29	6.72	7.84	7.66	7.54	7.11	7.05	6.83	6.90	7.84
08/01/31	08/31/31	Aug 2031	95.11	74.23	103.67	77.88	94.59	71.38	100.24	80.71	100.99	80.63	8.07	8.76	7.24	6.74	8.06	7.77	7.63	7.15	7.07	6.85	6.92	7.93
09/01/31	09/30/31	Sep 2031	87.14	72.75	89.97	75.66	85.64	69.83	91.67	78.99	92.89	78.51	8.03	8.72	7.28	6.78	7.93	7.64	7.63	7.02	7.11	6.89	6.96	7.94
10/01/31	10/31/31	Oct 2031	81.33	72.22	82.41	73.73	80.55	68.65	85.71	78.19	86.16	77.20	8.07	8.57	7.41	6.84	8.02	7.74	7.76	7.06	7.16	6.94	7.02	8.06
11/01/31	11/30/31	Nov 2031	82.05	75.29	80.97	74.03	82.25	74.66	85.42	78.80	84.82	77.06	8.25	8.54	7.51	7.01	8.40	8.28	8.17	7.28	7.35	7.12	7.20	8.54
12/01/31	12/31/31	Dec 2031	88.08	76.56	80.90	76.06	90.23	77.64	85.48	79.89	84.63	78.94	8.54	9.15	7.90	7.30	8.42	8.34	8.31	7.32	7.64	7.41	7.49	8.68
01/01/32	01/31/32	Jan 2032	79.50	73.72	83.30	76.41	77.07	71.04	84.24	79.03	84.30	78.70	8.70	9.32	7.97	7.36	8.19	8.20	8.15	7.24	7.70	7.48	7.55	8.53
02/01/32	02/29/32	Feb 2032	75.51	73.61	78.48	74.45	73.74	70.35	80.55	77.83	81.06	77.11	8.66	8.88	7.90	7.33	8.21	8.21	8.19	7.28	7.67	7.45	7.52	8.55
03/01/32	03/31/32	Mar 2032	74.06	71.94	76.46	72.11	72.19	69.75	79.15	75.93	79.67	74.98	8.04	8.50	7.34	6.83	7.96	7.96	7.82	7.11	7.16	6.94	7.01	8.18
04/01/32	04/30/32	Apr 2032	75.47	71.15	80.00	72.37	75.74	67.89	80.37	75.32	81.11	74.65	7.95	8.33	7.28	6.73	7.86	7.63	7.65	6.97	7.05	6.83	6.91	7.95
05/01/32	05/31/32	May 2032	72.54	70.21	79.07	72.46	71.52	67.46	77.69	74.48	80.48	74.77	8.00	8.39	7.28	6.75	7.87	7.63	7.59	7.01	7.07	6.86	6.93	7.89
06/01/32	06/30/32	Jun 2032	74.03	71.05	85.25	73.56	73.04	67.45	78.90	75.90	82.08	75.74	8.10	8.44	7.37	6.79	7.91	7.67	7.48	7.12	7.12	6.90	6.97	7.78
07/01/32	07/31/32	Jul 2032	91.98	74.95	103.75	80.27	91.95	73.18	96.99	80.62	99.93	81.70	8.17	9.12	7.43	6.85	7.99	7.80	7.68	7.25	7.18	6.96	7.03	7.98
08/01/32	08/31/32	Aug 2032	98.52	76.04	107.46	79.60	97.91	73.25	103.14	82.44	104.05	82.36	8.22	8.92	7.38	6.87	8.22	7.92	7.78	7.29	7.20	6.98	7.05	8.08
09/01/32	09/30/32	Sep 2032	89.99	75.23	92.63	77.70	88.34	72.20	94.10	80.59	95.25	80.54	8.19	8.89	7.42	6.91	8.08	7.78	7.78	7.16	7.24	7.02	7.09	8.08
10/01/32	10/31/32	Oct 2032	83.84	74.34	86.36	75.72	83.04	70.65	87.89	80.08	89.01	79.22	8.23	8.74	7.55	6.97	8.18	7.89	7.90	7.19	7.29	7.07	7.15	8.21
11/01/32	11/30/32	Nov 2032	83.67	77.06	82.63	75.42	84.06	76.05	87.15	80.39	86.39	78.41	8.40	8.70	7.66	7.15	8.56	8.44	8.33	7.42	7.48	7.26	7.33	8.69
12/01/32	12/31/32	Dec 2032	90.64	78.75	82.84	78.04	92.76	79.49	87.25	81.75	86.36	80.88	8.70	9.33	8.05	7.44	8.58	8.49	8.47	7.46	7.78	7.55	7.63	8.84
01/01/33	01/31/33	Jan 2033	81.75	75.59	85.86	78.76	79.48	73.08	86.36	80.98	86.52	80.68	8.87	9.50	8.13	7.50	8.35	8.35	8.30	7.38	7.84	7.62	7.69	8.68
02/01/33	02/28/33	Feb 2033	77.61	75.32	80.74	76.63	75.94	72.06	82.81	79.84	83.46	79.17	8.82	9.05	8.05	7.47	8.36	8.37	8.35	7.42	7.81	7.59	7.66	8.71
03/01/33	03/31/33	Mar 2033	75.82	73.58	78.34	73.77	73.40	71.42	81.06	77.46	81.54	76.53	8.19	8.66	7.48	6.96	8.11	8.11	7.97	7.24	7.29	7.07	7.14	8.33
04/01/33	04/30/33	Apr 2033	77.82	72.87	82.25	74.16	77.62	69.29	82.50	77.24	83.24	76.61	8.10	8.49	7.41	6.86	8.01	7.77	7.79	7.10	7.18	6.96	7.03	8.09
05/01/33	05/31/33	May 2033	74.92	72.16	81.19	74.27	74.26	69.75	79.94	76.08	82.17	76.54	8.15	8.55	7.42	6.88	8.02	7.77	7.73	7.14	7.20	6.98	7.06	8.03
06/01/33	06/30/33	Jun 2033	76.09	72.87	87.41	75.37	75.19	69.21	80.96	77.80	84.55	77.68	8.25	8.60	7.51	6.92	8.06	7.82	7.63	7.26	7.25	7.03	7.10	7.93
07/01/33	07/31/33	Jul 2033	93.65	76.31	105.45	82.14	93.25	74.77	98.77	82.23	102.04	83.34	8.32	9.29	7.57	6.98	8.15	7.95	7.83	7.39	7.31	7.09	7.16	8.13
08/01/33	08/31/33	Aug 2033	99.95	77.62	108.62	81.40	99.11	74.70	104.67	83.47	105.46	83.88	8.38	9.09	7.52	7.00	8.37	8.07	7.92	7.43	7.33	7.11	7.18	8.22
09/01/33	09/30/33	Sep 2033	89.56	76.64	93.27	79.22	87.73	73.51	94.20	82.19	95.17	82.10	8.34	9.06	7.56	7.04	8.23	7.93	7.93	7.29	7.37	7.15	7.22	8.23
10/01/33	10/31/33	Oct 2033	85.18	76.25	88.27	77.32	83.86	72.53	89.16	81.69	90.42	80.98	8.38	8.90	7.69	7.10	8.33	8.04	8.05	7.33	7.43	7.21	7.28	8.36
11/01/33	11/30/33	Nov 2033	85.04	78.74	84.55	77.24	84.37	77.30	88.71	82.27	88.29	80.24	8.56	8.87	7.80	7.28	8.72	8.60	8.49	7.56	7.62	7.39	7.47	8.85
12/01/33	12/31/33	Dec 2033	92.41	80.36	84.09	79.87	94.11	81.03	88.75	83.72	87.87	82.80	8.87	9.51	8.21	7.58	8.74	8.66	8.63	7.60	7.92	7.69	7.77	9.00
01/01/34	01/31/34	Jan 2034	83.45	77.29	87.47	80.75	80.72	74.97	87.87	82.74	87.87	82.52	9.04	9.68	8.28	7.64	8.51	8.51	8.46	7.52	7.99	7.76	7.84	8.84
02/01/34	02/28/34	Feb 2034	79.00	76.76	82.59	77.57	76.91	73.51	84.10	80.91	84.84	80.37	8.99	9.22	8.20	7.62	8.52	8.52	8.50	7.56	7.95	7.73	7.80	8.87
03/01/34	03/31/34	Mar 2034	77.60	75.35	80.98	76.18	74.79	72.57	82.87	79.81	83.38	78.93	8.35	8.83	7.63	7.09	8.27	8.27	8.12	7.38	7.42	7.20	7.27	8.48
04/01/34	04/30/34	Apr 2034	79.08	74.50	83.50	76.20	78.62	70.93	83.91	78.99	84.75	78.45	8.26	8.65	7.55	6.99	8.16	7.92	7.94	7.24	7.31	7.09	7.16	8.24
05/01/34	05/31/34	May 2034	76.10	73.99	83.53	75.94	74.62	71.45	81.32	77.67	84.40	78.17	8.31	8.71	7.56	7.01	8.17	7.92	7.88	7.28	7.33	7.12	7.19	8.18
06/01/34	06/30/34	Jun 2034	76.89	74.59	88.42	76.87	75.81	70.75	81.73	79.50	85.56	79.26	8.41	8.76	7.66	7.06	8.22	7.97	7.77	7.40	7.38	7.16	7.23	8.07
07/01/34	07/31/34	Jul 2034	96.12	78.64	107.37	84.00	95.44	76.53	101.00	84.46	104.11	85.55	8.48	9.47	7.71	7.11	8.30	8.10	7.98	7.53	7.44	7.22	7.29	8.28
08/01/34	08/31/34	Aug 2034	102.04	79.64	110.24	83.12	101.47	77.24	106.80	85.20	107.39	85.69	8.54	9.27	7.66	7.13	8.53	8.22	8.07	7.57	7.46	7.24	7.31	8.37
09/01/34	09/30/34	Sep 2034	92.23	78.58	95.89	81.12	90.76	75.67	96.64	84.13	98.24	84.02	8.50	9.23	7.70	7.18	8.39	8.08	8.08	7.43	7.50	7.28	7.36	8.38
10/01/34	10/31/34	Oct 2034	86.12	78.22	88.56	78.93	84.77	74.69	90.52	83.13	91.26	82.55	8.54	9.07	7.84	7.23	8.49	8.19	8.21	7.47	7.56	7.34	7.41	8.51
11/01/34	11/30/34	Nov 2034	86.88	81.30	86.25	79.09	86.28	79.54	90.67	84.26	90.10	82.55	8.73	9.03	7.95	7.42	8.89	8.77	8.65	7.70	7.75	7.53	7.61	9.01
12/01/34	12/31/34	Dec 2034	94.99	83.03	85.73	81.60	96.55	82.04	91.71	85.51	90.86	84.61	9.04	9.69	8.36	7.72	8.91	8.82	8.79	7.75	8.06	7.84	7.91	9.17
01/01/35	01/31/35	Jan 2035	85.96	79.15	89.58	82.79	83.20	77.16	90.39	84.64	90.47	84.54	9.21	9.86	8.44	7.79	8.67	8.67	8.62	7.66	8.13	7.90	7.98	9.00
02/01/35	02/28/35	Feb 2035	81.29	78.87	85.09	80.28	78.95	75.93	86.66	83.66	87.31	82.92	9.16	9.39	8.36	7.76	8.68	8.69	8.67	7.71	8.09	7.87	7.95	9.03
03/01/35	03/31/35	Mar 2035	79.34	77.20	82.28	77.02	76.62	74.18	84.33	80.82	84.87	79.86	8.51	9.00	7.77	7.22	8.42	8.42	8.27	7.52	7.55	7.33	7.41	8.63
04/01/35	04/30/35	Apr 2035	81.22	76.33	86.18	78.27	81.36	73.03	86.27	80.57	87.06	80.20	8.42	8.81	7.70	7.12	8.32	8.07	8.09	7.38	7.44	7.22	7.30	8.39
05/01/35	05/31/35	May 2035	79.10	75.67	86.23	77.82	77.72	73.28	84.12	79.73	87.16	80.12	8.47	8.88	7.71	7.14	8.32	8.07	8.03	7.42	7.47	7.25	7.32	8.33
06/01/35	06/30/35	Jun 2035	79.75	76.66	91.23	79.07	78.95	73.32	84.49	81.66	88.36	81.52	8.57	8.93	7.80	7.19	8.37	8.12	7.92	7.54	7.51	7.30	7.37	8.22
07/01/35	07/31/35	Jul 2035	98.93	80.17	111.35	86.17	98.61	78.52	104.05	86.44	107.53	87.55	8.64	9.65	7.86	7.25	8.46	8.26	8.13	7.67	7.58	7.36	7.43	8.43
08/01/35	08/31/35	Aug 2035	104.87	81.44	113.61	85.24	103.82	79.11	109.52	87.11	110.34	87.66	8.70	9.44	7.81	7.27	8.69	8.38	8.23	7.71	7.59	7.38	7.45	8.53
09/01/35	09/30/35	Sep 2035	95.33	80.62	99.49	83.47	93.85	78.05	100.08	86.32	101.80	86.36	8.66	9.41	7.85	7.31	8.55	8.24	8.23	7.57	7.64	7.42	7.49	8.53
10/01/35	10/31/35	Oct 2035	87.88	79.93	90.64	80.82	86.75	76.57	92.27	84.66	93.31	84.18	8.70	9.24	7.99	7.37	8.65	8.35	8.36	7.61	7.70	7.48	7.55	8.67
11/01/35	11/30/35	Nov 2035	89.00	82.65	88.20	80.82	87.90	80.72	92.55	86.03	91.90	83.95	8.89	9.21	8.10	7.56	9.06	8.93	8.81	7.85	7.89	7.67	7.75	9.17
12/01/35	12/31/35	Dec 2035	96.40	84.54	88.15	83.55	98.01	85.10	93.98	87.34	93.21	86.53	9.21	9.87	8.52	7.87	9.07	8.99	8.96	7.89	8.21	7.98	8.06	9.33
01/01/36	01/31/36	Jan 2036	88.77	81.56	93.00	85.71	86.48	78.69	93.25	87.30	93.70	87.23	9.38	10.05	8.60	7.94	8.83	8.84	8.78	7.81	8.28	8.05	8.13	9.16
02/01/36	02/29/36	Feb 2036	84.64	80.73	87.45	82.73	81.70	77.50	89.47	85.78	89.81	85.36	9.34	9.57	8.52	7.91	8.85	8.85	8.83	7.85	8.24	8.02	8.09	9.19
03/01/36	03/31/36	Mar 2036	81.73	78.96	84.62	80.24	79.14	75.74	86.83	83.63	87.45	83.19	8.67	9.17	7.92	7.36	8.58	8.58	8.43	7.67	7.69	7.47	7.54	8.79
04/01/36	04/30/36	Apr 2036	84.06	78.07	88.71	79.93	83.39	74.79	88.92	82.03	89.65	81.76	8.58	8.98	7.84	7.25	8.47	8.22	8.24	7.52	7.58	7.36	7.43	8.54
05/01/36	05/31/36	May 2036	80.79	76.88	87.64	79.68	78.84	74.65	85.52	81.19	89.86	81.51	8.63	9.05	7.85	7.28	8.48	8.22	8.18	7.56	7.60	7.38	7.46	8.48
06/01/36	06/30/36	Jun 2036	81.53	78.14	92.83	80.95	80.88	74.91	85.60	82.49	90.27	82.54	8.73	9.10	7.95	7.33	8.53	8.27	8.07	7.68	7.65	7.43	7.51	8.37

07/01/36	07/31/36	Jul 2036	101.74	82.43	112.32	87.79	101.48	80.22	106.31	88.25	108.77	89.31	8.81	9.83	8.01	7.39	8.62	8.41	8.28	7.82	7.71	7.49	7.57	8.58
08/01/36	08/31/36	Aug 2036	106.12	83.25	114.09	87.33	105.29	81.23	111.04	89.52	111.56	89.76	8.87	9.62	7.96	7.41	8.86	8.54	8.38	7.86	7.73	7.51	7.59	8.68
09/01/36	09/30/36	Sep 2036	96.25	81.65	99.13	84.52	94.75	79.09	100.97	87.94	101.99	87.58	8.83	9.58	8.00	7.45	8.71	8.39	8.39	7.72	7.78	7.56	7.63	8.69
10/01/36	10/31/36	Oct 2036	89.58	81.34	90.54	82.23	89.30	78.37	94.01	87.00	94.19	86.41	8.87	9.42	8.14	7.51	8.82	8.51	8.52	7.75	7.84	7.62	7.69	8.83
11/01/36	11/30/36	Nov 2036	91.16	85.08	90.59	82.90	90.19	82.93	95.00	88.33	94.64	86.75	9.06	9.38	8.25	7.71	9.23	9.10	8.98	8.00	8.04	7.82	7.89	9.34
12/01/36	12/31/36	Dec 2036	98.85	86.29	89.76	85.61	101.56	86.60	95.43	89.21	94.77	88.41	9.38	10.06	8.68	8.02	9.25	9.16	9.13	8.04	8.36	8.13	8.21	9.50
01/01/37	01/31/37	Jan 2037	89.90	83.11	94.51	87.26	87.35	80.97	95.00	88.73	95.48	88.55	9.56	10.24	8.76	8.09	9.00	9.00	8.95	7.96	8.43	8.20	8.28	9.33
02/01/37	02/28/37	Feb 2037	86.05	82.71	89.57	84.45	83.28	79.57	91.25	87.63	92.01	87.11	9.51	9.75	8.68	8.06	9.01	9.02	9.00	8.00	8.39	8.17	8.24	9.36
03/01/37	03/31/37	Mar 2037	83.28	80.40	86.52	81.83	80.76	76.99	88.22	84.98	89.62	84.50	8.83	9.34	8.07	7.50	8.75	8.75	8.59	7.81	7.83	7.61	7.68	8.95
04/01/37	04/30/37	Apr 2037	84.94	79.31	89.45	81.49	84.52	76.34	90.08	83.25	90.84	83.09	8.74	9.15	7.99	7.39	8.64	8.38	8.40	7.66	7.71	7.50	7.57	8.70
05/01/37	05/31/37	May 2037	82.69	77.90	89.61	81.60	80.78	76.29	87.16	82.59	91.41	83.20	8.79	9.22	8.00	7.42	8.64	8.38	8.34	7.70	7.74	7.52	7.60	8.64
06/01/37	06/30/37	Jun 2037	83.38	80.11	95.35	82.78	82.99	77.29	87.76	83.18	92.32	83.98	8.90	9.27	8.10	7.47	8.69	8.43	8.22	7.83	7.79	7.57	7.64	8.52
07/01/37	07/31/37	Jul 2037	103.03	83.55	115.32	89.68	102.57	81.65	108.22	90.02	111.35	91.27	8.97	10.02	8.16	7.53	8.78	8.57	8.44	7.97	7.85	7.63	7.71	8.74
08/01/37	08/31/37	Aug 2037	108.43	84.97	117.22	89.54	107.85	82.04	113.45	92.08	114.04	92.02	9.04	9.81	8.11	7.55	9.03	8.70	8.54	8.01	7.87	7.65	7.73	8.84
09/01/37	09/30/37	Sep 2037	97.99	83.55	101.52	86.49	97.23	80.78	102.69	89.59	103.97	89.31	8.99	9.77	8.15	7.59	8.88	8.55	8.55	7.86	7.92	7.70	7.77	8.85
10/01/37	10/31/37	Oct 2037	91.64	83.03	92.67	84.46	91.00	79.73	96.05	88.22	96.50	87.60	9.04	9.60	8.29	7.65	8.98	8.67	8.68	7.90	7.98	7.76	7.83	8.99
11/01/37	11/30/37	Nov 2037	93.51	86.38	92.37	84.68	91.53	83.94	97.25	89.73	96.49	88.42	9.23	9.56	8.41	7.85	9.41	9.27	9.15	8.15	8.18	7.96	8.04	9.51
12/01/37	12/31/37	Dec 2037	99.86	87.49	91.49	87.59	101.99	87.12	97.41	91.44	96.69	90.55	9.56	10.25	8.85	8.17	9.42	9.33	9.30	8.20	8.51	8.29	8.36	9.68
01/01/38	01/31/38	Jan 2038	93.02	85.36	97.32	89.23	90.71	83.34	97.46	90.97	97.94	90.73	9.75	10.45	8.94	8.25	9.18	9.18	9.13	8.11	8.59	8.36	8.44	9.51
02/01/38	02/28/38	Feb 2038	88.40	84.80	92.12	86.39	86.11	82.47	93.64	89.88	94.25	89.10	9.70	9.95	8.85	8.22	9.20	9.20	9.18	8.16	8.55	8.33	8.41	9.54
03/01/38	03/31/38	Mar 2038	85.78	82.95	88.82	82.45	82.94	80.04	90.97	86.17	91.42	85.25	9.01	9.53	8.23	7.65	8.92	8.92	8.76	7.97	7.98	7.76	7.83	9.12
04/01/38	04/30/38	Apr 2038	88.12	81.91	93.52	83.67	87.25	78.74	93.00	86.26	93.85	85.88	8.91	9.33	8.15	7.54	8.81	8.55	8.57	7.81	7.86	7.65	7.72	8.87
05/01/38	05/31/38	May 2038	84.25	80.87	91.83	83.80	82.17	77.46	89.34	85.56	93.89	86.19	8.97	9.40	8.16	7.57	8.82	8.55	8.50	7.86	7.89	7.67	7.74	8.81
06/01/38	06/30/38	Jun 2038	86.30	81.18	98.24	84.67	86.09	79.84	90.55	85.66	95.52	86.45	9.08	9.46	8.26	7.61	8.87	8.60	8.39	7.98	7.94	7.72	7.79	8.69
07/01/38	07/31/38	Jul 2038	105.51	86.18	117.03	92.17	105.47	84.92	110.95	92.04	113.58	93.30	9.15	10.22	8.33	7.68	8.96	8.75	8.61	8.12	8.00	7.78	7.86	8.91
08/01/38	08/31/38	Aug 2038	111.80	87.13	121.12	91.78	111.02	84.86	116.61	94.52	117.58	94.26	9.22	10.00	8.27	7.70	9.21	8.88	8.71	8.17	8.02	7.80	7.88	9.01
09/01/38	09/30/38	Sep 2038	100.96	85.48	104.48	89.14	100.55	82.89	105.59	92.56	106.98	92.06	9.17	9.96	8.32	7.75	9.05	8.72	8.72	8.02	8.07	7.85	7.93	9.02
10/01/38	10/31/38	Oct 2038	95.61	85.50	97.21	86.63	94.41	81.99	99.39	90.87	99.80	90.28	9.22	9.79	8.46	7.81	9.16	8.84	8.86	8.06	8.13	7.91	7.99	9.16
11/01/38	11/30/38	Nov 2038	95.20	88.29	94.67	86.78	94.33	87.32	99.04	92.34	98.39	90.28	9.42	9.75	8.58	8.01	9.59	9.46	9.34	8.31	8.34	8.12	8.19	9.70
12/01/38	12/31/38	Dec 2038	100.45	90.60	93.67	89.72	102.43	89.89	99.87	93.76	99.07	92.84	9.75	10.45	9.02	8.33	9.61	9.52	9.49	8.36	8.67	8.45	8.53	9.86
01/01/39	01/31/39	Jan 2039	94.53	87.40	99.46	91.94	92.42	85.05	98.90	93.04	99.29	93.16	9.95	10.65	9.12	8.41	9.36	9.37	9.31	8.28	8.76	8.53	8.61	9.69
02/01/39	02/28/39	Feb 2039	90.60	86.93	94.27	88.44	87.59	83.79	95.43	91.80	95.79	91.01	9.90	10.15	9.03	8.38	9.38	9.38	9.36	8.32	8.72	8.50	8.57	9.72
03/01/39	03/31/39	Mar 2039	88.17	85.17	91.16	84.91	85.32	82.08	93.29	88.74	93.98	87.91	9.19	9.72	8.39	7.80	9.10	9.10	8.94	8.13	8.13	7.91	7.99	9.30
04/01/39	04/30/39	Apr 2039	88.87	83.67	94.65	85.50	88.70	79.96	93.57	87.89	94.53	87.55	9.09	9.52	8.32	7.69	8.98	8.72	8.74	7.97	8.01	7.80	7.87	9.04
05/01/39	05/31/39	May 2039	87.87	82.34	94.31	85.71	87.22	80.86	92.48	87.21	95.64	87.84	9.15	9.59	8.32	7.72	8.99	8.72	8.67	8.01	8.04	7.82	7.89	8.98
06/01/39	06/30/39	Jun 2039	88.58	84.51	100.49	86.72	88.63	81.14	92.44	88.73	98.24	88.76	9.26	9.65	8.43	7.77	9.04	8.77	8.56	8.14	8.09	7.87	7.95	8.85
07/01/39	07/31/39	Jul 2039	108.26	88.44	119.87	94.45	108.33	87.75	113.56	93.87	116.70	95.26	9.34	10.42	8.49	7.83	9.14	8.92	8.78	8.29	8.16	7.94	8.01	9.08
08/01/39	08/31/39	Aug 2039	114.39	89.21	123.59	93.74	113.61	86.78	119.07	96.61	120.08	96.20	9.40	10.20	8.44	7.85	9.39	9.05	8.89	8.33	8.18	7.96	8.03	9.19
09/01/39	09/30/39	Sep 2039	102.49	87.64	105.84	91.13	102.01	85.26	106.95	94.68	108.22	94.07	9.36	10.16	8.48	7.90	9.24	8.90	8.89	8.18	8.23	8.01	8.08	9.19
10/01/39	10/31/39	Oct 2039	96.17	87.29	98.24	88.38	95.13	83.57	100.40	92.32	100.97	91.60	9.40	9.99	8.63	7.96	9.35	9.02	9.03	8.22	8.29	8.07	8.14	9.34
11/01/39	11/30/39	Nov 2039	97.78	91.38	96.81	88.43	96.90	89.10	101.41	94.46	100.78	92.95	9.61	9.95	8.75	8.17	9.79	9.65	9.52	8.48	8.50	8.28	8.35	9.88
12/01/39	12/31/39	Dec 2039	102.77	92.78	96.09	92.02	104.71	92.50	101.21	95.91	100.69	95.03	9.95	10.66	9.20	8.50	9.80	9.71	9.68	8.53	8.84	8.62	8.69	10.05
01/01/40	01/31/40	Jan 2040	96.16	89.63	102.46	93.75	93.97	87.66	101.57	95.16	102.19	95.29	10.15	10.87	9.30	8.58	9.55	9.56	9.50	8.44	8.92	8.70	8.78	9.88
02/01/40	02/29/40	Feb 2040	92.97	89.19	97.34	90.99	90.19	86.42	98.31	94.31	99.01	93.50	10.10	10.35	9.21	8.55	9.57	9.57	9.55	8.49	8.89	8.66	8.74	9.91
03/01/40	03/31/40	Mar 2040	90.44	87.36	93.56	88.27	87.44	84.25	95.59	91.94	96.33	91.28	9.37	9.91	8.56	7.96	9.28	9.28	9.12	8.29	8.29	8.07	8.14	9.47
04/01/40	04/30/40	Apr 2040	91.97	85.58	97.53	87.73	91.21	82.15	97.01	90.26	97.86	89.88	9.27	9.71	8.48	7.84	9.16	8.89	8.91	8.13	8.17	7.95	8.02	9.21
05/01/40	05/31/40	May 2040	88.54	84.48	96.72	87.64	86.73	81.43	93.54	89.37	98.08	89.40	9.33	9.78	8.49	7.87	9.17	8.89	8.85	8.17	8.19	7.98	8.05	9.15
06/01/40	06/30/40	Jun 2040	89.90	84.75	102.12	88.75	89.78	83.93	94.13	89.63	99.47	90.45	9.45	9.84	8.60	7.92	9.23	8.94	8.73	8.31	8.25	8.03	8.10	9.03
07/01/40	07/31/40	Jul 2040	111.63	90.36	123.96	96.72	111.84	89.46	116.84	96.39	120.21	97.61	9.52	10.63	8.66	7.99	9.32	9.10	8.96	8.45	8.31	8.10	8.17	9.26
08/01/40	08/31/40	Aug 2040	117.09	91.64	126.14	96.25	116.68	89.19	122.04	99.09	122.73	98.72	9.59	10.41	8.60	8.01	9.58	9.23	9.07	8.50	8.33	8.12	8.19	9.37
09/01/40	09/30/40	Sep 2040	104.98	90.39	109.35	93.73	105.19	87.91	109.94	97.02	111.63	96.63	9.54	10.36	8.65	8.06	9.42	9.08	9.07	8.34	8.39	8.17	8.24	9.37
10/01/40	10/31/40	Oct 2040	98.25	89.44	99.38	90.38	97.27	86.16	102.19	94.25	102.50	93.93	9.59	10.19	8.80	8.12	9.53	9.20	9.21	8.38	8.45	8.23	8.30	9.52
11/01/40	11/30/40	Nov 2040	100.42	94.46	99.31	91.00	99.48	91.61	104.16	96.81	103.42	95.73	9.80	10.14	8.93	8.33	9.98	9.84	9.71	8.65	8.67	8.44	8.52	10.07
12/01/40	12/31/40	Dec 2040	105.58	95.63	99.44	94.30	107.32	94.88	104.29	98.04	103.61	97.21	10.15	10.88	9.39	8.67	10.00	9.90	9.87	8.70	9.01	8.79	8.86	10.25
01/01/41	01/31/41	Jan 2041	98.61	91.92	105.28	96.20	96.55	89.58	104.05	97.58	104.77	97.65	10.35	11.08	9.48	8.75	9.74	9.75	9.69	8.61	9.10	8.87	8.95	10.07
02/01/41	02/28/41	Feb 2041	95.32	91.37	99.39	93.07	92.24	88.44	100.52	96.45	101.33	95.65	10.30	10.56	9.39	8.72	9.76	9.76	9.74	8.66	9.06	8.83	8.91	10.10
03/01/41	03/31/41	Mar 2041	92.75	89.58	95.74	90.24	89.71	85.89	97.51	93.85	98.39	93.08	9.56	10.11	8.73	8.12	9.47	9.47	9.30	8.45	8.45	8.23	8.30	9.66
04/01/41	04/30/41	Apr 2041	95.14	88.29	100.15	90.30	93.56	85.25	100.40	92.40	101.15	92.28	9.46	9.90	8.65	8.00	9.35	9.07	9.09	8.29	8.32	8.11	8.18	9.39
05/01/41	05/31/41	May 2041	91.41	85.23	99.90	89.88	89.33	84.54	96.29	90.67	101.48	91.57	9.52	9.98	8.66	8.03	9.36	9.07	9.03	8.34	8.35	8.13	8.21	9.33
06/01/41	06/30/41	Jun 2041	92.99	88.33	105.16	91.43	92.95	86.09	96.97	92.54	102.59	93.19	9.63	10.04	8.77	8.08	9.41	9.12	8.90	8.47	8.41	8.19	8.26	9.20
07/01/41	07/31/41	Jul 2041	113.15	92.44	126.73	98.87	113.01	90.97	118.50	98.79	122.92	100.02	9.71	10.84	8.84	8.15	9.51	9.28	9.14	8.62	8.47	8.25	8.33	9.44
08/01/41	08/31/41	Aug 2041	118.87	94.07	128.59	98.78	118.39	91.43	124.05	101.42	125.15	101.24	9.78	10.61	8.78	8.17	9.77	9.42	9.25	8.67	8.50	8.28	8.35	9.55
09/01/41	09/30/41	Sep 2041	108.29	92.63	112.86	95.99	108.18	90.06	112.99	99.06	115.21	98.86	9.73	10.57	8.82	8.22	9.61	9.26	9.25	8.51	8.55	8.33	8.40	9.55
10/01/41	10/31/41	Oct 2041	100.30	91.83	101.45	92.68	99.28	88.54	104.60	96.65	105.03	96.24	9.78	10.39	8.98	8.28	9.72	9.39	9.40	8.55	8.61	8.39	8.47	9.70
11/01/41	11/30/41	Nov 2041	101.90	94.97	101.02	92.69	100.58	92.91	105.89	98.48	105.01	97.50	9.99	10.35	9.10	8.50	10.18	10.04	9.91	8.82	8.83	8.61	8.68	10.27
12/01/41	12/31/41	Dec 2041	106.56	97.34	101.70	96.68	108.50	95.85	106.77	100.67	106.04	99.77	10.35	11.09	9.58	8.84	10.20	10.10	10.07	8.87	9.18	8.96	9.04	10.44
01/01/42	01/31/42	Jan 2042	100.58	93.76	107.39	98.12	98.48	91.37	106.13	99.53	106.87	99.60	10.56	11.31	9.67	8.93	9.94	9.94	9.88	8.78	9.27	9.04	9.12	10.26
02/01/42	02/28/42	Feb 2042	97.23	93.20	101.38	94.93	94.08	90.21	102.53	98.38	103.36	97.56	10.50	10.77	9.58	8.90	9.95	9.96	9.93	8.83	9.23	9.01	9.08	10.30
03/01/42	03/31/42	Mar 2042	94.61	91.37	97.65	92.04	91.50	87.61	99.46	95.73	100.36	94.94	9.75	10.31	8.91	8.28	9.66	9.66	9.48	8.62	8.61	8.39	8.47	9.84
04/01/42	04/30/42	Apr 2042	97.04	90.06	102.15	92.11	95.43	86.96	102.41	94.25	103.17	94.13	9.65	10.10	8.83	8.16	9.53	9.25	9.27	8.46	8.48	8.27	8.34	9.57
05/01/42	05/31/42	May 2042	93.24	86.93	101.90	91.68	91.12	86.23	98.22	92.48	103.51	93.40	9.71	10.18	8.83	8.19	9.54	9.25	9.21	8.50	8.51	8.29	8.37	9.51
06/01/42	06/30/42	Jun 2042	94.85	90.10	107.26	93.26	94.81	87.81	98.91	94.39	104.64	95.05	9.83	10.24	8.94	8.24	9.60	9.31	9.08	8.64	8.57	8.35	8.42	9.38
07/01/42	07/31/42	Jul 2042	115.41	94.29	129.26	100.85	115.27	92.79	120.87	100.77	125.38	102.02	9.91	11.06	9.01	8.31	9.70	9.47	9.32	8.79	8.64	8.42	8.49	9.62

	08/01/42	08/31/42	Aug 2042	121.25	95.95	131.16	100.76	120.76	93.26	126.53	103.45	127.65	103.26	9.98	10.83	8.95	8.33	9.97	9.61	9.43	8.84	8.66	8.44	8.51	9.73
	09/01/42	09/30/42	Sep 2042	110.46	94.48	115.12	97.91	110.34	91.86	115.25	101.04	117.51	100.84	9.93	10.78	9.00	8.38	9.80	9.44	9.44	8.68	8.71	8.49	8.57	9.74
	10/01/42	10/31/42	Oct 2042	102.31	93.67	103.48	94.53	101.27	90.31	106.69	98.58	107.13	98.16	9.98	10.60	9.16	8.45	9.92	9.57	9.59	8.72	8.78	8.56	8.63	9.89
	11/01/42	11/30/42	Nov 2042	103.94	96.87	103.04	94.54	102.59	94.77	108.01	100.45	107.11	99.45	10.19	10.55	9.29	8.67	10.38	10.24	10.10	9.00	9.00	8.78	8.85	10.47
	12/01/42	12/31/42	Dec 2042	108.69	99.29	103.73	98.61	110.67	97.77	108.91	102.68	108.16	101.77	10.56	11.32	9.77	9.02	10.40	10.30	10.27	9.05	9.36	9.14	9.21	10.64

Quote Date		**Data Type:**	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
11/8/2012		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/13	01/31/13	Jan 2013	36.92	31.05	33.58	27.55	34 72	29 43	41.20	32.50	42.75	32.13	3.74	3.89	3.62	3.70	3.76	3.72	4.13	3.42	3.99	3.79	3.83	4.41
02/01/13	02/28/13	Feb 2013	36.21	29.33	33.25	26.48	33.08	28.07	40.80	31.25	41.92	31.50	3.75	3.90	3.63	3.70	3.76	3.73	3.96	3.42	3.99	3.80	3.84	4.23
03/01/13	03/31/13	Mar 2013	33.37	25.88	32.92	26.22	30.46	24.25	38.00	30.00	39.84	30.87	3.72	3.86	3.58	3.64	3.73	3.70	3.75	3.40	3.93	3.74	3.78	4.01
04/01/13	04/30/13	Apr 2013	33.00	18.62	33.37	22.80	27.14	17.29	36.34	25.73	40.34	26.98	3.71	3.85	3.55	3.58	3.66	3.62	3.60	3.33	3.86	3.66	3.70	3.83
05/01/13	05/31/13	May 2013	28.80	11.60	35.50	23.50	23.46	8.27	37.49	26.78	40.75	27.52	3.74	3.89	3.59	3.61	3.69	3.66	3.57	3.36	3.90	3.70	3.73	3.79
06/01/13	06/30/13	Jun 2013	28.20	8.16	37.63	24.21	18.40	2.95	40.93	26.25	41.16	27.25	3.78	3.93	3.63	3.65	3.73	3.70	3.61	3.38	3.94	3.74	3.77	3.83
07/01/13	07/31/13	Jul 2013	39.99	26.32	46.20	29.21	34.58	19.76	45.00	33.08	51.01	33.22	3.83	3.97	3.67	3.70	3.78	3.74	3.72	3.41	3.98	3.78	3.82	3.95
08/01/13	08/31/13	Aug 2013	45.15	32.07	44.44	29.80	40.66	28.86	46.35	34.76	52.02	35.28	3.85	3.99	3.69	3.72	3.80	3.76	3.75	3.42	4.01	3.80	3.84	3.98
09/01/13	09/30/13	Sep 2013	43.86	32.37	41.36	29.50	38.76	29.38	43.65	33.41	48.48	34.25	3.85	3.99	3.69	3.72	3.80	3.76	3.74	3.46	4.01	3.80	3.84	3.97
10/01/13	10/31/13	Oct 2013	37.26	33.12	36.98	29.00	35.04	29.80	43.31	32.64	45.39	32.40	3.88	4.03	3.73	3.75	3.83	3.80	3.77	3.49	4.04	3.84	3.88	4.00
11/01/13	11/30/13	Nov 2013	40.91	33.81	36.25	28.42	39.27	32.42	43.31	34.34	43.61	33.75	3.99	4.13	3.85	3.90	3.98	3.94	4.45	3.63	4.20	3.99	4.03	4.73
12/01/13	12/31/13	Dec 2013	43.34	36.57	35.53	29.58	41.58	36.03	44.63	35.02	44.50	35.10	4.19	4.33	4.04	4.12	4.17	4.14	4.62	3.81	4.42	4.22	4.25	4.92
01/01/14	01/31/14	Jan 2014	43.68	35.96	39.00	29.90	41.61	34.06	47.25	36.92	48.10	36.31	4.29	4.43	4.15	4.22	4.28	4.24	4.70	3.88	4.53	4.32	4.36	5.00
02/01/14	02/28/14	Feb 2014	42.84	34.25	38.25	29.04	39.64	33.08	45.90	35.86	47.18	35.25	4.28	4.42	4.13	4.20	4.26	4.23	4.70	3.88	4.51	4.30	4.34	5.00
03/01/14	03/31/14	Mar 2014	39.48	32.54	35.25	27.31	36.50	31.11	41.85	33.73	43.48	34.19	4.20	4.34	4.06	4.12	4.19	4.15	4.64	3.82	4.42	4.21	4.25	4.93
04/01/14	04/30/14	Apr 2014	38.70	24.25	36.10	28.82	33.63	20.07	40.32	31.91	42.92	33.63	4.03	4.18	3.89	3.91	3.99	3.96	3.97	3.68	4.20	4.00	4.03	4.22
05/01/14	05/31/14	May 2014	33.73	16.49	37.24	23.46	27.65	12.45	41.58	26.74	43.81	27.44	4.04	4.19	3.90	3.92	4.00	3.97	3.95	3.66	4.21	4.01	4.04	4.19
06/01/14	06/30/14	Jun 2014	34.08	17.46	40.66	24.23	24.23	11.43	44.10	27.60	46.02	27.44	4.07	4.22	3.92	3.94	4.03	3.99	3.96	3.66	4.24	4.03	4.10	4.20
07/01/14	07/31/14	Jul 2014	47.77	26.07	50.62	30.08	38.68	23.68	51.00	35.41	56.36	35.41	4.10	4.25	3.95	3.97	4.06	4.02	4.02	3.68	4.27	4.06	4.13	4.26
08/01/14	08/31/14	Aug 2014	51.22	36.30	49.66	33.28	45.48	30.75	52.53	38.33	56.91	37.60	4.12	4.27	3.97	3.99	4.07	4.04	4.06	3.69	4.29	4.08	4.15	4.31
09/01/14	09/30/14	Sep 2014	48.76	36.63	42.98	32.64	45.48	37.82	49.47	35.77	52.49	36.50	4.12	4.27	3.97	3.99	4.08	4.04	4.07	3.72	4.29	4.08	4.15	4.32
10/01/14	10/31/14	Oct 2014	42.55	36.96	39.91	30.75	39.33	34.55	47.03	34.91	45.36	34.91	4.16	4.31	4.01	4.03	4.12	4.08	4.08	3.75	4.33	4.12	4.19	4.33
11/01/14	11/30/14	Nov 2014	45.29	37.73	39.14	30.14	43.18	36.38	47.03	36.02	47.75	35.65	4.24	4.39	4.10	4.16	4.21	4.18	4.71	3.87	4.46	4.26	4.32	5.03
12/01/14	12/31/14	Dec 2014	49.41	40.81	37.20	31.37	45.74	39.32	48.45	39.32	50.14	39.69	4.43	4.58	4.29	4.37	4.40	4.36	4.89	4.04	4.68	4.47	4.54	5.21
01/01/15	01/31/15	Jan 2015	45.93	37.86	41.00	30.90	43.36	35.31	49.25	38.67	50.10	38.06	4.54	4.70	4.40	4.48	4.52	4.48	4.98	4.11	4.79	4.58	4.64	5.30
02/01/15	02/28/15	Feb 2015	45.09	36.15	40.25	30.04	41.39	34.33	47.90	37.61	49.18	37.00	4.51	4.67	4.37	4.44	4.49	4.45	4.93	4.08	4.76	4.54	4.61	5.25
03/01/15	03/31/15	Mar 2015	41.73	34.44	37.25	28.31	38.25	32.36	43.85	35.48	45.48	35.94	4.42	4.58	4.28	4.35	4.40	4.37	4.86	4.01	4.66	4.45	4.51	5.18
04/01/15	04/30/15	Apr 2015	40.95	26.15	37.60	28.82	34.88	22.32	41.82	32.41	44.42	34.13	4.19	4.36	4.05	4.06	4.15	4.11	4.13	3.82	4.36	4.16	4.22	4.38
05/01/15	05/31/15	May 2015	35.98	18.39	38.74	23.46	28.90	14.70	43.08	27.24	45.31	27.94	4.20	4.37	4.06	4.08	4.16	4.13	4.13	3.80	4.38	4.17	4.23	4.39
06/01/15	06/30/15	Jun 2015	36.33	19.36	42.16	24.23	25.48	13.68	45.60	28.10	47.52	27.94	4.23	4.39	4.09	4.10	4.18	4.15	4.12	3.80	4.40	4.19	4.26	4.38
07/01/15	07/31/15	Jul 2015	50.02	27.97	52.87	31.83	40.93	25.43	53.25	37.41	58.61	37.16	4.26	4.43	4.12	4.13	4.22	4.18	4.14	3.83	4.44	4.23	4.30	4.40
08/01/15	08/31/15	Aug 2015	53.47	38.20	51.91	35.03	47.73	32.50	54.78	40.33	59.16	39.35	4.28	4.45	4.14	4.15	4.24	4.20	4.16	3.84	4.46	4.25	4.31	4.42
09/01/15	09/30/15	Sep 2015	51.01	38.53	45.23	34.39	47.73	39.57	51.72	37.77	54.74	38.25	4.28	4.45	4.14	4.16	4.24	4.21	4.18	3.86	4.46	4.25	4.32	4.44
10/01/15	10/31/15	Oct 2015	44.80	38.86	42.66	32.75	41.83	36.55	49.53	37.41	47.86	36.66	4.32	4.49	4.18	4.19	4.28	4.24	4.22	3.90	4.50	4.29	4.36	4.48
11/01/15	11/30/15	Nov 2015	47.54	39.63	41.89	32.14	45.68	38.38	49.53	38.52	50.25	37.40	4.41	4.57	4.25	4.31	4.38	4.34	4.86	4.02	4.62	4.41	4.48	5.18
12/01/15	12/31/15	Dec 2015	51.66	42.71	39.95	33.37	48.24	41.32	50.95	41.82	52.64	41.44	4.60	4.76	4.44	4.52	4.57	4.53	4.99	4.19	4.84	4.62	4.69	5.32

Quote Date		**Data Type:**	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
10/31/2012		**Commodity:**	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		POD:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		**Palo Verde**		**Mid-Columbia**		**NP 15**		**SP 15**		**Henry Hub Gas**	**SOCALBOR**	**SANJUAN**	**Opal Gas**	**Malin Gas**	**Stanfield Gas**	**SUMAS**	**AECO**	**GADSBY**	**Currant Creek**	**Lakeside**	**Z_CHEBRN***
			Forward Prices		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Forward Prices**		**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**	**Fwd Price**
Start	**End**	**Peak Type:**	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/13	01/31/13	Jan 2013	38.22	31.30	34.59	27.81	36.04	29.97	41.97	33.28	44.03	32.90	3.82	3.96	3.71	3.78	3.84	3.80	4.26	3.49	4.07	3.88	3.91	4.54
02/01/13	02/28/13	Feb 2013	37.49	30.13	34.25	26.73	34.34	28.58	41.57	32.00	43.18	32.25	3.83	3.97	3.71	3.78	3.84	3.81	4.08	3.48	4.07	3.88	3.92	4.36
03/01/13	03/31/13	Mar 2013	34.55	26.33	33.91	26.46	31.62	24.70	38.71	30.72	41.04	31.61	3.79	3.93	3.65	3.72	3.80	3.77	3.87	3.47	4.01	3.82	3.86	4.13
04/01/13	04/30/13	Apr 2013	32.77	17.85	34.08	22.80	28.32	17.39	37.05	26.71	41.58	27.97	3.77	3.92	3.62	3.64	3.72	3.69	3.67	3.40	3.93	3.73	3.76	3.90
05/01/13	05/31/13	May 2013	28.42	11.60	36.25	23.50	24.48	8.27	38.22	27.80	42.00	28.53	3.80	3.95	3.65	3.67	3.75	3.72	3.64	3.42	3.96	3.76	3.79	3.86
06/01/13	06/30/13	Jun 2013	25.81	8.80	38.43	24.21	19.20	2.85	41.73	27.25	42.42	28.25	3.84	3.99	3.69	3.71	3.79	3.76	3.67	3.44	4.00	3.80	3.83	3.90
07/01/13	07/31/13	Jul 2013	42.48	27.23	47.25	29.70	35.72	21.33	46.50	33.32	52.52	33.71	3.88	4.03	3.73	3.75	3.83	3.80	3.78	3.47	4.04	3.84	3.87	4.01
08/01/13	08/31/13	Aug 2013	46.46	31.76	45.45	30.30	42.00	29.97	47.90	35.02	53.56	35.79	3.90	4.05	3.75	3.77	3.85	3.82	3.81	3.48	4.06	3.86	3.90	4.05
09/01/13	09/30/13	Sep 2013	43.81	31.76	42.30	30.00	40.04	29.70	45.11	33.66	49.92	34.75	3.90	4.05	3.76	3.77	3.86	3.82	3.80	3.52	4.07	3.86	3.90	4.04
10/01/13	10/31/13	Oct 2013	37.95	34.32	38.63	29.00	35.72	30.94	45.05	32.78	46.92	33.01	3.94	4.09	3.79	3.81	3.89	3.86	3.83	3.54	4.10	3.90	3.94	4.07
11/01/13	11/30/13	Nov 2013	41.66	35.04	37.88	28.42	40.04	33.66	45.05	33.81	45.08	33.71	4.04	4.19	3.91	3.97	4.04	4.00	4.49	3.69	4.26	4.06	4.09	4.78
12/01/13	12/31/13	Dec 2013	44.14	37.90	36.00	29.58	42.39	37.40	46.41	36.92	46.00	37.53	4.24	4.39	4.10	4.19	4.24	4.20	4.67	3.88	4.49	4.28	4.32	4.97
01/01/14	01/31/14	Jan 2014	44.46	36.75	39.78	30.68	42.67	34.84	48.30	37.96	49.14	37.08	4.34	4.49	4.21	4.29	4.34	4.30	4.74	3.95	4.59	4.38	4.42	5.05
02/01/14	02/28/14	Feb 2014	43.61	35.00	39.02	29.80	40.65	33.84	46.92	36.87	48.20	36.00	4.33	4.47	4.19	4.26	4.32	4.29	4.74	3.94	4.57	4.36	4.40	5.04
03/01/14	03/31/14	Mar 2014	40.19	33.25	35.96	28.03	37.43	31.83	42.78	34.68	44.42	34.92	4.25	4.39	4.11	4.18	4.24	4.21	4.67	3.88	4.48	4.28	4.31	4.97
04/01/14	04/30/14	Apr 2014	38.97	25.00	37.05	29.10	34.22	20.89	41.28	32.75	44.38	34.20	4.07	4.23	3.94	3.94	4.04	4.01	4.01	3.73	4.24	4.04	4.07	4.25
05/01/14	05/31/14	May 2014	33.96	17.00	38.22	23.69	28.13	12.96	42.57	27.44	45.29	27.90	4.08	4.24	3.95	3.95	4.05	4.02	3.97	3.71	4.25	4.04	4.08	4.22
06/01/14	06/30/14	Jun 2014	34.32	18.00	41.73	24.46	24.65	11.90	45.15	28.32	47.58	27.90	4.11	4.27	3.97	3.98	4.08	4.04	3.98	3.71	4.28	4.07	4.14	4.23
07/01/14	07/31/14	Jul 2014	48.26	26.27	52.21	30.55	40.27	23.87	53.00	35.89	58.40	35.89	4.14	4.30	4.00	4.01	4.11	4.07	4.05	3.73	4.31	4.10	4.17	4.30
08/01/14	08/31/14	Aug 2014	51.74	36.58	51.22	33.80	47.35	31.00	54.59	38.85	58.97	38.11	4.16	4.32	4.02	4.03	4.13	4.09	4.09	3.75	4.33	4.12	4.19	4.34
09/01/14	09/30/14	Sep 2014	49.25	36.91	44.33	33.15	47.35	38.13	51.41	36.26	54.39	37.00	4.16	4.32	4.02	4.03	4.13	4.10	4.10	3.77	4.33	4.12	4.19	4.35
10/01/14	10/31/14	Oct 2014	42.78	37.20	40.69	31.50	39.79	34.78	47.77	35.63	46.08	35.63	4.20	4.36	4.06	4.07	4.17	4.13	4.11	3.80	4.37	4.16	4.23	4.36
11/01/14	11/30/14	Nov 2014	45.54	37.98	39.90	30.87	43.68	36.63	47.77	36.75	48.50	36.38	4.28	4.44	4.15	4.21	4.26	4.22	4.75	3.92	4.51	4.31	4.37	5.06
12/01/14	12/31/14	Dec 2014	49.68	41.08	37.92	32.13	46.28	39.59	49.22	40.13	50.93	40.50	4.47	4.63	4.34	4.42	4.45	4.41	4.93	4.08	4.73	4.52	4.59	5.25
01/01/15	01/31/15	Jan 2015	46.71	38.65	41.53	31.68	44.17	36.09	50.05	39.71	50.64	38.83	4.58	4.74	4.43	4.52	4.57	4.53	5.01	4.17	4.84	4.62	4.69	5.34
02/01/15	02/28/15	Feb 2015	45.86	36.90	40.77	30.80	42.15	35.09	48.67	38.62	49.70	37.75	4.55	4.71	4.40	4.49	4.54	4.50	4.96	4.14	4.80	4.59	4.66	5.29
03/01/15	03/31/15	Mar 2015	42.44	35.15	37.71	29.03	38.93	33.08	44.53	36.43	45.92	36.67	4.46	4.62	4.31	4.39	4.45	4.42	4.90	4.07	4.70	4.49	4.56	5.22
04/01/15	04/30/15	Apr 2015	41.22	26.90	38.30	29.60	35.47	22.89	42.53	33.25	45.63	34.70	4.24	4.40	4.09	4.11	4.21	4.17	4.17	3.88	4.41	4.20	4.27	4.43
05/01/15	05/31/15	May 2015	36.21	18.90	39.47	24.19	29.38	14.96	43.82	27.94	46.54	28.40	4.25	4.41	4.11	4.12	4.22	4.19	4.18	3.87	4.43	4.22	4.28	4.44
06/01/15	06/30/15	Jun 2015	36.57	19.90	42.98	24.96	25.90	13.90	46.40	28.82	48.83	28.40	4.27	4.44	4.13	4.14	4.24	4.21	4.17	3.87	4.45	4.24	4.31	4.43
07/01/15	07/31/15	Jul 2015	50.51	28.17	54.21	32.30	42.27	25.62	55.00	37.89	60.40	37.64	4.31	4.47	4.17	4.18	4.28	4.25	4.19	3.89	4.49	4.28	4.35	4.45
08/01/15	08/31/15	Aug 2015	53.99	38.48	53.22	35.55	49.35	32.75	56.59	40.85	60.97	39.86	4.33	4.49	4.19	4.20	4.30	4.26	4.21	3.91	4.51	4.30	4.36	4.47
09/01/15	09/30/15	Sep 2015	51.50	38.81	46.33	34.90	49.35	39.88	53.41	38.26	56.39	38.75	4.33	4.50	4.19	4.20	4.30	4.27	4.23	3.93	4.51	4.30	4.37	4.49
10/01/15	10/31/15	Oct 2015	45.03	39.10	43.19	33.50	42.04	36.78	50.02	38.13	48.33	37.38	4.37	4.53	4.23	4.24	4.34	4.30	4.27	3.96	4.55	4.34	4.41	4.54
11/01/15	11/30/15	Nov 2015	47.79	39.88	42.40	32.87	45.93	38.63	50.02	39.25	50.75	38.13	4.46	4.60	4.31	4.37	4.44	4.40	4.91	4.08	4.68	4.47	4.54	5.23
12/01/15	12/31/15	Dec 2015	51.93	42.98	40.42	34.13	48.53	41.59	51.47	42.63	53.18	42.25	4.65	4.79	4.50	4.58	4.63	4.59	5.04	4.25	4.89	4.68	4.75	5.37

0912 Official Forward Price Curve:
Blend of...
0912E Midas forecast completed 9/19/2012
9/28/2012 forward market curve

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
9/28/2012		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		D:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
10/01/12	10/31/12	Oct 2012	31.80	27.58	32.65	22.11	28.00	24.84	37.06	25.83	43.13	26.71	3.02	3.09	2.76	2.70	2.88	2.80	2.88	2.58	3.32	3.13	3.16	3.17
11/01/12	11/30/12	Nov 2012	34.75	28.50	30.50	23.00	32.25	27.50	35.25	26.75	37.75	26.75	3.32	3.47	3.21	3.29	3.40	3.37	3.70	3.06	3.56	3.38	3.41	3.95
12/01/12	12/31/12	Dec 2012	37.25	31.50	32.50	25.25	36.00	31.00	37.25	28.50	38.00	28.50	3.62	3.79	3.51	3.58	3.67	3.64	4.21	3.32	3.87	3.68	3.71	4.48
01/01/13	01/31/13	Jan 2013	37.44	31.03	33.08	25.49	35.25	29.70	39.91	32.24	43.52	32.64	3.77	3.91	3.65	3.70	3.79	3.76	4.10	3.38	3.99	3.80	3.83	4.38
02/01/13	02/28/13	Feb 2013	36.72	29.87	32.75	24.50	33.58	28.33	39.53	31.00	42.67	32.00	3.78	3.92	3.66	3.71	3.80	3.77	4.12	3.39	4.00	3.81	3.85	4.39
03/01/13	03/31/13	Mar 2013	33.84	26.10	32.42	24.26	30.92	24.48	36.81	29.76	40.56	31.36	3.75	3.89	3.63	3.69	3.77	3.74	4.09	3.37	3.98	3.78	3.82	4.36
04/01/13	04/30/13	Apr 2013	33.05	19.95	32.90	22.55	28.62	18.04	36.10	26.25	41.33	27.25	3.73	3.85	3.58	3.55	3.65	3.62	3.59	3.31	3.84	3.64	3.67	3.81
05/01/13	05/31/13	May 2013	28.67	12.97	35.00	22.55	24.74	9.35	37.24	26.25	41.75	27.25	3.76	3.87	3.61	3.58	3.68	3.64	3.52	3.33	3.86	3.66	3.70	3.74
06/01/13	06/30/13	Jun 2013	26.03	9.83	37.10	24.65	19.40	5.61	40.66	26.25	42.17	27.25	3.79	3.91	3.64	3.61	3.71	3.68	3.55	3.34	3.90	3.70	3.73	3.78
07/01/13	07/31/13	Jul 2013	41.76	27.23	46.99	28.71	35.04	22.14	46.25	32.50	53.28	33.22	3.83	3.94	3.68	3.65	3.75	3.72	3.69	3.37	3.94	3.74	3.77	3.91
08/01/13	08/31/13	Aug 2013	45.68	31.76	45.20	29.29	41.20	29.70	47.64	34.51	54.33	35.28	3.85	3.96	3.70	3.67	3.77	3.73	3.72	3.38	3.96	3.76	3.79	3.95
09/01/13	09/30/13	Sep 2013	43.07	31.76	42.07	29.00	39.27	29.16	44.86	32.83	50.64	34.25	3.85	3.96	3.70	3.67	3.77	3.73	3.70	3.42	3.96	3.76	3.79	3.93
10/01/13	10/31/13	Oct 2013	37.26	33.36	38.63	28.25	35.04	29.37	44.43	32.30	46.67	32.78	3.88	4.00	3.73	3.70	3.80	3.77	3.73	3.44	3.99	3.79	3.83	3.96
11/01/13	11/30/13	Nov 2013	40.91	34.06	37.88	27.69	39.27	32.67	44.43	33.32	44.84	33.47	3.98	4.07	3.82	3.85	3.94	3.91	4.38	3.59	4.14	3.94	3.97	4.66
12/01/13	12/31/13	Dec 2013	43.34	36.84	36.00	28.82	41.58	36.96	45.77	36.38	45.75	37.26	4.17	4.26	4.02	4.08	4.13	4.10	4.55	3.78	4.38	4.17	4.21	4.85
01/01/14	01/31/14	Jan 2014	43.16	36.49	39.26	30.68	41.34	34.58	46.73	37.70	48.10	37.08	4.27	4.36	4.11	4.17	4.23	4.19	4.63	3.83	4.47	4.26	4.30	4.93
02/01/14	02/28/14	Feb 2014	42.33	34.75	38.51	29.80	39.39	33.58	45.39	36.61	47.18	36.00	4.25	4.34	4.10	4.14	4.21	4.18	4.62	3.83	4.45	4.24	4.28	4.92
03/01/14	03/31/14	Mar 2014	39.01	33.01	35.49	28.03	36.27	31.59	41.39	34.44	43.48	34.92	4.18	4.28	4.03	4.07	4.15	4.11	4.57	3.78	4.37	4.16	4.20	4.86
04/01/14	04/30/14	Apr 2014	39.24	26.56	36.81	29.10	34.52	22.61	40.80	33.30	43.65	34.20	4.05	4.18	3.89	3.87	3.99	3.95	3.93	3.68	4.17	3.96	4.00	4.17
05/01/14	05/31/14	May 2014	34.20	18.06	37.98	23.69	28.37	14.03	42.08	27.90	44.55	27.90	4.06	4.19	3.90	3.88	4.00	3.97	3.87	3.66	4.18	3.98	4.01	4.11
06/01/14	06/30/14	Jun 2014	34.56	19.13	41.46	24.46	24.86	12.87	44.63	28.80	46.80	27.90	4.08	4.22	3.92	3.91	4.02	3.99	3.86	3.66	4.20	4.00	4.06	4.10
07/01/14	07/31/14	Jul 2014	46.56	26.27	52.47	30.55	38.68	23.87	52.25	35.89	57.89	35.89	4.12	4.25	3.95	3.94	4.06	4.02	3.95	3.68	4.24	4.03	4.10	4.20
08/01/14	08/31/14	Aug 2014	49.92	36.58	51.48	33.80	45.48	31.00	53.82	38.85	58.45	38.11	4.14	4.27	3.97	3.96	4.07	4.04	4.02	3.70	4.26	4.05	4.12	4.27
09/01/14	09/30/14	Sep 2014	47.52	36.91	44.55	33.15	45.48	38.13	50.68	36.26	53.91	37.00	4.14	4.27	3.97	3.96	4.08	4.04	4.03	3.72	4.26	4.05	4.12	4.28
10/01/14	10/31/14	Oct 2014	41.62	36.48	41.97	32.50	38.64	34.08	47.77	36.58	46.31	35.39	4.18	4.31	4.01	4.00	4.11	4.08	4.01	3.75	4.30	4.09	4.16	4.26
11/01/14	11/30/14	Nov 2014	44.30	37.24	41.16	31.85	42.42	35.89	47.77	37.73	48.75	36.13	4.26	4.37	4.11	4.13	4.20	4.17	4.49	3.87	4.43	4.22	4.29	4.79
12/01/14	12/31/14	Dec 2014	48.33	40.28	39.12	33.15	44.94	38.79	49.22	41.20	51.19	40.23	4.44	4.55	4.29	4.34	4.38	4.35	4.66	4.02	4.65	4.44	4.51	4.97
01/01/15	01/31/15	Jan 2015	45.41	38.39	41.26	32.68	43.84	36.58	48.73	39.95	50.10	38.83	4.54	4.65	4.36	4.44	4.50	4.46	4.75	4.10	4.75	4.54	4.60	5.07
02/01/15	02/28/15	Feb 2015	44.58	36.65	40.51	31.80	41.89	35.58	47.39	38.86	49.18	37.75	4.50	4.61	4.33	4.40	4.47	4.43	4.71	4.08	4.71	4.50	4.57	5.02
03/01/15	03/31/15	Mar 2015	41.26	34.91	37.49	30.03	38.77	33.59	43.39	36.69	45.48	36.67	4.42	4.53	4.25	4.31	4.38	4.35	4.64	4.02	4.62	4.41	4.48	4.95
04/01/15	04/30/15	Apr 2015	41.49	28.46	38.31	29.85	36.02	24.11	42.30	33.80	44.90	35.20	4.21	4.36	4.03	4.04	4.15	4.11	4.10	3.85	4.34	4.13	4.20	4.35
05/01/15	05/31/15	May 2015	36.45	19.96	39.48	24.44	29.87	15.53	43.58	28.40	45.80	28.90	4.23	4.37	4.04	4.06	4.16	4.13	4.04	3.83	4.36	4.15	4.21	4.28
06/01/15	06/30/15	Jun 2015	36.81	21.03	42.96	25.21	26.36	14.37	46.13	29.30	48.05	28.90	4.25	4.39	4.06	4.08	4.19	4.15	4.03	3.83	4.38	4.17	4.24	4.28
07/01/15	07/31/15	Jul 2015	48.81	28.17	54.72	32.80	41.68	26.12	54.00	37.89	59.89	37.64	4.29	4.43	4.10	4.11	4.22	4.19	4.12	3.85	4.42	4.21	4.28	4.38
08/01/15	08/31/15	Aug 2015	52.17	38.48	53.73	36.05	48.48	33.25	55.57	40.85	60.45	39.86	4.31	4.45	4.12	4.13	4.24	4.21	4.19	3.87	4.44	4.23	4.29	4.45
09/01/15	09/30/15	Sep 2015	49.77	38.81	46.80	35.40	48.48	40.38	52.43	38.26	55.91	38.75	4.31	4.45	4.12	4.14	4.25	4.21	4.20	3.89	4.44	4.23	4.30	4.46
10/01/15	10/31/15	Oct 2015	43.87	38.38	44.47	35.00	41.89	36.58	49.77	39.08	48.56	37.14	4.34	4.49	4.16	4.17	4.28	4.25	4.18	3.92	4.48	4.27	4.33	4.44
11/01/15	11/30/15	Nov 2015	46.55	39.14	43.66	34.35	45.67	38.39	49.77	40.23	51.00	37.88	4.43	4.56	4.26	4.27	4.37	4.34	4.66	4.04	4.58	4.37	4.43	4.97
12/01/15	12/31/15	Dec 2015	50.58	42.18	41.62	35.65	48.19	41.29	51.22	43.70	53.44	41.98	4.61	4.74	4.44	4.49	4.56	4.52	4.84	4.20	4.80	4.59	4.66	5.16
01/01/16	01/31/16	Jan 2016	47.66	40.14	43.26	34.33	46.09	38.33	50.48	41.60	51.85	40.48	4.71	4.84	4.54	4.60	4.68	4.64	4.93	4.28	4.92	4.71	4.78	5.26
02/01/16	02/29/16	Feb 2016	46.83	38.40	42.51	33.45	44.14	37.33	49.14	40.51	50.93	39.40	4.68	4.81	4.51	4.57	4.65	4.61	4.89	4.26	4.89	4.67	4.74	5.21
03/01/16	03/31/16	Mar 2016	43.51	36.66	39.49	31.68	41.02	35.34	45.14	38.34	47.23	38.32	4.60	4.73	4.43	4.48	4.56	4.53	4.82	4.20	4.79	4.58	4.65	5.14
04/01/16	04/30/16	Apr 2016	43.74	30.21	40.31	31.50	38.27	25.86	44.05	35.45	46.65	36.85	4.39	4.54	4.20	4.21	4.32	4.29	4.27	4.02	4.51	4.30	4.37	4.53
05/01/16	05/31/16	May 2016	38.70	21.71	41.48	26.09	32.12	17.28	45.33	30.05	47.55	30.55	4.40	4.56	4.22	4.22	4.34	4.30	4.21	4.01	4.53	4.32	4.38	4.47
06/01/16	06/30/16	Jun 2016	39.06	22.78	44.96	26.86	28.61	16.12	47.88	30.95	49.80	30.55	4.42	4.58	4.24	4.24	4.36	4.32	4.20	4.00	4.55	4.34	4.41	4.46
07/01/16	07/31/16	Jul 2016	51.06	29.92	56.72	34.45	43.93	27.87	55.75	39.54	61.64	39.29	4.46	4.62	4.28	4.28	4.40	4.36	4.30	4.03	4.59	4.38	4.44	4.56
08/01/16	08/31/16	Aug 2016	54.42	40.23	55.73	37.70	50.73	35.00	57.32	42.50	62.20	41.51	4.48	4.64	4.30	4.30	4.42	4.38	4.37	4.04	4.61	4.40	4.46	4.63
09/01/16	09/30/16	Sep 2016	52.02	40.56	48.80	37.05	50.73	42.13	54.18	39.91	57.66	40.40	4.48	4.64	4.30	4.30	4.42	4.38	4.38	4.06	4.61	4.40	4.47	4.65
10/01/16	10/31/16	Oct 2016	46.12	40.13	46.47	36.65	44.14	38.33	51.52	40.73	50.31	38.79	4.52	4.68	4.33	4.34	4.46	4.42	4.36	4.10	4.65	4.44	4.50	4.62
11/01/16	11/30/16	Nov 2016	48.80	40.89	45.66	36.00	47.92	40.14	51.52	41.88	52.75	39.53	4.61	4.75	4.44	4.44	4.55	4.51	4.84	4.22	4.75	4.54	4.61	5.16
12/01/16	12/31/16	Dec 2016	52.83	43.93	43.62	37.30	50.44	43.04	52.97	45.35	55.19	43.63	4.80	4.94	4.63	4.66	4.74	4.70	5.02	4.38	4.98	4.76	4.83	5.35
01/01/17	01/31/17	Jan 2017	49.66	41.89	45.26	36.23	48.09	40.08	52.48	43.50	53.85	42.38	4.89	5.03	4.72	4.78	4.86	4.82	5.11	4.46	5.11	4.89	4.96	5.45
02/01/17	02/28/17	Feb 2017	48.83	40.15	44.51	35.35	46.14	39.08	51.14	42.41	52.93	41.30	4.86	5.00	4.69	4.75	4.83	4.79	5.07	4.44	5.07	4.86	4.93	5.41
03/01/17	03/31/17	Mar 2017	45.51	38.41	41.49	33.58	43.02	37.09	47.14	40.24	49.23	40.22	4.78	4.92	4.61	4.66	4.75	4.71	5.00	4.38	4.98	4.77	4.84	5.33
04/01/17	04/30/17	Apr 2017	45.74	31.96	42.31	33.40	40.27	27.61	46.05	37.35	48.65	38.75	4.57	4.74	4.39	4.39	4.51	4.47	4.46	4.21	4.70	4.49	4.56	4.73
05/01/17	05/31/17	May 2017	40.70	23.46	43.48	27.99	34.12	19.03	47.33	31.95	49.55	32.45	4.59	4.76	4.40	4.41	4.53	4.49	4.40	4.19	4.72	4.51	4.58	4.67
06/01/17	06/30/17	Jun 2017	41.06	24.53	46.96	28.76	30.61	17.87	49.88	32.85	51.80	32.45	4.61	4.78	4.43	4.43	4.55	4.51	4.39	4.19	4.74	4.53	4.60	4.66
07/01/17	07/31/17	Jul 2017	53.06	31.67	58.72	36.35	45.93	29.62	57.75	41.44	63.64	41.19	4.65	4.82	4.47	4.47	4.59	4.55	4.49	4.22	4.78	4.57	4.64	4.76
08/01/17	08/31/17	Aug 2017	56.42	41.98	57.73	39.60	52.73	36.75	59.32	44.40	64.20	43.41	4.67	4.84	4.49	4.49	4.61	4.57	4.56	4.23	4.80	4.59	4.66	4.84
09/01/17	09/30/17	Sep 2017	54.02	42.31	50.80	38.95	52.73	43.88	56.18	41.81	59.66	42.30	4.68	4.85	4.49	4.49	4.61	4.57	4.57	4.26	4.81	4.59	4.66	4.85
10/01/17	10/31/17	Oct 2017	48.12	41.88	48.47	38.55	46.14	40.08	53.52	42.63	52.31	40.69	4.71	4.88	4.53	4.53	4.65	4.61	4.55	4.29	4.84	4.63	4.70	4.83
11/01/17	11/30/17	Nov 2017	50.80	42.64	47.66	37.90	49.92	41.89	53.52	43.78	54.75	41.43	4.81	4.96	4.64	4.64	4.76	4.72	5.05	4.42	4.96	4.75	4.82	5.38
12/01/17	12/31/17	Dec 2017	54.83	45.68	45.62	39.20	52.44	44.79	54.97	47.25	57.19	45.53	5.01	5.16	4.84	4.87	4.95	4.91	5.24	4.59	5.20	4.98	5.05	5.58

01/01/18	01/31/18	Jan 2018	51.91	43.64	47.51	38.13	50.34	41.83	54.73	45.40	56.10	44.28	5.11	5.26	4.93	4.99	5.07	5.03	5.32	4.68	5.32	5.10	5.17	5.67
02/01/18	02/28/18	Feb 2018	51.08	41.90	46.76	37.25	48.39	40.83	53.39	44.31	55.18	43.20	5.08	5.23	4.90	4.96	5.04	5.00	5.28	4.65	5.28	5.06	5.14	5.63
03/01/18	03/31/18	Mar 2018	47.76	40.16	43.74	35.48	45.27	38.84	49.39	42.14	51.48	42.12	5.00	5.15	4.82	4.87	4.96	4.92	5.22	4.59	5.19	4.97	5.05	5.56
04/01/18	04/30/18	Apr 2018	47.99	33.71	44.56	35.30	42.52	29.36	48.30	39.25	50.90	40.65	4.79	4.97	4.61	4.60	4.73	4.69	4.68	4.43	4.92	4.70	4.77	4.96
05/01/18	05/31/18	May 2018	42.95	25.21	45.73	29.89	36.37	20.78	49.58	33.85	51.80	34.35	4.81	4.99	4.63	4.62	4.75	4.71	4.62	4.42	4.94	4.72	4.79	4.90
06/01/18	06/30/18	Jun 2018	43.31	26.28	49.21	30.66	32.86	19.62	52.13	34.75	54.05	34.35	4.84	5.02	4.66	4.65	4.78	4.74	4.62	4.42	4.97	4.75	4.82	4.90
07/01/18	07/31/18	Jul 2018	55.31	33.42	60.97	38.25	48.18	31.37	60.00	43.34	65.89	43.09	4.89	5.07	4.70	4.70	4.82	4.78	4.73	4.46	5.01	4.80	4.87	5.01
08/01/18	08/31/18	Aug 2018	58.67	43.73	59.98	41.50	54.98	38.50	61.57	46.30	66.45	45.31	4.91	5.09	4.72	4.72	4.85	4.81	4.80	4.47	5.04	4.82	4.89	5.09
09/01/18	09/30/18	Sep 2018	56.27	44.06	53.05	40.85	54.98	45.63	58.43	43.71	61.91	44.20	4.92	5.10	4.73	4.72	4.85	4.81	4.81	4.50	5.04	4.83	4.90	5.10
10/01/18	10/31/18	Oct 2018	50.37	43.63	50.72	40.45	48.39	41.83	55.77	44.53	54.56	42.59	4.96	5.14	4.77	4.76	4.89	4.85	4.79	4.54	5.08	4.87	4.94	5.08
11/01/18	11/30/18	Nov 2018	53.84	45.49	50.77	41.45	54.45	44.04	59.57	51.77	60.57	51.17	5.48	5.59	5.34	5.18	5.32	5.27	5.25	4.88	5.51	5.29	5.36	5.60
12/01/18	12/31/18	Dec 2018	56.46	47.48	51.13	42.78	55.44	45.97	60.26	54.04	61.07	53.80	5.62	5.75	5.50	5.33	5.47	5.35	5.38	4.99	5.66	5.44	5.52	5.73
01/01/19	01/31/19	Jan 2019	51.37	45.78	50.18	42.68	50.14	44.28	57.01	50.85	58.19	50.86	5.74	5.80	5.55	5.43	5.55	5.52	5.75	5.11	5.77	5.54	5.62	6.12
02/01/19	02/28/19	Feb 2019	50.44	44.76	48.77	42.00	48.75	43.53	55.73	50.31	57.01	50.16	5.75	5.80	5.54	5.43	5.55	5.52	5.75	5.12	5.76	5.54	5.62	6.11
03/01/19	03/31/19	Mar 2019	47.84	43.48	46.33	40.90	45.72	41.63	53.00	48.92	54.92	49.23	5.64	5.69	5.44	5.32	5.44	5.35	5.50	5.05	5.65	5.43	5.51	5.86
04/01/19	04/30/19	Apr 2019	49.02	39.85	49.69	40.68	47.47	36.56	53.35	47.18	55.24	48.58	5.54	5.59	5.32	5.12	5.25	5.15	5.09	4.89	5.44	5.22	5.30	5.39
05/01/19	05/31/19	May 2019	44.35	32.27	50.11	38.42	38.77	29.25	53.24	44.21	56.64	45.75	5.58	5.63	5.34	5.12	5.28	5.18	5.05	4.90	5.44	5.23	5.30	5.35
06/01/19	06/30/19	Jun 2019	45.44	35.65	54.41	39.13	39.22	30.52	54.35	45.34	57.31	45.76	5.65	5.66	5.37	5.15	5.31	5.21	5.06	4.93	5.47	5.25	5.33	5.36
07/01/19	07/31/19	Jul 2019	58.56	40.94	67.29	44.66	55.96	39.02	64.89	50.47	69.08	51.55	5.74	5.78	5.47	5.20	5.39	5.27	5.15	4.97	5.53	5.31	5.38	5.46
08/01/19	08/31/19	Aug 2019	62.17	46.42	67.87	46.43	60.93	43.49	67.62	52.14	71.36	52.83	5.77	5.81	5.50	5.22	5.42	5.29	5.20	4.98	5.55	5.33	5.40	5.50
09/01/19	09/30/19	Sep 2019	59.54	45.95	58.96	44.61	59.57	46.26	63.81	50.26	66.95	51.36	5.67	5.74	5.44	5.21	5.40	5.28	5.17	4.95	5.54	5.32	5.39	5.47
10/01/19	10/31/19	Oct 2019	54.05	45.90	53.75	43.88	52.54	44.17	60.06	50.69	59.86	50.15	5.67	5.77	5.47	5.26	5.44	5.31	5.17	4.98	5.59	5.37	5.44	5.48
11/01/19	11/30/19	Nov 2019	56.87	48.33	53.88	45.00	58.98	46.20	65.63	59.75	66.38	60.90	6.15	6.22	6.04	5.72	5.88	5.83	5.45	5.33	6.04	5.83	5.90	5.80
12/01/19	12/31/19	Dec 2019	58.08	49.28	56.64	46.36	58.43	47.16	65.55	60.83	64.96	62.07	6.24	6.35	6.16	5.79	5.98	5.79	5.52	5.39	6.13	5.90	5.98	5.87
01/01/20	01/31/20	Jan 2020	50.83	47.93	52.85	47.22	49.93	46.73	59.30	56.29	60.27	57.44	6.38	6.34	6.16	5.87	6.02	6.01	6.18	5.55	6.21	5.99	6.06	6.55
02/01/20	02/29/20	Feb 2020	49.79	47.61	50.78	46.75	49.11	46.23	58.07	56.31	58.85	57.12	6.42	6.38	6.18	5.90	6.06	6.05	6.22	5.58	6.24	6.02	6.09	6.58
03/01/20	03/31/20	Mar 2020	47.91	46.79	48.93	46.33	46.16	44.42	56.62	55.70	58.37	56.33	6.27	6.22	6.06	5.77	5.92	5.78	5.78	5.52	6.11	5.88	5.96	6.13
04/01/20	04/30/20	Apr 2020	50.04	45.99	54.81	46.07	52.43	43.77	58.40	55.10	59.58	56.51	6.29	6.21	6.04	5.63	5.76	5.61	5.51	5.35	5.96	5.74	5.81	5.81
05/01/20	05/31/20	May 2020	45.75	39.32	54.49	46.94	41.17	37.72	56.90	54.57	61.47	57.14	6.34	6.26	6.05	5.62	5.81	5.64	5.49	5.38	5.94	5.72	5.80	5.79
06/01/20	06/30/20	Jun 2020	47.56	45.02	59.61	47.60	45.58	41.42	56.57	55.92	60.57	57.17	6.45	6.30	6.08	5.64	5.85	5.69	5.50	5.43	5.97	5.75	5.82	5.80
07/01/20	07/31/20	Jul 2020	61.80	48.46	73.60	51.07	63.74	46.66	69.78	57.59	72.27	60.01	6.59	6.50	6.25	5.70	5.95	5.76	5.58	5.48	6.03	5.81	5.88	5.89
08/01/20	08/31/20	Aug 2020	65.67	49.11	75.76	51.36	66.89	48.47	73.67	57.98	76.27	60.34	6.63	6.53	6.28	5.73	5.99	5.78	5.60	5.48	6.05	5.83	5.91	5.90
09/01/20	09/30/20	Sep 2020	62.80	47.84	64.86	48.36	64.17	46.89	69.19	56.81	71.99	58.51	6.42	6.37	6.15	5.70	5.95	5.74	5.52	5.41	6.03	5.81	5.88	5.83
10/01/20	10/31/20	Oct 2020	57.73	48.16	56.77	47.31	56.68	46.51	64.36	56.85	65.15	57.72	6.38	6.40	6.17	5.75	5.98	5.77	5.55	5.42	6.08	5.86	5.93	5.86
11/01/20	11/30/20	Nov 2020	56.50	49.36	56.40	48.07	57.75	46.14	64.46	58.21	64.71	58.52	6.45	6.47	6.28	5.89	6.09	5.92	5.96	5.55	6.22	6.00	6.07	6.31
12/01/20	12/31/20	Dec 2020	57.70	50.01	56.53	48.96	60.16	47.78	63.37	58.82	62.83	59.12	6.52	6.58	6.38	5.99	6.17	6.14	6.20	5.63	6.32	6.10	6.18	6.56
01/01/21	01/31/21	Jan 2021	53.93	50.64	55.83	49.75	53.18	49.19	62.66	59.49	63.41	60.18	6.69	6.63	6.44	6.09	6.30	6.30	6.36	5.77	6.43	6.21	6.28	6.72
02/01/21	02/28/21	Feb 2021	52.86	50.78	55.09	49.03	51.61	48.96	61.22	58.97	61.68	59.63	6.73	6.67	6.46	6.12	6.34	6.34	6.39	5.81	6.46	6.24	6.31	6.76
03/01/21	03/31/21	Mar 2021	51.77	49.77	53.07	48.64	49.14	46.50	60.36	58.50	61.99	59.11	6.58	6.52	6.35	6.02	6.18	6.05	6.23	5.78	6.36	6.14	6.21	6.58
04/01/21	04/30/21	Apr 2021	54.00	48.33	58.41	48.18	55.79	46.98	61.92	57.21	63.45	58.84	6.58	6.46	6.29	5.86	6.00	5.86	5.74	5.60	6.18	5.97	6.04	6.04
05/01/21	05/31/21	May 2021	51.22	47.17	57.12	48.89	49.52	44.03	59.67	58.58	64.59	59.59	6.64	6.51	6.30	5.85	6.05	5.89	5.65	5.64	6.17	5.95	6.03	5.95
06/01/21	06/30/21	Jun 2021	52.19	50.33	63.09	49.68	52.05	45.77	59.99	58.07	63.32	59.44	6.77	6.58	6.35	5.88	6.09	5.93	5.68	5.69	6.20	5.99	6.06	5.98
07/01/21	07/31/21	Jul 2021	65.27	50.94	77.07	53.93	67.58	49.66	73.64	60.38	76.03	62.98	6.91	6.80	6.50	5.96	6.19	6.01	5.83	5.74	6.29	6.07	6.14	6.14
08/01/21	08/31/21	Aug 2021	69.72	52.26	80.48	53.53	69.80	53.13	78.19	61.02	80.70	62.89	6.95	6.83	6.54	5.97	6.22	6.03	5.80	5.75	6.30	6.08	6.16	6.10
09/01/21	09/30/21	Sep 2021	64.54	49.94	65.67	49.41	66.37	51.05	71.96	58.49	73.31	59.97	6.57	6.52	6.30	5.80	6.13	5.91	5.55	5.53	6.13	5.91	5.98	5.86
10/01/21	10/31/21	Oct 2021	60.48	48.98	60.15	48.58	62.08	48.38	67.70	57.97	69.40	59.33	6.53	6.55	6.32	5.84	6.16	5.94	5.69	5.54	6.17	5.95	6.02	6.00
11/01/21	11/30/21	Nov 2021	59.73	50.97	59.44	49.21	60.59	50.17	67.31	59.86	67.12	60.27	6.61	6.64	6.42	5.99	6.26	6.23	6.29	5.68	6.31	6.09	6.17	6.64
12/01/21	12/31/21	Dec 2021	60.92	52.34	58.38	50.41	63.98	51.24	65.31	60.82	64.84	61.15	6.68	6.79	6.54	6.06	6.34	6.32	6.38	5.72	6.39	6.17	6.25	6.73
01/01/22	01/31/22	Jan 2022	58.98	56.03	63.78	58.24	59.34	54.10	63.49	60.54	64.09	60.69	6.85	6.76	6.55	6.16	6.42	6.42	6.54	5.87	6.50	6.27	6.35	6.90
02/01/22	02/28/22	Feb 2022	58.32	55.92	61.73	57.67	58.07	52.31	62.92	60.66	63.69	60.56	6.89	6.80	6.58	6.19	6.46	6.46	6.57	5.90	6.52	6.30	6.38	6.94
03/01/22	03/31/22	Mar 2022	55.84	53.98	59.68	55.99	54.38	52.12	60.63	58.97	61.71	58.90	6.63	6.50	6.31	5.92	6.14	6.00	6.18	5.71	6.26	6.03	6.11	6.54
04/01/22	04/30/22	Apr 2022	58.18	53.44	65.27	56.21	57.27	50.05	62.56	58.81	63.71	58.88	6.66	6.50	6.31	5.77	6.03	5.86	5.72	5.56	6.09	5.87	5.95	6.02
05/01/22	05/31/22	May 2022	54.91	51.62	63.69	56.15	54.24	49.11	60.06	58.45	62.95	58.88	6.71	6.55	6.35	5.78	6.08	5.89	5.64	5.61	6.11	5.89	5.96	5.94
06/01/22	06/30/22	Jun 2022	56.73	53.81	68.06	57.28	55.17	51.78	60.40	57.98	63.99	58.97	6.79	6.64	6.41	5.82	6.12	5.93	5.64	5.66	6.14	5.92	6.00	5.94
07/01/22	07/31/22	Jul 2022	69.39	55.55	81.02	60.68	69.38	53.58	74.45	61.32	76.54	62.83	6.94	6.80	6.54	5.88	6.17	5.98	5.77	5.69	6.20	5.98	6.06	6.08
08/01/22	08/31/22	Aug 2022	73.43	56.07	84.78	60.09	72.27	53.56	78.92	61.87	81.09	62.83	6.98	6.84	6.57	5.91	6.22	6.02	5.77	5.72	6.24	6.02	6.09	6.08
09/01/22	09/30/22	Sep 2022	69.82	55.59	72.70	58.26	68.69	53.16	74.65	60.98	75.86	61.46	6.75	6.69	6.43	5.86	6.23	6.00	5.68	5.66	6.19	5.97	6.04	5.99
10/01/22	10/31/22	Oct 2022	65.79	55.15	67.57	57.31	64.91	51.93	69.86	60.40	70.85	60.38	6.73	6.72	6.48	5.89	6.26	6.03	5.84	5.65	6.22	6.00	6.07	6.15
11/01/22	11/30/22	Nov 2022	64.12	56.04	65.66	57.67	65.17	57.26	68.62	61.09	68.74	60.67	6.80	6.77	6.56	6.07	6.40	6.38	6.44	5.83	6.40	6.18	6.25	6.79
12/01/22	12/31/22	Dec 2022	67.59	57.00	63.67	58.63	70.63	58.26	66.81	61.90	66.49	61.56	6.98	6.94	6.73	6.16	6.46	6.43	6.49	5.86	6.50	6.27	6.35	6.85
01/01/23	01/31/23	Jan 2023	61.17	57.66	66.21	60.17	60.73	55.40	65.62	62.89	66.33	62.53	7.16	7.05	6.83	6.28	6.60	6.59	6.65	6.01	6.61	6.39	6.46	7.01
02/01/23	02/28/23	Feb 2023	60.40	57.73	63.56	59.31	59.07	55.27	64.85	62.35	65.52	62.06	7.20	7.09	6.84	6.31	6.64	6.63	6.69	6.04	6.65	6.42	6.50	7.05
03/01/23	03/31/23	Mar 2023	58.49	56.74	62.18	58.63	57.17	54.56	63.42	61.93	64.33	61.66	7.07	6.90	6.69	6.19	6.46	6.32	6.50	6.03	6.53	6.30	6.38	6.86
04/01/23	04/30/23	Apr 2023	61.60	56.66	68.33	59.43	60.32	52.95	65.43	61.90	66.71	62.16	7.07	6.88	6.67	6.00	6.38	6.19	6.04	5.88	6.32	6.11	6.18	6.34
05/01/23	05/31/23	May 2023	59.13	56.04	67.23	59.04	58.66	53.10	64.07	61.53	66.28	61.84	7.13	6.95	6.71	6.03	6.40	6.22	5.98	5.94	6.36	6.14	6.21	6.28
06/01/23	06/30/23	Jun 2023	59.74	57.23	71.98	60.66	58.97	53.99	63.84	61.34	67.34	62.21	7.28	7.07	6.82	6.05	6.45	6.26	5.99	6.00	6.38	6.16	6.23	6.29
07/01/23	07/31/23	Jul 2023	73.40	58.61	85.50	64.21	73.39	57.55	78.63	64.45	80.94	66.36	7.40	7.23	6.96	6.12	6.52	6.30	6.12	6.04	6.44	6.22	6.30	6.43
08/01/23	08/31/23	Aug 2023	77.61	59.33	89.10	63.53	76.50	56.58	83.20	65.27	85.14	66.23	7.45	7.26	6.98	6.15	6.55	6.34	6.09	6.07	6.48	6.26	6.33	6.39
09/01/23	09/30/23	Sep 2023	71.83	57.68	75.49	60.84	70.47	54.90	76.33	63.22	78.74	63.73	7.09	7.00	6.74	6.02	6.46	6.23	5.87	5.87	6.35	6.13	6.20	6.18
10/01/23	10/31/23	Oct 2023	67.24	57.34	69.15	59.58	66.70	53.85	71.36	62.89	72.34	62.90	7.08	7.03	6.77	6.05	6.49	6.26	5.99	5.86	6.38	6.16	6.23	6.30
11/01/23	11/30/23	Nov 2023	66.33	58.42	67.87	60.10	67.29	59.30	71.02	63.74	71.09	63.19	7.16	7.08	6.84	6.19	6.68	6.62	6.68	6.01	6.51	6.30	6.37	7.03
12/01/23	12/31/23	Dec 2023	69.91	59.09	66.38	60.82	72.41	60.16	69.76	64.35	69.50	63.78	7.25	7.22	6.98	6.28	6.73	6.66	6.72	6.04	6.61	6.39	6.46	7.08
01/01/24	01/31/24	Jan 2024	62.69	59.49	67.72	61.92	62.18	57.67	67.57	64.34	68.25	64.20	7.43	7.25	7.02	6.34	6.81	6.80	6.89	6.18	6.67	6.45	6.53	7.26

02/01/24	02/29/24	Feb 2024	62.51	59.38	65.33	61.12	61.36	58.15	66.70	63.83	67.49	63.89	7.48	7.28	7.03	6.37	6.85	6.84	6.90	6.22	6.71	6.48	6.56	7.27
03/01/24	03/31/24	Mar 2024	59.15	57.17	62.61	59.04	57.27	54.90	64.85	62.24	65.45	62.10	7.06	6.89	6.66	6.02	6.46	6.29	6.48	5.96	6.35	6.13	6.20	6.84
04/01/24	04/30/24	Apr 2024	61.56	57.87	68.85	59.73	60.69	53.75	66.03	62.10	67.11	62.54	7.04	6.88	6.66	5.92	6.38	6.17	6.00	5.82	6.25	6.03	6.10	6.30
05/01/24	05/31/24	May 2024	58.27	55.69	67.43	59.30	57.20	52.17	63.35	61.63	66.93	62.32	7.10	6.93	6.68	5.87	6.32	6.13	5.88	5.84	6.20	5.98	6.05	6.18
06/01/24	06/30/24	Jun 2024	59.15	56.87	71.10	60.67	58.16	53.84	63.65	61.95	67.20	62.57	7.22	7.02	6.76	5.90	6.40	6.21	5.92	5.93	6.22	6.00	6.08	6.22
07/01/24	07/31/24	Jul 2024	73.74	58.64	85.79	63.96	73.62	57.34	78.71	64.66	80.93	66.39	7.38	7.21	6.93	6.01	6.50	6.28	6.06	5.96	6.33	6.11	6.19	6.36
08/01/24	08/31/24	Aug 2024	77.43	59.70	88.48	63.99	76.32	57.50	83.00	65.26	84.96	66.31	7.43	7.26	6.98	6.04	6.54	6.32	6.03	6.00	6.37	6.15	6.22	6.33
09/01/24	09/30/24	Sep 2024	73.16	59.05	76.36	61.74	71.87	55.75	77.62	64.62	79.44	64.82	7.28	7.16	6.88	6.00	6.48	6.26	5.93	5.94	6.33	6.11	6.18	6.24
10/01/24	10/31/24	Oct 2024	68.13	58.51	69.75	60.74	67.63	54.96	72.04	63.92	72.98	63.79	7.23	7.19	6.89	6.07	6.56	6.32	6.10	5.94	6.40	6.18	6.26	6.41
11/01/24	11/30/24	Nov 2024	67.28	59.35	68.67	60.82	68.44	60.36	71.85	64.70	71.76	64.09	7.29	7.21	6.96	6.19	6.76	6.70	6.76	6.08	6.51	6.29	6.37	7.10
12/01/24	12/31/24	Dec 2024	70.15	60.48	67.44	62.00	73.51	61.05	70.90	65.53	70.61	64.88	7.45	7.35	7.13	6.32	6.83	6.77	6.83	6.11	6.65	6.43	6.50	7.19
01/01/25	01/31/25	Jan 2025	64.64	60.97	68.48	62.93	63.34	57.70	69.19	66.22	69.80	65.79	7.64	7.44	7.20	6.44	6.93	6.91	7.00	6.27	6.78	6.55	6.63	7.37
02/01/25	02/28/25	Feb 2025	62.96	61.18	66.13	62.63	62.08	58.01	68.01	65.95	68.71	65.55	7.68	7.47	7.21	6.47	6.97	6.95	7.04	6.30	6.81	6.59	6.66	7.41
03/01/25	03/31/25	Mar 2025	61.47	59.65	65.05	61.10	59.51	57.08	66.48	64.84	67.01	64.45	7.40	7.18	6.94	6.23	6.75	6.58	6.77	6.21	6.56	6.34	6.42	7.13
04/01/25	04/30/25	Apr 2025	63.58	59.27	71.12	61.69	63.07	55.63	68.50	64.45	69.47	64.21	7.40	7.17	6.94	5.99	6.63	6.42	6.24	6.05	6.32	6.10	6.17	6.54
05/01/25	05/31/25	May 2025	61.13	58.59	69.35	61.44	59.64	55.55	66.08	63.45	68.96	63.92	7.46	7.22	6.99	5.91	6.55	6.36	6.11	6.06	6.24	6.02	6.09	6.41
06/01/25	06/30/25	Jun 2025	61.91	59.14	74.03	62.75	61.32	55.62	66.43	64.58	69.96	65.03	7.56	7.33	7.06	5.94	6.62	6.42	6.12	6.13	6.27	6.05	6.12	6.42
07/01/25	07/31/25	Jul 2025	76.20	61.09	88.09	66.26	76.12	59.53	81.42	66.94	83.56	68.22	7.75	7.54	7.26	6.07	6.74	6.52	6.36	6.21	6.40	6.18	6.25	6.66
08/01/25	08/31/25	Aug 2025	80.11	62.22	91.30	66.60	78.83	59.30	85.80	67.81	87.79	68.54	7.80	7.58	7.30	6.10	6.77	6.55	6.28	6.23	6.43	6.21	6.28	6.59
09/01/25	09/30/25	Sep 2025	75.37	61.11	78.60	63.70	74.15	57.71	79.62	66.57	81.60	66.76	7.59	7.42	7.15	6.10	6.71	6.47	6.13	6.11	6.43	6.21	6.28	6.44
10/01/25	10/31/25	Oct 2025	69.29	60.50	71.33	62.55	68.86	57.09	73.46	65.73	74.45	65.56	7.51	7.42	7.12	6.18	6.76	6.52	6.30	6.11	6.51	6.29	6.36	6.61
11/01/25	11/30/25	Nov 2025	69.46	61.74	70.89	63.13	70.51	62.73	74.13	67.12	73.93	66.48	7.57	7.45	7.05	6.60	7.03	6.97	7.04	6.34	6.92	6.70	6.78	7.38
12/01/25	12/31/25	Dec 2025	73.77	62.69	69.23	63.83	76.25	63.13	72.93	67.89	72.50	67.09	7.71	7.61	7.21	6.72	7.10	7.04	7.11	6.38	7.06	6.83	6.91	7.47
01/01/26	01/31/26	Jan 2026	66.66	63.34	70.51	65.08	66.14	60.45	71.49	68.30	72.06	67.89	7.90	7.65	7.34	6.87	7.20	7.19	7.28	6.54	7.21	6.99	7.06	7.65
02/01/26	02/28/26	Feb 2026	65.35	63.63	68.78	64.76	64.48	59.93	70.41	68.35	71.08	67.84	7.95	7.70	7.38	6.91	7.25	7.23	7.33	6.57	7.25	7.03	7.10	7.69
03/01/26	03/31/26	Mar 2026	63.14	61.17	67.13	62.49	61.61	59.37	67.80	65.97	68.47	65.46	7.57	7.30	6.98	6.58	6.90	6.89	6.95	6.37	6.91	6.69	6.76	7.31
04/01/26	04/30/26	Apr 2026	65.17	60.56	72.27	62.65	63.72	57.03	69.83	65.71	70.62	65.32	7.56	7.28	6.93	6.44	6.78	6.58	6.39	6.19	6.77	6.55	6.62	6.69
05/01/26	05/31/26	May 2026	62.10	58.94	70.74	62.77	60.57	55.55	67.65	64.75	70.03	65.50	7.61	7.34	6.97	6.45	6.79	6.57	6.29	6.23	6.78	6.56	6.63	6.59
06/01/26	06/30/26	Jun 2026	62.83	60.77	75.14	63.79	61.96	58.16	67.62	64.59	70.68	65.32	7.77	7.38	7.01	6.49	6.85	6.64	6.16	6.31	6.82	6.60	6.67	6.45
07/01/26	07/31/26	Jul 2026	77.84	62.66	89.85	67.04	77.85	60.27	83.11	68.46	84.89	69.12	7.92	7.50	7.12	6.59	6.91	6.68	6.52	6.35	6.92	6.70	6.77	6.83
08/01/26	08/31/26	Aug 2026	81.37	63.65	92.19	67.11	80.61	60.38	86.74	69.16	88.29	69.31	7.97	7.53	7.16	6.62	6.95	6.72	6.44	6.38	6.95	6.73	6.81	6.75
09/01/26	09/30/26	Sep 2026	77.09	62.69	80.27	65.19	75.74	59.37	81.42	68.09	83.31	68.08	7.74	7.55	7.13	6.60	6.98	6.73	6.37	6.33	6.93	6.71	6.78	6.68
10/01/26	10/31/26	Oct 2026	71.82	62.36	73.69	64.22	71.19	59.01	76.07	67.41	77.12	66.93	7.69	7.58	7.11	6.63	7.01	6.76	6.54	6.33	6.96	6.74	6.81	6.85
11/01/26	11/30/26	Nov 2026	70.91	63.35	72.50	64.76	72.99	64.60	75.56	68.32	75.62	67.50	7.74	7.69	7.22	6.77	7.20	7.15	7.22	6.49	7.10	6.88	6.95	7.56
12/01/26	12/31/26	Dec 2026	75.50	64.59	70.68	65.23	78.08	65.08	74.36	69.38	74.06	68.49	7.88	7.78	7.34	6.87	7.26	7.22	7.32	6.53	7.21	6.99	7.06	7.68
01/01/27	01/31/27	Jan 2027	67.89	65.06	72.08	66.81	67.23	62.24	72.65	69.51	73.26	68.88	8.08	7.79	7.46	6.99	7.38	7.37	7.50	6.69	7.32	7.10	7.18	7.87
02/01/27	02/28/27	Feb 2027	67.53	64.91	70.23	66.08	66.39	62.34	72.02	69.34	72.62	68.80	8.11	7.83	7.49	7.02	7.42	7.42	7.55	6.73	7.35	7.13	7.21	7.91
03/01/27	03/31/27	Mar 2027	64.10	62.13	68.54	63.31	62.96	60.51	68.83	66.83	69.47	66.23	7.62	7.36	7.03	6.59	6.97	6.96	7.02	6.42	6.93	6.70	6.78	7.38
04/01/27	04/30/27	Apr 2027	66.93	61.36	73.82	64.03	64.63	58.17	71.52	66.65	72.30	66.41	7.60	7.32	6.97	6.44	6.84	6.64	6.44	6.24	6.77	6.55	6.62	6.74
05/01/27	05/31/27	May 2027	63.81	60.03	71.73	63.57	62.57	58.23	68.64	65.77	70.90	65.95	7.66	7.38	7.01	6.48	6.86	6.63	6.35	6.28	6.81	6.59	6.66	6.65
06/01/27	06/30/27	Jun 2027	64.36	61.61	76.09	64.44	63.81	58.35	69.32	66.35	71.69	66.51	7.82	7.42	7.05	6.52	6.92	6.69	6.18	6.34	6.84	6.63	6.70	6.48
07/01/27	07/31/27	Jul 2027	78.60	63.71	90.23	67.91	78.45	61.42	83.98	69.45	85.67	69.98	7.99	7.57	7.14	6.60	6.97	6.73	6.56	6.38	6.93	6.71	6.78	6.87
08/01/27	08/31/27	Aug 2027	82.96	64.26	93.63	67.63	82.13	61.30	88.17	69.76	89.66	69.90	8.03	7.58	7.18	6.64	7.01	6.77	6.50	6.41	6.96	6.74	6.82	6.81
09/01/27	09/30/27	Sep 2027	77.09	63.45	80.12	65.80	75.85	60.40	81.63	68.75	82.89	68.68	7.77	7.61	7.15	6.62	7.04	6.79	6.43	6.38	6.94	6.72	6.80	6.74
10/01/27	10/31/27	Oct 2027	73.20	63.26	75.23	64.97	72.31	59.59	77.23	68.52	78.51	68.04	7.74	7.64	7.15	6.65	7.08	6.83	6.60	6.38	6.98	6.76	6.83	6.91
11/01/27	11/30/27	Nov 2027	71.84	64.28	73.38	65.51	73.20	65.42	76.70	69.04	76.74	68.36	7.82	7.75	7.27	6.80	7.26	7.23	7.29	6.58	7.12	6.90	6.98	7.64
12/01/27	12/31/27	Dec 2027	75.97	65.92	71.52	66.27	78.48	66.38	75.05	70.17	74.82	69.34	7.97	7.86	7.41	6.92	7.35	7.32	7.40	6.62	7.25	7.03	7.10	7.76
01/01/28	01/31/28	Jan 2028	68.92	66.13	73.96	67.57	69.13	64.06	73.59	70.41	74.17	69.97	8.17	7.86	7.52	7.04	7.46	7.45	7.58	6.78	7.38	7.15	7.23	7.95
02/01/28	02/29/28	Feb 2028	67.57	66.36	71.28	67.01	67.47	63.65	72.79	70.29	73.34	69.53	8.20	7.89	7.54	7.06	7.50	7.49	7.63	6.82	7.39	7.17	7.24	7.99
03/01/28	03/31/28	Mar 2028	65.85	63.91	68.88	64.74	64.80	62.18	70.55	68.68	71.14	68.04	7.82	7.52	7.16	6.69	7.15	7.14	7.21	6.60	7.02	6.80	6.87	7.57
04/01/28	04/30/28	Apr 2028	67.80	63.13	73.96	65.30	65.89	59.98	72.70	68.18	73.24	67.70	7.83	7.50	7.13	6.58	7.01	6.81	6.61	6.41	6.91	6.69	6.76	6.91
05/01/28	05/31/28	May 2028	64.64	60.24	72.23	65.11	63.32	58.95	70.14	67.17	71.98	67.33	7.90	7.56	7.15	6.61	7.05	6.82	6.55	6.47	6.94	6.72	6.79	6.85
06/01/28	06/30/28	Jun 2028	65.93	63.57	77.90	66.12	65.17	60.99	70.41	66.61	73.87	67.49	8.03	7.60	7.19	6.65	7.11	6.88	6.36	6.52	6.97	6.75	6.83	6.66
07/01/28	07/31/28	Jul 2028	80.72	65.49	92.68	69.86	80.60	63.09	85.95	71.17	87.98	71.79	8.25	7.75	7.29	6.75	7.16	6.93	6.76	6.57	7.07	6.85	6.93	7.06
08/01/28	08/31/28	Aug 2028	85.51	66.42	96.38	69.35	84.47	63.00	90.83	71.73	92.43	71.74	8.30	7.79	7.33	6.78	7.20	6.96	6.70	6.60	7.11	6.89	6.96	7.01
09/01/28	09/30/28	Sep 2028	79.64	65.54	82.29	67.88	78.21	62.23	83.86	70.64	85.27	70.68	7.91	7.82	7.28	6.72	7.24	6.98	6.59	6.55	7.05	6.83	6.91	6.90
10/01/28	10/31/28	Oct 2028	75.16	65.18	77.75	66.87	74.11	61.91	78.99	70.26	80.98	69.64	7.94	7.85	7.32	6.76	7.28	7.02	6.79	6.56	7.09	6.87	6.94	7.09
11/01/28	11/30/28	Nov 2028	73.83	66.40	75.48	67.32	74.97	67.32	78.63	71.01	78.55	70.09	8.02	7.92	7.42	6.93	7.48	7.45	7.51	6.78	7.25	7.03	7.11	7.86
12/01/28	12/31/28	Dec 2028	79.08	68.05	72.86	67.99	81.31	69.16	76.70	71.83	76.28	70.90	8.18	8.04	7.61	7.05	7.55	7.53	7.78	6.82	7.38	7.16	7.24	8.13
01/01/29	01/31/29	Jan 2029	70.28	68.29	74.99	69.72	70.04	65.94	75.69	72.54	76.33	71.72	8.39	8.12	7.74	7.18	7.69	7.68	7.97	6.99	7.52	7.29	7.37	8.33
02/01/29	02/28/29	Feb 2029	69.81	68.35	73.23	69.03	69.22	65.25	75.00	72.54	75.55	71.65	8.43	8.16	7.78	7.21	7.73	7.73	8.02	7.03	7.55	7.33	7.40	8.38
03/01/29	03/31/29	Mar 2029	67.81	66.17	70.85	66.82	66.57	64.31	72.52	70.33	72.97	69.43	8.00	7.75	7.33	6.84	7.39	7.39	7.45	6.82	7.17	6.95	7.02	7.81
04/01/29	04/30/29	Apr 2029	70.03	64.96	75.98	67.23	68.61	61.35	74.09	69.89	74.96	69.52	8.00	7.70	7.29	6.73	7.21	7.00	6.79	6.58	7.05	6.83	6.91	7.09
05/01/29	05/31/29	May 2029	66.51	63.99	74.48	66.90	65.69	62.05	72.23	68.86	73.98	69.06	8.07	7.77	7.27	6.72	7.24	7.01	6.72	6.63	7.05	6.83	6.90	7.02
06/01/29	06/30/29	Jun 2029	67.80	65.21	79.34	68.05	67.05	61.84	72.98	69.71	75.27	69.83	8.22	7.81	7.32	6.76	7.29	7.05	6.51	6.67	7.09	6.87	6.94	6.81
07/01/29	07/31/29	Jul 2029	83.41	67.49	95.88	71.73	83.20	65.13	88.67	73.06	90.71	73.80	8.42	7.98	7.45	6.89	7.35	7.11	6.93	6.74	7.22	7.00	7.07	7.24
08/01/29	08/31/29	Aug 2029	88.06	68.40	98.56	71.51	87.14	64.95	93.24	73.79	94.63	73.77	8.47	8.02	7.49	6.92	7.40	7.15	6.95	6.77	7.25	7.03	7.11	7.26
09/01/29	09/30/29	Sep 2029	81.82	67.81	85.19	70.11	80.01	64.62	86.29	73.05	88.12	73.01	8.29	8.05	7.46	6.90	7.44	7.17	6.84	6.75	7.23	7.01	7.08	7.15
10/01/29	10/31/29	Oct 2029	76.40	67.16	78.06	68.64	75.69	63.42	80.29	71.89	81.26	71.31	8.19	8.09	7.50	6.93	7.48	7.21	6.98	6.75	7.26	7.04	7.12	7.29
11/01/29	11/30/29	Nov 2029	75.92	68.20	76.95	68.94	77.71	69.21	80.05	72.59	80.13	71.64	8.24	8.13	7.60	7.05	7.65	7.63	7.70	6.95	7.37	7.15	7.23	8.04
12/01/29	12/31/29	Dec 2029	83.63	70.07	75.44	69.93	84.94	71.32	79.35	73.60	78.94	72.72	8.41	8.27	7.77	7.18	7.76	7.73	7.98	7.01	7.51	7.29	7.37	8.34
01/01/30	01/31/30	Jan 2030	72.79	70.26	77.69	71.66	72.77	68.12	77.69	73.49	78.33	73.31	8.62	8.32	7.90	7.30	7.88	7.87	8.18	7.18	7.64	7.41	7.49	8.54
02/01/30	02/28/30	Feb 2030	71.66	70.33	75.04	70.72	71.01	67.11	76.85	74.06	77.44	73.13	8.65	8.36	7.94	7.34	7.93	7.92	8.23	7.22	7.67	7.45	7.53	8.59

03/01/30	03/31/30	Mar 2030	69.05	67.21	72.10	68.21	68.24	65.67	73.90	71.53	74.37	70.63	8.08	7.87	7.40	6.84	7.47	7.46	7.53	6.88	7.18	6.95	7.03	7.89
04/01/30	04/30/30	Apr 2030	71.41	66.55	76.81	68.39	70.58	62.71	75.80	71.39	76.63	70.73	8.10	7.84	7.33	6.76	7.34	7.12	6.89	6.67	7.09	6.87	6.94	7.20
05/01/30	05/31/30	May 2030	67.82	64.52	75.97	68.37	66.18	61.74	73.62	70.66	75.53	70.61	8.16	7.91	7.36	6.79	7.36	7.13	6.81	6.71	7.12	6.90	6.97	7.10
06/01/30	06/30/30	Jun 2030	68.59	66.52	79.73	69.42	67.83	63.38	73.65	71.03	76.29	71.08	8.33	7.95	7.41	6.83	7.42	7.18	6.61	6.78	7.16	6.94	7.01	6.91
07/01/30	07/31/30	Jul 2030	84.61	68.91	96.35	72.83	84.26	66.33	89.76	74.67	91.40	74.99	8.56	8.13	7.59	6.93	7.50	7.25	7.06	6.86	7.26	7.04	7.11	7.36
08/01/30	08/31/30	Aug 2030	88.73	69.80	98.96	72.90	87.86	66.62	93.98	75.26	95.27	75.14	8.61	8.17	7.63	6.97	7.54	7.28	7.07	6.88	7.29	7.07	7.15	7.38
09/01/30	09/30/30	Sep 2030	82.25	69.05	85.81	70.95	80.39	66.12	87.07	74.12	88.69	73.90	8.40	8.19	7.57	6.99	7.57	7.31	7.04	6.88	7.31	7.09	7.17	7.35
10/01/30	10/31/30	Oct 2030	77.67	68.76	79.37	69.85	77.02	65.42	81.70	73.19	82.78	72.57	8.34	8.22	7.61	7.03	7.66	7.39	7.14	6.89	7.36	7.14	7.21	7.44
11/01/30	11/30/30	Nov 2030	77.18	70.18	78.48	70.36	79.10	71.07	81.40	74.00	81.42	73.04	8.40	8.37	7.74	7.14	7.84	7.82	7.88	7.09	7.46	7.24	7.32	8.23
12/01/30	12/31/30	Dec 2030	84.43	72.36	76.23	71.25	86.66	73.22	80.59	74.96	79.93	74.08	8.57	8.42	7.90	7.30	7.93	7.92	8.37	7.19	7.63	7.41	7.48	8.73
01/01/31	01/31/31	Jan 2031	74.66	72.50	79.64	73.55	74.31	70.64	80.10	76.62	80.60	75.70	8.79	8.64	8.07	7.45	8.12	8.10	8.59	7.37	7.79	7.56	7.64	8.95
02/01/31	02/28/31	Feb 2031	73.76	72.71	77.16	72.68	72.17	69.39	79.15	76.25	79.69	75.22	8.84	8.63	8.11	7.49	8.17	8.15	8.64	7.42	7.83	7.61	7.68	9.00
03/01/31	03/31/31	Mar 2031	71.19	69.82	74.80	70.30	70.00	68.11	76.14	73.85	76.68	72.91	8.37	8.14	7.67	7.06	7.75	7.75	7.82	7.16	7.39	7.17	7.25	8.18
04/01/31	04/30/31	Apr 2031	73.09	69.05	79.49	70.66	72.96	65.38	77.94	73.69	78.70	73.00	8.40	8.13	7.59	7.00	7.61	7.39	7.17	6.94	7.32	7.10	7.18	7.47
05/01/31	05/31/31	May 2031	71.54	68.48	78.56	70.88	70.81	66.52	76.92	72.00	77.94	72.46	8.46	8.20	7.62	7.04	7.66	7.59	7.08	6.99	7.36	7.14	7.22	7.38
06/01/31	06/30/31	Jun 2031	71.82	68.82	83.32	71.97	71.24	65.77	76.82	73.17	79.15	73.48	8.62	8.25	7.67	7.08	7.72	7.49	6.91	7.08	7.41	7.19	7.26	7.21
07/01/31	07/31/31	Jul 2031	87.71	71.74	99.68	75.63	87.33	68.78	92.80	77.63	94.49	77.78	8.86	8.45	7.89	7.18	7.81	7.55	7.35	7.14	7.51	7.29	7.37	7.66
08/01/31	08/31/31	Aug 2031	91.98	72.63	102.18	75.82	91.16	69.78	97.26	77.99	98.52	77.89	8.91	8.48	7.92	7.21	7.85	7.58	7.37	7.17	7.54	7.32	7.40	7.68
09/01/31	09/30/31	Sep 2031	85.19	71.53	88.88	73.52	83.23	68.52	90.09	76.86	91.60	76.63	8.67	8.48	7.88	7.22	7.89	7.62	7.33	7.16	7.55	7.33	7.40	7.64
10/01/31	10/31/31	Oct 2031	79.70	71.48	81.92	72.27	79.05	67.97	83.71	75.70	84.89	75.01	8.59	8.52	7.86	7.26	7.95	7.68	7.42	7.17	7.58	7.36	7.44	7.73
11/01/31	11/30/31	Nov 2031	79.76	72.84	80.94	72.79	81.08	73.67	84.21	76.31	84.08	75.36	8.65	8.57	7.98	7.40	8.12	8.10	8.17	7.36	7.72	7.51	7.58	8.52
12/01/31	12/31/31	Dec 2031	87.28	74.76	78.94	73.74	89.16	75.80	83.05	77.47	82.58	76.68	8.86	8.72	8.18	7.56	8.24	8.23	8.75	7.49	7.89	7.67	7.75	9.11
01/01/32	01/31/32	Jan 2032	76.42	74.27	81.07	75.41	76.02	72.55	81.88	78.29	82.29	77.41	8.97	8.81	8.23	7.60	8.28	8.27	8.76	7.52	7.94	7.71	7.79	9.12
02/01/32	02/29/32	Feb 2032	75.52	74.37	78.63	74.22	72.86	71.05	80.81	77.56	81.22	76.53	9.02	8.80	8.27	7.64	8.33	8.31	8.81	7.57	7.98	7.76	7.83	9.17
03/01/32	03/31/32	Mar 2032	72.96	71.57	76.27	71.70	71.31	69.57	78.35	75.26	78.67	74.28	8.54	8.30	7.82	7.20	7.90	7.90	7.97	7.30	7.53	7.31	7.39	8.33
04/01/32	04/30/32	Apr 2032	74.34	70.62	80.68	72.31	74.17	66.72	79.38	75.40	80.09	74.64	8.56	8.30	7.75	7.14	7.77	7.54	7.31	7.08	7.46	7.24	7.32	7.61
05/01/32	05/31/32	May 2032	71.23	66.92	79.20	72.69	70.44	65.77	77.67	74.35	79.14	74.17	8.63	8.36	7.77	7.18	7.81	7.74	7.22	7.13	7.50	7.28	7.36	7.52
06/01/32	06/30/32	Jun 2032	72.59	69.87	84.55	73.46	71.56	67.71	77.48	73.73	80.73	74.30	8.79	8.41	7.82	7.22	7.88	7.64	7.05	7.22	7.55	7.33	7.40	7.35
07/01/32	07/31/32	Jul 2032	88.48	73.60	100.41	77.47	88.12	70.49	93.89	79.51	95.60	79.46	9.04	8.62	8.05	7.33	7.96	7.70	7.50	7.29	7.66	7.44	7.51	7.81
08/01/32	08/31/32	Aug 2032	94.32	74.13	104.38	77.27	93.42	71.29	99.20	79.42	100.43	79.26	9.09	8.65	8.08	7.36	8.01	7.73	7.52	7.31	7.69	7.47	7.54	7.82
09/01/32	09/30/32	Sep 2032	86.06	73.09	89.21	75.01	83.76	70.19	90.60	78.11	92.00	77.81	8.84	8.65	8.03	7.36	8.05	7.77	7.48	7.30	7.69	7.47	7.55	7.79
10/01/32	10/31/32	Oct 2032	81.46	73.15	84.15	73.86	80.29	69.52	85.34	77.35	87.37	76.53	8.76	8.69	8.01	7.40	8.11	7.83	7.57	7.32	7.73	7.51	7.58	7.88
11/01/32	11/30/32	Nov 2032	81.11	74.54	81.69	73.69	82.46	75.25	84.70	77.10	84.65	76.20	8.82	8.74	8.14	7.55	8.29	8.26	8.34	7.51	7.87	7.65	7.73	8.68
12/01/32	12/31/32	Dec 2032	88.88	76.98	79.91	75.12	90.22	77.82	84.12	78.69	83.70	77.90	9.04	8.90	8.34	7.71	8.41	8.39	8.93	7.64	8.04	7.82	7.90	9.29
01/01/33	01/31/33	Jan 2033	77.89	76.10	82.80	76.87	78.39	74.64	83.13	79.43	83.74	78.58	9.15	8.99	8.39	7.75	8.45	8.43	8.93	7.67	8.09	7.86	7.94	9.30
02/01/33	02/28/33	Feb 2033	77.37	76.18	80.84	75.98	75.03	73.26	82.70	79.48	83.18	78.47	9.20	8.98	8.44	7.80	8.50	8.48	8.98	7.72	8.13	7.91	7.99	9.35
03/01/33	03/31/33	Mar 2033	74.53	73.27	78.06	73.66	72.92	71.27	79.98	76.71	80.22	75.70	8.71	8.47	7.98	7.34	8.06	8.06	8.13	7.45	7.68	7.46	7.53	8.49
04/01/33	04/30/33	Apr 2033	75.79	72.20	82.08	74.17	74.85	68.32	80.90	76.91	81.69	76.11	8.73	8.46	7.90	7.28	7.92	7.69	7.46	7.22	7.60	7.39	7.46	7.76
05/01/33	05/31/33	May 2033	74.30	71.83	81.62	74.62	73.56	69.83	79.78	75.54	81.44	76.19	8.81	8.53	7.93	7.32	7.97	7.90	7.37	7.27	7.65	7.43	7.50	7.67
06/01/33	06/30/33	Jun 2033	75.17	71.69	86.74	75.40	74.82	69.78	79.74	75.35	82.44	75.88	8.97	8.58	7.98	7.37	8.04	7.79	7.19	7.37	7.69	7.47	7.55	7.49
07/01/33	07/31/33	Jul 2033	90.98	75.28	102.65	79.40	90.60	72.71	96.17	80.99	97.75	80.93	9.22	8.79	8.21	7.47	8.12	7.85	7.65	7.43	7.80	7.58	7.66	7.96
08/01/33	08/31/33	Aug 2033	96.18	75.88	106.24	79.00	95.50	72.62	101.32	81.20	102.37	80.87	9.27	8.82	8.24	7.50	8.17	7.89	7.67	7.46	7.83	7.61	7.69	7.97
09/01/33	09/30/33	Sep 2033	87.36	74.93	90.60	76.66	84.35	71.92	92.17	79.63	93.23	79.09	9.02	8.82	8.19	7.51	8.21	7.92	7.63	7.45	7.84	7.62	7.69	7.94
10/01/33	10/31/33	Oct 2033	83.50	74.97	86.05	75.78	82.21	71.41	87.25	78.78	89.08	77.93	8.93	8.86	8.17	7.55	8.27	7.99	7.72	7.46	7.88	7.66	7.73	8.03
11/01/33	11/30/33	Nov 2033	82.77	76.30	83.57	75.74	85.02	77.12	86.25	79.04	86.29	78.20	9.00	8.92	8.30	7.70	8.45	8.43	8.50	7.66	8.02	7.81	7.88	8.85
12/01/33	12/31/33	Dec 2033	90.50	79.64	81.67	77.15	90.57	80.32	86.16	79.86	85.27	79.48	9.22	9.07	8.51	7.87	8.58	8.56	9.11	7.79	8.20	7.98	8.05	9.46
01/01/34	01/31/34	Jan 2034	79.66	77.86	85.19	79.06	80.34	76.54	84.98	80.90	85.53	80.09	9.33	9.17	8.56	7.91	8.62	8.60	9.11	7.83	8.24	8.02	8.10	9.48
02/01/34	02/28/34	Feb 2034	79.35	77.90	82.60	77.99	76.68	75.29	84.67	81.37	85.00	80.38	9.38	9.16	8.61	7.95	8.66	8.65	9.16	7.87	8.29	8.07	8.14	9.53
03/01/34	03/31/34	Mar 2034	76.31	75.08	79.75	75.77	75.44	73.15	81.78	79.04	81.95	78.04	8.88	8.63	8.14	7.49	8.22	8.22	8.30	7.60	7.82	7.60	7.68	8.66
04/01/34	04/30/34	Apr 2034	78.00	74.05	83.80	76.72	76.09	70.32	83.01	78.81	83.58	78.11	8.91	8.63	8.06	7.42	8.08	7.84	7.61	7.37	7.75	7.53	7.60	7.91
05/01/34	05/31/34	May 2034	75.65	73.02	83.67	76.75	73.93	69.39	81.16	76.85	82.25	76.74	8.98	8.70	8.09	7.47	8.13	8.05	7.51	7.42	7.79	7.57	7.65	7.81
06/01/34	06/30/34	Jun 2034	76.45	72.98	88.51	77.61	75.42	69.60	81.14	77.41	83.57	77.20	9.15	8.75	8.14	7.51	8.20	7.94	7.34	7.52	7.84	7.62	7.69	7.64
07/01/34	07/31/34	Jul 2034	93.04	77.32	104.53	81.28	92.56	74.55	98.18	82.90	99.79	82.75	9.40	8.97	8.38	7.62	8.28	8.01	7.80	7.58	7.95	7.73	7.81	8.11
08/01/34	08/31/34	Aug 2034	98.37	77.62	108.27	80.85	97.68	74.53	103.24	82.99	104.27	82.72	9.46	8.99	8.40	7.65	8.33	8.05	7.82	7.61	7.98	7.76	7.84	8.13
09/01/34	09/30/34	Sep 2034	89.71	76.88	93.48	78.80	87.33	74.04	94.49	81.85	96.08	81.36	9.20	9.00	8.36	7.66	8.37	8.08	7.78	7.60	7.99	7.77	7.84	8.09
10/01/34	10/31/34	Oct 2034	85.08	76.92	87.53	78.00	84.39	73.39	88.89	81.07	90.28	80.24	9.11	9.04	8.34	7.70	8.44	8.15	7.88	7.61	8.03	7.81	7.88	8.18
11/01/34	11/30/34	Nov 2034	84.76	78.33	84.94	77.64	86.99	79.21	88.01	80.81	88.08	80.04	9.18	9.10	8.47	7.85	8.62	8.60	8.67	7.81	8.18	7.96	8.03	9.02
12/01/34	12/31/34	Dec 2034	92.94	81.88	83.73	78.60	92.59	82.00	88.48	81.74	87.56	81.14	9.40	9.26	8.68	8.02	8.75	8.73	9.29	7.94	8.35	8.13	8.21	9.65
01/01/35	01/31/35	Jan 2035	81.74	79.86	87.56	81.21	83.39	78.43	86.95	82.51	87.53	81.66	9.52	9.35	8.73	8.06	8.79	8.77	9.29	7.98	8.40	8.18	8.25	9.66
02/01/35	02/28/35	Feb 2035	81.31	79.88	85.12	80.24	79.25	77.44	86.59	82.79	86.77	82.11	9.57	9.34	8.78	8.11	8.84	8.82	9.35	8.03	8.45	8.22	8.30	9.71
03/01/35	03/31/35	Mar 2035	78.07	77.00	81.88	77.72	77.21	75.02	83.45	80.11	83.58	79.19	9.06	8.81	8.30	7.64	8.39	8.39	8.46	7.75	7.97	7.75	7.83	8.82
04/01/35	04/30/35	Apr 2035	79.12	75.68	86.68	78.21	78.76	71.69	84.19	80.26	84.99	79.52	9.09	8.80	8.22	7.57	8.24	8.00	7.76	7.51	7.90	7.68	7.75	8.06
05/01/35	05/31/35	May 2035	78.30	75.74	86.71	79.09	76.94	72.81	83.65	78.74	84.80	79.43	9.16	8.88	8.25	7.62	8.29	8.21	7.67	7.56	7.94	7.72	7.80	7.96
06/01/35	06/30/35	Jun 2035	78.76	75.68	90.33	79.94	77.89	72.28	83.70	79.69	85.68	79.48	9.33	8.93	8.30	7.66	8.36	8.10	7.48	7.67	7.99	7.77	7.84	7.78
07/01/35	07/31/35	Jul 2035	95.26	79.00	107.12	83.28	95.01	76.36	100.26	84.66	101.80	84.59	9.59	9.15	8.54	7.78	8.45	8.17	7.96	7.73	8.10	7.88	7.96	8.26
08/01/35	08/31/35	Aug 2035	100.31	79.52	110.51	82.81	99.42	76.35	105.12	84.85	106.30	84.61	9.65	9.17	8.57	7.81	8.50	8.21	7.98	7.76	8.14	7.92	7.99	8.28
09/01/35	09/30/35	Sep 2035	91.64	78.91	94.98	80.92	89.93	75.70	96.31	83.86	97.84	83.47	9.38	9.18	8.52	7.81	8.54	8.24	7.94	7.75	8.14	7.92	8.00	8.25
10/01/35	10/31/35	Oct 2035	86.49	78.60	88.55	79.85	85.54	74.84	90.24	82.31	91.52	81.49	9.29	9.22	8.50	7.85	8.61	8.31	8.03	7.76	8.18	7.96	8.04	8.34
11/01/35	11/30/35	Nov 2035	86.06	80.15	86.75	79.92	87.97	81.46	89.44	82.53	89.45	81.59	9.36	9.28	8.64	8.01	8.79	8.77	8.85	7.97	8.33	8.12	8.19	9.19
12/01/35	12/31/35	Dec 2035	94.26	83.79	85.37	80.76	96.55	84.48	89.90	83.64	89.05	83.02	9.59	9.44	8.85	8.18	8.92	8.91	9.47	8.10	8.52	8.29	8.37	9.83
01/01/36	01/31/36	Jan 2036	84.44	81.91	89.74	83.41	83.91	80.26	89.91	86.11	90.37	85.15	9.71	9.54	8.91	8.23	8.96	8.95	9.48	8.14	8.56	8.34	8.41	9.84
02/01/36	02/29/36	Feb 2036	83.74	82.16	87.05	82.49	81.88	79.19	89.27	86.19	89.81	85.18	9.76	9.53	8.96	8.27	9.01	9.00	9.53	8.19	8.61	8.39	8.46	9.90
03/01/36	03/31/36	Mar 2036	80.51	78.88	83.84	79.56	78.63	76.92	85.92	82.99	86.06	82.03	9.24	8.98	8.47	7.79	8.55	8.55	8.63	7.90	8.13	7.91	7.98	8.99

04/01/36	04/30/36	Apr 2036	81.51	77.56	88.55	80.20	81.02	73.78	86.41	82.10	87.33	81.63	9.27	8.98	8.39	7.72	8.41	8.16	7.91	7.66	8.05	7.83	7.90	8.22
05/01/36	05/31/36	May 2036	80.08	76.74	88.31	80.73	78.22	73.21	85.47	81.14	87.90	81.69	9.34	9.05	8.41	7.77	8.45	8.38	7.82	7.72	8.10	7.88	7.95	8.12
06/01/36	06/30/36	Jun 2036	80.79	77.88	93.22	82.04	79.64	74.73	85.62	81.52	88.89	81.86	9.52	9.11	8.46	7.82	8.53	8.26	7.63	7.82	8.14	7.92	8.00	7.93
07/01/36	07/31/36	Jul 2036	97.73	80.83	109.11	85.28	97.34	77.78	102.68	86.90	104.04	86.80	9.78	9.33	8.71	7.93	8.62	8.33	8.12	7.89	8.26	8.04	8.11	8.42
08/01/36	08/31/36	Aug 2036	102.67	81.63	112.38	85.36	101.61	78.57	107.50	87.17	108.62	87.07	9.84	9.36	8.74	7.96	8.67	8.37	8.14	7.92	8.29	8.07	8.15	8.44
09/01/36	09/30/36	Sep 2036	93.46	80.82	96.55	82.72	91.07	77.68	98.42	85.13	99.32	84.74	9.57	9.36	8.70	7.97	8.71	8.41	8.09	7.90	8.30	8.08	8.15	8.40
10/01/36	10/31/36	Oct 2036	87.76	80.60	89.78	81.91	86.66	76.87	91.66	84.39	92.46	83.63	9.48	9.40	8.67	8.01	8.78	8.48	8.19	7.92	8.34	8.12	8.19	8.50
11/01/36	11/30/36	Nov 2036	88.16	82.25	88.98	82.41	89.05	83.48	92.23	85.20	92.05	84.25	9.55	9.46	8.81	8.17	8.97	8.94	9.02	8.13	8.49	8.28	8.35	9.37
12/01/36	12/31/36	Dec 2036	96.76	85.36	87.37	82.96	98.64	86.26	92.19	85.81	91.47	85.21	9.78	9.63	9.03	8.35	9.10	9.08	9.66	8.26	8.68	8.46	8.53	10.02
01/01/37	01/31/37	Jan 2037	86.26	83.91	92.13	85.88	86.52	82.18	91.44	87.26	91.93	86.27	9.90	9.73	9.08	8.39	9.14	9.13	9.67	8.31	8.73	8.50	8.58	10.03
02/01/37	02/28/37	Feb 2037	85.71	84.14	89.14	84.62	83.11	81.18	91.03	87.46	91.33	86.47	9.96	9.72	9.13	8.44	9.20	9.18	9.73	8.35	8.78	8.55	8.63	10.09
03/01/37	03/31/37	Mar 2037	82.78	80.81	86.37	81.57	79.75	77.95	88.18	85.01	88.48	84.12	9.42	9.16	8.64	7.95	8.73	8.73	8.80	8.06	8.28	8.06	8.14	9.16
04/01/37	04/30/37	Apr 2037	83.67	79.10	90.79	82.30	82.90	75.65	88.79	83.34	89.57	83.46	9.45	9.16	8.55	7.88	8.57	8.32	8.07	7.82	8.20	7.99	8.06	8.37
05/01/37	05/31/37	May 2037	81.84	77.30	90.28	83.16	79.72	75.85	87.31	82.15	88.70	82.55	9.53	9.24	8.58	7.93	8.62	8.55	7.97	7.87	8.25	8.03	8.11	8.27
06/01/37	06/30/37	Jun 2037	82.83	78.84	95.44	84.30	82.08	76.81	87.57	82.81	90.30	82.96	9.71	9.29	8.63	7.97	8.70	8.43	7.79	7.98	8.30	8.08	8.15	8.08
07/01/37	07/31/37	Jul 2037	99.48	82.72	111.79	87.57	99.34	79.85	104.36	88.27	106.15	88.43	9.98	9.52	8.89	8.09	8.79	8.50	8.28	8.04	8.42	8.20	8.27	8.59
08/01/37	08/31/37	Aug 2037	104.55	83.47	114.92	87.44	103.82	80.84	109.48	88.67	110.69	88.73	10.03	9.55	8.92	8.12	8.84	8.54	8.30	8.07	8.45	8.23	8.31	8.61
09/01/37	09/30/37	Sep 2037	95.43	82.66	99.33	84.86	94.32	79.31	100.11	87.04	101.60	86.66	9.76	9.55	8.87	8.13	8.89	8.58	8.26	8.06	8.46	8.24	8.31	8.57
10/01/37	10/31/37	Oct 2037	90.83	82.34	92.65	84.20	89.56	78.58	94.19	86.65	95.41	86.00	9.67	9.59	8.85	8.17	8.96	8.65	8.36	8.08	8.50	8.28	8.35	8.67
11/01/37	11/30/37	Nov 2037	90.53	84.25	91.52	84.42	91.23	84.61	94.82	86.86	94.57	85.91	9.74	9.65	8.98	8.33	9.15	9.12	9.20	8.29	8.66	8.44	8.51	9.55
12/01/37	12/31/37	Dec 2037	97.93	87.39	89.51	85.19	100.19	88.04	93.82	88.30	93.07	87.38	9.98	9.82	9.21	8.51	9.28	9.26	9.86	8.43	8.85	8.62	8.70	10.22
01/01/38	01/31/38	Jan 2038	88.78	86.02	94.95	87.94	90.77	84.96	93.50	88.85	94.05	87.85	10.10	9.93	9.27	8.56	9.33	9.31	9.86	8.47	8.89	8.67	8.75	10.23
02/01/38	02/28/38	Feb 2038	87.97	86.34	91.20	86.73	87.08	84.17	93.17	89.56	93.37	88.57	10.16	9.91	9.32	8.61	9.38	9.36	9.92	8.52	8.94	8.72	8.80	10.28
03/01/38	03/31/38	Mar 2038	84.60	82.94	88.74	83.27	82.60	81.38	90.09	85.96	90.46	85.05	9.61	9.35	8.81	8.11	8.90	8.90	8.98	8.22	8.44	8.22	8.29	9.34
04/01/38	04/30/38	Apr 2038	85.65	81.02	92.94	83.75	85.56	77.30	90.70	85.54	91.57	85.05	9.64	9.34	8.72	8.04	8.75	8.49	8.23	7.97	8.36	8.14	8.22	8.54
05/01/38	05/31/38	May 2038	83.10	78.90	92.58	85.19	81.39	75.58	89.44	84.65	91.14	84.83	9.72	9.42	8.75	8.08	8.80	8.72	8.13	8.03	8.41	8.19	8.26	8.43
06/01/38	06/30/38	Jun 2038	85.82	79.83	97.54	86.08	84.96	79.77	90.41	84.42	92.56	84.72	9.90	9.47	8.81	8.13	8.87	8.60	7.94	8.14	8.46	8.24	8.31	8.24
07/01/38	07/31/38	Jul 2038	102.20	85.06	114.04	89.94	102.50	82.72	107.26	90.79	108.69	90.74	10.18	9.71	9.07	8.25	8.97	8.67	8.45	8.21	8.58	8.36	8.43	8.75
08/01/38	08/31/38	Aug 2038	108.97	85.85	118.70	89.63	108.32	83.83	113.41	91.49	114.47	91.14	10.24	9.74	9.09	8.29	9.02	8.71	8.46	8.24	8.61	8.39	8.47	8.77
09/01/38	09/30/38	Sep 2038	99.18	84.94	102.02	86.86	98.44	82.10	103.79	89.48	104.77	89.06	9.96	9.74	9.05	8.29	9.07	8.75	8.42	8.22	8.62	8.40	8.48	8.73
10/01/38	10/31/38	Oct 2038	95.13	84.48	96.76	86.18	93.67	81.46	98.61	88.35	99.54	87.67	9.86	9.78	9.02	8.33	9.14	8.82	8.53	8.24	8.66	8.44	8.52	8.83
11/01/38	11/30/38	Nov 2038	94.19	86.64	93.49	86.53	96.46	87.18	96.15	88.45	96.19	87.66	9.94	9.85	9.16	8.50	9.33	9.31	9.39	8.46	8.82	8.61	8.68	9.73
12/01/38	12/31/38	Dec 2038	102.20	89.53	92.00	87.46	102.10	90.55	96.52	89.63	95.69	89.35	10.18	10.02	9.39	8.68	9.47	9.45	10.05	8.60	9.02	8.79	8.87	10.41
01/01/39	01/31/39	Jan 2039	90.72	88.22	96.99	90.01	91.56	86.99	95.60	90.96	96.13	89.99	10.30	10.12	9.45	8.73	9.51	9.50	10.06	8.64	9.07	8.84	8.92	10.42
02/01/39	02/28/39	Feb 2039	90.18	88.52	93.44	88.80	89.09	86.19	95.42	91.78	95.60	90.78	10.36	10.11	9.50	8.78	9.57	9.55	10.12	8.69	9.12	8.89	8.97	10.48
03/01/39	03/31/39	Mar 2039	86.62	84.98	90.46	84.94	84.34	83.08	91.99	87.43	92.29	86.49	9.80	9.53	8.99	8.27	9.08	9.08	9.16	8.39	8.60	8.38	8.46	9.52
04/01/39	04/30/39	Apr 2039	88.25	83.10	94.02	85.84	87.86	80.11	93.45	87.32	94.26	87.31	9.84	9.53	8.90	8.20	8.92	8.66	8.40	8.13	8.52	8.30	8.38	8.70
05/01/39	05/31/39	May 2039	86.21	81.29	94.66	86.84	84.50	79.07	92.13	86.71	93.75	87.38	9.92	9.61	8.93	8.25	8.97	8.89	8.30	8.19	8.57	8.35	8.43	8.60
06/01/39	06/30/39	Jun 2039	87.89	81.69	99.68	88.24	87.40	81.64	92.46	86.46	94.58	86.59	10.10	9.66	8.98	8.30	9.05	8.77	8.10	8.30	8.62	8.40	8.48	8.40
07/01/39	07/31/39	Jul 2039	104.34	86.84	116.35	92.26	104.20	84.14	109.48	93.07	111.06	93.03	10.38	9.90	9.25	8.42	9.14	8.84	8.62	8.37	8.74	8.53	8.60	8.92
08/01/39	08/31/39	Aug 2039	111.06	87.70	120.94	91.58	110.35	85.33	115.77	93.31	116.88	93.06	10.44	9.93	9.28	8.45	9.20	8.88	8.63	8.40	8.78	8.56	8.63	8.94
09/01/39	09/30/39	Sep 2039	99.84	87.08	103.05	88.94	99.19	84.10	104.53	91.05	105.51	90.57	10.16	9.93	9.23	8.46	9.25	8.92	8.59	8.39	8.79	8.57	8.64	8.90
10/01/39	10/31/39	Oct 2039	95.78	86.88	97.34	88.24	94.51	83.41	99.26	90.41	100.24	89.78	10.06	9.98	9.20	8.50	9.32	9.00	8.70	8.40	8.83	8.61	8.68	9.00
11/01/39	11/30/39	Nov 2039	96.17	88.28	95.54	88.57	97.36	89.27	98.60	90.79	98.49	89.90	10.13	10.04	9.35	8.67	9.52	9.49	9.57	8.63	8.99	8.78	8.85	9.92
12/01/39	12/31/39	Dec 2039	102.50	91.90	93.90	89.67	102.93	92.22	98.29	92.30	97.46	91.69	10.38	10.22	9.58	8.86	9.66	9.64	10.25	8.77	9.19	8.97	9.04	10.61
01/01/40	01/31/40	Jan 2040	92.78	90.44	99.58	92.21	92.18	88.84	98.00	93.09	98.42	92.09	10.51	10.33	9.64	8.90	9.70	9.69	10.26	8.81	9.24	9.02	9.09	10.62
02/01/40	02/29/40	Feb 2040	92.43	90.72	95.81	90.95	90.62	88.08	97.71	93.47	97.90	92.79	10.57	10.31	9.69	8.96	9.76	9.74	10.32	8.86	9.29	9.07	9.14	10.68
03/01/40	03/31/40	Mar 2040	88.90	87.15	92.13	87.28	86.39	85.41	94.26	90.35	94.52	89.45	10.00	9.72	9.17	8.44	9.26	9.26	9.34	8.55	8.77	8.55	8.62	9.70
04/01/40	04/30/40	Apr 2040	89.87	84.59	96.58	87.89	89.99	82.02	95.26	88.60	96.08	88.45	10.03	9.72	9.08	8.36	9.10	8.83	8.57	8.30	8.69	8.47	8.54	8.87
05/01/40	05/31/40	May 2040	86.66	82.21	96.88	88.82	84.45	78.79	93.68	88.63	95.55	88.05	10.11	9.80	9.11	8.41	9.15	9.07	8.46	8.35	8.74	8.52	8.59	8.76
06/01/40	06/30/40	Jun 2040	88.92	82.95	101.06	90.47	88.25	83.64	94.11	88.28	96.11	88.11	10.30	9.86	9.16	8.46	9.23	8.95	8.26	8.46	8.79	8.57	8.64	8.56
07/01/40	07/31/40	Jul 2040	107.73	89.04	119.67	94.66	107.67	86.30	112.40	95.45	114.02	95.27	10.59	10.10	9.43	8.59	9.33	9.02	8.79	8.54	8.91	8.69	8.77	9.09
08/01/40	08/31/40	Aug 2040	113.91	89.91	123.80	94.10	113.18	87.81	118.68	95.55	119.63	95.28	10.65	10.13	9.46	8.62	9.38	9.06	8.81	8.57	8.95	8.73	8.80	9.11
09/01/40	09/30/40	Sep 2040	103.66	89.45	106.54	91.62	102.90	87.20	108.03	93.59	108.97	93.17	10.36	10.13	9.41	8.63	9.43	9.10	8.76	8.56	8.96	8.74	8.81	9.07
10/01/40	10/31/40	Oct 2040	97.96	89.07	99.18	90.25	96.76	85.56	101.46	92.80	102.35	92.08	10.26	10.18	9.39	8.67	9.50	9.18	8.87	8.57	9.00	8.78	8.85	9.18
11/01/40	11/30/40	Nov 2040	99.48	90.75	97.94	90.68	100.53	92.65	101.29	93.13	101.11	92.19	10.34	10.24	9.53	8.84	9.71	9.68	9.77	8.80	9.17	8.95	9.02	10.11
12/01/40	12/31/40	Dec 2040	105.75	94.47	97.00	91.89	105.80	95.17	101.22	94.60	100.45	93.85	10.59	10.42	9.77	9.03	9.85	9.83	10.46	8.95	9.37	9.15	9.22	10.82
01/01/41	01/31/41	Jan 2041	95.41	92.78	102.16	94.45	95.09	91.15	100.45	95.27	100.80	94.29	10.72	10.53	9.83	9.08	9.90	9.88	10.47	8.99	9.42	9.19	9.27	10.83
02/01/41	02/28/41	Feb 2041	94.99	93.07	98.04	92.91	93.20	90.03	99.98	95.47	100.36	94.64	10.78	10.52	9.89	9.14	9.95	9.94	10.53	9.04	9.47	9.25	9.32	10.89
03/01/41	03/31/41	Mar 2041	91.28	89.37	94.16	89.21	88.78	87.57	96.38	91.63	96.57	90.66	10.20	9.92	9.35	8.61	9.44	9.44	9.53	8.72	8.94	8.72	8.79	9.89
04/01/41	04/30/41	Apr 2041	92.25	86.13	98.69	89.78	92.64	83.33	97.24	90.39	98.07	90.11	10.23	9.91	9.26	8.53	9.28	9.01	8.74	8.46	8.85	8.63	8.71	9.04
05/01/41	05/31/41	May 2041	90.65	84.11	99.72	91.12	88.62	82.08	97.08	90.88	98.54	91.23	10.32	10.00	9.29	8.58	9.33	9.25	8.63	8.52	8.90	8.69	8.76	8.93
06/01/41	06/30/41	Jun 2041	91.69	86.05	103.85	92.98	91.26	86.18	96.87	90.91	98.67	90.91	10.51	10.05	9.34	8.63	9.41	9.13	8.43	8.63	8.96	8.74	8.81	8.73
07/01/41	07/31/41	Jul 2041	109.59	90.84	121.49	96.75	109.69	88.01	114.59	97.43	116.21	97.48	10.80	10.30	9.62	8.76	9.51	9.20	8.96	8.71	9.08	8.87	8.94	9.27
08/01/41	08/31/41	Aug 2041	115.71	92.24	125.27	96.32	115.31	90.19	120.33	98.03	121.47	97.73	10.86	10.33	9.65	8.79	9.57	9.24	8.98	8.74	9.12	8.90	8.98	9.29
09/01/41	09/30/41	Sep 2041	106.20	91.59	109.31	93.74	105.57	89.27	110.71	95.85	111.70	95.46	10.57	10.33	9.60	8.80	9.62	9.28	8.94	8.73	9.13	8.91	8.98	9.25
10/01/41	10/31/41	Oct 2041	99.86	91.41	101.40	92.27	98.89	87.67	103.66	94.69	104.55	94.02	10.47	10.38	9.58	8.84	9.69	9.36	9.05	8.74	9.17	8.95	9.03	9.36
11/01/41	11/30/41	Nov 2041	100.06	92.89	99.75	92.53	101.51	94.39	102.90	95.06	102.81	94.22	10.54	10.45	9.72	9.02	9.90	9.88	9.96	8.97	9.34	9.13	9.20	10.31
12/01/41	12/31/41	Dec 2041	107.68	96.59	99.21	93.94	108.93	96.82	103.41	97.03	102.66	96.09	10.80	10.63	9.97	9.22	10.05	10.03	10.67	9.13	9.55	9.33	9.40	11.03
01/01/42	01/31/42	Jan 2042	97.32	94.64	104.20	96.34	96.99	92.97	102.46	97.18	102.82	96.18	10.93	10.74	10.03	9.26	10.10	10.08	10.67	9.17	9.60	9.38	9.45	11.04
02/01/42	02/28/42	Feb 2042	96.89	94.93	100.00	94.77	95.06	91.83	101.98	97.38	102.37	96.53	10.99	10.73	10.09	9.32	10.15	10.13	10.74	9.22	9.65	9.43	9.51	11.10
03/01/42	03/31/42	Mar 2042	93.11	91.16	96.04	90.99	90.56	89.32	98.31	93.46	98.50	92.47	10.40	10.12	9.54	8.78	9.63	9.63	9.72	8.90	9.11	8.89	8.96	10.08
04/01/42	04/30/42	Apr 2042	94.10	87.85	100.66	91.58	94.49	85.00	99.18	92.20	100.03	91.91	10.44	10.11	9.44	8.70	9.47	9.19	8.91	8.63	9.02	8.81	8.88	9.21

05/01/42	05/31/42	May 2042	92.46	85.79	101.71	92.94	90.39	83.72	99.02	92.70	100.51	93.05	10.52	10.20	9.48	8.75	9.52	9.44	8.80	8.69	9.08	8.86	8.93	9.10
06/01/42	06/30/42	Jun 2042	93.52	87.77	105.93	94.84	93.09	87.90	98.81	92.73	100.64	92.73	10.72	10.25	9.53	8.80	9.60	9.31	8.60	8.81	9.13	8.91	8.98	8.89
07/01/42	07/31/42	Jul 2042	111.78	92.66	123.92	98.69	111.88	89.77	116.88	99.38	118.53	99.43	11.02	10.51	9.81	8.93	9.70	9.39	9.14	8.88	9.26	9.04	9.11	9.45
08/01/42	08/31/42	Aug 2042	118.02	94.08	127.78	98.25	117.62	91.99	122.74	99.99	123.90	99.68	11.08	10.54	9.84	8.97	9.76	9.43	9.16	8.91	9.30	9.08	9.15	9.47
09/01/42	09/30/42	Sep 2042	108.32	93.42	111.50	95.61	107.68	91.06	112.92	97.77	113.93	97.37	10.78	10.54	9.79	8.98	9.81	9.47	9.12	8.90	9.31	9.09	9.16	9.43
52140	52170	52140	101.8572	93.2382	103.428	94.1154	100.868	89.4234	105.733	96.5838	106.641	95.9004	10.6752	10.588722	9.76752	9.020778	9.888798	9.549036	$ 9.229	$ 8.919	9.357174	9.132264	9.207948	9.542916

0612 Official Forward Price Curve:
Blend of...
0612K Midas forecast completed 6/19/2012
6/30/2012 forward market curve

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
6/29/2012		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		D:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
07/01/12	07/31/12	Jul 2012	28.10	11.53	36.57	20.48	21 49	5.82	35.66	20.91	40.10	22.49	2.77	2.88	2.49	2.38	2.51	2.43	2.41	2.12	2.85	2.66	2.69	2.70
08/01/12	08/31/12	Aug 2012	31.75	19.50	36.25	21.75	25.75	16.00	36.00	23.00	41.75	24.50	2.82	2.99	2.68	2.65	2.70	2.68	2.56	2.30	2.91	2.73	2.76	2.73
09/01/12	09/30/12	Sep 2012	30.50	23.00	32.25	21.50	26.50	21.00	34.00	23.50	38.00	24.50	2.83	2.95	2.68	2.66	2.71	2.68	2.60	2.36	2.91	2.73	2.76	2.77
10/01/12	10/31/12	Oct 2012	28.80	24.14	29.65	22.30	24.78	21.89	32.59	23.74	34.50	23.00	2.88	2.96	2.72	2.70	2.75	2.73	2.74	2.46	2.96	2.78	2.81	2.92
11/01/12	11/30/12	Nov 2012	32.00	27.75	29.65	22.75	29.50	25.24	32.59	25.50	34.16	25.50	3.09	3.21	2.96	2.96	3.07	3.04	3.41	2.75	3.22	3.04	3.07	3.66
12/01/12	12/31/12	Dec 2012	35.20	31.36	31.46	23.21	34.22	29.87	34.58	26.51	34.85	26.50	3.36	3.47	3.22	3.27	3.33	3.30	3.68	2.99	3.54	3.36	3.39	3.94
01/01/13	01/31/13	Jan 2013	36.99	31.05	31.67	25.46	33.21	28.89	40.17	30.13	42.23	31.16	3.50	3.61	3.36	3.41	3.47	3.44	3.82	3.11	3.69	3.51	3.54	4.09
02/01/13	02/28/13	Feb 2013	34.25	28.75	30.75	24.25	31.06	27.29	39.00	29.25	41.00	29.95	3.51	3.62	3.37	3.42	3.48	3.45	3.83	3.12	3.69	3.51	3.54	4.10
03/01/13	03/31/13	Mar 2013	31.51	26.45	29.83	23.04	27.98	24.08	37.83	28.37	39.77	29.65	3.48	3.60	3.35	3.39	3.46	3.43	3.80	3.12	3.66	3.48	3.51	4.08
04/01/13	04/30/13	Apr 2013	28.62	19.62	33.81	21.84	23.31	15.80	37.37	24.49	40.34	25.24	3.45	3.56	3.31	3.26	3.35	3.32	3.27	3.03	3.53	3.35	3.38	3.49
05/01/13	05/31/13	May 2013	26.77	14.16	34.16	20.37	21.63	9.30	35.86	24.01	38.71	23.77	3.48	3.59	3.34	3.29	3.38	3.35	3.30	3.05	3.56	3.38	3.41	3.52
06/01/13	06/30/13	Jun 2013	24.12	10.47	35.54	20.79	18.27	4.90	40.02	24.01	43.20	24.50	3.51	3.62	3.37	3.32	3.42	3.39	3.34	3.07	3.60	3.41	3.45	3.56
07/01/13	07/31/13	Jul 2013	42.24	24.80	47.12	29.00	35.49	22.40	47.53	33.57	51.94	33.47	3.56	3.67	3.42	3.37	3.46	3.43	3.38	3.11	3.64	3.46	3.50	3.61
08/01/13	08/31/13	Aug 2013	44.88	33.79	47.58	29.87	41.73	29.40	49.96	35.62	54.59	35.54	3.58	3.68	3.44	3.39	3.48	3.45	3.40	3.11	3.66	3.48	3.51	3.62
09/01/13	09/30/13	Sep 2013	44.88	34.41	42.55	28.13	39.78	32.20	48.02	33.57	52.47	34.50	3.58	3.69	3.44	3.39	3.48	3.45	3.40	3.15	3.66	3.48	3.52	3.63
10/01/13	10/31/13	Oct 2013	38.41	33.84	38.37	28.75	35.49	31.26	45.29	32.54	47.18	32.78	3.62	3.73	3.48	3.43	3.52	3.49	3.44	3.18	3.71	3.52	3.56	3.67
11/01/13	11/30/13	Nov 2013	42.17	34.55	37.62	28.18	39.78	32.92	45.29	33.57	45.33	33.47	3.74	3.87	3.59	3.62	3.71	3.68	4.06	3.36	3.90	3.71	3.75	4.34
12/01/13	12/31/13	Dec 2013	44.67	37.37	35.76	29.33	42.12	35.58	46.67	36.65	46.25	37.26	3.96	4.09	3.81	3.87	3.92	3.89	4.28	3.57	4.16	3.97	4.01	4.57
01/01/14	01/31/14	Jan 2014	41.24	33.30	38.67	29.71	40.21	33.89	45.67	35.88	46.73	35.16	4.07	4.20	3.92	3.97	4.03	4.00	4.39	3.64	4.27	4.08	4.12	4.69
02/01/14	02/28/14	Feb 2014	38.50	31.00	37.75	28.50	38.06	32.29	44.50	35.00	45.50	33.95	4.04	4.17	3.89	3.94	4.01	3.98	4.36	3.63	4.23	4.05	4.09	4.66
03/01/14	03/31/14	Mar 2014	35.76	28.70	36.83	27.29	34.98	29.08	43.33	34.12	44.27	33.65	3.96	4.09	3.81	3.85	3.93	3.90	4.28	3.57	4.14	3.96	4.00	4.58
04/01/14	04/30/14	Apr 2014	34.37	24.12	38.06	24.59	28.81	19.55	41.12	26.24	43.59	26.99	3.79	3.93	3.64	3.60	3.77	3.74	3.62	3.45	3.88	3.70	3.74	3.85
05/01/14	05/31/14	May 2014	32.52	18.66	38.41	23.12	27.13	13.05	39.61	25.76	41.96	25.52	3.81	3.95	3.65	3.62	3.79	3.76	3.63	3.44	3.90	3.72	3.75	3.87
06/01/14	06/30/14	Jun 2014	29.87	14.97	39.79	23.54	23.77	8.65	43.77	25.76	46.45	26.25	3.83	3.97	3.68	3.64	3.81	3.78	3.66	3.44	3.92	3.74	3.81	3.89
07/01/14	07/31/14	Jul 2014	47.99	28.05	52.87	32.50	41.74	24.90	53.03	36.57	56.44	35.97	3.87	4.01	3.72	3.68	3.86	3.82	3.70	3.47	3.97	3.78	3.85	3.94
08/01/14	08/31/14	Aug 2014	50.63	37.04	53.33	33.37	47.98	31.90	55.46	38.62	59.09	38.04	3.89	4.03	3.74	3.70	3.87	3.84	3.72	3.48	3.99	3.80	3.87	3.96
09/01/14	09/30/14	Sep 2014	50.63	37.66	48.30	31.63	46.03	34.70	53.52	36.57	56.97	37.00	3.90	4.04	3.74	3.71	3.88	3.84	3.72	3.50	3.99	3.81	3.87	3.96
10/01/14	10/31/14	Oct 2014	41.91	36.09	44.62	32.00	41.39	35.51	51.29	35.79	52.18	35.53	3.93	4.07	3.78	3.74	3.92	3.88	3.76	3.54	4.03	3.84	3.91	4.00
11/01/14	11/30/14	Nov 2014	45.67	36.80	43.87	31.43	45.68	37.17	51.29	36.82	50.33	36.22	4.03	4.15	3.88	3.90	4.00	3.97	4.35	3.66	4.19	4.00	4.07	4.65
12/01/14	12/31/14	Dec 2014	48.17	39.62	42.01	32.58	48.02	39.83	52.67	39.90	51.25	40.01	4.22	4.34	4.07	4.12	4.19	4.16	4.54	3.83	4.42	4.23	4.30	4.85
01/01/15	01/31/15	Jan 2015	44.24	35.55	41.57	31.96	43.21	36.14	49.17	38.63	49.98	37.66	4.31	4.44	4.14	4.22	4.28	4.24	4.66	3.91	4.51	4.33	4.40	4.98
02/01/15	02/28/15	Feb 2015	41.50	33.25	40.65	30.75	41.06	34.54	48.00	37.75	48.75	36.45	4.28	4.41	4.11	4.18	4.25	4.21	4.62	3.89	4.48	4.29	4.36	4.94
03/01/15	03/31/15	Mar 2015	38.76	30.95	39.73	29.54	37.98	31.33	46.83	36.87	47.52	36.15	4.20	4.32	4.03	4.09	4.16	4.12	4.54	3.82	4.38	4.19	4.26	4.85
04/01/15	04/30/15	Apr 2015	37.37	26.37	40.96	26.84	31.81	21.80	44.62	28.99	46.84	29.49	3.96	4.13	3.79	3.77	3.94	3.91	3.81	3.64	4.06	3.87	3.94	4.05
05/01/15	05/31/15	May 2015	35.52	20.91	41.31	25.37	30.13	15.30	43.11	28.51	45.21	28.02	3.98	4.15	3.80	3.79	3.96	3.92	3.82	3.63	4.07	3.89	3.96	4.07
06/01/15	06/30/15	Jun 2015	32.87	17.22	42.69	25.79	26.77	10.90	47.27	28.51	49.70	28.75	4.00	4.17	3.83	3.81	3.98	3.95	3.85	3.63	4.10	3.92	3.98	4.10
07/01/15	07/31/15	Jul 2015	50.99	30.30	55.77	34.75	44.74	27.15	56.53	39.32	59.69	38.47	4.04	4.21	3.86	3.85	4.02	3.99	3.88	3.66	4.14	3.95	4.02	4.14
08/01/15	08/31/15	Aug 2015	53.63	39.29	56.23	35.62	50.98	34.15	58.96	41.37	62.34	40.54	4.06	4.23	3.88	3.87	4.04	4.01	3.90	3.67	4.16	3.97	4.04	4.16
09/01/15	09/30/15	Sep 2015	53.63	39.91	51.20	33.88	49.03	36.95	57.02	39.32	60.22	39.50	4.06	4.23	3.89	3.87	4.04	4.01	3.91	3.69	4.16	3.98	4.04	4.16
10/01/15	10/31/15	Oct 2015	44.91	38.34	47.52	34.25	44.39	37.76	54.79	38.54	55.43	38.03	4.10	4.27	3.92	3.91	4.08	4.05	3.94	3.73	4.20	4.01	4.08	4.20
11/01/15	11/30/15	Nov 2015	48.67	39.05	46.77	33.68	48.68	39.42	54.79	39.57	53.58	38.72	4.19	4.31	4.02	4.01	4.17	4.13	4.53	3.84	4.30	4.12	4.19	4.85
12/01/15	12/31/15	Dec 2015	51.17	41.87	44.91	34.83	51.02	42.08	56.17	42.65	54.50	42.51	4.38	4.50	4.21	4.24	4.36	4.32	4.72	4.01	4.54	4.35	4.42	5.05
01/01/16	01/31/16	Jan 2016	46.99	37.55	44.47	33.96	45.96	38.14	52.42	41.03	53.23	40.16	4.48	4.60	4.31	4.37	4.44	4.41	4.82	4.08	4.67	4.49	4.56	5.16
02/01/16	02/29/16	Feb 2016	44.25	35.25	43.55	32.75	43.81	36.54	51.25	40.15	52.00	38.95	4.45	4.57	4.28	4.34	4.41	4.37	4.79	4.05	4.64	4.45	4.52	5.12
03/01/16	03/31/16	Mar 2016	41.51	32.95	42.63	31.54	40.73	33.33	50.08	39.27	50.77	38.65	4.36	4.49	4.19	4.24	4.33	4.29	4.70	3.98	4.54	4.35	4.42	5.03
04/01/16	04/30/16	Apr 2016	40.12	28.37	43.86	28.84	34.56	23.80	47.87	31.39	50.09	31.99	4.12	4.32	3.94	3.92	4.10	4.06	3.96	3.80	4.21	4.02	4.09	4.22
05/01/16	05/31/16	May 2016	38.27	22.91	44.21	27.37	32.88	17.30	46.36	30.91	48.46	30.52	4.13	4.33	3.96	3.93	4.11	4.08	3.98	3.78	4.22	4.04	4.11	4.23
06/01/16	06/30/16	Jun 2016	35.62	19.22	45.59	27.79	29.52	12.90	50.52	30.91	52.95	31.25	4.16	4.36	3.98	3.96	4.14	4.10	4.00	3.79	4.25	4.06	4.13	4.26
07/01/16	07/31/16	Jul 2016	53.74	32.30	58.67	36.75	47.49	29.15	59.78	41.72	62.94	40.97	4.19	4.39	4.02	3.99	4.17	4.14	4.04	3.81	4.29	4.10	4.17	4.30
08/01/16	08/31/16	Aug 2016	56.38	41.29	59.13	37.62	53.73	36.15	62.21	43.77	65.59	43.04	4.21	4.41	4.04	4.01	4.19	4.16	4.06	3.82	4.31	4.12	4.19	4.32
09/01/16	09/30/16	Sep 2016	56.38	41.91	54.10	35.88	51.78	38.95	60.27	41.72	63.47	42.00	4.22	4.42	4.04	4.02	4.20	4.16	4.06	3.85	4.31	4.12	4.19	4.32
10/01/16	10/31/16	Oct 2016	47.66	40.34	50.42	36.25	47.14	39.76	58.04	40.94	58.68	40.53	4.25	4.45	4.08	4.05	4.23	4.20	4.10	3.88	4.35	4.16	4.23	4.36
11/01/16	11/30/16	Nov 2016	51.42	41.05	49.67	35.68	51.43	41.42	58.04	41.97	56.83	41.22	4.34	4.49	4.18	4.15	4.32	4.28	4.68	4.00	4.45	4.26	4.33	5.01
12/01/16	12/31/16	Dec 2016	53.92	43.87	47.81	36.83	53.77	44.08	59.42	45.05	57.75	45.01	4.53	4.68	4.37	4.38	4.51	4.47	4.87	4.16	4.68	4.50	4.57	5.21
01/01/17	01/31/17	Jan 2017	49.74	39.55	47.37	35.96	48.71	40.14	55.67	43.43	56.48	42.66	4.63	4.78	4.46	4.53	4.60	4.56	4.98	4.23	4.83	4.64	4.72	5.32
02/01/17	02/28/17	Feb 2017	47.00	37.25	46.45	34.75	46.56	38.54	54.50	42.55	55.25	41.45	4.60	4.74	4.43	4.49	4.56	4.53	4.94	4.20	4.80	4.61	4.68	5.28
03/01/17	03/31/17	Mar 2017	44.26	34.95	45.53	33.54	43.48	35.33	53.33	41.67	54.02	41.15	4.51	4.66	4.34	4.39	4.48	4.44	4.85	4.14	4.70	4.51	4.58	5.19
04/01/17	04/30/17	Apr 2017	42.87	30.37	46.76	30.84	37.31	25.80	51.12	33.79	53.34	34.49	4.27	4.49	4.09	4.07	4.25	4.22	4.11	3.95	4.37	4.18	4.25	4.38
05/01/17	05/31/17	May 2017	41.02	24.91	47.11	29.37	35.63	19.30	49.61	33.31	51.71	33.02	4.28	4.50	4.11	4.09	4.27	4.23	4.13	3.93	4.38	4.19	4.26	4.40
06/01/17	06/30/17	Jun 2017	38.37	21.22	48.49	29.79	32.27	14.90	53.77	33.31	56.20	33.75	4.31	4.53	4.13	4.11	4.29	4.26	4.15	3.94	4.41	4.22	4.29	4.42
07/01/17	07/31/17	Jul 2017	56.49	34.30	61.57	38.75	50.24	31.15	63.03	44.12	66.19	43.47	4.34	4.56	4.17	4.15	4.33	4.29	4.19	3.96	4.44	4.26	4.33	4.46
08/01/17	08/31/17	Aug 2017	59.13	43.29	62.03	39.62	56.48	38.15	65.46	46.17	68.84	45.54	4.37	4.59	4.19	4.17	4.35	4.31	4.21	3.98	4.47	4.28	4.35	4.48
09/01/17	09/30/17	Sep 2017	59.13	43.91	57.00	37.88	54.53	40.95	63.52	44.12	66.72	44.50	4.37	4.59	4.20	4.17	4.35	4.32	4.22	4.00	4.47	4.28	4.35	4.49
10/01/17	10/31/17	Oct 2017	50.41	42.34	53.32	38.25	49.89	41.76	61.29	43.34	61.93	43.03	4.41	4.63	4.23	4.21	4.39	4.35	4.25	4.04	4.51	4.32	4.39	4.53

11/01/17	11/30/17	Nov 2017	54.17	43.05	52.57	37.68	54.18	43.42	61.29	44.37	60.08	43.72	4.50	4.66	4.33	4.31	4.47	4.44	4.84	4.15	4.61	4.42	4.49	5.17
12/01/17	12/31/17	Dec 2017	56.67	45.87	50.71	38.83	56.52	46.08	62.67	47.45	61.00	47.51	4.69	4.85	4.52	4.53	4.66	4.62	5.03	4.32	4.84	4.65	4.73	5.37
01/01/18	01/31/18	Jan 2018	52.49	41.55	50.27	37.96	51.46	42.14	58.92	45.83	59.73	45.01	4.78	4.95	4.61	4.66	4.75	4.71	5.13	4.38	4.98	4.79	4.86	5.48
02/01/18	02/28/18	Feb 2018	49.75	39.25	49.35	36.75	49.31	40.54	57.75	44.95	58.50	43.80	4.75	4.91	4.58	4.63	4.71	4.67	5.09	4.35	4.94	4.75	4.82	5.44
03/01/18	03/31/18	Mar 2018	47.01	36.95	48.43	35.54	46.23	37.33	56.58	44.07	57.27	43.50	4.67	4.83	4.50	4.54	4.63	4.60	5.01	4.29	4.85	4.66	4.73	5.36
04/01/18	04/30/18	Apr 2018	45.62	32.37	49.66	32.84	40.06	27.80	54.37	36.19	56.59	36.84	4.43	4.67	4.26	4.23	4.42	4.38	4.28	4.11	4.52	4.34	4.41	4.56
05/01/18	05/31/18	May 2018	43.77	26.91	50.01	31.37	38.38	21.30	52.86	35.71	54.96	35.37	4.44	4.68	4.27	4.24	4.43	4.39	4.29	4.09	4.54	4.35	4.42	4.57
06/01/18	06/30/18	Jun 2018	41.12	23.22	51.39	31.79	35.02	16.90	57.02	35.71	59.45	36.10	4.47	4.71	4.29	4.26	4.45	4.41	4.31	4.10	4.56	4.37	4.44	4.59
07/01/18	07/31/18	Jul 2018	59.24	36.30	64.47	40.75	52.99	33.15	66.28	46.52	69.44	45.82	4.50	4.74	4.33	4.30	4.49	4.45	4.35	4.12	4.60	4.41	4.48	4.63
08/01/18	08/31/18	Aug 2018	62.62	46.01	67.25	45.20	62.50	43.58	70.60	54.67	72.75	54.73	5.35	5.43	5.13	4.93	5.09	4.97	4.78	4.64	5.24	5.05	5.12	5.07
09/01/18	09/30/18	Sep 2018	60.58	47.11	58.61	42.77	59.19	44.48	67.21	52.67	69.14	53.54	5.27	5.38	5.09	4.93	5.07	4.95	4.75	4.61	5.23	5.04	5.12	5.03
10/01/18	10/31/18	Oct 2018	52.02	45.50	53.22	42.06	51.06	43.80	62.43	51.93	62.64	52.28	5.26	5.41	5.11	4.96	5.10	5.05	4.78	4.63	5.26	5.08	5.15	5.07
11/01/18	11/30/18	Nov 2018	56.98	46.53	53.76	41.57	57.47	46.19	64.69	52.67	64.18	52.75	5.33	5.44	5.18	5.01	5.18	5.13	5.14	4.74	5.32	5.13	5.20	5.49
12/01/18	12/31/18	Dec 2018	59.31	48.46	52.90	42.83	59.43	48.74	64.69	54.87	63.51	55.23	5.46	5.60	5.34	5.16	5.32	5.21	5.27	4.86	5.48	5.29	5.36	5.63
01/01/19	01/31/19	Jan 2019	53.84	44.81	51.57	42.57	52.48	45.10	60.50	51.41	60.81	51.46	5.58	5.64	5.38	5.27	5.38	5.36	5.65	4.97	5.58	5.39	5.47	6.02
02/01/19	02/28/19	Feb 2019	50.67	43.78	50.44	42.09	50.74	44.03	58.64	51.08	59.26	50.92	5.58	5.65	5.38	5.27	5.39	5.36	5.65	4.97	5.58	5.39	5.47	6.02
03/01/19	03/31/19	Mar 2019	48.14	41.98	49.31	40.89	47.18	41.19	57.09	49.97	57.71	50.25	5.47	5.53	5.28	5.16	5.28	5.19	5.39	4.90	5.47	5.28	5.35	5.75
04/01/19	04/30/19	Apr 2019	49.70	39.40	52.88	40.05	45.96	36.30	58.88	46.26	59.83	46.87	5.36	5.44	5.15	4.93	5.09	5.00	4.89	4.73	5.23	5.05	5.12	5.18
05/01/19	05/31/19	May 2019	45.96	34.40	51.34	39.26	41.75	30.92	56.15	46.20	57.44	46.39	5.39	5.47	5.16	4.93	5.12	5.02	4.89	4.74	5.23	5.04	5.11	5.18
06/01/19	06/30/19	Jun 2019	45.71	34.73	55.33	39.97	41.74	29.85	57.71	46.14	60.50	46.94	5.46	5.51	5.19	4.95	5.15	5.05	4.91	4.77	5.26	5.07	5.14	5.20
07/01/19	07/31/19	Jul 2019	60.51	42.83	68.63	46.77	57.22	40.58	68.98	53.42	71.10	53.56	5.55	5.62	5.29	5.00	5.22	5.10	4.97	4.80	5.30	5.12	5.19	5.26
08/01/19	08/31/19	Aug 2019	66.10	48.73	72.47	50.77	68.52	49.00	75.74	63.16	76.65	63.93	6.33	6.28	6.07	5.70	5.83	5.62	5.35	5.30	6.00	5.82	5.89	5.64
09/01/19	09/30/19	Sep 2019	62.02	50.30	60.22	47.66	63.85	48.00	70.90	61.23	71.55	62.58	6.18	6.18	5.98	5.69	5.79	5.59	5.28	5.22	5.99	5.80	5.88	5.56
10/01/19	10/31/19	Oct 2019	53.62	48.65	53.13	45.86	52.22	45.84	63.56	60.53	63.35	61.54	6.11	6.20	5.99	5.72	5.82	5.75	5.31	5.23	6.02	5.83	5.90	5.60
11/01/19	11/30/19	Nov 2019	59.79	50.01	54.95	45.46	60.75	48.96	68.08	60.98	68.29	61.78	6.15	6.22	6.04	5.72	5.88	5.83	5.45	5.33	6.02	5.84	5.91	5.80
12/01/19	12/31/19	Dec 2019	61.95	51.06	55.09	46.83	62.33	51.41	66.71	62.29	66.02	62.94	6.24	6.35	6.16	5.79	5.98	5.79	5.52	5.39	6.11	5.92	5.99	5.87
01/01/20	01/31/20	Jan 2020	55.18	48.06	52.87	47.18	53.49	48.05	62.08	56.99	61.88	57.92	6.38	6.34	6.16	5.87	6.02	6.01	6.18	5.55	6.19	6.00	6.07	6.55
02/01/20	02/29/20	Feb 2020	51.58	48.30	51.53	47.43	52.17	47.52	59.53	57.21	60.01	58.04	6.42	6.38	6.18	5.90	6.06	6.05	6.22	5.58	6.22	6.03	6.10	6.58
03/01/20	03/31/20	Mar 2020	49.27	47.00	50.19	46.25	48.12	45.05	57.59	55.86	58.14	57.00	6.27	6.22	6.06	5.77	5.92	5.78	5.78	5.52	6.09	5.90	5.97	6.13
04/01/20	04/30/20	Apr 2020	53.78	46.44	56.10	47.26	51.85	44.80	63.38	56.32	63.07	56.91	6.29	6.21	6.04	5.63	5.76	5.61	5.51	5.35	5.94	5.75	5.82	5.80
05/01/20	05/31/20	May 2020	48.15	41.89	52.68	47.14	45.12	40.53	59.43	56.69	59.92	57.41	6.34	6.26	6.05	5.62	5.81	5.64	5.49	5.38	5.92	5.73	5.80	5.78
06/01/20	06/30/20	Jun 2020	50.31	46.24	59.28	48.14	48.45	42.80	58.41	56.57	61.55	57.77	6.45	6.30	6.08	5.64	5.85	5.69	5.50	5.43	5.95	5.76	5.83	5.79
07/01/20	07/31/20	Jul 2020	61.78	49.35	72.78	52.78	61.45	48.01	71.68	60.33	72.76	61.31	6.59	6.50	6.25	5.70	5.95	5.76	5.58	5.48	6.01	5.82	5.89	5.88
08/01/20	08/31/20	Aug 2020	63.86	50.24	73.20	52.64	66.78	49.67	73.05	60.63	73.82	61.66	6.63	6.53	6.28	5.73	5.99	5.78	5.60	5.48	6.03	5.84	5.91	5.88
09/01/20	09/30/20	Sep 2020	60.39	48.13	61.80	48.81	62.72	47.48	68.01	57.60	68.41	59.10	6.42	6.37	6.15	5.70	5.95	5.74	5.52	5.41	6.00	5.81	5.89	5.80
10/01/20	10/31/20	Oct 2020	52.42	47.80	53.46	47.64	52.19	46.15	60.12	57.42	60.27	58.33	6.38	6.40	6.17	5.75	5.98	5.77	5.55	5.42	6.05	5.86	5.94	5.84
11/01/20	11/30/20	Nov 2020	59.70	50.62	58.77	49.14	59.06	48.92	65.61	59.13	65.21	58.85	6.45	6.47	6.28	5.89	6.09	5.92	5.96	5.55	6.20	6.01	6.08	6.31
12/01/20	12/31/20	Dec 2020	62.81	51.95	55.23	49.95	63.53	50.20	63.74	59.79	62.84	59.50	6.52	6.58	6.38	5.99	6.17	6.14	6.20	5.63	6.30	6.11	6.19	6.56
01/01/21	01/31/21	Jan 2021	57.68	51.31	55.63	50.09	56.24	48.82	65.12	60.28	64.76	60.48	6.69	6.63	6.44	6.09	6.30	6.30	6.36	5.77	6.41	6.22	6.30	6.72
02/01/21	02/28/21	Feb 2021	54.67	51.14	54.81	49.95	54.71	49.16	62.59	59.95	62.78	60.35	6.73	6.67	6.46	6.12	6.34	6.34	6.39	5.81	6.44	6.25	6.32	6.76
03/01/21	03/31/21	Mar 2021	53.38	50.54	53.71	48.76	54.55	47.71	61.08	59.05	60.86	59.77	6.58	6.52	6.35	6.02	6.18	6.05	6.23	5.78	6.34	6.15	6.22	6.58
04/01/21	04/30/21	Apr 2021	57.27	49.12	58.39	48.81	56.76	47.89	65.39	58.54	65.14	59.42	6.58	6.46	6.29	5.86	6.00	5.86	5.74	5.60	6.16	5.97	6.05	6.03
05/01/21	05/31/21	May 2021	52.50	48.58	55.05	49.01	51.52	45.83	61.83	59.22	62.41	59.91	6.64	6.51	6.30	5.85	6.05	5.89	5.65	5.64	6.15	5.96	6.03	5.94
06/01/21	06/30/21	Jun 2021	53.82	50.13	61.59	49.86	54.03	46.57	62.09	58.95	64.36	60.29	6.77	6.58	6.35	5.88	6.09	5.93	5.68	5.69	6.18	5.99	6.07	5.97
07/01/21	07/31/21	Jul 2021	65.53	52.23	75.42	54.96	67.00	51.19	75.01	63.10	76.02	64.12	6.91	6.80	6.50	5.96	6.19	6.01	5.83	5.74	6.27	6.08	6.15	6.13
08/01/21	08/31/21	Aug 2021	68.16	53.16	76.50	54.61	70.88	53.59	76.54	62.75	77.15	63.54	6.95	6.83	6.54	5.97	6.22	6.03	5.80	5.75	6.28	6.09	6.16	6.08
09/01/21	09/30/21	Sep 2021	61.72	50.24	62.27	49.72	64.34	50.67	69.13	59.50	69.43	60.12	6.57	6.52	6.30	5.80	6.13	5.91	5.55	5.53	6.10	5.91	5.98	5.83
10/01/21	10/31/21	Oct 2021	55.68	49.08	55.11	48.83	55.16	47.19	62.38	59.36	62.42	60.04	6.53	6.55	6.32	5.84	6.16	5.94	5.69	5.54	6.14	5.95	6.02	5.98
11/01/21	11/30/21	Nov 2021	63.31	52.53	59.24	49.74	61.44	50.97	67.20	61.09	66.25	60.58	6.61	6.64	6.42	5.99	6.26	6.23	6.29	5.68	6.29	6.10	6.18	6.64
12/01/21	12/31/21	Dec 2021	65.77	54.56	56.36	51.43	67.61	53.46	65.66	61.74	64.71	61.46	6.68	6.79	6.54	6.06	6.34	6.32	6.38	5.72	6.37	6.18	6.26	6.73
01/01/22	01/31/22	Jan 2022	62.34	56.08	63.57	58.02	60.56	55.48	65.82	61.43	65.29	61.03	6.85	6.76	6.55	6.16	6.42	6.42	6.54	5.87	6.48	6.28	6.36	6.90
02/01/22	02/28/22	Feb 2022	61.31	56.31	61.20	57.90	58.95	54.48	64.72	61.56	64.67	61.23	6.89	6.80	6.58	6.19	6.46	6.46	6.57	5.90	6.50	6.31	6.39	6.94
03/01/22	03/31/22	Mar 2022	57.65	54.18	58.38	55.87	54.92	52.88	61.44	59.85	61.35	59.20	6.63	6.50	6.31	5.92	6.14	6.00	6.18	5.71	6.24	6.05	6.12	6.54
04/01/22	04/30/22	Apr 2022	60.85	53.83	62.90	56.50	60.02	51.18	65.14	59.09	65.82	59.81	6.66	6.50	6.31	5.77	6.03	5.86	5.72	5.56	6.07	5.88	5.95	6.00
05/01/22	05/31/22	May 2022	55.49	51.66	59.85	56.77	54.23	49.73	61.37	59.10	62.56	59.84	6.71	6.55	6.35	5.78	6.08	5.89	5.64	5.61	6.09	5.90	5.97	5.93
06/01/22	06/30/22	Jun 2022	58.87	53.90	68.86	57.90	58.67	52.71	63.83	59.35	65.32	60.38	6.79	6.64	6.41	5.82	6.12	5.93	5.64	5.66	6.12	5.93	6.01	5.93
07/01/22	07/31/22	Jul 2022	69.73	57.17	80.62	62.05	69.69	55.59	75.63	63.29	76.52	63.99	6.94	6.80	6.54	5.88	6.17	5.98	5.77	5.69	6.18	5.99	6.07	6.07
08/01/22	08/31/22	Aug 2022	72.99	57.51	81.13	61.18	72.70	55.35	78.01	62.93	78.25	63.59	6.98	6.84	6.57	5.91	6.22	6.02	5.77	5.72	6.21	6.02	6.09	6.05
09/01/22	09/30/22	Sep 2022	66.99	55.97	70.44	58.49	67.15	52.97	71.73	61.39	72.41	61.81	6.75	6.69	6.43	5.86	6.23	6.00	5.68	5.66	6.16	5.97	6.04	5.96
10/01/22	10/31/22	Oct 2022	60.93	55.35	61.52	57.59	58.74	52.90	64.45	60.84	64.72	61.10	6.73	6.72	6.48	5.89	6.26	6.03	5.84	5.65	6.19	6.01	6.08	6.12
11/01/22	11/30/22	Nov 2022	68.25	57.09	65.80	58.36	67.93	58.36	69.81	62.25	69.10	61.58	6.80	6.77	6.56	6.07	6.40	6.38	6.44	5.83	6.38	6.19	6.26	6.79
12/01/22	12/31/22	Dec 2022	72.23	59.87	63.03	59.16	73.39	59.44	67.18	63.13	66.22	62.65	6.98	6.94	6.73	6.16	6.46	6.43	6.49	5.86	6.47	6.29	6.36	6.85
01/01/23	01/31/23	Jan 2023	63.90	57.92	66.06	60.17	61.87	56.94	67.94	63.57	67.44	63.43	7.16	7.05	6.83	6.28	6.60	6.59	6.65	6.01	6.59	6.40	6.48	7.01
02/01/23	02/28/23	Feb 2023	61.14	58.18	63.33	60.01	60.45	56.01	66.13	63.68	66.63	63.37	7.20	7.09	6.84	6.31	6.64	6.63	6.69	6.04	6.63	6.44	6.51	7.05
03/01/23	03/31/23	Mar 2023	60.56	57.31	61.77	59.04	57.92	55.30	64.54	62.82	64.44	62.03	7.07	6.90	6.69	6.19	6.46	6.32	6.50	6.03	6.51	6.32	6.39	6.86
04/01/23	04/30/23	Apr 2023	64.08	57.06	65.67	59.31	62.77	54.08	67.59	62.04	68.39	62.68	7.07	6.88	6.67	6.00	6.38	6.19	6.04	5.88	6.30	6.11	6.19	6.33
05/01/23	05/31/23	May 2023	59.36	56.71	63.43	59.98	58.30	54.01	65.05	62.29	66.57	63.28	7.13	6.95	6.71	6.03	6.40	6.22	5.98	5.94	6.33	6.15	6.22	6.27
06/01/23	06/30/23	Jun 2023	61.52	57.06	72.44	61.27	61.32	55.77	66.55	62.40	69.21	63.69	7.28	7.07	6.82	6.05	6.45	6.26	5.99	6.00	6.36	6.17	6.24	6.28
07/01/23	07/31/23	Jul 2023	73.84	60.67	84.88	65.78	73.73	58.39	80.05	67.07	80.89	67.84	7.40	7.23	6.96	6.12	6.52	6.30	6.12	6.04	6.42	6.23	6.31	6.41
08/01/23	08/31/23	Aug 2023	76.73	60.31	84.99	64.57	76.56	57.62	81.89	66.47	82.31	67.17	7.45	7.26	6.98	6.15	6.55	6.34	6.09	6.07	6.45	6.26	6.33	6.37
09/01/23	09/30/23	Sep 2023	69.33	58.25	72.17	61.30	69.34	55.15	74.26	64.08	74.88	64.62	7.09	7.00	6.74	6.02	6.46	6.23	5.87	5.87	6.32	6.13	6.20	6.15
10/01/23	10/31/23	Oct 2023	62.85	57.89	63.26	59.97	60.65	54.69	65.98	63.29	66.52	63.13	7.08	7.03	6.77	6.05	6.49	6.26	5.99	5.86	6.35	6.16	6.24	6.28
11/01/23	11/30/23	Nov 2023	70.54	59.36	68.16	60.73	68.90	60.41	72.05	64.65	71.42	64.05	7.16	7.08	6.84	6.19	6.68	6.62	6.68	6.01	6.49	6.31	6.38	7.03
12/01/23	12/31/23	Dec 2023	74.58	61.47	65.89	61.51	74.49	61.77	70.12	65.31	69.16	64.76	7.25	7.22	6.98	6.28	6.73	6.66	6.72	6.04	6.59	6.40	6.47	7.08

01/01/24	01/31/24	Jan 2024	63.05	59.66	67.78	62.01	63.65	58.87	68.53	65.26	69.13	65.20	7.43	7.25	7.02	6.34	6.81	6.80	6.89	6.18	6.65	6.46	6.54	7.26
02/01/24	02/29/24	Feb 2024	62.60	59.98	65.02	61.86	62.16	57.68	67.65	65.45	68.28	65.12	7.48	7.28	7.03	6.37	6.85	6.84	6.90	6.22	6.69	6.50	6.57	7.27
03/01/24	03/31/24	Mar 2024	59.65	57.41	62.34	59.61	58.04	55.72	64.42	62.76	65.04	62.82	7.06	6.89	6.66	6.02	6.46	6.29	6.48	5.96	6.33	6.14	6.22	6.84
04/01/24	04/30/24	Apr 2024	63.85	57.44	66.04	59.95	63.38	54.66	68.68	62.64	69.27	63.27	7.04	6.88	6.66	5.92	6.38	6.17	6.00	5.82	6.23	6.04	6.11	6.28
05/01/24	05/31/24	May 2024	59.31	56.77	63.64	59.91	57.97	54.88	64.88	62.46	66.44	63.18	7.10	6.93	6.68	5.87	6.32	6.13	5.88	5.84	6.18	5.99	6.06	6.17
06/01/24	06/30/24	Jun 2024	60.64	57.40	71.46	61.35	60.03	55.15	65.85	62.82	68.18	63.81	7.22	7.02	6.76	5.90	6.40	6.21	5.92	5.93	6.20	6.01	6.08	6.21
07/01/24	07/31/24	Jul 2024	73.66	60.26	84.91	65.48	73.18	58.39	79.87	66.64	80.74	67.49	7.38	7.21	6.93	6.01	6.50	6.28	6.06	5.96	6.31	6.12	6.20	6.35
08/01/24	08/31/24	Aug 2024	76.28	60.45	84.34	64.93	76.37	57.61	81.63	66.89	82.16	67.48	7.43	7.26	6.98	6.04	6.54	6.32	6.03	6.00	6.34	6.15	6.23	6.31
09/01/24	09/30/24	Sep 2024	70.54	59.40	73.15	62.23	70.33	56.30	75.25	64.83	75.87	65.09	7.28	7.16	6.88	6.00	6.48	6.26	5.93	5.94	6.30	6.11	6.19	6.21
10/01/24	10/31/24	Oct 2024	62.66	58.89	64.27	61.02	61.34	55.71	66.83	63.93	67.39	63.93	7.23	7.19	6.89	6.07	6.56	6.32	6.10	5.94	6.38	6.19	6.26	6.38
11/01/24	11/30/24	Nov 2024	70.86	60.20	69.18	61.97	68.84	61.26	72.88	65.67	72.44	65.09	7.29	7.21	6.96	6.19	6.76	6.70	6.76	6.08	6.49	6.30	6.38	7.10
12/01/24	12/31/24	Dec 2024	74.73	61.50	66.60	62.63	75.63	63.44	70.79	66.35	69.88	65.90	7.45	7.35	7.13	6.32	6.83	6.77	6.83	6.11	6.63	6.44	6.51	7.19
01/01/25	01/31/25	Jan 2025	64.86	61.39	68.92	63.50	64.37	60.09	70.11	66.86	70.53	66.60	7.64	7.44	7.20	6.44	6.93	6.91	7.00	6.27	6.76	6.56	6.64	7.37
02/01/25	02/28/25	Feb 2025	64.11	61.39	66.03	63.16	62.95	59.05	69.06	66.93	69.62	66.41	7.68	7.47	7.21	6.47	6.97	6.95	7.04	6.30	6.79	6.60	6.68	7.41
03/01/25	03/31/25	Mar 2025	61.78	60.17	64.39	61.95	59.46	57.86	66.77	65.00	67.26	64.75	7.40	7.18	6.94	6.23	6.75	6.58	6.77	6.21	6.54	6.35	6.43	7.13
04/01/25	04/30/25	Apr 2025	64.65	59.33	67.71	62.01	64.24	56.00	68.85	64.64	69.77	65.23	7.40	7.17	6.94	5.99	6.63	6.42	6.24	6.05	6.30	6.11	6.18	6.52
05/01/25	05/31/25	May 2025	61.01	59.07	65.29	62.00	59.02	56.49	66.38	63.79	68.28	64.62	7.46	7.22	6.99	5.91	6.55	6.36	6.11	6.06	6.21	6.03	6.10	6.40
06/01/25	06/30/25	Jun 2025	63.20	59.56	74.75	63.54	62.34	57.62	68.33	65.09	71.17	65.87	7.56	7.33	7.06	5.94	6.62	6.42	6.12	6.13	6.24	6.06	6.13	6.41
07/01/25	07/31/25	Jul 2025	76.37	62.63	87.53	67.77	75.51	60.23	82.72	68.96	83.58	69.85	7.75	7.54	7.26	6.07	6.74	6.52	6.36	6.21	6.38	6.19	6.26	6.65
08/01/25	08/31/25	Aug 2025	78.48	62.97	87.39	67.51	78.68	60.07	84.09	69.22	84.76	70.00	7.80	7.58	7.30	6.10	6.77	6.55	6.28	6.23	6.40	6.21	6.29	6.56
09/01/25	09/30/25	Sep 2025	72.55	61.59	75.82	64.47	72.69	58.54	77.58	66.10	78.23	66.82	7.59	7.42	7.15	6.10	6.71	6.47	6.13	6.11	6.40	6.21	6.28	6.42
10/01/25	10/31/25	Oct 2025	64.15	60.79	65.89	63.06	62.60	57.35	68.93	66.22	69.40	66.23	7.51	7.42	7.12	6.18	6.76	6.52	6.30	6.11	6.48	6.29	6.36	6.59
11/01/25	11/30/25	Nov 2025	72.22	62.48	70.92	64.19	70.90	63.46	74.46	67.90	74.11	67.39	7.57	7.45	7.05	6.60	7.03	6.97	7.04	6.34	6.90	6.71	6.79	7.38
12/01/25	12/31/25	Dec 2025	76.60	63.53	68.45	64.84	76.95	65.10	72.50	68.59	71.61	68.19	7.71	7.61	7.21	6.72	7.10	7.04	7.11	6.38	7.04	6.85	6.92	7.46
01/01/26	01/31/26	Jan 2026	66.94	63.91	71.53	65.66	67.05	62.60	72.13	68.84	72.54	68.61	7.90	7.65	7.34	6.87	7.20	7.19	7.28	6.54	7.19	7.00	7.08	7.65
02/01/26	02/28/26	Feb 2026	66.61	63.67	68.55	65.42	65.54	61.67	71.49	69.05	71.93	68.52	7.95	7.70	7.38	6.91	7.25	7.23	7.33	6.57	7.23	7.04	7.11	7.69
03/01/26	03/31/26	Mar 2026	62.78	61.16	64.96	62.65	61.38	60.04	67.84	66.11	68.28	65.48	7.57	7.30	6.98	6.58	6.90	6.89	6.95	6.37	6.89	6.70	6.77	7.31
04/01/26	04/30/26	Apr 2026	66.81	60.86	69.49	63.44	66.02	57.97	71.47	65.95	72.21	66.67	7.56	7.28	6.93	6.44	6.78	6.58	6.39	6.19	6.75	6.56	6.63	6.67
05/01/26	05/31/26	May 2026	62.06	60.72	66.72	63.17	59.82	57.42	68.30	65.96	69.81	66.18	7.61	7.34	6.97	6.45	6.79	6.57	6.29	6.23	6.76	6.57	6.64	6.58
06/01/26	06/30/26	Jun 2026	64.11	60.71	75.82	64.40	63.12	58.78	69.04	66.34	72.37	66.87	7.77	7.38	7.01	6.49	6.85	6.64	6.16	6.31	6.80	6.61	6.68	6.45
07/01/26	07/31/26	Jul 2026	77.42	63.71	88.81	68.50	76.75	61.27	83.62	69.99	84.41	70.62	7.92	7.50	7.12	6.59	6.91	6.68	6.52	6.35	6.90	6.71	6.78	6.81
08/01/26	08/31/26	Aug 2026	79.26	63.96	88.14	68.16	79.21	60.98	85.05	70.09	85.57	70.64	7.97	7.53	7.16	6.62	6.95	6.72	6.44	6.38	6.93	6.74	6.81	6.72
09/01/26	09/30/26	Sep 2026	74.42	62.95	77.33	65.85	74.03	59.50	79.43	68.49	80.14	69.00	7.74	7.55	7.13	6.60	6.98	6.73	6.37	6.33	6.90	6.71	6.78	6.65
10/01/26	10/31/26	Oct 2026	65.74	62.52	67.47	64.43	64.60	59.25	70.31	67.89	70.85	67.63	7.69	7.58	7.11	6.63	7.01	6.76	6.54	6.33	6.93	6.74	6.82	6.83
11/01/26	11/30/26	Nov 2026	73.40	63.80	72.37	65.91	72.28	65.17	75.89	69.39	75.30	68.95	7.74	7.69	7.22	6.77	7.20	7.15	7.22	6.49	7.08	6.89	6.96	7.56
12/01/26	12/31/26	Dec 2026	76.97	65.10	69.92	66.42	79.00	66.26	74.17	70.06	73.26	69.54	7.88	7.78	7.34	6.87	7.26	7.22	7.32	6.53	7.19	7.00	7.07	7.68
01/01/27	01/31/27	Jan 2027	68.31	64.93	72.54	67.06	68.21	64.22	73.47	70.36	74.05	70.10	8.08	7.79	7.46	6.99	7.38	7.37	7.50	6.69	7.30	7.11	7.19	7.87
02/01/27	02/28/27	Feb 2027	67.94	64.82	69.51	66.25	66.59	62.83	72.47	69.92	73.01	69.44	8.11	7.83	7.49	7.02	7.42	7.42	7.55	6.73	7.33	7.14	7.22	7.91
03/01/27	03/31/27	Mar 2027	63.92	62.12	66.47	63.87	62.26	60.91	69.37	67.28	69.81	66.63	7.62	7.36	7.03	6.59	6.97	6.96	7.02	6.42	6.91	6.71	6.79	7.38
04/01/27	04/30/27	Apr 2027	67.18	61.47	70.63	64.17	66.74	58.17	72.23	66.64	73.07	66.82	7.60	7.32	6.97	6.44	6.84	6.64	6.44	6.24	6.75	6.56	6.63	6.73
05/01/27	05/31/27	May 2027	63.51	61.03	67.68	64.48	61.42	58.29	68.91	66.42	70.62	67.03	7.66	7.38	7.01	6.48	6.86	6.63	6.35	6.28	6.78	6.60	6.67	6.64
06/01/27	06/30/27	Jun 2027	65.69	61.37	76.91	65.16	65.18	59.86	70.83	66.56	73.09	67.32	7.82	7.42	7.05	6.52	6.92	6.69	6.18	6.34	6.82	6.63	6.71	6.47
07/01/27	07/31/27	Jul 2027	77.88	64.72	89.10	69.41	77.17	62.01	84.14	70.93	84.90	71.48	7.99	7.57	7.14	6.60	6.97	6.73	6.56	6.38	6.91	6.72	6.79	6.85
08/01/27	08/31/27	Aug 2027	80.62	64.77	89.80	68.60	79.92	61.58	85.94	70.81	86.37	71.18	8.03	7.58	7.18	6.64	7.01	6.77	6.50	6.41	6.94	6.75	6.82	6.78
09/01/27	09/30/27	Sep 2027	74.16	63.67	77.69	66.39	73.94	60.46	78.74	69.16	79.39	69.35	7.77	7.61	7.15	6.62	7.04	6.79	6.43	6.38	6.92	6.73	6.80	6.71
10/01/27	10/31/27	Oct 2027	66.55	63.12	68.55	65.23	63.86	59.96	71.68	68.47	71.97	68.27	7.74	7.64	7.15	6.65	7.08	6.83	6.60	6.38	6.95	6.76	6.83	6.88
11/01/27	11/30/27	Nov 2027	71.86	64.56	72.40	66.33	72.24	65.75	75.75	70.14	75.35	69.56	7.82	7.75	7.27	6.80	7.26	7.23	7.29	6.58	7.10	6.91	6.99	7.64
12/01/27	12/31/27	Dec 2027	76.49	65.86	70.72	67.32	78.98	67.03	74.66	70.83	73.95	70.34	7.97	7.86	7.41	6.92	7.35	7.32	7.40	6.62	7.23	7.04	7.11	7.76
01/01/28	01/31/28	Jan 2028	68.94	65.61	73.44	67.88	69.06	65.42	74.19	71.07	74.82	70.81	8.17	7.86	7.52	7.04	7.46	7.45	7.58	6.78	7.36	7.16	7.24	7.95
02/01/28	02/29/28	Feb 2028	68.17	65.85	70.28	67.38	67.68	64.08	73.22	71.05	73.80	70.45	8.20	7.89	7.54	7.06	7.50	7.49	7.63	6.82	7.37	7.18	7.26	7.99
03/01/28	03/31/28	Mar 2028	65.70	63.64	68.01	65.62	64.13	62.89	70.77	68.51	71.32	68.15	7.82	7.52	7.16	6.69	7.15	7.14	7.21	6.60	7.00	6.81	6.88	7.56
04/01/28	04/30/28	Apr 2028	68.86	62.87	71.60	65.56	68.39	60.00	73.38	67.98	74.16	68.02	7.83	7.50	7.13	6.58	7.01	6.81	6.61	6.41	6.89	6.70	6.77	6.90
05/01/28	05/31/28	May 2028	64.48	62.92	68.87	65.38	62.14	60.32	70.27	68.37	72.05	68.14	7.90	7.56	7.15	6.61	7.05	6.82	6.55	6.47	6.91	6.73	6.80	6.84
06/01/28	06/30/28	Jun 2028	67.58	63.97	78.88	66.95	66.14	60.36	72.23	68.33	75.22	69.02	8.03	7.60	7.19	6.65	7.11	6.88	6.36	6.52	6.95	6.76	6.84	6.65
07/01/28	07/31/28	Jul 2028	80.48	66.64	91.09	71.35	79.78	64.18	86.62	72.92	87.38	73.46	8.25	7.75	7.29	6.75	7.16	6.93	6.76	6.57	7.05	6.86	6.94	7.05
08/01/28	08/31/28	Aug 2028	83.61	66.85	92.60	70.32	83.05	64.07	89.03	72.25	89.27	72.82	8.30	7.79	7.33	6.78	7.20	6.96	6.70	6.60	7.08	6.89	6.97	6.98
09/01/28	09/30/28	Sep 2028	77.08	65.77	81.29	68.62	76.59	62.69	81.97	71.31	82.67	71.83	7.91	7.82	7.28	6.72	7.24	6.98	6.59	6.55	7.03	6.84	6.91	6.87
10/01/28	10/31/28	Oct 2028	68.77	65.19	70.57	67.08	66.22	62.04	73.75	70.35	74.13	70.04	7.94	7.85	7.32	6.76	7.28	7.02	6.79	6.56	7.06	6.88	6.95	7.07
11/01/28	11/30/28	Nov 2028	74.78	66.67	74.59	68.38	75.47	67.98	78.16	72.26	77.61	71.61	8.02	7.92	7.42	6.93	7.48	7.45	7.51	6.78	7.23	7.04	7.12	7.86
12/01/28	12/31/28	Dec 2028	81.54	69.27	72.19	69.10	81.61	69.78	76.60	72.97	75.69	72.16	8.18	8.04	7.61	7.05	7.55	7.53	7.78	6.82	7.36	7.17	7.25	8.13
01/01/29	01/31/29	Jan 2029	71.16	68.02	75.66	69.96	71.18	67.44	76.53	73.36	77.02	73.03	8.39	8.12	7.74	7.18	7.69	7.68	7.97	6.99	7.49	7.30	7.38	8.33
02/01/29	02/28/29	Feb 2029	70.62	68.00	72.78	69.69	69.93	66.44	75.82	73.20	76.31	72.63	8.43	8.16	7.78	7.21	7.73	7.73	8.02	7.03	7.53	7.34	7.42	8.38
03/01/29	03/31/29	Mar 2029	67.69	66.14	69.62	67.31	66.29	65.05	72.93	70.60	73.02	69.90	8.00	7.75	7.33	6.84	7.39	7.39	7.45	6.82	7.15	6.96	7.04	7.81
04/01/29	04/30/29	Apr 2029	70.61	64.99	73.20	67.21	69.14	61.58	74.82	70.10	75.50	69.81	8.00	7.70	7.29	6.73	7.21	7.00	6.79	6.58	7.03	6.84	6.91	7.08
05/01/29	05/31/29	May 2029	66.34	64.27	70.57	67.45	64.10	60.97	71.89	69.99	73.90	70.32	8.07	7.77	7.27	6.72	7.24	7.01	6.72	6.63	7.02	6.84	6.91	7.01
06/01/29	06/30/29	Jun 2029	68.25	65.13	79.93	68.65	67.31	63.23	73.60	69.61	76.41	70.52	8.22	7.81	7.32	6.76	7.29	7.05	6.51	6.67	7.07	6.88	6.95	6.80
07/01/29	07/31/29	Jul 2029	82.30	68.54	93.76	72.95	81.36	65.70	88.73	74.21	89.48	74.89	8.42	7.98	7.45	6.89	7.35	7.11	6.93	6.74	7.19	7.01	7.08	7.23
08/01/29	08/31/29	Aug 2029	84.50	68.53	93.96	72.22	84.22	65.31	90.19	74.05	90.74	74.77	8.47	8.02	7.49	6.92	7.40	7.15	6.95	6.77	7.22	7.04	7.11	7.23
09/01/29	09/30/29	Sep 2029	78.05	67.84	81.67	70.61	76.89	64.92	82.91	73.17	83.58	73.51	8.29	8.05	7.46	6.90	7.44	7.17	6.84	6.75	7.20	7.01	7.08	7.12
10/01/29	10/31/29	Oct 2029	70.09	66.89	72.20	68.79	67.39	63.95	75.18	72.02	75.33	71.62	8.19	8.09	7.50	6.93	7.48	7.21	6.98	6.75	7.24	7.05	7.12	7.26
11/01/29	11/30/29	Nov 2029	76.16	68.24	75.46	69.41	76.81	69.74	79.07	73.16	78.35	72.43	8.24	8.13	7.60	7.05	7.65	7.63	7.70	6.95	7.35	7.17	7.24	8.04
12/01/29	12/31/29	Dec 2029	81.07	70.76	74.07	70.38	82.75	71.48	78.37	74.60	77.57	73.84	8.41	8.27	7.77	7.18	7.76	7.73	7.98	7.01	7.49	7.30	7.38	8.34
01/01/30	01/31/30	Jan 2030	72.64	69.58	77.12	71.47	73.74	69.55	78.02	74.71	78.61	74.35	8.62	8.32	7.90	7.30	7.88	7.87	8.18	7.18	7.62	7.43	7.50	8.54
02/01/30	02/28/30	Feb 2030	72.70	69.69	74.67	71.35	71.92	68.98	77.84	74.71	78.30	74.23	8.65	8.36	7.94	7.34	7.93	7.92	8.23	7.22	7.65	7.46	7.54	8.59

03/01/30	03/31/30	Mar 2030	68.57	65.97	70.89	68.17	67.51	66.10	73.73	71.40	74.35	70.81	8.08	7.87	7.40	6.84	7.47	7.46	7.53	6.88	7.16	6.97	7.04	7.89
04/01/30	04/30/30	Apr 2030	72.67	66.21	75.19	68.56	71.56	63.05	76.98	71.39	77.61	71.22	8.10	7.84	7.33	6.76	7.34	7.12	6.89	6.67	7.07	6.88	6.95	7.18
05/01/30	05/31/30	May 2030	67.86	65.67	71.90	68.64	64.54	62.04	73.96	71.60	75.25	71.47	8.16	7.91	7.36	6.79	7.36	7.13	6.81	6.71	7.10	6.91	6.98	7.09
06/01/30	06/30/30	Jun 2030	69.63	67.09	81.62	70.34	68.08	63.60	74.96	71.91	78.22	72.37	8.33	7.95	7.41	6.83	7.42	7.18	6.61	6.78	7.14	6.95	7.02	6.90
07/01/30	07/31/30	Jul 2030	83.89	70.03	95.88	74.41	82.68	67.23	90.73	75.99	91.51	76.67	8.56	8.13	7.59	6.93	7.50	7.25	7.06	6.86	7.24	7.05	7.12	7.35
08/01/30	08/31/30	Aug 2030	86.37	70.23	95.76	73.93	86.08	66.94	92.20	76.02	92.67	76.59	8.61	8.17	7.63	6.97	7.54	7.28	7.07	6.88	7.27	7.08	7.15	7.35
09/01/30	09/30/30	Sep 2030	79.86	69.30	83.59	71.80	78.89	66.37	84.37	74.61	85.02	74.63	8.40	8.19	7.57	6.99	7.57	7.31	7.04	6.88	7.29	7.10	7.17	7.32
10/01/30	10/31/30	Oct 2030	71.71	68.11	74.09	70.22	68.87	65.88	76.93	73.39	76.86	73.08	8.34	8.22	7.61	7.03	7.66	7.39	7.14	6.89	7.33	7.14	7.21	7.42
11/01/30	11/30/30	Nov 2030	78.74	70.28	77.99	71.67	78.22	71.88	81.49	75.37	80.89	74.71	8.40	8.37	7.74	7.14	7.84	7.82	7.88	7.09	7.44	7.26	7.33	8.23
12/01/30	12/31/30	Dec 2030	85.51	72.55	75.87	72.05	84.85	73.16	80.30	76.29	79.43	75.45	8.57	8.42	7.90	7.30	7.93	7.92	8.37	7.19	7.61	7.42	7.50	8.73
01/01/31	01/31/31	Jan 2031	75.76	72.03	79.77	74.02	74.90	71.47	81.16	77.12	81.66	76.77	8.79	8.64	8.07	7.45	8.12	8.10	8.59	7.37	7.77	7.58	7.65	8.95
02/01/31	02/28/31	Feb 2031	74.87	71.01	77.05	73.22	73.89	70.65	80.05	76.06	80.52	75.81	8.84	8.63	8.11	7.49	8.17	8.15	8.64	7.42	7.81	7.62	7.70	9.00
03/01/31	03/31/31	Mar 2031	71.32	69.71	73.48	70.63	69.79	68.47	76.60	74.18	77.09	73.42	8.37	8.14	7.67	7.06	7.75	7.75	7.82	7.16	7.37	7.18	7.26	8.18
04/01/31	04/30/31	Apr 2031	72.89	68.26	76.53	71.33	71.65	65.10	78.03	73.48	78.99	73.92	8.40	8.13	7.59	7.00	7.61	7.39	7.17	6.94	7.30	7.11	7.18	7.46
05/01/31	05/31/31	May 2031	70.04	67.64	75.11	71.33	66.75	63.61	76.59	73.82	78.48	74.01	8.46	8.20	7.62	7.04	7.66	7.59	7.08	6.99	7.34	7.15	7.23	7.37
06/01/31	06/30/31	Jun 2031	72.48	69.00	84.87	72.63	71.22	66.97	77.81	73.62	81.00	74.50	8.62	8.25	7.67	7.08	7.72	7.49	6.91	7.08	7.39	7.20	7.27	7.20
07/01/31	07/31/31	Jul 2031	87.23	72.77	99.06	77.15	86.40	69.91	93.43	78.09	94.32	78.91	8.86	8.45	7.89	7.18	7.81	7.55	7.35	7.14	7.49	7.30	7.37	7.65
08/01/31	08/31/31	Aug 2031	89.00	73.11	98.97	76.85	88.55	69.97	94.81	78.25	95.53	78.90	8.91	8.48	7.92	7.21	7.85	7.58	7.37	7.17	7.51	7.33	7.40	7.65
09/01/31	09/30/31	Sep 2031	81.76	71.88	86.15	74.07	81.16	68.86	86.64	76.79	87.40	76.73	8.67	8.48	7.88	7.22	7.89	7.62	7.33	7.16	7.52	7.33	7.41	7.61
10/01/31	10/31/31	Oct 2031	73.97	70.67	76.31	72.61	71.33	67.65	79.26	75.64	79.43	75.29	8.59	8.52	7.86	7.26	7.95	7.68	7.42	7.17	7.56	7.37	7.44	7.71
11/01/31	11/30/31	Nov 2031	79.51	72.81	80.10	73.83	79.21	73.97	83.68	77.59	83.13	76.88	8.65	8.57	7.98	7.40	8.12	8.10	8.17	7.36	7.71	7.52	7.59	8.52
12/01/31	12/31/31	Dec 2031	86.99	74.43	78.14	74.54	87.44	75.92	82.13	78.80	81.53	77.95	8.86	8.72	8.18	7.56	8.24	8.23	8.75	7.49	7.87	7.68	7.76	9.11
01/01/32	01/31/32	Jan 2032	76.94	73.50	80.96	75.78	76.64	72.82	82.44	78.74	82.95	78.43	8.97	8.81	8.23	7.60	8.28	8.27	8.76	7.52	7.92	7.72	7.80	9.12
02/01/32	02/29/32	Feb 2032	76.45	72.95	78.55	74.80	75.46	71.84	81.49	77.91	82.01	77.48	9.02	8.80	8.27	7.64	8.33	8.31	8.81	7.57	7.96	7.77	7.85	9.17
03/01/32	03/31/32	Mar 2032	73.19	70.13	75.03	72.01	71.66	70.27	78.20	75.51	78.74	74.71	8.54	8.30	7.82	7.20	7.90	7.90	7.97	7.30	7.51	7.32	7.40	8.33
04/01/32	04/30/32	Apr 2032	74.16	69.92	77.83	72.24	72.53	66.46	79.15	75.05	80.15	74.80	8.56	8.30	7.75	7.14	7.77	7.54	7.31	7.08	7.44	7.25	7.32	7.60
05/01/32	05/31/32	May 2032	70.27	68.87	76.14	72.99	67.20	65.01	77.91	75.32	79.54	75.65	8.63	8.36	7.77	7.18	7.81	7.74	7.22	7.13	7.48	7.29	7.37	7.51
06/01/32	06/30/32	Jun 2032	73.09	69.14	86.52	74.23	70.79	67.61	78.55	74.72	82.71	75.65	8.79	8.41	7.82	7.22	7.88	7.64	7.05	7.22	7.53	7.34	7.41	7.34
07/01/32	07/31/32	Jul 2032	88.36	74.21	100.15	79.13	87.55	71.16	94.07	79.49	95.18	80.41	9.04	8.62	8.05	7.33	7.96	7.70	7.50	7.29	7.63	7.44	7.52	7.79
08/01/32	08/31/32	Aug 2032	90.99	74.44	101.40	78.33	90.53	70.93	96.23	79.81	97.12	80.60	9.09	8.65	8.08	7.36	8.01	7.73	7.52	7.31	7.66	7.47	7.54	7.80
09/01/32	09/30/32	Sep 2032	82.58	72.97	87.50	75.55	81.61	70.11	87.58	78.28	88.30	78.32	8.84	8.65	8.03	7.36	8.05	7.77	7.48	7.30	7.67	7.48	7.55	7.76
10/01/32	10/31/32	Oct 2032	75.77	71.26	77.79	73.71	72.73	69.40	80.95	76.62	81.18	76.49	8.76	8.69	8.01	7.40	8.11	7.83	7.57	7.32	7.70	7.51	7.59	7.86
11/01/32	11/30/32	Nov 2032	80.30	74.04	80.64	75.04	78.71	75.31	83.48	78.55	83.45	77.86	8.82	8.74	8.14	7.55	8.29	8.26	8.34	7.51	7.85	7.66	7.74	8.68
12/01/32	12/31/32	Dec 2032	87.10	75.94	79.49	76.17	87.79	77.75	83.59	80.02	83.08	79.21	9.04	8.90	8.34	7.71	8.41	8.39	8.93	7.64	8.02	7.83	7.91	9.29
01/01/33	01/31/33	Jan 2033	78.43	74.08	82.48	77.29	77.72	74.85	83.90	79.41	84.43	79.64	9.15	8.99	8.39	7.75	8.45	8.43	8.93	7.67	8.07	7.88	7.95	9.30
02/01/33	02/28/33	Feb 2033	78.33	73.96	80.60	76.76	77.10	73.80	83.65	79.20	84.04	79.27	9.20	8.98	8.44	7.80	8.50	8.48	8.98	7.72	8.11	7.92	8.00	9.35
03/01/33	03/31/33	Mar 2033	74.02	71.19	76.76	73.70	73.39	72.08	79.58	76.37	80.17	76.28	8.71	8.47	7.98	7.34	8.06	8.06	8.13	7.45	7.66	7.47	7.54	8.49
04/01/33	04/30/33	Apr 2033	76.40	72.10	79.60	74.61	74.37	69.06	81.37	76.41	82.24	76.64	8.73	8.46	7.90	7.28	7.92	7.69	7.46	7.22	7.58	7.39	7.47	7.75
05/01/33	05/31/33	May 2033	73.70	70.82	78.55	75.07	70.38	66.76	80.20	77.84	81.72	77.80	8.81	8.53	7.93	7.32	7.97	7.90	7.37	7.27	7.63	7.44	7.51	7.66
06/01/33	06/30/33	Jun 2033	75.94	72.48	88.95	76.36	73.85	69.76	81.00	76.77	84.89	77.44	8.97	8.58	7.98	7.37	8.04	7.79	7.19	7.37	7.67	7.48	7.56	7.48
07/01/33	07/31/33	Jul 2033	90.86	76.17	102.81	81.46	89.94	73.23	96.91	81.58	97.93	82.35	9.22	8.79	8.21	7.47	8.12	7.85	7.65	7.43	7.78	7.59	7.66	7.94
08/01/33	08/31/33	Aug 2033	93.43	76.28	103.90	80.22	93.13	72.86	98.83	81.67	99.70	82.14	9.27	8.82	8.24	7.50	8.17	7.89	7.67	7.46	7.81	7.62	7.69	7.95
09/01/33	09/30/33	Sep 2033	83.98	74.58	89.41	77.34	82.66	72.21	88.91	79.88	89.61	79.93	9.02	8.82	8.19	7.51	8.21	7.92	7.63	7.45	7.81	7.63	7.70	7.91
10/01/33	10/31/33	Oct 2033	77.42	72.62	79.83	75.74	74.16	71.24	82.71	78.09	82.92	78.41	8.93	8.86	8.17	7.55	8.27	7.99	7.72	7.46	7.85	7.66	7.74	8.01
11/01/33	11/30/33	Nov 2033	81.64	75.43	82.89	76.97	81.48	77.54	85.76	80.35	85.67	79.76	9.00	8.92	8.30	7.70	8.45	8.43	8.50	7.66	8.00	7.82	7.89	8.85
12/01/33	12/31/33	Dec 2033	87.47	77.87	81.50	78.16	88.52	79.03	85.51	81.93	84.96	81.16	9.22	9.07	8.51	7.87	8.58	8.56	9.11	7.79	8.18	7.99	8.06	9.46
01/01/34	01/31/34	Jan 2034	80.61	76.52	84.77	79.21	79.99	76.79	85.86	81.86	86.51	81.52	9.33	9.17	8.56	7.91	8.62	8.60	9.11	7.83	8.22	8.03	8.11	9.48
02/01/34	02/28/34	Feb 2034	79.58	75.32	82.08	78.19	78.77	75.91	84.99	80.79	85.63	80.66	9.38	9.16	8.61	7.95	8.66	8.65	9.16	7.87	8.27	8.08	8.15	9.53
03/01/34	03/31/34	Mar 2034	76.33	74.46	78.81	75.99	74.90	73.71	81.77	79.01	82.36	78.44	8.88	8.63	8.14	7.49	8.22	8.22	8.30	7.60	7.80	7.61	7.69	8.65
04/01/34	04/30/34	Apr 2034	77.40	73.46	81.43	76.69	74.49	70.17	81.95	78.15	83.47	78.73	8.91	8.63	8.06	7.42	8.08	7.84	7.61	7.37	7.73	7.54	7.61	7.90
05/01/34	05/31/34	May 2034	73.80	71.37	79.92	76.83	69.80	67.57	81.81	78.08	83.11	78.75	8.98	8.70	8.09	7.47	8.13	8.05	7.51	7.42	7.77	7.58	7.66	7.80
06/01/34	06/30/34	Jun 2034	76.17	72.17	90.25	78.19	73.88	70.88	82.10	77.92	86.00	78.81	9.15	8.75	8.14	7.51	8.20	7.94	7.34	7.52	7.82	7.63	7.70	7.63
07/01/34	07/31/34	Jul 2034	92.62	77.84	104.44	83.30	91.81	74.57	98.13	83.18	99.22	83.98	9.40	8.97	8.38	7.62	8.28	8.01	7.80	7.58	7.93	7.74	7.81	8.10
08/01/34	08/31/34	Aug 2034	95.13	77.88	105.54	82.10	94.76	74.38	100.46	83.39	101.35	83.77	9.46	8.99	8.40	7.65	8.33	8.05	7.82	7.61	7.96	7.77	7.84	8.10
09/01/34	09/30/34	Sep 2034	86.16	75.99	90.95	79.60	84.67	74.07	90.98	81.49	91.58	81.81	9.20	9.00	8.36	7.66	8.37	8.08	7.78	7.60	7.96	7.78	7.85	8.06
10/01/34	10/31/34	Oct 2034	79.22	74.89	81.38	78.09	76.47	72.95	84.46	80.34	84.81	80.59	9.11	9.04	8.34	7.70	8.44	8.15	7.88	7.61	8.00	7.81	7.89	8.16
11/01/34	11/30/34	Nov 2034	84.18	77.15	84.77	78.76	82.43	79.41	88.09	82.22	87.72	81.56	9.18	9.10	8.47	7.85	8.62	8.60	8.67	7.81	8.16	7.97	8.04	9.02
12/01/34	12/31/34	Dec 2034	90.27	79.06	83.30	79.94	90.56	81.36	87.28	82.74	86.75	82.45	9.40	9.26	8.68	8.02	8.75	8.73	9.29	7.94	8.33	8.14	8.22	9.65
01/01/35	01/31/35	Jan 2035	82.19	77.49	87.66	81.21	82.01	78.42	87.64	82.94	88.32	83.09	9.52	9.35	8.73	8.06	8.79	8.77	9.29	7.98	8.38	8.19	8.27	9.66
02/01/35	02/28/35	Feb 2035	81.66	77.42	84.29	80.21	80.60	77.60	87.02	82.78	87.59	82.75	9.57	9.34	8.78	8.11	8.84	8.82	9.35	8.03	8.43	8.24	8.31	9.71
03/01/35	03/31/35	Mar 2035	78.00	75.14	80.45	77.63	76.91	75.48	83.20	80.25	83.78	80.06	9.06	8.81	8.30	7.64	8.39	8.39	8.46	7.75	7.95	7.76	7.84	8.82
04/01/35	04/30/35	Apr 2035	80.12	75.66	83.76	79.03	77.68	73.26	85.01	79.61	85.95	80.22	9.09	8.80	8.22	7.57	8.24	8.00	7.76	7.51	7.88	7.69	7.76	8.05
05/01/35	05/31/35	May 2035	77.47	74.09	82.55	79.51	74.17	69.90	84.15	81.68	85.76	82.01	9.16	8.88	8.25	7.62	8.29	8.21	7.67	7.56	7.92	7.73	7.81	7.95
06/01/35	06/30/35	Jun 2035	79.39	75.83	92.29	80.88	77.39	72.84	84.75	80.81	88.07	80.90	9.33	8.93	8.30	7.66	8.36	8.10	7.48	7.67	7.97	7.78	7.85	7.77
07/01/35	07/31/35	Jul 2035	95.74	80.03	108.19	85.80	95.23	77.49	101.34	84.95	102.45	85.80	9.59	9.15	8.54	7.78	8.45	8.17	7.96	7.73	8.08	7.89	7.97	8.25
08/01/35	08/31/35	Aug 2035	97.94	80.22	108.39	84.39	97.54	77.07	103.28	85.07	104.15	85.57	9.65	9.17	8.57	7.81	8.50	8.21	7.98	7.76	8.11	7.92	7.99	8.26
09/01/35	09/30/35	Sep 2035	89.11	78.66	93.86	81.88	87.70	76.22	93.97	84.01	94.57	84.25	9.38	9.18	8.52	7.81	8.54	8.24	7.94	7.75	8.12	7.93	8.00	8.22
10/01/35	10/31/35	Oct 2035	80.93	76.14	83.22	80.08	78.00	74.79	86.24	81.65	86.65	81.78	9.29	9.22	8.50	7.85	8.61	8.31	8.03	7.76	8.16	7.97	8.04	8.32
11/01/35	11/30/35	Nov 2035	85.67	79.24	86.85	80.86	84.97	81.47	89.78	84.33	89.38	83.46	9.36	9.28	8.64	8.01	8.79	8.77	8.85	7.97	8.32	8.13	8.20	9.19
12/01/35	12/31/35	Dec 2035	93.06	81.22	85.70	81.93	94.11	83.28	89.77	85.65	89.12	84.84	9.59	9.44	8.85	8.18	8.92	8.91	9.47	8.10	8.50	8.31	8.38	9.83
01/01/36	01/31/36	Jan 2036	84.45	80.02	89.85	83.31	84.22	80.51	89.77	85.48	90.45	85.45	9.71	9.54	8.91	8.23	8.96	8.95	9.48	8.14	8.54	8.35	8.43	9.84
02/01/36	02/29/36	Feb 2036	83.85	79.63	86.36	82.60	82.71	79.84	89.21	85.03	89.86	84.89	9.76	9.53	8.96	8.27	9.01	9.00	9.53	8.19	8.59	8.40	8.48	9.90
03/01/36	03/31/36	Mar 2036	80.03	78.05	82.72	79.81	78.86	77.09	85.60	82.83	86.21	82.44	9.24	8.98	8.47	7.79	8.55	8.55	8.63	7.90	8.11	7.92	7.99	8.99
04/01/36	04/30/36	Apr 2036	81.82	77.24	85.79	80.73	78.88	73.89	86.70	82.57	87.83	82.96	9.27	8.98	8.39	7.72	8.41	8.16	7.91	7.66	8.03	7.84	7.91	8.20

05/01/36	05/31/36	May 2036	77.41	74.63	84.62	81.53	73.87	70.41	85.84	83.53	87.77	83.97	9.34	9.05	8.41	7.77	8.45	8.38	7.82	7.72	8.07	7.89	7.96	8.11
06/01/36	06/30/36	Jun 2036	79.53	75.60	94.82	83.26	76.96	74.17	85.88	81.45	90.00	82.08	9.52	9.11	8.46	7.82	8.53	8.26	7.63	7.82	8.12	7.93	8.01	7.92
07/01/36	07/31/36	Jul 2036	96.88	81.29	109.89	87.54	95.96	78.41	102.80	86.59	104.14	87.36	9.78	9.33	8.71	7.93	8.62	8.33	8.12	7.89	8.24	8.05	8.12	8.41
08/01/36	08/31/36	Aug 2036	98.73	81.60	110.03	86.76	98.34	78.72	104.55	87.05	105.49	87.60	9.84	9.36	8.74	7.96	8.67	8.37	8.14	7.92	8.27	8.08	8.15	8.42
09/01/36	09/30/36	Sep 2036	89.74	78.65	95.45	83.59	87.91	77.56	94.47	84.16	94.96	84.60	9.57	9.36	8.70	7.97	8.71	8.41	8.09	7.90	8.27	8.08	8.16	8.38
10/01/36	10/31/36	Oct 2036	83.05	77.81	85.04	82.15	79.54	76.72	88.12	83.29	88.49	83.78	9.48	9.40	8.67	8.01	8.78	8.48	8.19	7.92	8.31	8.12	8.20	8.48
11/01/36	11/30/36	Nov 2036	87.03	81.14	88.60	83.06	86.12	83.95	91.46	86.00	91.35	85.51	9.55	9.46	8.81	8.17	8.97	8.94	9.02	8.13	8.48	8.29	8.36	9.37
12/01/36	12/31/36	Dec 2036	96.17	82.84	87.24	83.69	94.79	85.25	91.29	86.83	90.71	86.19	9.78	9.63	9.03	8.35	9.10	9.08	9.66	8.26	8.66	8.47	8.54	10.02
01/01/37	01/31/37	Jan 2037	86.27	80.76	92.03	85.47	87.19	82.87	91.56	86.29	92.29	86.79	9.90	9.73	9.08	8.39	9.14	9.13	9.67	8.31	8.71	8.52	8.59	10.03
02/01/37	02/28/37	Feb 2037	85.77	82.27	88.30	84.83	85.32	81.90	91.08	87.66	91.81	87.05	9.96	9.72	9.13	8.44	9.20	9.18	9.73	8.35	8.76	8.56	8.64	10.09
03/01/37	03/31/37	Mar 2037	81.91	78.76	84.73	82.06	80.84	79.23	87.42	84.08	88.16	84.44	9.42	9.16	8.64	7.95	8.73	8.73	8.80	8.06	8.26	8.07	8.15	9.16
04/01/37	04/30/37	Apr 2037	83.33	78.72	87.94	82.51	80.48	75.86	88.49	83.86	89.58	84.48	9.45	9.16	8.55	7.88	8.57	8.32	8.07	7.82	8.18	7.99	8.07	8.36
05/01/37	05/31/37	May 2037	79.72	76.43	87.09	83.81	76.24	72.24	88.37	84.73	90.06	85.52	9.53	9.24	8.58	7.93	8.62	8.55	7.97	7.87	8.23	8.04	8.11	8.26
06/01/37	06/30/37	Jun 2037	82.67	77.75	97.84	85.46	81.25	76.30	88.71	83.51	92.64	83.84	9.71	9.29	8.63	7.97	8.70	8.43	7.79	7.98	8.28	8.09	8.16	8.08
07/01/37	07/31/37	Jul 2037	100.40	83.60	113.04	90.08	99.37	80.70	105.96	88.97	107.19	89.70	9.98	9.52	8.89	8.09	8.79	8.50	8.28	8.04	8.40	8.21	8.28	8.57
08/01/37	08/31/37	Aug 2037	101.93	83.92	112.90	89.08	101.69	80.95	107.54	89.14	108.46	89.67	10.03	9.55	8.92	8.12	8.84	8.54	8.30	8.07	8.42	8.24	8.31	8.58
09/01/37	09/30/37	Sep 2037	93.20	81.05	98.03	85.81	91.88	79.66	97.92	86.52	98.49	87.13	9.76	9.55	8.87	8.13	8.89	8.58	8.26	8.06	8.43	8.24	8.32	8.54
10/01/37	10/31/37	Oct 2037	85.54	80.18	87.60	84.40	82.70	78.73	90.57	85.60	91.05	86.31	9.67	9.59	8.85	8.17	8.96	8.65	8.36	8.08	8.47	8.29	8.36	8.64
11/01/37	11/30/37	Nov 2037	90.05	83.39	91.48	85.39	90.17	85.68	94.29	88.73	94.29	87.94	9.74	9.65	8.98	8.33	9.15	9.12	9.20	8.29	8.64	8.45	8.52	9.55
12/01/37	12/31/37	Dec 2037	98.59	85.66	89.83	85.85	97.99	88.32	93.81	89.51	93.15	88.44	9.98	9.82	9.21	8.51	9.28	9.26	9.86	8.43	8.83	8.64	8.71	10.21
01/01/38	01/31/38	Jan 2038	90.06	83.34	95.13	88.04	91.85	86.66	94.86	88.81	95.53	89.26	10.10	9.93	9.27	8.56	9.33	9.31	9.86	8.47	8.87	8.68	8.76	10.23
02/01/38	02/28/38	Feb 2038	88.88	83.84	91.06	87.09	88.42	85.23	93.61	89.37	94.30	89.30	10.16	9.91	9.32	8.61	9.38	9.36	9.92	8.52	8.92	8.73	8.81	10.28
03/01/38	03/31/38	Mar 2038	84.84	81.08	87.09	84.25	83.47	81.58	89.72	86.20	90.55	86.44	9.61	9.35	8.81	8.11	8.90	8.90	8.98	8.22	8.42	8.23	8.31	9.34
04/01/38	04/30/38	Apr 2038	85.84	79.84	90.27	84.85	83.70	77.96	91.12	85.01	92.00	85.80	9.64	9.34	8.72	8.04	8.75	8.49	8.23	7.97	8.34	8.15	8.22	8.52
05/01/38	05/31/38	May 2038	80.43	78.16	89.58	86.24	77.48	74.31	90.34	86.88	91.98	87.64	9.72	9.42	8.75	8.08	8.80	8.72	8.13	8.03	8.39	8.20	8.27	8.42
06/01/38	06/30/38	Jun 2038	84.44	79.24	100.00	87.68	82.99	77.31	90.69	85.36	94.88	85.65	9.90	9.47	8.81	8.13	8.87	8.60	7.94	8.14	8.44	8.25	8.32	8.23
07/01/38	07/31/38	Jul 2038	101.83	85.22	115.10	92.53	100.40	82.41	108.28	91.13	109.40	91.75	10.18	9.71	9.07	8.25	8.97	8.67	8.45	8.21	8.56	8.37	8.44	8.74
08/01/38	08/31/38	Aug 2038	105.43	85.82	116.49	91.15	105.20	82.99	111.27	91.39	111.98	91.99	10.24	9.74	9.09	8.29	9.02	8.71	8.46	8.24	8.59	8.40	8.47	8.75
09/01/38	09/30/38	Sep 2038	95.80	83.12	100.41	88.22	94.17	82.27	100.79	88.62	101.16	89.31	9.96	9.74	9.05	8.29	9.07	8.75	8.42	8.22	8.59	8.41	8.48	8.70
10/01/38	10/31/38	Oct 2038	88.16	81.88	89.91	86.45	85.28	81.39	93.08	87.45	93.28	88.14	9.86	9.78	9.02	8.33	9.14	8.82	8.53	8.24	8.64	8.45	8.52	8.81
11/01/38	11/30/38	Nov 2038	94.67	85.50	93.08	87.25	93.28	87.52	95.78	89.81	95.50	88.90	9.94	9.85	9.16	8.50	9.33	9.31	9.39	8.46	8.81	8.62	8.69	9.73
12/01/38	12/31/38	Dec 2038	98.72	87.81	91.43	88.03	101.55	90.37	95.67	91.39	95.01	90.66	10.18	10.02	9.39	8.68	9.47	9.45	10.05	8.60	9.00	8.81	8.88	10.41
01/01/39	01/31/39	Jan 2039	91.27	84.99	96.01	90.32	91.06	88.25	96.47	90.61	96.99	91.12	10.30	10.12	9.45	8.73	9.51	9.50	10.06	8.64	9.05	8.85	8.93	10.42
02/01/39	02/28/39	Feb 2039	90.36	85.14	93.03	89.21	89.59	86.78	95.66	90.60	96.05	91.11	10.36	10.11	9.50	8.78	9.57	9.55	10.12	8.69	9.10	8.91	8.98	10.48
03/01/39	03/31/39	Mar 2039	84.70	81.61	89.00	85.66	85.31	83.48	91.88	86.91	92.55	87.81	9.80	9.53	8.99	8.27	9.08	9.08	9.16	8.39	8.58	8.39	8.47	9.52
04/01/39	04/30/39	Apr 2039	87.29	82.13	92.67	86.98	85.85	80.21	93.33	87.28	94.58	88.14	9.84	9.53	8.90	8.20	8.92	8.66	8.40	8.13	8.50	8.31	8.38	8.69
05/01/39	05/31/39	May 2039	82.60	80.08	91.41	88.17	79.64	76.07	92.90	89.72	94.25	90.28	9.92	9.61	8.93	8.25	8.97	8.89	8.30	8.19	8.55	8.36	8.43	8.59
06/01/39	06/30/39	Jun 2039	87.39	81.91	102.43	89.81	85.53	79.40	93.06	87.75	97.38	88.01	10.10	9.66	8.98	8.30	9.05	8.77	8.10	8.30	8.60	8.41	8.49	8.39
07/01/39	07/31/39	Jul 2039	104.42	87.56	117.97	95.09	103.49	84.82	111.07	93.31	112.14	94.07	10.38	9.90	9.25	8.42	9.14	8.84	8.62	8.37	8.72	8.53	8.61	8.91
08/01/39	08/31/39	Aug 2039	107.98	88.00	119.87	93.32	107.72	85.14	113.80	93.36	114.35	93.61	10.44	9.93	9.28	8.45	9.20	8.88	8.63	8.40	8.75	8.57	8.64	8.92
09/01/39	09/30/39	Sep 2039	97.34	85.16	102.30	90.38	95.79	84.67	102.36	90.51	102.68	90.43	10.16	9.93	9.23	8.46	9.25	8.92	8.59	8.39	8.76	8.57	8.64	8.87
10/01/39	10/31/39	Oct 2039	90.21	84.05	92.07	88.61	87.22	83.35	95.26	89.60	95.54	90.24	10.06	9.98	9.20	8.50	9.32	9.00	8.70	8.40	8.80	8.62	8.69	8.98
11/01/39	11/30/39	Nov 2039	96.62	88.26	95.35	89.34	96.18	89.99	98.60	91.86	97.92	91.04	10.13	10.04	9.35	8.67	9.52	9.49	9.57	8.63	8.98	8.79	8.86	9.92
12/01/39	12/31/39	Dec 2039	101.69	90.76	93.64	90.46	102.67	91.76	98.13	94.11	97.23	93.23	10.38	10.22	9.58	8.86	9.66	9.64	10.25	8.77	9.17	8.98	9.05	10.61
01/01/40	01/31/40	Jan 2040	93.97	87.42	98.35	92.64	94.02	90.78	99.14	93.00	99.52	93.53	10.51	10.33	9.64	8.90	9.70	9.69	10.26	8.81	9.22	9.03	9.11	10.62
02/01/40	02/29/40	Feb 2040	92.76	87.30	95.64	91.61	92.02	89.61	97.98	92.85	98.69	93.39	10.57	10.31	9.69	8.96	9.76	9.74	10.32	8.86	9.27	9.08	9.16	10.68
03/01/40	03/31/40	Mar 2040	88.40	84.61	91.27	88.11	87.49	85.95	93.81	89.96	94.57	90.68	10.00	9.72	9.17	8.44	9.26	9.26	9.34	8.55	8.75	8.56	8.63	9.70
04/01/40	04/30/40	Apr 2040	90.99	85.12	94.72	89.04	87.80	82.09	95.76	90.00	96.59	90.79	10.03	9.72	9.08	8.36	9.10	8.83	8.57	8.30	8.66	8.48	8.55	8.85
05/01/40	05/31/40	May 2040	82.86	81.98	93.96	90.39	80.37	77.75	95.77	91.10	96.67	91.77	10.11	9.80	9.11	8.41	9.15	9.07	8.46	8.35	8.71	8.53	8.60	8.75
06/01/40	06/30/40	Jun 2040	88.37	83.71	104.10	92.28	86.68	81.87	95.57	89.91	99.01	90.74	10.30	9.86	9.16	8.46	9.23	8.95	8.26	8.46	8.77	8.58	8.65	8.55
07/01/40	07/31/40	Jul 2040	107.61	89.70	121.35	97.51	106.28	86.93	114.48	95.86	115.43	96.53	10.59	10.10	9.43	8.59	9.33	9.02	8.79	8.54	8.89	8.70	8.78	9.08
08/01/40	08/31/40	Aug 2040	110.76	90.61	122.38	95.86	110.43	87.51	116.65	95.74	117.25	96.29	10.65	10.13	9.46	8.62	9.38	9.06	8.81	8.57	8.92	8.73	8.81	9.09
09/01/40	09/30/40	Sep 2040	100.13	87.75	105.21	93.18	98.51	87.04	105.49	93.38	105.91	93.64	10.36	10.13	9.41	8.63	9.43	9.10	8.76	8.56	8.93	8.74	8.81	9.04
10/01/40	10/31/40	Oct 2040	91.91	85.93	94.56	90.85	89.20	85.44	97.59	91.70	98.03	92.33	10.26	10.18	9.39	8.67	9.50	9.18	8.87	8.57	8.97	8.79	8.86	9.15
11/01/40	11/30/40	Nov 2040	98.42	89.70	97.91	91.81	97.49	91.75	101.47	94.57	100.81	94.35	10.34	10.24	9.53	8.84	9.71	9.68	9.77	8.80	9.15	8.96	9.03	10.11
12/01/40	12/31/40	Dec 2040	103.81	93.26	96.31	92.98	106.14	94.33	101.10	96.38	100.14	95.49	10.59	10.42	9.77	9.03	9.85	9.83	10.46	8.95	9.35	9.16	9.23	10.82
01/01/41	01/31/41	Jan 2041	96.66	89.98	101.06	94.99	96.06	92.61	101.84	95.49	102.17	96.06	10.72	10.53	9.83	9.08	9.90	9.88	10.47	8.99	9.40	9.21	9.28	10.83
02/01/41	02/28/41	Feb 2041	95.05	89.61	97.72	93.86	94.23	91.71	100.46	95.25	101.12	95.76	10.78	10.52	9.89	9.14	9.95	9.94	10.53	9.04	9.45	9.26	9.34	10.89
03/01/41	03/31/41	Mar 2041	90.94	87.34	93.74	90.39	89.50	87.88	96.48	92.73	97.18	92.87	10.20	9.92	9.35	8.61	9.44	9.44	9.53	8.72	8.92	8.73	8.80	9.89
04/01/41	04/30/41	Apr 2041	93.72	87.63	97.48	91.42	90.99	84.42	99.60	93.07	100.15	93.62	10.23	9.91	9.26	8.53	9.28	9.01	8.74	8.46	8.83	8.64	8.72	9.03
05/01/41	05/31/41	May 2041	86.60	84.28	96.94	92.82	83.41	80.14	97.99	94.32	99.19	94.76	10.32	10.00	9.29	8.58	9.33	9.25	8.63	8.52	8.88	8.69	8.77	8.92
06/01/41	06/30/41	Jun 2041	91.90	86.52	106.94	94.91	90.18	84.93	98.35	92.52	101.75	93.34	10.51	10.05	9.34	8.63	9.41	9.13	8.43	8.63	8.94	8.75	8.82	8.72
07/01/41	07/31/41	Jul 2041	110.45	92.38	124.62	100.07	108.78	89.20	117.52	98.28	118.37	98.84	10.80	10.30	9.62	8.76	9.51	9.20	8.96	8.71	9.06	8.87	8.95	9.26
08/01/41	08/31/41	Aug 2041	113.25	93.07	125.00	98.63	112.89	90.24	119.31	98.23	119.82	98.37	10.86	10.33	9.65	8.79	9.57	9.24	8.98	8.74	9.09	8.91	8.98	9.26
09/01/41	09/30/41	Sep 2041	103.96	90.17	108.77	95.65	102.08	89.31	108.94	95.91	109.39	96.47	10.57	10.33	9.60	8.80	9.62	9.28	8.94	8.73	9.10	8.91	8.99	9.22
10/01/41	10/31/41	Oct 2041	94.16	87.99	96.78	93.05	92.28	87.63	99.80	93.71	100.26	94.42	10.47	10.38	9.58	8.84	9.69	9.36	9.05	8.74	9.15	8.96	9.03	9.33
11/01/41	11/30/41	Nov 2041	101.14	92.42	100.07	93.92	99.36	94.41	103.43	96.37	102.59	95.42	10.54	10.45	9.72	9.02	9.90	9.88	9.96	8.97	9.33	9.14	9.21	10.31
12/01/41	12/31/41	Dec 2041	107.16	95.75	99.01	95.37	108.77	96.39	103.59	98.91	102.70	98.02	10.80	10.63	9.97	9.22	10.05	10.03	10.67	9.13	9.53	9.34	9.41	11.03
01/01/42	01/31/42	Jan 2042	98.59	91.78	103.08	96.89	97.98	94.46	103.88	97.40	104.21	97.98	10.93	10.74	10.03	9.26	10.10	10.08	10.67	9.17	9.58	9.39	9.47	11.04
02/01/42	02/28/42	Feb 2042	96.95	91.40	99.67	95.74	96.11	93.54	102.47	97.16	103.14	97.68	10.99	10.73	10.09	9.32	10.15	10.13	10.74	9.22	9.63	9.44	9.52	11.10
03/01/42	03/31/42	Mar 2042	92.76	89.09	95.61	92.20	91.29	89.64	98.41	94.58	99.12	94.73	10.40	10.12	9.54	8.78	9.63	9.63	9.72	8.90	9.09	8.90	8.98	10.08
04/01/42	04/30/42	Apr 2042	95.59	89.38	99.43	93.25	92.81	86.11	101.59	94.93	102.15	95.49	10.44	10.11	9.44	8.70	9.47	9.19	8.91	8.63	9.00	8.81	8.89	9.20
05/01/42	05/31/42	May 2042	88.33	85.97	98.88	94.68	85.08	81.74	99.95	96.21	101.17	96.66	10.52	10.20	9.48	8.75	9.52	9.44	8.80	8.69	9.05	8.87	8.94	9.09
06/01/42	06/30/42	Jun 2042	93.74	88.25	109.08	96.81	91.98	86.63	100.32	94.37	103.79	95.21	10.72	10.25	9.53	8.80	9.60	9.31	8.60	8.81	9.11	8.92	8.99	8.89

52048	52078	52048	112.659	94.2276	127.1124	102.0714	110.9556	90.984	119.8704	100.2456	120.7374	100.8168	11.0161	10.507224	9.81342	8.932038	9.704586	9.386346	$ 9.144	$ 8.882	9.244056	9.051582	9.126144	9.441324

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
3/30/2012		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
0312 Official Forward Price Curve:		:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
Blend of...																								
0312C Midas forecast completed 3/20/2012 3/30/2012 forward market curve																								
			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
04/01/12	04/30/12	Apr 2012	19.96	5.98	21.70	14.38	15 91	2.26	22.65	13.87	25.18	14.86	2.19	2.37	1.92	1.84	2.07	2.00	1.98	1.78	2.09	1.96	1.98	2.06
05/01/12	05/31/12	May 2012	18.00	4.75	24.25	13.25	15.00	1.70	24.00	13.25	25.00	13.75	2.13	2.24	1.95	1.98	2.04	2.02	1.85	1.77	2.23	2.03	2.05	1.97
06/01/12	06/30/12	Jun 2012	18.25	2.00	25.50	12.50	14.00	0.25	23.75	12.50	25.25	12.50	2.26	2.30	2.07	2.07	2.12	2.10	1.92	1.80	2.33	2.12	2.14	2.05
07/01/12	07/31/12	Jul 2012	26.32	15.41	34.24	19.80	22.00	9.15	29.59	18.57	33.50	19.09	2.39	2.52	2.24	2.24	2.30	2.28	2.12	1.93	2.50	2.29	2.32	2.26
08/01/12	08/31/12	Aug 2012	28.84	21.45	32.32	20.60	26.50	17.21	31.42	20.34	34.51	21.37	2.46	2.62	2.33	2.31	2.38	2.35	2.19	2.00	2.57	2.36	2.39	2.34
09/01/12	09/30/12	Sep 2012	28.84	21.84	29.44	19.60	26.50	20.15	30.50	20.34	32.50	21.79	2.49	2.61	2.35	2.34	2.41	2.38	2.22	2.04	2.60	2.39	2.42	2.37
10/01/12	10/31/12	Oct 2012	25.96	22.92	29.10	21.25	24.92	21.56	30.20	23.04	30.75	22.09	2.57	2.59	2.35	2.40	2.48	2.46	2.42	2.11	2.67	2.46	2.48	2.58
11/01/12	11/30/12	Nov 2012	29.80	25.75	27.69	21.04	27.44	24.50	29.89	24.49	30.14	23.72	2.82	2.87	2.64	2.65	2.77	2.74	2.99	2.45	2.93	2.71	2.74	3.26
12/01/12	12/31/12	Dec 2012	32.75	28.58	27.97	21.46	31.64	27.44	31.42	25.22	31.37	23.95	3.18	3.24	3.00	3.07	3.13	3.11	3.36	2.79	3.37	3.15	3.18	3.64
01/01/13	01/31/13	Jan 2013	35.10	28.62	31.42	24.96	31.86	27.82	35.35	28.84	35.60	27.81	3.33	3.39	3.15	3.22	3.28	3.25	3.51	2.91	3.52	3.30	3.33	3.80
02/01/13	02/28/13	Feb 2013	32.50	25.97	30.81	24.00	29.80	26.78	35.00	28.00	35.25	27.00	3.34	3.40	3.16	3.22	3.29	3.27	3.52	2.93	3.53	3.30	3.33	3.81
03/01/13	03/31/13	Mar 2013	29.90	24.91	29.28	23.04	26.85	23.14	34.65	27.16	34.90	26.19	3.33	3.38	3.15	3.20	3.28	3.25	3.50	2.94	3.50	3.28	3.31	3.80
04/01/13	04/30/13	Apr 2013	29.96	19.25	31.50	19.31	24.08	15.48	31.56	22.71	33.58	23.01	3.31	3.36	3.11	3.12	3.19	3.16	3.09	2.88	3.41	3.19	3.23	3.29
05/01/13	05/31/13	May 2013	25.41	13.06	30.24	18.00	21.50	9.53	30.63	19.16	32.59	16.77	3.36	3.41	3.16	3.17	3.24	3.21	3.13	2.91	3.46	3.24	3.27	3.34
06/01/13	06/30/13	Jun 2013	24.88	8.94	32.76	18.94	18.92	5.64	31.56	17.38	33.58	18.72	3.41	3.46	3.21	3.22	3.29	3.27	3.19	2.95	3.51	3.30	3.33	3.40
07/01/13	07/31/13	Jul 2013	37.03	21.73	42.75	26.50	32.99	20.00	40.43	28.62	43.37	27.65	3.47	3.52	3.27	3.28	3.35	3.32	3.24	2.99	3.57	3.35	3.39	3.45
08/01/13	08/31/13	Aug 2013	42.26	30.25	43.16	27.30	38.79	26.25	42.49	30.98	45.58	29.36	3.49	3.54	3.29	3.30	3.37	3.34	3.27	3.00	3.59	3.38	3.41	3.48
09/01/13	09/30/13	Sep 2013	41.46	30.53	38.60	25.71	36.98	28.75	40.84	28.91	43.81	28.50	3.50	3.54	3.30	3.30	3.38	3.35	3.27	3.05	3.60	3.38	3.42	3.48
10/01/13	10/31/13	Oct 2013	35.88	31.20	37.08	26.50	33.71	29.14	40.10	30.16	40.80	28.74	3.53	3.58	3.33	3.34	3.41	3.38	3.31	3.07	3.64	3.42	3.46	3.52
11/01/13	11/30/13	Nov 2013	39.39	31.85	36.36	25.97	36.25	30.69	40.10	31.12	39.20	29.34	3.66	3.72	3.46	3.49	3.58	3.55	3.84	3.25	3.80	3.58	3.61	4.16
12/01/13	12/31/13	Dec 2013	41.73	34.45	34.56	27.03	38.79	33.17	41.31	33.97	40.00	32.67	3.88	3.94	3.68	3.76	3.80	3.77	4.06	3.46	4.08	3.85	3.89	4.39
01/01/14	01/31/14	Jan 2014	39.85	31.62	36.17	28.34	36.86	31.57	40.85	33.09	41.10	31.31	3.99	4.05	3.79	3.87	3.91	3.88	4.17	3.53	4.19	3.96	4.00	4.50
02/01/14	02/28/14	Feb 2014	37.25	28.97	35.56	27.52	34.80	30.53	40.50	32.25	40.75	30.50	3.98	4.04	3.78	3.84	3.90	3.87	4.16	3.53	4.16	3.93	3.97	4.49
03/01/14	03/31/14	Mar 2014	34.65	27.91	34.03	25.89	31.85	26.89	40.15	31.41	40.40	29.69	3.93	3.99	3.73	3.78	3.85	3.82	4.11	3.49	4.10	3.87	3.91	4.44
04/01/14	04/30/14	Apr 2014	34.71	22.25	35.50	22.21	27.33	19.48	36.81	25.21	39.08	26.26	3.82	3.87	3.58	3.62	3.70	3.67	3.59	3.43	3.92	3.71	3.74	3.82
05/01/14	05/31/14	May 2014	30.16	16.06	34.24	20.90	24.75	13.53	35.88	21.66	38.09	20.02	3.84	3.89	3.60	3.64	3.72	3.69	3.61	3.42	3.94	3.73	3.76	3.84
06/01/14	06/30/14	Jun 2014	29.63	11.94	36.76	21.84	22.17	9.64	36.81	19.88	39.08	21.97	3.87	3.92	3.63	3.67	3.76	3.72	3.64	3.43	3.98	3.76	3.83	3.88
07/01/14	07/31/14	Jul 2014	41.53	25.23	48.25	30.00	38.49	24.25	46.68	33.12	49.62	32.15	3.91	3.96	3.67	3.71	3.79	3.76	3.68	3.45	4.02	3.80	3.87	3.92
08/01/14	08/31/14	Aug 2014	46.76	33.75	48.66	30.80	44.29	30.50	48.74	35.48	51.83	33.86	3.92	3.97	3.69	3.73	3.81	3.78	3.70	3.46	4.03	3.82	3.88	3.94
09/01/14	09/30/14	Sep 2014	45.96	34.03	44.10	29.21	42.48	33.00	47.09	33.41	50.06	33.00	3.93	3.98	3.69	3.73	3.82	3.78	3.70	3.49	4.04	3.82	3.89	3.94
10/01/14	10/31/14	Oct 2014	40.63	34.45	42.58	30.25	39.96	33.89	46.85	35.16	47.30	33.99	3.97	4.02	3.73	3.77	3.85	3.82	3.74	3.52	4.08	3.86	3.93	3.98
11/01/14	11/30/14	Nov 2014	44.14	35.10	41.86	29.72	42.50	35.44	46.85	36.12	45.70	34.59	4.06	4.10	3.87	3.87	3.96	3.93	4.24	3.65	4.19	3.97	4.03	4.58
12/01/14	12/31/14	Dec 2014	46.48	37.70	40.06	30.78	45.04	37.92	48.06	38.97	46.50	37.92	4.26	4.30	4.06	4.12	4.16	4.12	4.43	3.82	4.45	4.22	4.29	4.78
01/01/15	01/31/15	Jan 2015	42.85	33.87	39.42	30.59	40.11	33.82	45.35	36.09	45.60	34.41	4.36	4.40	4.14	4.22	4.28	4.24	4.54	3.89	4.55	4.32	4.39	4.90
02/01/15	02/28/15	Feb 2015	40.25	31.22	38.81	29.77	38.05	32.78	45.00	35.25	45.25	33.60	4.34	4.38	4.12	4.19	4.26	4.22	4.51	3.88	4.52	4.29	4.36	4.87
03/01/15	03/31/15	Mar 2015	37.65	30.16	37.28	28.14	35.10	29.14	44.65	34.41	44.90	32.79	4.27	4.31	4.05	4.11	4.19	4.15	4.45	3.83	4.44	4.20	4.27	4.80
04/01/15	04/30/15	Apr 2015	37.71	24.50	38.75	24.46	30.58	21.73	41.31	28.21	43.58	29.36	4.12	4.15	3.86	3.92	4.00	3.97	3.89	3.73	4.24	4.02	4.08	4.14
05/01/15	05/31/15	May 2015	33.16	18.31	37.49	23.15	28.00	15.78	40.38	24.66	42.59	23.12	4.13	4.16	3.87	3.94	4.02	3.98	3.90	3.71	4.25	4.03	4.10	4.15
06/01/15	06/30/15	Jun 2015	32.63	14.19	40.01	24.09	25.42	11.89	41.31	22.88	43.58	25.07	4.16	4.19	3.90	3.97	4.04	4.01	3.93	3.71	4.28	4.06	4.13	4.18
07/01/15	07/31/15	Jul 2015	44.53	27.48	51.50	32.25	41.74	26.50	51.18	36.12	54.12	35.25	4.19	4.22	3.94	4.00	4.08	4.04	3.96	3.73	4.31	4.09	4.16	4.22
08/01/15	08/31/15	Aug 2015	49.76	36.00	51.91	33.05	47.54	32.75	53.24	38.48	56.33	36.96	4.21	4.24	3.95	4.02	4.10	4.06	3.98	3.74	4.33	4.11	4.18	4.24
09/01/15	09/30/15	Sep 2015	48.96	36.28	47.35	31.46	45.73	35.25	51.59	36.41	54.56	36.10	4.21	4.24	3.96	4.02	4.10	4.06	3.98	3.77	4.34	4.12	4.18	4.24
10/01/15	10/31/15	Oct 2015	43.63	36.70	45.83	32.50	43.21	36.14	51.35	38.16	51.80	37.09	4.25	4.28	3.99	4.06	4.13	4.10	4.02	3.80	4.37	4.15	4.22	4.28
11/01/15	11/30/15	Nov 2015	47.14	37.35	45.11	31.97	45.75	37.69	51.35	39.12	50.20	37.69	4.34	4.36	4.13	4.13	4.24	4.20	4.51	3.92	4.46	4.23	4.30	4.87
12/01/15	12/31/15	Dec 2015	49.48	39.95	43.31	33.03	48.29	40.17	52.56	41.97	51.00	41.02	4.53	4.56	4.32	4.37	4.43	4.39	4.71	4.09	4.70	4.47	4.54	5.07
01/01/16	01/31/16	Jan 2016	45.85	35.87	42.42	32.59	43.01	35.82	48.95	38.59	49.25	36.91	4.63	4.66	4.41	4.46	4.55	4.51	4.81	4.17	4.80	4.57	4.64	5.18
02/01/16	02/29/16	Feb 2016	43.25	33.22	41.81	31.77	40.95	34.78	48.60	37.75	48.90	36.10	4.61	4.63	4.39	4.43	4.53	4.49	4.78	4.15	4.77	4.53	4.61	5.15
03/01/16	03/31/16	Mar 2016	40.65	32.16	40.28	30.14	38.00	31.14	48.25	36.91	48.55	35.29	4.53	4.56	4.31	4.35	4.45	4.42	4.71	4.09	4.68	4.45	4.52	5.07
04/01/16	04/30/16	Apr 2016	40.71	26.50	41.75	26.46	33.48	23.73	44.91	30.71	47.23	31.86	4.37	4.38	4.11	4.17	4.25	4.22	4.14	3.98	4.49	4.27	4.34	4.40
05/01/16	05/31/16	May 2016	36.16	20.31	40.49	25.15	30.90	17.78	43.98	27.16	46.24	25.62	4.38	4.39	4.12	4.18	4.27	4.23	4.15	3.96	4.50	4.28	4.35	4.41
06/01/16	06/30/16	Jun 2016	35.63	16.19	43.01	26.09	28.32	13.89	44.91	25.38	47.23	27.57	4.40	4.41	4.15	4.21	4.29	4.26	4.18	3.96	4.53	4.31	4.38	4.44
07/01/16	07/31/16	Jul 2016	47.53	29.48	54.50	34.25	44.64	28.50	54.78	38.62	57.77	37.75	4.44	4.45	4.19	4.25	4.33	4.29	4.21	3.98	4.57	4.35	4.42	4.48
08/01/16	08/31/16	Aug 2016	52.76	38.00	54.91	35.05	50.44	34.75	56.84	40.98	59.98	39.46	4.46	4.47	4.20	4.26	4.35	4.31	4.23	3.99	4.58	4.36	4.43	4.50
09/01/16	09/30/16	Sep 2016	51.96	38.28	50.35	33.46	48.63	37.25	55.19	38.91	58.21	38.60	4.46	4.47	4.21	4.27	4.35	4.31	4.23	4.02	4.59	4.37	4.44	4.50
10/01/16	10/31/16	Oct 2016	46.63	38.70	48.83	34.50	46.11	38.14	54.95	40.66	55.45	39.59	4.50	4.51	4.24	4.30	4.38	4.35	4.27	4.05	4.62	4.40	4.47	4.54
11/01/16	11/30/16	Nov 2016	50.14	39.35	48.11	33.97	48.65	39.69	54.95	41.62	53.85	40.19	4.59	4.63	4.38	4.39	4.49	4.45	4.77	4.17	4.72	4.49	4.57	5.13
12/01/16	12/31/16	Dec 2016	52.48	41.95	46.31	35.03	51.19	42.17	56.16	44.47	54.65	43.52	4.79	4.82	4.58	4.61	4.69	4.65	4.96	4.35	4.95	4.72	4.79	5.34
01/01/17	01/31/17	Jan 2017	48.60	37.87	45.42	34.59	45.91	37.07	52.55	41.09	52.90	39.41	4.89	4.93	4.67	4.71	4.81	4.77	5.07	4.42	5.06	4.82	4.90	5.46
02/01/17	02/28/17	Feb 2017	46.00	35.22	44.81	33.77	43.85	36.03	52.20	40.25	52.55	38.60	4.87	4.90	4.65	4.69	4.79	4.75	5.04	4.41	5.03	4.80	4.87	5.43
03/01/17	03/31/17	Mar 2017	43.40	34.16	43.28	32.14	40.90	32.39	51.85	39.41	52.20	37.79	4.79	4.83	4.57	4.60	4.71	4.67	4.97	4.35	4.94	4.71	4.79	5.35
04/01/17	04/30/17	Apr 2017	43.46	28.50	44.75	28.46	36.38	24.98	48.51	33.21	50.88	34.36	4.62	4.64	4.36	4.42	4.50	4.47	4.39	4.23	4.75	4.53	4.60	4.67
05/01/17	05/31/17	May 2017	38.91	22.31	43.49	27.15	33.80	19.03	47.58	29.66	49.89	28.12	4.63	4.65	4.37	4.43	4.51	4.48	4.40	4.21	4.76	4.54	4.61	4.68
06/01/17	06/30/17	Jun 2017	38.38	18.19	46.01	28.09	31.22	15.14	48.51	27.88	50.88	30.07	4.65	4.67	4.40	4.46	4.54	4.50	4.42	4.21	4.78	4.56	4.63	4.70
07/01/17	07/31/17	Jul 2017	50.28	31.48	57.50	36.25	47.54	29.75	58.38	41.12	61.42	40.25	4.69	4.71	4.43	4.49	4.57	4.54	4.46	4.23	4.82	4.60	4.67	4.74

08/01/17	08/31/17	Aug 2017	55.51	40.00	57.91	37.05	53.34	36.00	60.44	43.48	63.63	41.96	4.71	4.73	4.46	4.52	4.60	4.56	4.48	4.25	4.84	4.62	4.70	4.77
09/01/17	09/30/17	Sep 2017	54.71	40.28	53.35	35.46	51.53	38.50	58.79	41.41	61.86	41.10	4.72	4.74	4.46	4.52	4.60	4.57	4.49	4.27	4.85	4.63	4.70	4.77
10/01/17	10/31/17	Oct 2017	49.38	40.70	51.83	36.50	49.01	39.39	58.55	43.16	59.10	42.09	4.75	4.77	4.50	4.56	4.64	4.60	4.53	4.31	4.89	4.66	4.74	4.81
11/01/17	11/30/17	Nov 2017	52.89	41.35	51.11	35.97	51.55	40.94	58.55	44.12	57.50	42.69	4.85	4.89	4.64	4.65	4.75	4.71	5.02	4.43	4.99	4.76	4.83	5.41
12/01/17	12/31/17	Dec 2017	55.23	43.95	49.31	37.03	54.09	43.42	59.76	46.97	58.30	46.02	5.05	5.09	4.83	4.87	4.95	4.91	5.22	4.60	5.22	4.98	5.06	5.62
01/01/18	01/31/18	Jan 2018	51.35	39.62	48.17	36.34	48.66	38.82	56.05	43.34	56.40	41.66	5.15	5.19	4.93	4.96	5.07	5.03	5.33	4.68	5.31	5.08	5.15	5.73
02/01/18	02/28/18	Feb 2018	48.75	36.97	47.56	35.52	46.60	37.78	55.70	42.50	56.05	40.85	5.12	5.17	4.90	4.93	5.04	5.00	5.30	4.66	5.28	5.05	5.13	5.70
03/01/18	03/31/18	Mar 2018	46.15	35.91	46.03	33.89	43.65	34.14	55.35	41.66	55.70	40.04	5.05	5.09	4.83	4.85	4.97	4.93	5.22	4.61	5.20	4.97	5.04	5.62
04/01/18	04/30/18	Apr 2018	46.21	30.25	47.50	30.21	39.13	26.73	52.01	35.46	54.38	36.61	4.85	4.88	4.60	4.65	4.74	4.70	4.63	4.47	4.98	4.76	4.83	4.99
05/01/18	05/31/18	May 2018	43.58	32.73	48.18	36.59	39.97	32.31	56.26	44.74	57.97	43.94	5.48	5.42	5.21	5.11	5.17	5.13	5.06	4.93	5.44	5.22	5.29	5.42
06/01/18	06/30/18	Jun 2018	44.09	30.59	52.35	37.57	40.92	28.76	56.85	44.50	58.75	45.48	5.52	5.46	5.24	5.14	5.20	5.16	5.09	4.95	5.47	5.25	5.32	5.45
07/01/18	07/31/18	Jul 2018	55.45	40.21	66.09	43.68	54.61	38.82	68.13	53.66	69.66	53.00	5.62	5.55	5.32	5.18	5.25	5.20	5.13	4.97	5.51	5.29	5.37	5.49
08/01/18	08/31/18	Aug 2018	59.20	44.52	66.19	43.51	58.15	41.85	70.09	54.96	71.80	53.87	5.65	5.58	5.35	5.21	5.27	5.23	5.15	4.99	5.54	5.32	5.39	5.51
09/01/18	09/30/18	Sep 2018	59.06	41.96	57.52	41.22	58.29	40.77	65.63	51.56	67.12	51.23	5.44	5.43	5.19	5.11	5.17	5.11	5.02	4.86	5.44	5.22	5.29	5.39
10/01/18	10/31/18	Oct 2018	52.46	41.07	54.17	40.71	51.53	39.83	63.01	51.98	63.08	51.21	5.42	5.45	5.22	5.13	5.19	5.13	5.04	4.87	5.46	5.24	5.31	5.40
11/01/18	11/30/18	Nov 2018	54.63	43.96	54.82	40.60	53.39	43.50	63.01	52.68	62.09	51.53	5.48	5.52	5.33	5.18	5.26	5.22	5.32	4.97	5.53	5.29	5.37	5.72
12/01/18	12/31/18	Dec 2018	59.47	45.36	52.91	41.72	58.98	45.38	63.52	54.45	62.38	53.67	5.62	5.67	5.48	5.33	5.41	5.37	5.38	5.10	5.69	5.45	5.53	5.79
01/01/19	01/31/19	Jan 2019	50.55	41.41	50.20	41.40	48.17	40.55	58.01	49.48	57.93	48.28	5.76	5.73	5.52	5.41	5.49	5.46	5.49	5.21	5.77	5.53	5.61	5.91
02/01/19	02/28/19	Feb 2019	48.46	39.62	49.29	40.93	46.23	38.99	57.54	48.91	57.43	47.84	5.76	5.73	5.52	5.41	5.49	5.46	5.49	5.22	5.77	5.53	5.61	5.91
03/01/19	03/31/19	Mar 2019	46.56	38.61	46.79	38.75	43.61	36.47	56.66	48.15	56.33	46.87	5.59	5.57	5.37	5.26	5.35	5.32	5.36	5.10	5.62	5.38	5.46	5.77
04/01/19	04/30/19	Apr 2019	47.06	35.44	48.88	37.65	43.50	33.17	55.45	44.76	56.69	45.30	5.51	5.45	5.24	5.08	5.14	5.10	5.04	4.93	5.41	5.19	5.27	5.41
05/01/19	05/31/19	May 2019	48.24	43.15	52.86	46.02	46.14	45.59	64.94	59.83	66.05	59.75	6.33	6.20	6.04	5.79	5.83	5.78	5.71	5.64	6.12	5.89	5.97	6.07
06/01/19	06/30/19	Jun 2019	49.81	42.99	58.69	47.05	50.61	42.39	65.19	61.12	66.62	60.88	6.39	6.24	6.08	5.82	5.86	5.82	5.75	5.69	6.15	5.93	6.00	6.12
07/01/19	07/31/19	Jul 2019	60.61	48.94	74.69	51.10	61.68	47.89	77.89	66.20	77.91	65.76	6.54	6.39	6.21	5.87	5.92	5.87	5.79	5.72	6.20	5.98	6.05	6.16
08/01/19	08/31/19	Aug 2019	62.89	49.04	74.46	49.97	62.97	47.69	79.75	66.45	79.98	65.79	6.58	6.43	6.24	5.90	5.95	5.90	5.81	5.73	6.23	6.01	6.08	6.18
09/01/19	09/30/19	Sep 2019	63.41	43.65	61.70	46.99	65.06	43.04	72.48	61.70	72.39	61.36	6.16	6.11	5.92	5.69	5.73	5.66	5.55	5.44	6.02	5.80	5.87	5.92
10/01/19	10/31/19	Oct 2019	55.53	41.43	56.50	44.91	54.05	40.26	67.47	60.79	67.05	60.34	6.09	6.12	5.94	5.70	5.74	5.66	5.54	5.43	6.03	5.81	5.88	5.91
11/01/19	11/30/19	Nov 2019	56.37	46.56	58.52	45.22	55.23	46.05	67.47	61.24	66.67	60.36	6.12	6.14	6.02	5.71	5.76	5.72	5.62	5.51	6.06	5.82	5.90	6.02
12/01/19	12/31/19	Dec 2019	63.70	46.77	56.50	46.41	63.87	47.33	67.27	61.92	66.46	61.32	6.20	6.25	6.13	5.79	5.88	5.83	5.53	5.60	6.15	5.91	5.99	5.94
01/01/20	01/31/20	Jan 2020	49.74	43.20	52.24	46.45	47.68	42.27	59.97	55.62	59.46	54.89	6.36	6.27	6.12	5.86	5.92	5.89	5.65	5.74	6.22	5.98	6.06	6.07
02/01/20	02/29/20	Feb 2020	48.17	42.27	51.03	46.34	45.86	40.19	59.37	55.32	58.81	54.82	6.39	6.30	6.15	5.89	5.94	5.91	5.68	5.77	6.25	6.01	6.09	6.10
03/01/20	03/31/20	Mar 2020	46.97	41.31	47.54	43.62	43.58	38.80	57.97	54.64	56.96	53.69	6.14	6.05	5.91	5.67	5.73	5.70	5.50	5.59	6.03	5.79	5.87	5.91
04/01/20	04/30/20	Apr 2020	47.91	40.62	50.25	45.09	47.87	39.61	58.88	54.05	59.00	53.99	6.16	6.01	5.89	5.50	5.55	5.51	5.45	5.39	5.84	5.62	5.69	5.82
05/01/20	05/31/20	May 2020	43.60	40.64	50.35	44.52	45.23	39.82	57.18	53.79	58.55	54.36	6.21	6.03	5.87	5.52	5.59	5.55	5.49	5.42	5.85	5.63	5.70	5.85
06/01/20	06/30/20	Jun 2020	47.60	41.35	57.92	45.44	49.00	41.95	58.54	53.89	59.82	54.05	6.27	6.07	5.89	5.55	5.62	5.59	5.53	5.48	5.88	5.66	5.73	5.89
07/01/20	07/31/20	Jul 2020	58.43	46.53	70.84	50.12	59.95	45.58	69.72	59.06	70.61	59.36	6.42	6.20	5.97	5.58	5.69	5.64	5.57	5.51	5.92	5.69	5.77	5.94
08/01/20	08/31/20	Aug 2020	60.98	47.32	72.14	49.85	61.54	46.32	72.53	59.13	73.02	59.12	6.46	6.23	6.00	5.61	5.69	5.65	5.58	5.52	5.94	5.72	5.79	5.95
09/01/20	09/30/20	Sep 2020	61.81	43.94	61.55	46.01	63.89	42.01	68.22	56.70	67.96	56.34	6.24	6.15	5.95	5.57	5.72	5.66	5.56	5.46	5.90	5.68	5.76	5.92
10/01/20	10/31/20	Oct 2020	54.35	41.97	54.51	45.57	54.31	39.92	62.74	55.08	62.69	54.55	6.24	6.17	6.01	5.63	5.75	5.68	5.57	5.46	5.96	5.74	5.81	5.94
11/01/20	11/30/20	Nov 2020	57.77	47.11	56.51	45.51	56.24	46.81	63.65	56.82	62.84	55.88	6.26	6.24	6.12	5.77	5.86	5.82	5.72	5.62	6.12	5.88	5.96	6.12
12/01/20	12/31/20	Dec 2020	65.19	47.84	56.00	47.38	65.20	49.12	63.13	57.52	62.32	56.68	6.37	6.33	6.21	5.86	5.96	5.92	5.76	5.72	6.21	5.98	6.06	6.17
01/01/21	01/31/21	Jan 2021	61.60	54.38	59.83	54.46	59.41	53.71	64.09	57.96	63.30	57.15	6.53	6.45	6.29	5.99	6.04	6.01	5.77	5.86	6.35	6.11	6.19	6.19
02/01/21	02/28/21	Feb 2021	60.26	53.89	58.60	54.28	57.48	52.73	62.46	57.60	61.80	56.84	6.56	6.49	6.33	6.02	6.08	6.05	5.81	5.90	6.38	6.14	6.22	6.23
03/01/21	03/31/21	Mar 2021	57.63	52.99	56.62	54.04	54.03	52.52	60.63	57.69	59.87	56.86	6.44	6.34	6.21	5.94	6.00	5.98	5.79	5.88	6.29	6.06	6.14	6.20
04/01/21	04/30/21	Apr 2021	61.41	53.27	63.24	55.31	59.60	51.52	66.00	57.77	66.42	58.41	6.44	6.33	6.19	5.81	5.90	5.85	5.77	5.68	6.14	5.92	6.00	6.14
05/01/21	05/31/21	May 2021	57.94	53.20	60.87	55.78	57.84	51.12	62.44	58.21	63.25	58.48	6.50	6.38	6.20	5.82	5.95	5.90	5.81	5.73	6.15	5.93	6.00	6.17
06/01/21	06/30/21	Jun 2021	58.51	53.16	68.19	56.36	58.34	49.94	63.01	58.61	65.20	58.78	6.57	6.45	6.24	5.85	5.99	5.94	5.86	5.79	6.19	5.96	6.04	6.23
07/01/21	07/31/21	Jul 2021	69.60	57.35	79.64	61.46	70.08	55.91	74.90	63.21	75.83	63.51	6.75	6.55	6.34	5.91	6.02	5.97	5.90	5.82	6.24	6.02	6.09	6.26
08/01/21	08/31/21	Aug 2021	73.15	58.80	80.72	60.58	73.01	57.30	78.04	63.41	78.48	63.26	6.79	6.58	6.37	5.93	6.06	6.00	5.92	5.83	6.26	6.04	6.11	6.28
09/01/21	09/30/21	Sep 2021	71.06	55.84	70.59	56.78	70.78	54.72	73.88	60.10	73.62	59.74	6.64	6.54	6.34	5.94	6.09	6.03	5.94	5.84	6.27	6.05	6.12	6.30
10/01/21	10/31/21	Oct 2021	66.47	54.62	65.83	55.77	66.21	53.08	69.76	59.17	69.39	58.50	6.67	6.56	6.37	5.98	6.12	6.06	5.96	5.86	6.32	6.09	6.17	6.33
11/01/21	11/30/21	Nov 2021	71.15	58.41	64.67	56.35	70.11	58.70	68.88	60.10	67.91	59.12	6.69	6.66	6.53	6.29	6.34	6.29	6.17	6.04	6.63	6.40	6.48	6.57
12/01/21	12/31/21	Dec 2021	72.71	60.23	65.03	57.52	74.87	61.29	70.13	61.47	69.12	60.54	6.89	6.82	6.65	6.40	6.46	6.42	6.11	6.18	6.76	6.52	6.60	6.52
01/01/22	01/31/22	Jan 2022	65.81	58.84	63.79	58.37	63.57	57.17	68.11	62.19	67.31	61.32	7.07	6.98	6.81	6.56	6.62	6.57	6.26	6.34	6.91	6.68	6.76	6.67
02/01/22	02/28/22	Feb 2022	64.55	58.13	63.48	58.50	61.88	56.52	67.02	61.72	66.58	61.08	7.11	7.02	6.86	6.60	6.66	6.61	6.30	6.38	6.95	6.72	6.80	6.71
03/01/22	03/31/22	Mar 2022	61.46	57.77	61.32	58.36	58.42	56.20	64.50	62.04	64.02	61.20	7.01	6.92	6.79	6.55	6.61	6.57	6.33	6.41	6.90	6.66	6.74	6.74
04/01/22	04/30/22	Apr 2022	65.36	57.41	66.87	59.03	63.95	55.13	69.58	61.85	70.11	61.91	7.02	6.88	6.77	6.40	6.45	6.39	6.30	6.21	6.73	6.51	6.59	6.67
05/01/22	05/31/22	May 2022	60.66	56.83	63.75	59.38	59.62	53.93	65.98	61.63	66.74	62.17	7.08	6.94	6.79	6.45	6.50	6.44	6.35	6.26	6.78	6.56	6.63	6.71
06/01/22	06/30/22	Jun 2022	63.57	57.49	73.14	60.56	63.62	55.50	68.25	62.43	69.94	62.89	7.14	7.01	6.83	6.49	6.54	6.49	6.40	6.32	6.82	6.60	6.67	6.77
07/01/22	07/31/22	Jul 2022	76.32	62.26	86.33	66.87	76.65	61.44	81.59	68.19	82.49	68.80	7.32	7.15	6.95	6.53	6.59	6.53	6.44	6.36	6.86	6.64	6.71	6.81
08/01/22	08/31/22	Aug 2022	79.95	63.31	87.92	65.56	80.14	61.96	84.82	68.25	85.22	68.41	7.37	7.19	6.99	6.56	6.64	6.57	6.47	6.37	6.89	6.67	6.75	6.84
09/01/22	09/30/22	Sep 2022	77.61	60.60	77.46	61.49	77.17	58.78	80.73	65.10	80.61	64.83	7.17	7.08	6.93	6.59	6.65	6.58	6.46	6.35	6.92	6.70	6.77	6.83
10/01/22	10/31/22	Oct 2022	71.62	58.84	71.09	59.90	71.28	56.80	74.86	63.45	74.65	62.91	7.18	7.11	6.96	6.62	6.69	6.61	6.48	6.36	6.96	6.73	6.81	6.85
11/01/22	11/30/22	Nov 2022	75.90	61.93	70.04	60.43	75.24	62.61	74.24	64.41	73.30	63.53	7.24	7.20	7.07	6.76	6.83	6.78	6.66	6.55	7.11	6.88	6.95	7.06
12/01/22	12/31/22	Dec 2022	75.97	63.70	69.88	61.84	77.96	64.92	74.57	65.53	73.60	64.77	7.37	7.34	7.20	6.85	6.91	6.87	6.68	6.64	7.21	6.97	7.05	7.09
01/01/23	01/31/23	Jan 2023	70.19	62.12	67.75	62.24	67.96	60.15	71.91	65.78	71.18	65.12	7.56	7.48	7.33	7.01	7.07	7.03	6.72	6.80	7.37	7.13	7.21	7.14
02/01/23	02/28/23	Feb 2023	66.82	61.67	67.12	61.82	64.98	59.27	70.72	65.61	70.34	64.86	7.60	7.50	7.36	7.03	7.09	7.05	6.77	6.84	7.38	7.15	7.22	7.18
03/01/23	03/31/23	Mar 2023	63.28	60.39	63.98	61.13	60.83	58.68	67.12	64.85	66.76	63.99	7.39	7.29	7.16	6.86	6.92	6.90	6.69	6.77	7.21	6.98	7.06	7.10
04/01/23	04/30/23	Apr 2023	69.20	60.84	70.17	62.38	67.69	58.62	73.16	64.85	73.60	65.44	7.43	7.26	7.13	6.70	6.75	6.70	6.62	6.54	7.04	6.81	6.89	7.00
05/01/23	05/31/23	May 2023	63.88	59.47	67.47	62.28	64.00	58.73	68.07	64.13	69.84	64.89	7.49	7.32	7.14	6.73	6.80	6.75	6.68	6.60	7.06	6.84	6.91	7.04
06/01/23	06/30/23	Jun 2023	66.87	59.60	76.48	63.50	67.34	59.01	71.62	64.92	74.14	65.89	7.58	7.37	7.18	6.77	6.84	6.80	6.74	6.67	7.10	6.88	6.95	7.10
07/01/23	07/31/23	Jul 2023	79.48	65.44	89.87	70.35	79.76	64.06	85.41	71.64	86.27	72.19	7.78	7.55	7.34	6.81	6.88	6.84	6.77	6.71	7.14	6.92	6.99	7.14
08/01/23	08/31/23	Aug 2023	82.50	65.66	91.36	68.77	82.95	63.98	87.41	70.90	88.07	71.57	7.83	7.59	7.38	6.84	6.91	6.87	6.80	6.72	7.17	6.95	7.02	7.16
09/01/23	09/30/23	Sep 2023	77.92	61.11	77.46	62.86	77.33	60.16	80.60	65.97	80.53	65.98	7.25	7.15	6.99	6.57	6.74	6.66	6.52	6.39	6.91	6.68	6.76	6.89

10/01/23	10/31/23	Oct 2023	71.41	59.64	70.67	60.86	71.17	57.57	74.28	64.20	73.96	63.75	7.27	7.19	7.02	6.61	6.78	6.68	6.54	6.39	6.94	6.72	6.79	6.91
11/01/23	11/30/23	Nov 2023	75.84	61.41	70.50	61.49	74.87	63.68	74.24	65.31	73.59	64.44	7.33	7.29	7.15	6.75	6.89	6.84	6.70	6.57	7.10	6.86	6.94	7.10
12/01/23	12/31/23	Dec 2023	78.89	64.44	70.84	62.50	80.32	66.96	75.57	66.46	74.65	65.72	7.43	7.40	7.26	6.84	6.95	6.89	6.89	6.61	7.19	6.96	7.03	7.30
01/01/24	01/31/24	Jan 2024	69.03	61.42	67.78	62.54	69.26	60.66	71.93	66.02	71.23	65.48	7.61	7.49	7.34	6.95	7.02	6.98	6.70	6.78	7.31	7.08	7.15	7.11
02/01/24	02/29/24	Feb 2024	67.43	61.04	67.19	62.18	65.00	60.10	70.97	65.80	70.43	65.17	7.65	7.52	7.37	6.99	7.06	7.02	6.74	6.82	7.35	7.11	7.19	7.15
03/01/24	03/31/24	Mar 2024	60.82	58.71	63.26	60.90	59.54	57.55	65.61	63.92	66.13	63.67	7.23	7.12	6.98	6.63	6.69	6.67	6.44	6.52	6.99	6.75	6.83	6.85
04/01/24	04/30/24	Apr 2024	66.20	58.75	68.36	61.31	65.09	57.10	70.63	63.65	71.26	64.23	7.20	7.06	6.91	6.49	6.55	6.49	6.40	6.31	6.83	6.61	6.68	6.77
05/01/24	05/31/24	May 2024	63.06	58.36	66.70	61.55	62.57	55.88	67.84	63.70	69.27	64.13	7.26	7.11	6.92	6.45	6.60	6.54	6.45	6.35	6.78	6.56	6.63	6.81
06/01/24	06/30/24	Jun 2024	64.06	59.11	74.58	62.89	63.03	56.36	68.46	64.42	71.89	65.04	7.35	7.17	6.98	6.49	6.64	6.59	6.50	6.41	6.83	6.60	6.68	6.86
07/01/24	07/31/24	Jul 2024	78.01	63.90	88.31	68.46	78.27	61.81	83.64	69.89	84.54	70.63	7.56	7.33	7.13	6.54	6.68	6.62	6.54	6.45	6.87	6.65	6.72	6.90
08/01/24	08/31/24	Aug 2024	80.45	64.48	89.20	67.45	80.68	62.69	85.61	69.68	86.23	70.18	7.61	7.38	7.16	6.57	6.72	6.66	6.56	6.47	6.90	6.68	6.76	6.93
09/01/24	09/30/24	Sep 2024	78.21	62.09	77.46	63.51	77.26	60.52	80.55	66.65	80.41	66.38	7.40	7.27	7.07	6.60	6.76	6.68	6.56	6.44	6.93	6.71	6.78	6.93
10/01/24	10/31/24	Oct 2024	72.42	59.77	71.61	61.71	71.54	58.62	75.21	64.95	74.78	64.49	7.37	7.29	7.12	6.64	6.79	6.71	6.58	6.45	6.98	6.76	6.83	6.95
11/01/24	11/30/24	Nov 2024	76.07	62.33	70.65	62.16	75.17	64.19	74.70	65.89	73.96	64.99	7.41	7.34	7.20	6.79	6.92	6.87	6.74	6.60	7.14	6.90	6.98	7.13
12/01/24	12/31/24	Dec 2024	80.05	64.10	71.14	63.31	82.17	67.30	75.80	67.20	74.82	66.36	7.60	7.50	7.34	6.90	7.01	6.96	6.90	6.71	7.25	7.02	7.10	7.31
01/01/25	01/31/25	Jan 2025	70.47	62.79	68.96	63.76	68.40	61.81	73.13	67.35	72.34	66.56	7.80	7.62	7.45	7.01	7.14	7.09	6.79	6.88	7.37	7.13	7.21	7.21
02/01/25	02/28/25	Feb 2025	68.95	62.23	68.44	63.87	66.12	61.00	72.13	67.12	71.53	66.53	7.85	7.65	7.49	7.05	7.18	7.14	6.84	6.92	7.41	7.17	7.25	7.25
03/01/25	03/31/25	Mar 2025	63.04	61.23	65.30	62.96	61.04	59.74	67.81	66.21	68.36	65.68	7.57	7.38	7.24	6.83	6.89	6.87	6.66	6.75	7.18	6.95	7.03	7.08
04/01/25	04/30/25	Apr 2025	68.10	60.44	70.73	63.44	67.65	59.05	72.13	65.81	72.98	66.25	7.53	7.34	7.20	6.64	6.78	6.72	6.63	6.54	6.97	6.75	6.83	7.00
05/01/25	05/31/25	May 2025	65.44	60.77	68.31	63.73	63.70	57.75	69.14	66.12	70.56	66.36	7.59	7.39	7.20	6.66	6.84	6.77	6.68	6.58	6.99	6.76	6.84	7.04
06/01/25	06/30/25	Jun 2025	68.00	61.56	77.62	65.25	67.42	58.67	72.38	66.82	74.88	67.47	7.69	7.43	7.24	6.69	6.88	6.82	6.73	6.64	7.03	6.80	6.88	7.09
07/01/25	07/31/25	Jul 2025	80.97	66.44	91.21	71.09	81.15	64.31	86.49	72.08	87.49	72.95	7.94	7.61	7.41	6.73	6.91	6.86	6.77	6.68	7.07	6.84	6.92	7.13
08/01/25	08/31/25	Aug 2025	83.42	67.25	92.35	70.53	82.93	65.92	88.40	72.25	89.15	72.88	7.98	7.66	7.44	6.77	6.95	6.89	6.80	6.70	7.10	6.88	6.95	7.16
09/01/25	09/30/25	Sep 2025	81.32	63.89	81.37	66.09	80.50	62.91	84.18	68.86	84.21	69.02	7.74	7.56	7.35	6.78	7.00	6.92	6.80	6.68	7.12	6.89	6.97	7.17
10/01/25	10/31/25	Oct 2025	74.60	62.08	74.00	64.05	73.66	60.63	77.75	67.19	77.57	66.97	7.67	7.54	7.37	6.83	7.03	6.94	6.80	6.66	7.16	6.94	7.01	7.17
11/01/25	11/30/25	Nov 2025	78.20	64.43	73.13	64.39	77.76	66.65	77.04	68.07	76.43	67.22	7.69	7.57	7.38	7.08	7.15	7.09	6.95	6.80	7.43	7.20	7.27	7.35
12/01/25	12/31/25	Dec 2025	81.06	66.00	73.57	65.73	82.32	68.82	78.58	69.62	77.59	68.77	7.93	7.77	7.57	7.21	7.27	7.22	7.14	6.96	7.56	7.33	7.40	7.56
01/01/26	01/31/26	Jan 2026	72.95	65.40	71.80	66.14	72.51	64.62	75.93	69.80	75.25	69.04	8.12	7.90	7.66	7.37	7.44	7.39	7.05	7.13	7.73	7.49	7.57	7.47
02/01/26	02/28/26	Feb 2026	72.08	64.89	71.25	66.29	70.49	63.65	74.86	69.67	74.31	69.08	8.17	7.94	7.71	7.41	7.48	7.43	7.10	7.18	7.77	7.53	7.61	7.51
03/01/26	03/31/26	Mar 2026	65.36	64.20	67.65	65.07	64.13	62.78	70.52	68.58	70.82	67.89	7.90	7.66	7.48	7.22	7.28	7.24	6.97	7.05	7.57	7.33	7.41	7.38
04/01/26	04/30/26	Apr 2026	71.40	63.46	73.77	66.08	70.87	61.71	75.23	68.44	76.11	68.93	7.86	7.64	7.41	7.05	7.11	7.03	6.92	6.81	7.39	7.17	7.24	7.30
05/01/26	05/31/26	May 2026	67.84	62.98	71.63	66.36	66.70	60.84	72.54	68.22	73.94	68.88	7.92	7.66	7.43	7.08	7.16	7.09	6.98	6.87	7.41	7.19	7.26	7.34
06/01/26	06/30/26	Jun 2026	70.04	63.79	80.39	67.82	69.70	60.50	74.52	69.06	77.05	69.74	8.06	7.73	7.47	7.12	7.20	7.14	7.04	6.95	7.45	7.23	7.30	7.41
07/01/26	07/31/26	Jul 2026	85.00	69.33	95.45	74.57	85.54	68.19	90.44	75.03	91.34	75.89	8.31	7.95	7.62	7.18	7.26	7.20	7.09	6.99	7.51	7.29	7.36	7.46
08/01/26	08/31/26	Aug 2026	87.32	70.46	96.41	73.91	87.32	69.66	92.09	75.42	92.82	76.18	8.36	8.00	7.66	7.21	7.30	7.23	7.12	7.01	7.54	7.32	7.40	7.49
09/01/26	09/30/26	Sep 2026	84.26	66.41	84.58	68.32	83.36	65.94	87.75	71.16	87.76	71.26	8.05	7.84	7.59	7.22	7.34	7.25	7.11	6.97	7.56	7.33	7.41	7.48
10/01/26	10/31/26	Oct 2026	77.20	64.86	77.16	66.70	76.33	63.87	80.90	69.92	80.64	69.49	8.02	7.86	7.62	7.26	7.37	7.27	7.12	6.97	7.59	7.37	7.45	7.49
11/01/26	11/30/26	Nov 2026	80.93	67.12	75.72	67.16	80.50	69.45	79.57	70.85	78.88	69.95	8.05	7.92	7.71	7.40	7.50	7.43	7.26	7.09	7.74	7.51	7.59	7.66
12/01/26	12/31/26	Dec 2026	86.48	69.51	76.80	68.70	86.73	71.77	81.42	72.40	80.46	71.67	8.28	8.10	7.87	7.50	7.60	7.55	7.53	7.26	7.85	7.62	7.70	7.95
01/01/27	01/31/27	Jan 2027	75.33	67.15	74.64	68.86	74.65	67.57	78.92	72.28	78.22	71.76	8.49	8.23	7.98	7.67	7.74	7.69	7.36	7.44	8.03	7.79	7.87	7.78
02/01/27	02/28/27	Feb 2027	73.94	66.82	73.93	68.75	73.05	66.25	77.76	72.03	77.19	71.69	8.53	8.27	8.03	7.71	7.79	7.74	7.41	7.49	8.07	7.83	7.91	7.83
03/01/27	03/31/27	Mar 2027	69.00	66.32	70.69	68.18	66.68	64.93	73.57	71.54	73.97	71.04	8.25	8.02	7.82	7.51	7.57	7.54	7.26	7.34	7.86	7.62	7.70	7.67
04/01/27	04/30/27	Apr 2027	75.06	66.17	77.21	69.01	74.64	63.54	79.11	71.22	79.91	71.89	8.24	7.96	7.73	7.33	7.39	7.32	7.21	7.10	7.67	7.45	7.52	7.58
05/01/27	05/31/27	May 2027	71.09	66.49	74.65	69.53	69.54	63.58	76.20	71.67	77.25	72.21	8.31	8.00	7.73	7.33	7.45	7.38	7.28	7.17	7.66	7.44	7.51	7.64
06/01/27	06/30/27	Jun 2027	74.10	66.68	84.18	70.97	73.68	64.25	78.97	72.00	80.75	72.76	8.46	8.10	7.78	7.37	7.50	7.44	7.34	7.25	7.70	7.47	7.55	7.71
07/01/27	07/31/27	Jul 2027	88.44	72.65	99.08	78.32	88.73	71.27	94.00	78.22	95.02	79.14	8.72	8.32	7.95	7.48	7.57	7.50	7.39	7.29	7.81	7.59	7.66	7.76
08/01/27	08/31/27	Aug 2027	90.83	73.20	100.32	77.09	91.13	72.05	95.75	78.39	96.63	79.28	8.76	8.37	7.98	7.50	7.59	7.52	7.42	7.31	7.84	7.62	7.69	7.78
09/01/27	09/30/27	Sep 2027	85.36	68.68	85.80	70.83	84.82	68.17	88.97	73.78	89.02	73.69	8.37	8.14	7.89	7.43	7.63	7.53	7.39	7.24	7.77	7.54	7.62	7.76
10/01/27	10/31/27	Oct 2027	80.14	67.34	80.30	69.26	79.11	66.10	84.24	72.62	83.88	72.17	8.34	8.15	7.90	7.47	7.67	7.56	7.39	7.22	7.80	7.58	7.66	7.76
11/01/27	11/30/27	Nov 2027	81.65	69.64	78.23	69.79	82.59	71.48	82.06	73.52	81.32	72.64	8.40	8.24	8.03	7.63	7.81	7.74	7.56	7.39	7.98	7.74	7.82	7.96
12/01/27	12/31/27	Dec 2027	89.77	71.64	79.39	71.45	90.55	73.97	84.04	74.89	83.11	74.35	8.59	8.41	8.16	7.71	7.87	7.81	7.79	7.50	8.07	7.83	7.91	8.21
01/01/28	01/31/28	Jan 2028	78.61	69.94	78.54	71.88	77.24	70.23	82.07	75.03	81.45	74.73	8.80	8.54	8.28	7.88	8.00	7.95	7.62	7.69	8.24	8.00	8.08	8.03
02/01/28	02/29/28	Feb 2028	76.15	69.43	76.08	71.76	75.23	68.52	79.96	74.69	79.36	74.60	8.83	8.56	8.32	7.93	8.05	8.00	7.66	7.74	8.28	8.05	8.12	8.08
03/01/28	03/31/28	Mar 2028	71.06	68.40	73.80	70.67	68.98	67.40	76.29	73.89	76.79	73.50	8.52	8.27	8.05	7.66	7.73	7.70	7.48	7.56	8.02	7.78	7.86	7.89
04/01/28	04/30/28	Apr 2028	76.37	67.71	78.67	70.97	75.63	65.25	80.40	73.11	81.23	73.71	8.54	8.17	7.94	7.48	7.60	7.53	7.42	7.31	7.81	7.59	7.67	7.80
05/01/28	05/31/28	May 2028	72.70	67.71	76.54	71.46	72.21	65.19	77.43	73.12	79.04	73.87	8.61	8.24	7.95	7.49	7.67	7.60	7.49	7.38	7.82	7.60	7.67	7.85
06/01/28	06/30/28	Jun 2028	74.91	68.47	87.00	73.46	74.61	66.07	79.43	73.82	83.41	74.87	8.79	8.36	8.02	7.55	7.71	7.65	7.56	7.47	7.88	7.66	7.73	7.92
07/01/28	07/31/28	Jul 2028	91.35	75.30	102.01	81.41	91.73	73.67	96.86	80.79	97.98	81.71	9.06	8.56	8.16	7.61	7.82	7.75	7.63	7.51	7.95	7.72	7.80	7.99
08/01/28	08/31/28	Aug 2028	93.51	75.13	103.19	78.86	93.18	74.04	98.56	80.21	99.48	81.03	9.11	8.61	8.18	7.65	7.87	7.79	7.67	7.55	7.98	7.76	7.84	8.03
09/01/28	09/30/28	Sep 2028	88.99	70.89	89.62	73.12	88.24	70.64	92.60	76.00	92.71	76.19	8.51	8.30	8.01	7.54	7.85	7.74	7.57	7.40	7.88	7.65	7.73	7.93
10/01/28	10/31/28	Oct 2028	82.73	69.03	83.02	71.08	82.22	68.61	86.79	74.46	86.41	74.12	8.53	8.33	8.06	7.58	7.89	7.77	7.58	7.39	7.92	7.70	7.77	7.95
11/01/28	11/30/28	Nov 2028	85.17	72.09	80.58	72.16	84.11	73.91	84.72	75.77	83.88	75.04	8.59	8.47	8.22	7.74	8.03	7.95	7.76	7.57	8.09	7.85	7.93	8.16
12/01/28	12/31/28	Dec 2028	90.67	73.84	81.36	73.71	90.58	75.82	86.07	77.06	85.24	76.78	8.82	8.60	8.35	7.86	8.08	8.02	8.00	7.70	8.21	7.97	8.05	8.41
01/01/29	01/31/29	Jan 2029	80.42	71.21	80.00	73.94	78.46	72.20	83.68	76.56	82.96	76.71	9.04	8.75	8.49	8.01	8.21	8.16	7.82	7.90	8.36	8.13	8.21	8.24
02/01/29	02/28/29	Feb 2029	78.64	71.54	78.72	74.39	77.56	71.21	82.74	76.99	82.00	77.23	9.08	8.79	8.54	8.06	8.26	8.21	7.87	7.95	8.41	8.18	8.25	8.29
03/01/29	03/31/29	Mar 2029	72.58	70.16	75.04	72.18	70.66	69.42	77.72	75.58	78.09	75.07	8.75	8.44	8.19	7.77	7.91	7.88	7.65	7.73	8.13	7.89	7.97	8.06
04/01/29	04/30/29	Apr 2029	77.40	69.45	79.45	72.27	76.39	67.35	81.40	74.77	82.14	75.14	8.72	8.32	8.08	7.59	7.77	7.70	7.59	7.48	7.92	7.70	7.78	7.96
05/01/29	05/31/29	May 2029	74.44	70.12	79.03	73.35	72.92	66.88	78.51	75.63	81.62	76.14	8.79	8.38	8.08	7.60	7.84	7.76	7.65	7.53	7.93	7.71	7.78	8.01
06/01/29	06/30/29	Jun 2029	77.19	70.35	88.86	75.27	76.11	68.73	81.57	75.85	84.88	76.69	8.99	8.51	8.14	7.65	7.88	7.82	7.71	7.61	7.98	7.76	7.83	8.08
07/01/29	07/31/29	Jul 2029	93.07	76.83	105.01	83.67	93.08	75.77	98.70	82.20	100.08	83.15	9.27	8.72	8.31	7.73	7.99	7.91	7.79	7.67	8.06	7.84	7.91	8.15
08/01/29	08/31/29	Aug 2029	95.13	76.74	104.73	81.25	95.32	75.64	99.89	81.93	100.94	82.76	9.32	8.78	8.35	7.76	8.05	7.96	7.83	7.69	8.10	7.87	7.95	8.19
09/01/29	09/30/29	Sep 2029	90.59	73.89	91.85	76.05	90.02	73.13	94.68	78.71	94.94	78.88	9.03	8.59	8.25	7.72	8.02	7.93	7.78	7.64	8.05	7.83	7.90	8.15
10/01/29	10/31/29	Oct 2029	83.28	70.99	83.74	72.91	82.90	70.48	87.17	76.28	87.23	75.91	8.83	8.58	8.28	7.74	8.06	7.95	7.78	7.60	8.08	7.86	7.93	8.14
11/01/29	11/30/29	Nov 2029	86.20	73.45	81.33	73.37	85.60	75.83	85.28	76.96	84.50	76.19	8.86	8.62	8.36	7.84	8.17	8.10	7.92	7.74	8.18	7.95	8.03	8.32

12/01/29	12/31/29	Dec 2029	93.47	75.54	83.74	75.48	93.89	77.86	88.12	78.81	87.25	78.47	9.06	8.82	8.56	7.99	8.26	8.20	8.21	7.89	8.34	8.11	8.18	8.62
01/01/30	01/31/30	Jan 2030	82.86	73.63	82.39	76.08	83.30	74.15	86.06	78.92	85.35	78.88	9.29	8.97	8.71	8.17	8.43	8.37	8.02	8.10	8.53	8.29	8.37	8.43
02/01/30	02/28/30	Feb 2030	79.91	73.01	80.95	76.12	81.15	73.55	84.37	78.54	84.18	79.02	9.33	9.00	8.73	8.21	8.48	8.42	8.07	8.14	8.56	8.33	8.41	8.48
03/01/30	03/31/30	Mar 2030	73.45	70.67	76.42	73.50	71.97	69.40	78.68	76.24	79.36	76.35	8.85	8.52	8.25	7.73	7.93	7.91	7.68	7.77	8.09	7.85	7.93	8.10
04/01/30	04/30/30	Apr 2030	78.78	70.39	80.98	73.65	77.50	67.76	82.91	75.86	83.56	76.59	8.82	8.39	8.10	7.57	7.84	7.76	7.63	7.51	7.91	7.68	7.76	8.01
05/01/30	05/31/30	May 2030	74.01	70.10	80.09	74.42	72.55	68.11	78.31	75.30	82.88	76.45	8.89	8.45	8.15	7.60	7.90	7.82	7.69	7.56	7.94	7.71	7.79	8.05
06/01/30	06/30/30	Jun 2030	76.54	71.39	90.34	77.32	75.52	68.72	80.71	76.80	85.99	77.94	9.14	8.61	8.23	7.65	7.95	7.88	7.76	7.65	7.98	7.76	7.83	8.13
07/01/30	07/31/30	Jul 2030	94.45	77.75	106.51	85.34	94.41	75.89	99.70	83.29	101.18	84.21	9.49	8.85	8.36	7.76	8.06	7.97	7.84	7.71	8.10	7.87	7.95	8.21
08/01/30	08/31/30	Aug 2030	96.13	77.89	105.92	83.25	96.17	76.42	101.14	83.15	102.35	84.05	9.54	8.90	8.40	7.80	8.12	8.03	7.88	7.74	8.13	7.91	7.98	8.25
09/01/30	09/30/30	Sep 2030	90.98	73.98	92.18	77.25	90.11	73.23	94.82	79.29	95.11	79.83	9.16	8.70	8.33	7.73	8.09	8.00	7.85	7.70	8.06	7.84	7.92	8.22
10/01/30	10/31/30	Oct 2030	84.85	71.84	85.62	74.43	84.05	71.17	88.92	77.27	88.90	77.26	9.01	8.69	8.36	7.76	8.13	8.02	7.85	7.69	8.10	7.87	7.95	8.22
11/01/30	11/30/30	Nov 2030	87.62	74.65	83.39	75.08	87.85	77.21	87.35	78.66	86.58	77.98	9.05	8.76	8.48	7.86	8.31	8.23	8.05	7.86	8.21	7.98	8.05	8.45
12/01/30	12/31/30	Dec 2030	95.08	76.33	85.95	77.25	95.19	79.44	89.85	79.92	89.16	80.13	9.24	8.95	8.67	8.05	8.38	8.32	8.35	7.99	8.40	8.17	8.25	8.76
01/01/31	01/31/31	Jan 2031	82.93	74.95	84.14	77.97	84.40	75.37	87.37	80.39	86.86	80.68	9.48	9.13	8.85	8.22	8.58	8.44	8.13	8.20	8.58	8.34	8.42	8.55
02/01/31	02/28/31	Feb 2031	81.44	75.12	82.15	78.03	80.71	74.24	86.15	80.60	85.58	80.79	9.54	9.15	8.88	8.25	8.63	8.49	8.18	8.25	8.60	8.37	8.45	8.59
03/01/31	03/31/31	Mar 2031	74.60	71.73	77.24	74.66	72.91	70.12	79.54	77.23	80.29	77.53	8.96	8.55	8.28	7.74	7.97	7.87	7.70	7.79	8.10	7.86	7.94	8.11
04/01/31	04/30/31	Apr 2031	78.46	71.17	81.39	74.38	77.65	68.38	82.72	76.69	83.90	77.20	8.92	8.42	8.12	7.51	7.83	7.67	7.41	7.53	7.85	7.62	7.70	7.78
05/01/31	05/31/31	May 2031	76.46	70.30	81.12	75.07	75.24	68.81	80.70	75.47	83.60	76.70	8.99	8.48	8.10	7.51	7.79	7.64	7.44	7.58	7.84	7.62	7.69	7.80
06/01/31	06/30/31	Jun 2031	76.96	71.42	91.25	77.49	75.72	69.00	81.12	76.83	87.05	77.98	9.25	8.58	8.16	7.55	7.84	7.72	7.51	7.66	7.89	7.66	7.74	7.87
07/01/31	07/31/31	Jul 2031	95.21	77.91	107.66	85.79	95.36	75.91	100.45	83.33	101.92	84.14	9.55	8.90	8.36	7.61	7.91	7.76	7.56	7.70	7.94	7.72	7.79	7.92
08/01/31	08/31/31	Aug 2031	96.51	78.03	106.70	83.70	96.52	76.62	101.62	83.37	102.83	84.27	9.61	8.88	8.40	7.63	7.94	7.78	7.56	7.71	7.97	7.74	7.82	7.93
09/01/31	09/30/31	Sep 2031	95.97	78.00	97.28	81.15	95.12	76.47	99.98	83.30	100.24	83.86	9.74	9.22	8.82	8.22	8.59	8.41	8.09	8.22	8.55	8.33	8.40	8.46
10/01/31	10/31/31	Oct 2031	90.54	78.36	91.82	80.69	90.07	76.55	95.02	83.83	95.04	83.66	9.84	9.52	9.18	8.58	9.03	8.81	8.44	8.56	8.92	8.69	8.77	8.81
11/01/31	11/30/31	Nov 2031	93.85	80.62	89.61	81.05	94.07	82.48	93.65	84.65	92.92	84.00	9.87	9.55	9.22	8.61	9.08	9.08	8.56	8.61	8.96	8.72	8.80	8.96
12/01/31	12/31/31	Dec 2031	101.99	82.50	92.03	83.11	102.61	85.09	96.32	86.01	95.44	85.99	9.97	9.84	9.35	8.66	9.13	9.12	8.60	8.65	9.02	8.78	8.86	9.01
01/01/32	01/31/32	Jan 2032	85.93	77.20	85.62	79.40	85.98	76.87	89.31	82.69	88.67	82.34	9.66	9.30	9.02	8.37	8.74	8.60	8.28	8.36	8.73	8.49	8.57	8.70
02/01/32	02/29/32	Feb 2032	83.31	76.96	83.51	79.21	83.34	75.83	87.64	82.41	86.96	82.08	9.72	9.32	9.05	8.40	8.79	8.65	8.33	8.41	8.76	8.52	8.60	8.75
03/01/32	03/31/32	Mar 2032	75.90	73.03	78.21	75.24	74.14	72.17	80.95	78.57	81.44	78.09	9.13	8.71	8.44	7.89	8.12	8.02	7.84	7.94	8.24	8.01	8.09	8.26
04/01/32	04/30/32	Apr 2032	79.92	72.58	82.42	75.91	78.89	69.93	84.37	78.08	85.33	78.43	9.09	8.58	8.27	7.65	7.98	7.82	7.55	7.67	7.99	7.77	7.84	7.92
05/01/32	05/31/32	May 2032	75.87	72.27	82.48	76.94	73.88	69.53	80.30	77.28	84.53	78.61	9.17	8.64	8.26	7.65	7.94	7.79	7.58	7.72	7.98	7.76	7.84	7.95
06/01/32	06/30/32	Jun 2032	77.79	72.59	93.05	79.17	77.33	70.17	82.06	77.89	88.35	79.23	9.43	8.75	8.32	7.70	7.99	7.86	7.65	7.80	8.03	7.81	7.88	8.02
07/01/32	07/31/32	Jul 2032	95.96	78.46	108.70	87.44	96.05	76.89	101.40	83.95	103.05	84.95	9.73	9.07	8.52	7.75	8.06	7.91	7.70	7.84	8.08	7.86	7.94	8.06
08/01/32	08/31/32	Aug 2032	97.53	78.36	108.55	84.85	97.71	77.12	102.78	83.67	104.22	84.63	9.79	9.05	8.56	7.78	8.09	7.93	7.71	7.86	8.11	7.89	7.97	8.07
09/01/32	09/30/32	Sep 2032	96.44	78.89	97.82	82.20	95.84	77.85	100.50	84.34	100.73	84.81	9.92	9.40	8.99	8.38	8.75	8.57	8.25	8.37	8.71	8.49	8.56	8.61
10/01/32	10/31/32	Oct 2032	92.55	80.20	93.71	82.04	91.99	78.43	96.96	85.51	97.19	85.06	10.03	9.70	9.36	8.74	9.20	8.98	8.60	8.73	9.08	8.85	8.93	8.97
11/01/32	11/30/32	Nov 2032	93.47	81.48	90.36	81.90	93.89	84.01	94.16	85.74	93.42	85.07	10.06	9.73	9.40	8.77	9.25	9.25	8.72	8.77	9.12	8.88	8.96	9.12
12/01/32	12/31/32	Dec 2032	101.96	83.37	92.90	84.56	103.31	86.07	97.10	87.27	96.27	87.41	10.16	10.03	9.53	8.83	9.30	9.30	8.76	8.81	9.18	8.94	9.02	9.18
01/01/33	01/31/33	Jan 2033	86.63	78.52	86.59	80.86	86.29	78.87	90.49	83.92	89.90	83.77	9.84	9.48	9.19	8.53	8.91	8.77	8.44	8.52	8.89	8.65	8.73	8.86
02/01/33	02/28/33	Feb 2033	84.35	78.58	84.96	80.72	84.97	77.55	88.75	83.89	88.53	83.55	9.90	9.50	9.22	8.56	8.96	8.82	8.49	8.57	8.92	8.68	8.76	8.91
03/01/33	03/31/33	Mar 2033	77.88	74.46	79.94	77.00	75.66	73.53	82.73	80.06	83.22	79.78	9.30	8.88	8.60	8.04	8.27	8.17	7.99	8.09	8.39	8.16	8.24	8.40
04/01/33	04/30/33	Apr 2033	80.86	74.34	83.66	77.46	79.01	71.41	85.13	79.76	86.80	80.14	9.26	8.74	8.43	7.80	8.13	7.97	7.69	7.82	8.14	7.91	7.99	8.07
05/01/33	05/31/33	May 2033	77.54	74.10	84.03	78.31	74.79	71.13	82.01	78.93	86.44	80.23	9.34	8.81	8.41	7.80	8.09	7.94	7.73	7.87	8.13	7.91	7.98	8.09
06/01/33	06/30/33	Jun 2033	80.14	74.45	95.01	80.89	79.24	72.29	84.34	79.84	90.85	81.00	9.61	8.91	8.47	7.84	8.14	8.01	7.80	7.95	8.18	7.95	8.03	8.16
07/01/33	07/31/33	Jul 2033	98.22	80.60	111.14	89.24	98.11	78.76	103.63	86.06	105.53	87.03	9.92	9.24	8.68	7.90	8.22	8.06	7.85	7.99	8.23	8.01	8.08	8.21
08/01/33	08/31/33	Aug 2033	99.54	79.60	110.47	85.96	99.48	77.86	104.64	84.96	106.03	85.85	9.97	9.22	8.72	7.93	8.24	8.08	7.85	8.01	8.26	8.04	8.11	8.22
09/01/33	09/30/33	Sep 2033	96.35	80.33	98.74	83.90	95.21	79.05	100.67	85.83	101.14	86.35	10.11	9.58	9.16	8.53	8.92	8.73	8.40	8.53	8.87	8.64	8.72	8.77
10/01/33	10/31/33	Oct 2033	93.69	82.17	95.32	83.90	92.54	80.07	97.82	87.50	98.48	87.03	10.22	9.89	9.54	8.91	9.38	9.15	8.76	8.89	9.24	9.02	9.10	9.13
11/01/33	11/30/33	Nov 2033	95.38	83.53	92.08	83.69	96.31	85.55	96.54	87.73	95.52	86.97	10.25	9.91	9.57	8.94	9.43	9.42	8.89	8.94	9.29	9.05	9.13	9.29
12/01/33	12/31/33	Dec 2033	102.67	85.75	94.18	86.22	103.30	88.14	98.62	89.58	97.78	89.26	10.36	10.22	9.71	8.99	9.48	9.47	8.93	8.98	9.35	9.11	9.19	9.34
01/01/34	01/31/34	Jan 2034	88.41	80.32	88.02	82.68	88.33	80.35	92.04	85.84	91.49	85.48	10.04	9.67	9.37	8.70	9.09	8.94	8.61	8.69	9.06	8.82	8.90	9.03
02/01/34	02/28/34	Feb 2034	86.23	80.60	86.96	82.71	86.02	79.62	90.53	86.01	90.22	85.46	10.10	9.69	9.40	8.73	9.14	8.99	8.66	8.74	9.09	8.85	8.93	9.08
03/01/34	03/31/34	Mar 2034	79.25	76.48	81.85	79.33	77.29	75.90	84.26	82.09	85.19	82.07	9.49	9.06	8.77	8.20	8.44	8.33	8.15	8.25	8.56	8.32	8.40	8.56
04/01/34	04/30/34	Apr 2034	82.78	76.47	85.74	79.68	81.05	73.78	86.65	81.85	88.42	82.15	9.45	8.92	8.60	7.96	8.29	8.13	7.85	7.97	8.29	8.07	8.15	8.22
05/01/34	05/31/34	May 2034	78.81	75.27	86.31	80.40	77.04	72.36	83.15	80.60	87.93	81.88	9.53	8.98	8.58	7.95	8.25	8.10	7.88	8.03	8.29	8.06	8.14	8.24
06/01/34	06/30/34	Jun 2034	80.37	75.70	96.24	82.87	79.45	73.31	84.35	81.25	91.48	82.47	9.80	9.09	8.64	8.00	8.30	8.17	7.95	8.11	8.33	8.11	8.18	8.32
07/01/34	07/31/34	Jul 2034	99.94	82.41	113.43	91.81	100.23	81.01	105.27	87.79	107.53	88.79	10.12	9.43	8.86	8.06	8.38	8.22	8.00	8.15	8.39	8.17	8.24	8.37
08/01/34	08/31/34	Aug 2034	101.42	80.89	111.86	88.67	101.56	79.84	106.51	86.27	107.70	87.31	10.17	9.40	8.90	8.09	8.41	8.24	8.01	8.17	8.42	8.20	8.27	8.38
09/01/34	09/30/34	Sep 2034	99.18	82.58	101.74	86.67	97.94	81.81	103.64	88.00	104.25	88.81	10.31	9.77	9.34	8.71	9.10	8.91	8.57	8.70	9.04	8.82	8.89	8.94
10/01/34	10/31/34	Oct 2034	93.80	84.03	96.62	86.02	92.75	82.15	98.59	89.43	100.08	89.09	10.42	10.08	9.73	9.09	9.56	9.33	8.94	9.07	9.42	9.20	9.27	9.31
11/01/34	11/30/34	Nov 2034	97.21	85.22	94.32	85.73	98.77	87.63	98.58	89.55	97.84	88.86	10.46	10.11	9.77	9.12	9.62	9.61	9.07	9.12	9.46	9.23	9.31	9.47
12/01/34	12/31/34	Dec 2034	105.84	87.78	97.32	88.13	106.72	90.20	101.51	91.37	100.75	91.08	10.56	10.42	9.91	9.17	9.67	9.66	9.11	9.16	9.53	9.29	9.37	9.52
01/01/35	01/31/35	Jan 2035	90.35	82.21	90.93	84.86	90.45	82.34	94.35	87.77	93.94	87.58	10.23	9.85	9.55	8.87	9.26	9.11	8.77	8.85	9.23	8.99	9.07	9.19
02/01/35	02/28/35	Feb 2035	88.49	82.27	89.38	84.80	88.06	81.59	93.05	87.74	92.86	87.53	10.29	9.87	9.58	8.90	9.31	9.16	8.83	8.91	9.26	9.02	9.10	9.24
03/01/35	03/31/35	Mar 2035	81.48	78.65	83.85	81.51	79.22	77.54	86.51	84.27	87.29	84.21	9.67	9.23	8.94	8.36	8.60	8.49	8.31	8.41	8.71	8.48	8.55	8.72
04/01/35	04/30/35	Apr 2035	84.10	77.72	87.46	81.72	81.78	75.37	88.13	83.27	89.98	84.05	9.63	9.09	8.76	8.11	8.45	8.28	7.99	8.12	8.44	8.22	8.30	8.37
05/01/35	05/31/35	May 2035	81.78	77.72	89.76	83.06	78.73	74.39	86.22	82.93	92.09	84.07	9.71	9.15	8.74	8.10	8.41	8.25	8.03	8.18	8.44	8.21	8.29	8.39
06/01/35	06/30/35	Jun 2035	83.03	77.32	99.48	85.53	82.45	75.80	86.94	82.86	94.40	84.14	9.99	9.26	8.81	8.15	8.46	8.33	8.10	8.26	8.49	8.26	8.34	8.47
07/01/35	07/31/35	Jul 2035	102.22	84.09	116.58	94.15	102.28	82.62	107.61	89.48	110.33	90.64	10.31	9.61	9.03	8.21	8.54	8.38	8.15	8.31	8.54	8.32	8.39	8.52
08/01/35	08/31/35	Aug 2035	103.61	82.82	115.55	91.31	103.75	81.68	108.69	88.12	110.52	89.24	10.37	9.58	9.06	8.24	8.57	8.40	8.16	8.32	8.57	8.35	8.43	8.53
09/01/35	09/30/35	Sep 2035	102.21	85.12	104.91	89.14	101.30	83.75	106.68	90.46	107.31	91.18	10.51	9.95	9.52	8.87	9.27	9.08	8.74	8.87	9.20	8.98	9.06	9.10
10/01/35	10/31/35	Oct 2035	96.38	85.84	99.11	87.84	95.38	83.77	101.34	91.20	102.49	90.79	10.62	10.28	9.91	9.26	9.75	9.51	9.11	9.24	9.60	9.37	9.45	9.48
11/01/35	11/30/35	Nov 2035	98.85	86.79	95.84	87.60	100.49	89.33	99.69	91.62	99.13	90.82	10.66	10.30	9.95	9.29	9.80	9.79	9.24	9.29	9.64	9.40	9.48	9.64
12/01/35	12/31/35	Dec 2035	108.64	89.12	100.06	90.52	107.32	91.41	104.04	93.33	103.25	93.09	10.76	10.62	10.09	9.35	9.85	9.84	9.28	9.34	9.70	9.47	9.55	9.69
01/01/36	01/31/36	Jan 2036	91.29	84.18	92.32	86.85	92.37	84.33	95.86	89.70	95.75	89.56	10.43	10.04	9.73	9.04	9.43	9.29	8.94	9.02	9.39	9.16	9.24	9.36

02/01/36	02/29/36	Feb 2036	89.98	84.13	91.07	86.65	89.55	83.17	94.66	89.63	94.72	89.39	10.49	10.06	9.76	9.07	9.49	9.34	8.99	9.07	9.43	9.19	9.27	9.41
03/01/36	03/31/36	Mar 2036	83.34	79.83	85.75	83.56	80.50	78.46	88.41	85.44	89.07	86.12	9.85	9.40	9.11	8.52	8.76	8.65	8.47	8.56	8.87	8.63	8.71	8.88
04/01/36	04/30/36	Apr 2036	85.56	79.52	88.99	83.76	83.38	76.70	90.47	85.07	92.09	85.79	9.81	9.26	8.93	8.26	8.61	8.44	8.15	8.28	8.60	8.37	8.45	8.52
05/01/36	05/31/36	May 2036	81.97	79.25	92.58	85.12	78.82	75.79	87.36	85.09	94.07	86.26	9.89	9.33	8.91	8.26	8.57	8.41	8.18	8.33	8.59	8.37	8.44	8.55
06/01/36	06/30/36	Jun 2036	84.15	79.10	101.42	88.16	83.65	77.04	88.48	84.64	96.15	85.98	10.18	9.44	8.98	8.31	8.62	8.49	8.26	8.42	8.64	8.42	8.49	8.62
07/01/36	07/31/36	Jul 2036	103.61	85.20	118.56	95.60	103.24	83.63	109.49	90.66	112.15	91.77	10.50	9.79	9.20	8.37	8.70	8.53	8.31	8.46	8.70	8.48	8.55	8.67
08/01/36	08/31/36	Aug 2036	105.49	85.09	117.39	93.90	105.37	83.95	110.52	90.40	112.49	91.40	10.56	9.77	9.24	8.40	8.73	8.55	8.32	8.48	8.73	8.51	8.58	8.68
09/01/36	09/30/36	Sep 2036	102.22	85.77	105.83	90.57	101.41	84.60	106.95	91.23	107.78	91.94	10.71	10.14	9.70	9.04	9.45	9.25	8.90	9.04	9.37	9.15	9.22	9.27
10/01/36	10/31/36	Oct 2036	97.42	87.93	100.31	89.78	96.37	85.50	102.65	93.25	103.65	92.77	10.82	10.47	10.10	9.44	9.93	9.69	9.28	9.42	9.77	9.55	9.62	9.65
11/01/36	11/30/36	Nov 2036	100.08	89.03	98.25	89.85	101.37	91.10	102.24	93.83	101.66	93.05	10.86	10.50	10.14	9.47	9.98	9.98	9.41	9.47	9.81	9.58	9.66	9.81
12/01/36	12/31/36	Dec 2036	109.26	91.04	101.40	91.73	108.75	92.89	105.56	95.13	104.76	94.88	10.97	10.82	10.29	9.53	10.04	10.03	9.46	9.51	9.88	9.64	9.72	9.87
01/01/37	01/31/37	Jan 2037	95.90	86.27	94.42	88.68	97.66	86.71	98.20	91.78	97.82	91.42	10.62	10.23	9.92	9.21	9.61	9.46	9.11	9.19	9.57	9.33	9.41	9.53
02/01/37	02/28/37	Feb 2037	92.56	86.63	93.27	88.87	93.95	85.13	96.72	92.11	96.73	91.57	10.69	10.25	9.95	9.24	9.67	9.52	9.16	9.25	9.60	9.36	9.44	9.58
03/01/37	03/31/37	Mar 2037	85.67	82.73	88.32	86.01	83.29	81.35	91.21	88.34	91.66	88.64	10.04	9.58	9.28	8.68	8.93	8.82	8.63	8.73	9.03	8.80	8.87	9.04
04/01/37	04/30/37	Apr 2037	87.84	80.97	91.32	86.27	85.45	79.35	91.45	86.56	94.07	87.44	10.00	9.44	9.09	8.42	8.77	8.60	8.30	8.43	8.76	8.53	8.61	8.68
05/01/37	05/31/37	May 2037	84.79	80.82	95.35	87.97	82.47	77.80	89.38	86.37	95.54	87.74	10.08	9.51	9.08	8.42	8.73	8.57	8.34	8.49	8.75	8.52	8.60	8.70
06/01/37	06/30/37	Jun 2037	86.57	80.87	103.61	90.23	86.34	80.10	90.46	86.33	98.53	87.69	10.37	9.62	9.15	8.47	8.78	8.65	8.42	8.58	8.80	8.57	8.65	8.78
07/01/37	07/31/37	Jul 2037	105.16	86.78	121.26	98.45	105.93	85.74	110.40	92.03	114.92	93.63	10.70	9.98	9.37	8.52	8.87	8.70	8.47	8.62	8.86	8.63	8.71	8.83
08/01/37	08/31/37	Aug 2037	107.16	87.03	120.53	96.45	107.08	85.94	112.18	92.09	115.22	93.41	10.77	9.95	9.41	8.56	8.89	8.72	8.47	8.64	8.89	8.67	8.74	8.84
09/01/37	09/30/37	Sep 2037	105.03	87.55	109.09	92.53	104.00	86.52	109.52	93.03	110.59	93.78	10.91	10.34	9.89	9.21	9.63	9.43	9.07	9.21	9.54	9.32	9.40	9.44
10/01/37	10/31/37	Oct 2037	100.84	89.82	104.07	92.28	99.68	87.88	105.15	95.22	107.54	95.11	11.03	10.67	10.29	9.62	10.12	9.88	9.46	9.60	9.95	9.73	9.80	9.83
11/01/37	11/30/37	Nov 2037	101.98	90.60	100.35	91.81	103.10	92.87	104.19	95.71	103.81	95.04	11.06	10.70	10.33	9.65	10.17	10.17	9.59	9.65	9.99	9.76	9.84	9.99
12/01/37	12/31/37	Dec 2037	111.04	93.41	103.93	94.12	111.07	96.01	107.79	97.14	107.05	97.09	11.18	11.03	10.48	9.71	10.23	10.22	9.64	9.69	10.06	9.83	9.90	10.05
01/01/38	01/31/38	Jan 2038	98.85	88.78	97.32	91.05	100.70	90.50	101.22	93.94	100.69	93.68	10.83	10.43	10.10	9.38	9.80	9.64	9.28	9.37	9.74	9.51	9.58	9.70
02/01/38	02/28/38	Feb 2038	96.05	88.54	95.19	90.57	97.36	89.24	99.09	93.78	98.63	93.27	10.89	10.45	10.14	9.42	9.85	9.70	9.34	9.42	9.77	9.54	9.62	9.75
03/01/38	03/31/38	Mar 2038	86.82	83.46	90.33	88.54	85.56	83.91	92.27	89.07	93.59	90.02	10.23	9.76	9.46	8.84	9.10	8.99	8.79	8.89	9.20	8.96	9.04	9.20
04/01/38	04/30/38	Apr 2038	89.03	82.81	94.54	88.69	87.14	81.48	94.18	88.40	96.95	89.40	10.19	9.62	9.27	8.58	8.94	8.76	8.46	8.59	8.92	8.69	8.77	8.83
05/01/38	05/31/38	May 2038	84.74	82.24	97.46	90.84	81.84	78.25	90.98	88.19	98.10	89.90	10.27	9.69	9.25	8.58	8.90	8.73	8.50	8.65	8.91	8.68	8.76	8.86
06/01/38	06/30/38	Jun 2038	88.86	82.86	106.45	93.00	88.52	82.19	92.10	88.29	100.84	89.05	10.57	9.80	9.32	8.63	8.95	8.81	8.58	8.74	8.96	8.74	8.81	8.94
07/01/38	07/31/38	Jul 2038	107.36	89.46	124.45	101.18	107.92	88.36	112.71	94.58	117.42	95.93	10.91	10.17	9.55	8.69	9.04	8.86	8.63	8.79	9.02	8.80	8.87	8.99
08/01/38	08/31/38	Aug 2038	110.28	88.73	123.77	98.91	110.66	88.61	115.11	93.99	118.08	95.15	10.97	10.14	9.59	8.72	9.06	8.88	8.63	8.80	9.05	8.83	8.90	9.00
09/01/38	09/30/38	Sep 2038	108.01	89.96	112.51	95.28	107.02	89.06	112.59	95.41	113.32	96.08	11.12	10.53	10.07	9.39	9.81	9.61	9.24	9.38	9.72	9.50	9.57	9.61
10/01/38	10/31/38	Oct 2038	104.77	91.42	108.00	94.21	103.24	90.99	109.34	96.84	111.26	96.91	11.24	10.87	10.49	9.80	10.31	10.06	9.64	9.78	10.13	9.91	9.99	10.01
11/01/38	11/30/38	Nov 2038	104.83	93.51	102.08	93.79	107.46	95.67	106.16	97.86	105.43	97.03	11.27	10.90	10.53	9.83	10.37	10.36	9.78	9.83	10.18	9.94	10.02	10.18
12/01/38	12/31/38	Dec 2038	113.44	95.46	106.05	96.66	113.12	98.21	110.20	99.52	109.47	99.29	11.39	11.24	10.68	9.89	10.42	10.42	9.82	9.88	10.25	10.01	10.09	10.23
01/01/39	01/31/39	Jan 2039	99.08	90.14	98.48	93.16	99.85	91.70	102.13	95.23	101.81	95.51	11.03	10.62	10.30	9.56	9.98	9.82	9.46	9.55	9.92	9.68	9.76	9.88
02/01/39	02/28/39	Feb 2039	97.36	90.56	96.84	93.07	97.93	90.30	100.75	95.72	100.24	95.54	11.10	10.64	10.33	9.60	10.04	9.88	9.52	9.60	9.95	9.72	9.80	9.93
03/01/39	03/31/39	Mar 2039	88.87	85.61	92.70	90.22	87.40	86.22	94.39	91.20	95.81	92.09	10.42	9.95	9.64	9.01	9.27	9.16	8.96	9.06	9.36	9.13	9.21	9.37
04/01/39	04/30/39	Apr 2039	92.30	85.56	96.65	91.53	90.09	83.66	96.35	90.94	99.41	91.89	10.38	9.80	9.44	8.74	9.11	8.93	8.62	8.76	9.08	8.85	8.93	8.99
05/01/39	05/31/39	May 2039	87.81	84.67	99.85	92.85	86.72	82.54	93.01	90.20	100.06	91.87	10.47	9.87	9.43	8.74	9.07	8.89	8.66	8.82	9.07	8.85	8.92	9.02
06/01/39	06/30/39	Jun 2039	90.79	84.49	108.98	95.39	90.62	84.88	93.61	89.91	102.76	90.46	10.77	9.99	9.50	8.79	9.12	8.98	8.74	8.91	9.12	8.90	8.97	9.10
07/01/39	07/31/39	Jul 2039	109.38	90.67	127.04	103.96	109.81	90.39	114.58	95.95	119.77	97.57	11.11	10.36	9.73	8.85	9.21	9.03	8.79	8.96	9.19	8.96	9.04	9.16
08/01/39	08/31/39	Aug 2039	111.80	89.61	126.38	100.86	112.65	90.36	116.48	94.83	119.59	96.07	11.18	10.33	9.77	8.88	9.23	9.05	8.80	8.97	9.22	8.99	9.07	9.17
09/01/39	09/30/39	Sep 2039	107.84	91.53	114.46	97.86	106.69	90.91	112.79	96.65	113.80	96.76	11.33	10.73	10.27	9.56	10.00	9.79	9.42	9.56	9.90	9.67	9.75	9.79
10/01/39	10/31/39	Oct 2039	103.42	92.79	110.24	96.60	102.70	92.55	108.50	98.18	113.29	98.50	11.45	11.08	10.69	9.98	10.51	10.26	9.82	9.96	10.32	10.10	10.17	10.19
11/01/39	11/30/39	Nov 2039	106.79	95.54	104.21	96.00	109.02	97.89	108.00	99.77	107.58	99.00	11.49	11.11	10.73	10.02	10.56	10.56	9.96	10.02	10.36	10.13	10.21	10.36
12/01/39	12/31/39	Dec 2039	114.22	98.38	107.82	98.95	113.92	100.88	111.80	101.72	111.01	101.61	11.61	11.45	10.88	10.08	10.62	10.61	10.01	10.07	10.43	10.20	10.28	10.42
01/01/40	01/31/40	Jan 2040	103.43	91.95	100.76	96.07	105.26	94.35	104.28	96.96	103.93	97.52	11.24	10.83	10.49	9.74	10.17	10.01	9.64	9.73	10.10	9.87	9.94	10.06
02/01/40	02/29/40	Feb 2040	100.65	92.87	99.49	95.93	102.25	92.75	103.47	98.23	102.89	98.24	11.31	10.85	10.53	9.78	10.23	10.07	9.70	9.78	10.13	9.90	9.98	10.11
03/01/40	03/31/40	Mar 2040	90.51	87.95	94.85	92.61	89.84	88.36	95.95	93.51	98.11	94.51	10.62	10.14	9.82	9.18	9.45	9.33	9.13	9.23	9.54	9.30	9.38	9.54
04/01/40	04/30/40	Apr 2040	92.47	86.74	99.74	95.31	91.03	85.52	97.36	92.26	99.94	93.27	10.58	9.98	9.62	8.91	9.28	9.10	8.78	8.92	9.24	9.02	9.10	9.16
05/01/40	05/31/40	May 2040	88.39	86.03	103.15	95.84	86.22	82.16	94.85	91.91	100.61	93.17	10.67	10.06	9.61	8.90	9.24	9.06	8.82	8.99	9.24	9.01	9.09	9.19
06/01/40	06/30/40	Jun 2040	91.51	86.67	111.02	98.20	90.71	85.36	95.46	92.22	104.30	93.01	10.97	10.18	9.68	8.96	9.29	9.15	8.90	9.08	9.29	9.07	9.14	9.27
07/01/40	07/31/40	Jul 2040	112.35	93.71	131.31	106.98	112.66	92.52	117.82	98.62	123.30	100.27	11.33	10.56	9.92	9.02	9.38	9.20	8.96	9.13	9.35	9.13	9.20	9.32
08/01/40	08/31/40	Aug 2040	115.21	92.54	128.97	103.93	114.93	92.30	120.17	97.36	122.74	98.60	11.39	10.53	9.96	9.05	9.41	9.22	8.97	9.14	9.39	9.16	9.24	9.33
09/01/40	09/30/40	Sep 2040	111.93	94.21	119.11	101.88	110.53	93.76	116.69	99.39	117.94	100.14	11.54	10.94	10.46	9.75	10.19	9.97	9.60	9.74	10.08	9.86	9.93	9.96
10/01/40	10/31/40	Oct 2040	106.35	95.24	112.01	99.27	105.55	94.36	110.96	100.68	115.24	100.96	11.67	11.29	10.89	10.17	10.71	10.45	10.01	10.15	10.51	10.29	10.36	10.38
11/01/40	11/30/40	Nov 2040	108.93	97.70	106.83	98.49	111.34	100.28	110.75	102.00	110.28	101.30	11.71	11.32	10.93	10.21	10.77	10.76	10.15	10.21	10.55	10.32	10.40	10.55
12/01/40	12/31/40	Dec 2040	117.79	100.44	111.67	101.43	117.60	102.35	115.48	104.14	114.73	103.93	11.83	11.67	11.09	10.27	10.82	10.82	10.20	10.26	10.63	10.39	10.47	10.61
01/01/41	01/31/41	Jan 2041	104.24	94.39	103.76	99.14	106.68	96.27	107.08	99.41	106.80	100.11	11.47	11.04	10.70	9.94	10.38	10.21	9.83	9.92	10.30	10.06	10.14	10.25
02/01/41	02/28/41	Feb 2041	102.23	94.48	102.11	99.00	101.79	94.95	105.70	99.99	105.22	100.43	11.53	11.06	10.74	9.97	10.43	10.27	9.89	9.98	10.33	10.09	10.17	10.31
03/01/41	03/31/41	Mar 2041	93.78	90.21	97.91	95.54	91.86	90.58	99.37	95.78	100.77	96.73	10.83	10.34	10.02	9.37	9.64	9.52	9.31	9.42	9.72	9.48	9.56	9.72
04/01/41	04/30/41	Apr 2041	96.21	89.26	102.49	97.21	94.62	88.27	100.55	94.81	103.45	95.86	10.79	10.18	9.82	9.08	9.47	9.28	8.96	9.10	9.42	9.20	9.27	9.33
05/01/41	05/31/41	May 2041	92.86	88.89	107.69	98.71	90.94	86.97	98.83	94.59	105.57	96.05	10.88	10.26	9.80	9.08	9.42	9.24	9.00	9.17	9.41	9.19	9.27	9.36
06/01/41	06/30/41	Jun 2041	95.71	89.43	114.78	102.14	95.64	89.31	98.45	94.66	108.31	96.60	11.19	10.38	9.87	9.14	9.48	9.33	9.08	9.26	9.47	9.25	9.32	9.45
07/01/41	07/31/41	Jul 2041	115.16	95.64	134.99	110.27	115.58	95.29	120.37	100.46	126.97	102.89	11.55	10.77	10.12	9.20	9.57	9.39	9.14	9.31	9.53	9.31	9.39	9.50
08/01/41	08/31/41	Aug 2041	118.28	94.92	133.06	107.86	117.81	95.12	122.97	99.93	126.23	101.74	11.62	10.74	10.16	9.23	9.60	9.41	9.15	9.33	9.57	9.34	9.42	9.51
09/01/41	09/30/41	Sep 2041	115.93	96.57	123.66	105.34	114.42	96.33	120.64	102.00	122.33	103.50	11.78	11.16	10.67	9.94	10.39	10.17	9.79	9.94	10.27	10.05	10.13	10.16
10/01/41	10/31/41	Oct 2041	108.40	96.95	114.83	102.10	107.71	96.76	113.24	102.41	118.02	102.76	11.90	11.52	11.11	10.38	10.92	10.66	10.21	10.36	10.71	10.49	10.56	10.58
11/01/41	11/30/41	Nov 2041	111.60	100.21	109.18	100.97	112.88	102.36	113.37	104.23	112.66	103.44	11.94	11.55	11.15	10.41	10.98	10.98	10.35	10.41	10.76	10.52	10.60	10.75
12/01/41	12/31/41	Dec 2041	121.12	103.05	115.01	104.22	120.61	105.08	118.72	106.54	117.95	106.63	12.06	11.90	11.31	10.48	11.04	11.03	10.40	10.46	10.83	10.59	10.67	10.81
01/01/42	01/31/42	Jan 2042	106.32	96.28	105.84	101.12	108.81	98.20	109.22	101.40	108.94	102.11	11.70	11.26	10.92	10.14	10.58	10.42	10.03	10.12	10.50	10.26	10.34	10.45
02/01/42	02/28/42	Feb 2042	104.27	96.37	104.15	100.98	103.83	96.85	107.81	101.99	107.32	102.44	11.77	11.29	10.95	10.17	10.64	10.48	10.09	10.18	10.53	10.29	10.37	10.50
03/01/42	03/31/42	Mar 2042	95.66	92.01	99.87	97.45	93.70	92.39	101.36	97.70	102.79	98.66	11.05	10.55	10.22	9.55	9.83	9.71	9.50	9.61	9.91	9.67	9.75	9.91

51957	51986	51957	98.1342	91.0452	104.5398	99.1542	96.5124	90.0354	102.561	96.7062	105.519	97.7772	11.007432	10.388088	10.011606	9.26619	9.659298	9.466008	$ 9.138	$ 9.285	9.610746	9.381552	9.459684	9.52068

1211 Official Base Case:
Blend of...
1211D Midas forecast completed 12/15/2011
12/30/2011 forward market curve

Quote Date		Data Type:	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC	FPC
12/30/2011		Commodity:	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	ELEC	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG	NG
		P:	COB N-S	COB N-S	PV	PV	MID-C	MID-C	NP15	NP15	SP15	SP15	HENRYHUB	SOCALBOR	SANJUAN	ROCKOPAL	MALINGAS	STANFLD5	SUMAS5	AECO	GADSBY	CURRCRK	LAKESIDE	Z_CHEBRN
			COB		Palo Verde		Mid-Columbia		NP 15		SP 15		Henry Hub Gas	SOCALBOR	SANJUAN	Opal Gas	Malin Gas	Stanfield Gas	SUMAS	AECO	GADSBY	Currant Creek	Lakeside	Z_CHEBRN*
			Forward Prices		Forward Prices		Forward Prices		Forward Prices		Forward Prices		Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price	Fwd Price
Start	End	Peak Type:	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	HLH	LLH	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat	Flat
01/01/12	01/31/12	Jan 2012	30.80	26.89	29.99	24.05	29.22	26.12	30.94	26.21	31.14	24.43	3.08	3.42	3.10	3.04	3.17	3.15	3.48	2.80	3.20	3.02	3.05	3.43
02/01/12	02/29/12	Feb 2012	30.50	26.75	29.75	23.00	27.75	24.75	30.50	25.50	31.00	24.00	2.99	3.14	2.91	2.95	3.03	2.95	3.04	2.72	3.25	3.02	3.06	3.31
03/01/12	03/31/12	Mar 2012	29.50	24.50	30.25	21.75	26.25	22.00	30.25	23.00	31.00	23.00	3.02	3.12	2.88	2.91	3.01	2.93	2.90	2.73	3.20	2.98	3.01	3.16
04/01/12	04/30/12	Apr 2012	29.96	22.88	30.75	22.41	25.37	19.20	29.80	21.09	30.25	21.19	3.08	3.16	2.90	2.92	2.98	2.90	2.83	2.71	3.20	2.99	3.02	3.01
05/01/12	05/31/12	May 2012	25.95	14.95	29.83	19.92	22.25	12.00	28.91	18.13	29.65	18.00	3.13	3.21	2.95	2.97	3.03	2.95	2.88	2.72	3.25	3.04	3.07	3.07
06/01/12	06/30/12	Jun 2012	24.34	7.93	31.67	19.92	19.14	4.80	29.80	16.28	30.86	17.06	3.18	3.26	3.00	3.02	3.08	3.00	2.93	2.76	3.30	3.09	3.12	3.12
07/01/12	07/31/12	Jul 2012	33.81	22.14	39.14	27.00	31.83	18.87	37.25	25.46	39.39	25.89	3.24	3.33	3.06	3.08	3.15	3.07	2.99	2.78	3.37	3.15	3.19	3.19
08/01/12	08/31/12	Aug 2012	38.59	27.81	39.53	27.54	35.18	25.97	38.37	26.78	40.17	28.07	3.28	3.36	3.10	3.11	3.18	3.10	3.02	2.81	3.40	3.19	3.22	3.22
09/01/12	09/30/12	Sep 2012	37.85	31.05	37.59	26.46	33.50	28.67	36.13	26.51	37.44	27.80	3.28	3.37	3.10	3.12	3.19	3.11	3.03	2.85	3.41	3.19	3.23	3.23
10/01/12	10/31/12	Oct 2012	34.04	30.00	35.54	26.25	31.51	27.44	37.88	29.50	38.37	29.04	3.32	3.40	3.14	3.16	3.22	3.14	3.07	2.89	3.45	3.23	3.27	3.27
11/01/12	11/30/12	Nov 2012	37.37	30.94	33.81	25.99	33.57	30.09	36.75	29.50	36.51	28.46	3.48	3.56	3.31	3.31	3.42	3.34	3.57	3.08	3.61	3.38	3.42	3.87
12/01/12	12/31/12	Dec 2012	39.59	32.81	34.16	26.51	37.33	30.98	37.88	29.50	36.88	28.75	3.76	3.84	3.59	3.64	3.69	3.61	3.84	3.33	3.96	3.73	3.77	4.16
01/01/13	01/31/13	Jan 2013	39.75	32.81	37.60	28.56	36.57	31.34	44.81	32.50	43.94	32.25	3.88	3.96	3.71	3.77	3.86	3.78	3.97	3.43	4.09	3.86	3.90	4.29
02/01/13	02/28/13	Feb 2013	37.88	31.25	36.87	28.00	34.85	29.61	43.50	33.48	43.50	32.25	3.88	3.96	3.71	3.76	3.90	3.82	3.97	3.43	4.08	3.85	3.89	4.29
03/01/13	03/31/13	Mar 2013	34.88	29.69	35.04	27.44	32.09	25.30	42.20	31.53	43.07	32.25	3.87	3.95	3.70	3.74	3.84	3.76	3.95	3.44	4.05	3.83	3.86	4.28
04/01/13	04/30/13	Apr 2013	36.40	25.20	37.00	22.40	32.16	20.21	38.38	25.88	39.64	26.26	3.82	3.90	3.63	3.64	3.70	3.62	3.54	3.42	3.94	3.72	3.76	3.77
05/01/13	05/31/13	May 2013	30.88	17.10	35.52	20.88	26.43	12.54	37.24	21.83	38.47	19.14	3.84	3.92	3.65	3.66	3.72	3.64	3.56	3.40	3.96	3.74	3.78	3.79
06/01/13	06/30/13	Jun 2013	30.23	11.70	38.48	21.97	23.16	11.51	38.38	19.80	39.64	21.36	3.87	3.95	3.68	3.69	3.75	3.67	3.59	3.41	3.99	3.78	3.81	3.82
07/01/13	07/31/13	Jul 2013	41.63	24.49	48.93	30.00	37.54	21.75	49.00	32.50	51.45	32.01	3.91	3.99	3.72	3.73	3.79	3.71	3.63	3.43	4.04	3.82	3.86	3.87
08/01/13	08/31/13	Aug 2013	47.51	34.10	49.40	30.90	44.14	29.66	51.50	35.18	54.08	33.99	3.93	4.01	3.74	3.75	3.81	3.73	3.65	3.44	4.06	3.84	3.88	3.89
09/01/13	09/30/13	Sep 2013	46.61	34.41	44.18	29.10	42.08	33.34	49.50	32.83	51.98	33.00	3.94	4.02	3.75	3.76	3.82	3.74	3.66	3.47	4.06	3.85	3.88	3.89
10/01/13	10/31/13	Oct 2013	40.71	35.04	40.69	30.75	38.18	32.90	47.52	34.91	48.96	33.25	3.97	4.05	3.78	3.79	3.85	3.77	3.69	3.52	4.10	3.88	3.92	3.93
11/01/13	11/30/13	Nov 2013	44.69	35.77	39.90	30.14	41.92	34.65	47.52	36.02	47.04	33.95	4.09	4.15	3.81	3.94	4.00	3.92	4.16	3.66	4.26	4.03	4.07	4.50
12/01/13	12/31/13	Dec 2013	47.35	38.69	37.92	31.37	44.41	37.45	48.96	39.32	48.00	37.80	4.31	4.37	4.03	4.21	4.22	4.14	4.38	3.86	4.53	4.30	4.35	4.73
01/01/14	01/31/14	Jan 2014	44.50	35.81	41.35	30.31	40.57	34.84	49.81	35.50	48.94	35.25	4.42	4.48	4.14	4.31	4.38	4.30	4.50	3.96	4.64	4.41	4.45	4.86
02/01/14	02/28/14	Feb 2014	42.63	34.25	40.62	29.75	38.85	33.11	48.50	36.48	48.50	35.25	4.40	4.46	4.12	4.28	4.40	4.32	4.48	3.94	4.61	4.38	4.42	4.83
03/01/14	03/31/14	Mar 2014	39.63	32.69	38.79	29.19	36.09	28.80	47.20	34.53	48.07	35.25	4.33	4.40	4.06	4.21	4.28	4.20	4.41	3.90	4.53	4.30	4.35	4.76
04/01/14	04/30/14	Apr 2014	41.15	28.20	39.75	22.40	32.41	21.71	42.88	27.88	44.64	29.01	4.20	4.26	3.93	4.02	4.06	3.98	3.91	3.79	4.33	4.11	4.15	4.17
05/01/14	05/31/14	May 2014	35.63	20.10	38.27	20.88	26.68	14.04	41.74	23.83	43.47	21.89	4.21	4.28	3.94	4.03	4.08	4.00	3.93	3.77	4.34	4.12	4.16	4.18
06/01/14	06/30/14	Jun 2014	34.98	14.70	41.23	21.97	23.41	13.01	42.88	21.80	44.64	24.11	4.24	4.30	3.97	4.06	4.10	4.02	3.95	3.78	4.37	4.15	4.22	4.21
07/01/14	07/31/14	Jul 2014	46.13	27.99	53.18	30.75	41.54	25.00	54.50	36.00	56.95	35.76	4.28	4.34	4.01	4.10	4.14	4.06	3.99	3.79	4.41	4.19	4.26	4.25
08/01/14	08/31/14	Aug 2014	52.01	37.60	53.65	31.65	48.14	32.91	57.00	38.68	59.58	37.74	4.30	4.36	4.03	4.11	4.16	4.08	4.01	3.80	4.43	4.21	4.28	4.27
09/01/14	09/30/14	Sep 2014	51.11	37.91	48.43	29.85	46.08	36.59	55.00	36.33	57.48	36.75	4.30	4.36	4.03	4.12	4.16	4.08	4.01	3.83	4.43	4.21	4.28	4.27
10/01/14	10/31/14	Oct 2014	45.46	38.29	45.44	32.25	42.68	36.65	53.02	38.41	54.96	36.75	4.34	4.40	4.07	4.15	4.20	4.12	4.05	3.87	4.47	4.25	4.32	4.31
11/01/14	11/30/14	Nov 2014	49.44	39.02	44.65	31.64	46.42	38.40	53.02	39.52	53.04	37.45	4.43	4.49	4.07	4.28	4.32	4.24	4.49	3.99	4.61	4.38	4.45	4.85
12/01/14	12/31/14	Dec 2014	52.10	41.94	42.67	32.87	48.91	41.20	54.46	42.82	54.00	41.30	4.63	4.69	4.28	4.52	4.53	4.45	4.70	4.17	4.86	4.63	4.70	5.06
01/01/15	01/31/15	Jan 2015	47.75	37.56	45.20	32.31	43.82	36.59	54.66	38.00	53.79	37.75	4.73	4.80	4.40	4.62	4.69	4.61	4.82	4.27	4.96	4.73	4.80	5.19
02/01/15	02/28/15	Feb 2015	45.88	36.00	44.47	31.75	42.10	34.86	53.35	38.98	53.35	37.75	4.71	4.77	4.37	4.59	4.71	4.63	4.76	4.23	4.93	4.70	4.77	5.13
03/01/15	03/31/15	Mar 2015	42.88	34.44	42.64	31.19	39.34	30.55	52.05	37.03	52.92	37.75	4.62	4.68	4.29	4.50	4.57	4.49	4.68	4.17	4.83	4.60	4.68	5.05
04/01/15	04/30/15	Apr 2015	44.40	29.95	43.60	24.40	35.66	23.46	47.73	30.38	49.49	31.51	4.44	4.51	4.11	4.14	4.31	4.23	4.14	4.02	4.46	4.24	4.31	4.40
05/01/15	05/31/15	May 2015	38.88	21.85	42.12	22.88	29.93	15.79	46.59	26.33	48.32	24.39	4.45	4.52	4.12	4.15	4.32	4.24	4.15	3.99	4.47	4.25	4.32	4.41
06/01/15	06/30/15	Jun 2015	38.23	16.45	45.08	23.97	26.66	14.76	47.73	24.30	49.49	26.61	4.48	4.54	4.15	4.18	4.34	4.26	4.17	4.00	4.50	4.28	4.35	4.44
07/01/15	07/31/15	Jul 2015	49.38	29.74	57.03	32.75	44.79	26.75	59.35	38.50	61.80	38.26	4.52	4.58	4.19	4.22	4.38	4.30	4.21	4.00	4.53	4.31	4.38	4.48
08/01/15	08/31/15	Aug 2015	55.26	39.35	57.50	33.65	51.39	34.66	61.85	41.18	64.43	40.24	4.54	4.60	4.21	4.24	4.40	4.32	4.23	4.02	4.55	4.33	4.40	4.50
09/01/15	09/30/15	Sep 2015	54.36	39.66	52.28	31.85	49.33	38.34	59.85	38.83	62.33	39.25	4.54	4.60	4.21	4.24	4.40	4.32	4.23	4.05	4.56	4.34	4.41	4.50
10/01/15	10/31/15	Oct 2015	48.71	40.04	49.29	34.25	45.93	38.40	57.87	40.91	59.81	39.25	4.58	4.64	4.25	4.27	4.44	4.36	4.27	4.09	4.59	4.37	4.44	4.54
11/01/15	11/30/15	Nov 2015	52.69	40.77	48.50	33.64	49.67	40.15	57.87	42.02	57.89	39.95	4.67	4.50	4.26	4.41	4.57	4.49	4.72	4.22	4.75	4.51	4.59	5.08
12/01/15	12/31/15	Dec 2015	55.35	43.69	46.52	34.87	52.16	42.95	59.31	45.32	58.85	43.80	4.88	4.71	4.47	4.67	4.78	4.70	4.93	4.40	5.02	4.78	4.86	5.31
01/01/16	01/31/16	Jan 2016	51.25	39.46	48.45	35.31	47.32	38.49	59.16	40.50	58.29	40.15	4.99	4.82	4.65	4.78	4.95	4.87	5.07	4.53	5.12	4.89	4.96	5.46
02/01/16	02/29/16	Feb 2016	49.38	37.90	47.72	34.75	45.60	36.76	57.85	41.48	57.85	40.15	4.96	4.79	4.63	4.74	4.96	4.88	5.02	4.48	5.08	4.85	4.92	5.40
03/01/16	03/31/16	Mar 2016	46.38	36.34	45.89	34.19	42.84	32.45	56.55	39.53	57.42	40.15	4.88	4.71	4.54	4.64	4.83	4.75	4.93	4.42	4.98	4.75	4.82	5.32
04/01/16	04/30/16	Apr 2016	47.90	31.85	46.85	27.40	39.16	25.36	52.23	32.88	53.99	33.91	4.70	4.51	4.37	4.43	4.56	4.48	4.39	4.27	4.76	4.54	4.61	4.67
05/01/16	05/31/16	May 2016	42.38	23.75	45.37	25.88	33.43	17.69	51.09	28.83	52.82	26.79	4.71	4.39	4.38	4.44	4.57	4.49	4.40	4.24	4.77	4.55	4.62	4.68
06/01/16	06/30/16	Jun 2016	41.73	18.35	48.33	26.97	30.16	16.66	52.23	26.80	53.99	29.01	4.73	4.40	4.40	4.47	4.59	4.51	4.42	4.25	4.80	4.57	4.65	4.71
07/01/16	07/31/16	Jul 2016	52.88	31.64	60.28	35.75	48.29	28.65	63.85	41.00	66.30	40.66	4.77	4.67	4.44	4.51	4.63	4.55	4.46	4.26	4.83	4.61	4.68	4.75
08/01/16	08/31/16	Aug 2016	58.76	41.25	60.75	36.65	54.89	36.56	66.35	43.68	68.93	42.64	4.79	4.69	4.46	4.53	4.65	4.57	4.48	4.27	4.85	4.63	4.71	4.77
09/01/16	09/30/16	Sep 2016	57.86	41.56	55.53	34.85	52.83	40.24	64.35	41.33	66.83	41.65	4.80	4.68	4.47	4.53	4.66	4.58	4.49	4.31	4.86	4.64	4.71	4.78
10/01/16	10/31/16	Oct 2016	52.21	41.94	52.54	37.25	49.43	40.30	62.37	43.41	64.31	41.65	4.83	4.57	4.50	4.57	4.69	4.61	4.52	4.35	4.90	4.68	4.75	4.81
11/01/16	11/30/16	Nov 2016	56.19	42.67	51.75	36.64	53.17	42.05	62.37	44.52	62.39	42.35	4.94	4.76	4.53	4.70	4.84	4.76	4.99	4.49	5.04	4.81	4.88	5.37
12/01/16	12/31/16	Dec 2016	58.85	45.59	49.77	37.87	55.66	44.85	63.81	47.82	63.35	46.20	5.16	4.98	4.75	4.94	5.06	4.98	5.21	4.68	5.29	5.05	5.13	5.61
01/01/17	01/31/17	Jan 2017	54.75	41.26	51.70	37.11	50.82	40.29	63.41	42.75	62.54	42.40	5.28	5.10	4.94	5.05	5.24	5.16	5.42	4.87	5.40	5.17	5.25	5.83
02/01/17	02/28/17	Feb 2017	52.88	39.70	50.97	36.55	49.10	38.56	62.10	43.73	62.10	42.40	5.25	5.07	4.91	5.02	5.25	5.17	5.36	4.83	5.37	5.14	5.22	5.77
03/01/17	03/31/17	Mar 2017	49.88	38.14	49.14	35.99	46.34	34.25	60.80	41.78	61.67	42.40	5.16	4.98	4.83	4.93	5.11	5.03	5.28	4.77	5.28	5.05	5.12	5.68

04/01/17	04/30/17	Apr 2017	51.40	33.65	50.10	29.20	42.66	27.16	56.48	35.13	58.24	36.16	4.96	4.80	4.63	4.70	4.82	4.74	4.71	4.59	5.03	4.81	4.88	5.01
05/01/17	05/31/17	May 2017	45.88	25.55	48.62	27.68	36.93	19.49	55.34	31.08	57.07	29.04	4.97	4.69	4.64	4.71	4.83	4.75	4.72	4.57	5.04	4.82	4.89	5.02
06/01/17	06/30/17	Jun 2017	45.23	20.15	51.58	28.77	33.66	18.46	56.48	29.05	58.24	31.26	5.00	4.71	4.67	4.74	4.86	4.78	4.75	4.58	5.07	4.85	4.92	5.05
07/01/17	07/31/17	Jul 2017	56.38	33.44	63.53	37.55	51.79	30.45	68.10	43.25	70.55	42.91	5.03	4.94	4.70	4.77	4.90	4.82	4.79	4.58	5.11	4.88	4.96	5.09
08/01/17	08/31/17	Aug 2017	62.26	43.05	64.00	38.45	58.39	38.36	70.60	45.93	73.18	44.89	5.06	4.98	4.73	4.80	4.93	4.85	4.82	4.61	5.14	4.91	4.99	5.12
09/01/17	09/30/17	Sep 2017	61.36	43.36	58.78	36.65	56.33	42.04	68.60	43.58	71.08	43.90	5.07	4.97	4.74	4.81	4.93	4.85	4.82	4.64	5.14	4.92	5.00	5.13
10/01/17	10/31/17	Oct 2017	55.71	43.74	55.79	39.05	52.93	42.10	66.62	45.66	68.56	43.90	5.10	4.87	4.77	4.84	4.97	4.89	4.86	4.68	5.18	4.95	5.03	5.16
11/01/17	11/30/17	Nov 2017	59.69	44.47	55.00	38.44	56.67	43.85	66.62	46.77	66.64	44.60	5.22	5.04	4.81	4.98	5.12	5.04	5.33	4.83	5.33	5.10	5.17	5.73
12/01/17	12/31/17	Dec 2017	62.35	47.39	53.02	39.67	59.16	46.65	68.06	50.07	67.60	48.45	5.45	5.27	5.03	5.22	5.34	5.26	5.55	5.03	5.58	5.34	5.42	5.97
01/01/18	01/31/18	Jan 2018	58.00	43.01	54.95	38.91	54.07	42.04	67.41	45.00	66.54	44.65	5.57	5.39	5.23	5.33	5.53	5.45	5.73	5.19	5.69	5.46	5.54	6.16
02/01/18	02/28/18	Feb 2018	53.27	41.71	53.74	41.80	50.64	41.09	63.17	50.87	62.74	49.95	5.85	5.76	5.61	5.58	5.72	5.66	5.78	5.37	5.94	5.70	5.78	6.21
03/01/18	03/31/18	Mar 2018	48.61	40.25	50.58	40.68	45.98	37.93	60.71	49.85	60.80	49.78	5.72	5.60	5.46	5.44	5.56	5.50	5.56	5.29	5.80	5.56	5.64	5.98
04/01/18	04/30/18	Apr 2018	50.08	38.26	49.59	37.50	46.87	34.58	58.23	46.49	59.46	46.96	5.62	5.48	5.34	5.25	5.34	5.27	5.20	5.10	5.59	5.37	5.44	5.59
05/01/18	05/31/18	May 2018	47.56	33.80	50.64	36.57	43.58	30.99	59.11	44.22	60.23	43.60	5.65	5.44	5.34	5.25	5.33	5.27	5.22	5.10	5.59	5.36	5.44	5.60
06/01/18	06/30/18	Jun 2018	48.35	31.71	55.23	38.04	43.24	31.32	60.00	43.64	61.30	44.63	5.69	5.47	5.37	5.28	5.36	5.30	5.25	5.13	5.62	5.39	5.47	5.64
07/01/18	07/31/18	Jul 2018	60.73	41.00	70.06	44.59	59.57	38.98	72.32	53.46	74.30	53.13	5.79	5.67	5.46	5.32	5.41	5.34	5.29	5.15	5.66	5.44	5.52	5.68
08/01/18	08/31/18	Aug 2018	64.08	45.86	67.05	44.42	62.47	42.81	74.90	54.67	76.79	53.91	5.82	5.70	5.49	5.35	5.44	5.37	5.31	5.17	5.69	5.47	5.54	5.71
09/01/18	09/30/18	Sep 2018	62.12	43.88	60.19	41.53	60.34	43.11	69.39	51.36	70.72	51.50	5.61	5.54	5.33	5.25	5.33	5.26	5.19	5.04	5.59	5.37	5.44	5.58
10/01/18	10/31/18	Oct 2018	56.37	42.83	56.73	41.89	54.95	41.13	66.48	51.75	67.40	50.66	5.60	5.50	5.36	5.27	5.35	5.28	5.20	5.05	5.61	5.39	5.47	5.60
11/01/18	11/30/18	Nov 2018	57.85	45.75	54.51	41.41	55.95	44.81	65.54	52.80	65.07	51.29	5.67	5.59	5.41	5.34	5.44	5.38	5.47	5.17	5.70	5.47	5.55	5.90
12/01/18	12/31/18	Dec 2018	61.52	47.12	55.24	43.55	59.86	46.79	66.98	54.66	66.26	53.35	5.82	5.76	5.58	5.51	5.61	5.55	5.54	5.31	5.87	5.64	5.72	5.98
01/01/19	01/31/19	Jan 2019	57.01	42.81	55.17	42.53	56.00	41.36	66.10	51.85	65.53	51.24	5.97	5.83	5.67	5.60	5.72	5.67	5.69	5.46	5.97	5.73	5.81	6.14
02/01/19	02/28/19	Feb 2019	53.66	43.71	56.52	47.05	52.18	43.62	64.23	58.01	63.37	57.50	6.46	6.46	6.30	6.14	6.19	6.15	6.20	5.91	6.50	6.26	6.34	6.62
03/01/19	03/31/19	Mar 2019	47.35	42.36	52.01	45.36	45.63	41.61	60.63	57.93	59.93	57.15	6.29	6.22	6.09	5.95	6.00	5.97	5.84	5.81	6.31	6.07	6.15	6.26
04/01/19	04/30/19	Apr 2019	48.76	42.87	49.07	45.80	51.08	42.00	59.98	57.86	60.68	57.76	6.28	6.16	6.05	5.80	5.85	5.79	5.70	5.60	6.14	5.92	6.00	6.08
05/01/19	05/31/19	May 2019	49.24	42.05	52.65	45.45	50.23	42.50	62.87	57.36	63.39	58.17	6.33	6.20	6.04	5.79	5.83	5.78	5.71	5.64	6.13	5.90	5.98	6.10
06/01/19	06/30/19	Jun 2019	51.47	43.27	58.87	47.32	52.81	44.19	63.52	58.23	64.36	57.99	6.39	6.24	6.08	5.82	5.86	5.82	5.75	5.69	6.16	5.94	6.01	6.14
07/01/19	07/31/19	Jul 2019	65.07	48.56	76.59	51.62	67.35	47.50	76.54	63.68	78.05	63.35	6.54	6.39	6.21	5.87	5.92	5.87	5.79	5.72	6.21	5.99	6.06	6.18
08/01/19	08/31/19	Aug 2019	65.90	48.66	70.10	50.39	66.56	47.25	79.20	63.42	80.41	62.93	6.58	6.43	6.24	5.90	5.95	5.90	5.81	5.73	6.24	6.01	6.09	6.20
09/01/19	09/30/19	Sep 2019	62.89	44.40	61.61	46.40	64.35	44.19	70.18	59.13	70.36	59.10	6.16	6.11	5.92	5.69	5.73	5.66	5.55	5.44	6.03	5.81	5.88	5.94
10/01/19	10/31/19	Oct 2019	57.03	41.92	57.68	44.72	56.96	40.15	66.34	57.83	66.23	57.41	6.09	6.12	5.94	5.70	5.74	5.66	5.54	5.43	6.04	5.82	5.89	5.94
11/01/19	11/30/19	Nov 2019	56.00	47.03	54.02	44.38	55.23	45.77	64.46	58.84	63.49	57.98	6.12	6.14	6.02	5.71	5.76	5.72	5.62	5.51	6.07	5.83	5.91	6.04
12/01/19	12/31/19	Dec 2019	60.69	46.84	57.46	47.44	60.57	46.93	65.89	59.25	64.92	58.24	6.20	6.25	6.13	5.79	5.88	5.83	5.53	5.60	6.16	5.92	6.00	5.97
01/01/20	01/31/20	Jan 2020	56.02	42.60	55.40	46.15	57.92	40.68	64.80	58.70	64.53	57.82	6.36	6.27	6.12	5.86	5.92	5.89	5.65	5.74	6.23	5.99	6.08	6.10
02/01/20	02/29/20	Feb 2020	51.19	42.34	54.83	46.21	48.88	40.06	62.71	58.21	61.81	57.62	6.39	6.30	6.15	5.89	5.94	5.91	5.68	5.77	6.25	6.01	6.09	6.11
03/01/20	03/31/20	Mar 2020	47.18	40.45	49.75	43.37	44.35	38.69	60.13	57.11	59.30	56.17	6.14	6.05	5.91	5.67	5.73	5.70	5.50	5.59	6.03	5.80	5.87	5.92
04/01/20	04/30/20	Apr 2020	46.37	41.84	48.49	44.04	47.02	39.70	59.40	57.53	60.12	56.91	6.16	6.01	5.89	5.50	5.55	5.51	5.45	5.39	5.84	5.62	5.70	5.83
05/01/20	05/31/20	May 2020	46.36	41.55	51.25	43.45	43.77	43.60	61.14	55.71	62.88	56.01	6.21	6.03	5.87	5.52	5.59	5.55	5.49	5.42	5.86	5.63	5.71	5.87
06/01/20	06/30/20	Jun 2020	49.38	40.52	58.39	46.01	50.18	39.75	61.65	56.57	62.81	56.24	6.27	6.07	5.89	5.55	5.62	5.59	5.53	5.48	5.89	5.67	5.74	5.92
07/01/20	07/31/20	Jul 2020	63.53	47.57	75.59	50.08	65.75	46.49	75.12	62.58	76.87	62.20	6.42	6.20	5.97	5.58	5.69	5.64	5.57	5.51	5.92	5.70	5.78	5.96
08/01/20	08/31/20	Aug 2020	64.29	47.61	69.51	49.22	64.64	46.32	77.70	62.51	79.08	62.07	6.46	6.23	6.00	5.61	5.69	5.65	5.58	5.52	5.95	5.73	5.80	5.98
09/01/20	09/30/20	Sep 2020	62.90	43.60	60.95	46.38	64.27	42.61	70.10	59.00	70.43	58.93	6.24	6.15	5.95	5.57	5.72	5.66	5.56	5.46	5.91	5.69	5.77	5.95
10/01/20	10/31/20	Oct 2020	56.36	41.83	56.09	45.43	56.28	39.52	66.27	58.00	66.12	57.34	6.24	6.17	6.01	5.63	5.75	5.68	5.57	5.46	5.97	5.74	5.82	5.96
11/01/20	11/30/20	Nov 2020	57.25	47.24	52.91	46.01	55.34	46.77	65.81	59.37	64.70	58.63	6.26	6.24	6.12	5.77	5.86	5.82	5.72	5.62	6.13	5.89	5.97	6.15
12/01/20	12/31/20	Dec 2020	60.61	46.80	56.66	47.64	60.31	47.98	67.19	59.98	66.22	59.40	6.37	6.33	6.21	5.86	5.96	5.92	5.76	5.72	6.23	5.99	6.07	6.20
01/01/21	01/31/21	Jan 2021	62.54	54.29	61.88	54.57	62.23	53.14	66.40	57.92	65.61	57.16	6.53	6.45	6.29	5.99	6.04	6.01	5.77	5.86	6.36	6.12	6.20	6.22
02/01/21	02/28/21	Feb 2021	61.09	53.70	61.76	54.22	60.38	51.92	64.97	57.63	64.83	56.87	6.56	6.49	6.33	6.02	6.08	6.05	5.81	5.90	6.38	6.15	6.23	6.24
03/01/21	03/31/21	Mar 2021	57.49	53.29	57.64	54.10	55.51	52.25	60.40	57.61	60.57	56.84	6.44	6.34	6.21	5.94	6.00	5.98	5.79	5.88	6.30	6.06	6.14	6.21
04/01/21	04/30/21	Apr 2021	56.42	52.66	59.38	55.04	55.23	50.92	60.71	57.50	61.55	58.12	6.44	6.33	6.19	5.81	5.90	5.85	5.77	5.68	6.15	5.92	6.00	6.15
05/01/21	05/31/21	May 2021	58.03	52.94	60.94	55.66	57.27	50.94	62.82	58.07	63.89	58.19	6.50	6.38	6.20	5.82	5.95	5.90	5.81	5.73	6.16	5.93	6.01	6.20
06/01/21	06/30/21	Jun 2021	58.99	52.99	68.42	56.22	58.79	49.64	63.58	58.44	65.14	58.55	6.57	6.45	6.24	5.85	5.99	5.94	5.86	5.79	6.19	5.97	6.05	6.25
07/01/21	07/31/21	Jul 2021	72.97	57.00	83.32	61.33	73.22	56.37	78.19	62.81	79.32	63.24	6.75	6.55	6.34	5.91	6.02	5.97	5.90	5.82	6.25	6.03	6.10	6.29
08/01/21	08/31/21	Aug 2021	76.65	58.66	80.07	59.93	75.42	56.46	81.09	63.14	82.07	63.00	6.79	6.58	6.37	5.93	6.06	6.00	5.92	5.83	6.27	6.05	6.12	6.31
09/01/21	09/30/21	Sep 2021	71.30	55.45	71.22	56.74	70.79	54.36	74.48	60.09	74.59	59.65	6.64	6.54	6.34	5.94	6.09	6.03	5.94	5.84	6.28	6.06	6.13	6.33
10/01/21	10/31/21	Oct 2021	68.27	54.60	67.53	55.79	68.03	52.99	71.66	59.00	71.07	58.43	6.67	6.56	6.37	5.98	6.12	6.06	5.96	5.86	6.33	6.10	6.18	6.35
11/01/21	11/30/21	Nov 2021	69.05	58.21	63.39	56.38	68.72	58.30	67.60	60.28	66.76	59.29	6.69	6.66	6.53	6.29	6.34	6.29	6.17	6.04	6.64	6.41	6.49	6.59
12/01/21	12/31/21	Dec 2021	72.83	60.17	65.65	57.63	72.61	60.16	69.87	61.50	68.90	60.53	6.89	6.82	6.65	6.40	6.46	6.42	6.11	6.18	6.77	6.53	6.61	6.55
01/01/22	01/31/22	Jan 2022	67.73	58.84	65.98	58.62	66.98	57.15	70.42	61.98	69.54	61.30	7.07	6.98	6.81	6.56	6.62	6.57	6.26	6.34	6.93	6.69	6.77	6.70
02/01/22	02/28/22	Feb 2022	65.71	58.09	65.74	58.39	65.37	56.26	69.66	61.66	69.20	60.94	7.11	7.02	6.86	6.60	6.66	6.61	6.30	6.38	6.96	6.72	6.80	6.72
03/01/22	03/31/22	Mar 2022	60.74	57.70	62.22	58.27	59.08	55.81	65.10	61.88	64.94	61.09	7.01	6.92	6.79	6.55	6.61	6.57	6.33	6.41	6.90	6.67	6.75	6.75
04/01/22	04/30/22	Apr 2022	60.96	57.61	63.80	58.82	59.17	54.78	66.27	61.94	66.53	61.70	7.02	6.88	6.77	6.40	6.45	6.39	6.30	6.21	6.74	6.51	6.59	6.68
05/01/22	05/31/22	May 2022	62.21	56.71	64.52	59.15	61.11	53.95	66.88	61.29	67.52	61.84	7.08	6.94	6.79	6.45	6.50	6.44	6.35	6.26	6.79	6.57	6.64	6.74
06/01/22	06/30/22	Jun 2022	63.52	57.55	73.26	60.41	63.88	55.32	68.38	62.26	69.76	62.50	7.14	7.01	6.83	6.49	6.54	6.49	6.40	6.32	6.83	6.60	6.68	6.79
07/01/22	07/31/22	Jul 2022	79.48	62.28	90.24	66.67	79.60	61.76	84.72	67.99	86.17	68.40	7.32	7.15	6.95	6.53	6.59	6.53	6.44	6.36	6.87	6.64	6.72	6.83
08/01/22	08/31/22	Aug 2022	82.81	63.29	86.81	64.76	81.96	61.56	87.13	67.92	88.43	67.91	7.37	7.19	6.99	6.56	6.64	6.57	6.47	6.37	6.90	6.68	6.76	6.86
09/01/22	09/30/22	Sep 2022	78.44	60.17	77.79	61.51	77.44	59.11	81.18	64.78	81.15	64.60	7.17	7.08	6.93	6.59	6.65	6.58	6.46	6.35	6.93	6.71	6.78	6.86
10/01/22	10/31/22	Oct 2022	73.39	58.91	72.55	59.89	73.23	56.77	76.48	63.45	76.07	62.84	7.18	7.11	6.96	6.62	6.69	6.61	6.48	6.36	6.97	6.74	6.82	6.88
11/01/22	11/30/22	Nov 2022	73.89	61.93	67.63	60.52	73.61	62.39	72.52	64.55	71.59	63.61	7.24	7.20	7.07	6.76	6.83	6.78	6.66	6.55	7.12	6.89	6.97	7.09
12/01/22	12/31/22	Dec 2022	76.56	63.62	70.05	61.99	76.17	64.14	73.92	65.63	73.00	64.77	7.37	7.34	7.20	6.85	6.91	6.87	6.68	6.64	7.22	6.98	7.06	7.12
01/01/23	01/31/23	Jan 2023	72.69	62.48	69.92	62.23	71.41	59.88	74.47	65.85	73.60	65.14	7.56	7.48	7.33	7.01	7.07	7.03	6.72	6.80	7.38	7.14	7.22	7.17
02/01/23	02/28/23	Feb 2023	69.53	61.49	69.48	61.67	68.98	59.09	73.32	65.27	72.72	64.59	7.60	7.50	7.36	7.03	7.09	7.05	6.77	6.84	7.39	7.15	7.23	7.19
03/01/23	03/31/23	Mar 2023	64.66	60.51	64.51	60.98	62.03	57.70	67.77	64.73	67.44	63.81	7.39	7.29	7.16	6.86	6.92	6.90	6.69	6.77	7.22	6.98	7.06	7.11
04/01/23	04/30/23	Apr 2023	64.61	60.37	66.53	62.08	62.29	58.16	69.95	64.61	69.95	65.24	7.43	7.26	7.13	6.70	6.75	6.70	6.62	6.54	7.04	6.82	6.89	7.01

05/01/23	05/31/23	May 2023	65.86	59.49	68.18	62.08	65.80	58.34	70.29	64.52	70.98	64.78	7.49	7.32	7.14	6.73	6.80	6.75	6.68	6.60	7.07	6.85	6.92	7.06
06/01/23	06/30/23	Jun 2023	67.56	59.78	76.81	63.35	68.30	59.39	72.45	65.05	74.07	65.56	7.58	7.37	7.18	6.77	6.84	6.80	6.74	6.67	7.11	6.89	6.96	7.12
07/01/23	07/31/23	Jul 2023	82.77	65.61	93.78	70.28	83.41	65.37	88.57	71.34	90.08	71.98	7.78	7.55	7.34	6.81	6.88	6.84	6.77	6.71	7.15	6.92	7.00	7.16
08/01/23	08/31/23	Aug 2023	86.07	65.13	90.22	68.15	85.33	63.90	90.65	70.62	91.76	71.22	7.83	7.59	7.38	6.84	6.91	6.87	6.80	6.72	7.18	6.96	7.03	7.19
09/01/23	09/30/23	Sep 2023	78.83	61.24	78.59	62.92	78.34	60.16	81.66	66.05	81.53	65.90	7.25	7.15	6.99	6.57	6.74	6.66	6.52	6.39	6.92	6.69	6.77	6.92
10/01/23	10/31/23	Oct 2023	73.30	59.88	72.69	60.79	73.21	57.52	76.66	64.38	76.10	63.89	7.27	7.19	7.02	6.61	6.78	6.68	6.54	6.39	6.95	6.72	6.80	6.93
11/01/23	11/30/23	Nov 2023	74.64	61.78	69.38	61.57	74.02	63.72	73.61	65.50	72.67	64.52	7.33	7.29	7.15	6.75	6.89	6.84	6.70	6.57	7.11	6.87	6.95	7.13
12/01/23	12/31/23	Dec 2023	77.66	63.95	71.26	62.86	77.60	65.48	75.39	66.64	74.40	65.86	7.43	7.40	7.26	6.84	6.95	6.89	6.89	6.61	7.20	6.97	7.05	7.32
01/01/24	01/31/24	Jan 2024	72.03	62.02	70.34	62.83	72.78	60.49	74.77	66.47	73.94	65.73	7.61	7.49	7.34	6.95	7.02	6.98	6.70	6.78	7.32	7.09	7.17	7.15
02/01/24	02/29/24	Feb 2024	69.57	61.39	69.95	62.79	69.25	59.26	73.75	66.03	73.42	65.38	7.65	7.52	7.37	6.99	7.06	7.02	6.74	6.82	7.35	7.12	7.19	7.16
03/01/24	03/31/24	Mar 2024	61.84	59.17	64.19	60.84	60.51	56.97	66.40	63.82	66.62	63.51	7.23	7.12	6.98	6.63	6.69	6.67	6.44	6.52	6.99	6.75	6.83	6.86
04/01/24	04/30/24	Apr 2024	61.61	58.33	65.25	60.94	60.31	56.17	66.18	63.58	67.05	63.68	7.20	7.06	6.91	6.49	6.55	6.49	6.40	6.31	6.83	6.61	6.69	6.78
05/01/24	05/31/24	May 2024	63.59	57.76	66.40	61.14	61.91	56.16	68.28	63.34	69.56	63.78	7.26	7.11	6.92	6.45	6.60	6.54	6.45	6.35	6.79	6.57	6.64	6.83
06/01/24	06/30/24	Jun 2024	64.08	58.95	74.41	62.58	63.33	55.94	68.41	64.38	70.93	64.49	7.35	7.17	6.98	6.49	6.64	6.59	6.50	6.41	6.84	6.61	6.69	6.89
07/01/24	07/31/24	Jul 2024	80.48	63.41	91.49	68.03	80.97	61.87	85.60	69.05	87.23	69.79	7.56	7.33	7.13	6.54	6.68	6.62	6.54	6.45	6.88	6.66	6.73	6.93
08/01/24	08/31/24	Aug 2024	82.61	63.31	87.48	66.33	82.31	62.04	87.75	68.60	88.82	69.18	7.61	7.38	7.16	6.57	6.72	6.66	6.56	6.47	6.91	6.69	6.77	6.96
09/01/24	09/30/24	Sep 2024	77.63	61.50	77.57	63.26	76.93	60.01	80.33	66.46	80.48	66.15	7.40	7.27	7.07	6.60	6.76	6.68	6.56	6.44	6.94	6.72	6.79	6.95
10/01/24	10/31/24	Oct 2024	73.39	59.74	72.57	61.64	72.79	58.68	76.43	64.87	75.90	64.34	7.37	7.29	7.12	6.64	6.79	6.71	6.58	6.45	6.99	6.76	6.84	6.97
11/01/24	11/30/24	Nov 2024	74.65	62.47	68.61	62.25	73.70	64.12	73.32	66.10	72.44	65.14	7.41	7.34	7.20	6.79	6.92	6.87	6.74	6.60	7.15	6.91	6.99	7.16
12/01/24	12/31/24	Dec 2024	77.94	63.55	71.37	63.34	77.55	65.54	75.64	67.31	74.64	66.46	7.60	7.50	7.34	6.90	7.01	6.96	6.90	6.71	7.27	7.03	7.11	7.34
01/01/25	01/31/25	Jan 2025	71.10	62.93	71.14	63.83	70.95	61.43	75.21	67.49	74.58	66.62	7.80	7.62	7.45	7.01	7.14	7.09	6.79	6.88	7.38	7.14	7.23	7.24
02/01/25	02/28/25	Feb 2025	70.04	62.47	70.78	64.01	69.20	60.39	74.38	67.22	74.16	66.50	7.85	7.65	7.49	7.05	7.18	7.14	6.84	6.92	7.41	7.18	7.26	7.26
03/01/25	03/31/25	Mar 2025	63.01	61.11	65.61	62.88	61.87	59.53	67.56	65.76	68.05	65.38	7.57	7.38	7.24	6.83	6.89	6.87	6.66	6.75	7.19	6.95	7.03	7.09
04/01/25	04/30/25	Apr 2025	64.28	60.22	67.44	63.14	62.58	58.25	68.65	65.45	69.37	65.88	7.53	7.34	7.20	6.64	6.78	6.72	6.63	6.54	6.98	6.75	6.83	7.01
05/01/25	05/31/25	May 2025	65.95	61.22	69.22	63.64	65.42	57.88	70.53	66.34	71.39	66.31	7.59	7.39	7.20	6.66	6.84	6.77	6.68	6.58	7.00	6.77	6.85	7.07
06/01/25	06/30/25	Jun 2025	68.43	61.66	78.19	65.09	68.16	58.26	73.13	66.94	74.35	66.97	7.69	7.43	7.24	6.69	6.88	6.82	6.73	6.64	7.04	6.81	6.89	7.12
07/01/25	07/31/25	Jul 2025	83.60	66.44	95.70	70.96	84.23	64.94	89.65	71.76	91.26	72.57	7.94	7.61	7.41	6.73	6.91	6.86	6.77	6.68	7.08	6.85	6.93	7.16
08/01/25	08/31/25	Aug 2025	85.95	66.68	91.79	69.80	85.41	65.27	91.10	71.92	92.60	72.48	7.98	7.66	7.44	6.77	6.95	6.89	6.80	6.70	7.11	6.88	6.96	7.19
09/01/25	09/30/25	Sep 2025	81.61	63.98	81.93	66.09	80.60	62.67	84.75	68.97	84.89	68.91	7.74	7.56	7.35	6.78	7.00	6.92	6.80	6.68	7.13	6.90	6.98	7.20
10/01/25	10/31/25	Oct 2025	76.51	62.46	76.32	64.05	76.11	60.60	79.95	67.45	79.70	66.89	7.67	7.54	7.37	6.83	7.03	6.94	6.80	6.66	7.17	6.95	7.02	7.20
11/01/25	11/30/25	Nov 2025	78.07	64.80	71.12	64.61	76.43	66.51	76.11	68.39	75.19	67.54	7.69	7.57	7.38	7.08	7.15	7.09	6.95	6.80	7.44	7.21	7.29	7.37
12/01/25	12/31/25	Dec 2025	82.25	66.35	74.17	65.77	81.08	68.48	78.45	69.77	77.44	68.87	7.93	7.77	7.57	7.21	7.27	7.22	7.14	6.96	7.57	7.34	7.42	7.58
01/01/26	01/31/26	Jan 2026	75.91	66.23	74.18	66.57	76.62	64.48	78.39	70.24	77.64	69.37	8.12	7.90	7.66	7.37	7.44	7.39	7.05	7.13	7.74	7.50	7.59	7.50
02/01/26	02/28/26	Feb 2026	73.72	65.08	73.84	66.58	72.53	63.69	77.30	69.86	76.90	69.21	8.17	7.94	7.71	7.41	7.48	7.43	7.10	7.18	7.77	7.54	7.62	7.52
03/01/26	03/31/26	Mar 2026	67.15	64.38	69.09	65.16	65.95	62.47	70.99	68.87	71.30	68.01	7.90	7.66	7.48	7.22	7.28	7.24	6.97	7.05	7.57	7.34	7.42	7.39
04/01/26	04/30/26	Apr 2026	67.70	63.35	70.56	65.93	66.77	61.39	71.38	68.43	72.20	68.73	7.86	7.64	7.41	7.05	7.11	7.03	6.92	6.81	7.39	7.17	7.24	7.31
05/01/26	05/31/26	May 2026	68.59	62.83	71.55	66.10	68.32	61.14	72.91	68.08	73.84	68.60	7.92	7.66	7.43	7.08	7.16	7.09	6.98	6.87	7.42	7.19	7.27	7.37
06/01/26	06/30/26	Jun 2026	70.61	63.78	80.76	67.61	70.25	61.01	75.20	69.32	76.73	69.33	8.06	7.73	7.47	7.12	7.20	7.14	7.04	6.95	7.46	7.24	7.31	7.43
07/01/26	07/31/26	Jul 2026	87.32	69.27	99.54	74.59	88.23	68.36	92.35	74.69	94.89	75.58	8.31	7.95	7.62	7.18	7.26	7.20	7.09	6.99	7.52	7.30	7.37	7.48
08/01/26	08/31/26	Aug 2026	89.19	69.69	96.20	73.11	89.24	68.69	93.94	74.95	96.42	75.75	8.36	8.00	7.66	7.21	7.30	7.23	7.12	7.01	7.55	7.33	7.41	7.51
09/01/26	09/30/26	Sep 2026	84.26	66.16	84.96	68.34	83.86	65.61	88.26	71.28	88.26	71.27	8.05	7.84	7.59	7.22	7.34	7.25	7.11	6.97	7.57	7.34	7.42	7.50
10/01/26	10/31/26	Oct 2026	79.64	64.90	78.90	66.68	78.42	63.78	82.64	69.99	82.23	69.47	8.02	7.86	7.62	7.26	7.37	7.27	7.12	6.97	7.60	7.38	7.46	7.52
11/01/26	11/30/26	Nov 2026	81.45	67.42	74.73	67.17	80.52	69.72	79.12	71.01	78.14	70.11	8.05	7.92	7.71	7.40	7.50	7.43	7.26	7.09	7.75	7.52	7.60	7.69
12/01/26	12/31/26	Dec 2026	85.55	68.98	76.90	68.88	83.86	71.42	81.73	72.06	80.80	71.47	8.28	8.10	7.87	7.50	7.60	7.55	7.53	7.26	7.87	7.63	7.71	7.97
01/01/27	01/31/27	Jan 2027	76.83	67.56	77.06	69.02	74.89	67.38	81.15	72.53	80.54	71.89	8.49	8.23	7.98	7.67	7.74	7.69	7.36	7.44	8.04	7.80	7.88	7.81
02/01/27	02/28/27	Feb 2027	76.47	67.13	77.13	68.96	75.61	65.66	80.26	72.28	80.02	71.70	8.53	8.27	8.03	7.71	7.79	7.74	7.41	7.49	8.07	7.84	7.92	7.84
03/01/27	03/31/27	Mar 2027	69.42	66.29	71.90	68.43	67.85	64.03	74.03	71.70	74.47	71.30	8.25	8.02	7.82	7.51	7.57	7.54	7.26	7.34	7.86	7.63	7.71	7.68
04/01/27	04/30/27	Apr 2027	70.74	65.85	74.29	68.83	69.40	63.42	75.64	71.01	76.37	71.65	8.24	7.96	7.73	7.33	7.39	7.32	7.21	7.10	7.67	7.45	7.53	7.59
05/01/27	05/31/27	May 2027	71.75	66.25	74.98	69.27	70.80	63.52	76.43	71.61	77.31	71.90	8.31	8.00	7.73	7.33	7.45	7.38	7.28	7.17	7.67	7.45	7.52	7.66
06/01/27	06/30/27	Jun 2027	74.46	66.51	84.57	70.83	74.09	64.13	79.42	71.99	80.71	72.42	8.46	8.10	7.78	7.37	7.50	7.44	7.34	7.25	7.71	7.48	7.56	7.73
07/01/27	07/31/27	Jul 2027	90.14	72.22	103.34	78.33	90.31	70.69	95.72	78.02	98.63	78.92	8.72	8.32	7.95	7.48	7.57	7.50	7.39	7.29	7.82	7.59	7.67	7.78
08/01/27	08/31/27	Aug 2027	92.56	72.28	100.63	76.37	92.16	71.05	97.47	77.79	100.22	78.64	8.76	8.37	7.98	7.50	7.59	7.52	7.42	7.31	7.85	7.62	7.70	7.81
09/01/27	09/30/27	Sep 2027	84.74	68.70	86.26	70.87	84.23	67.62	89.08	73.76	89.42	73.65	8.37	8.14	7.89	7.43	7.63	7.53	7.39	7.24	7.78	7.55	7.63	7.78
10/01/27	10/31/27	Oct 2027	82.88	67.31	82.93	69.32	81.43	66.16	86.50	72.57	86.34	72.14	8.34	8.15	7.90	7.47	7.67	7.56	7.39	7.22	7.81	7.59	7.67	7.79
11/01/27	11/30/27	Nov 2027	82.61	70.23	77.70	69.85	82.05	71.75	81.72	73.62	80.78	72.75	8.40	8.24	8.03	7.63	7.81	7.74	7.56	7.39	7.99	7.75	7.83	7.99
12/01/27	12/31/27	Dec 2027	87.82	71.61	79.81	71.63	85.37	73.89	84.36	74.57	83.45	74.10	8.59	8.41	8.16	7.71	7.87	7.81	7.79	7.50	8.08	7.84	7.92	8.23
01/01/28	01/31/28	Jan 2028	79.99	70.39	80.36	72.14	79.92	69.98	84.22	75.51	83.85	75.02	8.80	8.54	8.28	7.88	8.00	7.95	7.62	7.69	8.25	8.01	8.09	8.06
02/01/28	02/29/28	Feb 2028	79.49	69.29	80.14	71.97	79.55	68.79	83.54	74.72	83.29	74.78	8.83	8.56	8.32	7.93	8.05	8.00	7.66	7.74	8.29	8.05	8.13	8.09
03/01/28	03/31/28	Mar 2028	71.95	68.42	74.46	70.66	70.83	66.68	76.05	73.92	76.74	73.49	8.52	8.27	8.05	7.66	7.73	7.70	7.48	7.56	8.02	7.78	7.86	7.90
04/01/28	04/30/28	Apr 2028	72.73	67.63	75.72	70.48	71.86	65.55	76.82	72.87	77.64	73.14	8.54	8.17	7.94	7.48	7.60	7.53	7.42	7.31	7.82	7.59	7.67	7.81
05/01/28	05/31/28	May 2028	73.03	67.37	76.52	71.07	73.04	64.97	77.52	72.77	78.50	73.31	8.61	8.24	7.95	7.49	7.67	7.60	7.49	7.38	7.83	7.61	7.68	7.88
06/01/28	06/30/28	Jun 2028	75.37	68.24	87.28	73.23	75.34	66.00	80.12	73.63	82.83	74.22	8.79	8.36	8.02	7.55	7.71	7.65	7.56	7.47	7.89	7.66	7.74	7.95
07/01/28	07/31/28	Jul 2028	92.52	74.46	106.37	81.26	92.81	73.35	97.96	79.93	101.21	80.83	9.06	8.56	8.16	7.61	7.82	7.75	7.63	7.51	7.96	7.73	7.81	8.02
08/01/28	08/31/28	Aug 2028	94.83	73.81	103.40	78.23	94.60	72.47	99.64	79.25	102.38	80.16	9.11	8.61	8.18	7.65	7.87	7.79	7.67	7.55	7.99	7.77	7.85	8.06
09/01/28	09/30/28	Sep 2028	88.41	70.94	89.76	73.05	87.24	69.91	92.46	76.08	92.72	75.90	8.51	8.30	8.01	7.54	7.85	7.74	7.57	7.40	7.88	7.66	7.74	7.96
10/01/28	10/31/28	Oct 2028	85.65	69.02	85.34	71.12	84.88	68.57	89.25	74.43	88.83	74.02	8.53	8.33	8.06	7.58	7.89	7.77	7.58	7.39	7.93	7.70	7.78	7.98
11/01/28	11/30/28	Nov 2028	84.61	72.42	79.64	72.17	83.22	73.98	84.71	75.87	83.74	75.05	8.59	8.47	8.22	7.74	8.03	7.95	7.76	7.57	8.10	7.86	7.94	8.19
12/01/28	12/31/28	Dec 2028	88.71	73.60	80.97	73.64	86.53	75.05	85.79	76.84	84.91	76.37	8.82	8.60	8.35	7.86	8.08	8.02	8.00	7.70	8.22	7.98	8.07	8.44
01/01/29	01/31/29	Jan 2029	81.50	71.79	81.28	73.85	79.58	71.35	85.57	77.02	84.94	76.62	9.04	8.75	8.49	8.01	8.21	8.16	7.82	7.90	8.38	8.14	8.22	8.27
02/01/29	02/28/29	Feb 2029	81.85	71.41	82.18	73.95	81.25	71.10	85.28	76.73	85.16	76.68	9.08	8.79	8.54	8.06	8.26	8.21	7.87	7.95	8.42	8.18	8.26	8.30
03/01/29	03/31/29	Mar 2029	72.83	70.11	75.51	72.24	71.76	69.15	77.50	75.60	78.13	75.10	8.75	8.44	8.19	7.77	7.91	7.88	7.65	7.73	8.13	7.89	7.97	8.07
04/01/29	04/30/29	Apr 2029	74.44	69.54	77.43	72.40	72.87	67.03	78.86	74.83	79.60	75.26	8.72	8.32	8.08	7.59	7.77	7.70	7.59	7.48	7.93	7.70	7.78	7.97
05/01/29	05/31/29	May 2029	74.95	69.92	78.98	72.80	74.73	66.73	79.88	75.35	80.90	75.31	8.79	8.38	8.08	7.60	7.84	7.76	7.65	7.53	7.94	7.71	7.79	8.03

06/01/29	06/30/29	Jun 2029	77.20	70.20	88.88	75.15	76.93	68.49	81.80	75.75	84.69	76.14	8.99	8.51	8.14	7.65	7.88	7.82	7.71	7.61	7.99	7.77	7.84	8.10
07/01/29	07/31/29	Jul 2029	95.33	76.40	109.57	83.59	95.70	75.53	100.50	81.90	104.20	82.82	9.27	8.72	8.31	7.73	7.99	7.91	7.79	7.67	8.07	7.84	7.92	8.18
08/01/29	08/31/29	Aug 2029	97.11	76.04	105.78	80.71	96.85	74.81	102.02	81.42	104.54	82.35	9.32	8.78	8.35	7.76	8.05	7.96	7.83	7.69	8.11	7.88	7.96	8.22
09/01/29	09/30/29	Sep 2029	90.81	73.70	92.44	76.20	90.01	72.69	95.14	78.86	95.40	78.95	9.03	8.59	8.25	7.72	8.02	7.93	7.78	7.64	8.06	7.83	7.91	8.17
10/01/29	10/31/29	Oct 2029	86.09	70.94	86.14	73.01	85.56	70.31	89.84	76.21	89.58	75.88	8.83	8.58	8.28	7.74	8.06	7.95	7.78	7.60	8.09	7.86	7.94	8.17
11/01/29	11/30/29	Nov 2029	86.53	73.59	81.49	73.52	85.49	75.68	85.94	77.19	85.04	76.36	8.86	8.62	8.36	7.84	8.17	8.10	7.92	7.74	8.19	7.96	8.04	8.34
12/01/29	12/31/29	Dec 2029	91.48	75.60	84.20	75.82	90.20	77.27	89.01	78.61	88.19	78.45	9.06	8.82	8.56	7.99	8.26	8.20	8.21	7.89	8.35	8.11	8.20	8.65
01/01/30	01/31/30	Jan 2030	84.97	74.21	84.13	76.17	83.88	73.67	88.41	79.27	87.78	79.03	9.29	8.97	8.71	8.17	8.43	8.37	8.02	8.10	8.54	8.30	8.38	8.47
02/01/30	02/28/30	Feb 2030	84.49	73.53	84.36	76.25	84.17	73.15	87.89	78.94	87.60	79.08	9.33	9.00	8.73	8.21	8.48	8.42	8.07	8.14	8.57	8.33	8.41	8.49
03/01/30	03/31/30	Mar 2030	73.72	70.94	76.23	73.14	72.16	68.68	78.53	76.36	79.03	76.00	8.85	8.52	8.25	7.73	7.93	7.91	7.68	7.77	8.09	7.86	7.93	8.10
04/01/30	04/30/30	Apr 2030	75.22	70.12	77.85	73.33	73.31	68.19	79.72	75.56	80.36	76.09	8.82	8.39	8.10	7.57	7.84	7.76	7.63	7.51	7.91	7.69	7.76	8.02
05/01/30	05/31/30	May 2030	74.85	69.98	79.75	73.91	73.50	67.19	79.32	75.49	81.98	76.21	8.89	8.45	8.15	7.60	7.90	7.82	7.69	7.56	7.94	7.72	7.80	8.08
06/01/30	06/30/30	Jun 2030	75.49	70.74	89.31	76.50	75.06	68.59	80.00	76.12	84.80	76.95	9.14	8.61	8.23	7.65	7.95	7.88	7.76	7.65	7.99	7.76	7.84	8.15
07/01/30	07/31/30	Jul 2030	95.28	76.42	109.74	84.07	95.20	74.99	100.44	81.95	103.91	82.90	9.49	8.85	8.36	7.76	8.06	7.97	7.84	7.71	8.11	7.88	7.96	8.23
08/01/30	08/31/30	Aug 2030	97.15	76.25	106.59	81.59	96.46	74.87	101.67	81.61	104.85	82.49	9.54	8.90	8.40	7.80	8.12	8.03	7.88	7.74	8.14	7.91	7.99	8.28
09/01/30	09/30/30	Sep 2030	89.52	73.62	91.16	76.54	88.72	72.42	93.86	78.92	94.28	79.12	9.16	8.70	8.33	7.73	8.09	8.00	7.85	7.70	8.07	7.85	7.93	8.24
10/01/30	10/31/30	Oct 2030	86.90	71.82	87.33	73.74	86.42	71.00	90.75	77.09	90.56	76.85	9.01	8.69	8.36	7.76	8.13	8.02	7.85	7.69	8.11	7.88	7.96	8.25
11/01/30	11/30/30	Nov 2030	86.54	74.63	81.63	74.76	87.69	77.39	86.77	78.52	85.93	77.75	9.05	8.76	8.48	7.86	8.31	8.23	8.05	7.86	8.22	7.99	8.07	8.47
12/01/30	12/31/30	Dec 2030	92.06	75.87	84.50	76.71	90.51	78.29	89.72	79.81	88.88	79.56	9.24	8.95	8.67	8.05	8.38	8.32	8.35	7.99	8.41	8.18	8.26	8.78
01/01/31	01/31/31	Jan 2031	84.63	75.35	84.64	77.59	83.95	74.45	89.04	80.61	88.46	80.44	9.48	9.13	8.85	8.22	8.58	8.44	8.13	8.20	8.59	8.35	8.43	8.58
02/01/31	02/28/31	Feb 2031	84.42	75.37	85.05	77.48	84.05	73.42	88.33	80.70	88.01	80.39	9.54	9.15	8.88	8.25	8.63	8.49	8.18	8.25	8.61	8.37	8.45	8.60
03/01/31	03/31/31	Mar 2031	75.04	71.54	77.28	74.13	73.29	69.65	79.27	77.11	79.87	76.99	8.96	8.55	8.28	7.74	7.97	7.87	7.70	7.79	8.10	7.86	7.94	8.12
04/01/31	04/30/31	Apr 2031	75.27	71.05	78.39	73.92	74.01	68.31	80.01	76.54	80.75	76.48	8.92	8.42	8.12	7.51	7.83	7.67	7.41	7.53	7.85	7.63	7.70	7.79
05/01/31	05/31/31	May 2031	76.69	70.04	81.30	74.70	75.76	68.65	81.20	75.24	83.62	76.33	8.99	8.48	8.10	7.51	7.79	7.64	7.44	7.58	7.85	7.63	7.70	7.83
06/01/31	06/30/31	Jun 2031	77.43	71.15	91.07	77.47	76.92	68.88	81.95	76.58	86.13	77.34	9.25	8.58	8.16	7.55	7.84	7.72	7.51	7.66	7.90	7.67	7.75	7.90
07/01/31	07/31/31	Jul 2031	96.67	76.97	111.90	85.62	97.11	75.58	101.83	82.46	105.87	83.41	9.55	8.90	8.36	7.61	7.91	7.76	7.56	7.70	7.95	7.72	7.80	7.95
08/01/31	08/31/31	Aug 2031	98.20	77.16	108.82	83.17	97.99	75.71	102.95	82.51	106.51	83.36	9.61	8.88	8.40	7.63	7.94	7.78	7.56	7.71	7.98	7.75	7.83	7.95
09/01/31	09/30/31	Sep 2031	95.36	77.88	97.60	81.14	94.75	75.93	99.69	83.28	100.45	83.64	9.74	9.22	8.82	8.22	8.59	8.41	8.09	8.22	8.56	8.34	8.42	8.49
10/01/31	10/31/31	Oct 2031	93.05	78.44	93.87	80.57	92.63	76.40	97.05	83.78	96.99	83.54	9.84	9.52	9.18	8.58	9.03	8.81	8.44	8.56	8.92	8.70	8.78	8.84
11/01/31	11/30/31	Nov 2031	93.68	80.74	89.39	81.27	93.15	82.16	93.53	84.79	92.71	84.10	9.87	9.55	9.22	8.61	9.08	9.08	8.56	8.61	8.97	8.73	8.81	8.98
12/01/31	12/31/31	Dec 2031	99.53	81.70	92.17	83.27	97.96	83.28	96.91	86.03	96.09	86.00	9.97	9.84	9.35	8.66	9.13	9.12	8.60	8.65	9.03	8.79	8.87	9.04
01/01/32	01/31/32	Jan 2032	87.41	77.73	86.93	79.62	86.51	76.71	91.31	82.84	90.76	82.55	9.66	9.30	9.02	8.37	8.74	8.60	8.28	8.36	8.74	8.50	8.59	8.73
02/01/32	02/29/32	Feb 2032	87.33	77.44	87.38	79.56	86.97	74.98	90.91	82.69	90.49	82.40	9.72	9.32	9.05	8.40	8.79	8.65	8.33	8.41	8.76	8.53	8.61	8.76
03/01/32	03/31/32	Mar 2032	76.66	73.10	78.87	75.15	75.30	71.68	81.06	78.53	81.70	77.93	9.13	8.71	8.44	7.89	8.12	8.02	7.84	7.94	8.25	8.01	8.09	8.26
04/01/32	04/30/32	Apr 2032	76.23	72.18	79.19	75.25	74.14	69.76	81.15	77.74	81.97	77.91	9.09	8.58	8.27	7.65	7.98	7.82	7.55	7.67	7.99	7.77	7.85	7.93
05/01/32	05/31/32	May 2032	76.57	72.03	81.51	76.48	74.75	68.53	80.55	77.37	83.54	78.33	9.17	8.64	8.26	7.65	7.94	7.79	7.58	7.72	7.99	7.77	7.84	7.97
06/01/32	06/30/32	Jun 2032	77.89	72.04	91.41	78.48	77.22	69.82	82.35	77.48	86.86	77.67	9.43	8.75	8.32	7.70	7.99	7.86	7.65	7.80	8.04	7.81	7.89	8.04
07/01/32	07/31/32	Jul 2032	96.87	77.58	111.65	86.40	96.95	76.54	102.12	83.05	105.92	84.01	9.73	9.07	8.52	7.75	8.06	7.91	7.70	7.84	8.09	7.87	7.95	8.09
08/01/32	08/31/32	Aug 2032	98.45	77.24	108.89	83.54	97.98	75.94	103.47	82.66	106.92	83.61	9.79	9.05	8.56	7.78	8.09	7.93	7.71	7.86	8.12	7.90	7.98	8.10
09/01/32	09/30/32	Sep 2032	95.06	78.90	97.17	81.80	94.58	77.29	99.48	84.25	100.36	84.45	9.92	9.40	8.99	8.38	8.75	8.57	8.25	8.37	8.72	8.49	8.57	8.64
10/01/32	10/31/32	Oct 2032	94.66	80.18	95.44	81.77	93.81	78.39	98.59	85.50	98.73	84.88	10.03	9.70	9.36	8.74	9.20	8.98	8.60	8.73	9.09	8.86	8.94	9.00
11/01/32	11/30/32	Nov 2032	93.75	81.23	89.97	81.99	94.50	83.71	93.96	85.89	93.11	85.09	10.06	9.73	9.40	8.77	9.25	9.25	8.72	8.77	9.13	8.89	8.97	9.15
12/01/32	12/31/32	Dec 2032	99.39	83.55	92.06	84.57	97.88	85.25	97.33	87.58	96.52	87.41	10.16	10.03	9.53	8.83	9.30	9.30	8.76	8.81	9.19	8.95	9.04	9.20
01/01/33	01/31/33	Jan 2033	87.79	79.01	87.43	80.89	87.85	78.70	92.10	84.17	91.54	83.77	9.84	9.48	9.19	8.53	8.91	8.77	8.44	8.52	8.90	8.66	8.75	8.89
02/01/33	02/28/33	Feb 2033	88.55	78.71	87.74	80.85	89.91	77.39	91.58	84.07	91.12	83.71	9.90	9.50	9.22	8.56	8.96	8.82	8.49	8.57	8.92	8.69	8.77	8.92
03/01/33	03/31/33	Mar 2033	78.28	74.20	80.30	76.94	76.37	73.21	82.77	79.78	83.34	79.61	9.30	8.88	8.60	8.04	8.27	8.17	7.99	8.09	8.40	8.16	8.24	8.41
04/01/33	04/30/33	Apr 2033	77.84	74.22	81.00	77.03	75.87	71.21	83.17	79.78	83.87	79.73	9.26	8.74	8.43	7.80	8.13	7.97	7.69	7.82	8.14	7.91	7.99	8.08
05/01/33	05/31/33	May 2033	78.52	74.06	84.07	78.27	76.24	71.05	82.65	78.93	86.58	80.16	9.34	8.81	8.41	7.80	8.09	7.94	7.73	7.87	8.14	7.91	7.99	8.11
06/01/33	06/30/33	Jun 2033	80.87	74.00	94.64	80.69	79.74	72.25	85.29	79.37	89.95	79.59	9.61	8.91	8.47	7.84	8.14	8.01	7.80	7.95	8.19	7.96	8.04	8.19
07/01/33	07/31/33	Jul 2033	99.57	79.73	115.27	89.02	99.23	78.44	104.70	85.16	109.36	86.13	9.92	9.24	8.68	7.90	8.22	8.06	7.85	7.99	8.24	8.02	8.09	8.24
08/01/33	08/31/33	Aug 2033	100.42	78.53	111.92	85.38	100.10	77.13	105.30	83.93	109.32	84.89	9.97	9.22	8.72	7.93	8.24	8.08	7.85	8.01	8.27	8.05	8.12	8.24
09/01/33	09/30/33	Sep 2033	95.75	80.47	98.43	83.69	95.23	78.60	100.50	85.91	101.38	86.12	10.11	9.58	9.16	8.53	8.92	8.73	8.40	8.53	8.88	8.65	8.73	8.80
10/01/33	10/31/33	Oct 2033	95.47	82.14	97.52	83.74	94.30	80.06	100.03	87.47	100.62	86.92	10.22	9.89	9.54	8.91	9.38	9.15	8.76	8.89	9.25	9.03	9.11	9.16
11/01/33	11/30/33	Nov 2033	95.10	83.83	92.00	83.69	96.15	85.28	96.44	87.91	95.31	87.08	10.25	9.91	9.57	8.94	9.43	9.42	8.89	8.94	9.30	9.06	9.14	9.31
12/01/33	12/31/33	Dec 2033	99.79	85.00	94.13	86.67	98.58	86.70	99.30	89.50	98.51	89.51	10.36	10.22	9.71	8.99	9.48	9.47	8.93	8.98	9.36	9.12	9.20	9.37
01/01/34	01/31/34	Jan 2034	90.07	80.83	89.33	83.18	89.97	80.65	94.23	86.23	93.81	85.92	10.04	9.67	9.37	8.70	9.09	8.94	8.61	8.69	9.07	8.83	8.92	9.06
02/01/34	02/28/34	Feb 2034	90.13	80.87	89.62	82.82	89.80	79.05	93.49	86.11	93.06	85.56	10.10	9.69	9.40	8.73	9.14	8.99	8.66	8.74	9.09	8.86	8.94	9.09
03/01/34	03/31/34	Mar 2034	80.27	76.73	82.16	79.43	77.89	75.32	84.67	82.35	85.26	82.12	9.49	9.06	8.77	8.20	8.44	8.33	8.15	8.25	8.56	8.32	8.40	8.57
04/01/34	04/30/34	Apr 2034	80.18	76.11	83.05	79.26	78.37	73.19	84.87	81.56	85.63	81.78	9.45	8.92	8.60	7.96	8.29	8.13	7.85	7.97	8.30	8.07	8.15	8.23
05/01/34	05/31/34	May 2034	80.19	75.35	86.36	80.51	78.19	71.84	84.66	80.77	87.50	81.72	9.53	8.98	8.58	7.95	8.25	8.10	7.88	8.03	8.29	8.07	8.15	8.27
06/01/34	06/30/34	Jun 2034	81.20	75.88	95.79	82.54	80.25	73.08	85.78	81.07	90.55	81.07	9.80	9.09	8.64	8.00	8.30	8.17	7.95	8.11	8.34	8.12	8.19	8.34
07/01/34	07/31/34	Jul 2034	102.04	82.14	117.73	91.31	101.94	80.98	107.10	87.57	111.64	88.52	10.12	9.43	8.86	8.06	8.38	8.22	8.00	8.15	8.40	8.17	8.25	8.39
08/01/34	08/31/34	Aug 2034	103.40	80.55	113.67	87.56	102.71	79.38	108.08	86.02	111.09	86.97	10.17	9.40	8.90	8.09	8.41	8.24	8.01	8.17	8.43	8.20	8.28	8.40
09/01/34	09/30/34	Sep 2034	99.18	83.14	102.10	86.29	98.60	81.64	103.79	88.38	104.94	88.56	10.31	9.77	9.34	8.71	9.10	8.91	8.57	8.70	9.05	8.82	8.90	8.97
10/01/34	10/31/34	Oct 2034	97.48	84.16	99.41	85.88	96.05	82.06	102.21	89.50	102.57	89.00	10.42	10.08	9.73	9.09	9.56	9.33	8.94	9.07	9.43	9.21	9.28	9.33
11/01/34	11/30/34	Nov 2034	98.44	85.92	94.47	85.66	99.83	87.85	98.31	89.81	97.56	88.94	10.46	10.11	9.77	9.12	9.62	9.61	9.07	9.12	9.47	9.24	9.32	9.49
12/01/34	12/31/34	Dec 2034	103.51	87.54	96.80	88.25	101.94	89.13	101.73	91.82	100.88	91.32	10.56	10.42	9.91	9.17	9.67	9.66	9.11	9.16	9.54	9.30	9.38	9.55
01/01/35	01/31/35	Jan 2035	92.98	82.81	92.17	84.99	92.88	82.79	96.62	88.22	96.07	87.77	10.23	9.85	9.55	8.87	9.26	9.11	8.77	8.85	9.24	9.00	9.08	9.22
02/01/35	02/28/35	Feb 2035	92.95	82.94	93.06	84.96	93.09	81.07	96.55	88.35	96.24	87.75	10.29	9.87	9.58	8.90	9.31	9.16	8.83	8.91	9.26	9.02	9.10	9.25
03/01/35	03/31/35	Mar 2035	81.96	78.70	83.88	81.10	79.93	77.42	86.75	84.28	87.02	83.76	9.67	9.23	8.94	8.36	8.60	8.49	8.31	8.41	8.71	8.48	8.56	8.73
04/01/35	04/30/35	Apr 2035	82.11	77.56	85.05	81.59	79.66	75.36	87.20	83.06	87.90	83.81	9.63	9.09	8.76	8.11	8.45	8.28	7.99	8.12	8.45	8.22	8.30	8.38
05/01/35	05/31/35	May 2035	82.68	77.33	88.98	82.77	80.42	74.25	87.15	82.73	90.63	83.77	9.71	9.15	8.74	8.10	8.41	8.25	8.03	8.18	8.44	8.22	8.30	8.42
06/01/35	06/30/35	Jun 2035	83.28	76.93	98.52	85.17	82.64	76.01	87.30	82.52	93.14	82.48	9.99	9.26	8.81	8.15	8.46	8.33	8.10	8.26	8.49	8.27	8.35	8.49

07/01/35	07/31/35	Jul 2035	103.25	83.26	119.89	93.20	103.14	82.30	108.29	88.37	113.36	89.24	10.31	9.61	9.03	8.21	8.54	8.38	8.15	8.31	8.55	8.33	8.40	8.54
08/01/35	08/31/35	Aug 2035	104.22	82.25	115.91	89.86	103.66	81.08	108.77	87.21	112.62	88.16	10.37	9.58	9.06	8.24	8.57	8.40	8.16	8.32	8.58	8.36	8.44	8.55
09/01/35	09/30/35	Sep 2035	100.82	84.74	104.44	88.61	100.24	83.48	105.70	90.19	107.00	90.47	10.51	9.95	9.52	8.87	9.27	9.08	8.74	8.87	9.21	8.99	9.07	9.13
10/01/35	10/31/35	Oct 2035	97.93	85.86	100.66	87.53	96.66	83.85	102.73	90.95	103.66	90.29	10.62	10.28	9.91	9.26	9.75	9.51	9.11	9.24	9.60	9.38	9.46	9.50
11/01/35	11/30/35	Nov 2035	98.66	86.97	95.90	87.67	100.69	88.97	99.42	91.66	98.86	90.76	10.66	10.30	9.95	9.29	9.80	9.79	9.24	9.29	9.65	9.41	9.49	9.66
12/01/35	12/31/35	Dec 2035	104.53	89.53	99.39	90.11	103.19	89.80	103.46	93.29	102.66	93.01	10.76	10.62	10.09	9.35	9.85	9.84	9.28	9.34	9.71	9.48	9.56	9.72
01/01/36	01/31/36	Jan 2036	94.25	84.72	93.10	86.82	95.37	85.09	97.21	90.04	96.79	89.49	10.43	10.04	9.73	9.04	9.43	9.29	8.94	9.02	9.41	9.17	9.25	9.39
02/01/36	02/29/36	Feb 2036	93.48	84.40	93.30	86.73	95.15	83.48	97.31	89.69	96.80	89.43	10.49	10.06	9.76	9.07	9.49	9.34	8.99	9.07	9.43	9.19	9.27	9.42
03/01/36	03/31/36	Mar 2036	83.92	79.91	85.93	83.44	81.40	78.74	88.43	85.53	89.04	86.09	9.85	9.40	9.11	8.52	8.76	8.65	8.47	8.56	8.87	8.64	8.72	8.89
04/01/36	04/30/36	Apr 2036	83.05	79.29	86.24	83.33	80.06	76.54	88.74	84.88	89.39	85.62	9.81	9.26	8.93	8.26	8.61	8.44	8.15	8.28	8.60	8.38	8.45	8.53
05/01/36	05/31/36	May 2036	82.43	78.81	90.01	84.52	79.30	75.51	87.48	84.34	91.89	85.56	9.89	9.33	8.91	8.26	8.57	8.41	8.18	8.33	8.60	8.37	8.45	8.57
06/01/36	06/30/36	Jun 2036	84.35	78.84	99.88	87.17	83.64	76.88	88.92	84.33	94.75	84.73	10.18	9.44	8.98	8.31	8.62	8.49	8.26	8.42	8.65	8.42	8.50	8.65
07/01/36	07/31/36	Jul 2036	104.94	84.71	121.57	93.80	104.90	83.14	109.98	89.96	115.23	90.86	10.50	9.79	9.20	8.37	8.70	8.53	8.31	8.46	8.71	8.48	8.56	8.70
08/01/36	08/31/36	Aug 2036	105.92	84.29	117.29	91.38	105.47	82.84	110.53	89.68	114.67	90.57	10.56	9.77	9.24	8.40	8.73	8.55	8.32	8.48	8.74	8.51	8.59	8.71
09/01/36	09/30/36	Sep 2036	101.08	85.97	104.77	89.78	100.33	84.59	106.42	91.47	107.57	91.55	10.71	10.14	9.70	9.04	9.45	9.25	8.90	9.04	9.38	9.16	9.23	9.29
10/01/36	10/31/36	Oct 2036	99.33	87.95	101.62	89.52	98.12	85.58	104.06	93.02	104.64	92.43	10.82	10.47	10.10	9.44	9.93	9.69	9.28	9.42	9.78	9.56	9.63	9.68
11/01/36	11/30/36	Nov 2036	100.19	89.13	97.59	89.83	100.29	91.10	102.13	93.91	101.26	92.98	10.86	10.50	10.14	9.47	9.98	9.98	9.41	9.47	9.82	9.59	9.67	9.84
12/01/36	12/31/36	Dec 2036	105.60	90.85	99.72	91.74	104.72	91.58	104.92	95.04	104.10	94.71	10.97	10.82	10.29	9.53	10.04	10.03	9.46	9.51	9.89	9.65	9.74	9.90
01/01/37	01/31/37	Jan 2037	96.93	86.85	95.20	88.67	98.06	87.41	99.63	92.04	98.94	91.41	10.62	10.23	9.92	9.21	9.61	9.46	9.11	9.19	9.58	9.34	9.42	9.56
02/01/37	02/28/37	Feb 2037	96.44	86.98	95.55	88.96	98.30	85.79	99.36	92.44	98.95	91.74	10.69	10.25	9.95	9.24	9.67	9.52	9.16	9.25	9.60	9.36	9.44	9.59
03/01/37	03/31/37	Mar 2037	86.34	81.83	88.22	85.52	83.84	80.94	90.88	87.46	91.45	88.09	10.04	9.58	9.28	8.68	8.93	8.82	8.63	8.73	9.04	8.80	8.88	9.05
04/01/37	04/30/37	Apr 2037	85.73	80.78	88.47	85.73	83.29	79.10	90.42	86.38	91.32	87.26	10.00	9.44	9.09	8.42	8.77	8.60	8.30	8.43	8.76	8.53	8.61	8.69
05/01/37	05/31/37	May 2037	86.97	80.95	93.96	87.37	84.91	78.23	91.47	86.39	95.17	87.55	10.08	9.51	9.08	8.42	8.73	8.57	8.34	8.49	8.76	8.53	8.61	8.73
06/01/37	06/30/37	Jun 2037	87.51	80.78	102.49	89.43	86.87	79.55	91.34	86.30	97.07	86.35	10.37	9.62	9.15	8.47	8.78	8.65	8.42	8.58	8.81	8.58	8.66	8.80
07/01/37	07/31/37	Jul 2037	107.61	86.77	124.44	96.61	107.49	85.74	112.48	91.87	118.19	92.65	10.70	9.98	9.37	8.52	8.87	8.70	8.47	8.62	8.87	8.64	8.72	8.86
08/01/37	08/31/37	Aug 2037	108.10	86.39	120.88	94.44	107.63	85.10	112.61	91.63	117.59	92.59	10.77	9.95	9.41	8.56	8.89	8.72	8.47	8.64	8.90	8.67	8.75	8.87
09/01/37	09/30/37	Sep 2037	103.79	87.58	107.90	91.84	102.98	86.23	109.10	93.05	110.64	93.15	10.91	10.34	9.89	9.21	9.63	9.43	9.07	9.21	9.55	9.33	9.41	9.46
10/01/37	10/31/37	Oct 2037	102.10	90.03	105.63	91.82	101.06	87.61	106.87	95.17	108.88	94.57	11.03	10.67	10.29	9.62	10.12	9.88	9.46	9.60	9.96	9.73	9.81	9.85
11/01/37	11/30/37	Nov 2037	102.50	91.32	99.67	91.75	103.18	93.38	103.89	95.82	103.30	94.89	11.06	10.70	10.33	9.65	10.17	10.17	9.59	9.65	10.00	9.77	9.85	10.02
12/01/37	12/31/37	Dec 2037	108.27	93.09	102.45	93.93	106.66	94.00	107.38	97.12	106.62	96.87	11.18	11.03	10.48	9.71	10.23	10.22	9.64	9.69	10.07	9.83	9.92	10.08
01/01/38	01/31/38	Jan 2038	103.59	89.15	98.56	91.12	103.06	91.11	102.37	94.19	101.77	93.59	10.83	10.43	10.10	9.38	9.80	9.64	9.28	9.37	9.75	9.51	9.60	9.73
02/01/38	02/28/38	Feb 2038	101.41	89.09	98.39	91.02	101.44	89.18	102.28	94.41	102.11	93.75	10.89	10.45	10.14	9.42	9.85	9.70	9.34	9.42	9.78	9.54	9.62	9.76
03/01/38	03/31/38	Mar 2038	88.50	83.56	90.54	87.55	86.86	84.06	92.93	89.16	93.77	89.76	10.23	9.76	9.46	8.84	9.10	8.99	8.79	8.89	9.20	8.96	9.04	9.21
04/01/38	04/30/38	Apr 2038	88.12	82.82	92.05	88.37	86.05	81.80	92.94	88.39	94.54	89.34	10.19	9.62	9.27	8.58	8.94	8.76	8.46	8.59	8.92	8.69	8.77	8.84
05/01/38	05/31/38	May 2038	88.94	82.87	96.61	90.39	86.61	80.75	93.37	88.32	97.25	89.76	10.27	9.69	9.25	8.58	8.90	8.73	8.50	8.65	8.92	8.69	8.77	8.89
06/01/38	06/30/38	Jun 2038	90.05	82.75	105.92	92.37	89.99	82.06	93.24	88.28	100.68	88.60	10.57	9.80	9.32	8.63	8.95	8.81	8.58	8.74	8.97	8.74	8.82	8.96
07/01/38	07/31/38	Jul 2038	109.73	89.21	129.02	99.84	109.71	88.74	114.58	94.30	122.18	95.26	10.91	10.17	9.55	8.69	9.04	8.86	8.63	8.79	9.03	8.80	8.88	9.02
08/01/38	08/31/38	Aug 2038	110.57	88.36	126.28	97.27	110.78	87.97	115.08	93.65	122.47	94.59	10.97	10.14	9.59	8.72	9.06	8.88	8.63	8.80	9.06	8.84	8.91	9.03
09/01/38	09/30/38	Sep 2038	107.62	90.04	111.48	94.37	106.93	88.84	112.21	95.46	113.91	95.72	11.12	10.53	10.07	9.39	9.81	9.61	9.24	9.38	9.73	9.50	9.58	9.64
10/01/38	10/31/38	Oct 2038	105.93	91.99	110.37	94.00	104.85	90.94	110.16	96.88	113.82	96.42	11.24	10.87	10.49	9.80	10.31	10.06	9.64	9.78	10.14	9.92	10.00	10.03
11/01/38	11/30/38	Nov 2038	105.82	93.90	102.40	94.04	104.97	95.73	107.14	97.58	106.31	96.72	11.27	10.90	10.53	9.83	10.37	10.36	9.78	9.83	10.19	9.95	10.03	10.20
12/01/38	12/31/38	Dec 2038	111.31	95.94	105.47	96.52	109.97	96.99	110.45	99.58	109.63	99.31	11.39	11.24	10.68	9.89	10.42	10.42	9.82	9.88	10.26	10.02	10.10	10.26
01/01/39	01/31/39	Jan 2039	100.72	90.79	100.20	93.51	101.73	92.62	104.00	96.03	103.57	95.73	11.03	10.62	10.30	9.56	9.98	9.82	9.46	9.55	9.93	9.69	9.78	9.91
02/01/39	02/28/39	Feb 2039	101.04	91.22	100.49	93.61	101.91	91.04	104.46	96.63	104.33	96.35	11.10	10.64	10.33	9.60	10.04	9.88	9.52	9.60	9.96	9.72	9.80	9.94
03/01/39	03/31/39	Mar 2039	89.54	85.56	92.96	89.79	87.00	85.76	94.65	91.10	95.96	91.85	10.42	9.95	9.64	9.01	9.27	9.16	8.96	9.06	9.37	9.13	9.21	9.38
04/01/39	04/30/39	Apr 2039	89.04	84.73	93.89	90.56	86.94	83.04	94.29	90.33	95.77	91.25	10.38	9.80	9.44	8.74	9.11	8.93	8.62	8.76	9.08	8.86	8.93	9.01
05/01/39	05/31/39	May 2039	88.98	84.53	97.70	92.09	86.80	82.45	94.18	90.14	98.98	91.55	10.47	9.87	9.43	8.74	9.07	8.89	8.66	8.82	9.08	8.85	8.93	9.05
06/01/39	06/30/39	Jun 2039	90.84	84.66	108.11	94.74	90.49	84.07	94.17	90.02	101.86	90.03	10.77	9.99	9.50	8.79	9.12	8.98	8.74	8.91	9.13	8.91	8.98	9.13
07/01/39	07/31/39	Jul 2039	109.98	90.42	131.05	101.64	110.05	89.31	115.27	95.76	123.66	96.67	11.11	10.36	9.73	8.85	9.21	9.03	8.79	8.96	9.19	8.97	9.05	9.18
08/01/39	08/31/39	Aug 2039	110.88	88.85	127.67	98.95	110.96	88.74	115.52	94.34	122.94	95.26	11.18	10.33	9.77	8.88	9.23	9.05	8.80	8.97	9.23	9.00	9.08	9.19
09/01/39	09/30/39	Sep 2039	107.40	91.88	112.55	96.71	106.67	90.26	112.93	97.20	114.33	97.15	11.33	10.73	10.27	9.56	10.00	9.79	9.42	9.56	9.91	9.68	9.76	9.81
10/01/39	10/31/39	Oct 2039	104.60	93.61	112.47	96.13	102.90	92.10	109.57	98.56	115.80	98.03	11.45	11.08	10.69	9.98	10.51	10.26	9.82	9.96	10.33	10.10	10.18	10.22
11/01/39	11/30/39	Nov 2039	105.66	95.16	103.59	96.08	106.82	97.11	108.16	99.63	107.60	98.80	11.49	11.11	10.73	10.02	10.56	10.56	9.96	10.02	10.37	10.14	10.22	10.39
12/01/39	12/31/39	Dec 2039	111.62	97.46	106.71	98.31	110.64	98.42	111.36	101.83	110.58	101.19	11.61	11.45	10.88	10.08	10.62	10.61	10.01	10.07	10.44	10.21	10.29	10.45
01/01/40	01/31/40	Jan 2040	104.84	93.08	101.22	96.08	104.95	93.40	105.09	98.08	104.71	97.66	11.24	10.83	10.49	9.74	10.17	10.01	9.64	9.73	10.11	9.87	9.96	10.09
02/01/40	02/29/40	Feb 2040	102.24	92.68	101.66	95.90	102.85	93.01	105.94	97.97	105.54	98.13	11.31	10.85	10.53	9.78	10.23	10.07	9.70	9.78	10.14	9.90	9.98	10.12
03/01/40	03/31/40	Mar 2040	91.16	87.99	95.40	92.41	89.27	88.17	96.70	93.59	98.63	94.52	10.62	10.14	9.82	9.18	9.45	9.33	9.13	9.23	9.54	9.30	9.38	9.55
04/01/40	04/30/40	Apr 2040	91.12	86.81	97.47	93.96	88.29	85.38	96.57	92.36	98.17	93.33	10.58	9.98	9.62	8.91	9.28	9.10	8.78	8.92	9.25	9.02	9.10	9.17
05/01/40	05/31/40	May 2040	89.53	85.97	101.52	95.08	87.23	82.07	95.46	91.93	100.66	93.16	10.67	10.06	9.61	8.90	9.24	9.06	8.82	8.99	9.24	9.02	9.10	9.21
06/01/40	06/30/40	Jun 2040	92.06	86.76	110.30	97.33	91.41	85.30	95.66	92.24	103.77	92.59	10.97	10.18	9.68	8.96	9.29	9.15	8.90	9.08	9.30	9.07	9.15	9.29
07/01/40	07/31/40	Jul 2040	113.69	93.22	135.18	105.44	113.75	92.18	118.45	98.31	127.85	99.53	11.33	10.56	9.92	9.02	9.38	9.20	8.96	9.13	9.36	9.14	9.21	9.35
08/01/40	08/31/40	Aug 2040	114.40	91.99	131.76	102.31	114.42	91.40	119.05	96.99	126.36	97.78	11.39	10.53	9.96	9.05	9.41	9.22	8.97	9.14	9.40	9.17	9.25	9.36
09/01/40	09/30/40	Sep 2040	111.11	94.76	117.41	100.50	110.43	93.37	116.48	99.86	118.98	100.49	11.54	10.94	10.46	9.75	10.19	9.97	9.60	9.74	10.09	9.86	9.94	9.99
10/01/40	10/31/40	Oct 2040	107.67	95.25	115.28	98.76	106.42	94.33	112.19	100.67	118.32	100.53	11.67	11.29	10.89	10.17	10.71	10.45	10.01	10.15	10.52	10.29	10.37	10.40
11/01/40	11/30/40	Nov 2040	109.72	97.96	107.15	98.74	111.63	99.94	111.52	101.92	110.69	101.32	11.71	11.32	10.93	10.21	10.77	10.76	10.15	10.21	10.56	10.33	10.41	10.57
12/01/40	12/31/40	Dec 2040	115.19	100.08	110.74	100.90	114.35	101.76	114.91	104.20	114.13	103.67	11.83	11.67	11.09	10.27	10.82	10.82	10.20	10.26	10.64	10.40	10.48	10.64
01/01/41	01/31/41	Jan 2041	106.94	94.94	103.24	98.00	107.05	95.27	107.19	100.04	106.80	99.61	11.47	11.04	10.70	9.94	10.38	10.21	9.83	9.92	10.31	10.07	10.15	10.28
02/01/41	02/28/41	Feb 2041	104.28	94.53	103.69	97.82	104.91	94.87	108.06	99.93	107.65	100.09	11.53	11.06	10.74	9.97	10.43	10.27	9.89	9.98	10.33	10.10	10.18	10.32
03/01/41	03/31/41	Mar 2041	92.98	89.75	97.31	94.26	91.06	89.93	98.63	95.46	100.60	96.41	10.83	10.34	10.02	9.37	9.64	9.52	9.31	9.42	9.72	9.49	9.57	9.73
04/01/41	04/30/41	Apr 2041	92.94	88.55	99.42	95.84	90.06	87.09	98.50	94.21	100.13	95.20	10.79	10.18	9.82	9.08	9.47	9.28	8.96	9.10	9.42	9.20	9.28	9.34
05/01/41	05/31/41	May 2041	91.32	87.69	103.55	96.98	88.97	83.71	97.37	93.77	102.67	95.02	10.88	10.26	9.80	9.08	9.42	9.24	9.00	9.17	9.42	9.20	9.28	9.39
06/01/41	06/30/41	Jun 2041	93.90	88.50	112.51	99.28	93.24	87.01	97.57	94.08	105.85	94.44	11.19	10.38	9.87	9.14	9.48	9.33	9.08	9.26	9.48	9.25	9.33	9.47
07/01/41	07/31/41	Jul 2041	115.96	95.08	137.88	107.55	116.03	94.02	120.82	100.28	130.41	101.52	11.55	10.77	10.12	9.20	9.57	9.39	9.14	9.31	9.54	9.32	9.40	9.53

08/01/41	08/31/41	Aug 2041	116.69	93.83	134.40	104.36	116.71	93.23	121.43	98.93	128.89	99.74	11.62	10.74	10.16	9.23	9.60	9.41	9.15	9.33	9.58	9.35	9.43	9.54
09/01/41	09/30/41	Sep 2041	113.33	96.66	119.76	102.51	112.64	95.24	118.81	101.86	121.36	102.50	11.78	11.16	10.67	9.94	10.39	10.17	9.79	9.94	10.28	10.06	10.14	10.18
10/01/41	10/31/41	Oct 2041	109.82	97.16	117.59	100.74	108.55	96.22	114.43	102.68	120.69	102.54	11.90	11.52	11.11	10.38	10.92	10.66	10.21	10.36	10.72	10.50	10.57	10.60
11/01/41	11/30/41	Nov 2041	111.91	99.92	109.29	100.71	113.86	101.94	113.75	103.96	112.90	103.35	11.94	11.55	11.15	10.41	10.98	10.98	10.35	10.41	10.77	10.53	10.61	10.78
12/01/41	12/31/41	Dec 2041	117.49	102.08	112.95	102.92	116.64	103.80	117.21	106.28	116.41	105.74	12.06	11.90	11.31	10.48	11.04	11.03	10.40	10.46	10.84	10.60	10.69	10.84
51867	51897	51867	109.0755	96.8404	105.309	99.9616	109.19	97.1734	109.336	102.042	108.94	101.605	11.695218	11.263758	10.915734	10.138188	10.583622	10.41573	$ 10.029	$ 10.121	10.514568	10.271094	10.35555	10.486416