

# AVISTA UTILITIES

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## 2019 Washington Natural Gas Hedge Report

### Exhibit 2 – Strategic Oversight Group Presentation and Minutes



**SOG**

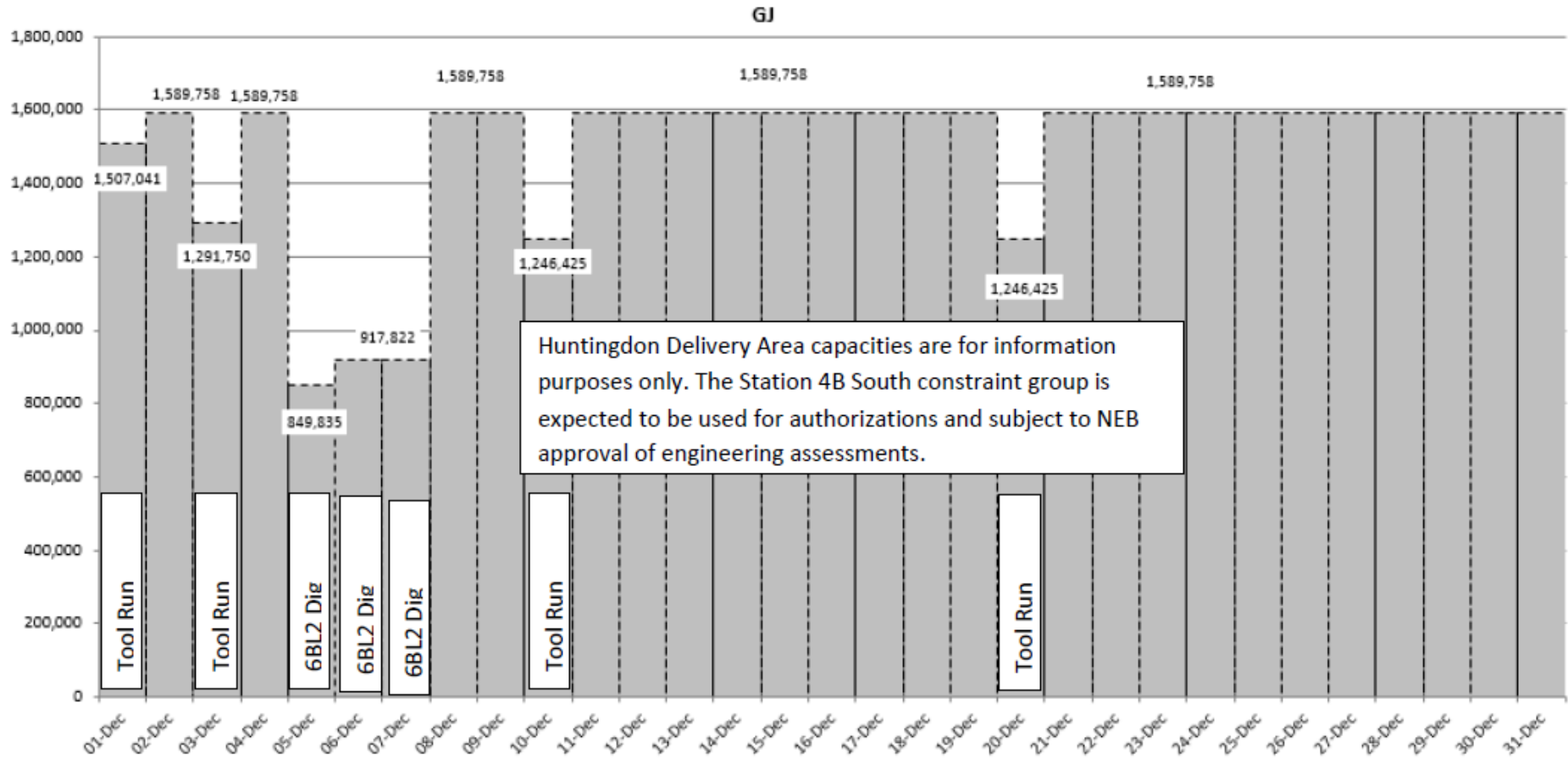
# **Gas Supply Update**

December 14, 2018

# Agenda

- Rates update
- Market Overview
- Procurement Plan
- Operational Flow Orders
- Enbridge Commission Updates
- Accounting update
- Risk update

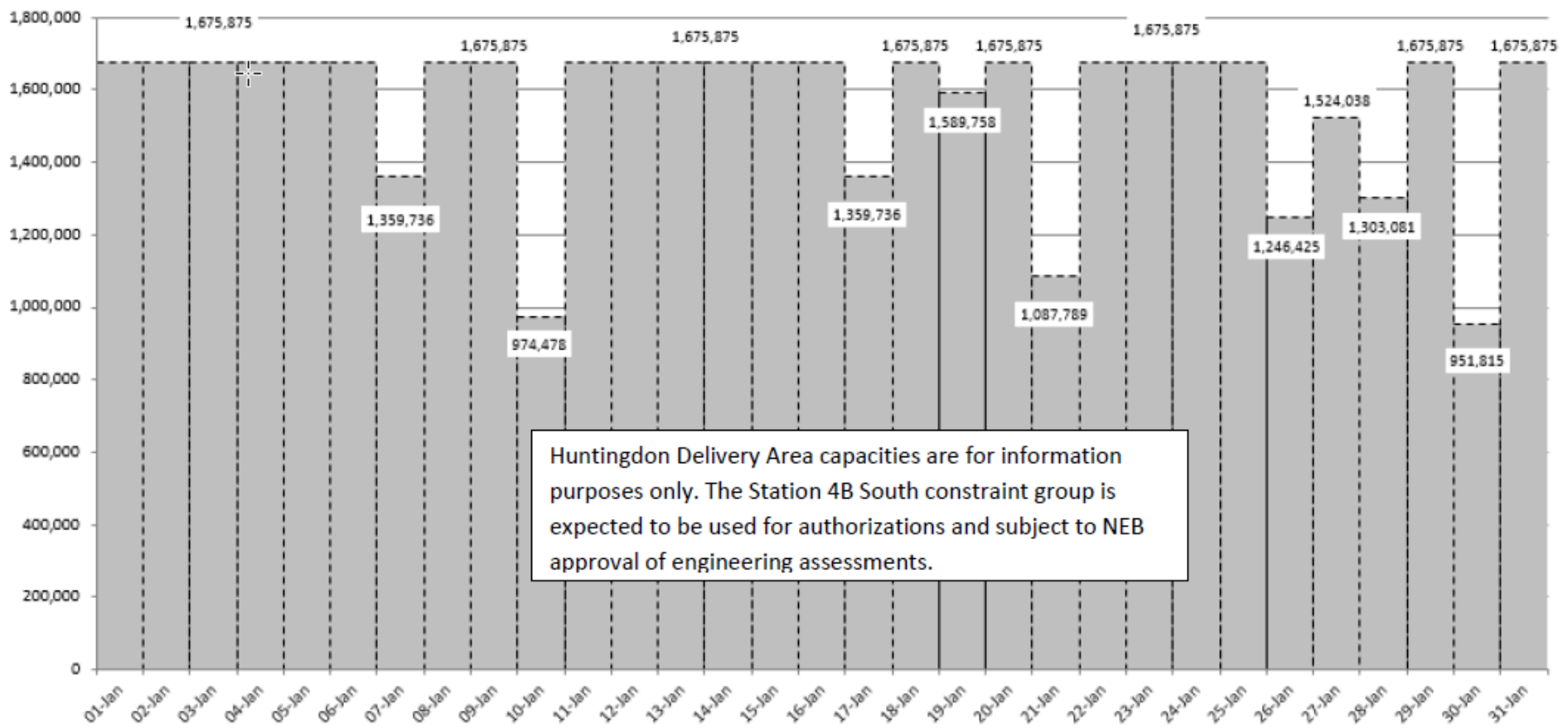
## Dec. 2018 Huntingdon Delivery Area Capacity



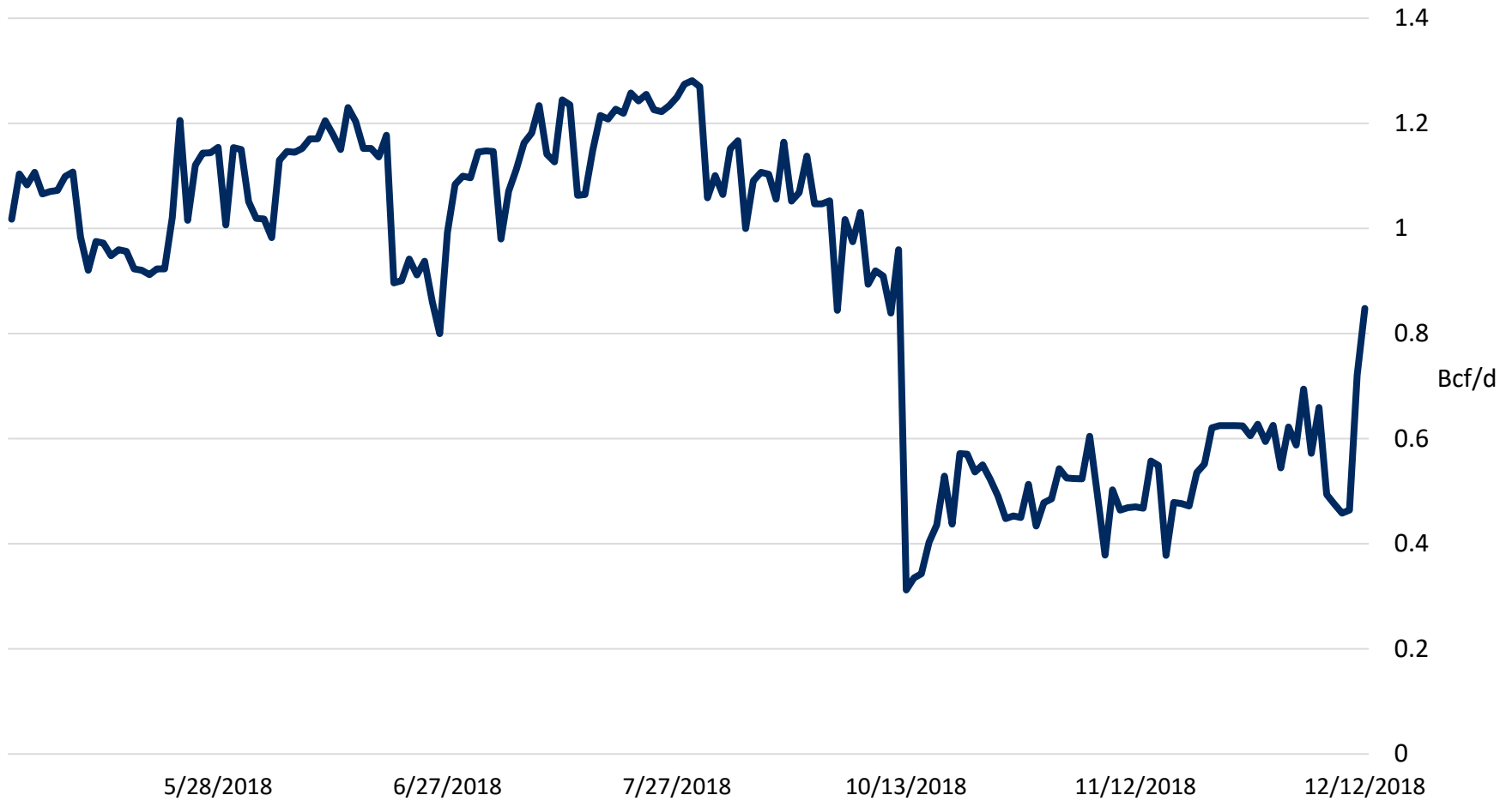


## Jan. 2019 Huntingdon Delivery Area Capacity

GJ

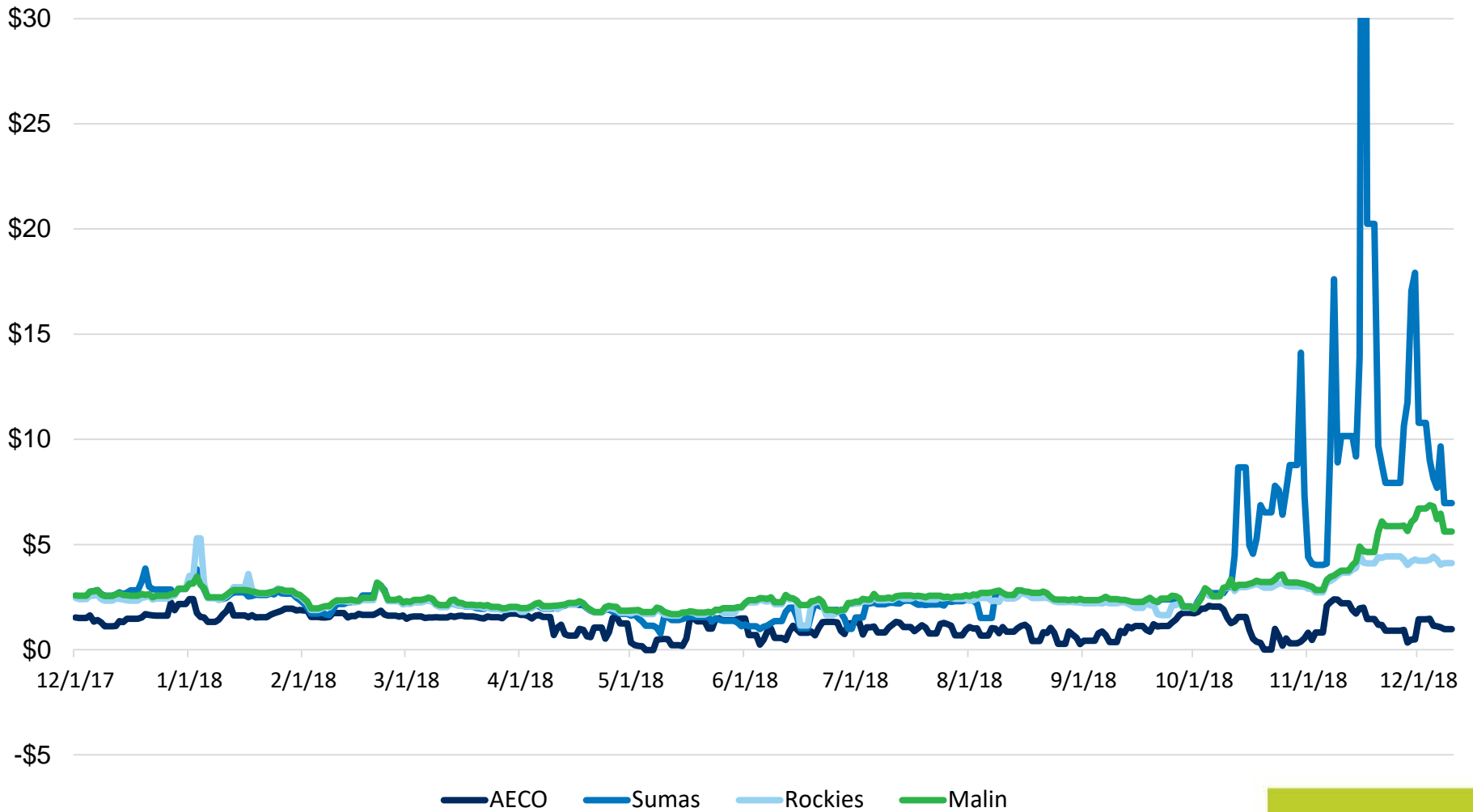


# Sumas Southbound Flow

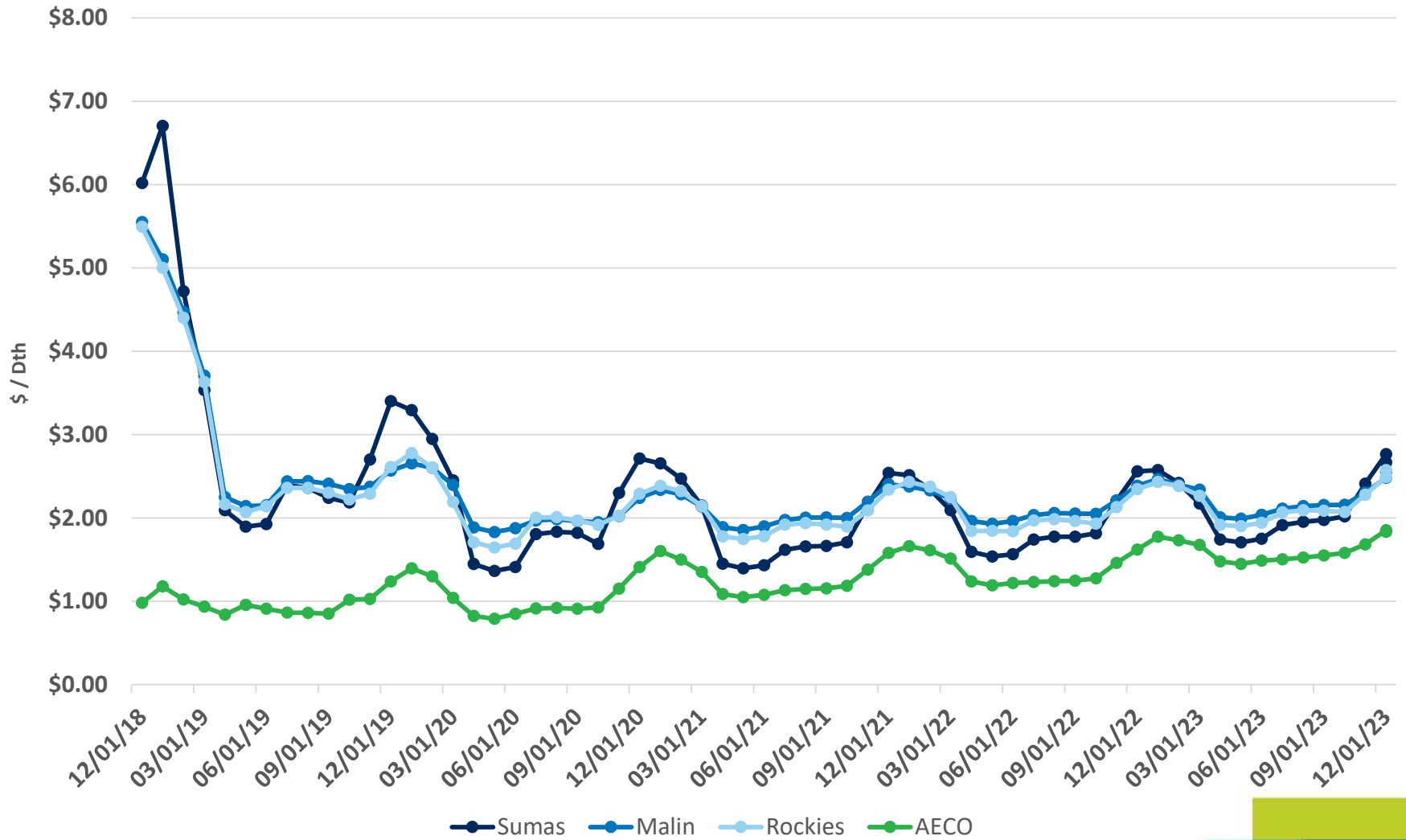


# Cash Market

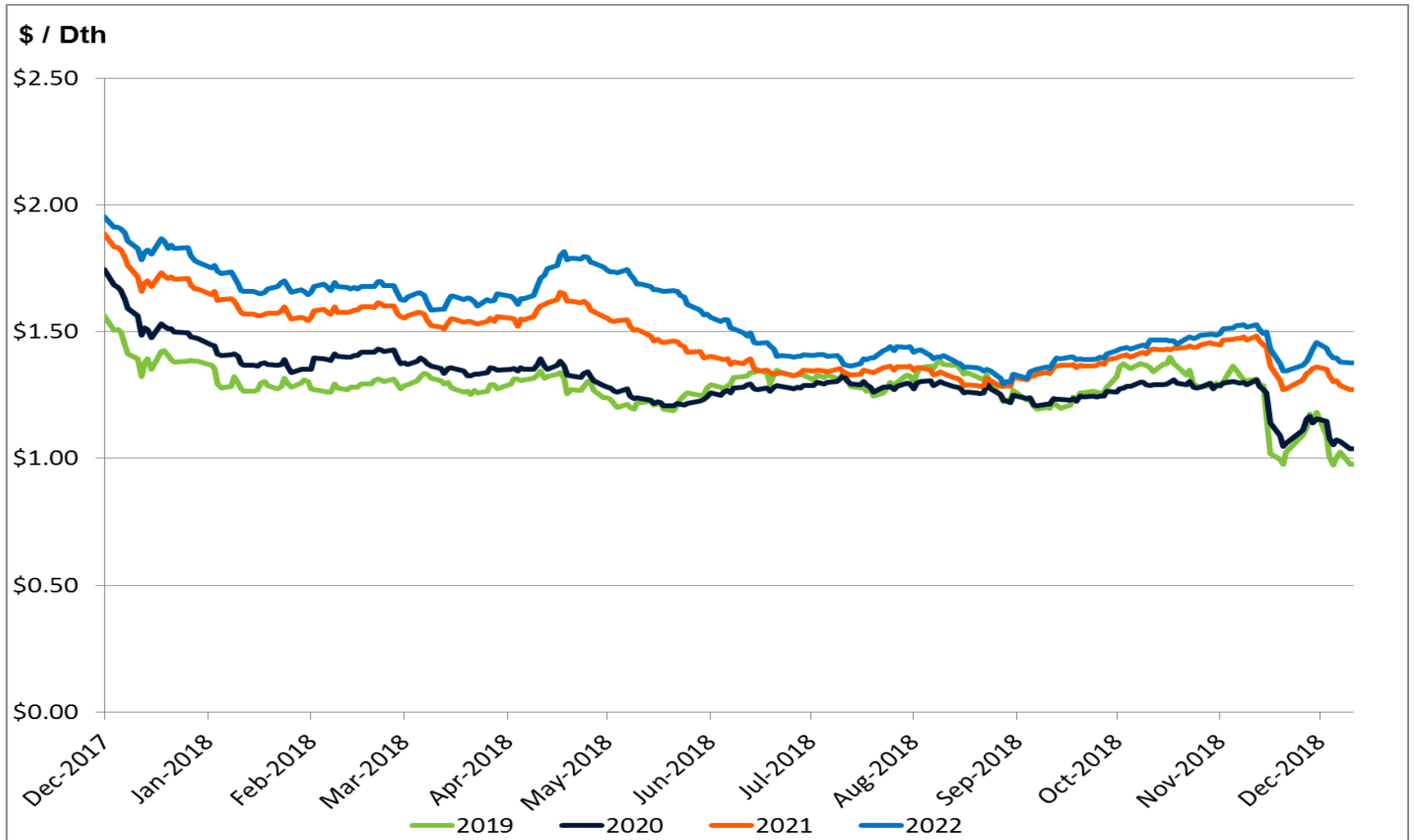
\*11/16/2018  
Sumas: \$69.60



# Forward Curves (12/11/2018)

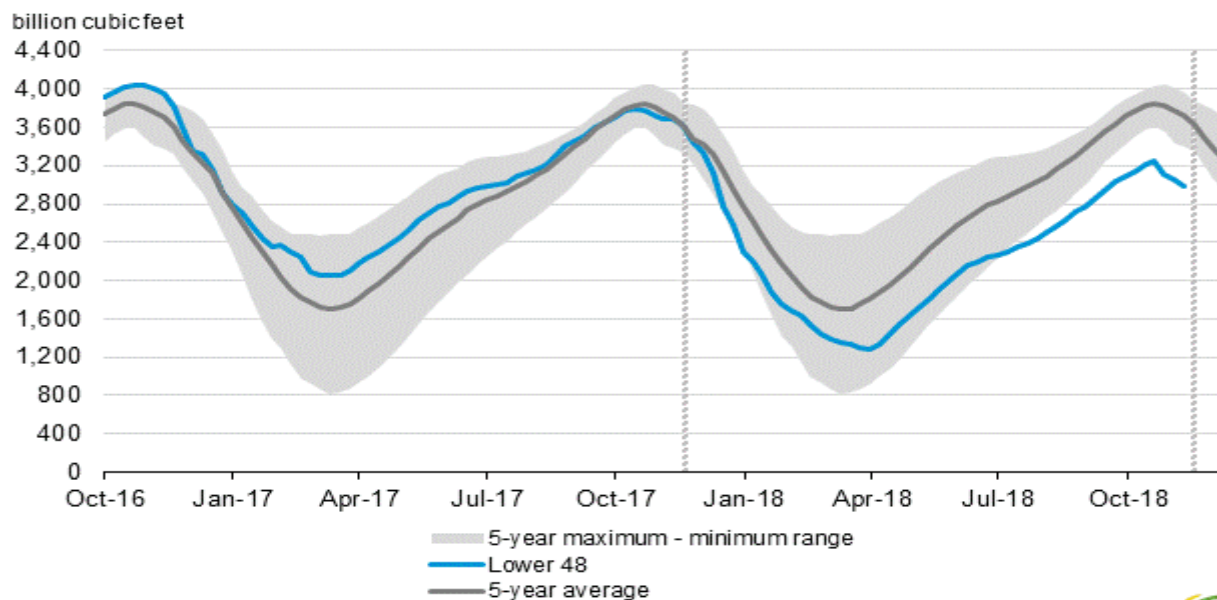


# AECO Calendar Forwards

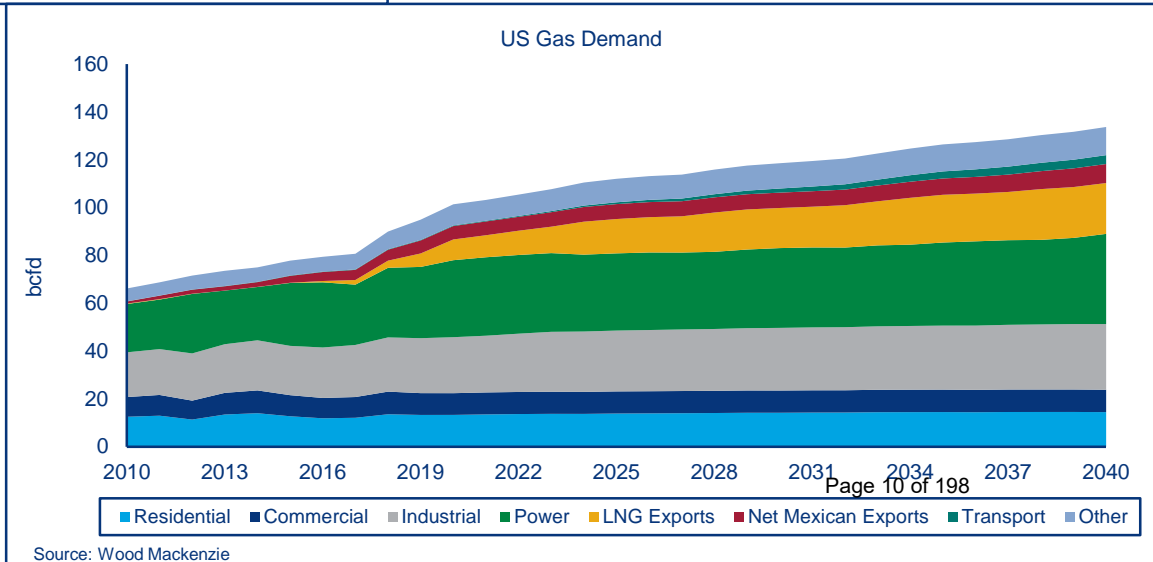
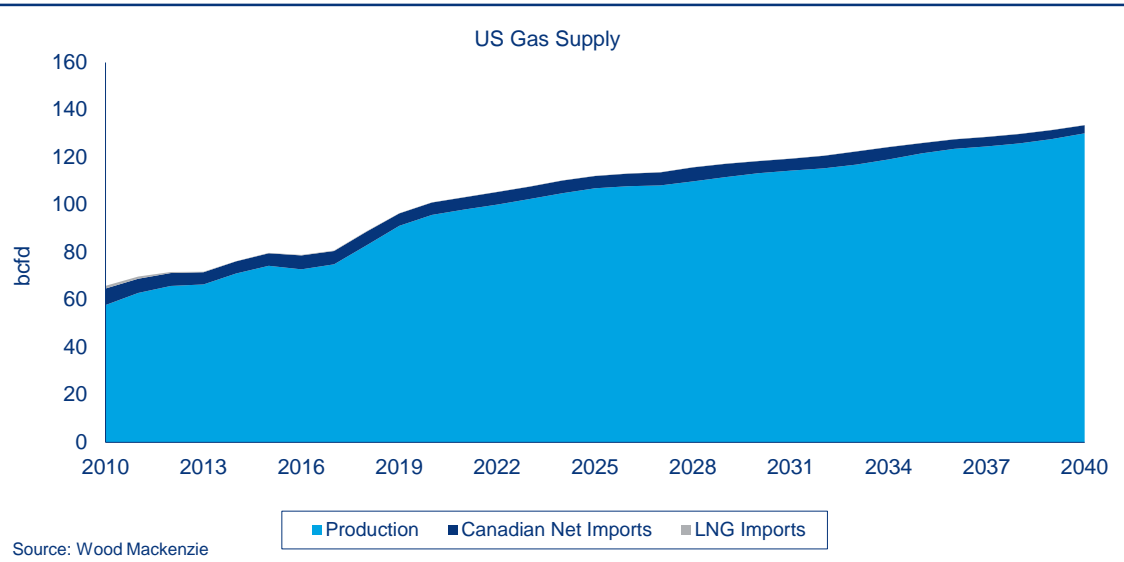


# US Storage

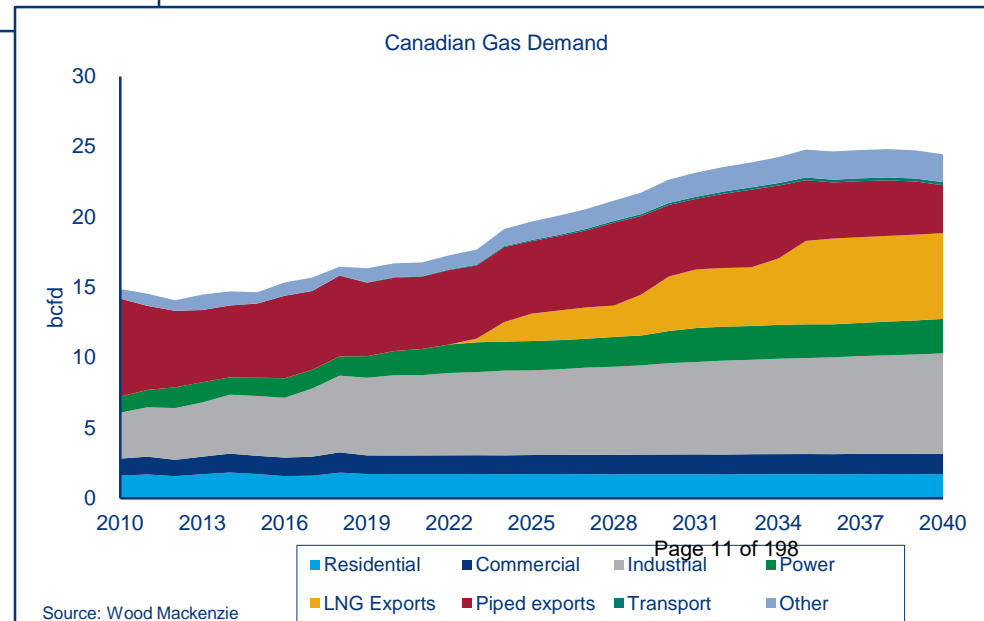
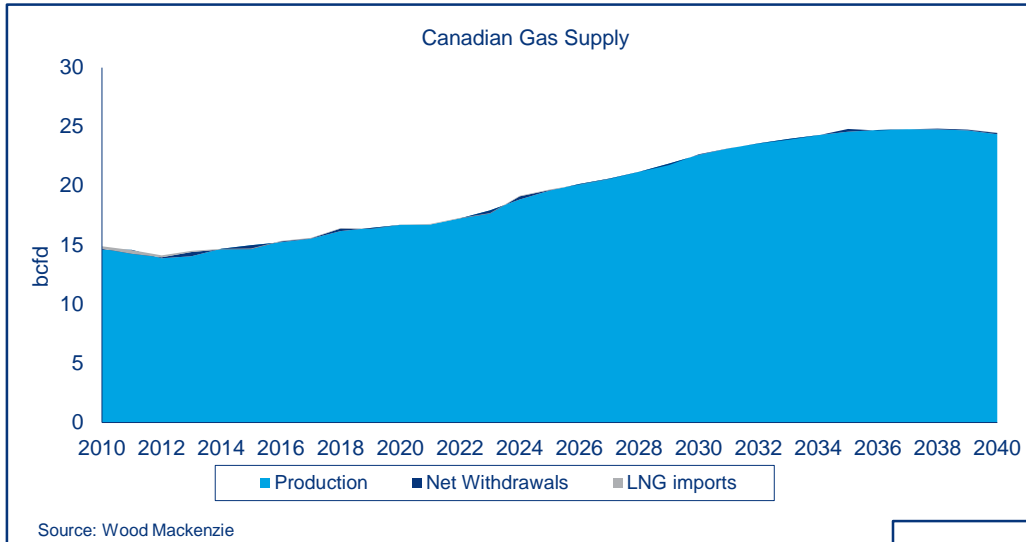
Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	11/30/18	11/23/18	net change	implied flow	Year ago (11/30/17)		5-year average (2013-17)	
					Bcf	% change	Bcf	% change
East	752	778	-26	-26	869	-13.5	876	-14.2
Midwest	914	938	-24	-24	1,059	-13.7	1,046	-12.6
Mountain	168	171	-3	-3	221	-24.0	213	-21.1
Pacific	253	254	-1	-1	313	-19.2	342	-26.0
South Central	905	914	-9	-9	1,232	-26.5	1,239	-27.0
Salt	263	259	4	4	358	-26.5	352	-25.3
Nonsalt	642	654	-12	-12	874	-26.5	887	-27.6
<b>Total</b>	<b>2,991</b>	<b>3,054</b>	<b>-63</b>	<b>-63</b>	<b>3,695</b>	<b>-19.1</b>	<b>3,716</b>	<b>-19.5</b>



# US Supply and Demand



# Canada Supply and Demand





Dth

### Jackson Prairie Owned (February 15th Forecast)

	Current Inventory	Fortis
12/12/2018	6,339,652	1,500,000



Less Fortis      W/D rights

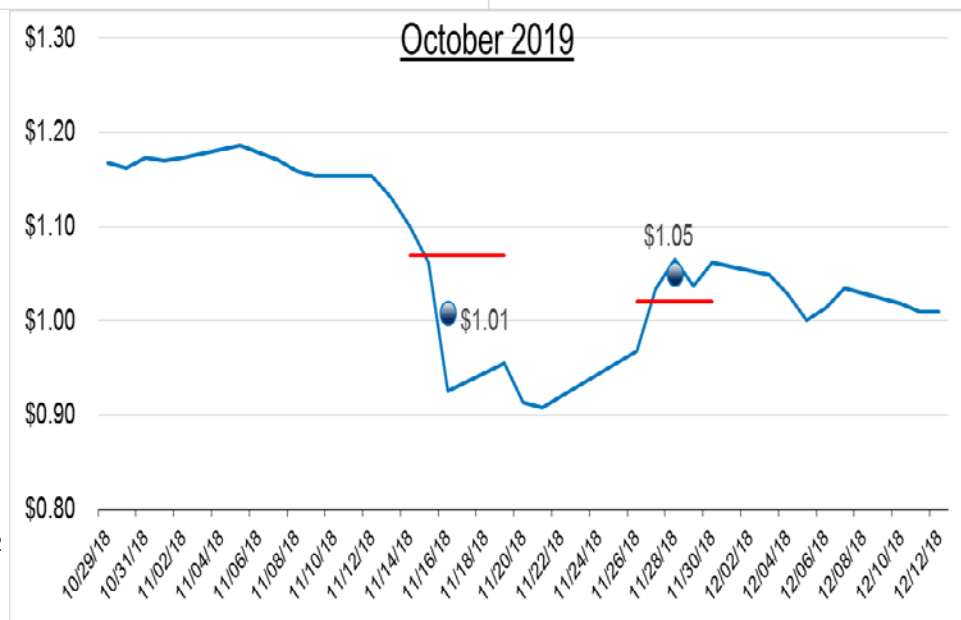
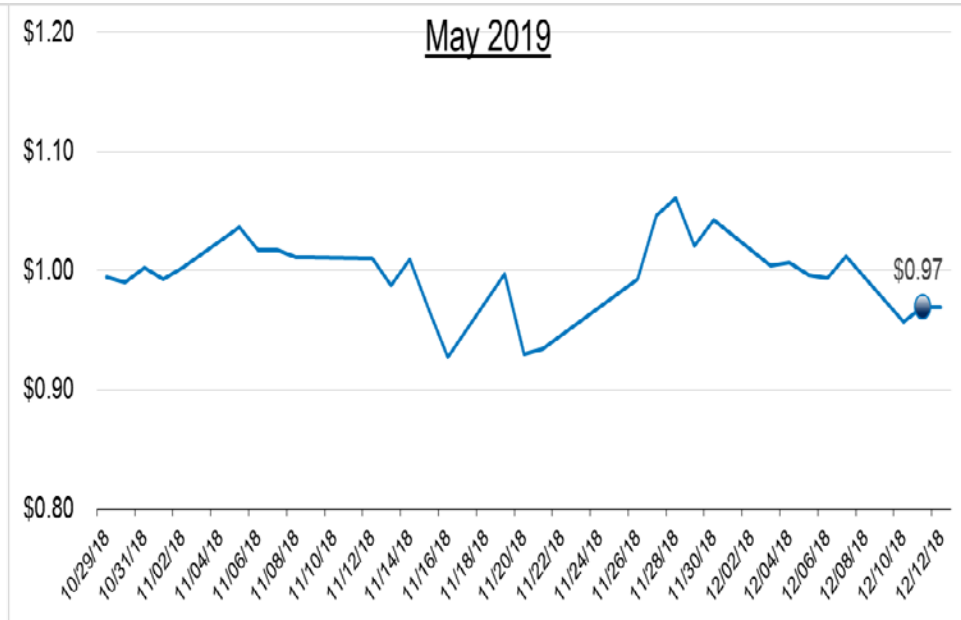
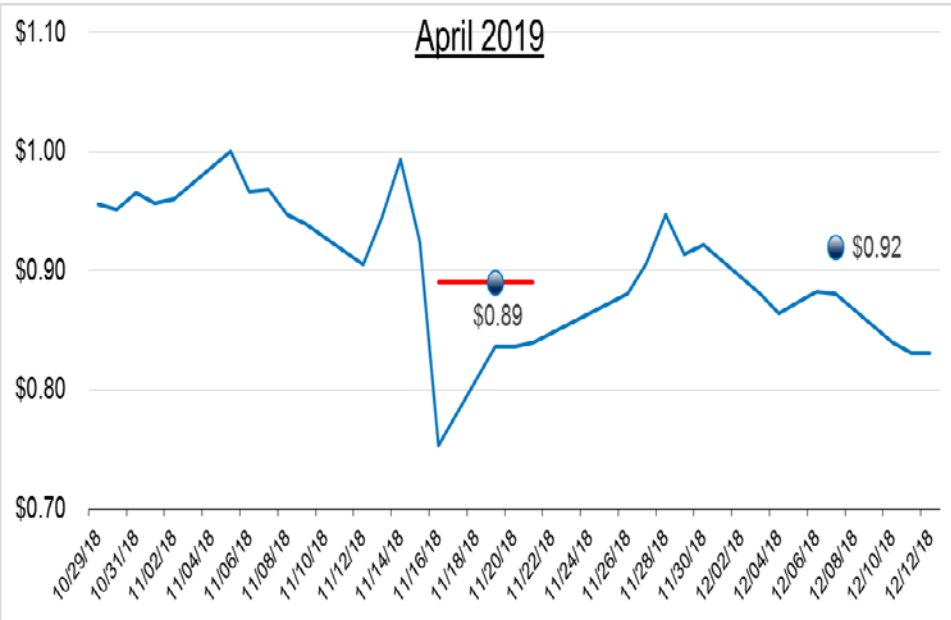
Month	Sumas Sales	St2	GP w/d	OFO	Total
Dec	36,000	9,000	5,000	25,000	(57,000)
Jan	15,000	9,000	5,000	25,000	(36,000)
Feb	22,500	9,000	5,000	17,000	(35,500)
Mar	15,000	9,000	5,000	10,000	(21,000)



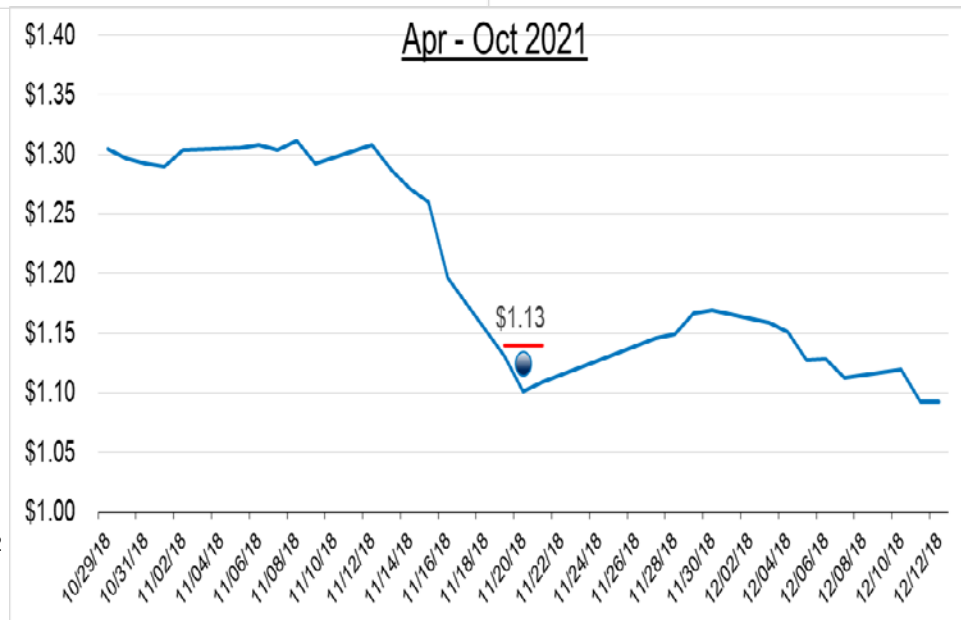
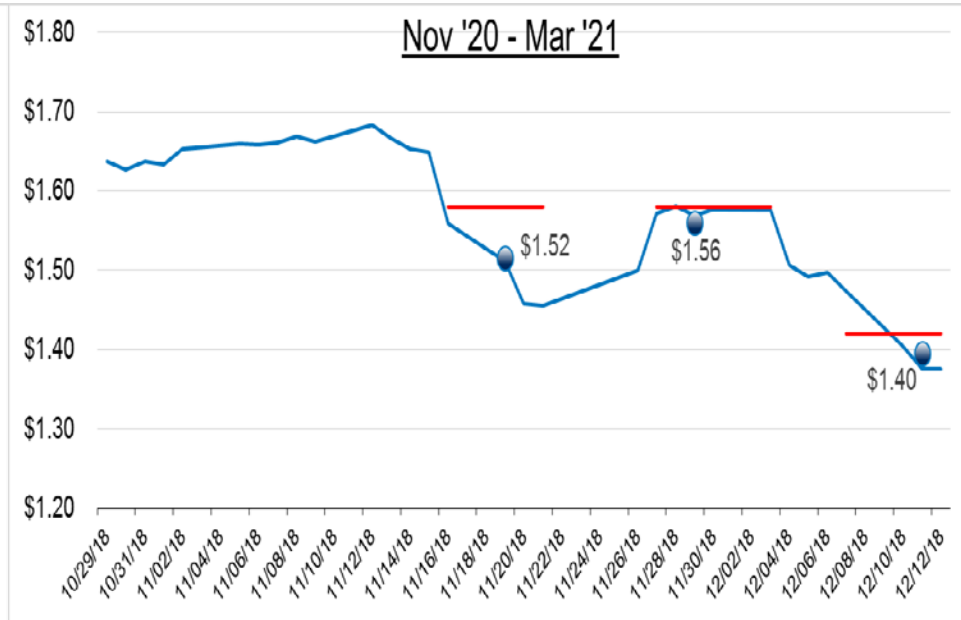
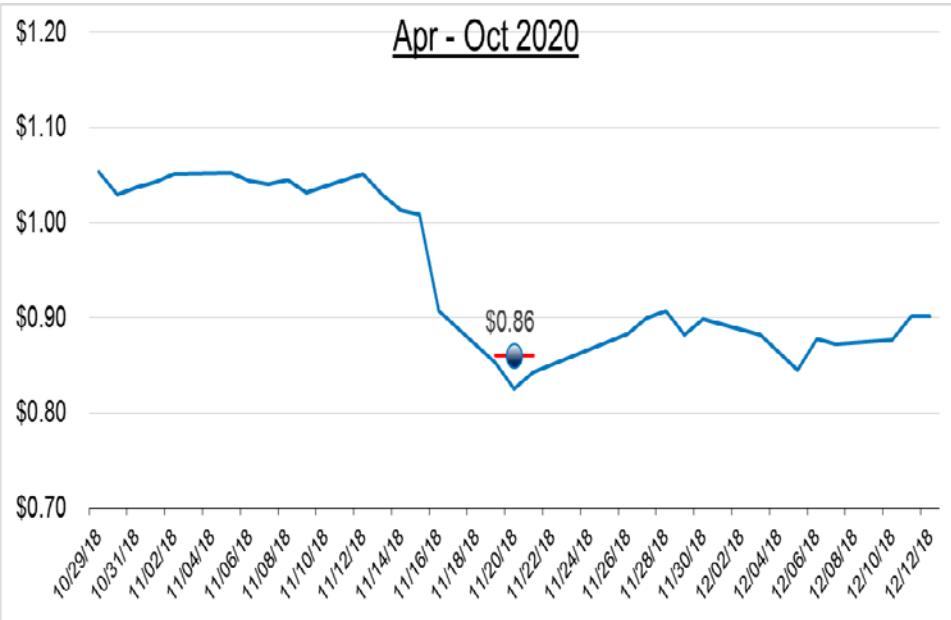
# Current Procurement Plan

December 11, 2018													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
January-19	-184,472	82,500	-101,972	40%	45%	0							
February-19	-163,647	72,500	-91,147	40%	44%	0							
March-19	-129,735	62,500	-67,235	40%	48%	0							
April-19	-83,834	17,500	-66,334	40%	21%	6	12/07/18	12/21/18	0.75	0.83	0.98		AECO
May-19	-47,612	12,500	-35,112	40%	26%	3	12/11/18	01/17/19	0.82	0.97	1.15		AECO
June-19	-32,415	10,000	-22,415	40%	31%	1	10/31/18	05/01/19	0.75	0.90	1.13		AECO
July-19	-28,940	10,000	-18,940	40%	35%	1	10/31/18	05/31/19	0.73	0.86	1.03		AECO
August-19	-29,051	10,000	-19,051	40%	34%	1	10/31/18	07/01/19	0.77	0.85	1.05		AECO
September-19	-33,914	10,000	-23,914	40%	29%	1	10/31/18	08/01/19	0.78	0.85	1.06		AECO
October-19	-75,051	17,500	-57,551	40%	23%	5	11/28/18	01/22/19	0.86	1.01	1.25		AECO
Nov19-Mar20	-164,059	72,500	-91,559	32%	44%	0							
Apr20-Oct20	-47,653	10,000	-37,653	25%	21%	1	11/20/18	03/01/20	0.61	0.90	1.30		AECO
Nov20-Mar21	-166,386	27,500	-138,886	32%	17%	11	12/11/18	02/09/19	1.20	1.38	1.57		AECO
Apr21-Oct21	-48,316	2,500	-45,816	25%	5%	4	11/20/18	6/16/2019	0.97	1.09	1.34		AECO

# AECO Dynamic Window Hedges

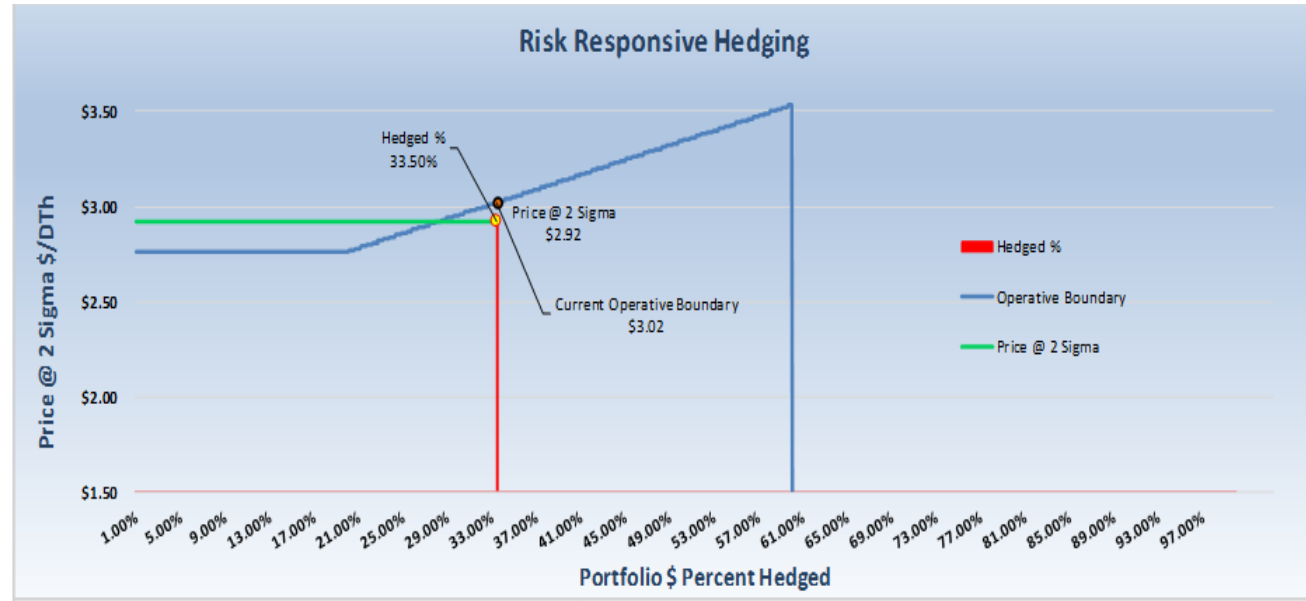


# AECO Dynamic Window Hedges

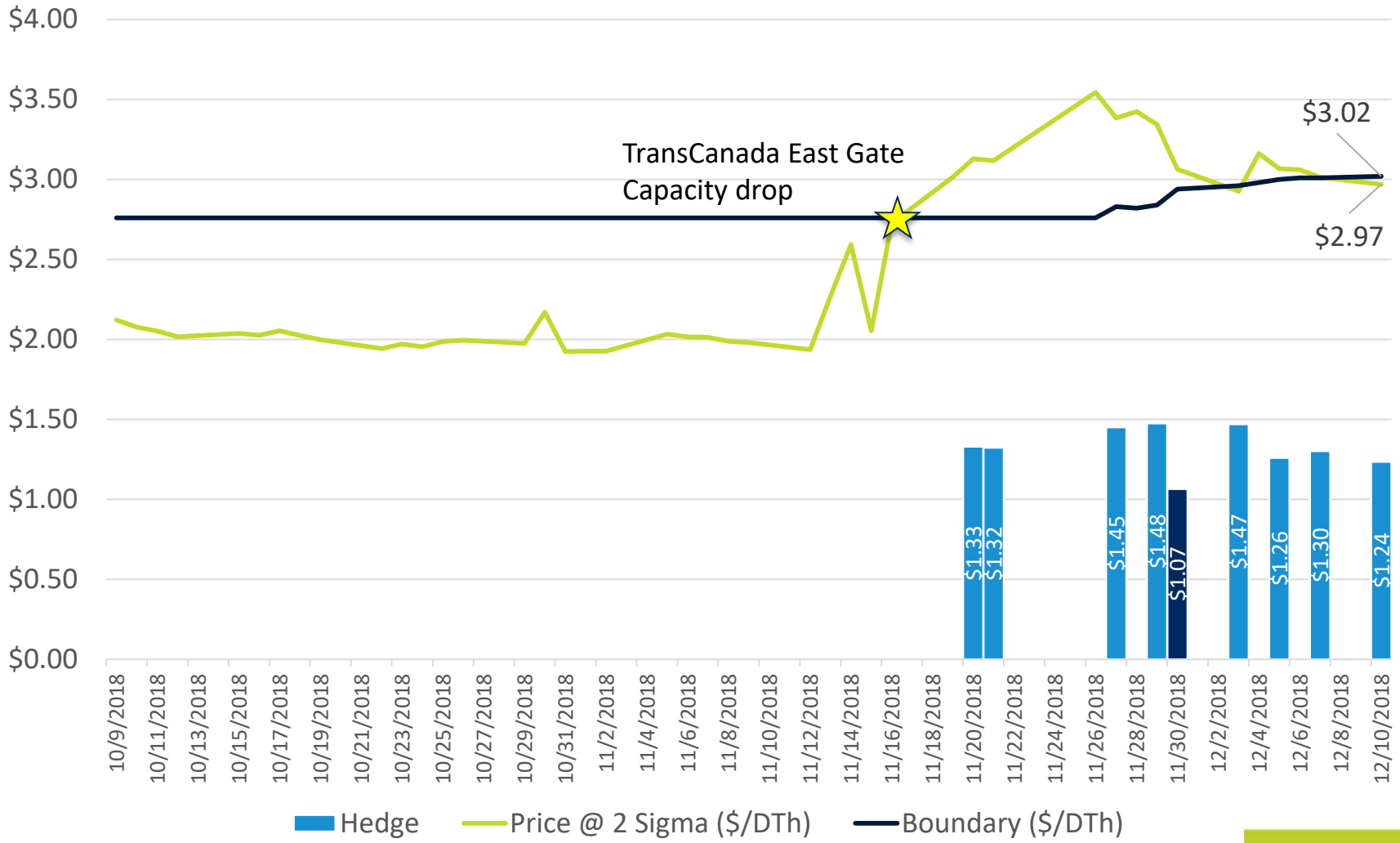


# Risk Responsive Hedging Tool

Parameters / Metrics Used	
Beg Period:	Jan-19
End Period:	Dec-20
Risk Responsive Ending	
Period:	Apr20-Oct20
Periods:	12
Report Date:	12/11/18
Current Position #:	-51,007,871
Natural Position \$:	\$93,957,339
Current Position(NPV)\$:	\$62,516,350
VaRC:	\$86,404,000
Cost @ 2 Sigma (\$):	\$148,920,350
Price @ 2 Sigma (\$/DTh):	\$2.920
Boundary (\$/DTh):	\$3.020
Financial Hedged %:	33.50%
Target Financial Hedge %:	#N/A



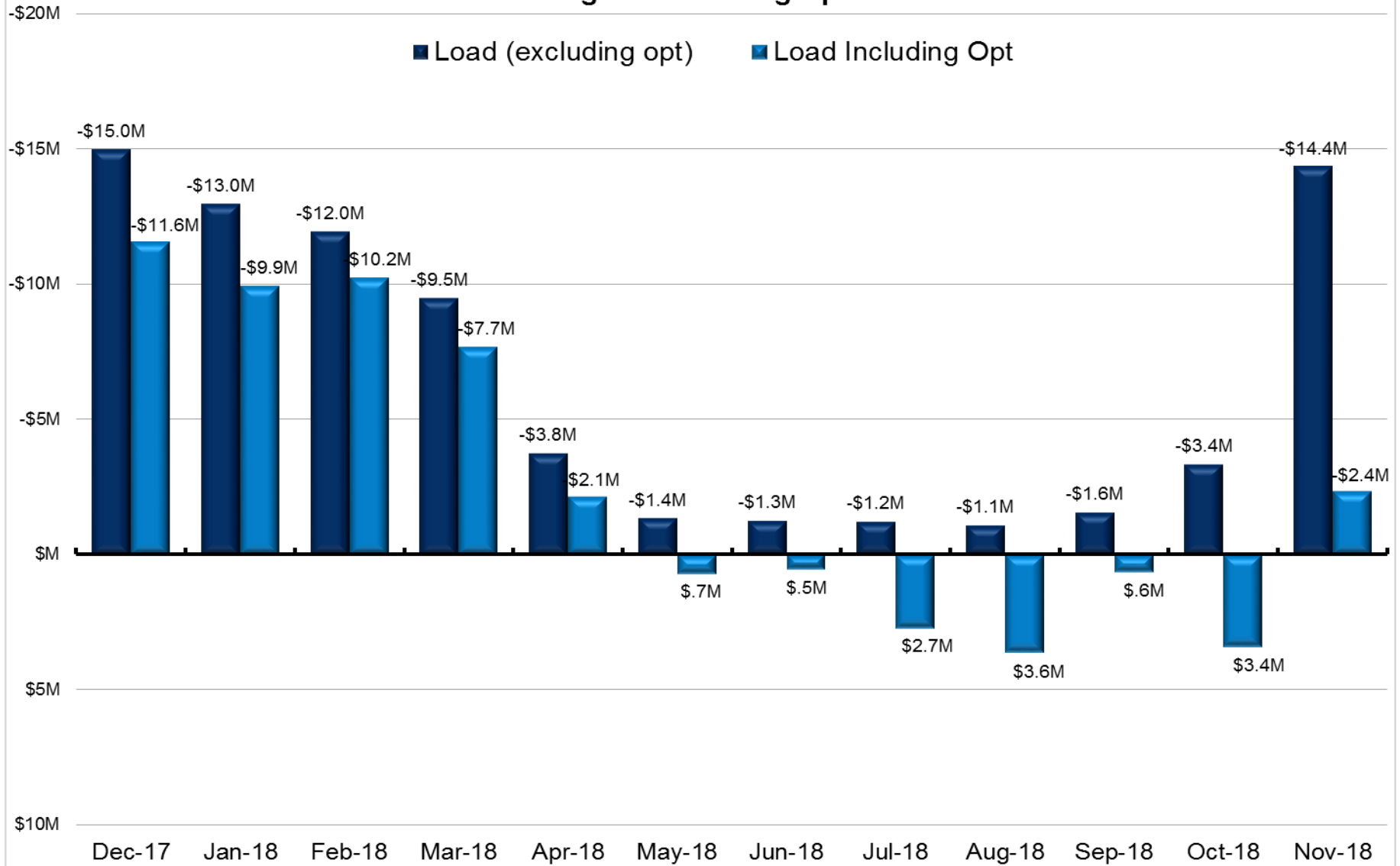
# Winter '18 – '19 Volatile Market to RRHT



Risk Hedges	Weighted Average cost of RRHT	Total Volume
<b>9 Hedges</b>	<b>\$ 1.35</b>	<b>3.12 MM Dth</b>



## Estimated 2017-2018 Monthly Total Load Benefit/(Cost) Excluding and Including Optimization



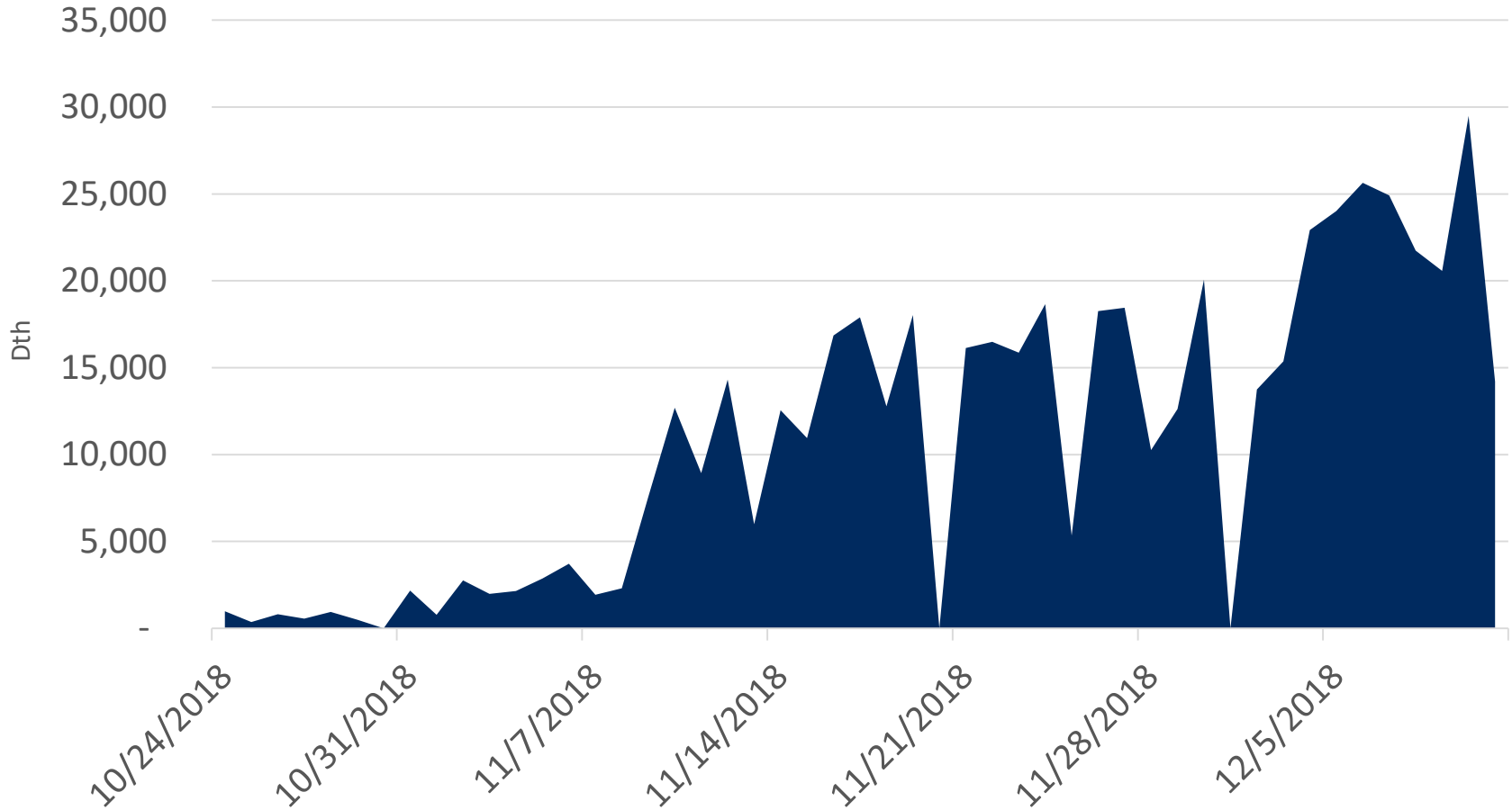
# Operational Flow Orders (OFO)

## Avista Natural Gas Service Areas, Gas Fields, Trading Hubs and Major Pipelines





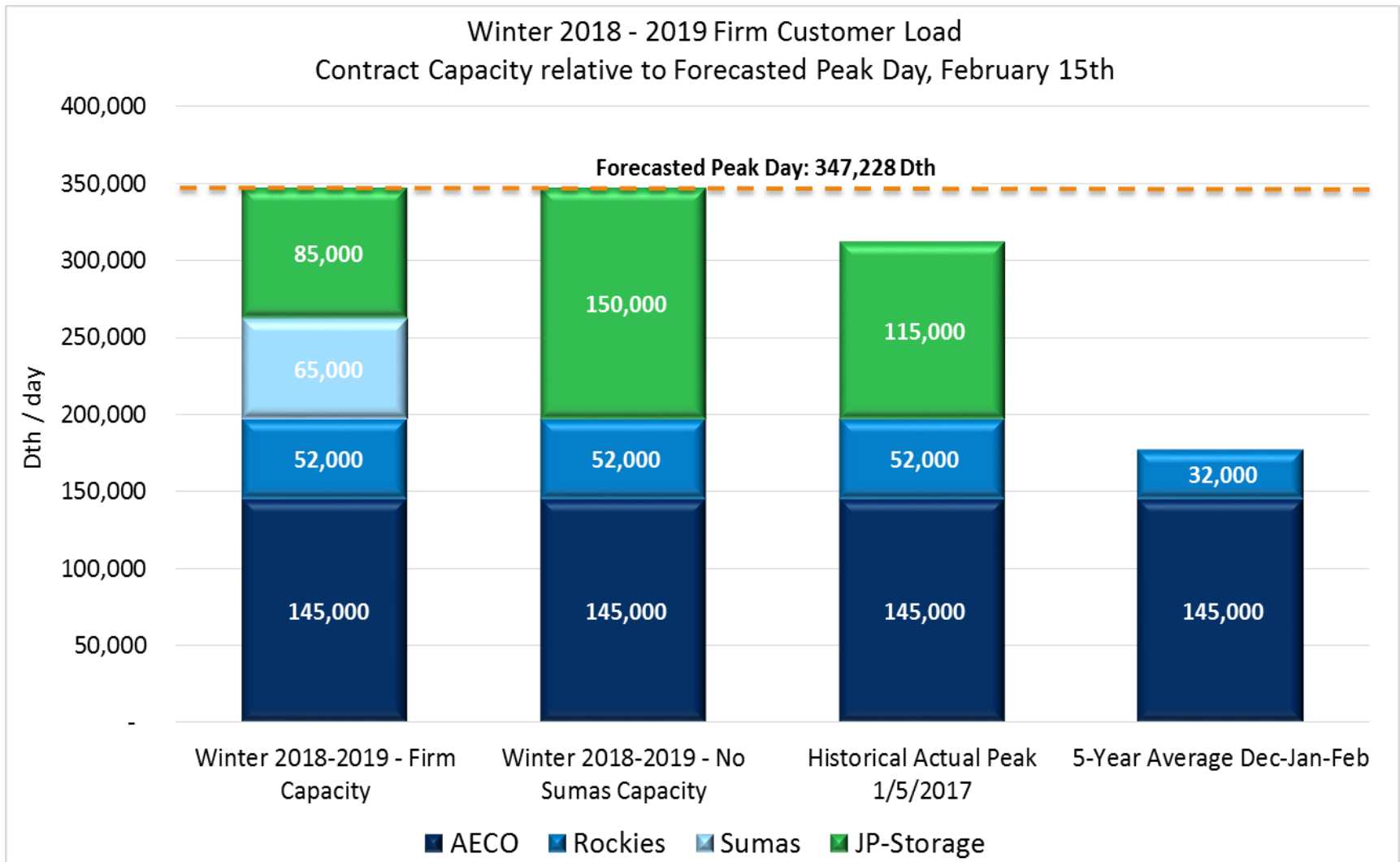
# Avista's OFO Obligation



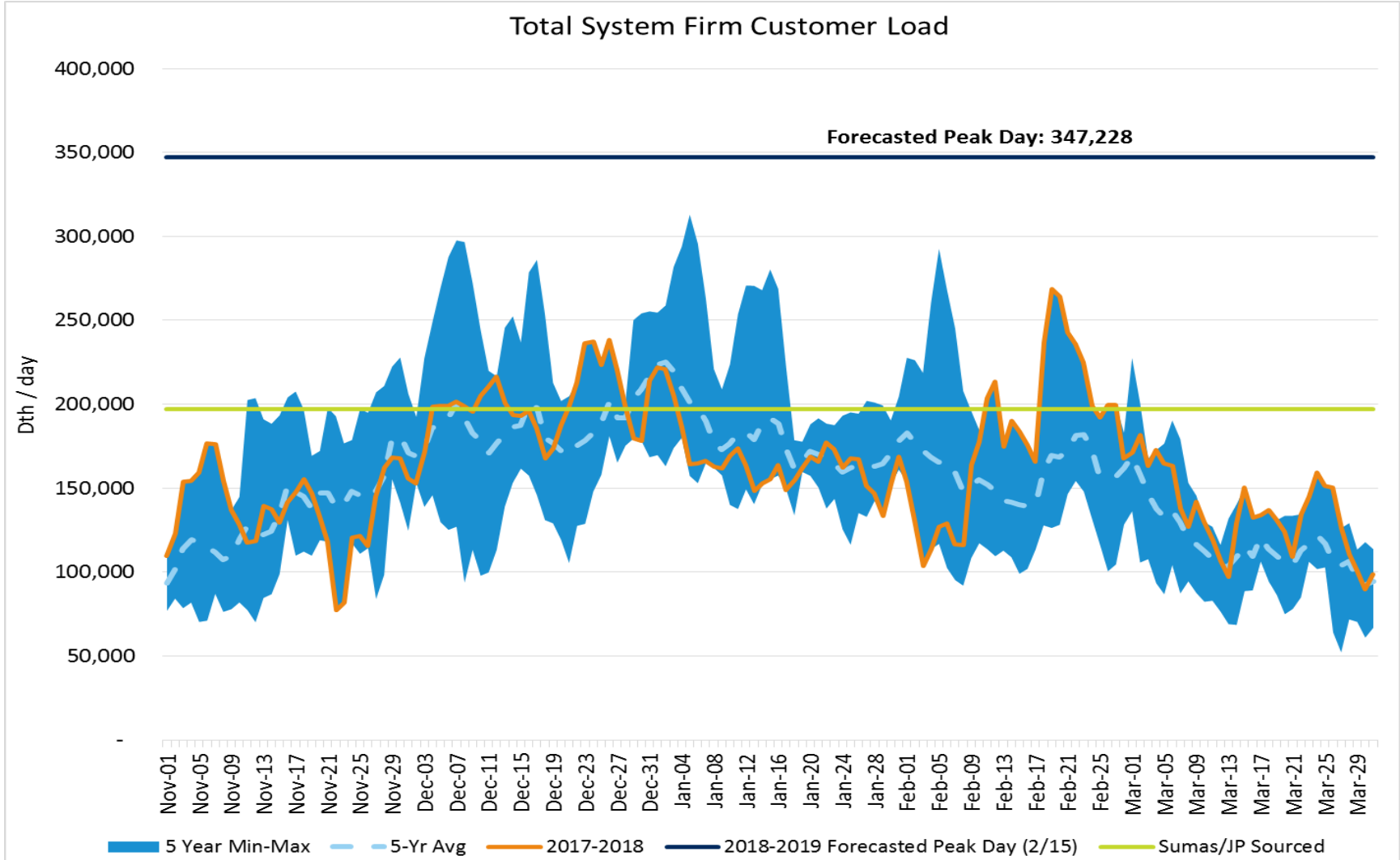
# Enbridge Updates to Commissions

- Mutual Assistance – Commissions complimented this
- Can maintenance coordination on major pipeline assets improve? (JP, Clay Basin, compressors, etc.)
- Will LDC consider changes to IRPs?
  - Portfolio diversity a key
  - Locally sourced RNG?
  - Pipeline infrastructure in PNW may be under-built
- Affects to hedging and rates
  - Cascade has filed PGA adjustment
  - PSE indicated filing soon

# Winter 2018-2019 Outlook



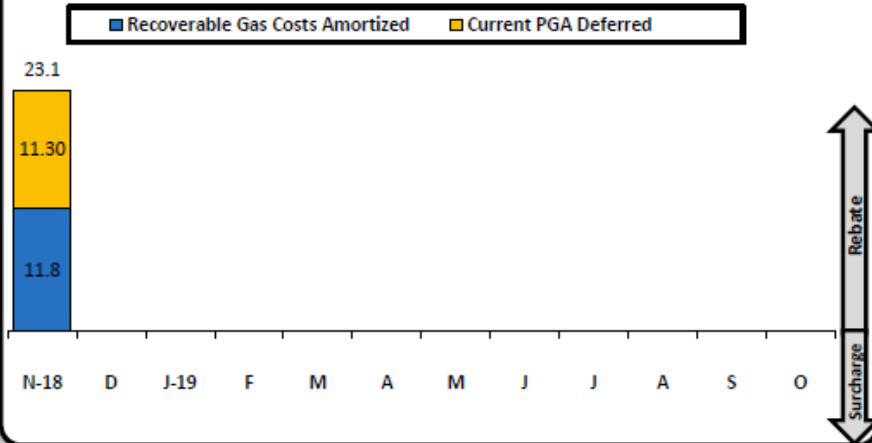
# Historical Winter Firm Customer Load



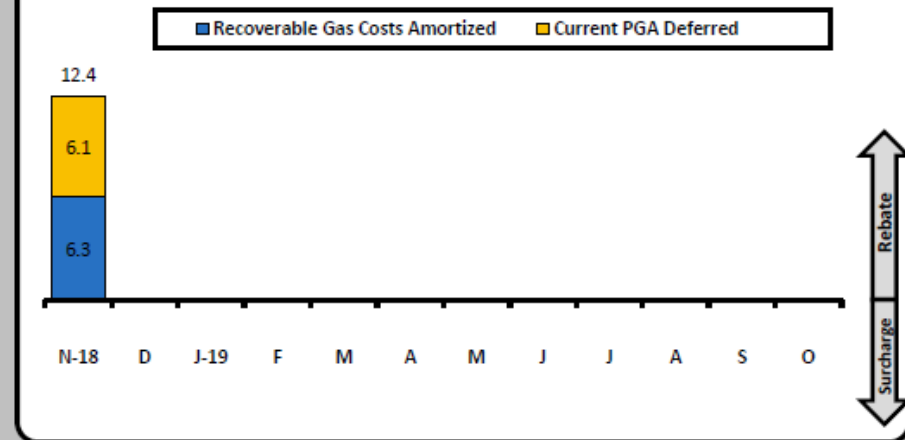
# Gas Deferral Report - November 2018

\$s in Millions: (+) Rebate; (-) Surcharge

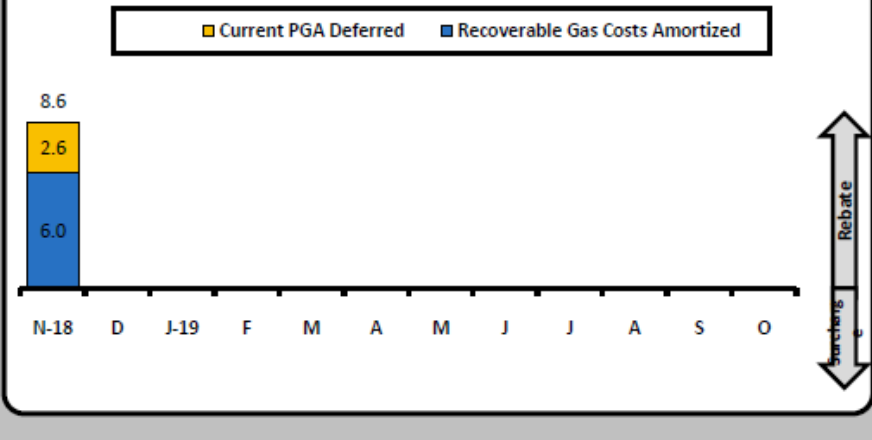
## Washington PGA Deferral Balance



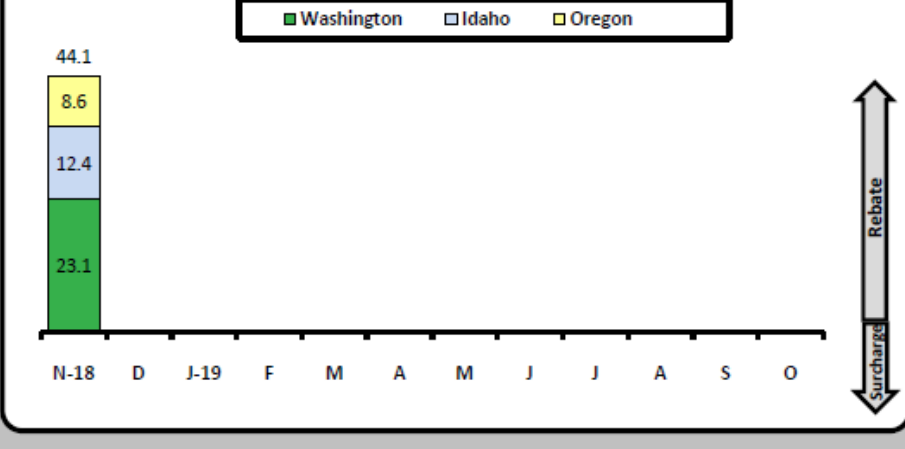
## Idaho PGA Deferral Balance



## Oregon PGA Deferral Balance



## Total Gas Deferral Balances\*





**SOG**

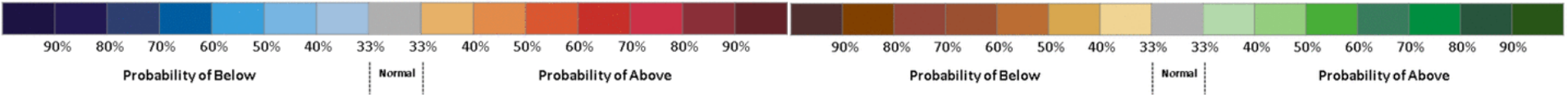
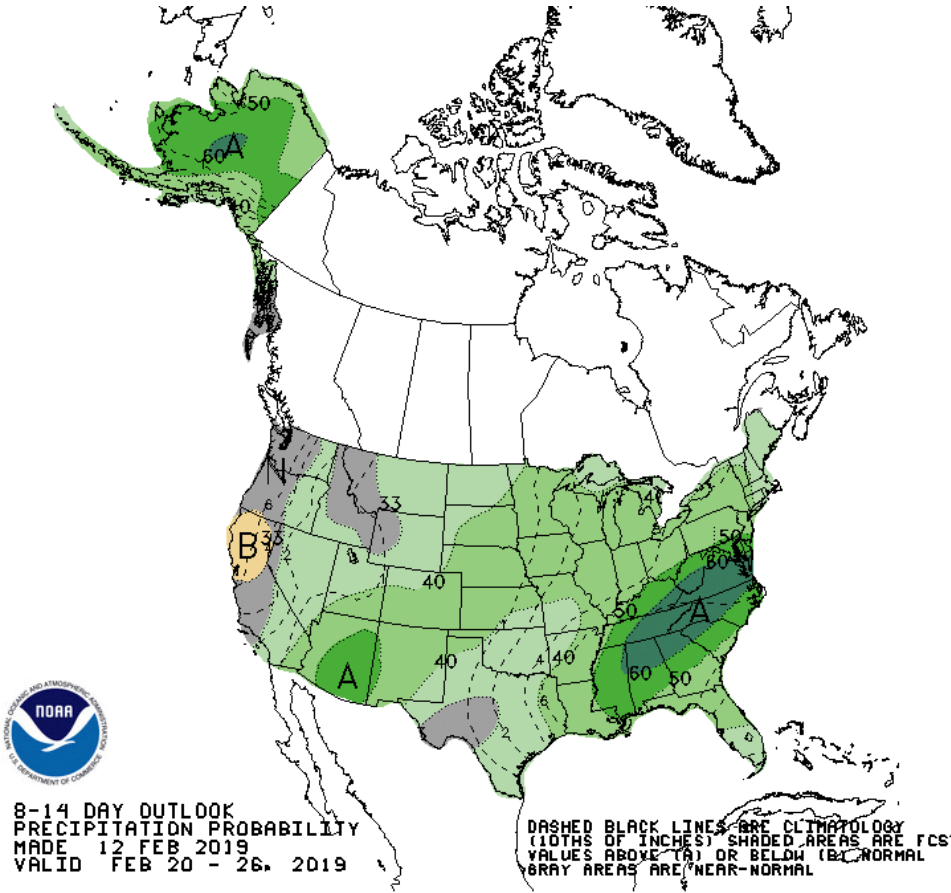
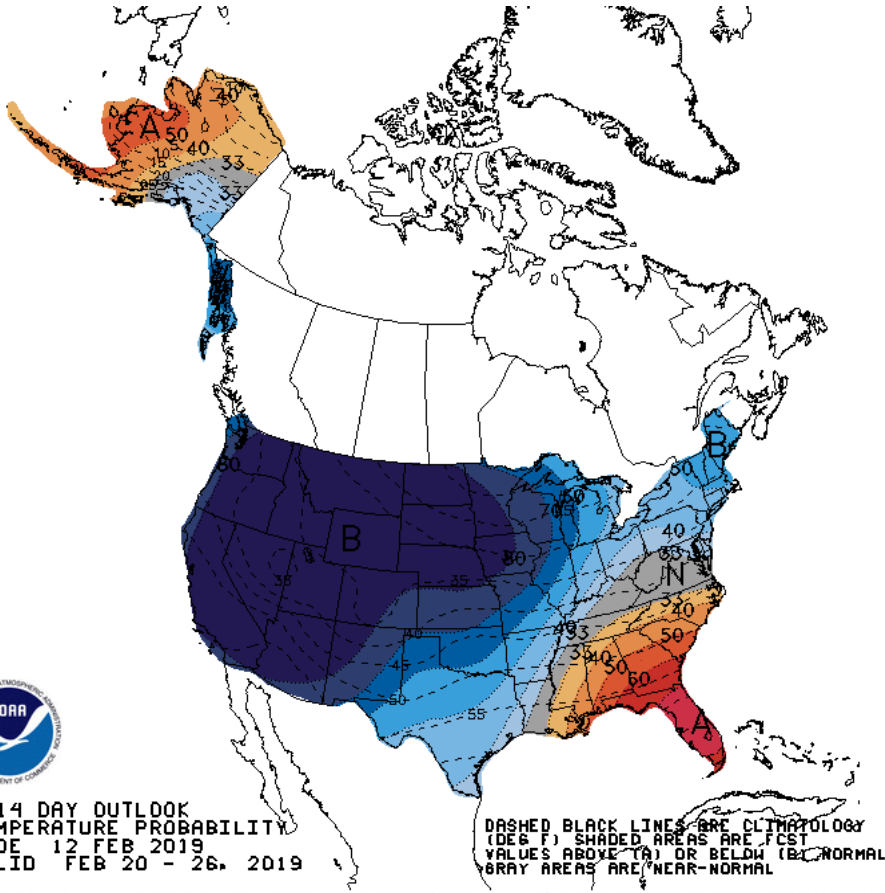
# **Gas Supply Update**

February 13, 2019

# Agenda

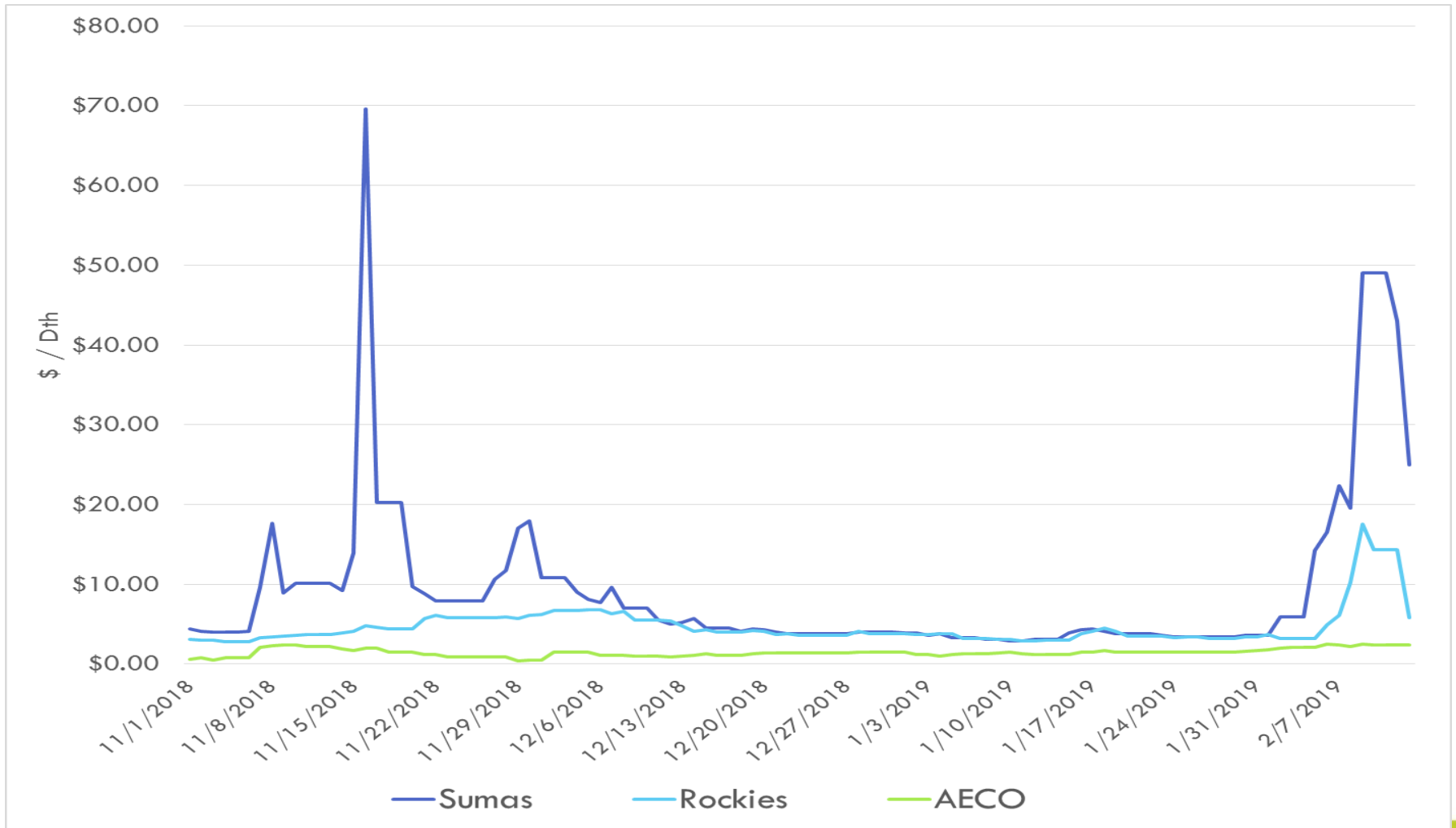
- Market Overview
- Procurement Plan
- Accounting Update
- Rates Update
- Risk Update

# 8 – 14 Day Outlook

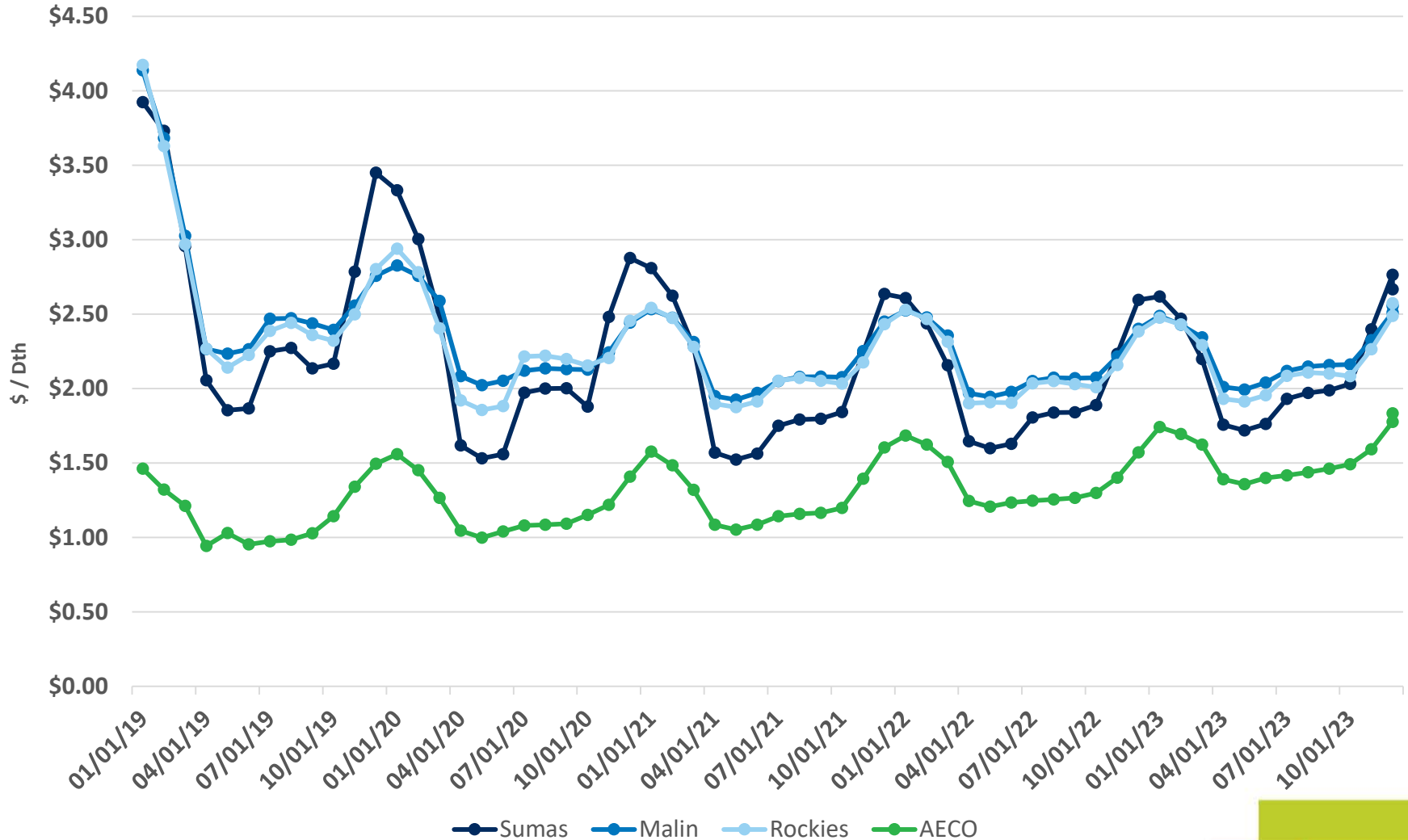




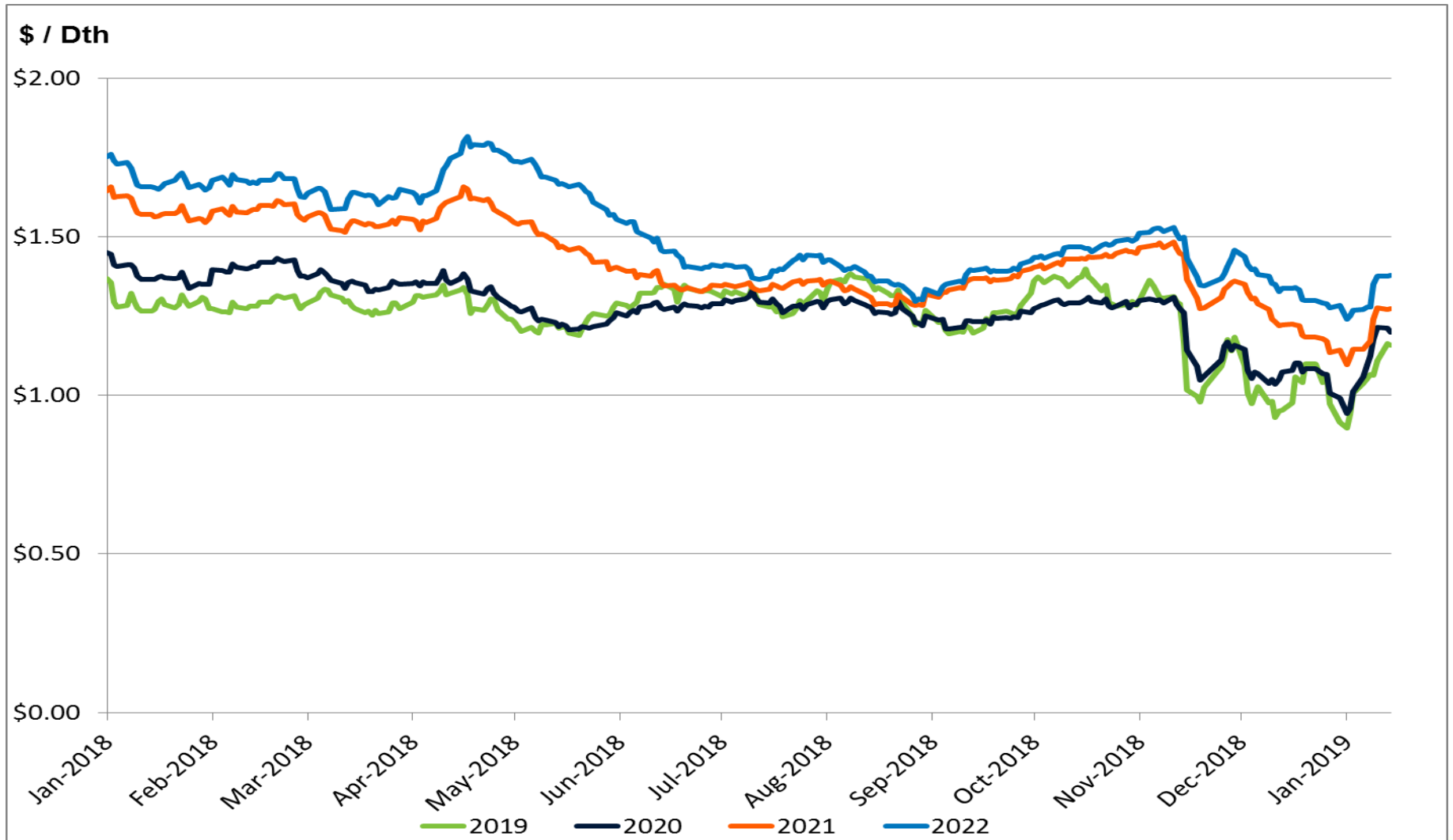
# Cash Market



# Forward Curves (1/16/2019)



# AECO Calendar Forwards



# US Storage

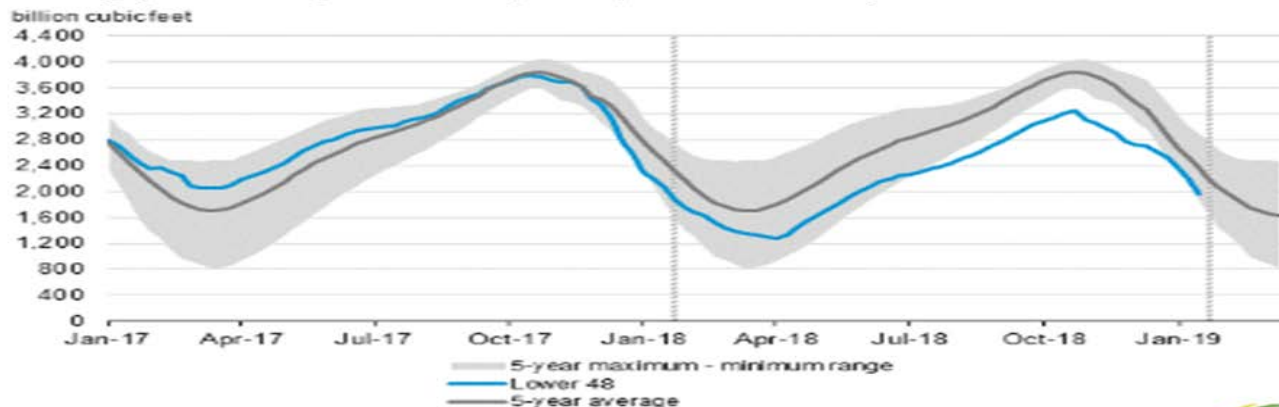
Working gas in underground storage, Lower 48 states

[Summary text](#) [CSV](#) [JSON](#)

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	02/01/19	01/25/19	net change	Implied flow	Year ago (02/01/18)		5-year average (2014-18)	
					Bcf	% change	Bcf	% change
East	468	527	-59	-59	493	-5.1	530	-11.7
Midwest	522	606	-84	-84	551	-5.3	612	-14.7
Mountain	105	114	-9	-9	132	-20.5	142	-26.1
Pacific	172	178	-6	-6	214	-19.6	232	-25.9
South Central	692	771	-79	-79	705	-1.8	858	-19.3
Salt	241	278	-37	-37	182	32.4	241	0.0
Nonsalt	451	493	-42	-42	523	-13.8	617	-26.9
<b>Total</b>	<b>1,960</b>	<b>2,197</b>	<b>-237</b>	<b>-237</b>	<b>2,095</b>	<b>-6.4</b>	<b>2,375</b>	<b>-17.5</b>

Totals may not equal sum of components because of independent rounding.

Working gas in underground storage compared with the 5-year maximum and minimum

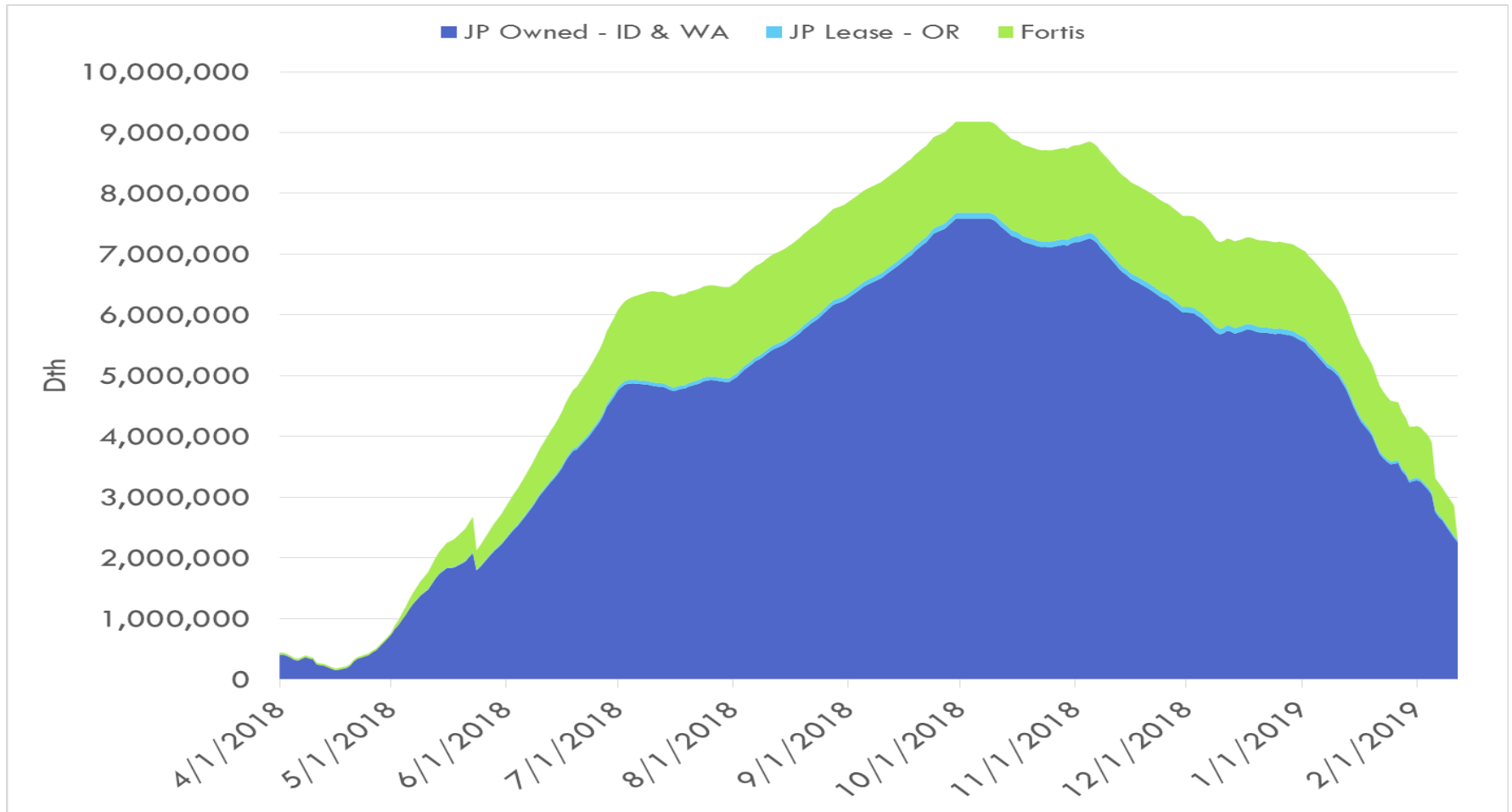


Source: U.S. Energy Information Administration

Note: The shaded area indicates the range between the historical minimum and maximum values for the weekly series from 2014 through 2018. The dashed vertical lines indicate current and year-ago weekly periods.



# JP Storage Levels



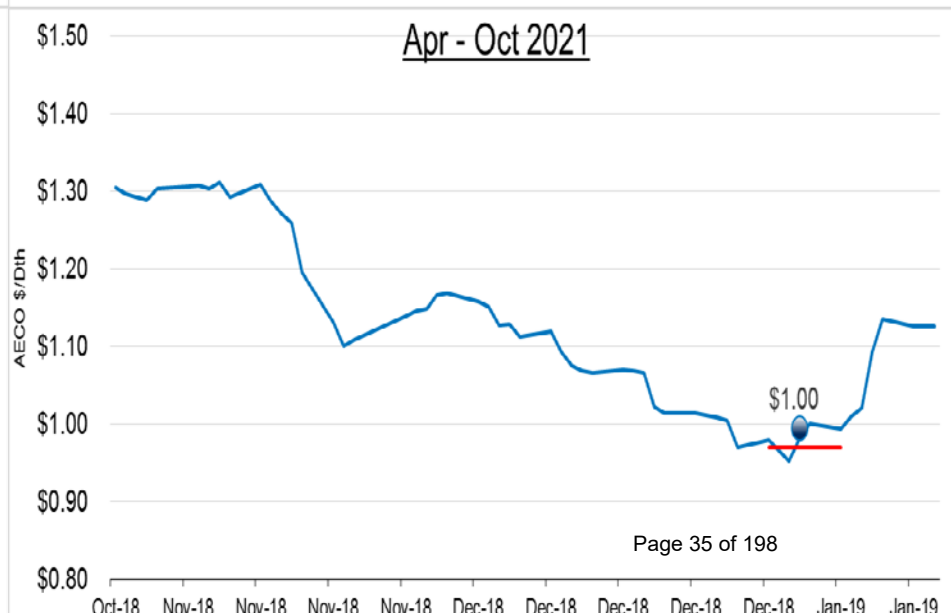
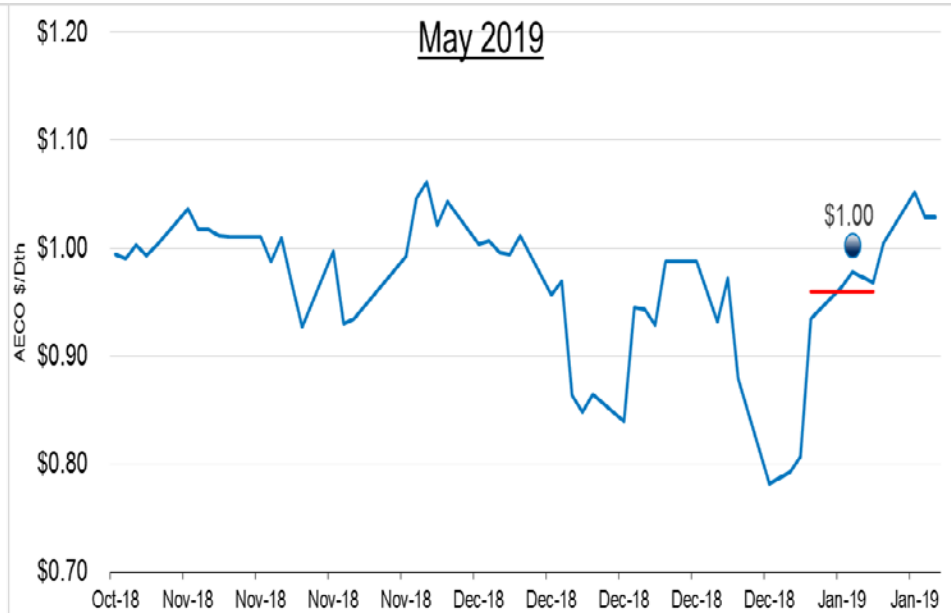
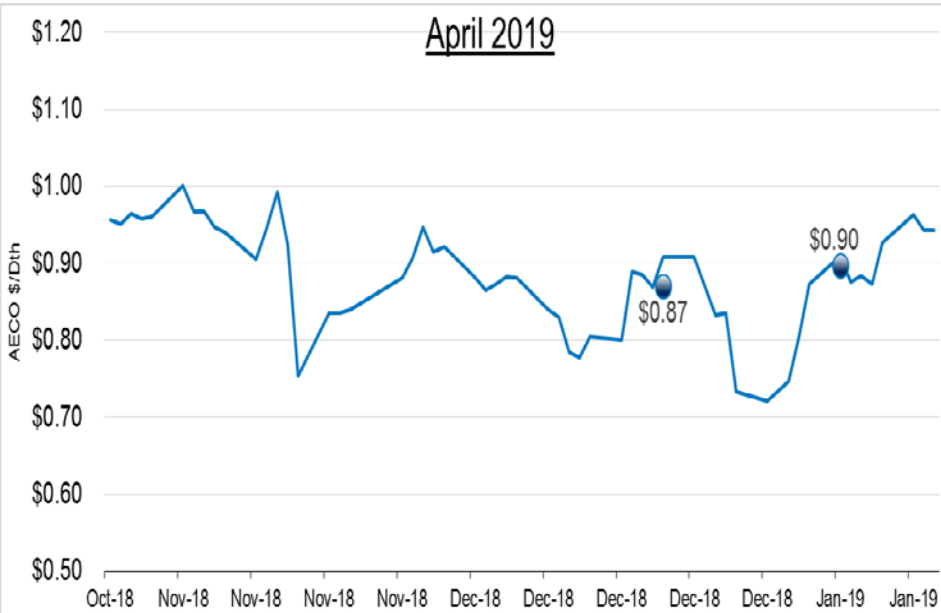
# Procurement Plan Hedges

# Current Procurement Plan

February 12, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
March-19	-129,735	62,500	-67,235	40%	48%	0							
April-19	-83,834	27,500	-56,334	40%	33%	2	02/07/19	02/18/19	0.98	1.17	1.35		AECO
May-19	-47,612	15,000	-32,612	40%	32%	2	01/08/19	02/18/19	0.92	1.16	1.33		AECO
June-19	-32,415	10,000	-22,415	40%	31%	1	10/31/18	05/01/19	0.82	1.02	1.05		AECO
July-19	-28,940	12,500	-16,440	40%	43%	0							
August-19	-29,051	12,500	-16,551	40%	43%	0							
September-19	-33,914	12,500	-21,414	40%	37%	0							
October-19	-75,051	22,500	-52,551	40%	30%	3	01/15/19	04/01/19	0.87	1.19	1.61		AECO
Nov19-Mar20	-164,345	90,000	-74,345	32%	55%	0							
Apr20-Oct20	-47,653	10,000	-37,653	25%	21%	1	11/20/18	03/01/20	0.88	1.14	1.30		AECO
Nov20-Mar21	-166,667	32,500	-134,167	32%	19%	9	01/23/19	04/02/19	1.28	1.49	1.77		AECO
Apr21-Oct21	-48,316	5,000	-43,316	25%	10%	3	01/03/19	09/23/19	0.99	1.19	1.28		AECO

# AECO Dynamic Window Hedges

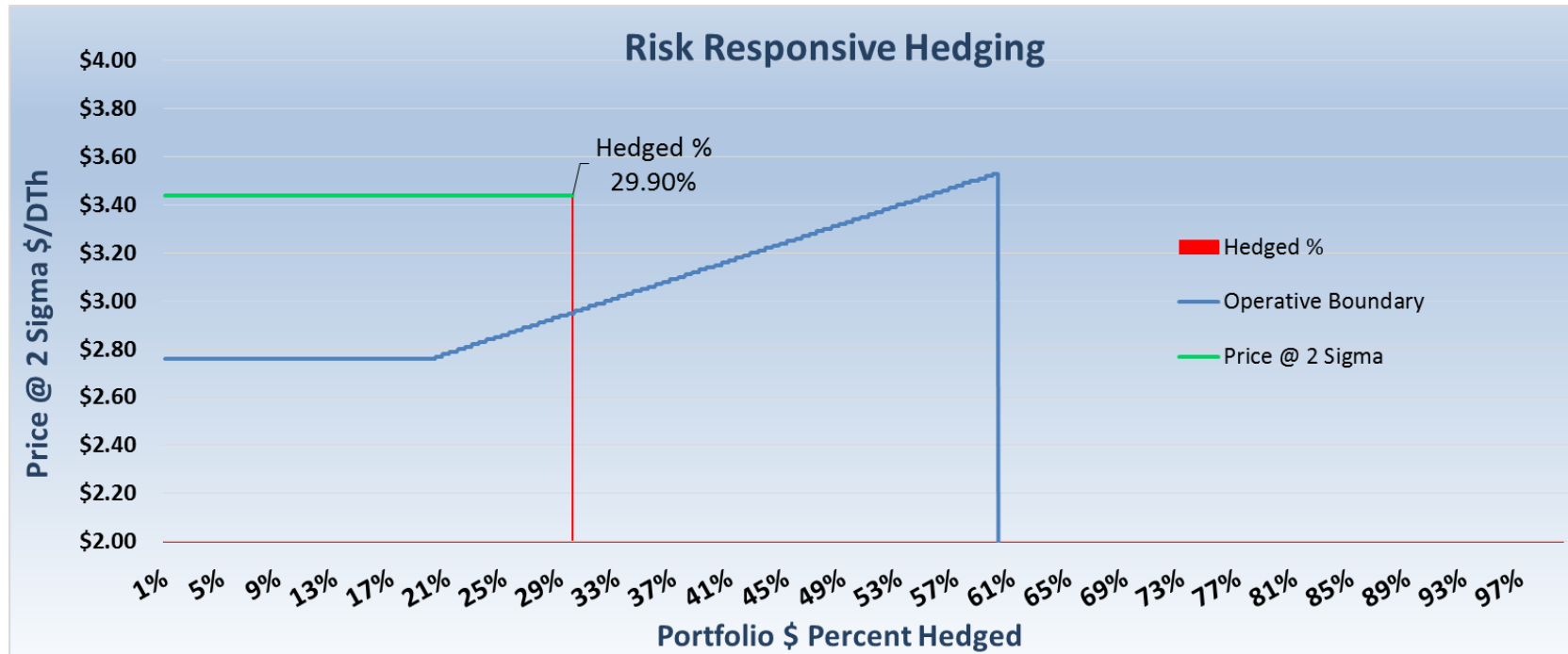
\$0.995 per  
Dth avg.



\$1.70



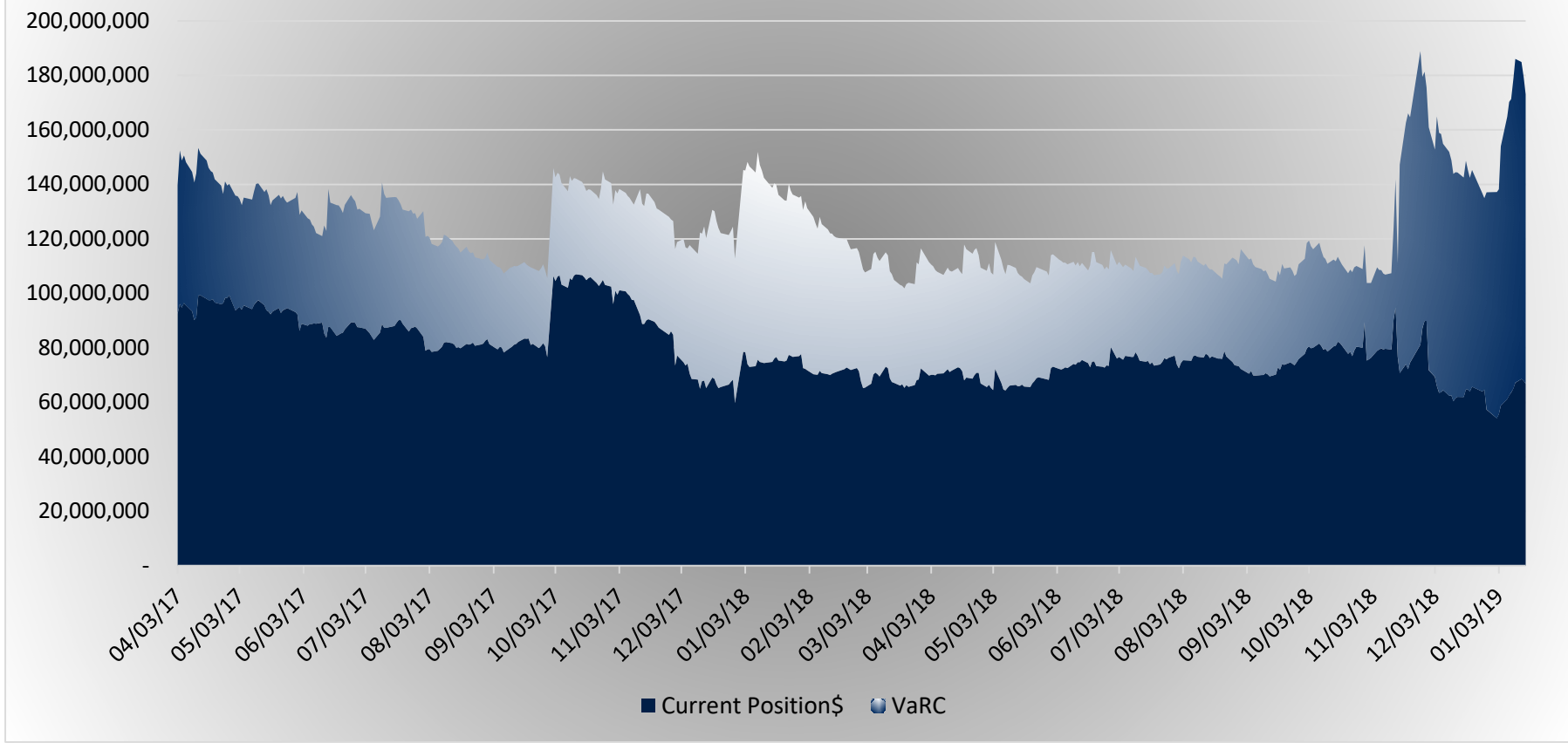
# Risk Responsive Hedging Tool (RRHT)



Parameters / Metrics Used	
Beg Period:	Feb-19
End Period:	Jan-21
Risk Responsive Ending Period:	Nov20-Mar21
Periods:	12
Report Date:	01/16/19
Current Position #:	-50,251,245
Natural Position \$:	\$95,310,603
Current Position(NPV)\$:	\$66,777,087
VaRC:	\$106,311,936
Cost @ 2 Sigma (\$):	\$173,089,023
Price @ 2 Sigma (\$/DTh):	<b>\$3.444</b>
Boundary (\$/DTh):	\$2.950
Financial Hedged %:	<b>29.90%</b>
Target Financial Hedge %:	#N/A

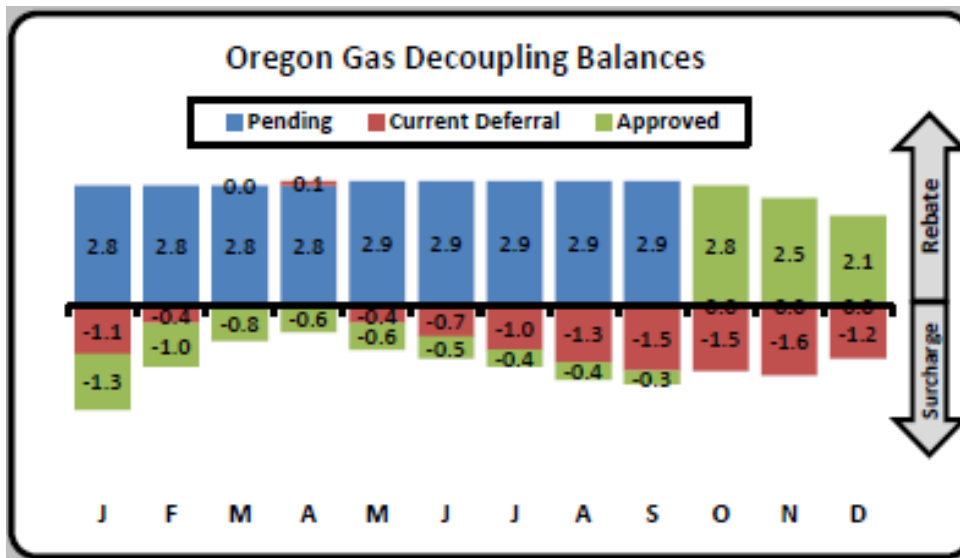
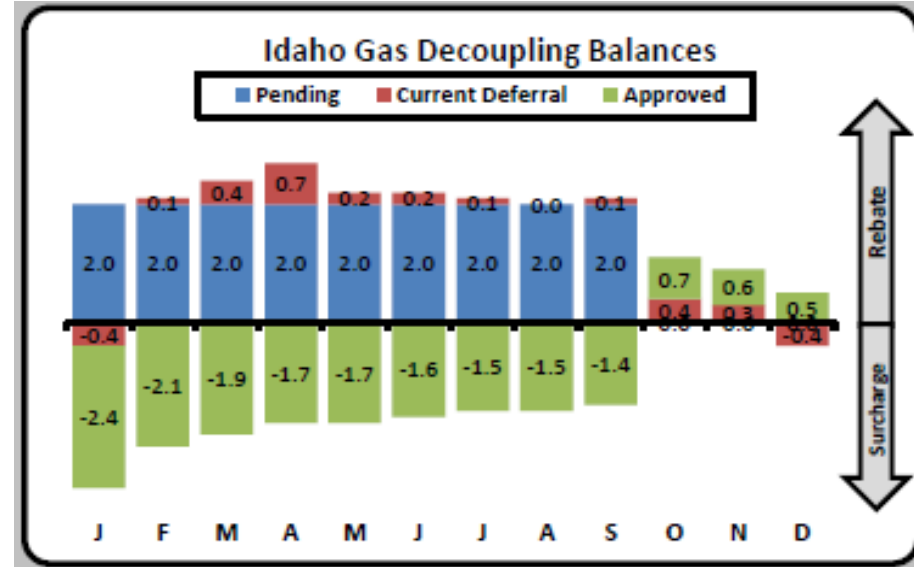
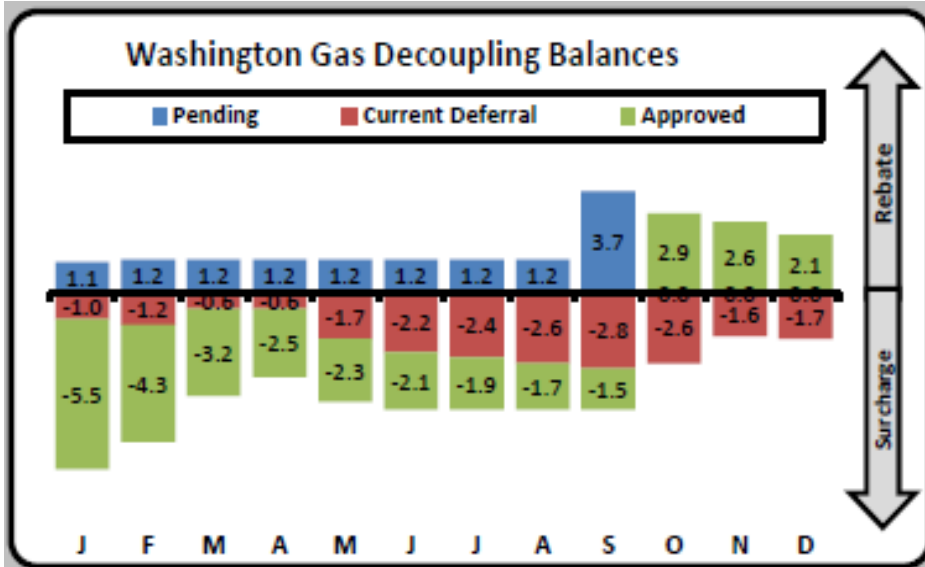
# RRHT Volatility

## Gas Supply Historical Portfolio Risk



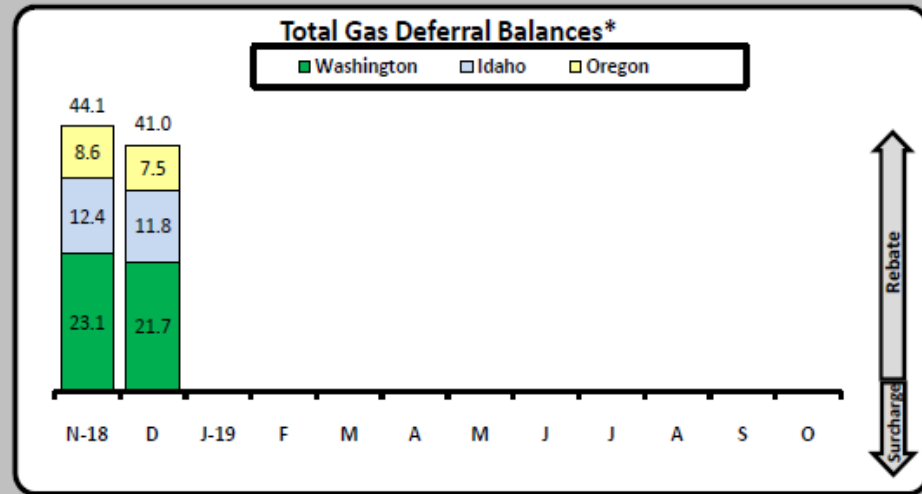
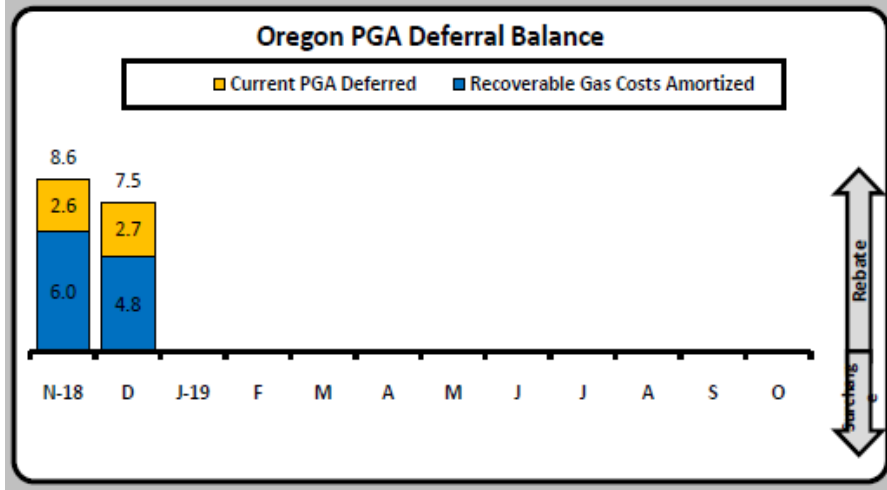
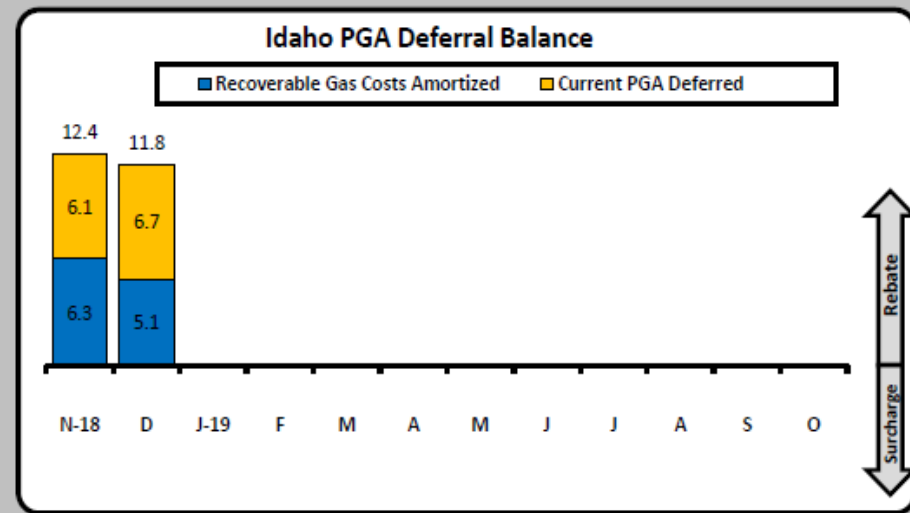
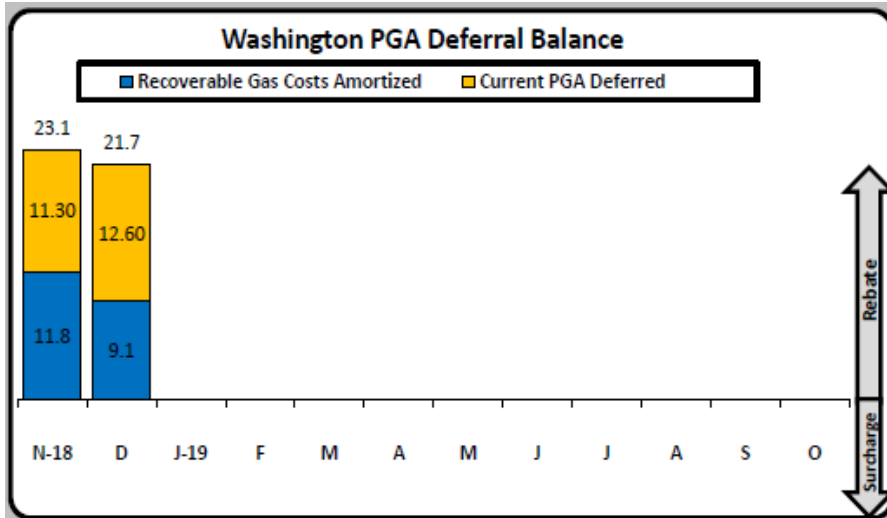
# Decoupling Balances – December 2018

\$s in Millions: (+) Rebate; (-) Surcharge



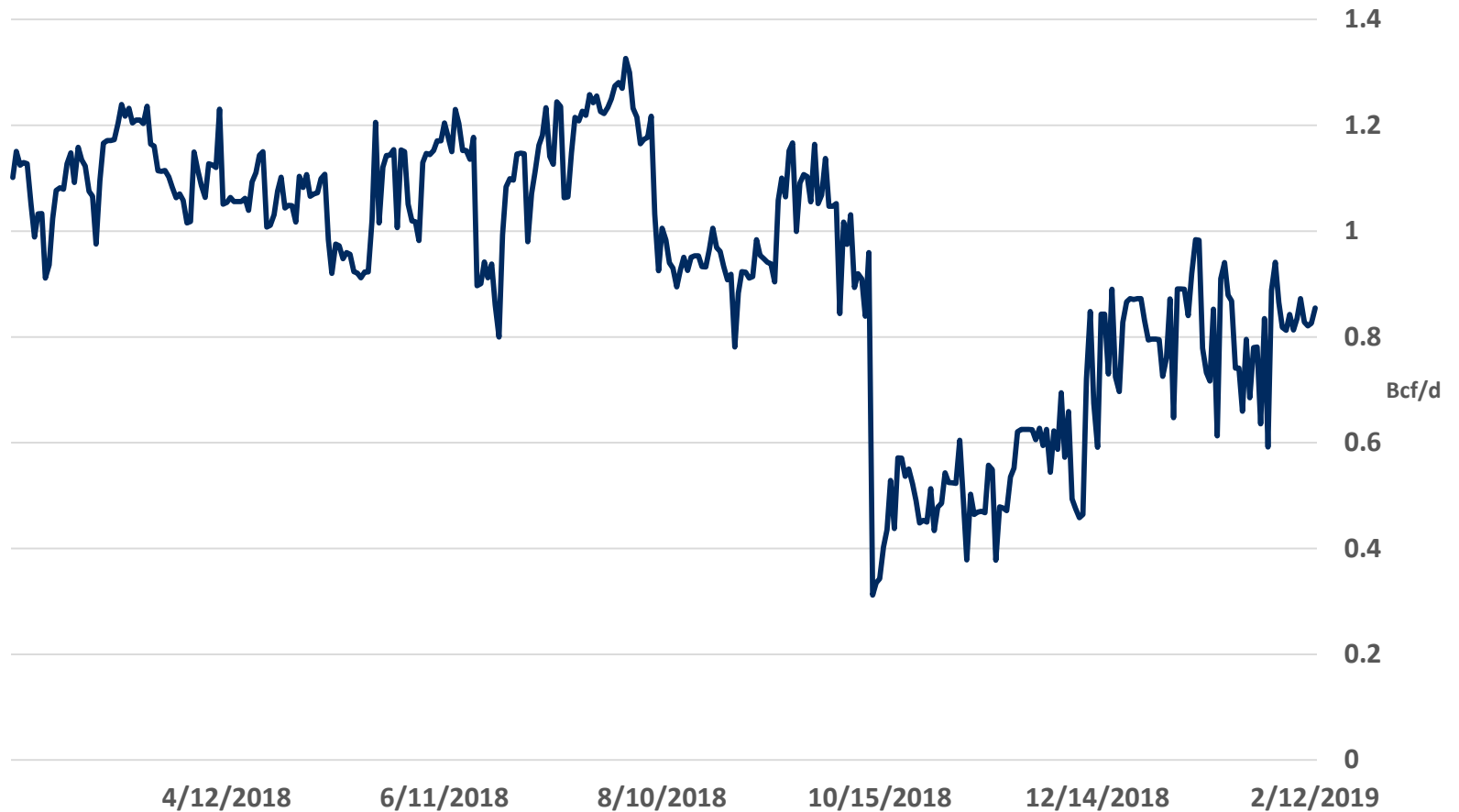
# Gas Deferral Report – December 2018

\$s in Millions: (+) Rebate; (-) Surcharge



\*Total Gas Deferral Balances above excludes Decoupling, JP in WA, Intervenor Funding, Deferred Gas Costs Margin Reduction and Commission Fees in OR

## -Sumas imports remain 300 mcf/d below normal



# Jackson Prairie Restrictions

- On 2/10 the largest compressor unit at JP failed reducing withdrawal capacity at the facility by roughly 250,000 dth/d.
- Repairs are not expected to be completed until sometime in March.
- Not only is current withdrawal capacity impacted but the decline curve (rate at which withdrawal capacity drops as storage balance declines) will be steeper.
  - Decline curve: 3% loss of withdrawal capacity for every 1% below 60% of storage capacity (normally 2%)

Northwest is posting withdrawal capacity daily (currently 476,000 dth)

- Northwest is allowing only primary withdrawal rights in the timely cycle. Only allowing post id withdrawals to satisfy entitlement requirements.



**SOG**

# **Gas Supply Update**

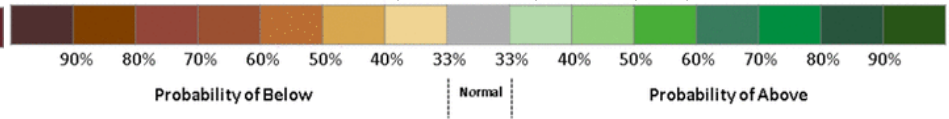
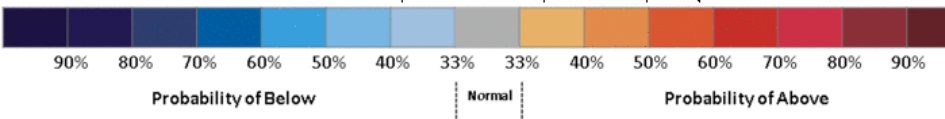
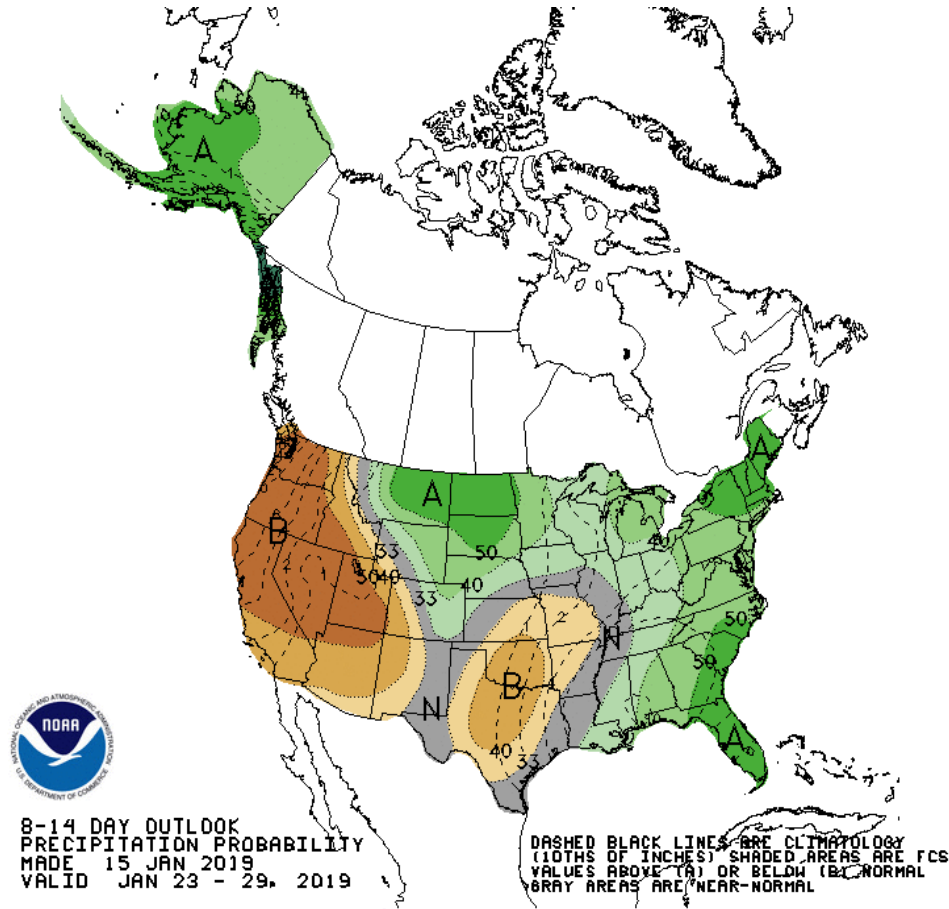
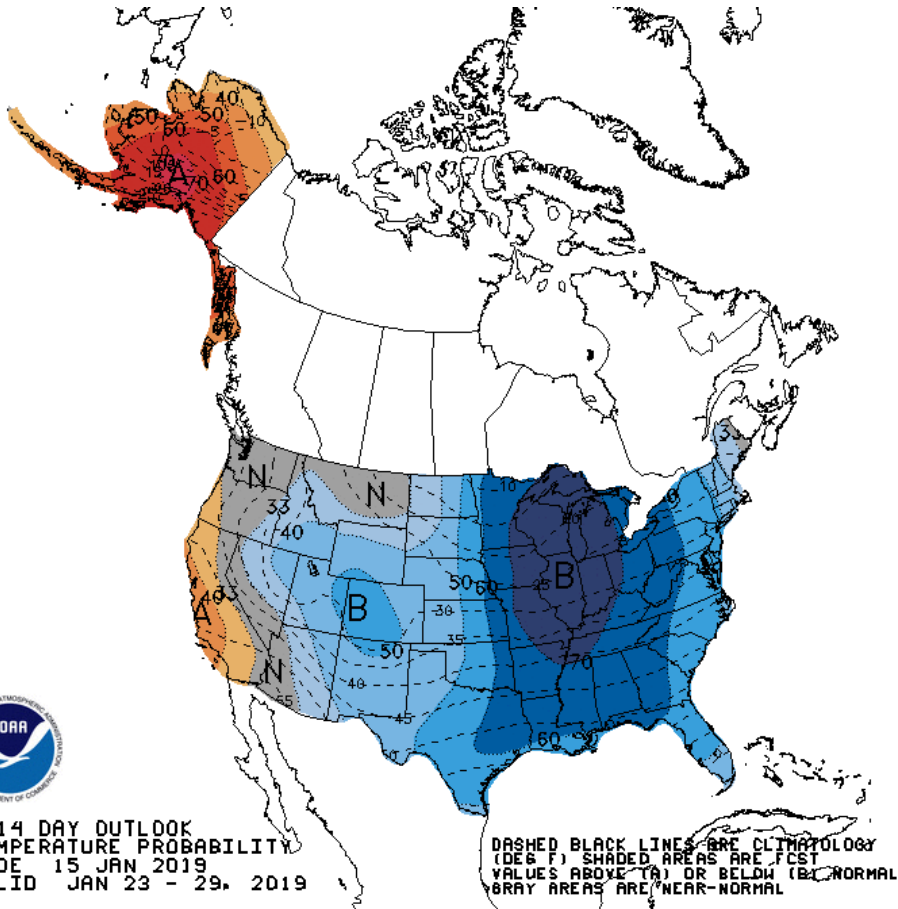
February 13, 2019

# Agenda

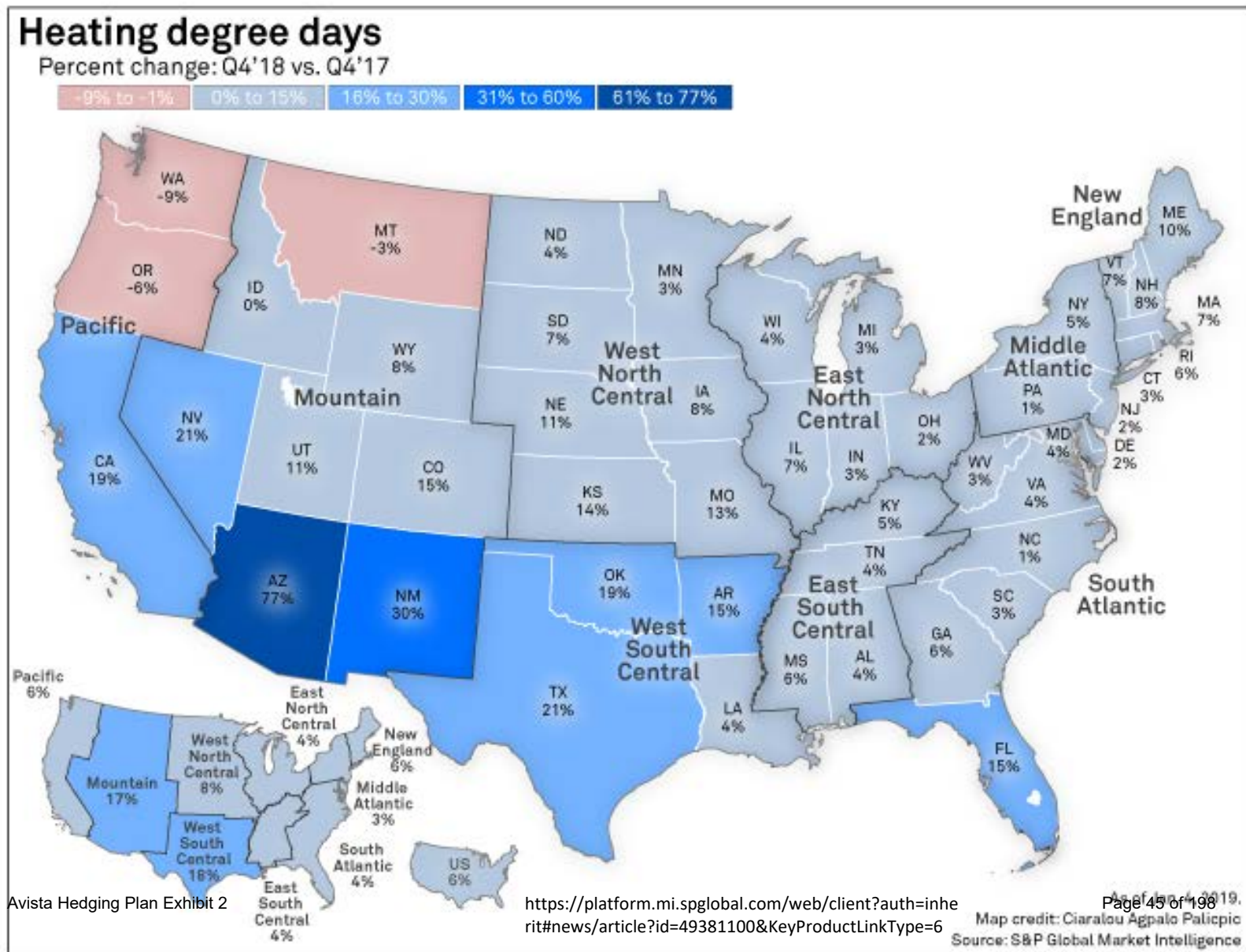
- Market Overview
- Procurement Plan
- Accounting Update
- Rates Update
- Risk Update



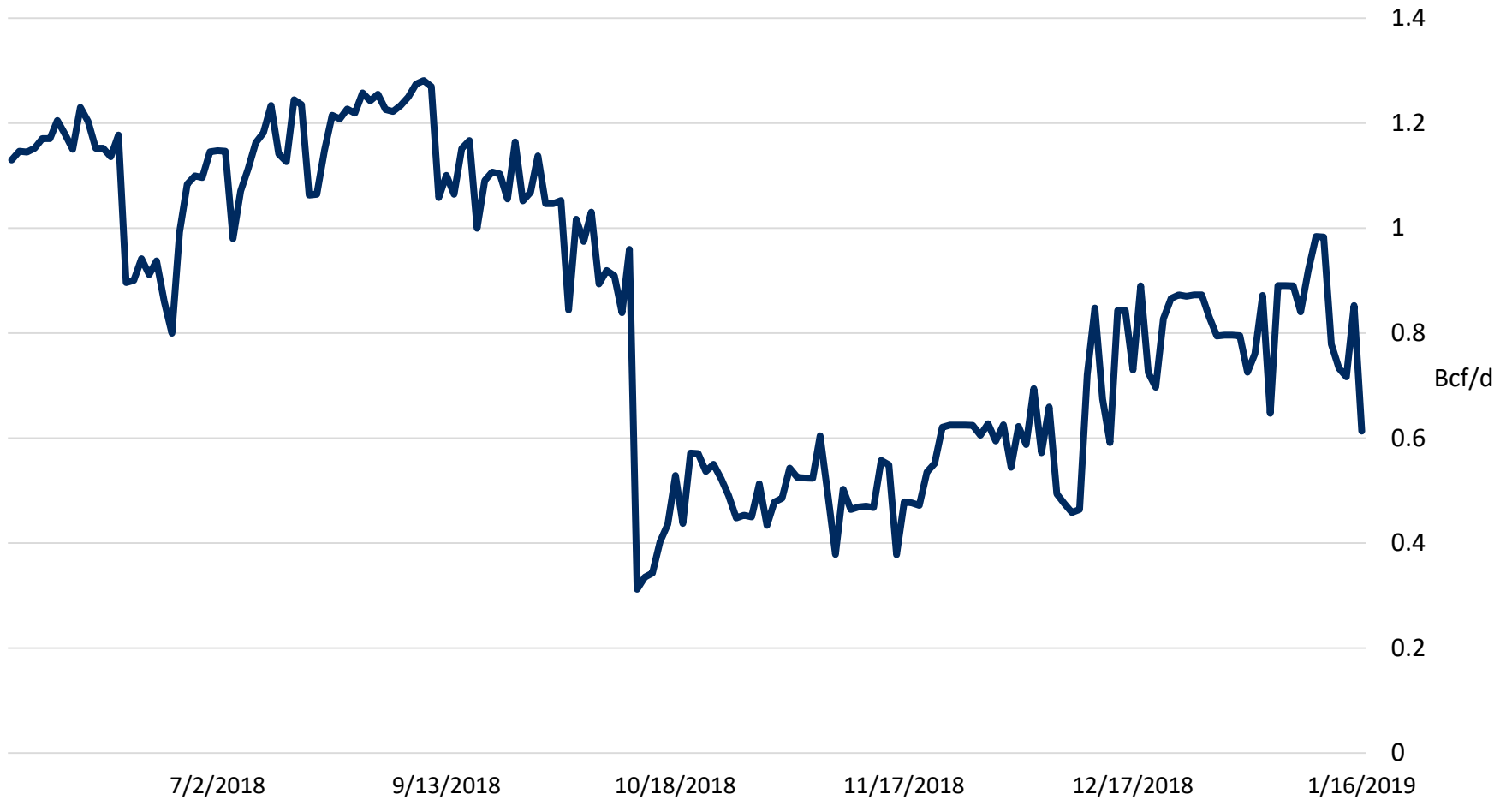
# 8 – 14 Day Outlook



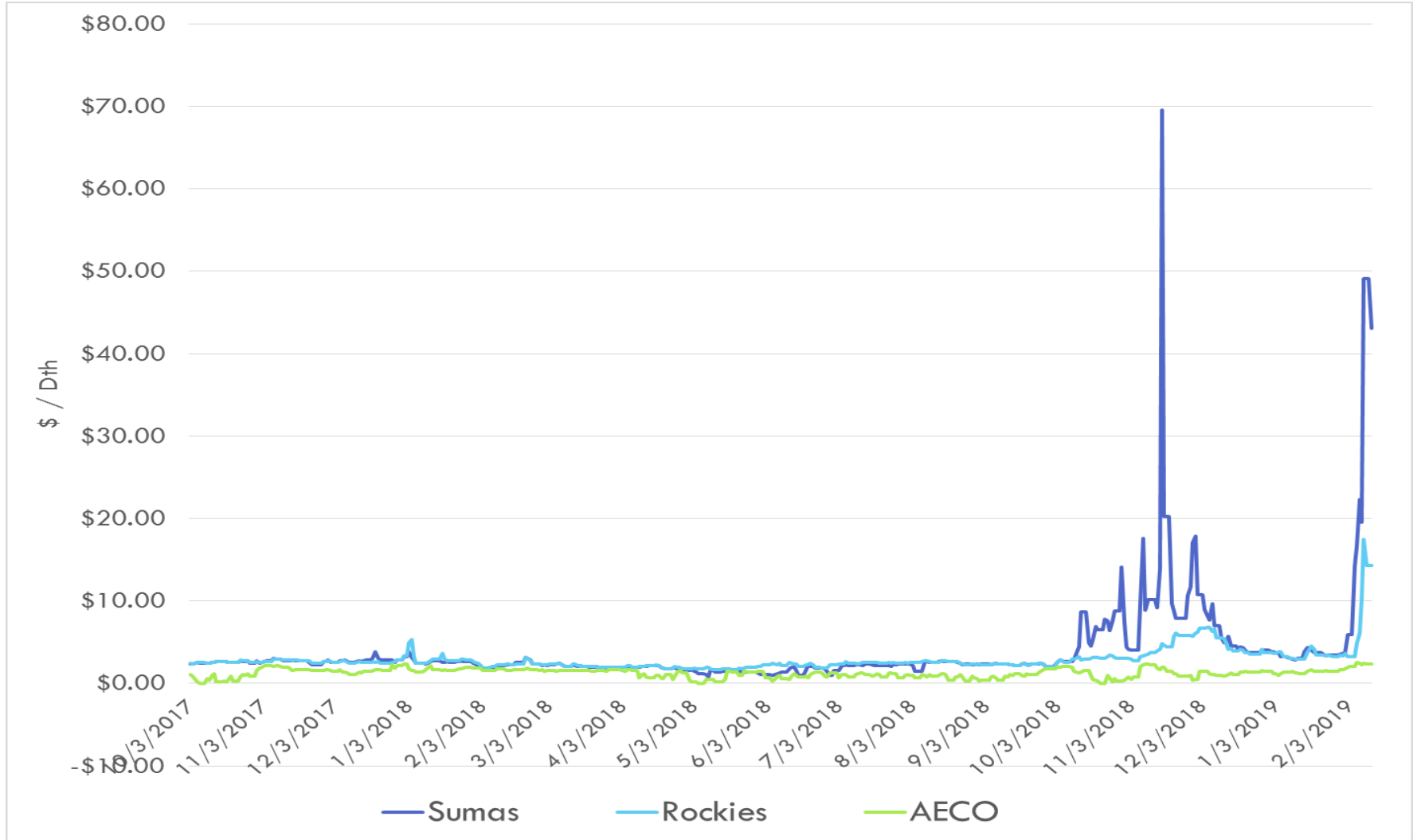
# PNW HDD Q4 YOY % Change Declines



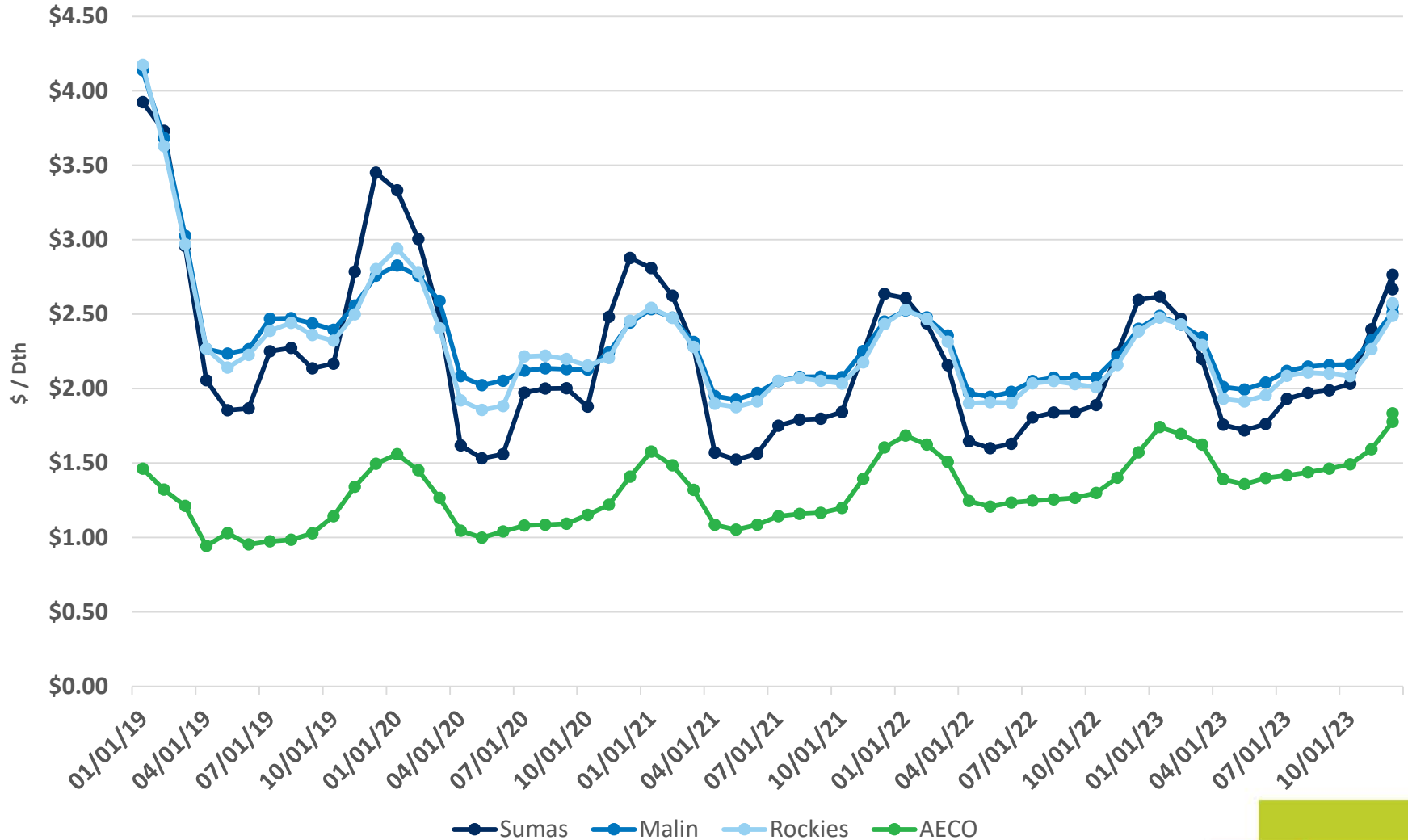
# Sumas Southbound Flow



# Cash Market

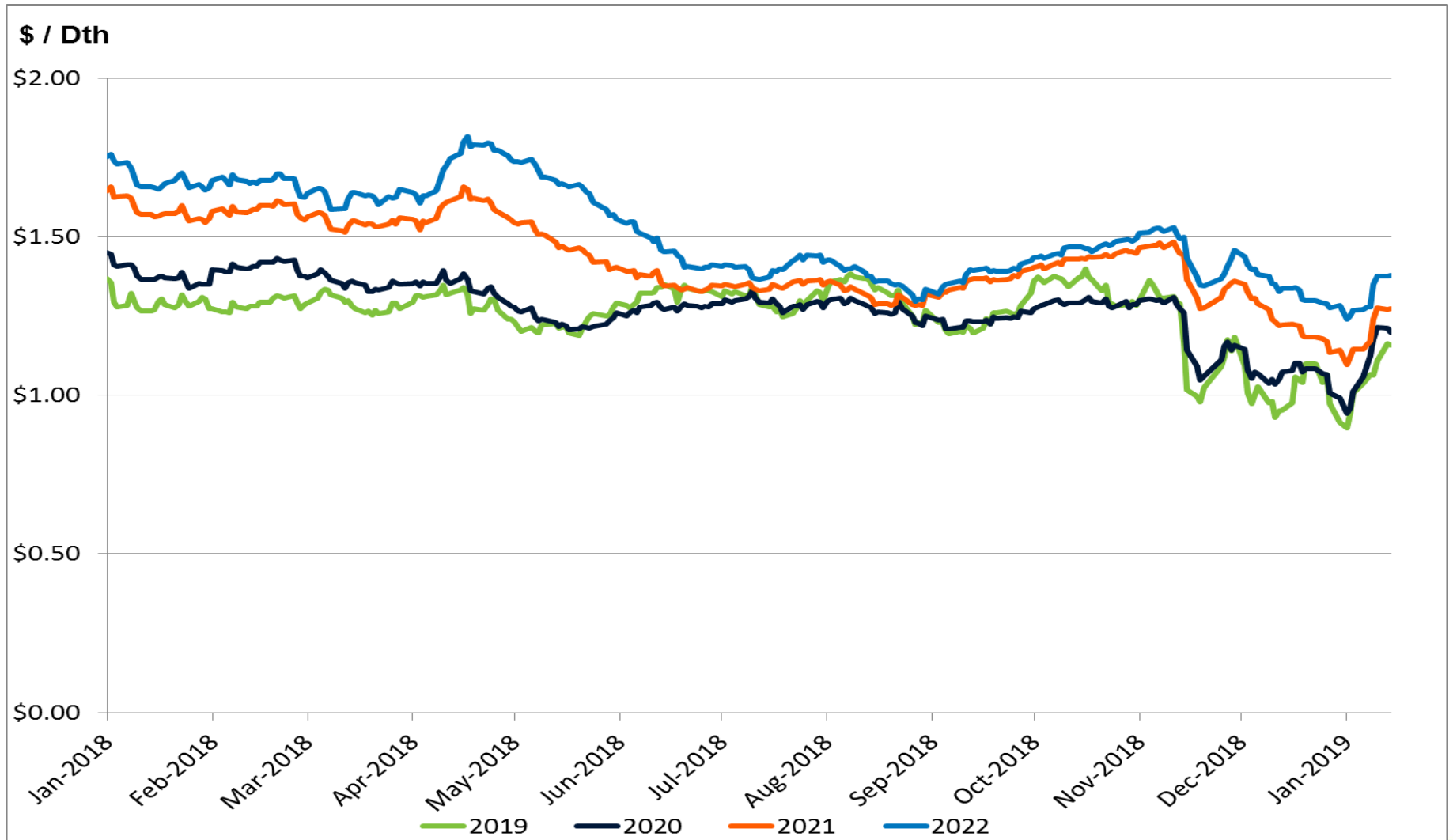


# Forward Curves (1/16/2019)





# AECO Calendar Forwards



# US Storage

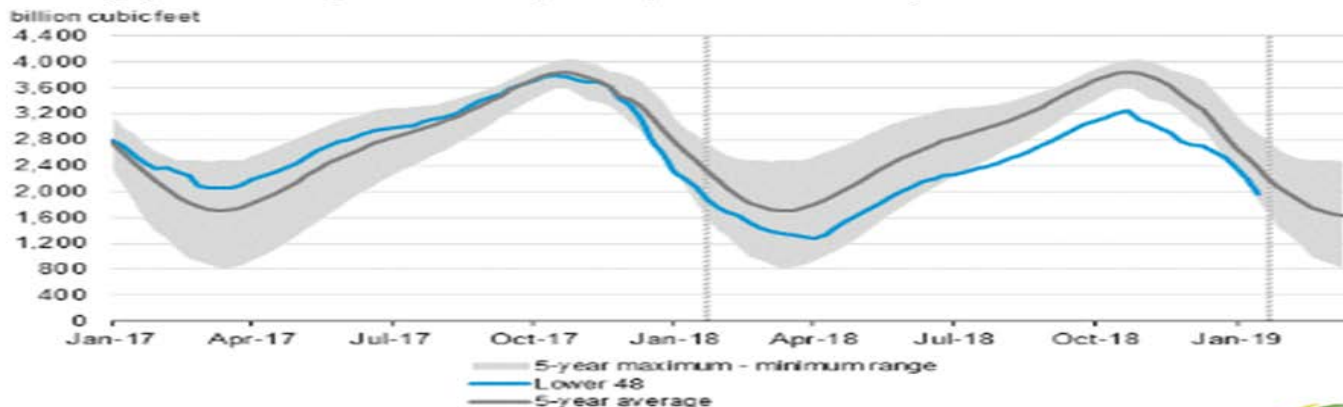
Working gas in underground storage, Lower 48 states

[Summary text](#) [CSV](#) [JSN](#)

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	02/01/19	01/25/19	net change	Implied flow	Year ago (02/01/18)		5-year average (2014-18)	
					Bcf	% change	Bcf	% change
East	468	527	-59	-59	493	-5.1	530	-11.7
Midwest	522	606	-84	-84	551	-5.3	612	-14.7
Mountain	105	114	-9	-9	132	-20.5	142	-26.1
Pacific	172	178	-6	-6	214	-19.6	232	-25.9
South Central	692	771	-79	-79	705	-1.8	858	-19.3
Salt	241	278	-37	-37	182	32.4	241	0.0
Nonsalt	451	493	-42	-42	523	-13.8	617	-26.9
<b>Total</b>	<b>1,960</b>	<b>2,197</b>	<b>-237</b>	<b>-237</b>	<b>2,095</b>	<b>-6.4</b>	<b>2,375</b>	<b>-17.5</b>

Totals may not equal sum of components because of Independent rounding.

Working gas in underground storage compared with the 5-year maximum and minimum



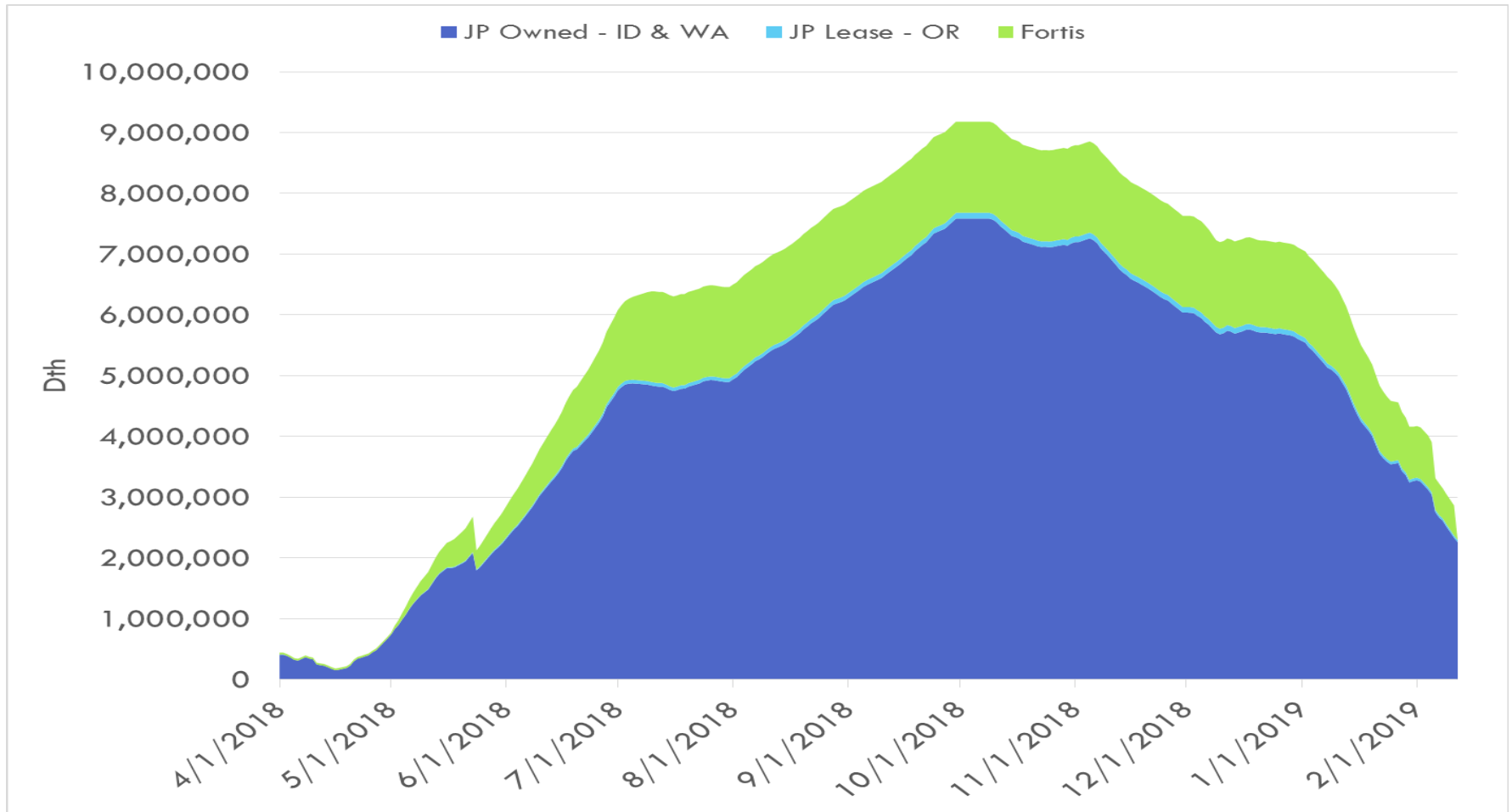
Source: U.S. Energy Information Administration

Note: The shaded area indicates the range between the historical minimum and maximum values for the weekly series from 2014 through 2018. The dashed vertical lines indicate current and year-ago weekly periods.





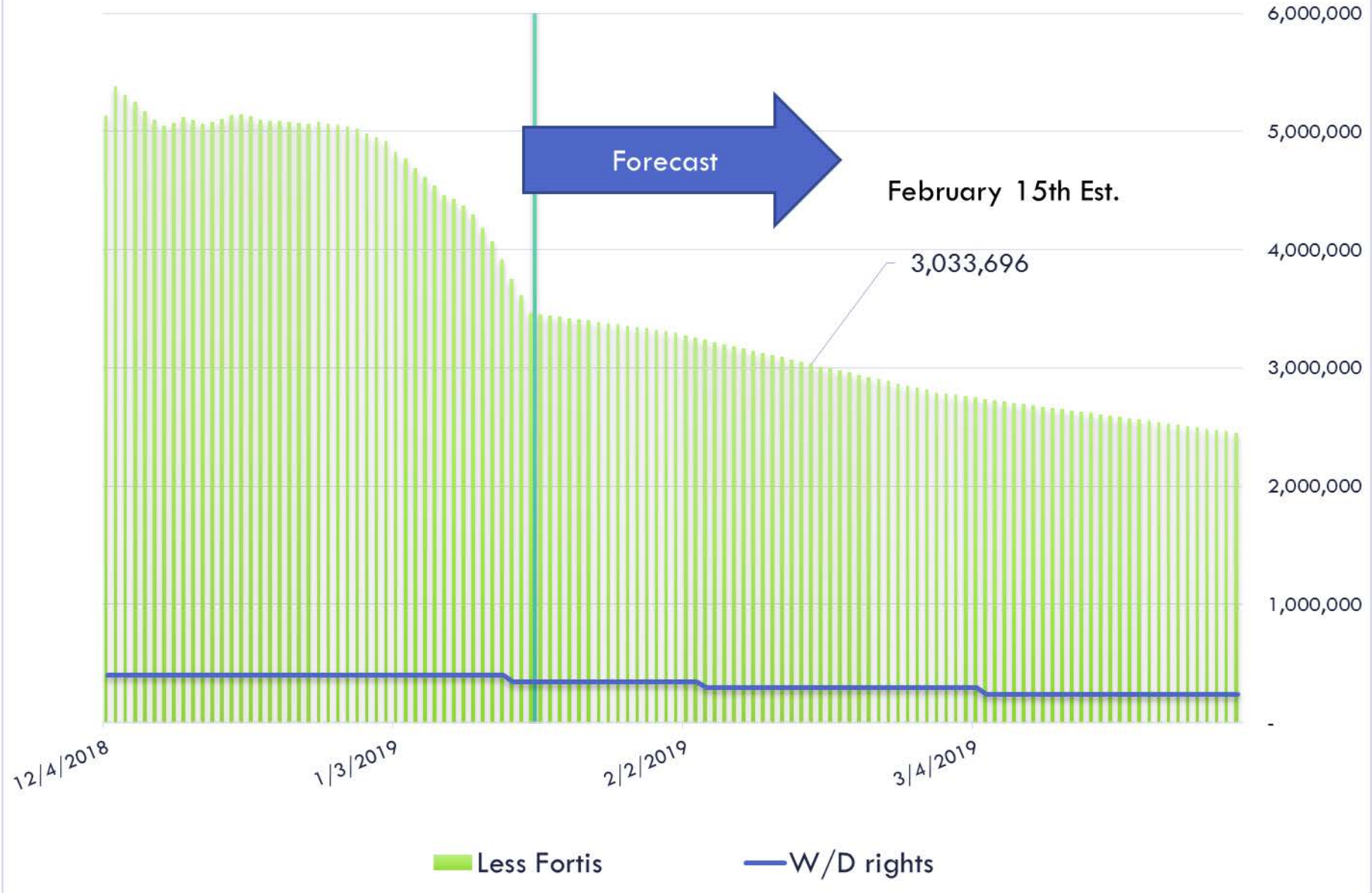
# JP Storage Levels



Dth

### Jackson Prairie Owned (February 15th Forecast)

As of: 1/17/2019



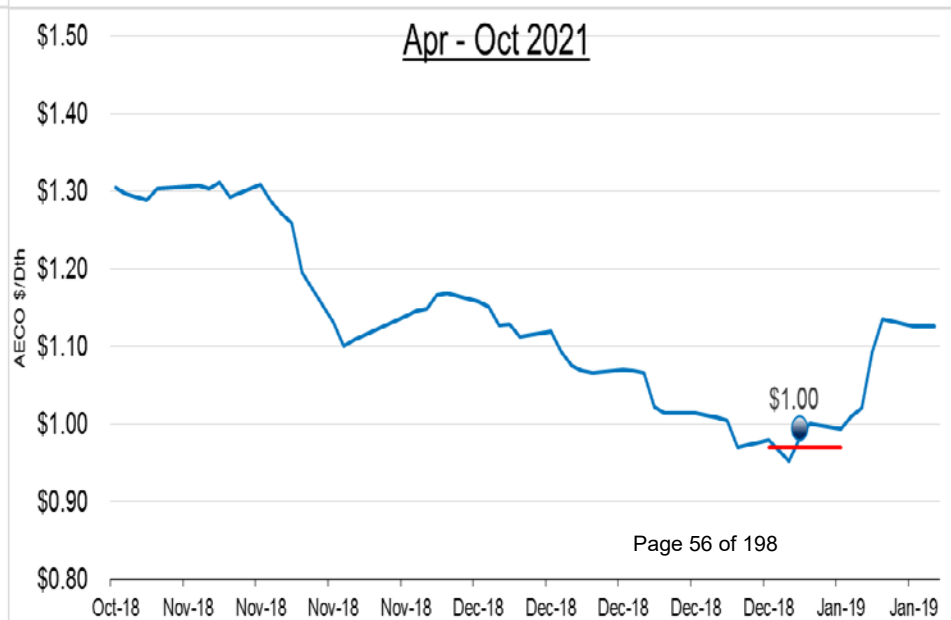
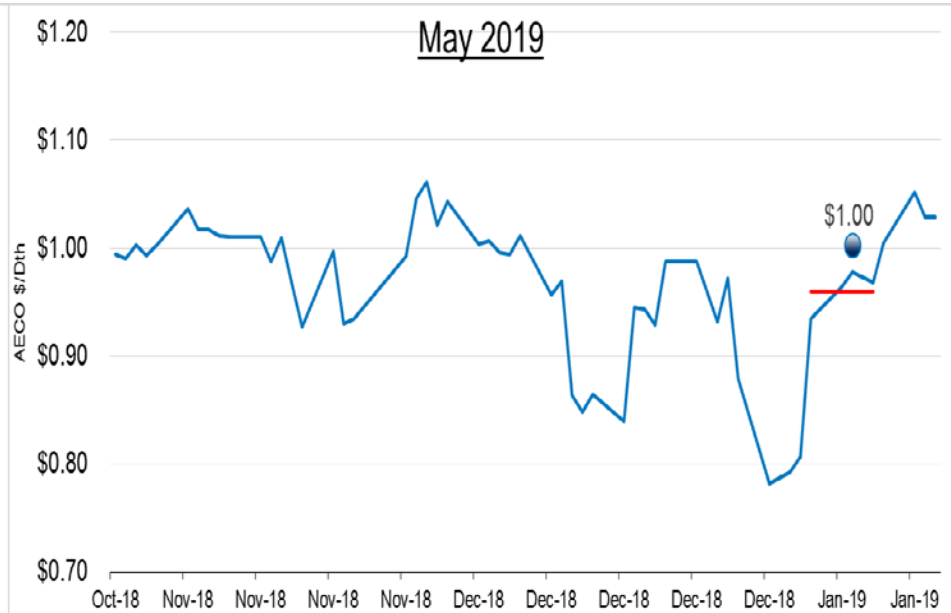
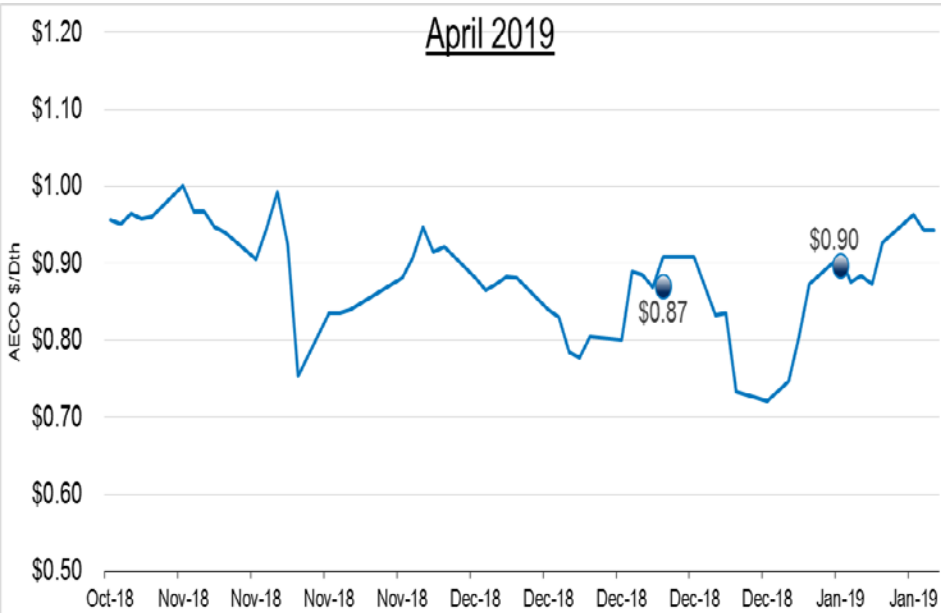
# Procurement Plan Hedges

# Current Procurement Plan

January 16, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
February-19	-163,647	72,500	-91,147	40%	44%	0							
March-19	-129,735	62,500	-67,235	40%	48%	0							
April-19	-83,834	22,500	-61,334	40%	27%	4	01/07/19	01/20/19	0.80	0.95	1.07		AECO
May-19	-47,612	15,000	-32,612	40%	32%	2	01/08/19	02/18/19	0.82	1.08	1.33		AECO
June-19	-32,415	10,000	-22,415	40%	31%	1	10/31/18	05/01/19	0.76	0.99	1.05		AECO
July-19	-28,940	10,000	-18,940	40%	35%	1	10/31/18	05/31/19	0.79	0.98	1.03		AECO
August-19	-29,051	10,000	-19,051	40%	34%	1	10/31/18	07/01/19	0.78	1.01	1.05		AECO
September-19	-33,914	10,000	-23,914	40%	29%	1	10/31/18	08/01/19	0.82	1.04	1.06		AECO
October-19	-75,051	22,500	-52,551	40%	30%	3	01/15/19	04/01/19	0.81	1.16	1.63		AECO
Nov19-Mar20	-163,623	75,000	-88,623	32%	46%	0							
Apr20-Oct20	-47,653	10,000	-37,653	25%	21%	1	11/20/18	03/01/20	0.80	1.06	1.30		AECO
Nov20-Mar21	-166,211	30,000	-136,211	32%	18%	10	12/11/18	02/15/19	1.23	1.38	1.40		AECO
Apr21-Oct21	-48,316	5,000	-43,316	25%	10%	3	01/03/19	09/23/19	0.91	1.10	1.28		AECO

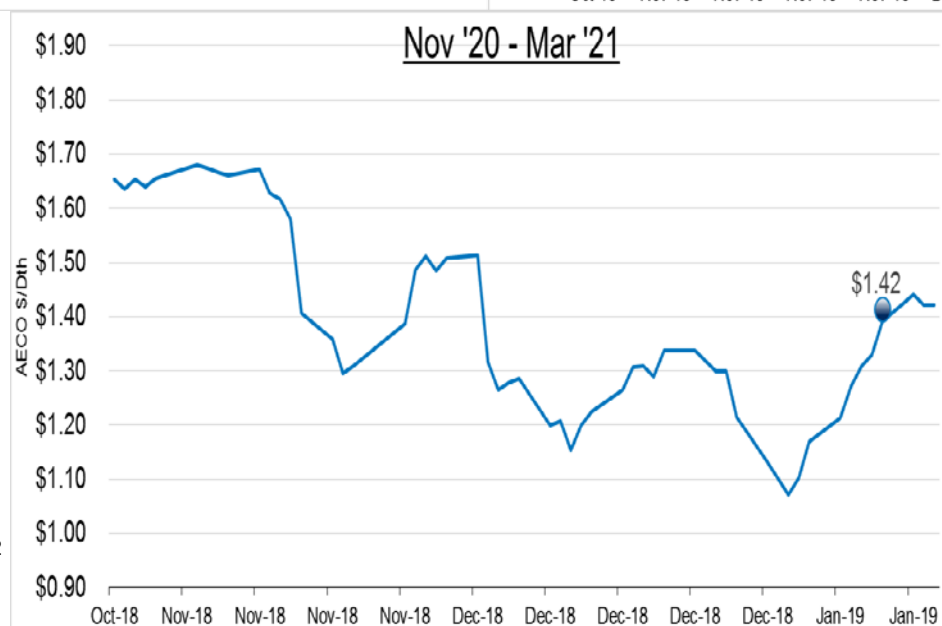
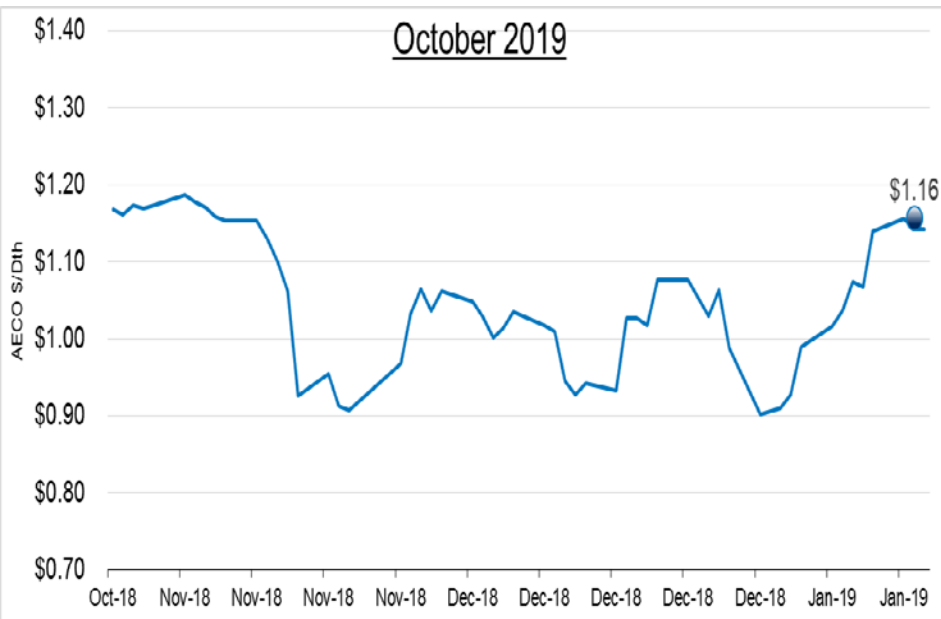
# AECO Dynamic Window Hedges

\$0.995 per  
Dth avg.

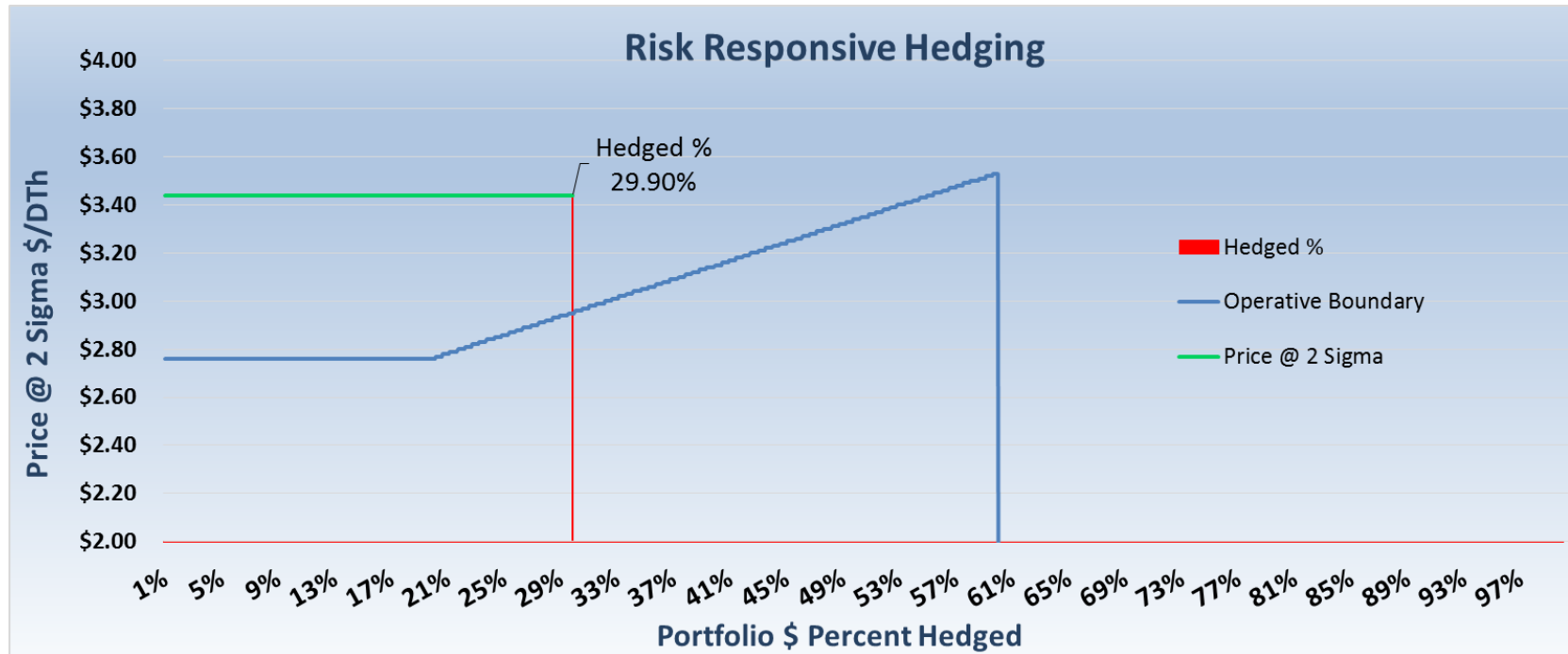


\$1.34 per Dth  
avg.

# AECO Risk Responsive Hedges

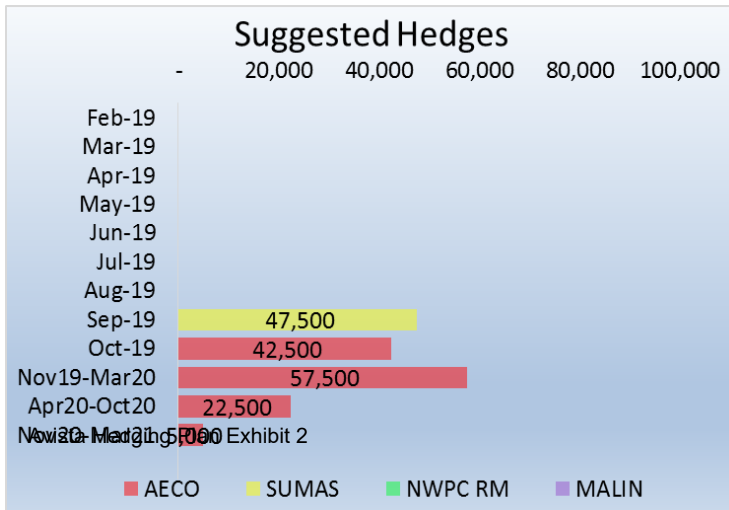
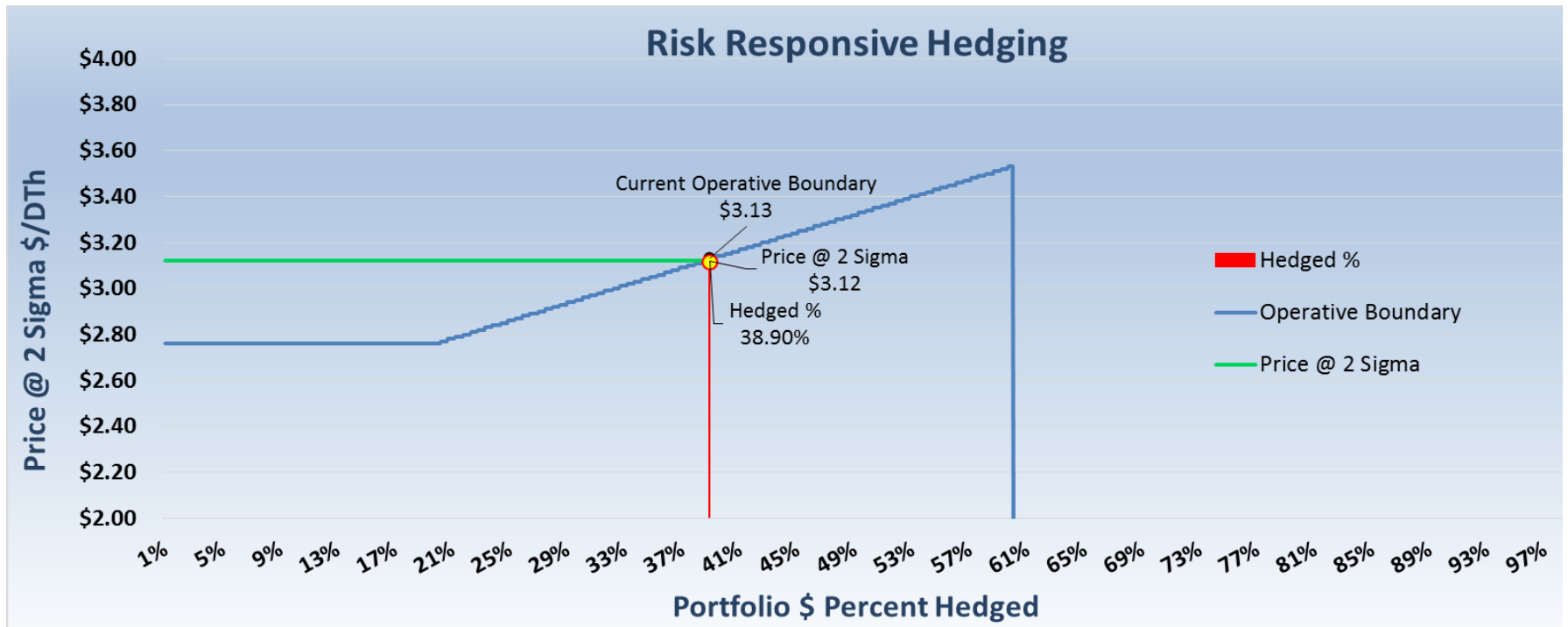


# Risk Responsive Hedging Tool (RRHT)



Parameters / Metrics Used	
Beg Period:	Feb-19
End Period:	Jan-21
Risk Responsive Ending Period:	Nov20-Mar21
Periods:	12
Report Date:	01/16/19
Current Position #:	-50,251,245
Natural Position \$:	\$95,310,603
Current Position(NPV)\$:	\$66,777,087
VaRC:	\$106,311,936
Cost @ 2 Sigma (\$):	\$173,089,023
Price @ 2 Sigma (\$/DTh):	<b>\$3.444</b>
Boundary (\$/DTh):	\$2.950
Financial Hedged %:	<b>29.90%</b>
Target Financial Hedge %:	#N/A

# RRHT Optimization Results

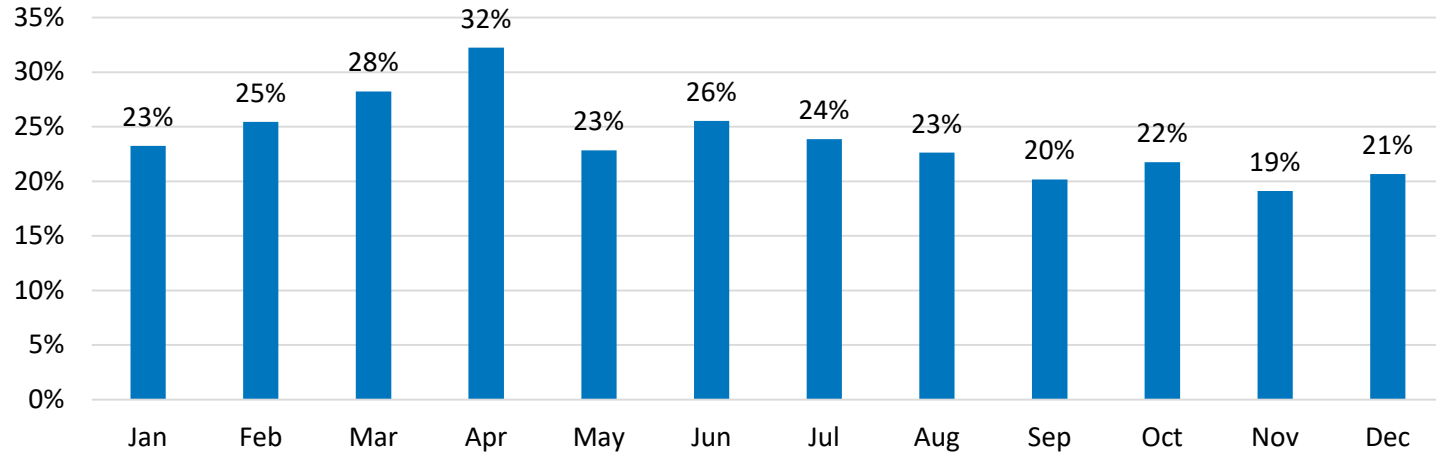


Parameters / Metrics Used	
Beg Period:	Feb-19
End Period:	Jan-21
Risk Responsive Ending Period:	Nov20-Mar21
Periods:	12
Report Date:	01/16/19
Current Position #:	-33,493,745
Natural Position \$:	\$73,267,856
Current Position(NPV)\$:	\$44,734,340
VaRC:	\$59,710,404
Cost @ 2 Sigma (\$):	\$104,444,744
Price @ 2 Sigma (\$/DTh):	\$3.118
Boundary (\$/DTh):	\$3.130
Financial Hedged %:	38.90%
Target Financial Hedge %:	#N/A

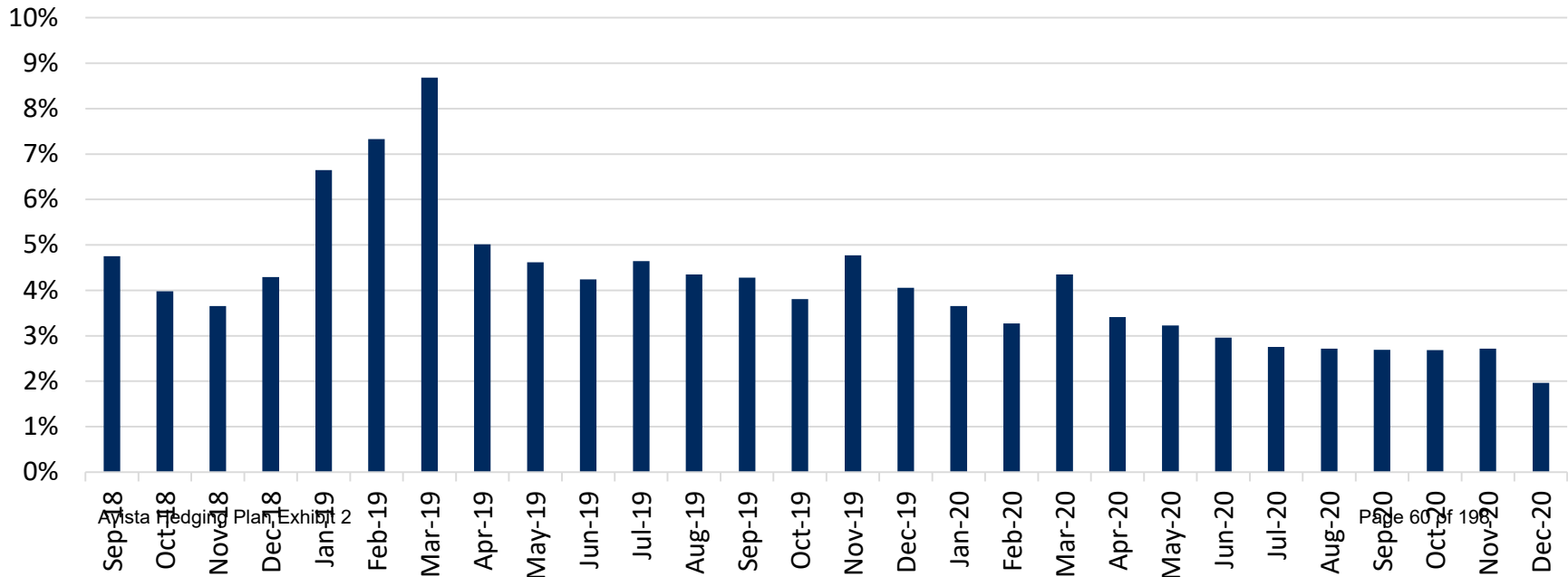


# AECO Forward Price Volatility

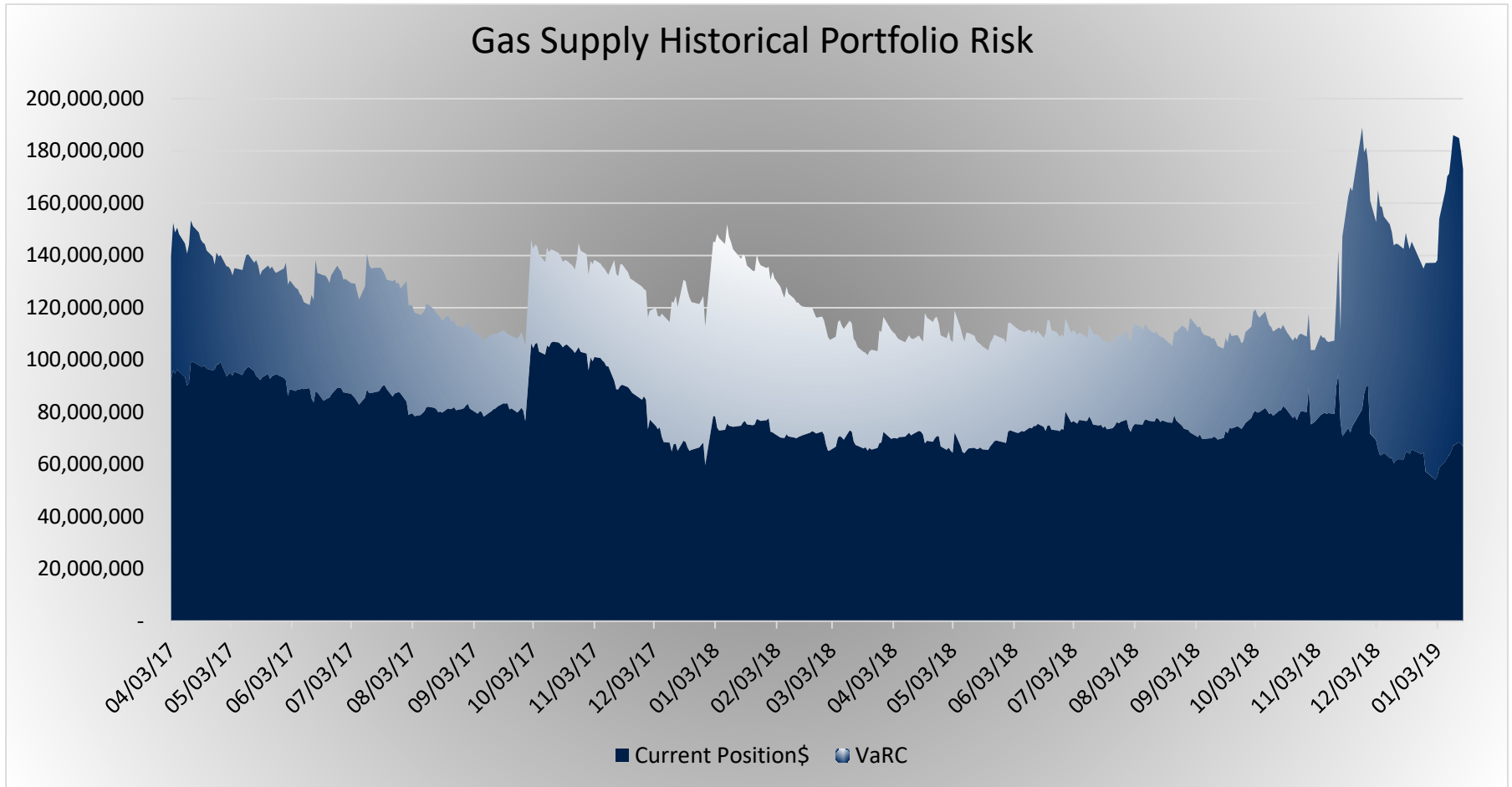
2018-2020 Average Monthly AECO Volatility



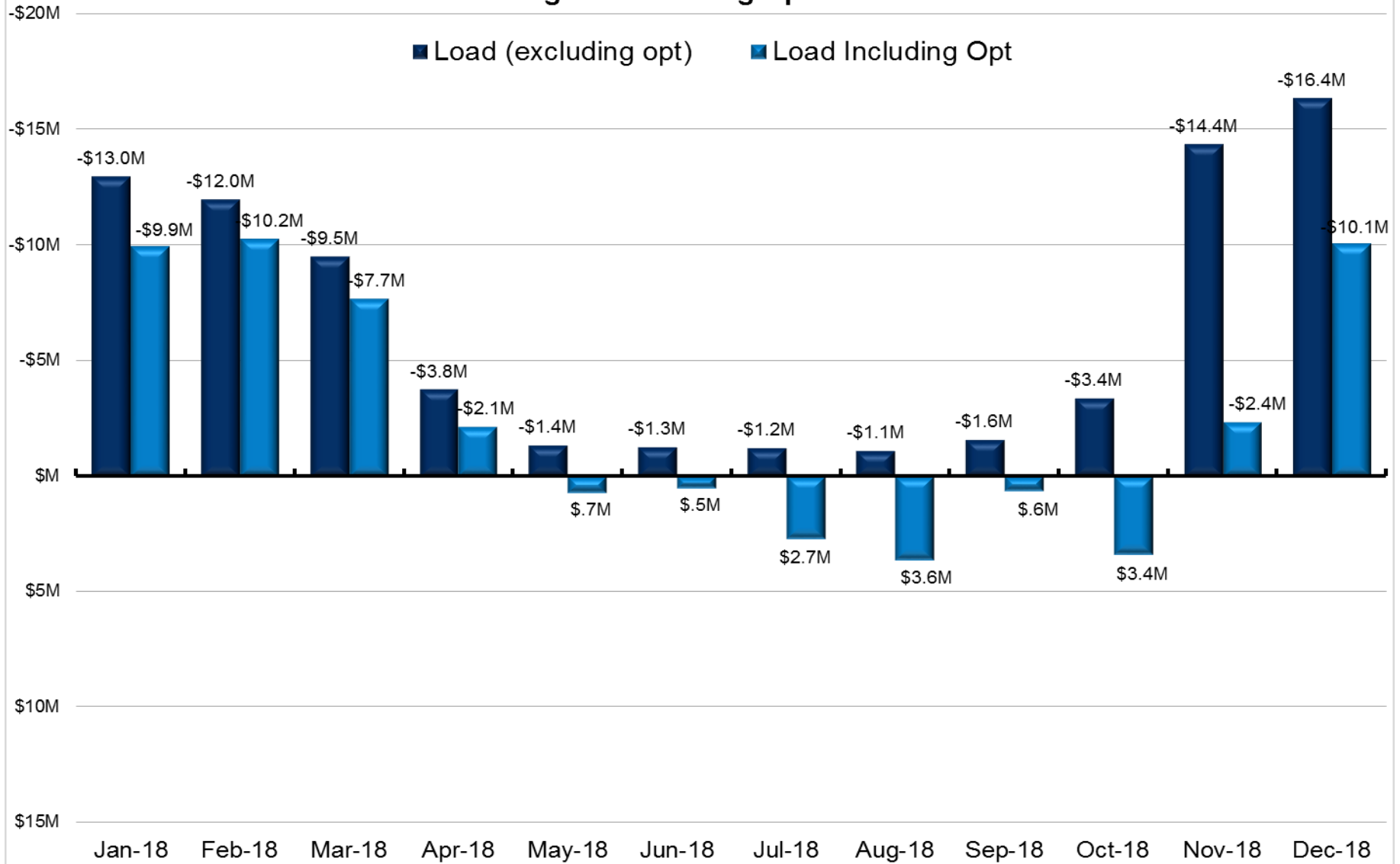
AECO 1-Day Volatility by Month



# RRHT Volatility

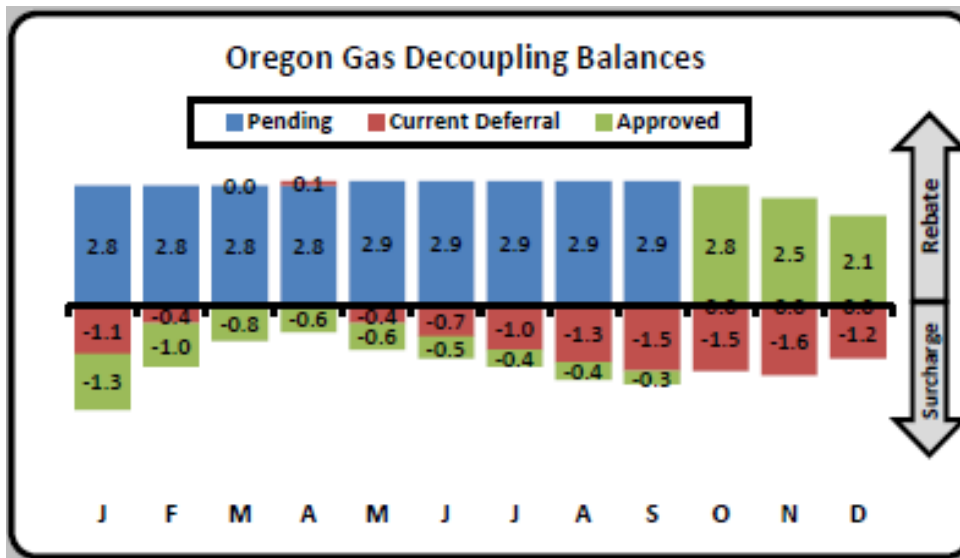
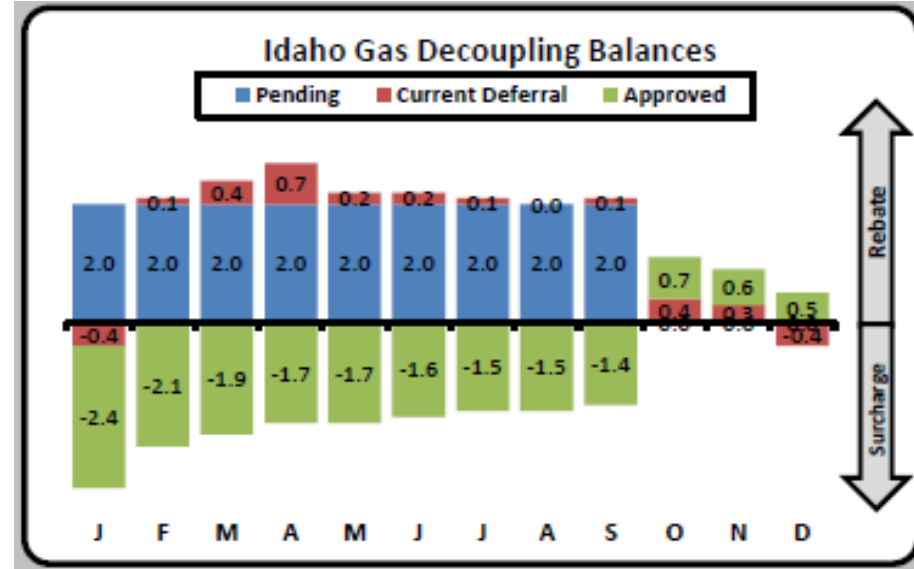
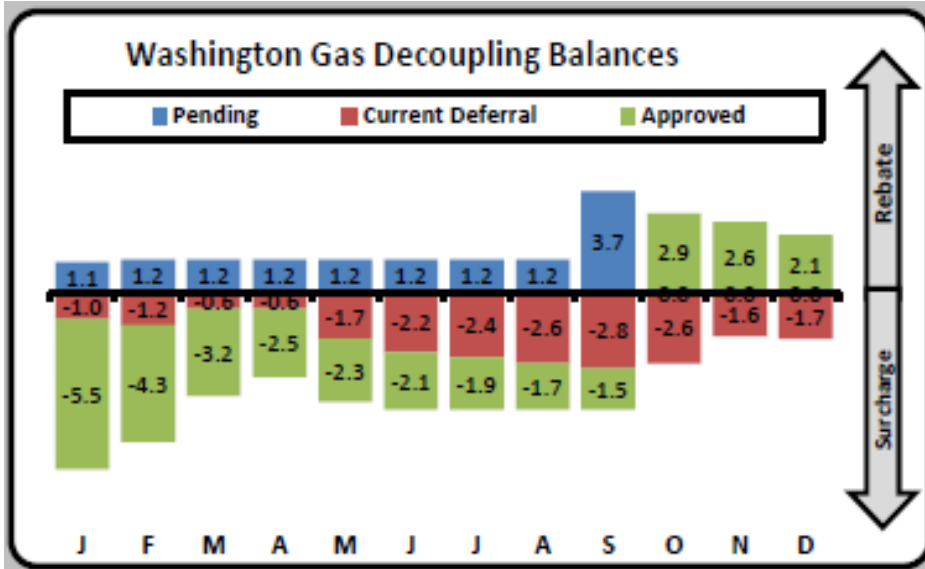


## Estimated 2018 Monthly Total Load Benefit/(Cost) Excluding and Including Optimization



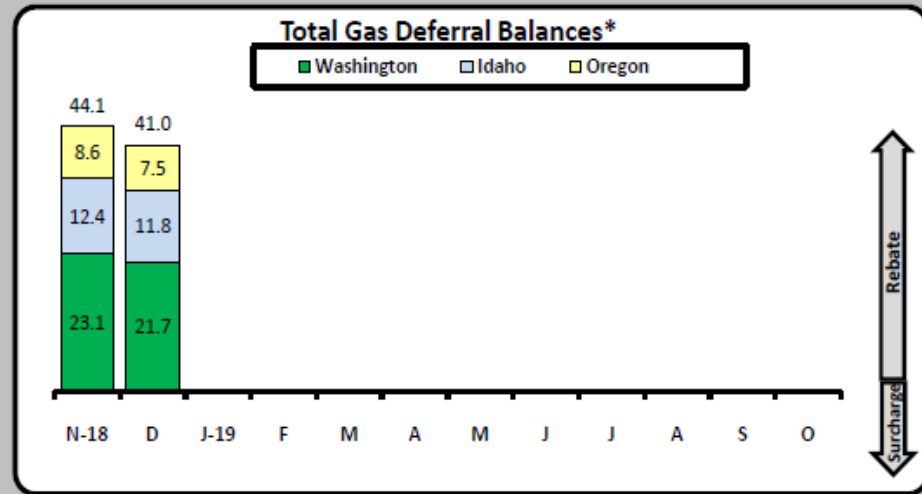
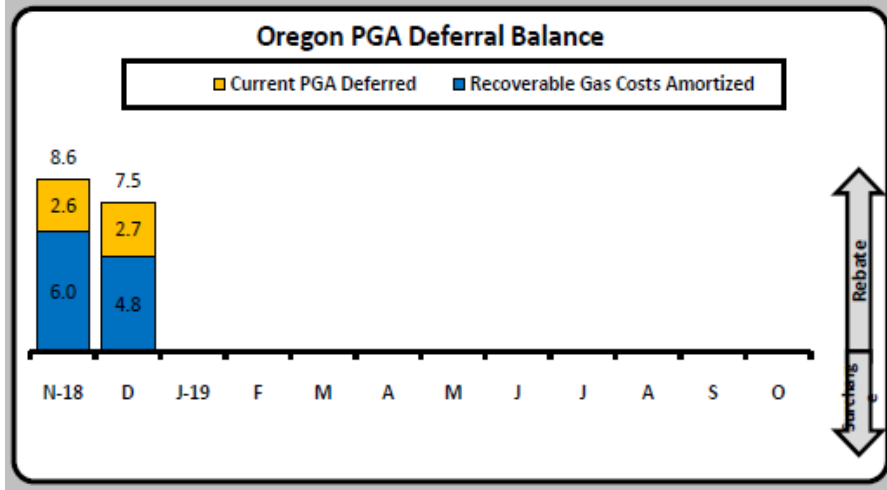
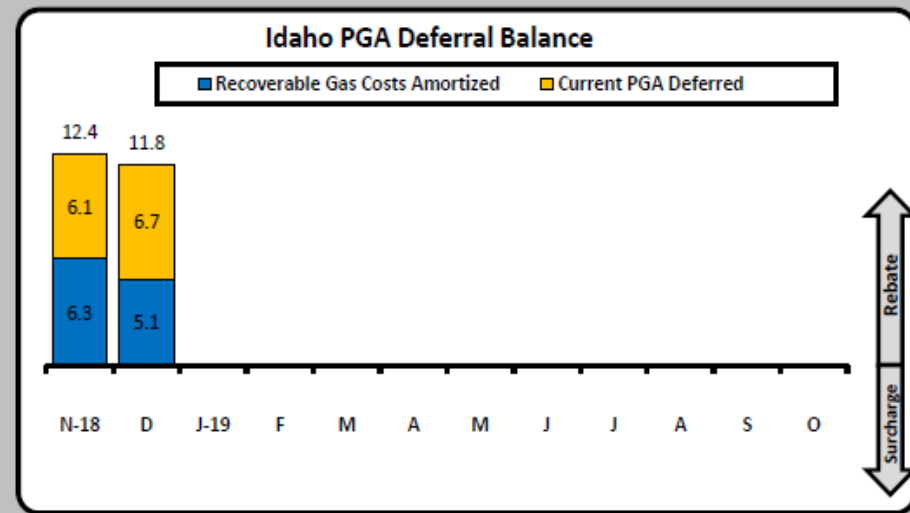
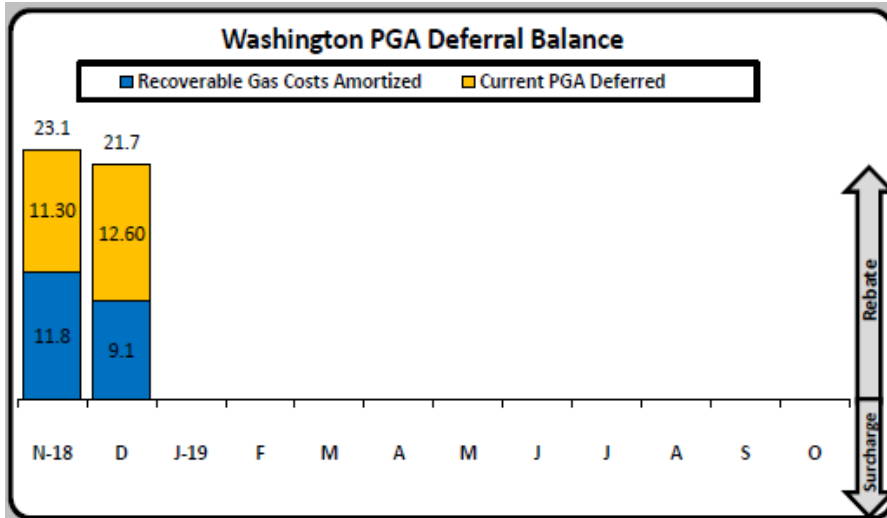
# Decoupling Balances – December 2018

\$s in Millions: (+) Rebate; (-) Surcharge



# Gas Deferral Report – December 2018

\$s in Millions: (+) Rebate; (-) Surcharge



\*Total Gas Deferral Balances above excludes Decoupling, JP in WA, Intervenor Funding, Deferred Gas Costs Margin Reduction and Commission Fees in OR



# **SOG**

# **Procurement Plan Review**

# **DRAFT**

# **July 25, 2019**

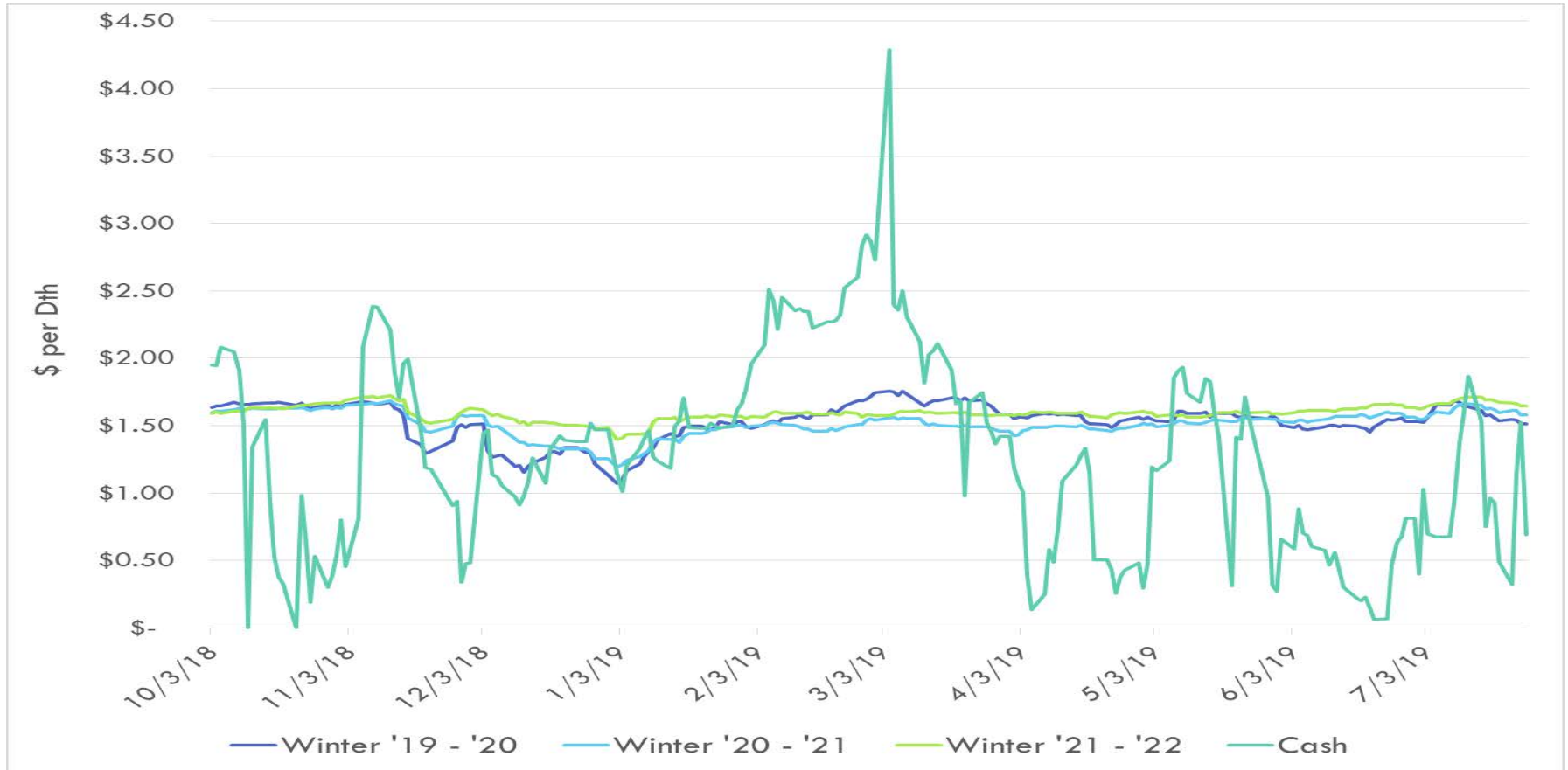
# Agenda

- Market Dynamics
- Procurement Plan
  - Procurement Plan performance
  - LDC Hedge %
  - RRHT Operative Boundary
- Winter '18 – '19: Back-up

# Market Dynamics

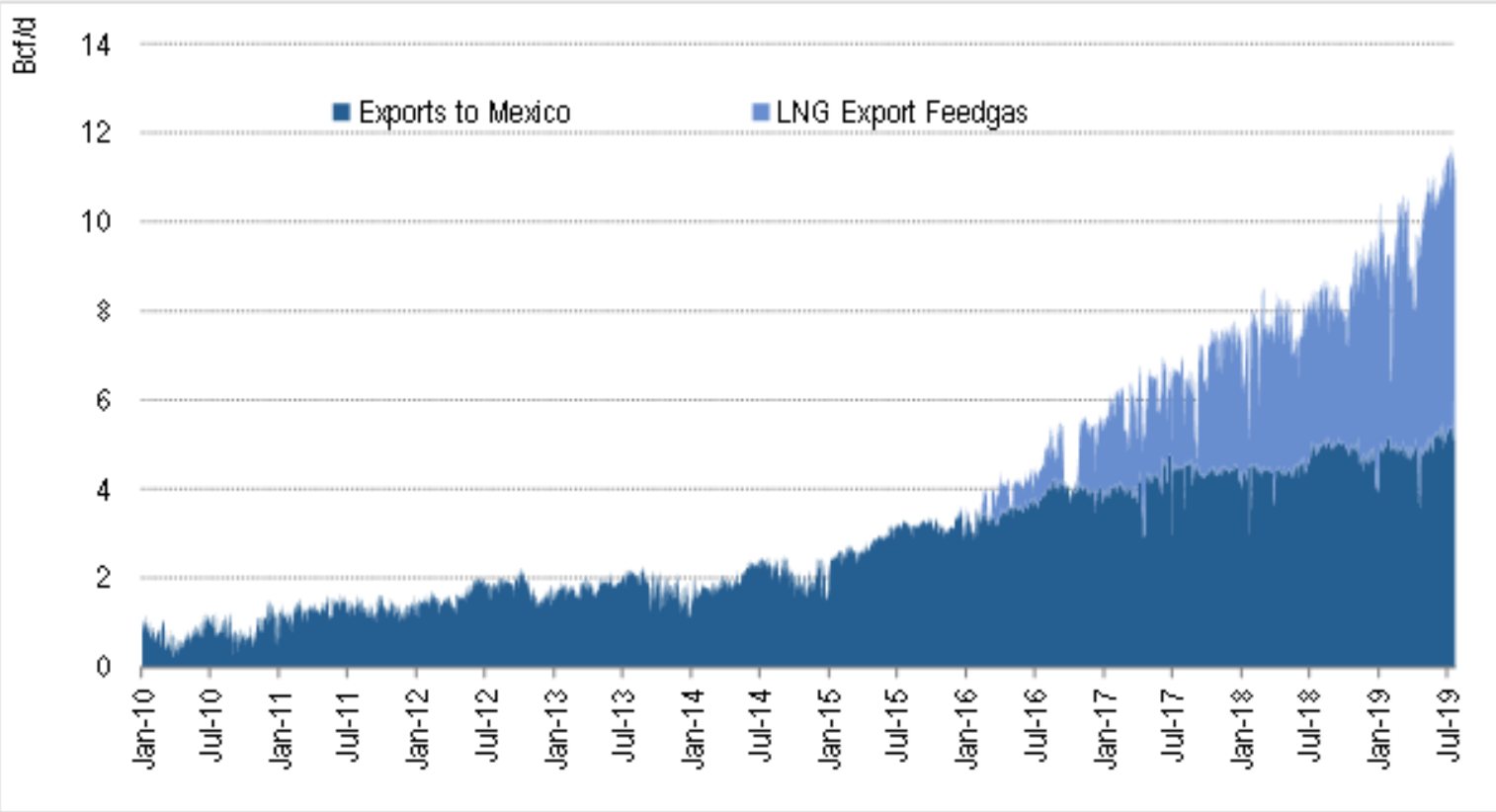


# AECO Cash vs. Winter Forwards



Date	Winter '19 - '20	Winter '20 - '21	Winter '21 - '22	Cash
Average	\$ 1.54	\$ 1.52	\$ 1.60	\$ 1.29
Max	\$ 1.76	\$ 1.68	\$ 1.73	\$ 4.29
Min	\$ 1.07	\$ 1.19	\$ 1.40	\$ -
Std. Dev	\$ 0.14	\$ 0.10	\$ 0.06	\$ 0.73

### US Exports to Mexico LNG Export Feedgas



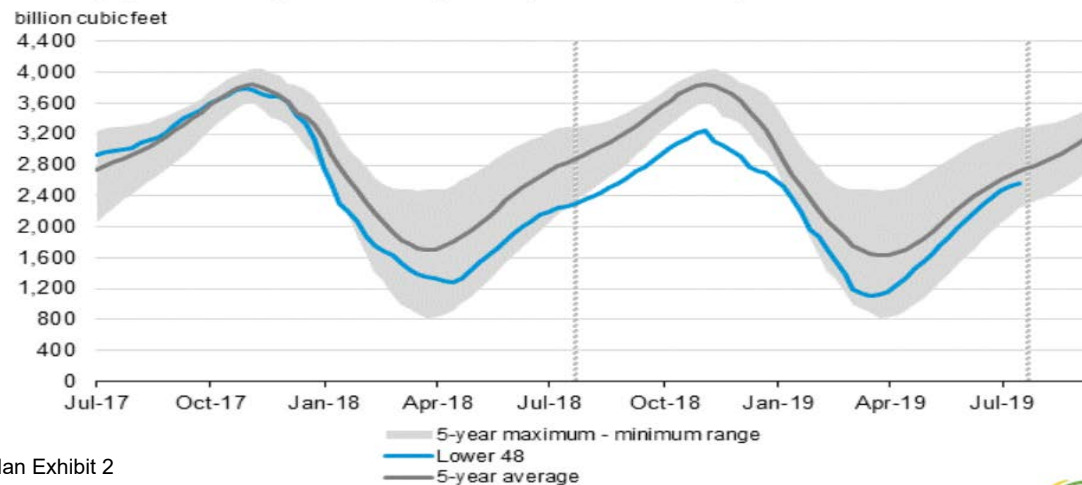
as of 24-Jul-19	Last	1W	ΔW	1M	ΔM	1Y	ΔY
Exports to Mexico	5.3	6.0	-10.7%	5.3	0.9%	4.8	11.1%
LNG Export Feedgas	5.5	5.7	-2.8%	5.9	-6.0%	2.8	93.8%

Source: Bentek, NBC

# US Natural Gas Storage

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	07/19/19	07/12/19	net change	implied flow	Year ago (07/19/18)		5-year average (2014-18)	
					Bcf	% change	Bcf	% change
East	575	561	14	14	524	9.7	604	-4.8
Midwest	650	627	23	23	522	24.5	656	-0.9
Mountain	151	147	4	4	145	4.1	172	-12.2
Pacific	271	268	3	3	256	5.9	294	-7.8
South Central	921	929	-8	-8	823	11.9	994	-7.3
Salt	229	246	-17	-17	217	5.5	276	-17.0
Nonsalt	692	683	9	9	605	14.4	718	-3.6
<b>Total</b>	<b>2,569</b>	<b>2,533</b>	<b>36</b>	<b>36</b>	<b>2,269</b>	<b>13.2</b>	<b>2,720</b>	<b>-5.6</b>

Working gas in underground storage compared with the 5-year maximum and minimum



## North American winter 2019/20 versus winter 2018/19 change in natural gas demand and supply\*

Bcf/d (unless stated otherwise)

	Component	Winter-to-winter change	Key market drivers
<b>Demand</b>	Domestic residential; commercial; industrial; and pipeline, lease, and plant fuel consumption	-1.9	<b>Normal weather assumption</b> (during the 2018/19 winter, recurrent cold weather shots raised heating loads)
	Exports**	4.0	<b>LNG</b> —Continued liquefaction capacity additions during 2019, (including Cameron LNG and Elba Island LNG); <b>Mexico</b> —Pipeline expansions (including the effect of some delays to downstream Mexico projects)
	<b>Non-power sector demand***</b>	<b>2.0</b>	
	Power	3.3	<b>Net effect of the power sector's coal-fired plant retirements and gas-fired capacity additions, normal weather assumption, and lower Henry Hub prices</b>
	<b>North American demand growth***</b>	<b>5.4</b>	
<b>Imbalance****</b>		<b>-2.4</b>	
<b>Supply</b>	Production growth	3.8	<b>Appalachia, associated gas, and Haynesville</b>
	Regasified LNG sendout into gas pipeline grid	0.1	
	<b>North American supply growth***</b>	<b>3.9</b>	
<b>Storage withdrawals</b>		<b>-0.8</b>	<b>Stronger production and assumed normal weather</b> reduce the need for storage withdrawals
<b>Price (\$/MMBtu)</b>	<b>Henry Hub nominal cash price</b>	<b>-1.23</b>	<b>Production growth, normal weather assumption</b>

\*Winter refers to November–March. Deltas shown in this table are based on averages for winter 2019/20 versus winter 2018/19. Negative deltas indicate a drop in winter 2019/20 from winter 2018/19.

\*\*For purposes of this table, exports include US lower-48 pipeline deliveries of gas to liquefaction/export facilities plus US lower-48 pipeline exports to Mexico.

\*\*\*Total changes may not reconcile fully with the composite data shown in this table because of rounding.

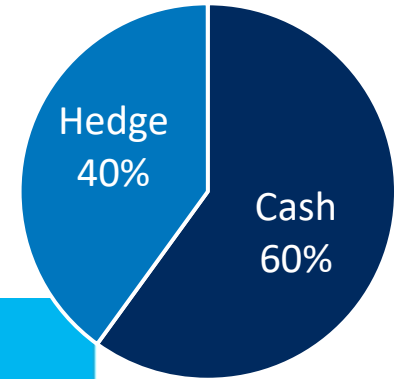
\*\*\*\*There is an imbalance between EIA historical supply, demand, and storage data.

Source: IHS Markit

© 2019 IHS Markit

# Procurement Plan

# Procurement Plan Mix



## Avista Natural Gas Service Areas, Gas Fields, Trading Hubs and Major Pipelines



as of 3/31/2015

Avista Hedging Plan Exhibit 2

# Procurement Plan Performance

Trade Dat	Pric	Begin Dat	End Dat	Strategy	Bas	Window descriptio	Days of Hedg	Total Volum	Total Pric
15-Nov-18	\$ 0.90	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 67,650
16-Nov-18	\$ 1.01	1-Oct-19	31-Oct-19	LDC Prompt Yr Hedges	AECO	LCL	31	77,500	\$ 78,120
19-Nov-18	\$ 0.89	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	UCL	30	75,000	\$ 66,750
19-Nov-18	\$ 1.52	1-Nov-20	31-Mar-21	LDC Prompt Yr Hedges	AECO	UCL	151	377,500	\$ 571,913
20-Nov-18	\$ 1.33	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 505,400
20-Nov-18	\$ 0.86	1-Apr-20	31-Oct-20	LDC Prompt Yr Hedges	AECO	LCL	214	535,000	\$ 460,100
20-Nov-18	\$ 1.13	1-Apr-21	31-Oct-21	LDC Prompt Yr Hedges	AECO	LCL	214	535,000	\$ 601,875
21-Nov-18	\$ 1.32	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 502,740
27-Nov-18	\$ 1.45	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 551,000
28-Nov-18	\$ 1.05	1-Oct-19	31-Oct-19	LDC Prompt Yr Hedges	AECO	UCL	31	77,500	\$ 81,375
29-Nov-18	\$ 1.48	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 560,500
29-Nov-18	\$ 1.56	1-Nov-20	31-Mar-21	LDC Prompt Yr Hedges	AECO	UCL	151	377,500	\$ 588,900
30-Nov-18	\$ 1.07	1-Oct-19	31-Oct-19	Risk Resp Hedge	AECO	Operative Boundary	31	77,500	\$ 82,538
3-Dec-18	\$ 1.47	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 558,600
5-Dec-18	\$ 1.26	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 478,800
7-Dec-18	\$ 0.92	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 69,000
7-Dec-18	\$ 1.30	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 494,760
10-Dec-18	\$ 1.24	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 469,300
11-Dec-18	\$ 0.97	1-May-19	31-May-19	LDC Prompt Yr Hedges	AECO	Time Expire	31	77,500	\$ 75,175
11-Dec-18	\$ 1.40	1-Nov-20	31-Mar-21	LDC Prompt Yr Hedges	AECO	LCL	151	377,500	\$ 526,613
21-Dec-18	\$ 0.87	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 65,250
3-Jan-19	\$ 1.00	1-Apr-21	31-Oct-21	LDC Prompt Yr Hedges	AECO	LCL	214	535,000	\$ 532,325
7-Jan-19	\$ 0.90	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 67,313
8-Jan-19	\$ 1.00	1-May-19	31-May-19	LDC Prompt Yr Hedges	AECO	UCL	31	77,500	\$ 77,733
9-Jan-19	\$ 1.29	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 489,060
11-Jan-19	\$ 1.42	1-Nov-20	31-Mar-21	Risk Resp Hedge	AECO	Operative Boundary	151	377,500	\$ 534,163
15-Jan-19	\$ 1.17	1-Oct-19	31-Oct-19	LDC Prompt Yr Hedges	AECO	UCL	31	77,500	\$ 90,288
15-Jan-19	\$ 1.16	1-Oct-19	31-Oct-19	Risk Resp Hedge	AECO	Operative Boundary	31	77,500	\$ 89,668
18-Jan-19	\$ 1.53	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 581,020
22-Jan-19	\$ 1.03	1-Jul-19	31-Jul-19	LDC Prompt Yr Hedges	AECO	UCL	31	77,500	\$ 80,135
22-Jan-19	\$ 1.02	1-Aug-19	31-Aug-19	LDC Prompt Yr Hedges	AECO	UCL	31	77,500	\$ 79,283
22-Jan-19	\$ 1.06	1-Sep-19	30-Sep-19	LDC Prompt Yr Hedges	AECO	UCL	30	75,000	\$ 79,500
23-Jan-19	\$ 1.49	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 564,300
23-Jan-19	\$ 1.46	1-Nov-20	31-Mar-21	LDC Prompt Yr Hedges	AECO	UCL	151	377,500	\$ 551,150
24-Jan-19	\$ 1.49	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 564,300
25-Jan-19	\$ 1.09	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 81,750
25-Jan-19	\$ 1.51	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 575,225
28-Jan-19	\$ 1.51	1-Nov-19	31-Mar-20	Risk Resp Hedge	AECO	Operative Boundary	152	380,000	\$ 572,470
7-Feb-19	\$ 1.12	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 84,000
20-Feb-19	\$ 1.04	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 78,000
20-Feb-19	\$ 1.01	1-May-19	31-May-19	LDC Prompt Yr Hedges	AECO	Time Expire	31	77,500	\$ 78,546
4-Mar-19	\$ 1.09	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 81,750
7-Mar-19	\$ 1.16	1-Apr-19	30-Apr-19	LDC Prompt Yr Hedges	AECO	Time Expire	30	75,000	\$ 86,925
27-Mar-19	\$ 0.80	1-Jun-19	30-Jun-19	LDC Prompt Yr Hedges	AECO	LCL	30	75,000	\$ 59,625
2-Apr-19	\$ 1.10	1-Oct-19	31-Oct-19	LDC Prompt Yr Hedges	AECO	Time Expire	31	77,500	\$ 85,405
5-Apr-19	\$ 1.48	1-Nov-20	31-Mar-21	LDC Prompt Yr Hedges	AECO	Time Expire	151	377,500	\$ 560,215
16-Apr-19	\$ 1.59	1-Nov-21	31-Mar-22	LDC Prompt Yr Hedges	AECO	Time Expire	151	377,500	\$ 600,225
31-May-19	\$ 1.60	1-Nov-21	31-Mar-22	LDC Prompt Yr Hedges	AECO	Time Expire	151	377,500	\$ 604,000
13-Jun-19	\$ 1.56	1-Nov-20	31-Mar-21	LDC Prompt Yr Hedges	AECO	Time Expire	151	377,500	\$ 588,900
21-Jun-19	\$ 0.85	1-Apr-20	31-Oct-20	LDC Prompt Yr Hedges	AECO	Time Expire	214	535,000	\$ 453,680
25-Jun-19	\$ 1.67	1-Nov-21	31-Mar-22	LDC Prompt Yr Hedges	AECO	UCL	151	377,500	\$ 629,293
27-Jun-19	\$ 1.14	1-Oct-19	31-Oct-19	LDC Prompt Yr Hedges	AECO	Time Expire	31	77,500	\$ 88,428
11-Jul-19	\$ 1.71	1-Nov-21	31-Mar-22	LDC Prompt Yr Hedges	AECO	UCL	151	377,500	\$ 644,393

Window description	Count	Total Volume	Total Cost	Weighted Avg. Price
Time Expire	18	3,030,000	3,816,206	\$ 1.259
LCL	6	2,135,000	2,258,658	\$ 1.058
UCL	12	2,425,000	3,540,710	\$ 1.460
Operative Boundary	17	5,852,500	8,173,843	\$ 1.397

Plan Performance	Comments
\$ 902,462	M2M as of - 7/24/2019
\$ 0.06713	M2M per Dth

Weighted Avg. Price
\$ 1.323

# Current LDC firm load Hedge - 40%

July 24, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
August-19	-29,129	12,500	-16,629	40%	43%	0							
September-19	-34,780	12,500	-22,280	40%	36%	1	01/22/19	08/01/19	0.59	0.76	1.63		AECO
October-19	-79,058	27,500	-51,558	40%	35%	2	06/27/19	07/30/19	1.76	<b>1.76</b>	1.99	2,500	NWPC RM
November-19	-145,271	90,000	-55,271	40%	62%	0							
December-19	-199,978	90,000	-109,978	40%	45%	0							
January-20	-197,320	90,000	-107,320	40%	46%	0							
February-20	-180,560	90,000	-90,560	40%	50%	0							
March-20	-133,104	90,000	-43,104	40%	68%	0							
Apr20-Oct20	-48,396	12,500	-35,896	25%	26%	0							
Nov20-Mar21	-172,637	37,500	-135,137	32%	22%	7	06/13/19	08/20/19	1.55	1.58	1.67		AECO
Apr21-Oct21	-49,091	5,000	-44,091	24%	10%	3	01/03/19	09/23/19	0.99	1.21	1.28		AECO
Nov21-Mar22	-176,503	10,000	-166,503	32%	6%	19	07/11/19	08/23/19	1.64	1.65	1.73		AECO

32 Hedges



# Optional LDC firm load Hedge %

July 24, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
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September-19	-34,780	12,500	-22,280	30%	36%	0							
October-19	-79,058	27,500	-51,558	30%	35%	0							
November-19	-145,271	90,000	-55,271	30%	62%	0							
December-19	-199,978	90,000	-109,978	30%	45%	0							
January-20	-197,320	90,000	-107,320	30%	46%	0							
February-20	-180,560	90,000	-90,560	30%	50%	0							
March-20	-133,104	90,000	-43,104	30%	68%	0							
Apr20-Oct20	-48,396	12,500	-35,896	18%	26%	0							
Nov20-Mar21	-172,637	37,500	-135,137	24%	22%	2	06/13/19	02/06/20	1.46	1.58	1.78		AECO
Apr21-Oct21	-49,091	5,000	-44,091	18%	10%	2	01/03/19	02/01/20	0.94	1.21	1.36		AECO
Nov21-Mar22	-176,503	10,000	-166,503	24%	6%	13	07/11/19	09/12/19	1.62	1.65	1.75		AECO

30%  
17 Hedges

July 24, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
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October-19	-79,058	27,500	-51,558	35%	35%	0							
November-19	-145,271	90,000	-55,271	35%	62%	0							
December-19	-199,978	90,000	-109,978	35%	45%	0							
January-20	-197,320	90,000	-107,320	35%	46%	0							
February-20	-180,560	90,000	-90,560	35%	50%	0							
March-20	-133,104	90,000	-43,104	35%	68%	0							
Apr20-Oct20	-48,396	12,500	-35,896	21%	26%	0							
Nov20-Mar21	-172,637	37,500	-135,137	28%	22%	4	06/13/19	10/10/19	1.52	1.58	1.71		AECO
Apr21-Oct21	-49,091	5,000	-44,091	21%	10%	2	01/03/19	02/01/20	0.94	1.21	1.36		AECO
Nov21-Mar22	-176,503	10,000	-166,503	28%	6%	16	07/11/19	08/31/19	1.63	1.65	1.74		AECO

35%  
22 Hedges

# Optional LDC firm load Hedge %

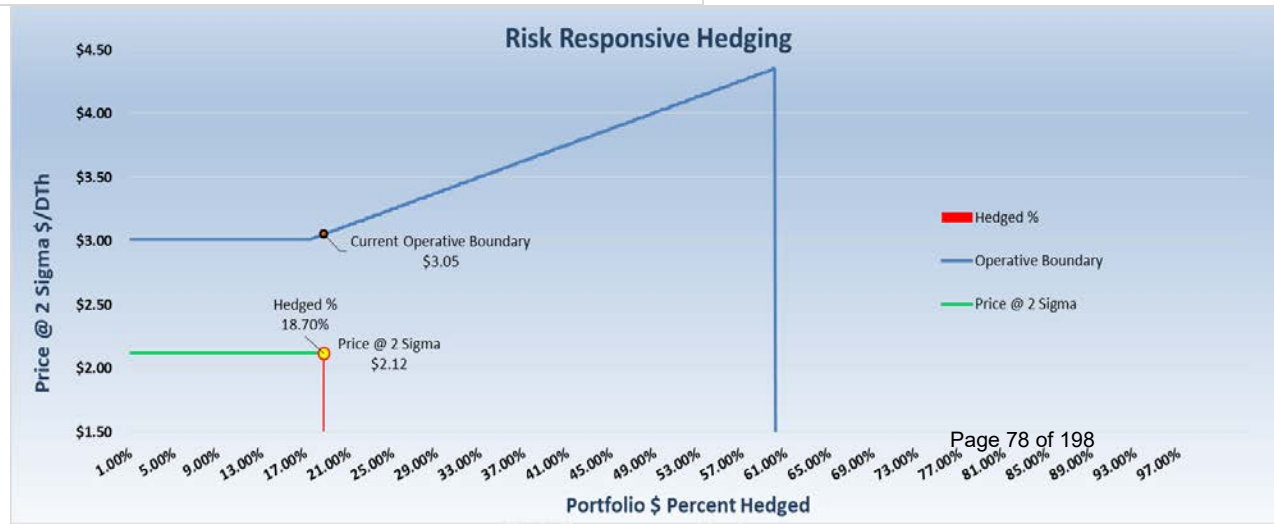
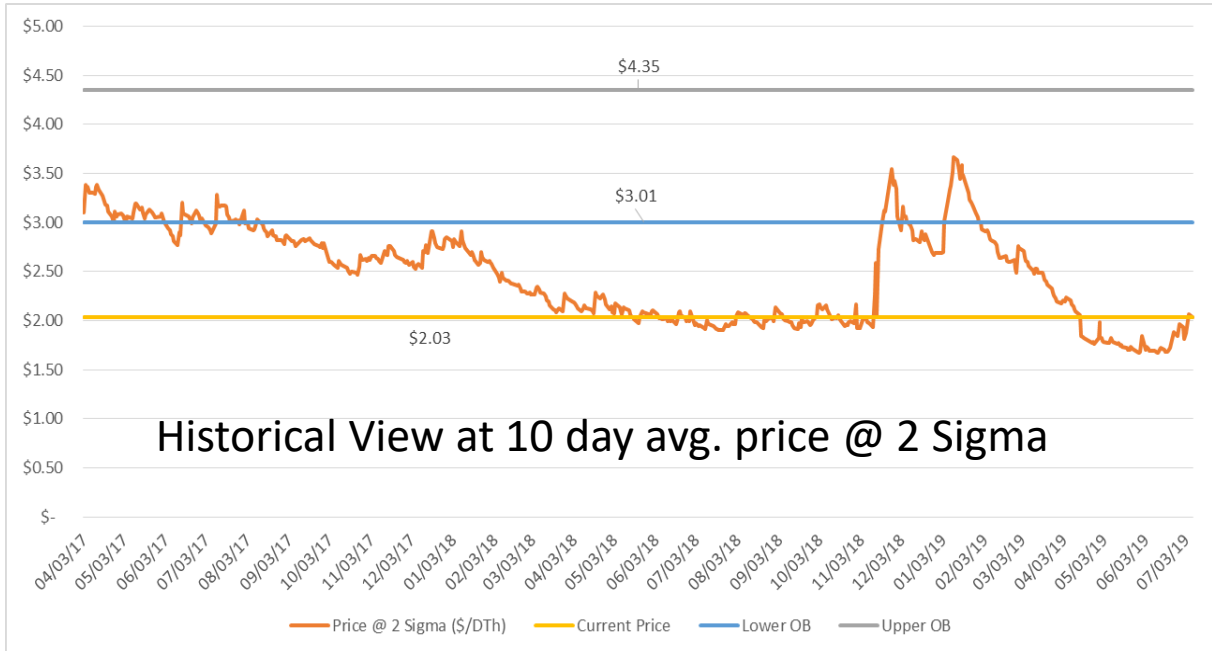
July 24, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
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October-19	-79,058	27,500	-51,558	45%	35%	3	06/27/19	07/19/19	1.80	1.76	1.95	2,500	NWPC RM
November-19	-145,271	90,000	-55,271	45%	62%	0							
December-19	-199,978	90,000	-109,978	45%	45%	0							
January-20	-197,320	90,000	-107,320	45%	46%	0							
February-20	-180,560	90,000	-90,560	45%	50%	0							
March-20	-133,104	90,000	-43,104	45%	68%	0							
Apr20-Oct20	-48,396	12,500	-35,896	28%	26%	0							
Nov20-Mar21	-172,637	37,500	-135,137	36%	22%	10	06/13/19	07/31/19	1.57	1.58	1.65		AECO
Apr21-Oct21	-49,091	5,000	-44,091	27%	10%	3	01/03/19	09/23/19	0.99	1.21	1.28		AECO
Nov21-Mar22	-176,503	10,000	-166,503	36%	6%	21	07/11/19	08/19/19	1.64	1.65	1.73		AECO

45%  
38 Hedges

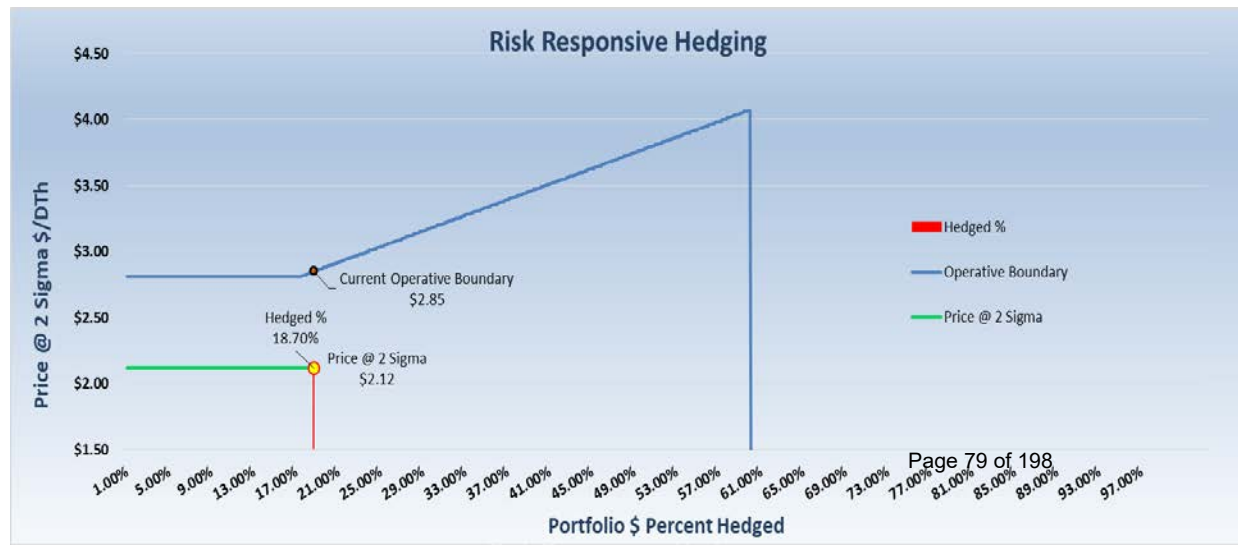
July 24, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
August-19	-29,129	12,500	-16,629	50%	43%	0							
September-19	-34,780	12,500	-22,280	50%	36%	2	01/22/19	04/28/19	0.71	0.76	1.29	2,500	AECO
October-19	-79,058	27,500	-51,558	50%	35%	5	06/27/19	07/10/19	1.84	1.76	1.91	2,500	NWPC RM
November-19	-145,271	90,000	-55,271	50%	62%	0							
December-19	-199,978	90,000	-109,978	50%	45%	4	05/31/19	07/08/19	2.62	2.59	2.75	2,500	NWPC RM
January-20	-197,320	90,000	-107,320	50%	46%	3	05/31/19	07/31/19	2.59	2.56	2.80	2,500	NWPC RM
February-20	-180,560	90,000	-90,560	50%	50%	0							
March-20	-133,104	90,000	-43,104	50%	68%	0							
Apr20-Oct20	-48,396	12,500	-35,896	31%	26%	1	06/21/19	03/01/20	0.84	0.98	1.11		AECO
Nov20-Mar21	-172,637	37,500	-135,137	40%	22%	13	06/13/19	07/20/19	1.58	1.58	1.64	2,500	AECO
Apr21-Oct21	-49,091	5,000	-44,091	31%	10%	4	01/03/19	07/19/19	1.02	1.21	1.24	2,500	AECO
Nov21-Mar22	-176,503	10,000	-166,503	40%	6%	24	07/11/19	08/14/19	1.64	1.65	1.72		AECO

50%  
56 Hedges

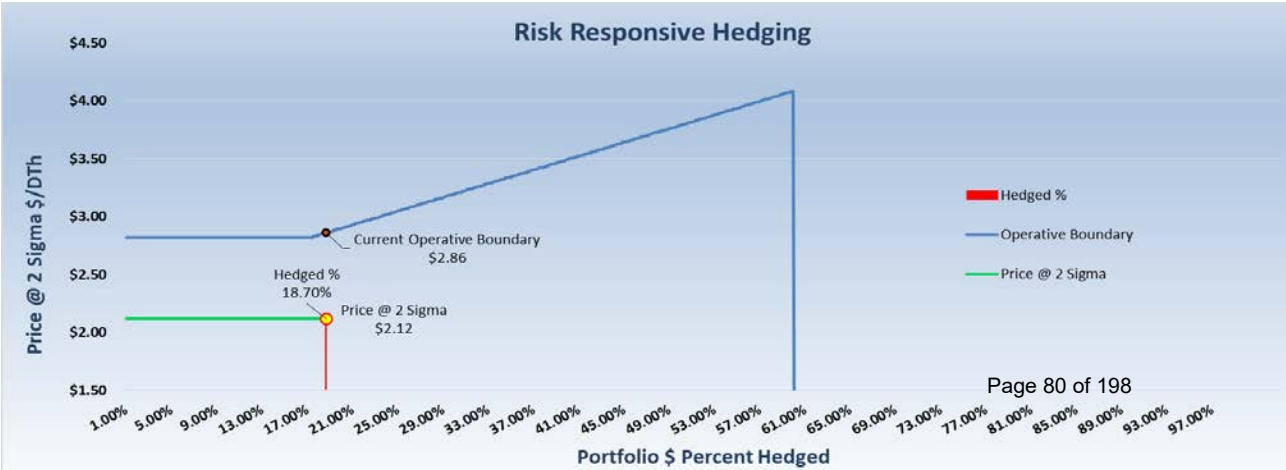
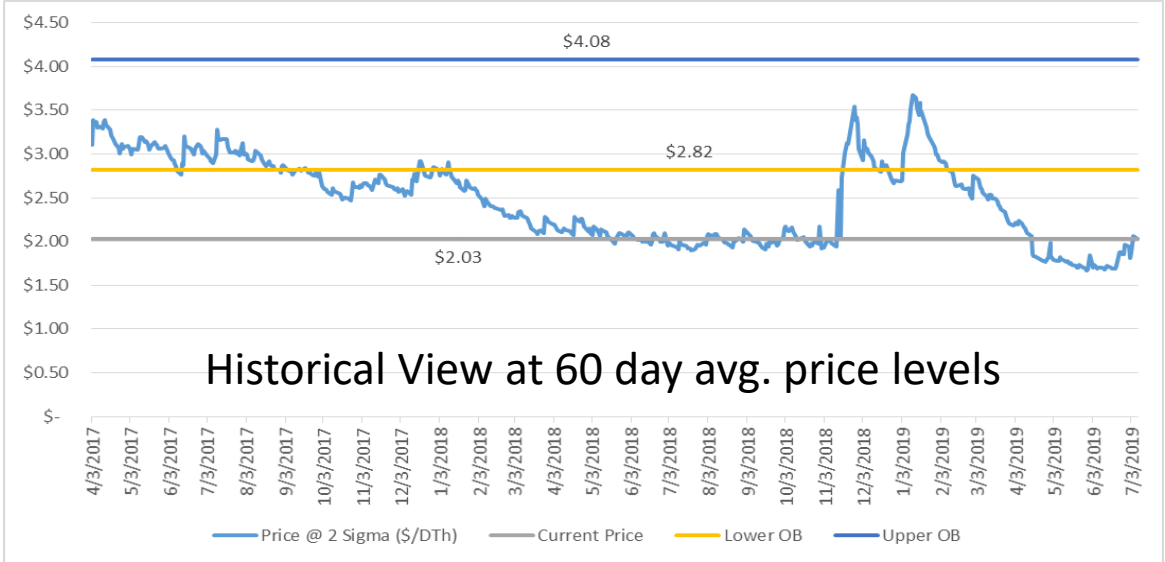
# Operative Boundary (10 Day Avg.)



# Operative Boundary - Alternative Avg. price (30 Day Avg.)



# Operative Boundary - Alternative Avg. price (60 Day Avg.)



# Gas Supply Recommendations

- Keep LDC hedges based on average load at 40%
- Continue with the Operative boundary at current levels of assumptions:
  - Last 10 day average price @ 2 Sigma (Median Method)
    - Initial boundary starts with a 1 in 10 probability
      - Current Calculation \$3.01
    - Final boundary contains a 1 in 100 probability
      - Current Calculation \$4.35
- Updated calculations will be provided to SOG members prior to RMC meeting in mid-August

# Winter '18 – '19: Back-up

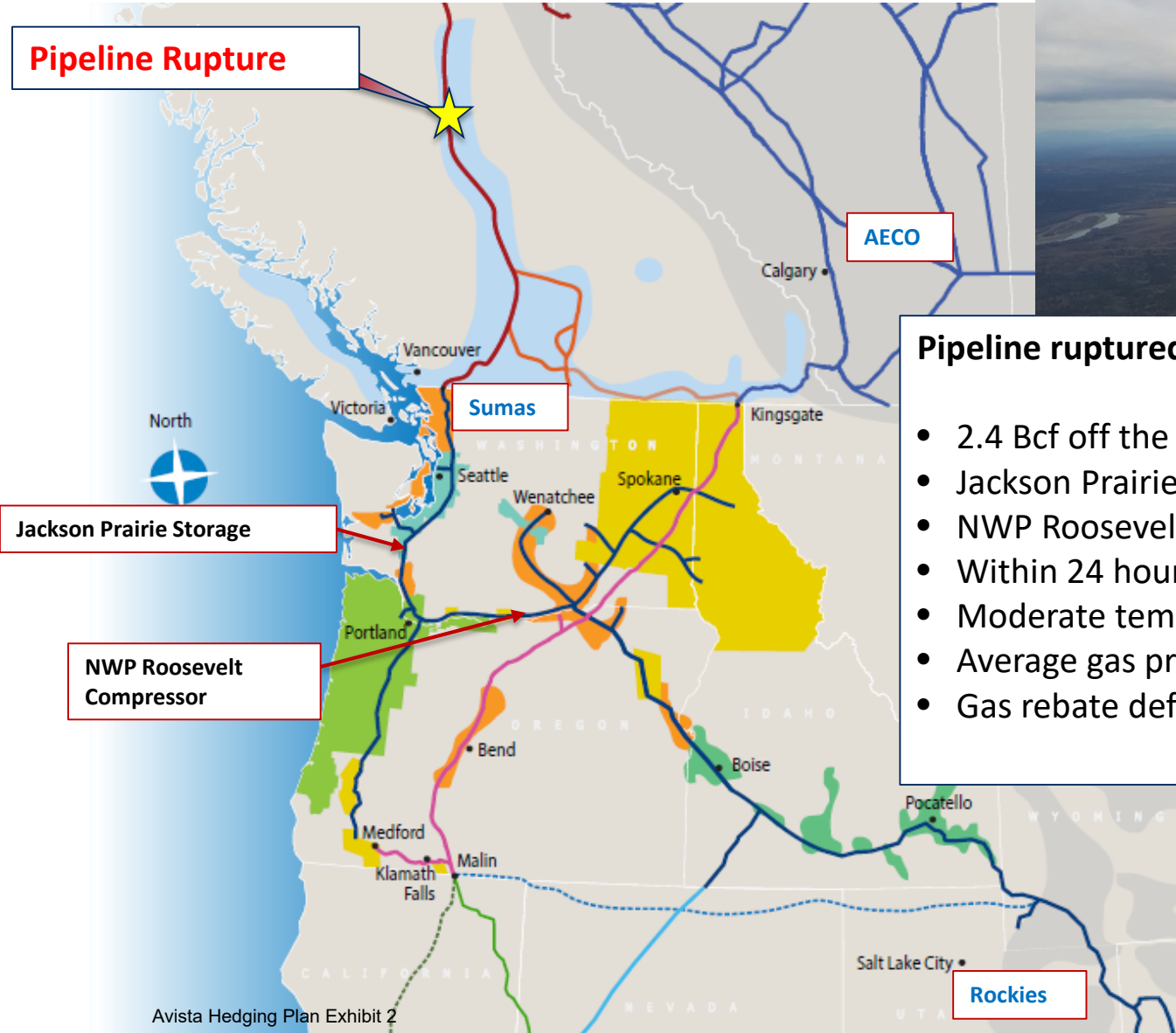
# October 2018 – February 2019

## A winter full of risks and operational anomalies

- Enbridge pipeline rupture
- Operational flow orders
- Entitlements
- Jackson Prairie
- Dithiazine
- Extended cold late in winter



# Enbridge Pipeline Rupture



**Pipeline ruptured October 9<sup>th</sup>**

- 2.4 Bcf off the system
- Jackson Prairie Storage - down
- NWP Roosevelt compressor maintenance
- Within 24 hours, 50% of demand came off
- Moderate temperatures across Pacific NW
- Average gas prices < \$3/Dth
- Gas rebate deferral balances growing

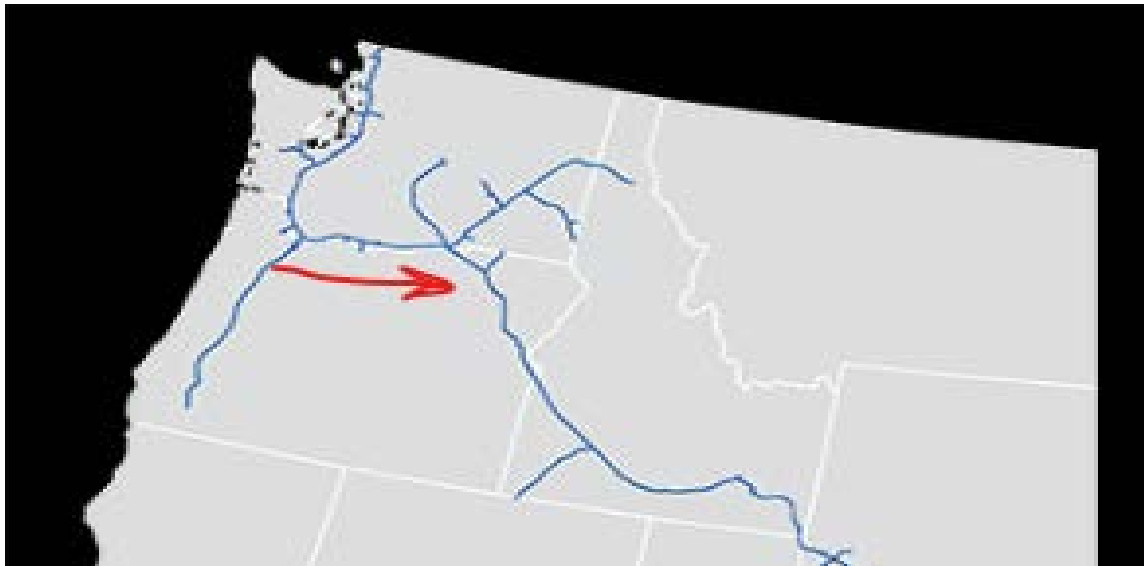
Avista Hedging Plan Exhibit 2

# Operation Flow Order (OFO)

- **Northwest Pipeline (NWP) Operational Flow Order**

An OFO is declared to provide the needed displacement on NWP's system to meet firm commitments. When scheduled quantities exceed physical capacity, NWP is in a potential OFO situation. In other words,

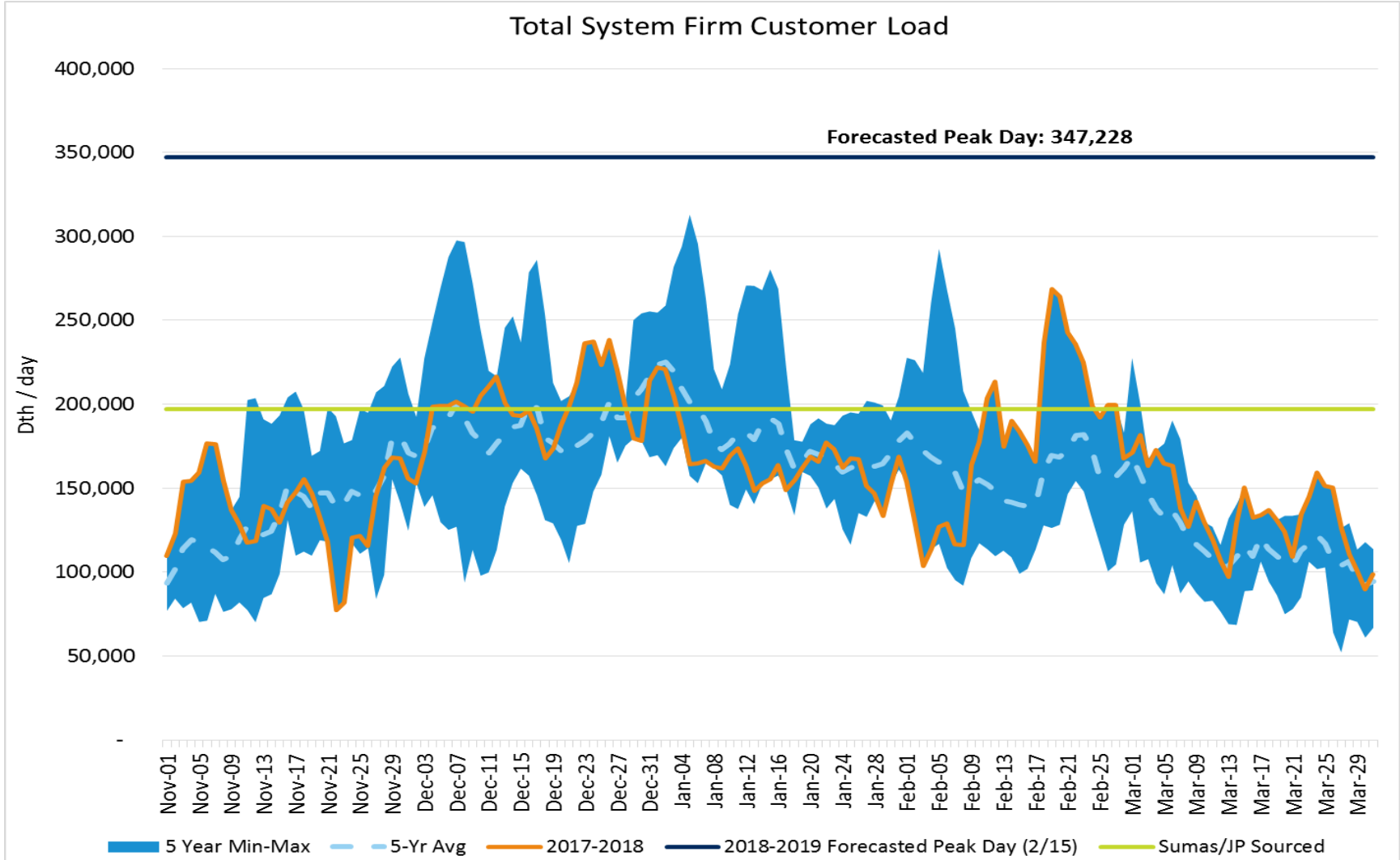
**\*\*Avista must flow gas from west to east.\*\***



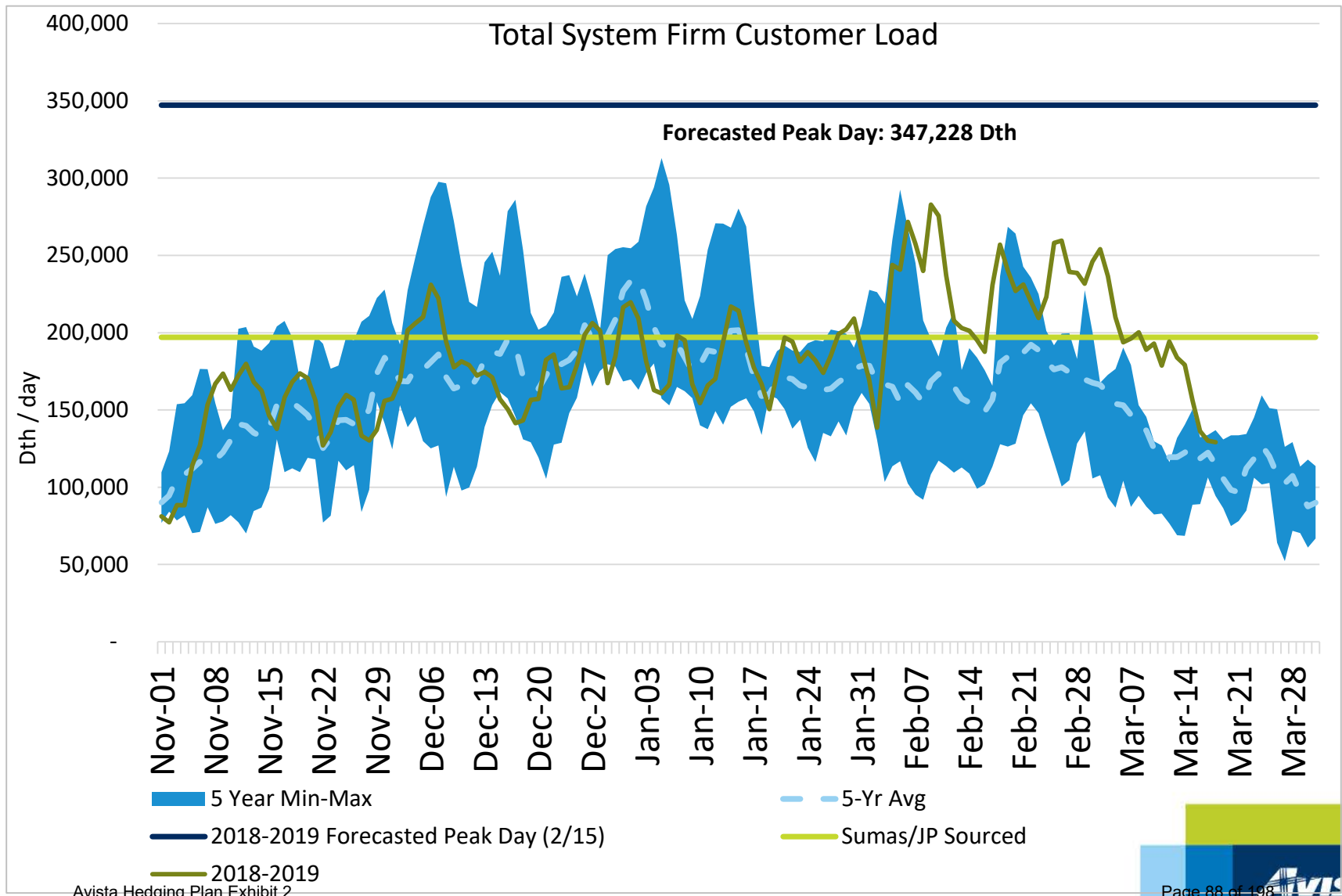
# Pipeline Entitlements

- Entitlements are used to balance demand
  - Entitlement tolerances are tiered
    - 13%, 8%, 5%, 3% depending on severity of issue
  - Overrun entitlement
    - Total demand must not exceed nominations by the prescribed level
    - Example: Avista nominates 150,000 Dth on pipeline, demand must be AT MOST 169,500 Dth
  - Entitlement penalties
    - Greater of \$10.00/ dth or 4x the highest midpoint price in region

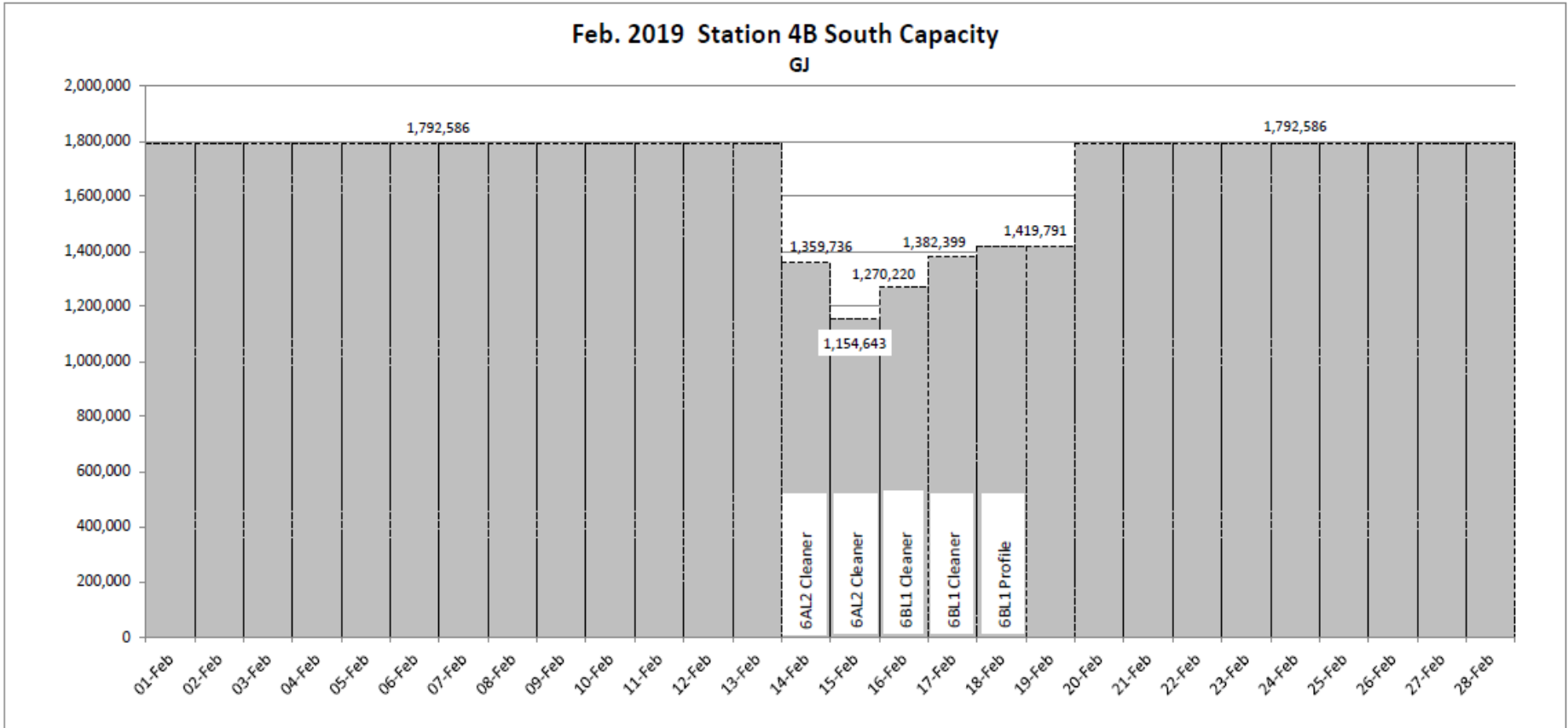
# Historical Winter Firm Customer Load



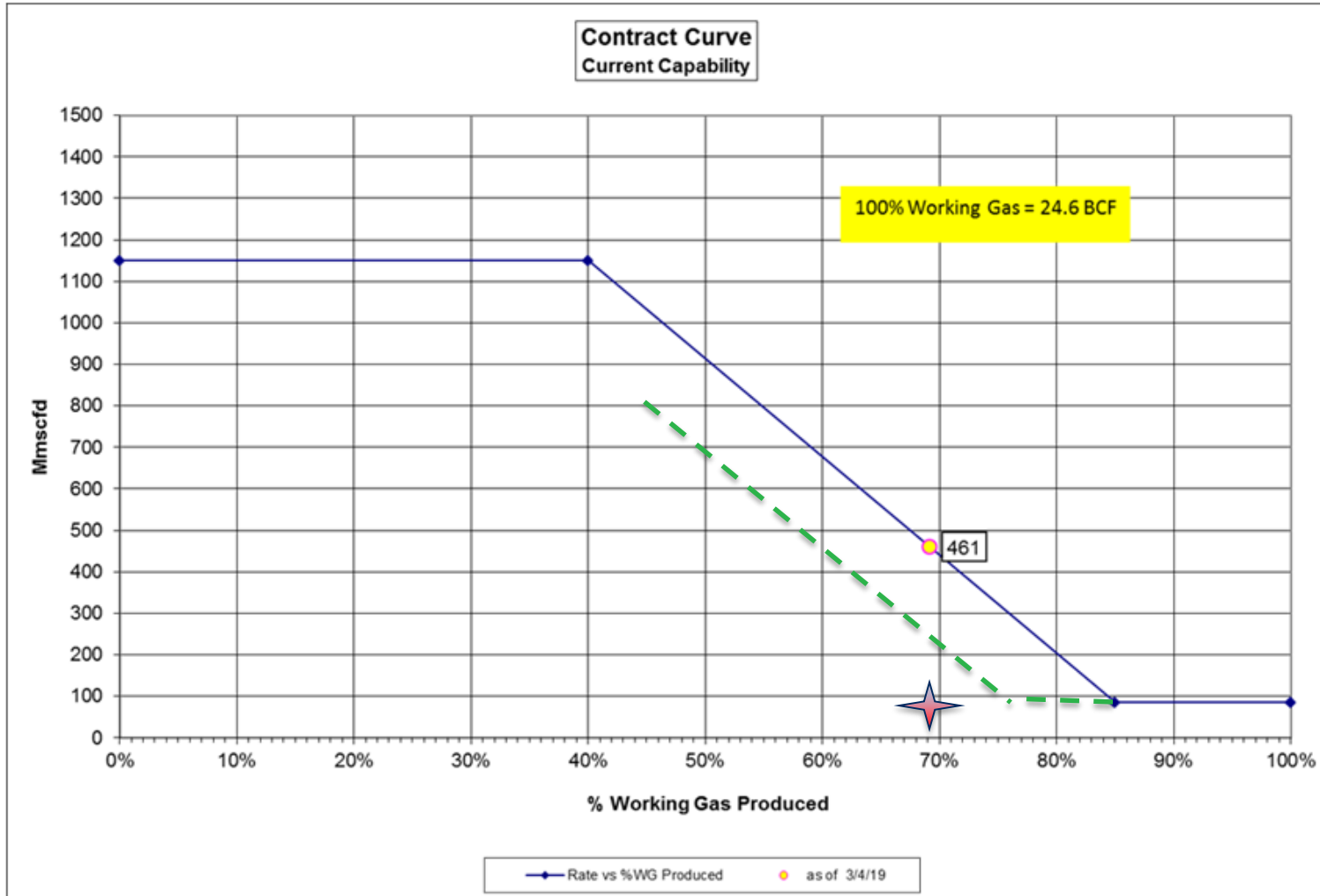
# Historical and Current Winter Loads



# Enbridge Capacity Cuts



# Jackson Prairie C9 Compressor Failure



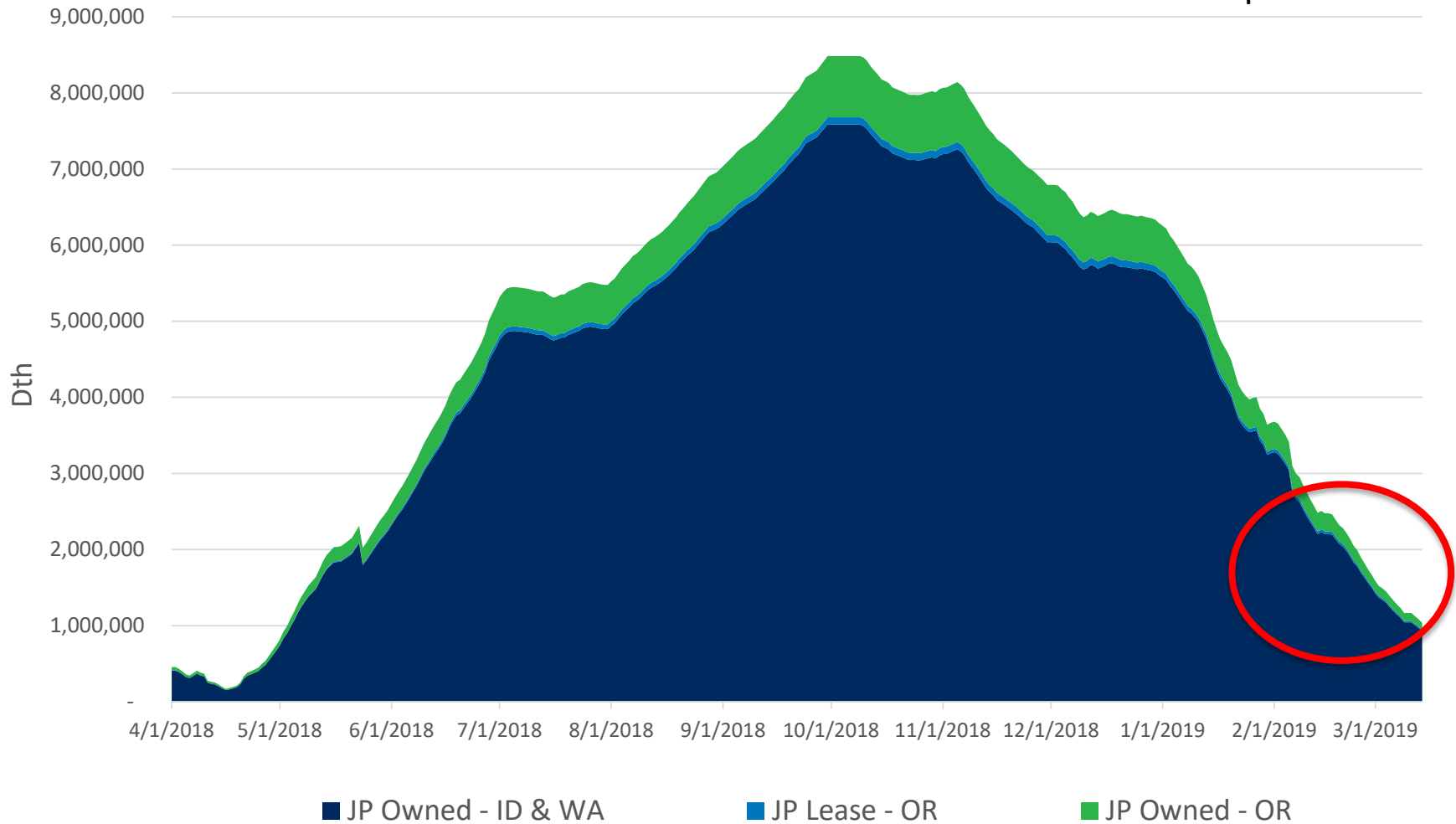
Compressor  
Failed  
2/10/19

Reduction of withdrawal capability by approx. 200-300 MMscfd  
 Avista Hedging Plan Exhibit 2  
 Avista withdrawal ability < 90 MMscfd (JP demand 50 – 90 MMscfd)



# JP Storage Levels

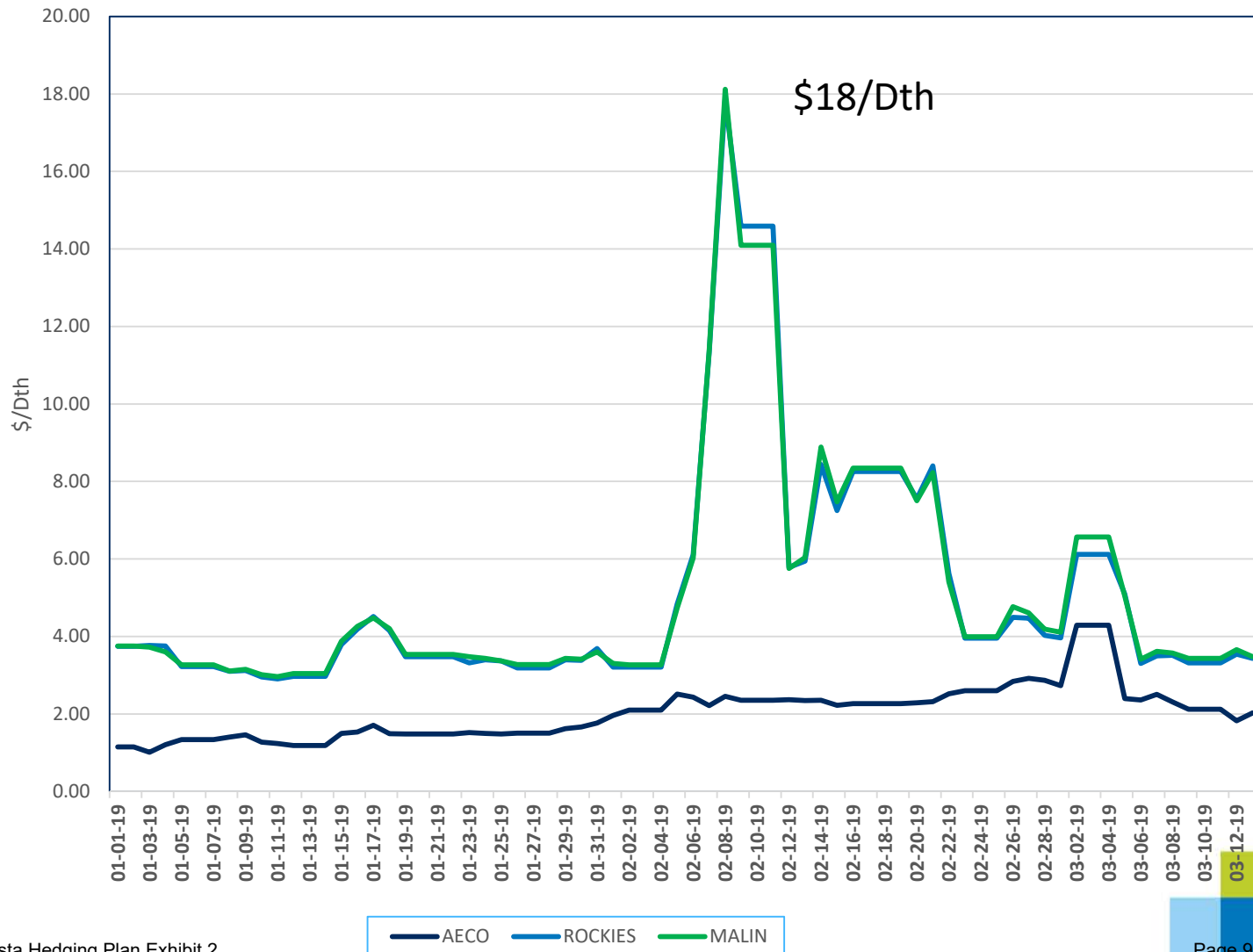
Avista – 1.0 bcf  
Puget – 2.2 bcf  
Nwp – 3.5 bcf





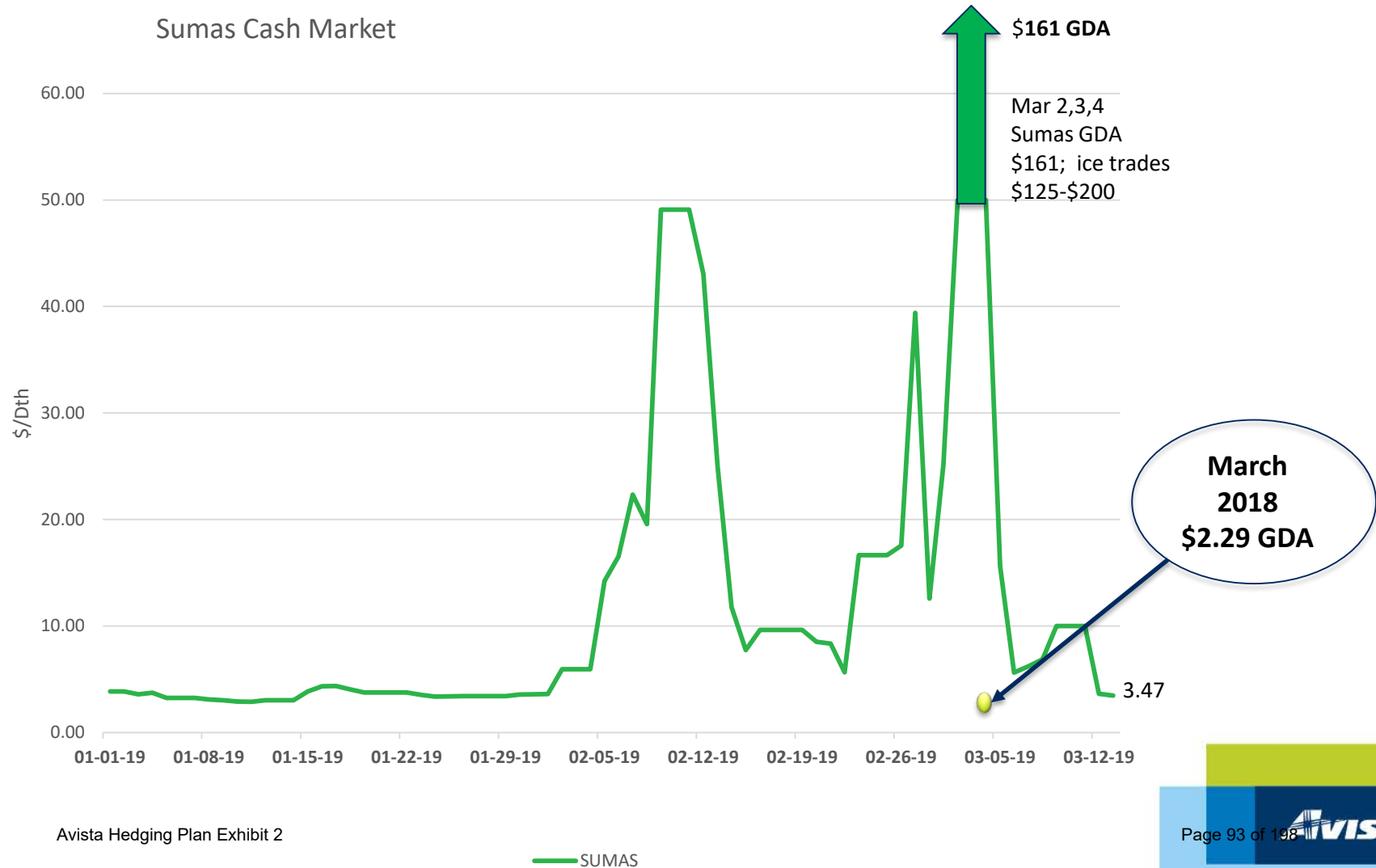
# Gas Cash Market

Cash Market

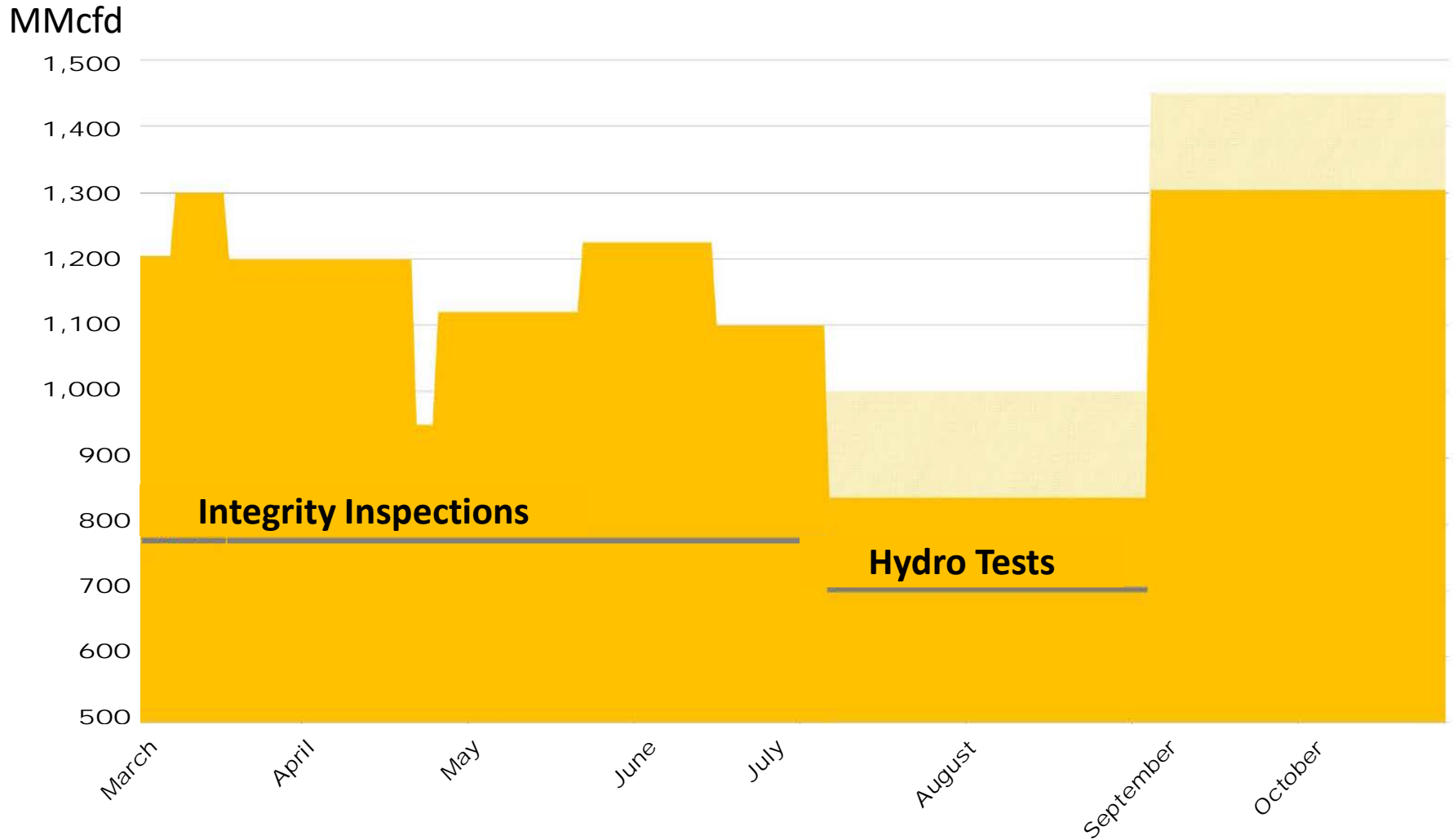


# “Perfect Storm”

Record cold temps, reduced Enbridge capacity, JP limited W/D capacity, NWP entitlements and OFO's



# Enbridge Capacity Forecast for T-South through summer 2019





**SOG**

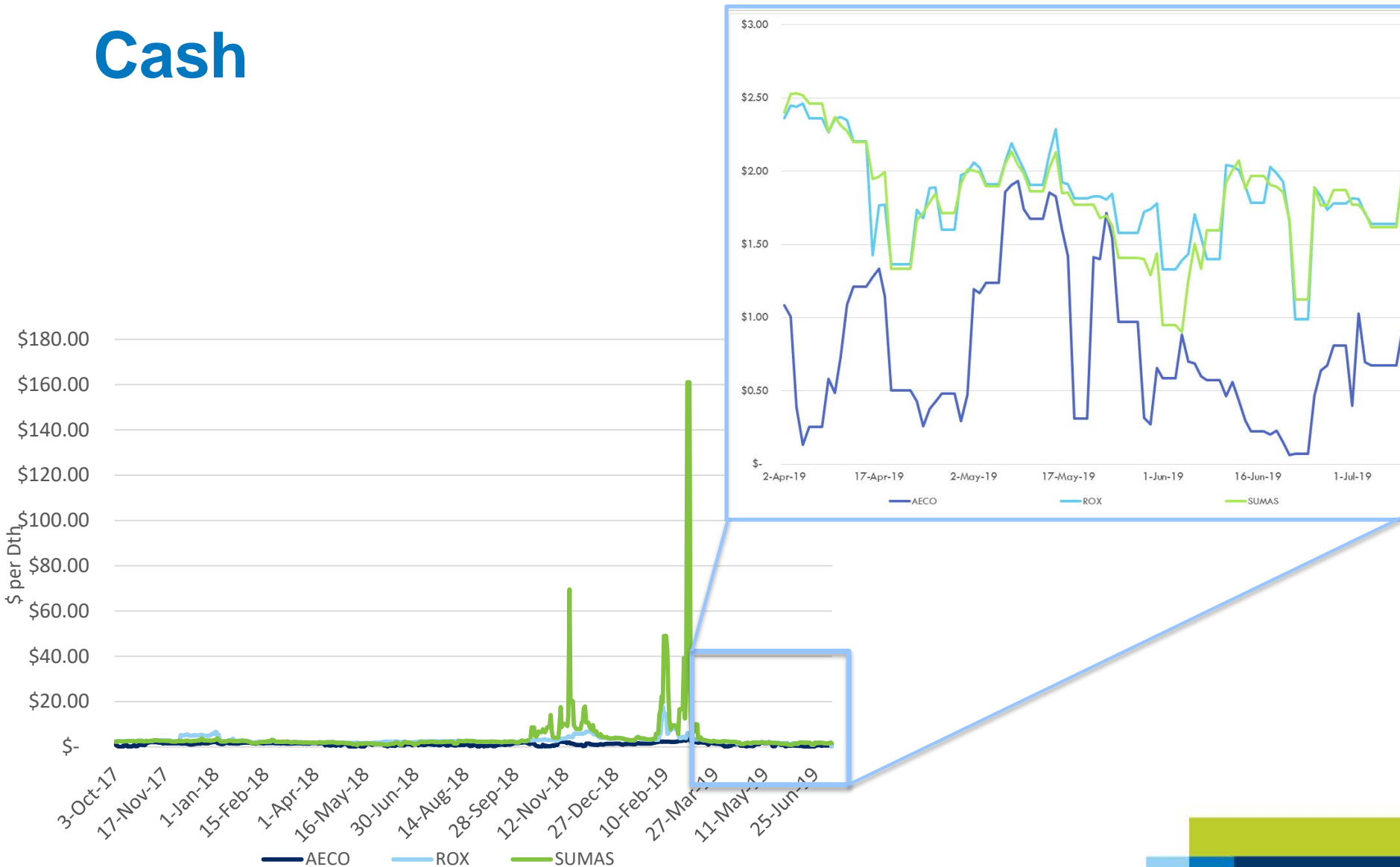
# **Gas Supply Update**

July 10, 2019

# Agenda

- Market Overview
- Procurement Plan
- Deferrals
- Rates Update
- Risk Update

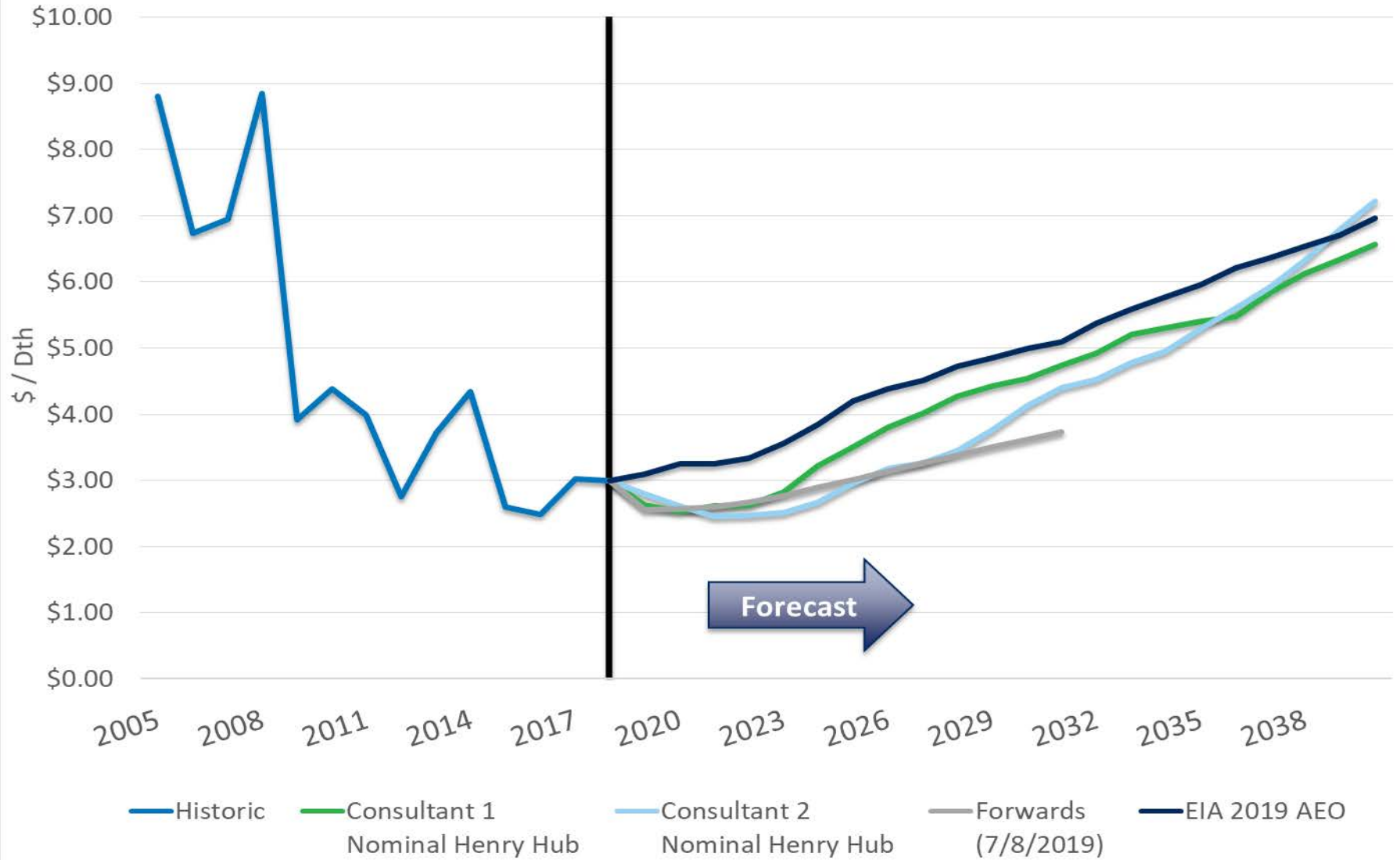
# Cash



# Forwards, '19-'20 winter strips

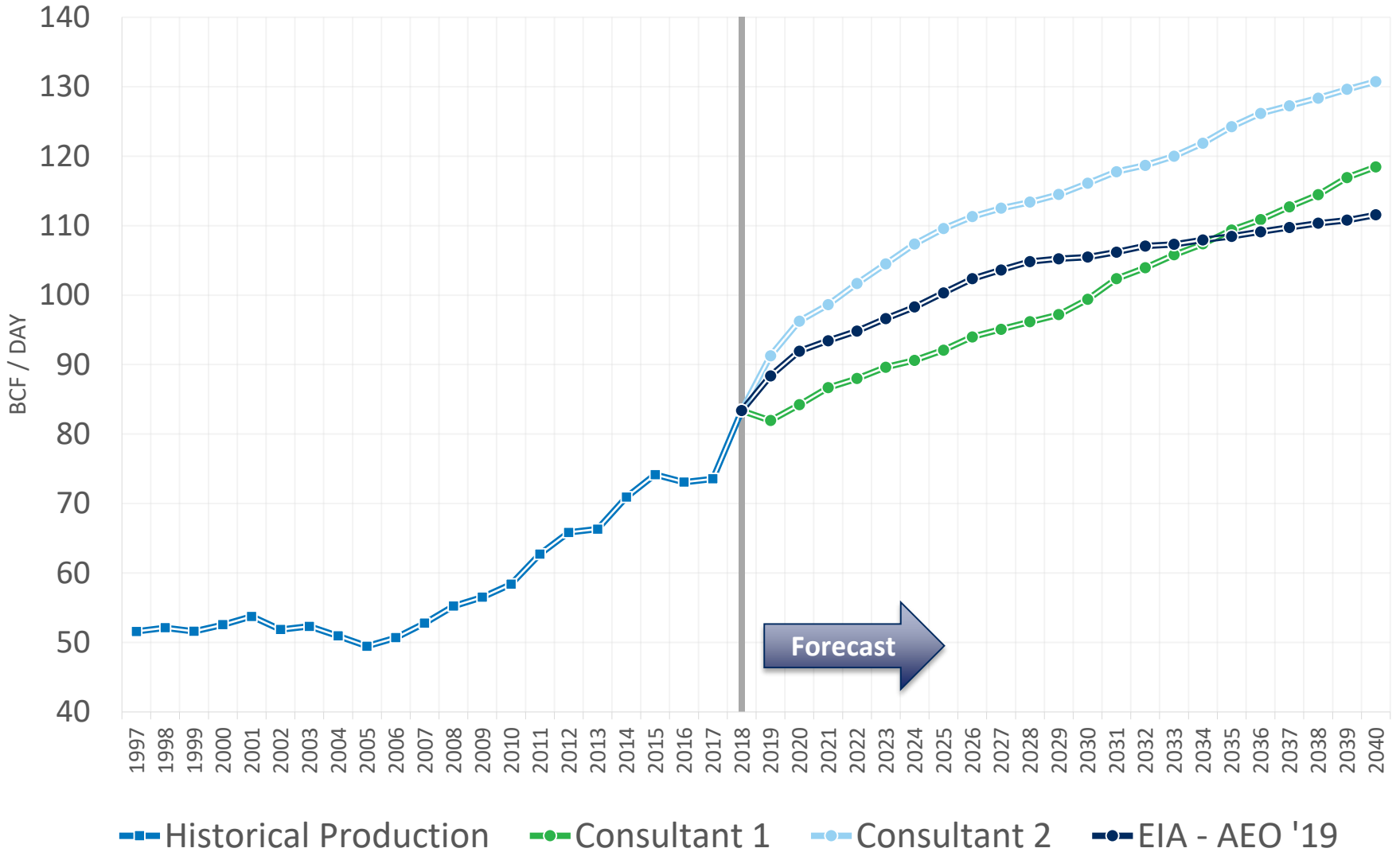


## Henry Hub Forecast (Nominal \$)



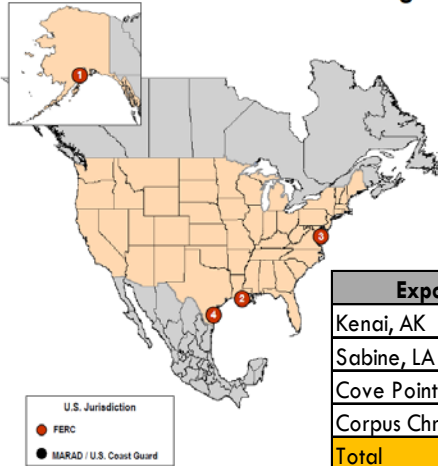


# US NATURAL GAS PRODUCTION



# LNG Exports

## North American LNG Export Terminals Existing

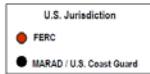


### Export Terminals

#### UNITED STATES

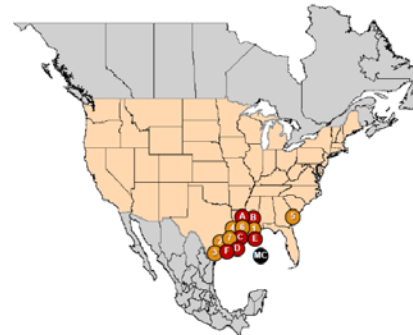
1. Kenai, AK: 0.2 Bcfd (ConocoPhillips)
2. Sabine, LA: 3.5 Bcfd (Cheniere/Sabine Pass LNG - Trains 1-5)
3. Cove Point, MD: 0.82 Bcfd (Dominion-Cove Point LNG)
4. Corpus Christi, TX: 0.71 Bcfd (Cheniere - Corpus Christi LNG Train 1)

Export Terminals (Existing)	Bcfd
Kenai, AK	0.20
Sabine, LA	3.50
Cove Point, MD	0.82
Corpus Christie, TX	0.71
<b>Total</b>	<b>5.23</b>



As of May 8, 2019

## North American LNG Export Terminals Approved, Not Yet Built



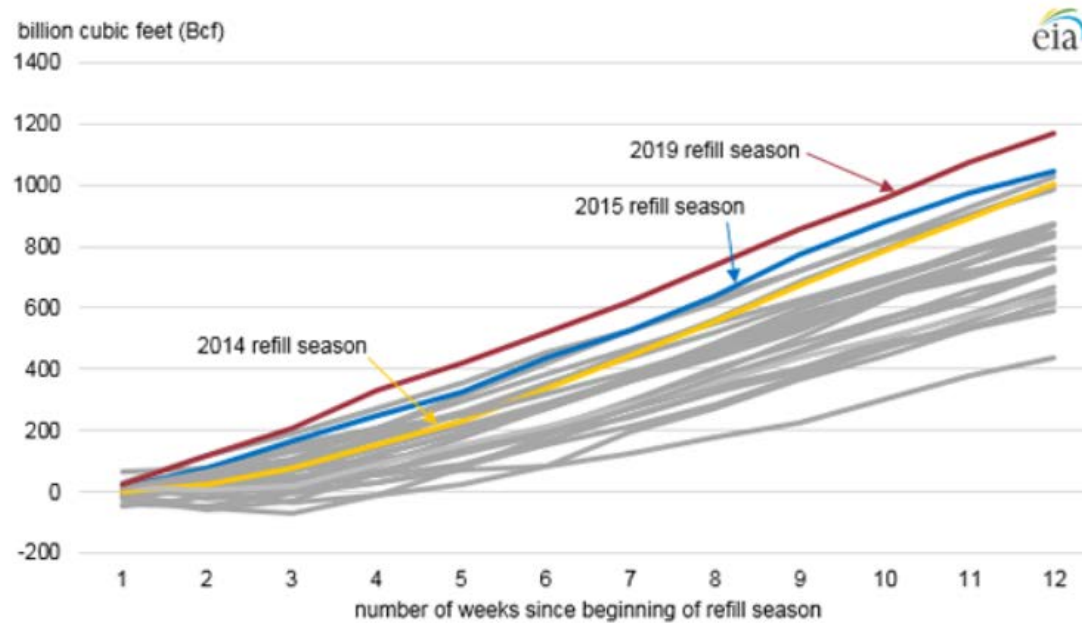
Export Terminals (Under Construction)	Bcfd
Hackberry, LA	2.10
Freeport, TX	2.14
Corpus Christi, TX	1.40
Sabine Pass, LA	0.70
Elba Island, GA	0.35
Cameron Parish, LA	1.41
Golden Pass	2.10
<b>Total (under construction)</b>	<b>10.20</b>

Export (Not under Construction) <sup>1</sup>	Bcfd
Lake Charles, LA	2.20
Magnolia LNG	1.08
Cameron LNG	1.41
Port Arthur LNG	1.86
Driftwood LNG	4.00
Freeport	0.72
<b>Total (Not under construction)</b>	<b>11.27</b>

Total Bcf per day potential = 26.7

# US Natural Gas Storage

Cumulative weekly net injections during refill season (Lower 48 states, 1994-2019)



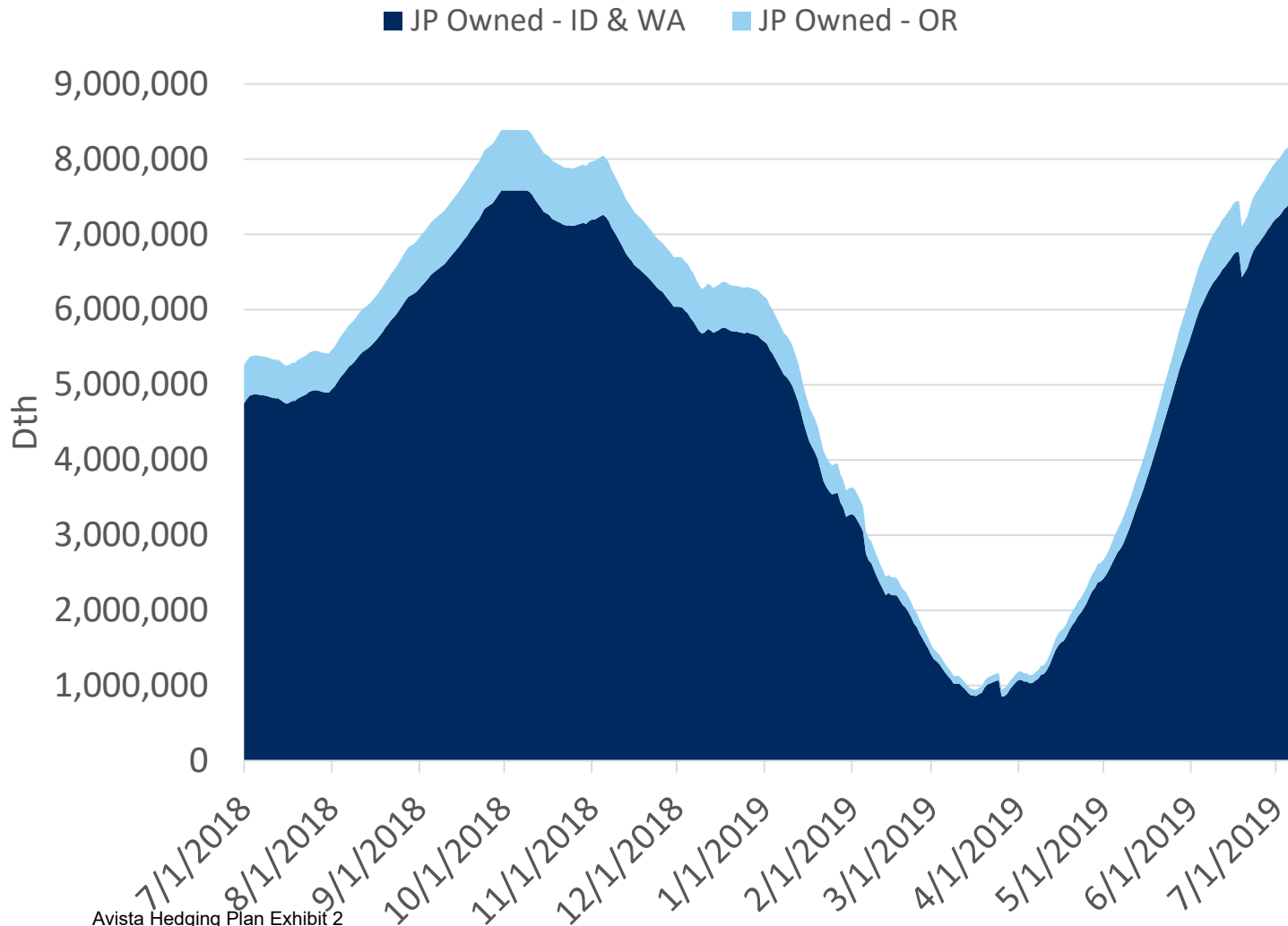
Historical Comparisons

Region	Stocks billion cubic feet (Bcf)				Year ago (06/28/18)		5-year average (2014-18)	
	06/28/19	06/21/19	net change	implied flow	Bcf	% change	Bcf	% change
East	526	499	27	27	456	15.4	536	-1.9
Midwest	568	538	30	30	451	25.9	583	-2.6
Mountain	134	127	7	7	138	-2.9	160	-16.3
Pacific	255	245	10	10	256	-0.4	286	-10.8
South Central	907	893	14	14	840	8.0	976	-7.1
Salt	259	263	-4	-4	246	5.3	284	-8.8
Nonsalt	648	630	18	18	594	9.1	693	-6.5
<b>Total</b>	<b>2,390</b>	<b>2,301</b>	<b>89</b>	<b>89</b>	<b>2,141</b>	<b>11.6</b>	<b>2,542</b>	<b>-6.0</b>

# Storage

	Capacity (Dth)	Current (Dth)	WACOG
Total	8,623,158	8,444,328	\$1.64

98% full



# Procurement Plan Hedges

# Current Procurement Plan

July 9, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
August-19	-29,129	12,500	-16,629	40%	43%	0							
September-19	-34,780	12,500	-22,280	40%	36%	1	01/22/19	08/01/19	0.59	0.83	1.63		AECO
October-19	-79,058	27,500	-51,558	40%	35%	2	06/27/19	07/30/19	1.15	1.30	1.30		AECO
November-19	-145,271	90,000	-55,271	40%	62%	0							
December-19	-199,978	90,000	-109,978	40%	45%	0							
January-20	-197,320	90,000	-107,320	40%	46%	0							
February-20	-180,560	90,000	-90,560	40%	50%	0							
March-20	-133,104	90,000	-43,104	40%	68%	0							
Apr20-Oct20	-48,396	12,500	-35,896	25%	26%	0							
Nov20-Mar21	-172,637	37,500	-135,137	32%	22%	7	06/13/19	08/20/19	1.52	1.63	1.67		AECO
Apr21-Oct21	-49,091	5,000	-44,091	24%	10%	3	01/03/19	09/23/19	0.99	1.13	1.28		AECO
Nov21-Mar22	-176,503	7,500	-169,003	32%	4%	20	06/25/19	08/05/19	1.62	1.68	1.70		AECO

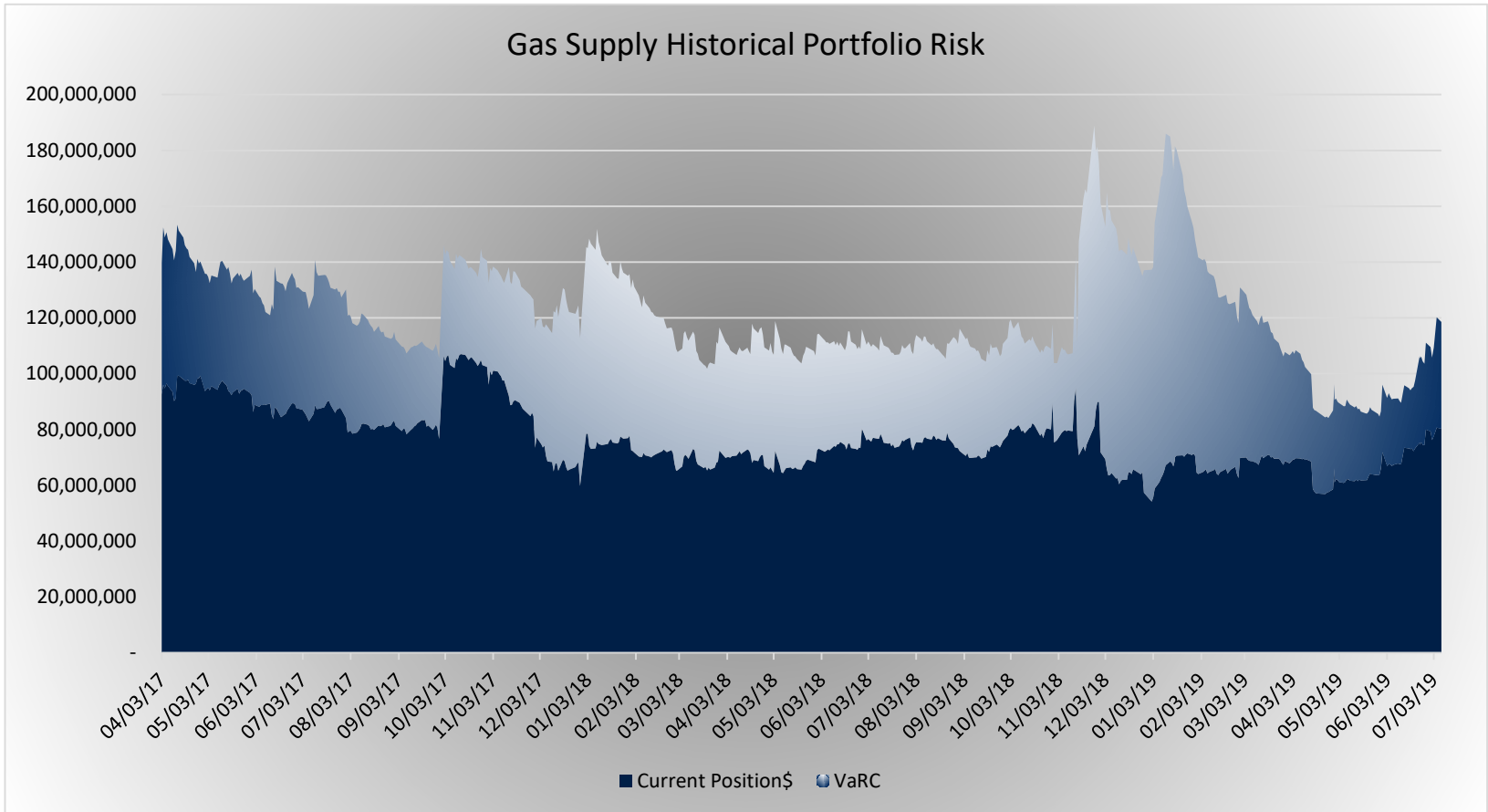
Trade Date	Contract Month	Price
5-31-19	Nov '21 - Mar '22	\$ 1.60
6-13-19	Nov '20 - Mar '21	\$ 1.56
6-21-19	Summer '20	\$ 0.85
6-25-19	Nov '21 - Mar '22	\$ 1.67
6-27-19	October '19	\$ 1.14

Avista Hedging Plan Exhibit 2 \*Hedges since last SOG on 5/15/2019

# Risk Responsive Hedging Tool (RRHT)



# Price at 2 Sigma history





# Procurement Plan Review

Scenarios you may have interest in to help determine hedging % and RRHT boundaries?

- LDC hedges at 35%

- RRHT with a 1 in 1000 probability

Other pieces of the plan to look into for our next meeting?

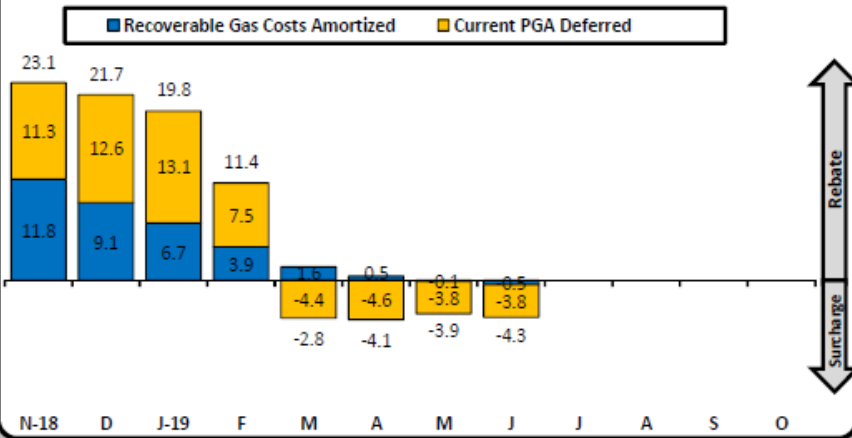
New targets and elements need agreement by mid-August 2019

# Accounting, Compliance, Rates, Risk Updates

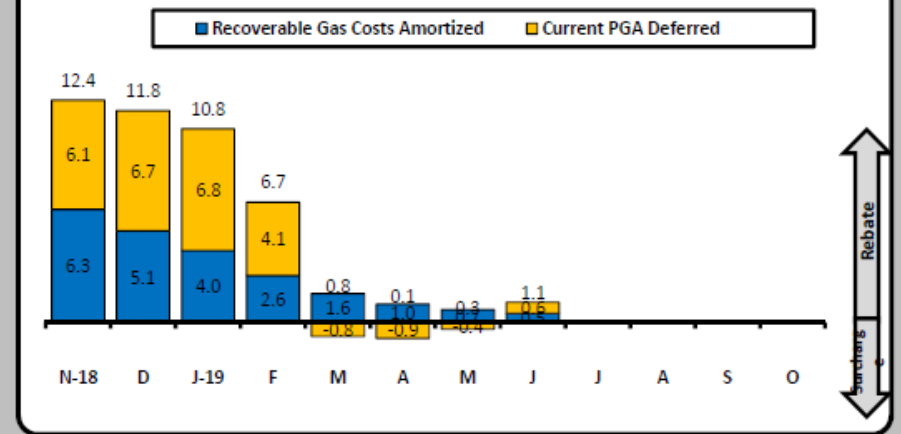
# Gas Deferral Report - June 2019

\$s in Millions: (+) Rebate; (-) Surcharge

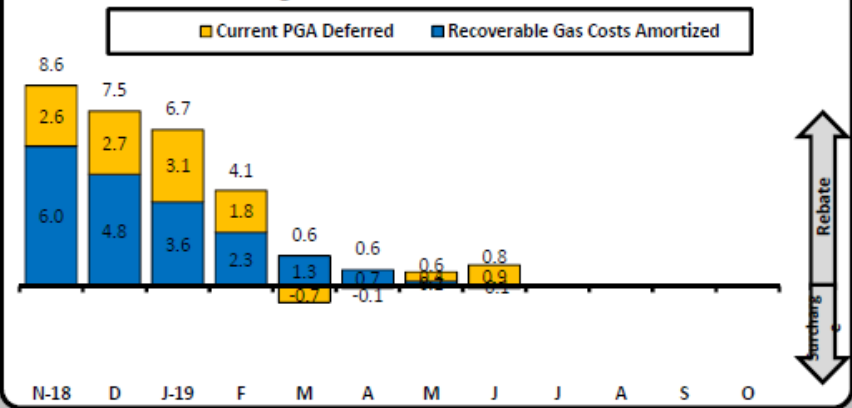
### Washington PGA Deferral Balance



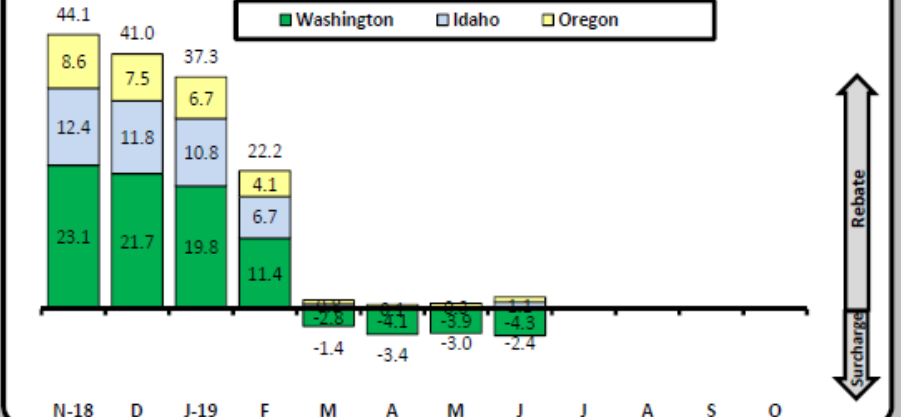
### Idaho PGA Deferral Balance



### Oregon PGA Deferral Balance



### Total Gas Deferral Balances\*



\* Total Gas Deferral Balances above excludes Decoupling, JP in WA, Intervenor Funding, Deferred Gas Costs Margin Reduction and Commission Fees in OR

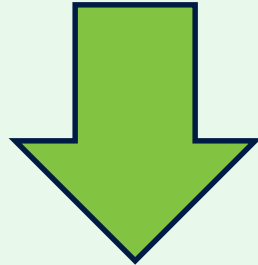
# OR PGA Forecast\*

## PRELIMINARY

### Commodity

*Current:*  
\$0.21039

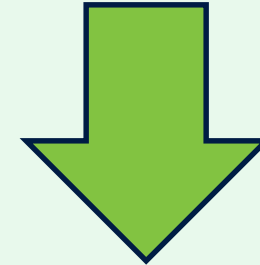
*Projected:*  
\$0.17244



### Demand

*Current:*  
\$0.16192

*Projected:*  
\$0.16094



### Amortization

*Current:*  
(\$7.9 million)

*Projected:*  
(\$0.9 million)



### Total Cost Increase

*Projected  
Overall Cost  
Increase:*  
5-7%



Based on Prices and Deferral Balances as of 06.30.2019  
\*Avista Hedging Plan Exhibit 2  
\*Excludes revenue conversion factor



**SOG**

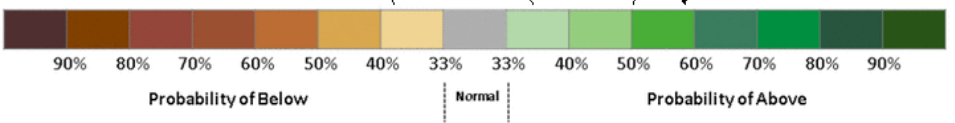
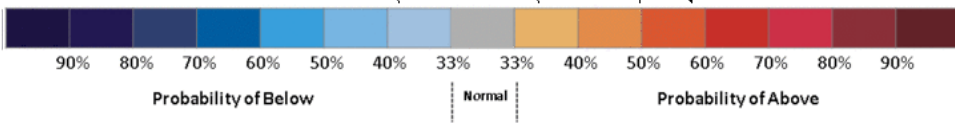
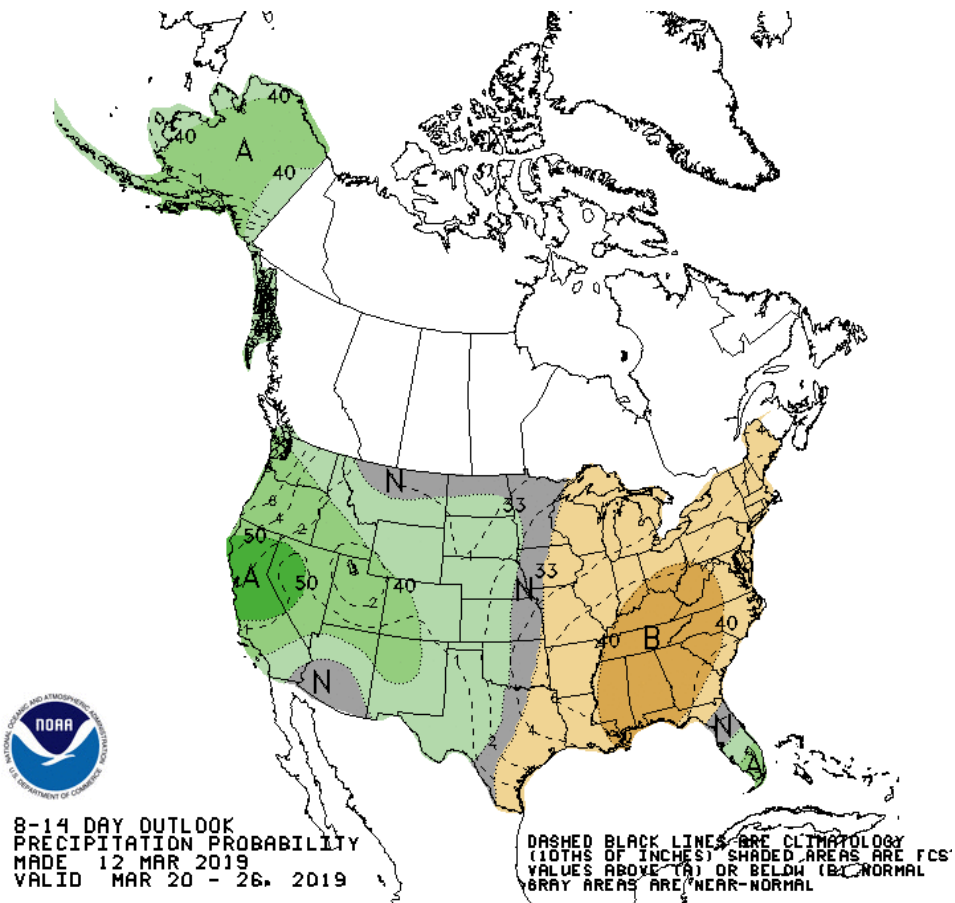
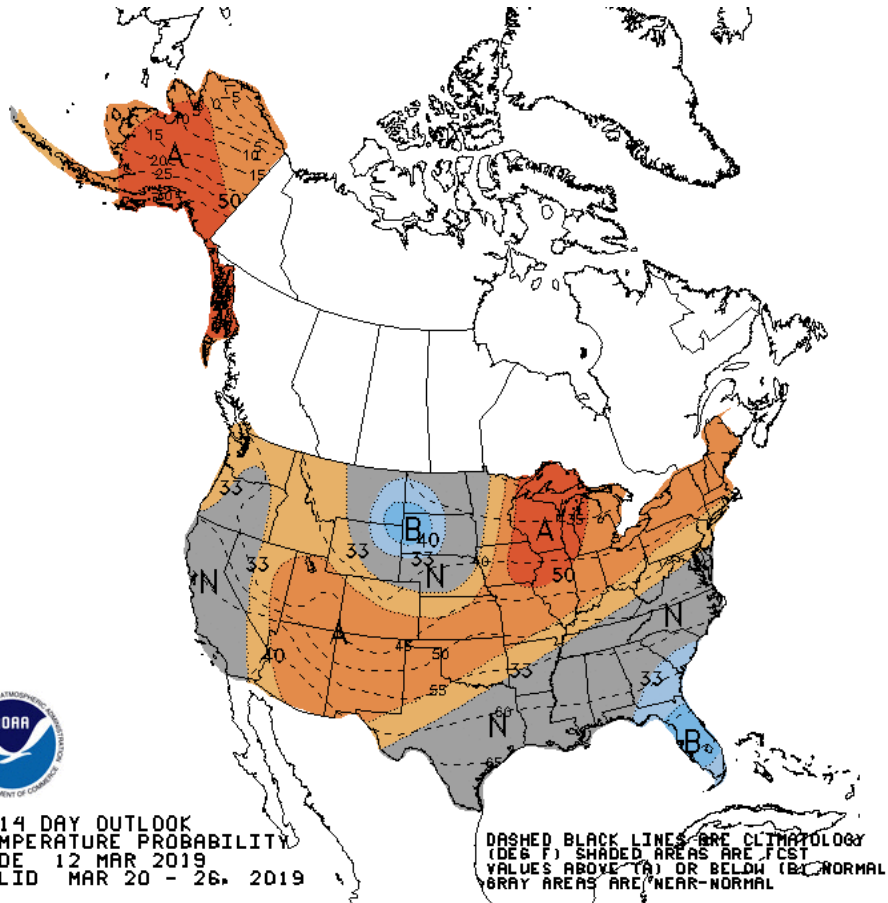
# **Gas Supply Update**

March 14, 2019

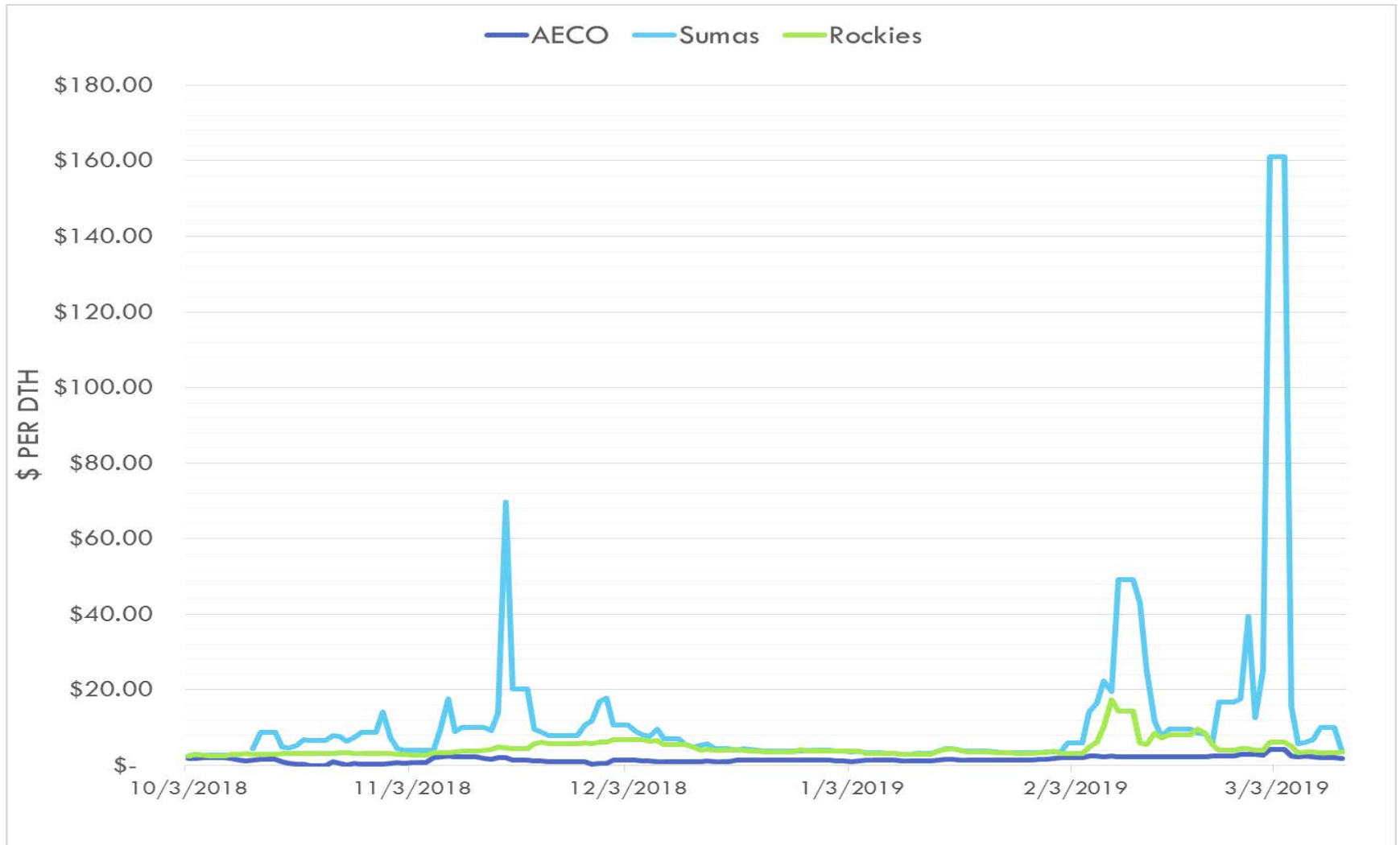
# Agenda

- Market Overview
- Procurement Plan
- Deferrals
- Gas Quality / Dithiazine
- Rates Update
- Risk Update

# 8 – 14 Day Outlook

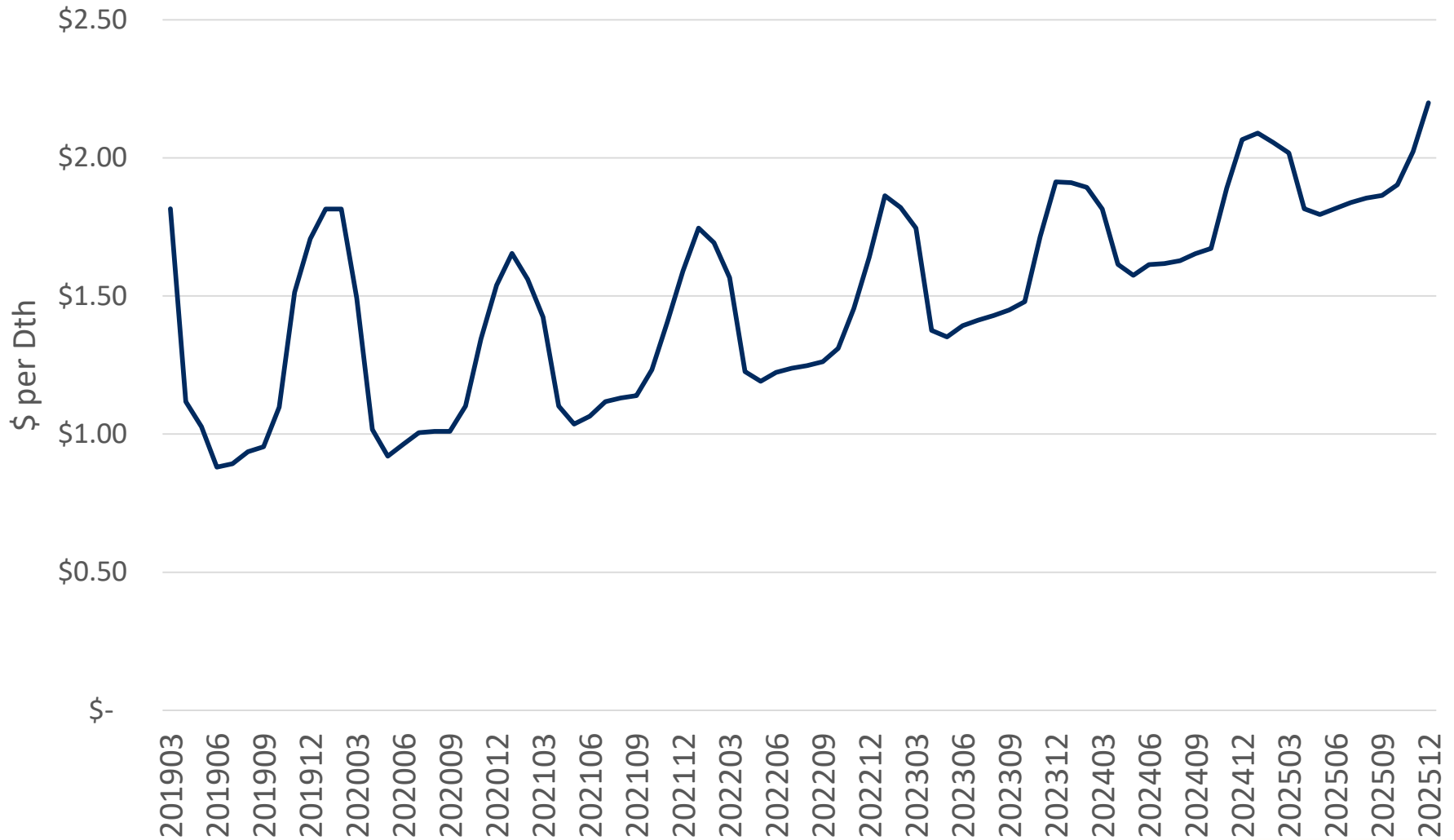


# Cash Market

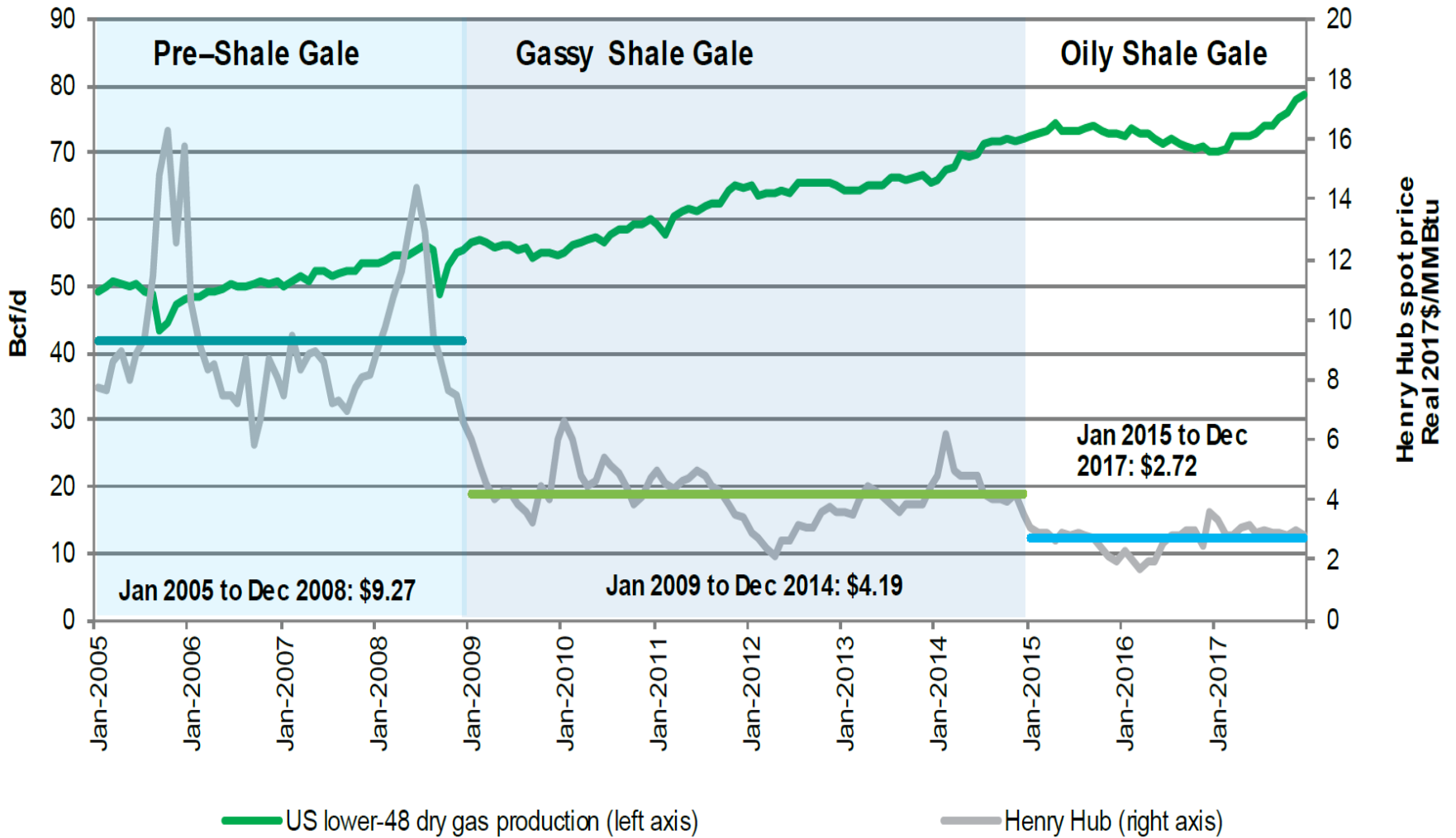




# AECO Forward Curves (3/13/2019)



# Pricing eras of the Shale Gale

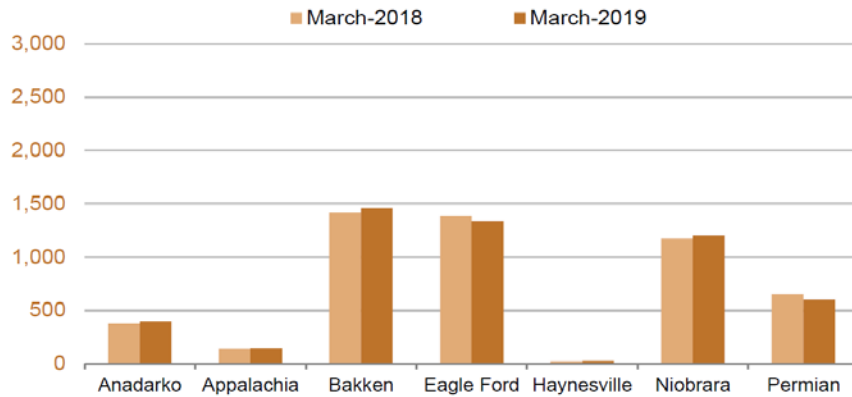


Source: IHS Markit, US Energy Information Administration, Intelligence Press

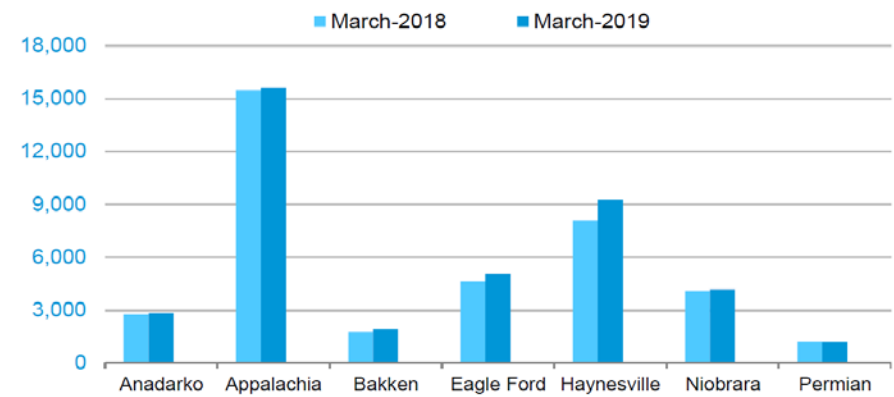
© 2019 IHS Markit

# Production per Rig

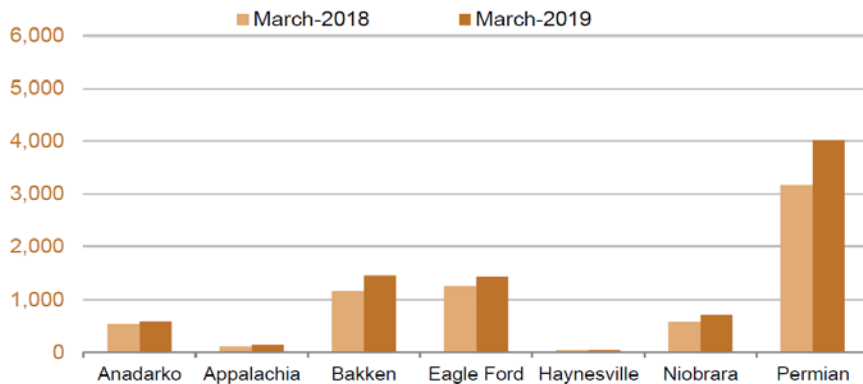
**New-well oil production per rig**  
barrels/day



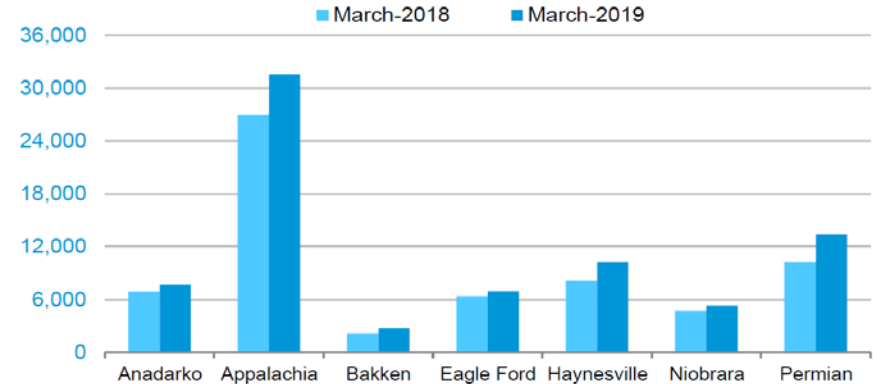
**New-well gas production per rig**  
thousand cubic feet/day



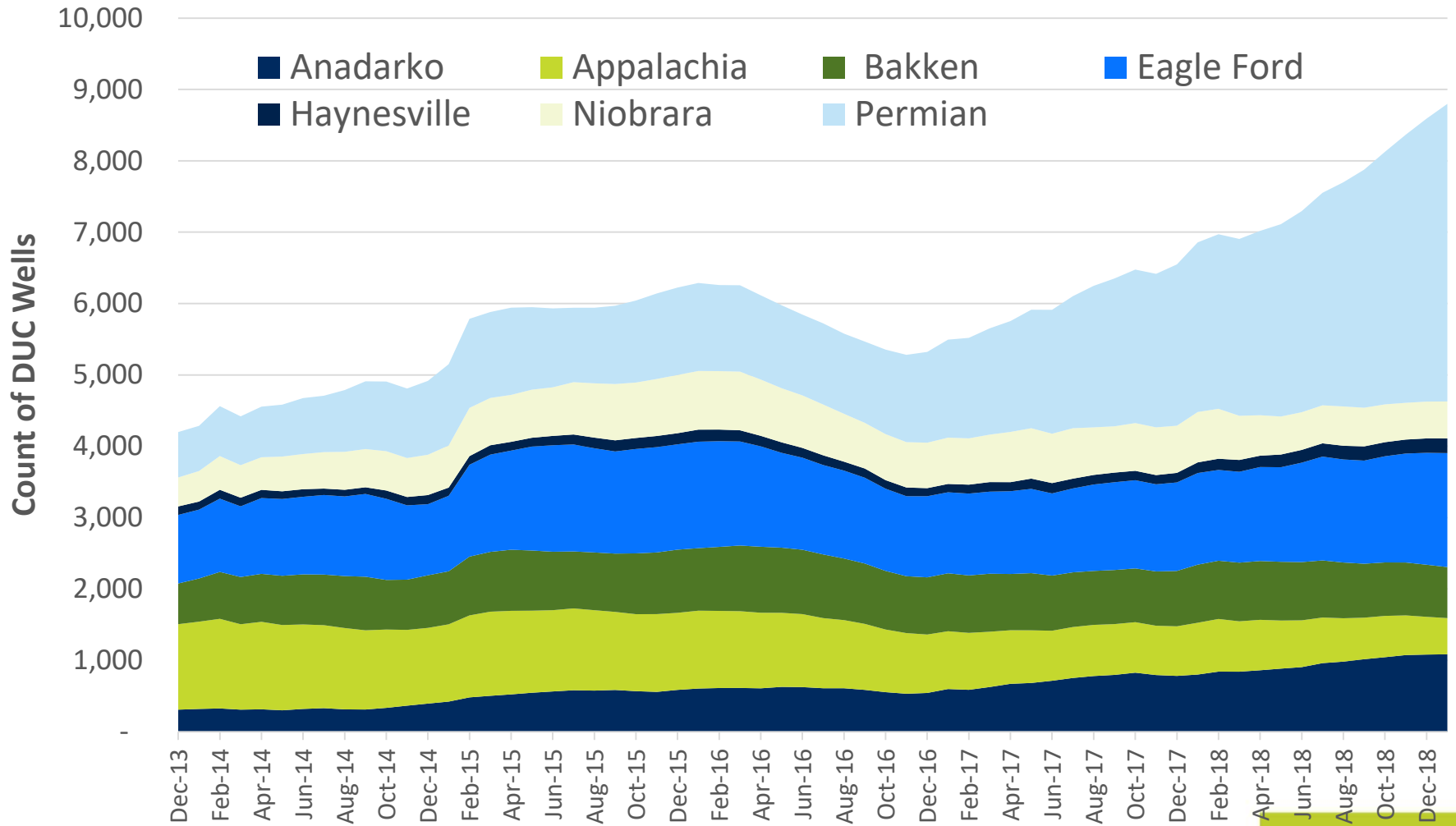
**Oil production**  
thousand barrels/day



**Natural gas production**  
million cubic feet/day



# Drilled but Uncompleted Wells (DUC)



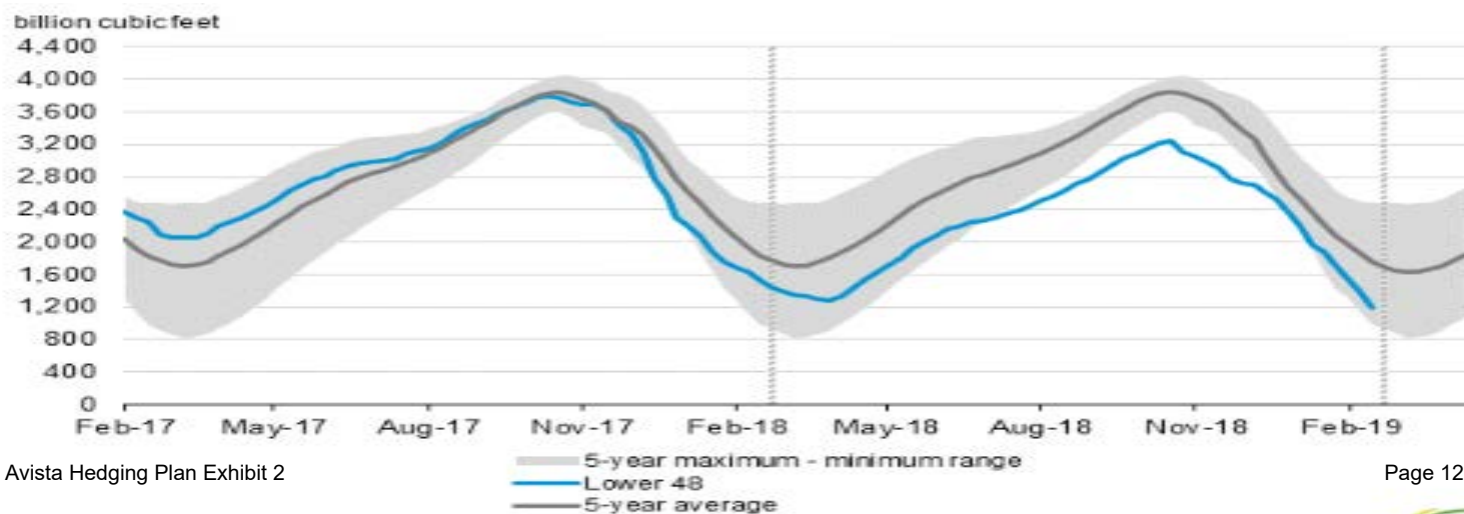
# US Storage

## Working gas in underground storage, Lower 48 states

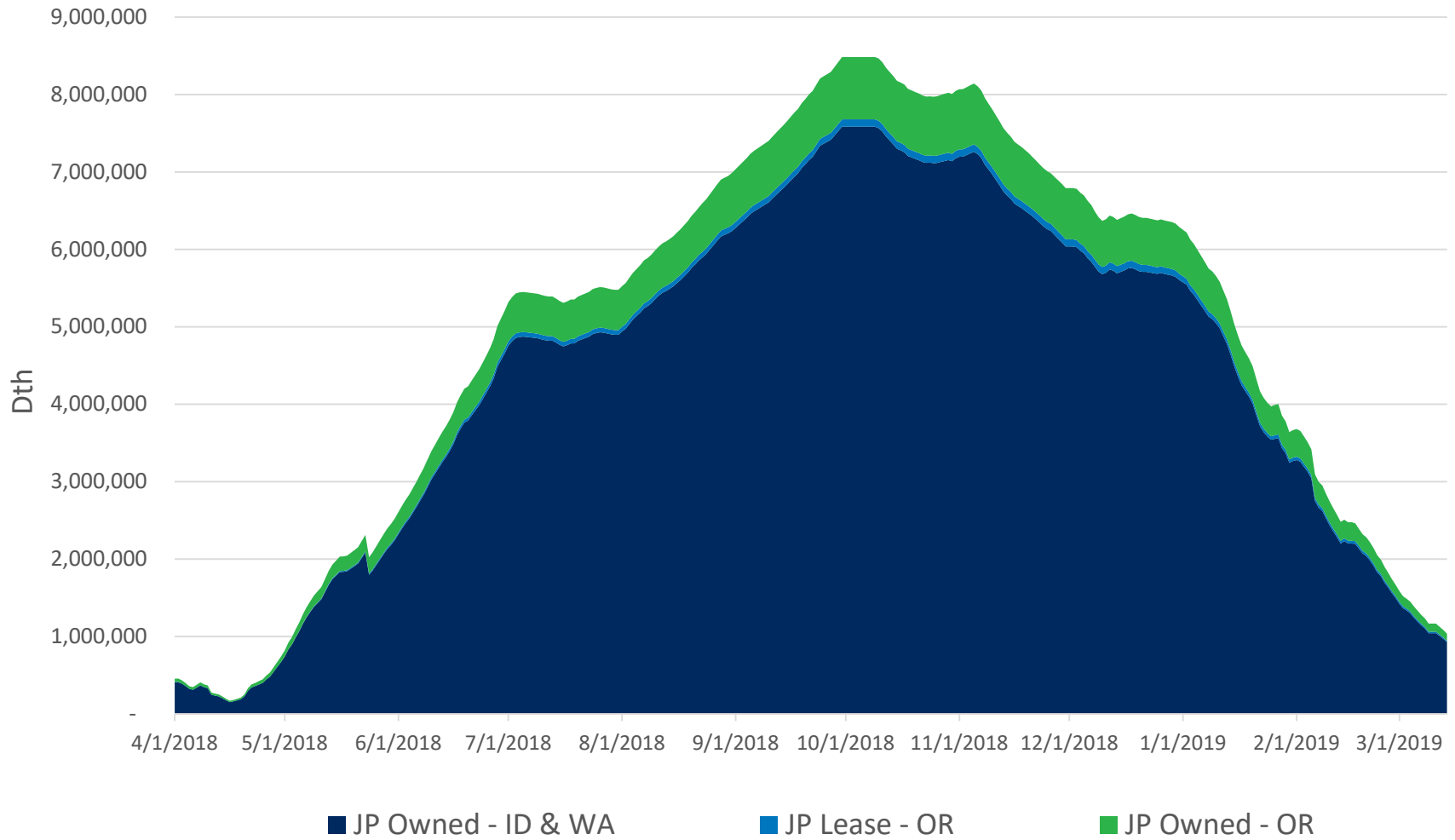
[Summary text](#) [CSV](#) [JSON](#)

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	03/08/19	03/01/19	net change	implied flow	Year ago (03/08/18)	% change	5-year average (2014-18)	% change
East	262	311	-49	-49	320	-18.1	338	-22.5
Midwest	287	338	-51	-51	354	-18.9	398	-27.9
Mountain	66	73	-7	-7	94	-29.8	116	-43.1
Pacific	102	112	-10	-10	170	-40.0	199	-48.7
South Central	469	557	-88	-88	607	-22.7	705	-33.5
Salt	129	180	-51	-51	186	-30.6	195	-33.8
Nonsalt	340	377	-37	-37	420	-19.0	510	-33.3
<b>Total</b>	<b>1,186</b>	<b>1,390</b>	<b>-204</b>	<b>-204</b>	<b>1,545</b>	<b>-23.2</b>	<b>1,755</b>	<b>-32.4</b>

Totals may not equal sum of components because of independent rounding.



# JP Storage Levels



# Procurement Plan Hedges

# Current Procurement Plan

March 13, 2019													
Physical Positions			Dynamic Window Hedging										
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
April-19	-84,848	35,000	-49,848	40%	41%	0							
May-19	-47,612	17,500	-30,112	40%	37%	1	02/20/19	03/31/19	0.84	1.03	1.33		AECO
June-19	-32,415	10,000	-22,415	40%	31%	1	10/31/18	05/01/19	0.82	0.88	1.05		AECO
July-19	-28,940	12,500	-16,440	40%	43%	0							
August-19	-29,051	12,500	-16,551	40%	43%	0							
September-19	-33,914	12,500	-21,414	40%	37%	0							
October-19	-75,051	22,500	-52,551	40%	30%	3	01/15/19	04/01/19	0.87	1.10	1.56		AECO
Nov19-Mar20	-163,694	90,000	-73,694	32%	55%	0							
Apr20-Oct20	-47,799	10,000	-37,799	25%	21%	1	11/20/18	03/01/20	0.88	1.00	1.30		AECO
Nov20-Mar21	-166,091	32,500	-133,591	32%	20%	9	01/23/19	04/02/19	1.31	1.50	1.76		AECO
Apr21-Oct21	-48,480	5,000	-43,480	25%	10%	3	01/03/19	09/23/19	0.99	1.12	1.28		AECO
Nov21-Mar22	-169,744	0	-169,744	32%	0%	22	02/28/19	04/12/19	1.47	1.60	1.74		AECO

Trade Date	Contract Month	BS	FF	Purchase Price
2/20/2019	Apr-19	\$ (1.64)	\$ 2.68	\$ 1.04
2/20/2019	May-19	\$ (1.69)	\$ 2.70	\$ 1.01
3/4/2019	Apr-19	\$ (1.75)	\$ 2.84	\$ 1.09
3/7/2019	Apr-19	\$ (1.70)	\$ 2.86	\$ 1.16

Avista Hedging Plan Exhibit 2

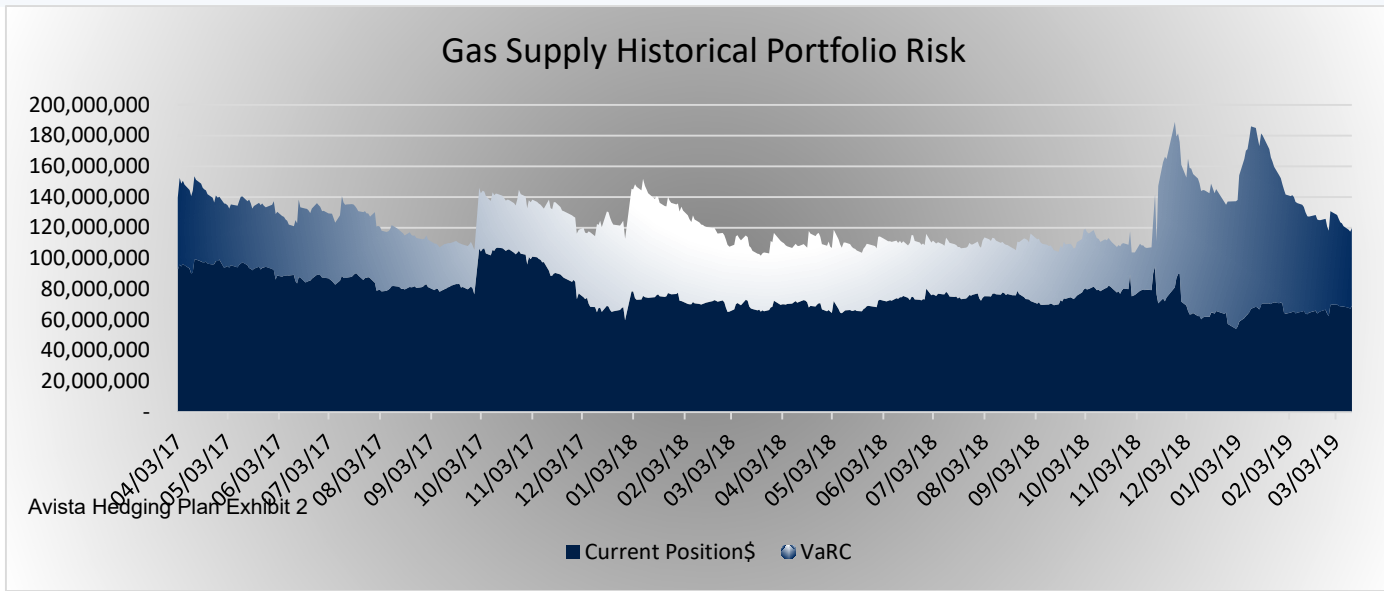
Page 123 of 198



\*Hedges since last SOG on 2/14/2019

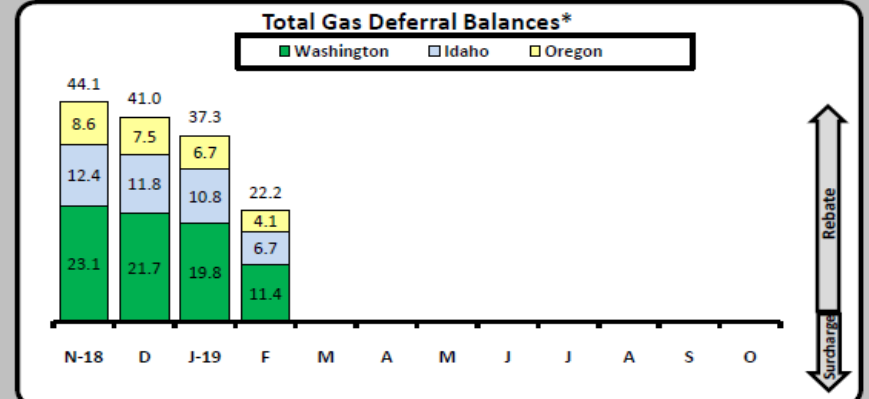
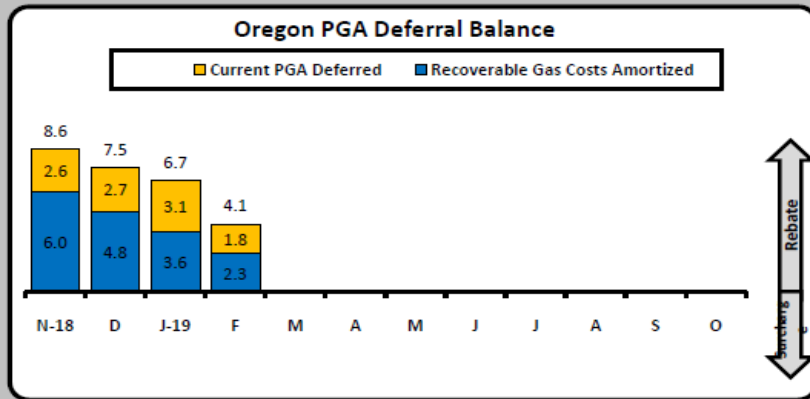
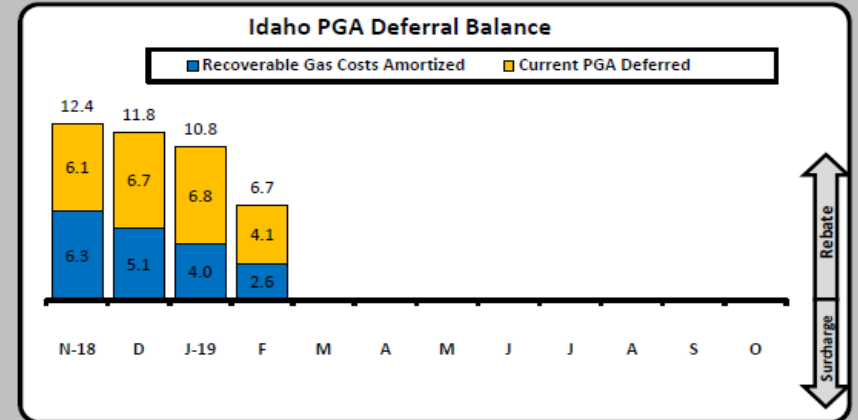
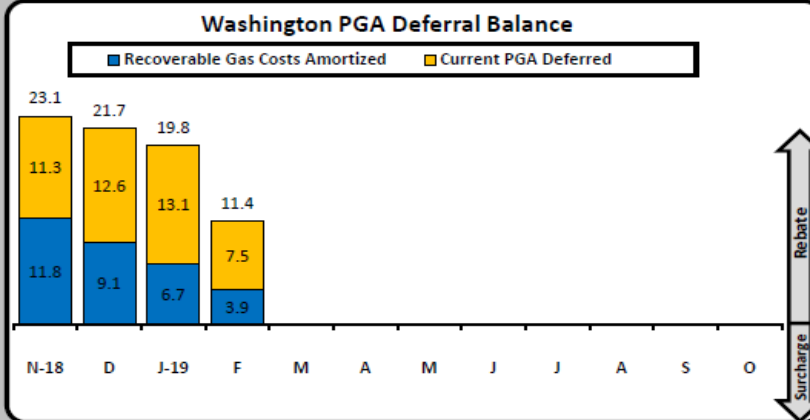


# Risk Responsive Hedging Tool (RRHT)



# Gas Deferral Report – February 2019

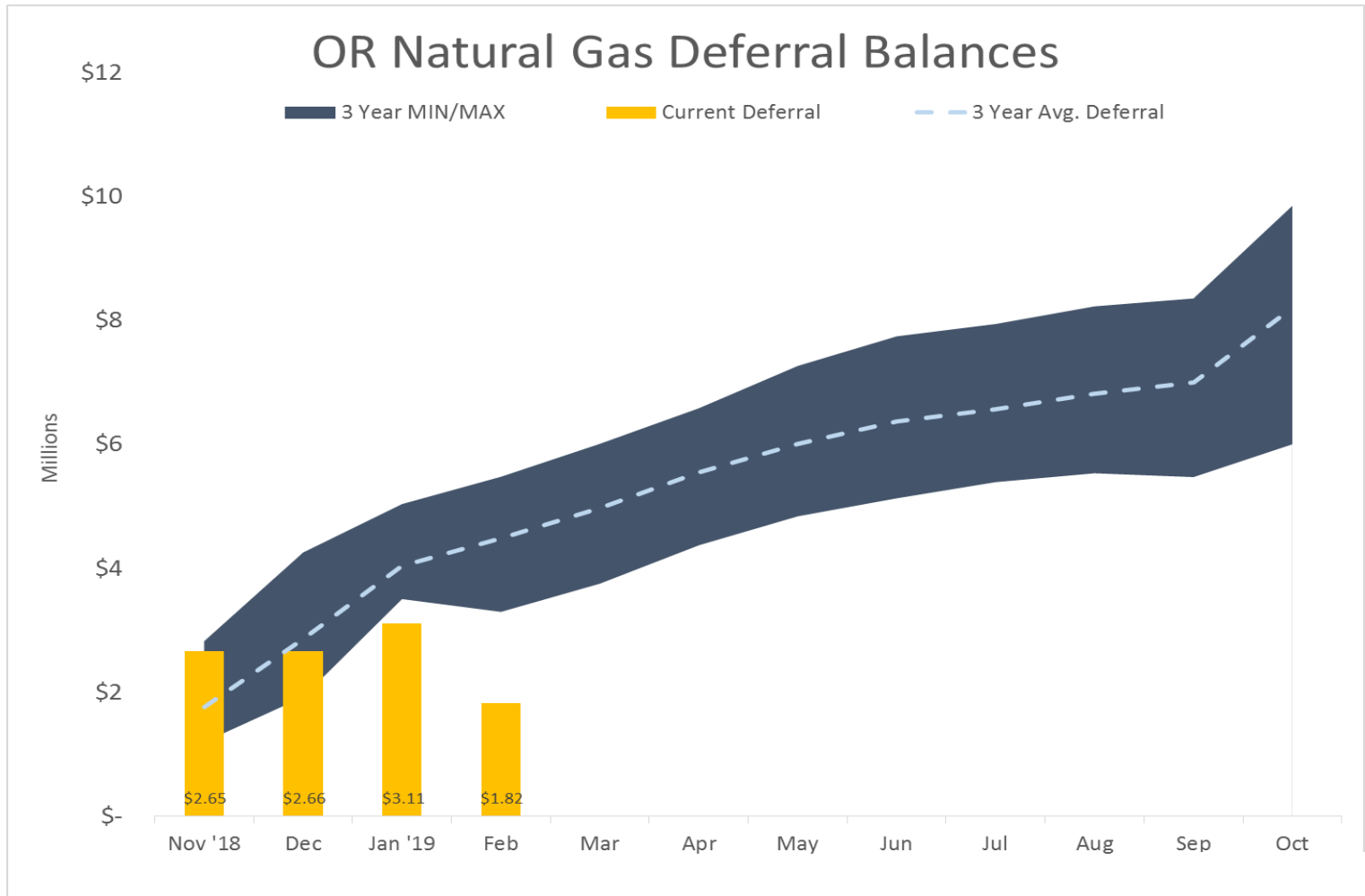
\$s in Millions: (+) Rebate; (-) Surcharge



\* Total Gas Deferral Balances above excludes Decoupling, JP in WA, Intervenor Funding, Deferred Gas Costs Margin Reduction and Commission Fees in OR

# Gas Deferral Report – February 2019

\$s in Millions: Direction = Rebate





# Gas Quality / Dithiazine

# What is Dithiazine?

## Devil's dandruff...

- By-product of Triazine
  - H<sub>2</sub>S scavenger
  - Used industry-wide for decades – gas and oil
  - Injected at well-head, or field processing
- White powder, liquid and gas
  - Conditions of pressure, temperature, velocity it can precipitate out onto facilities
- ONLY found in WCSB gas stream
  - No reports anywhere else (US or Canada)
  - All fouling tied to WCSB gas from NGTL

*Information as of Mar. 31, 2018*

Avista Hedging Plan Exhibit 2







## D-Zine Timeline

- 🔥 2015 First discovered (NGTL system)
- 🔥 2016-2017 Officially identified (NGTL)
- 🔥 Early 2018 D-zine increasing frequency across systems
- 🔥 June 2018 to now TransCanada industry engagement
  - 🔥 Executive summits
  - 🔥 Producer associations
  - 🔥 Regulators (NEB, PHMSA, FERC)
  - 🔥 Technical surveys, Task Force meetings, shipper engagement
  - 🔥 Gas quality notice
    - 🔥 April 2019 “deadline”

# TransCanada Notice

JANUARY 16 2018

As a follow up to its EBB notice dated June 29, 2018, 11:29, Gas Transmission Northwest LLC (GTN), indirectly and partially owned by TransCanada PipeLines Limited (TransCanada), is informing interested parties that a chemical substance, Dithiazine, continues to appear at facilities on the GTN System, and those of some upstream and downstream connecting pipelines.

Dithiazine is a sulphur compound by-product created through the use of Triazine, a liquid chemical scavenger used by producers to remove hydrogen sulfide (H<sub>2</sub>S) from gas streams. TransCanada has become aware that Dithiazine may drop out of the gas stream, under certain conditions, in the form of a white powder, and further chemically change to an adhesive, putty-like substance at some points of pressure reduction (for example, at a regulator) due to a temperature drop that accompanies the pressure reduction. If a sufficient quantity of the material is accumulated in certain appurtenances, it could cause them not to function properly.

As TransCanada has previously advised, multi-stage pressure regulation and/or heating of the gas stream prior to the pressure cut can mitigate against Dithiazine dropping out of the natural gas stream. In addition, periodic equipment inspections and cleaning to remove any observed solid deposits may help prevent operational issues with facility equipment.

**However, due to the potential for Dithiazine to interfere with equipment–functionality, TransCanada is considering disallowing the receipt of gas that has interacted with Triazine into the GTN System if the factors contributing to the presence of Dithiazine do not change. In the event Dithiazine continues to appear at facilities on the GTN System, GTN may decide to issue an Operational Flow Order by April 1, 2019 in accordance with Section 6.30 of its FERC Gas Tariff, as amended from time to time, to maintain or restore the operational integrity of its system.**

Excludes AEL&P



# Where is D-zine Used?

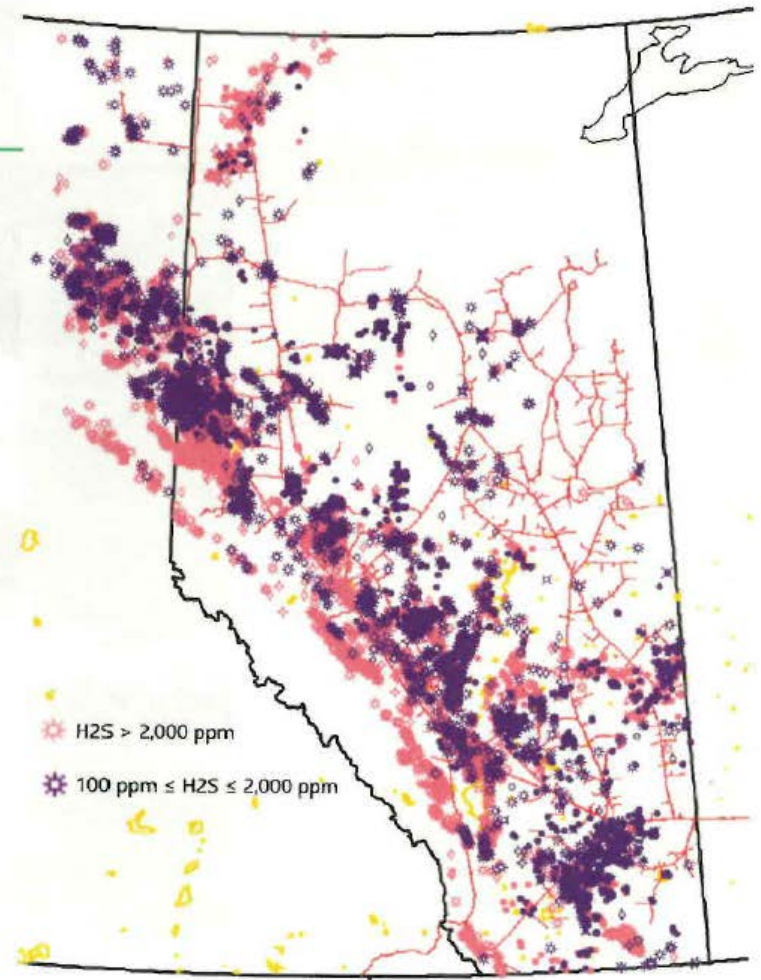
## Gas Composition and Source

According to literature and chemical suppliers, triazine scavenger is most suitable for H<sub>2</sub>S concentrations of up to 2,000 ppm (though some producers may use for H<sub>2</sub>S concentrations greater than 2,000 ppm)

808,683 wells in Accumap Database

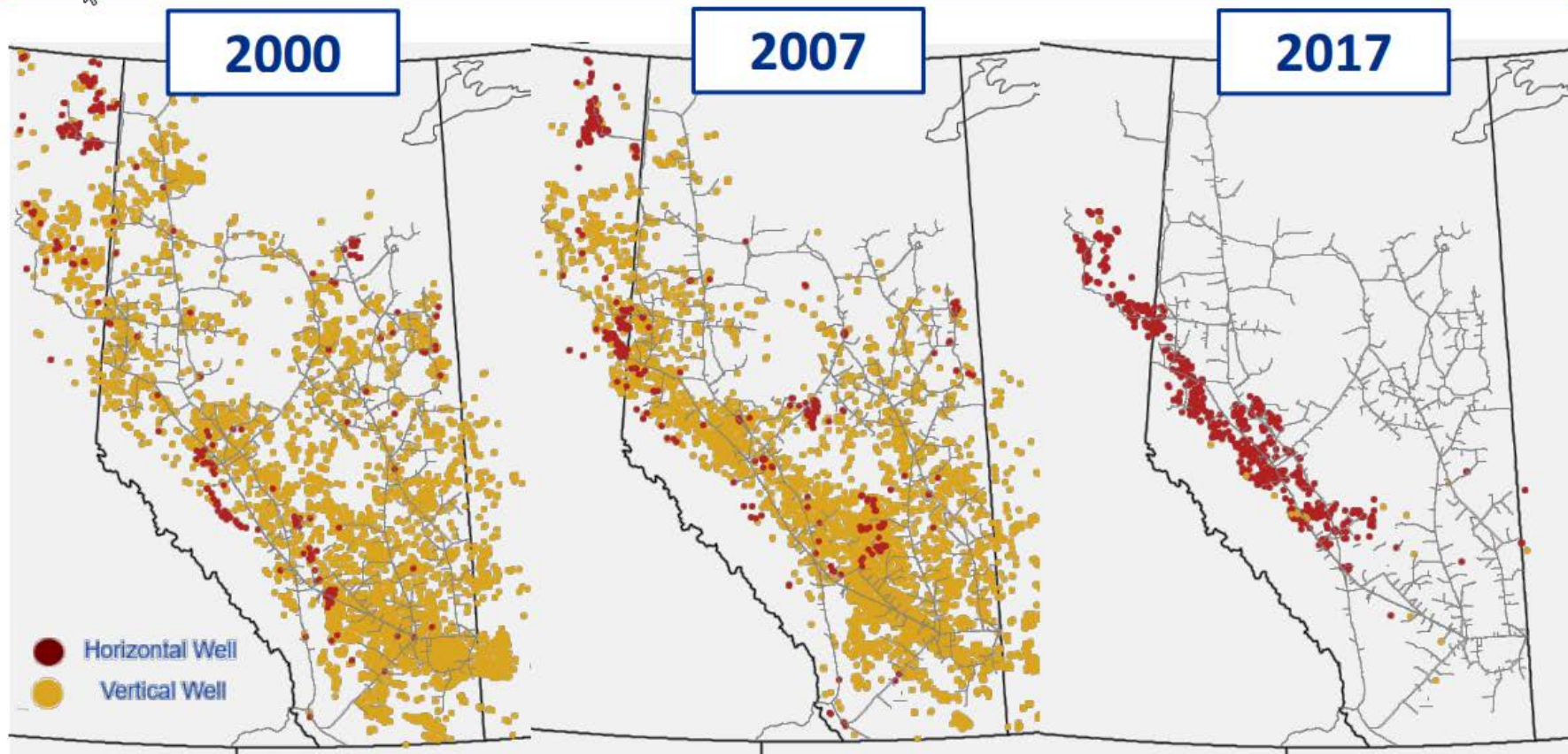
- 10,005 wells potentially active (not abandoned) with H<sub>2</sub>S > 2,000 ppm
- 6,350 wells 100 ppm < H<sub>2</sub>S ≤ 2,000 ppm (most suitable range for triazine scavenging)

Source: Accumap data showing wells with H<sub>2</sub>S analysis. Note that reporting is not mandatory and Accumap does not show wells with H<sub>2</sub>S greater than 0 ppm but less than 100 ppm



# Where Does D-zine Come From?

## Evolution of Drilling Activity





## Regulator/meter failures

- High pressure & low pressure alarms
- Blowing relief valves - gas released to atmosphere
  - 4 “reportables” for pressure excursions
  - Reported to Commissions and the PHMSA
- Safety issue
- Rathdrum forced off-line – 3<sup>rd</sup> time
- Fouling found at CS2 during routine maintenance





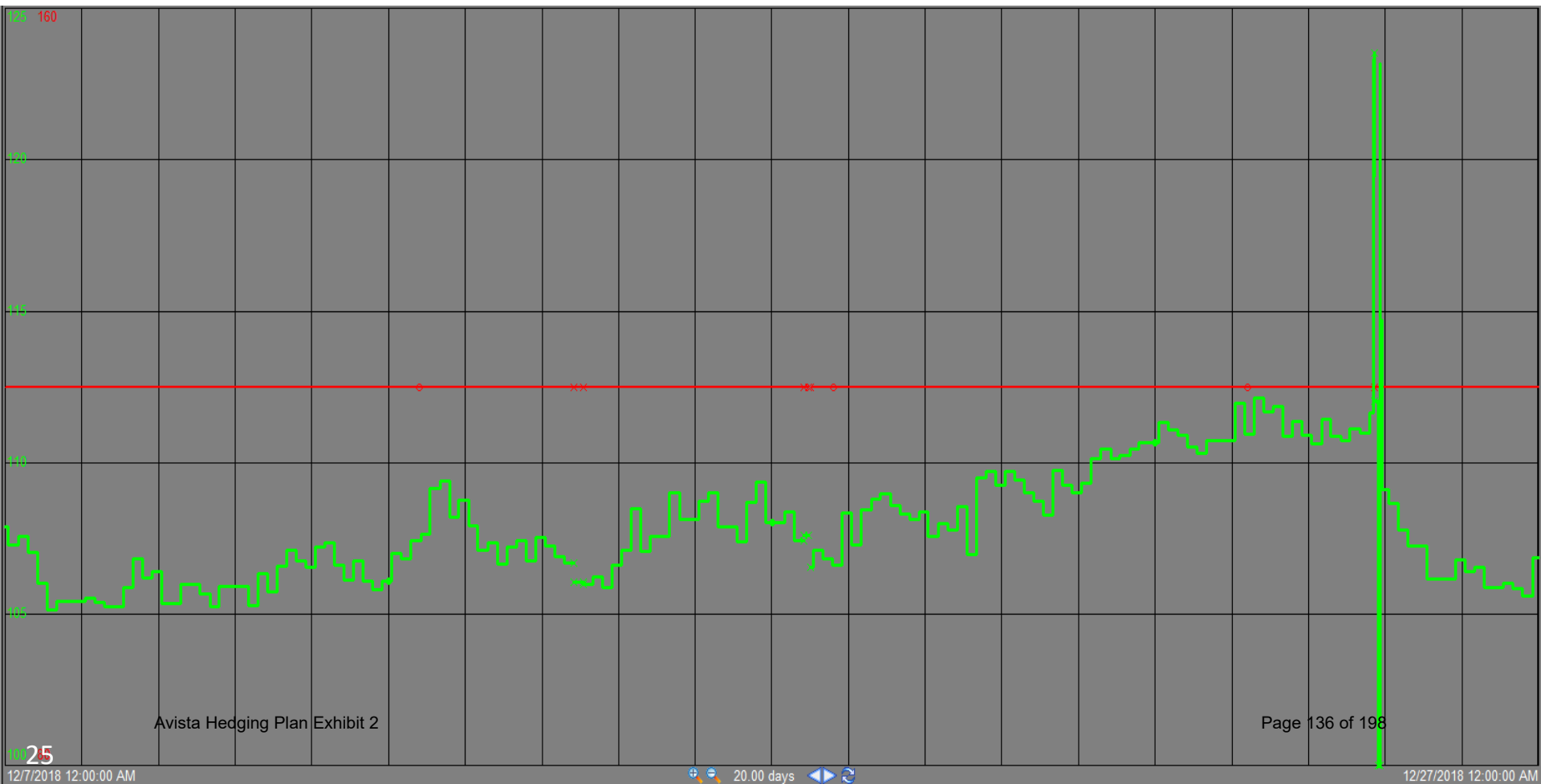
# Avista Distribution Facilities

- 13,437 miles of pipe
- 1,530 gate, regulator, and industrial meter stns
- Only 200 stns have telemetry



# Pressure Monitoring

## 20 day pressure trend



# Mitigation

- Pilot Filters
- Pilot Heaters
- Monitoring SCADA
- Increasing maintenance
- AGA SOS





## Safety – 1<sup>st</sup> and foremost

- Deliver energy to our customers safely, reliably and responsibly

## Reliability

- No system redundancy

## Natural gas future

- State and federal policy





**SOG**

# **Gas Supply Update**

May 15, 2019

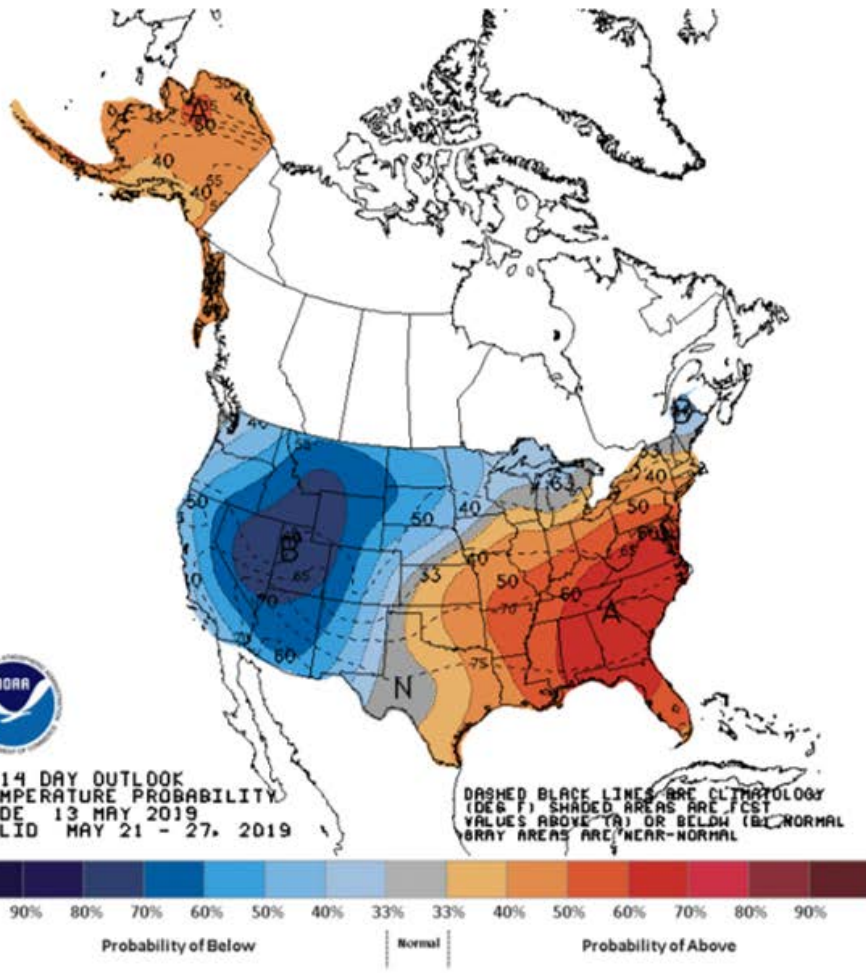


# Agenda

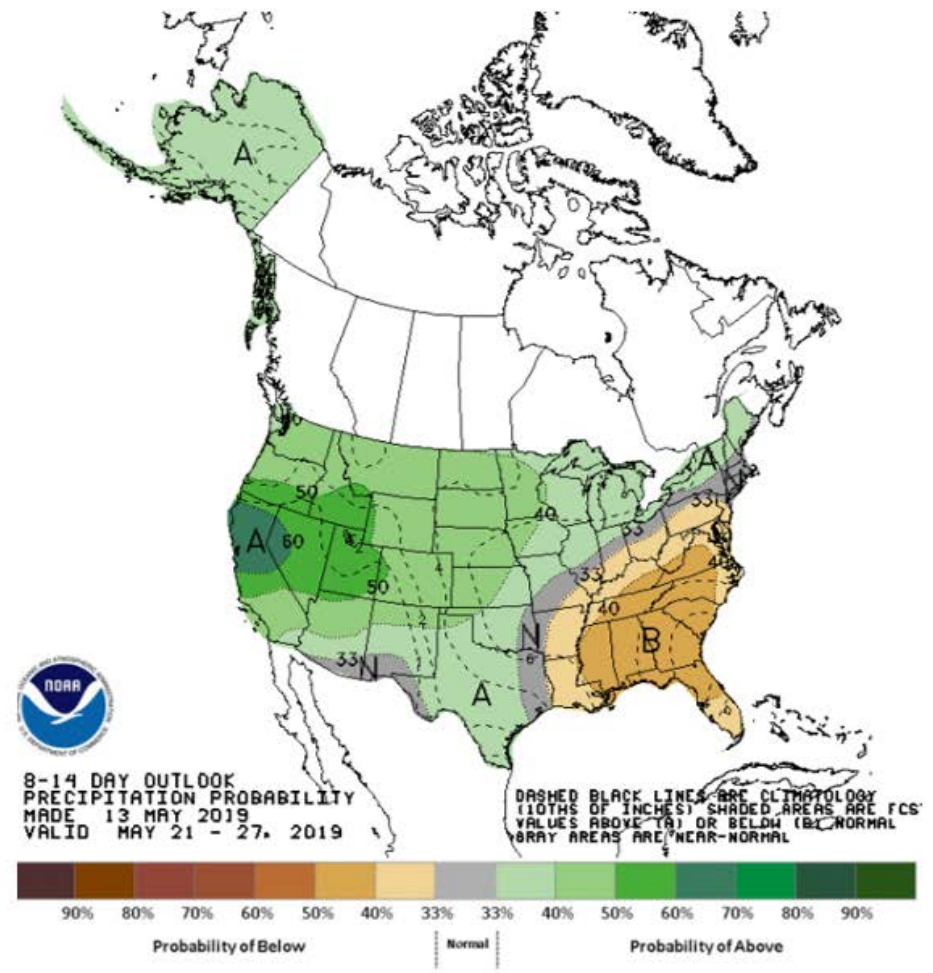
- Market Overview
- Procurement Plan
- JP Update
- Deferrals
- Rates Update
- Risk Update

# 8 – 14 Day Outlook

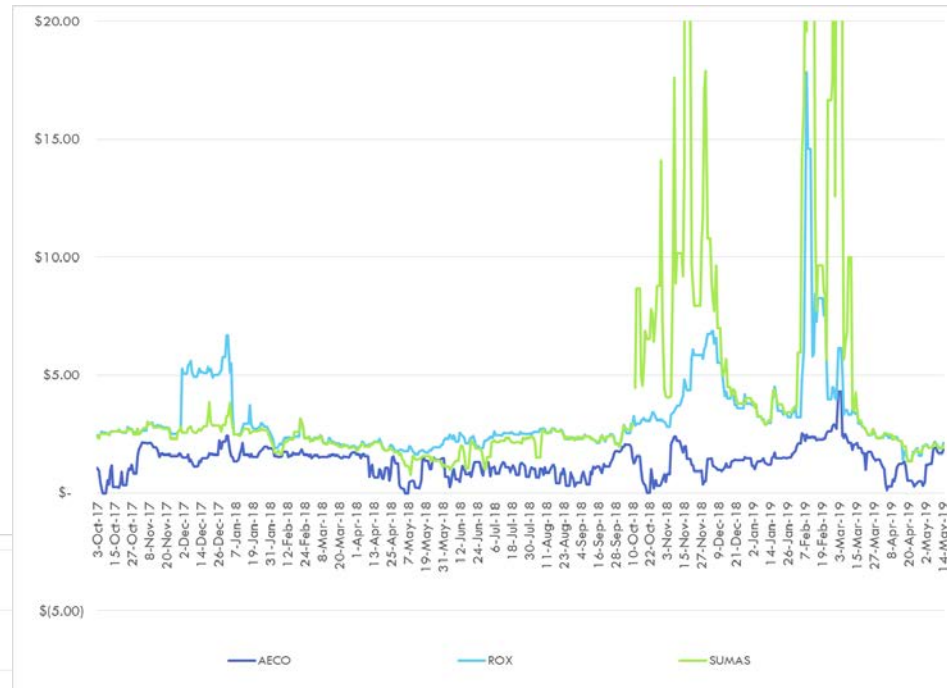
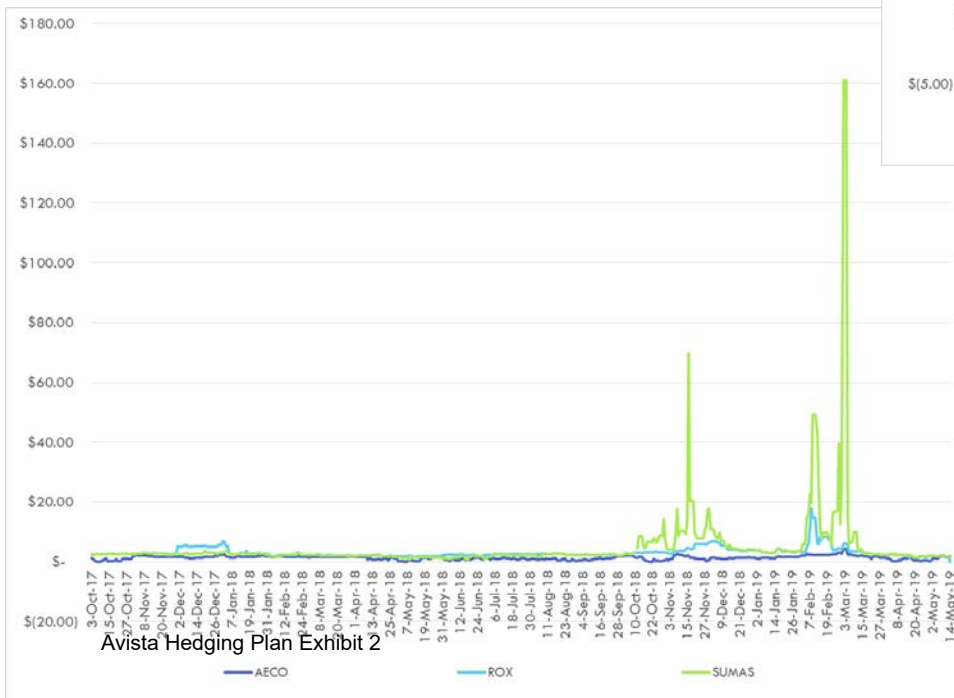
Temperature Probability



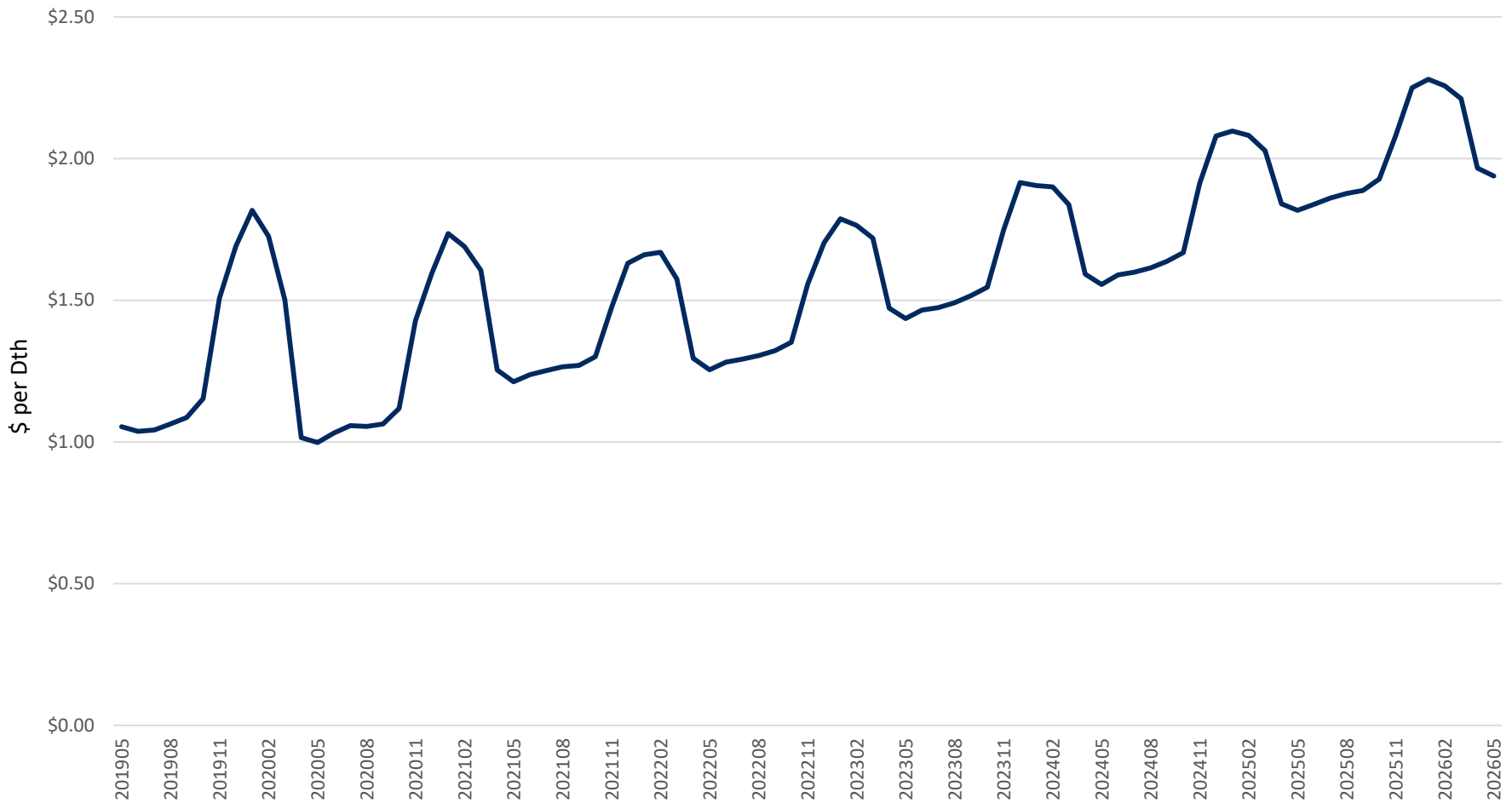
Precipitation Probability



# Cash Market



# AECO Forward Curves (5/13/2019)



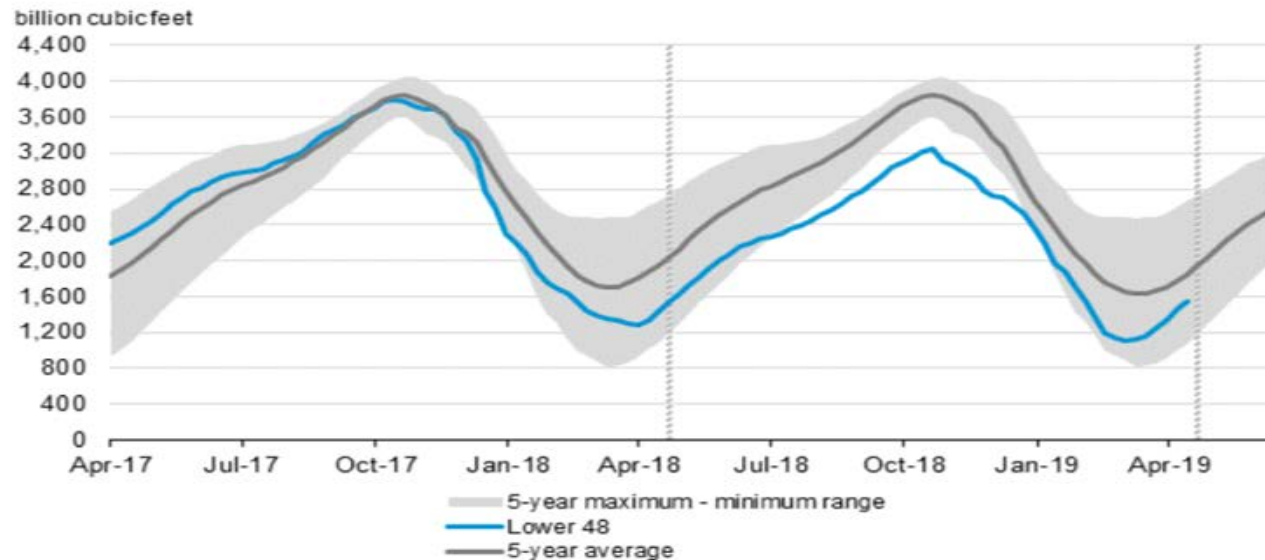
# US Storage

Working gas in underground storage, Lower 48 states

[Summary text](#) [CSV](#) [JSON](#)

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	05/03/19	04/26/19	net change	implied flow	Year ago (05/03/18)		5-year average (2014-18)	
					Bcf	% change	Bcf	% change
East	299	279	20	20	240	24.6	317	-5.7
Midwest	309	290	19	19	237	30.4	367	-15.8
Mountain	78	75	3	3	91	-14.3	122	-36.1
Pacific	162	152	10	10	194	-16.5	230	-29.6
South Central	699	666	33	33	657	6.4	814	-14.1
Salt	234	224	10	10	202	15.8	248	-5.6
Nonsalt	466	442	24	24	455	2.4	566	-17.7
<b>Total</b>	<b>1,547</b>	<b>1,462</b>	<b>85</b>	<b>85</b>	<b>1,419</b>	<b>9.0</b>	<b>1,850</b>	<b>-16.4</b>

Totals may not equal sum of components because of independent rounding.



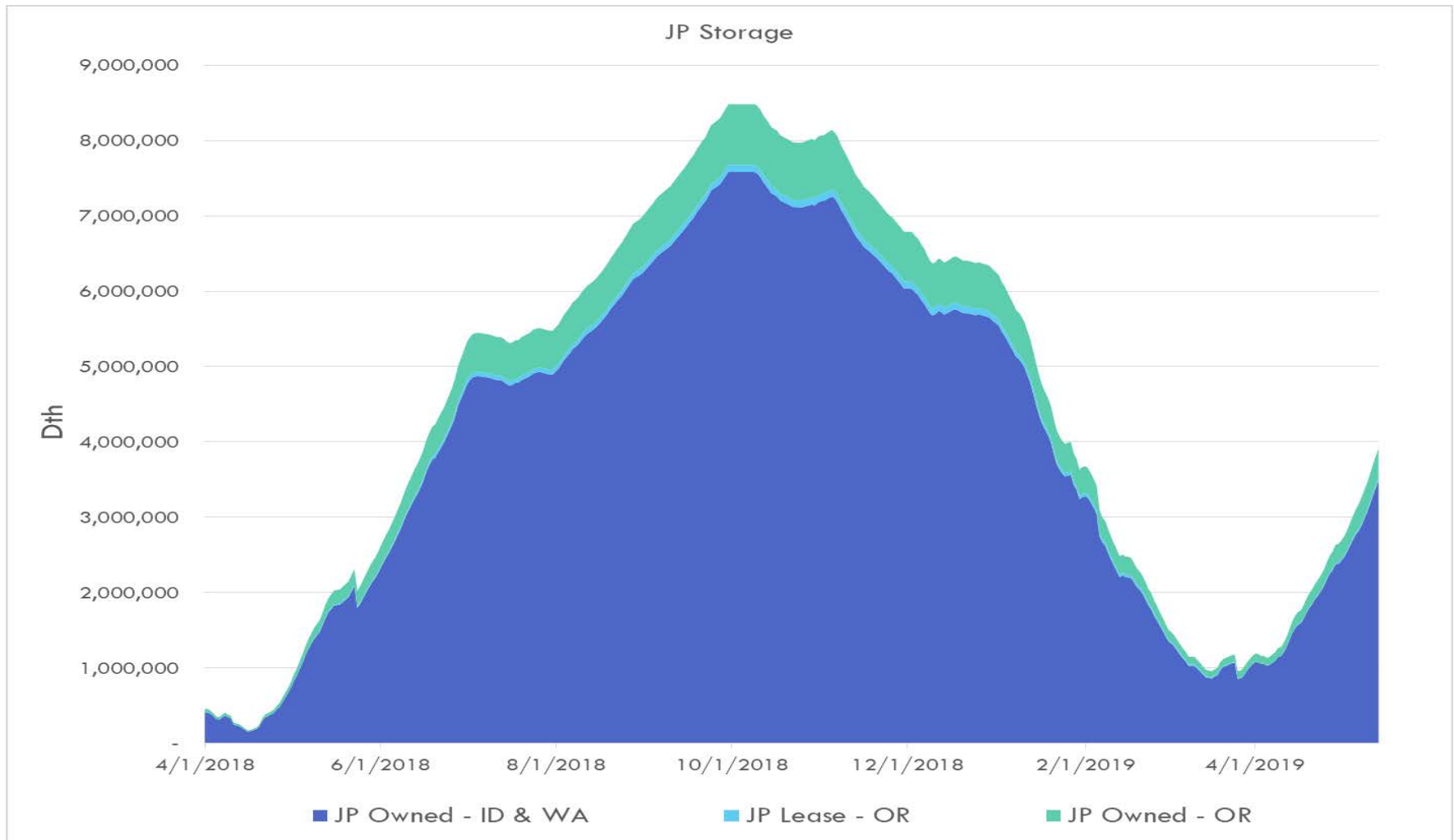
Avista Hedging Plan Exhibit 2

Source: U.S. Energy Information Administration

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# JP Storage Levels



# Procurement Plan Hedges

# Current Procurement Plan

May 14, 2019													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
June-19	-32,415	12,500	-19,915	40%	39%	0							
July-19	-28,940	12,500	-16,440	40%	43%	0							
August-19	-29,051	12,500	-16,551	40%	43%	0							
September-19	-33,914	12,500	-21,414	40%	37%	0							
October-19	-75,051	25,000	-50,051	40%	33%	2	04/02/19	06/17/19	0.95	1.11	1.37		AECO
Nov19-Mar20	-164,345	90,000	-74,345	32%	55%	0							
Apr20-Oct20	-47,653	10,000	-37,653	25%	21%	1	11/20/18	03/01/20	0.88	0.94	1.30		AECO
Nov20-Mar21	-166,667	35,000	-131,667	32%	21%	8	04/05/19	06/12/19	1.41	1.53	1.60		AECO
Apr21-Oct21	-48,316	5,000	-43,316	25%	10%	3	01/03/19	09/23/19	0.99	1.13	1.28		AECO
Nov21-Mar22	-170,777	2,500	-168,277	32%	1%	21	04/16/19	05/29/19	1.54	1.57	1.64		AECO

Trade Date	Contract Month	Price
3-27-19	Jun-19	\$0.80
4-2-19	Oct-19	\$1.10
4-5-19	Winter '20 - '21	\$1.48
4-16-19	Winter '21 - '22	\$1.59

Avista Hedging Plan Exhibit 2 \*Hedges since last SOG on 3/13/2019



# Risk Responsive Hedging Tool (RRHT)



# Price at 2 Sigma history

Potential Price @ 2 Sigma



# Avista's Acknowledgment of 2018 Hedge Plan

- Avista has begun incorporating risk responsive hedging protocols into its risk management activities, and has made substantial progress in meeting the fundamental objective of the Commission's Policy Statement.
- The Commission commends Avista for its ability to develop a risk responsive hedging tool and its demonstration of successful implementation of risk responsive hedging protocols.
- The Commission also commends Avista for its overall strategic approach to gas procurement that optimizes the use of the company's available resources and includes a balance of risk responsive hedging, programmatic hedging, storage, and index purchases.

# Avista's Acknowledgment of 2018 Hedge Plan

1. With respect to goals and objectives, Avista should include a clear definition of the goal of its hedging activities as well as measurable objectives in pursuit of that goal.
2. The Company should include a more detailed description of how its Risk Policy governs hedging activities and how the Gas Supply Department operationalizes the Risk Policy directives.
3. To the extent Risk Management Committee, meetings relate to the Company's hedging activities, they should be discussed in the hedging plan. The Company should also demonstrate how the committee incorporates the Strategic Oversight Group collaboration in its decision making process.
4. The Company should provide a comprehensive list of the individuals involved in the hedging decision-making process, including individual responsibilities of each member, decision-making hierarchy, and other relevant details to understand how hedging decisions are made.
5. Regarding the ongoing design and assessment of the Company's hedging program, the Company should provide a list of source documents on which the Company relied or that influenced that design or assessment.
6. The Company should produce a retrospective report, consistent with the guidelines provided in the Policy Statement.

# Cascade

1. Describe its newly developed capacity to execute risk-responsive hedging protocols;
2. Include a clear definition of the goal of its hedging activities, as well as measurable objectives in pursuit of that goal;
3. Identify relevant oversight and control entities within the Company and their capacities. Include a description of the team overseen by the Director of Gas Supply-Utility Group;
4. Document Gas Supply Oversight Committee meetings, as well as committee decisions and guidance. To the extent committee meetings relate to the Company's hedging activities, they should be discussed in the hedging plan;
5. Provide a comprehensive list of the individuals involved in the hedging decision-making process, including the individual responsibilities of each member, decision-making hierarchy, and other relevant details to understand how hedging decisions are made;
6. Identify specific risk metrics and analysis the Company will use for decision-making. This should include how the Company will use metrics and analysis for decision making purposes, basins it will consider, and how the model will establish price tolerances for hedging decisions;
7. Identify policy guidance and metrics used to make decisions with respect to trading structured products, caps, floors, and derivatives that are used to offset hedging losses;
8. Perform independent third-party evaluations once the Company develops the autonomy to manage its own hedging program;
9. Provide a list of source documents that were used or that influenced the ongoing design or assessment of the Company's hedging program; and
10. Produce a retrospective report, consistent with the guidelines provided in the Policy Statement. In the retrospective report, discuss more thoroughly the information provided in the monthly guidance documents and how that information relates to ongoing program evolution.

1. Include demonstration that the Company has developed the capacity to execute risk-responsive hedging protocols;
2. Include a clear definition of the goal of its hedging activities as well as measurable objectives in pursuit of that goal;
3. Identify relevant oversight and control entities and their capacities;
4. Provide a comprehensive list of the individuals involved in the hedging decision-making process including individual responsibilities of each member, decision-making hierarchy, and other relevant details to understand how hedging decisions are made;
5. Provide a list of source documents that were used or that influenced the ongoing design or assessment of the Company's hedging program; and
6. Produce a retrospective report, consistent with the guidelines provided in the Policy Statement.

# NWN cont.

Consistent with the Commission's prior direction, the annual purchased gas adjustment (PGA) review is the best vehicle to consider the recovery of hedging losses and gains. NW Natural should provide the following in future PGA filings and, where appropriate, in the retrospective report:

1. Detail of all financial instruments that aim to reduce exposure in the natural gas markets;
2. Hedging program results, including costs associated with transactions (i.e., broker's fees or other necessary expenses) and how those costs are allocated;
3. A description of multijurisdictional cost allocations for hedging transactions; and
4. A list of individual hedging transactions with identification of:
  - a) Gains and losses;
  - b) Hedged price;
  - c) Commodity price at settlement date;
  - d) Type of hedge executed (e.g., fixed-price physical, financial derivative);
  - e) Hedge strategy (e.g., programmatic, defensive); and
  - f) Reason for execution (e.g., tolerance exceedance, upper or lower control limit breach, time window expiration).

# PSE

1. Include a clear definition of the goal of its hedging activities as well as measurable objectives in pursuit of that goal;
2. Identify all changes to hedge policies and practices including relevant documentation that supports the changes;
3. Define “market opportunities” and “low price opportunities” in the context of PSE’s programmatic portfolio. The Company should identify what metrics it uses to decide that market conditions are favorable for triggering a hedging transaction. The Company should also describe its “low cost methodology”;
4. Discuss whether there is value in updating the risk responsive model inputs more frequently (such as on a daily basis). Provide justification if the Company considers more frequent market updates unnecessary or non-applicable to the risk responsive model;
5. Provide a description of the Merchant and its role in influencing hedging policy, and a summary of the contents of the monthly report;
6. Produce a retrospective hedging report, including hedging results, consistent with the guidelines provided in the policy statement. Hedges included should be the ones executed and settled in the previous PGA year, along with the metrics associated with the decision to hedge;
7. Demonstrate how exposure boundaries are established in the risk responsive model and how they relate to defined tolerances;
8. Provide a comprehensive list of the individuals involved in the hedging decision-making process, including individual responsibilities of each member, decision-making hierarchy, and other relevant details to understand how hedging decisions are made;
9. Provide a list of source documents that were used or that influenced the ongoing design or assessment of the Company’s hedging program; and
10. Perform independent evaluations on hedging plan practices.





# Jackson Prairie Update

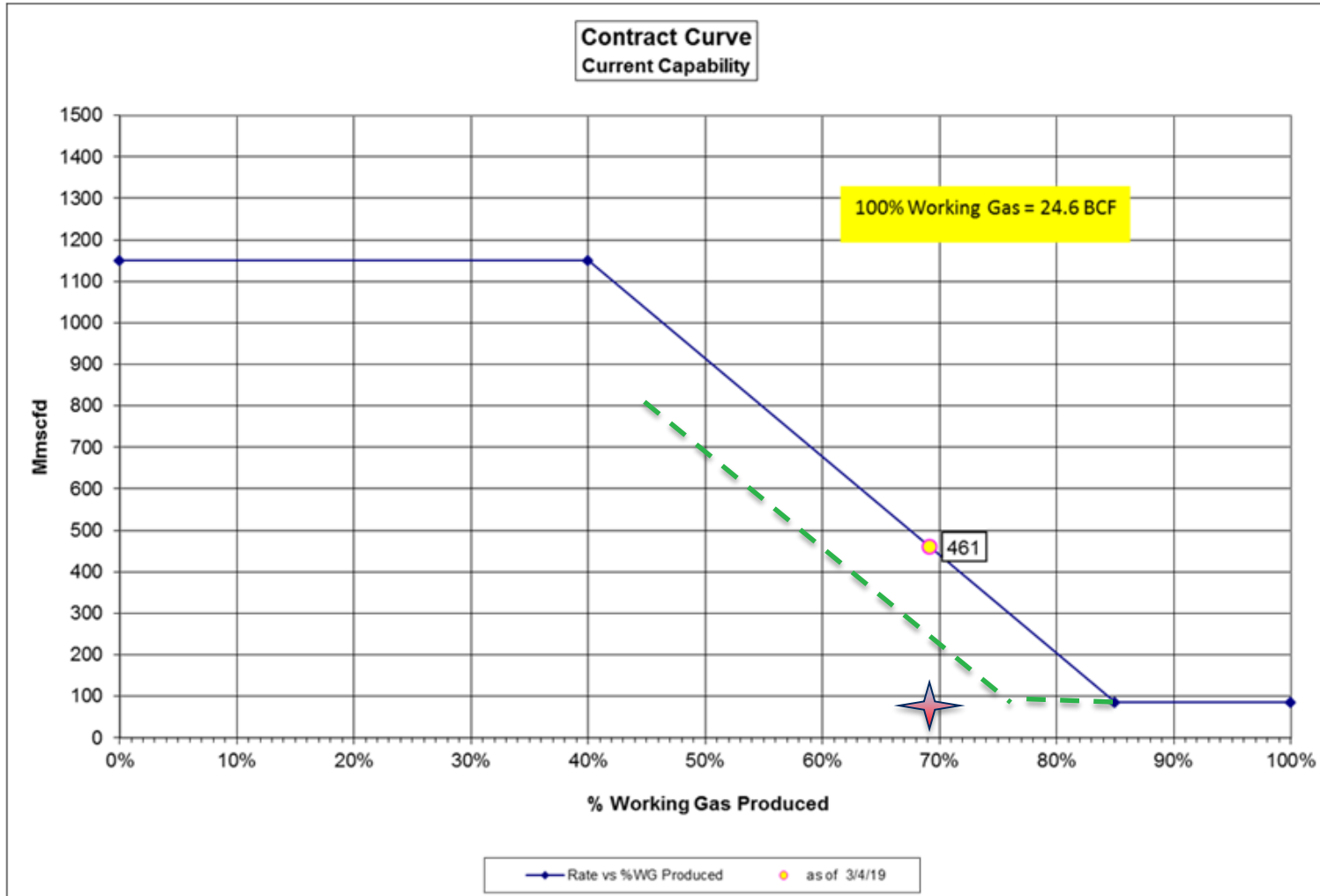
May 2019



# JP Operations Winter 2018 – 2019

- Accelerated online in October 2018 due to Enbridge incident
  - Sand trap/slug catcher inspection postponed
  - Wellbore liner screens failures in 2 wells spring 2018
  - Slug catcher undersized for full station flowrate
- December 2018 – C8 compressor failure due to sand
- February 2019 – C9 compressor failure
  - 2<sup>nd</sup> stage impeller failure
  - Cause yet to be determined

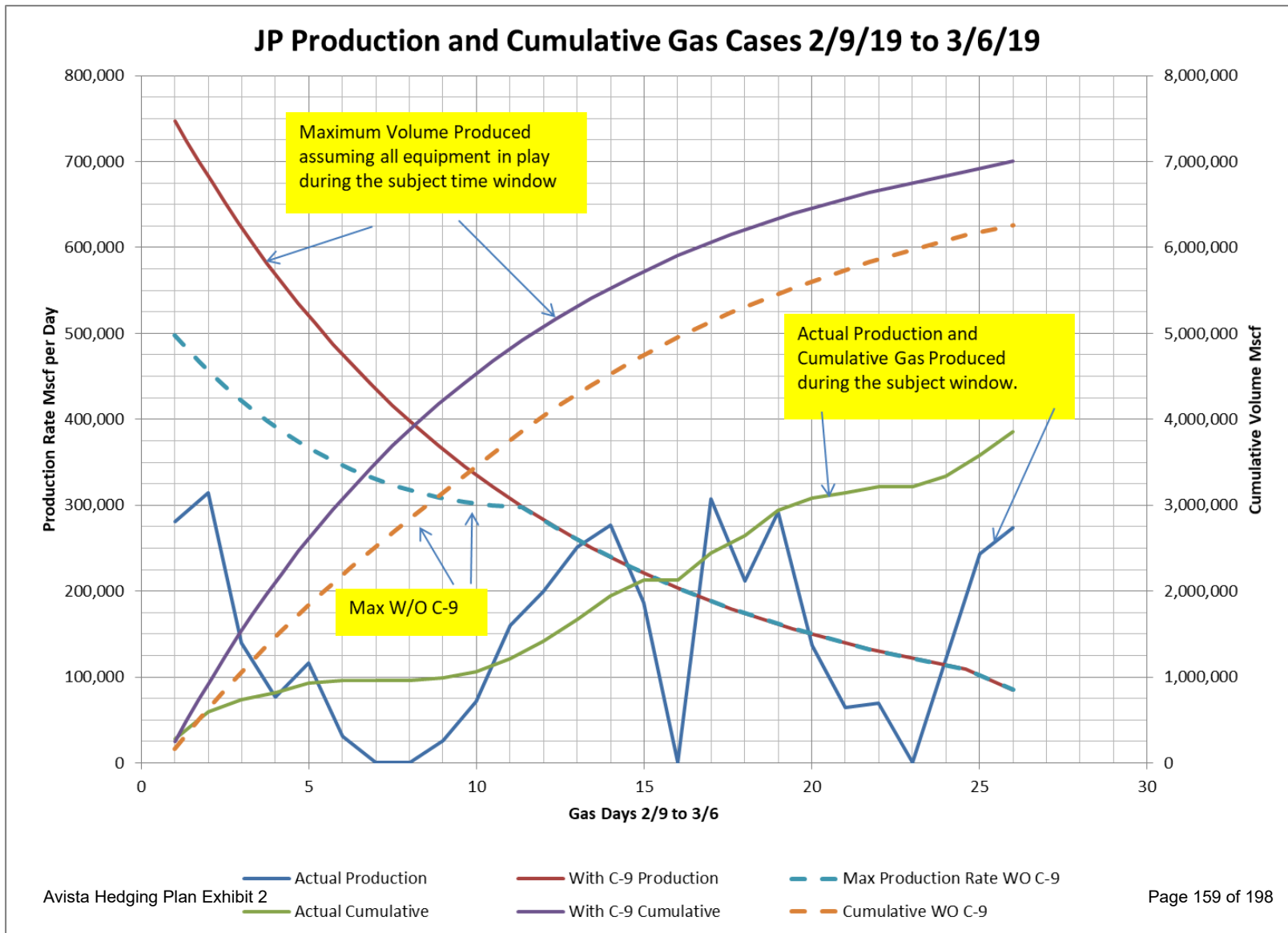
# Jackson Prairie Compressor C-9



Compressor  
Failed  
2/10/19

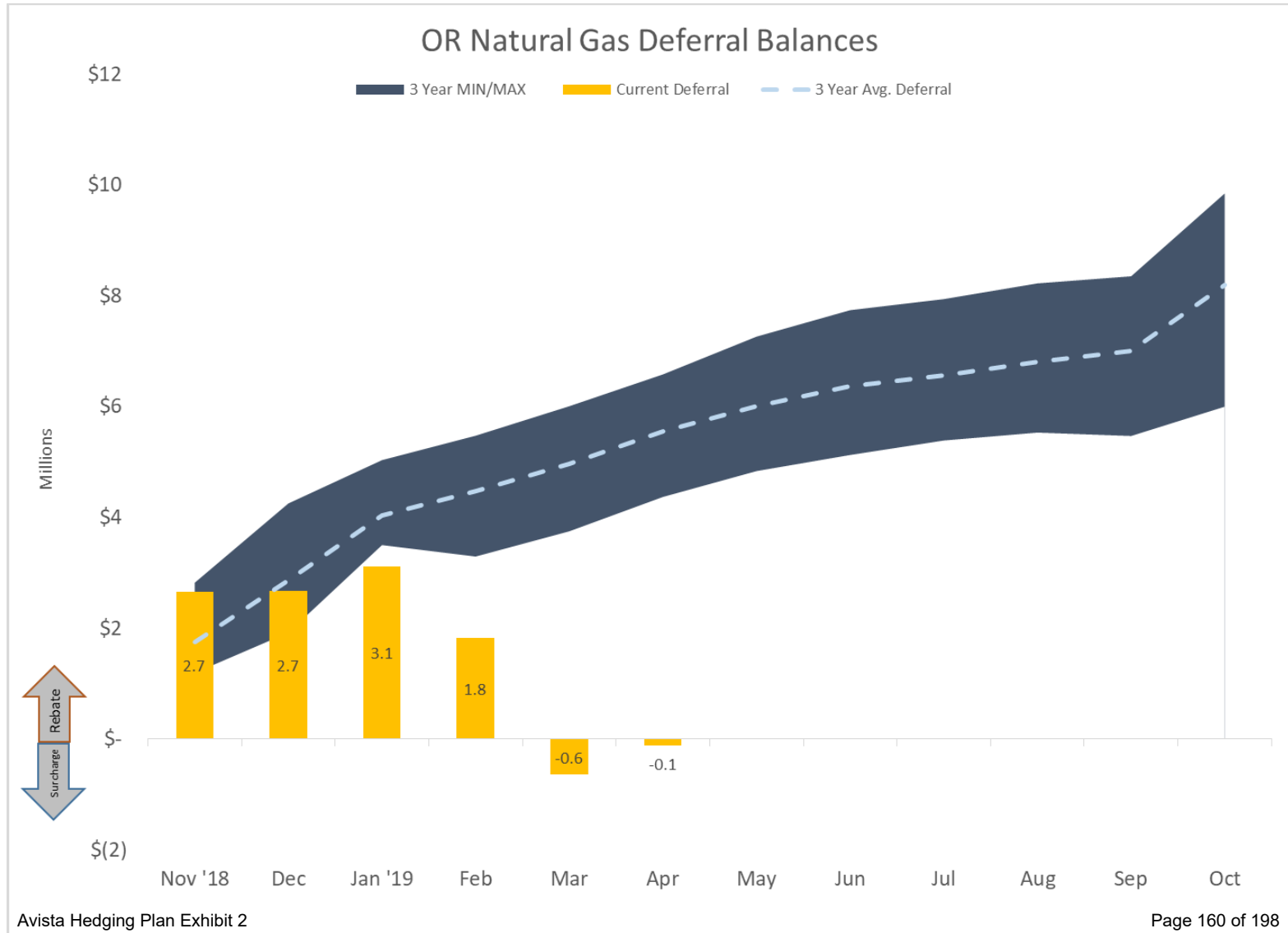
Reduction of withdrawal capability by approx. 200-300 MMscfd  
 Avista Hedging Plan Exhibit 2  
 Avista withdrawal ability < 90 MMscfd (JP demand 50 – 90 MMscfd)

# Impact of C9 Compressor Failure



# Gas Deferral Report – April 2019

\$s in Millions: Direction = Surcharge





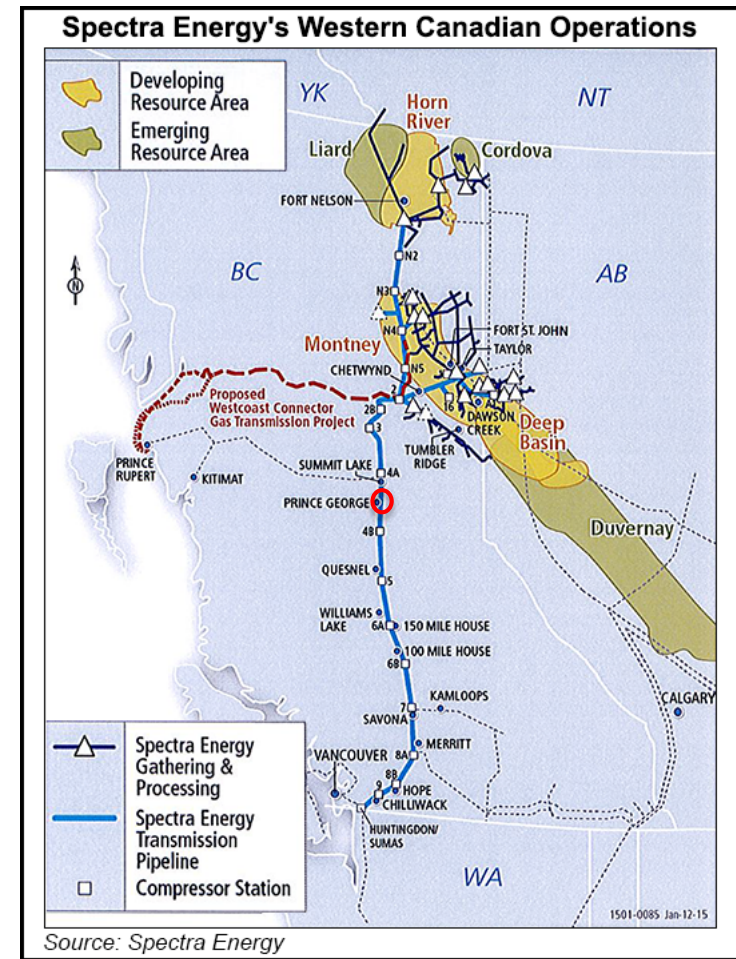
**SOG**

November 16th

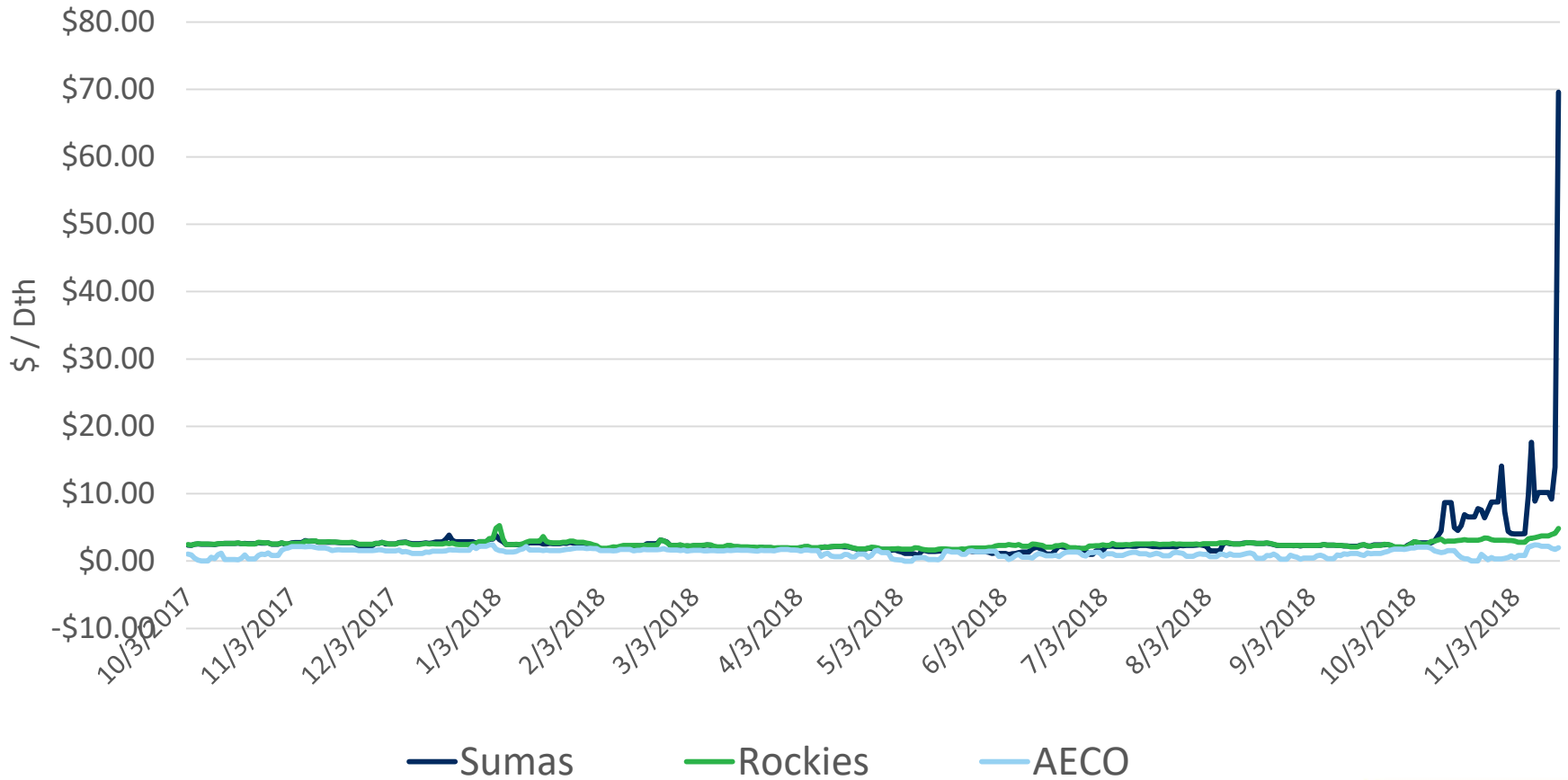
# Enbridge pipeline rupture



- 3,540 miles of pipeline with a daily processing capacity of 2.2 billion cubic feet. BC Pipeline's infrastructure stretches across the entire length of the province from Fort Nelson to the Canada/US border, and is capable of transporting 2.4 billion cubic feet of natural gas per day.
- Two lines make up this take away capacity
  - 36" – the line that had a rupture
  - 30" – out of commission until operational status can be verified
- JP was back up early to help with supply issues on the west side.
  - Can deliver up to 1.2 Bcf per day



# Cash Prices



11/15/2018

**\$ 69.60**

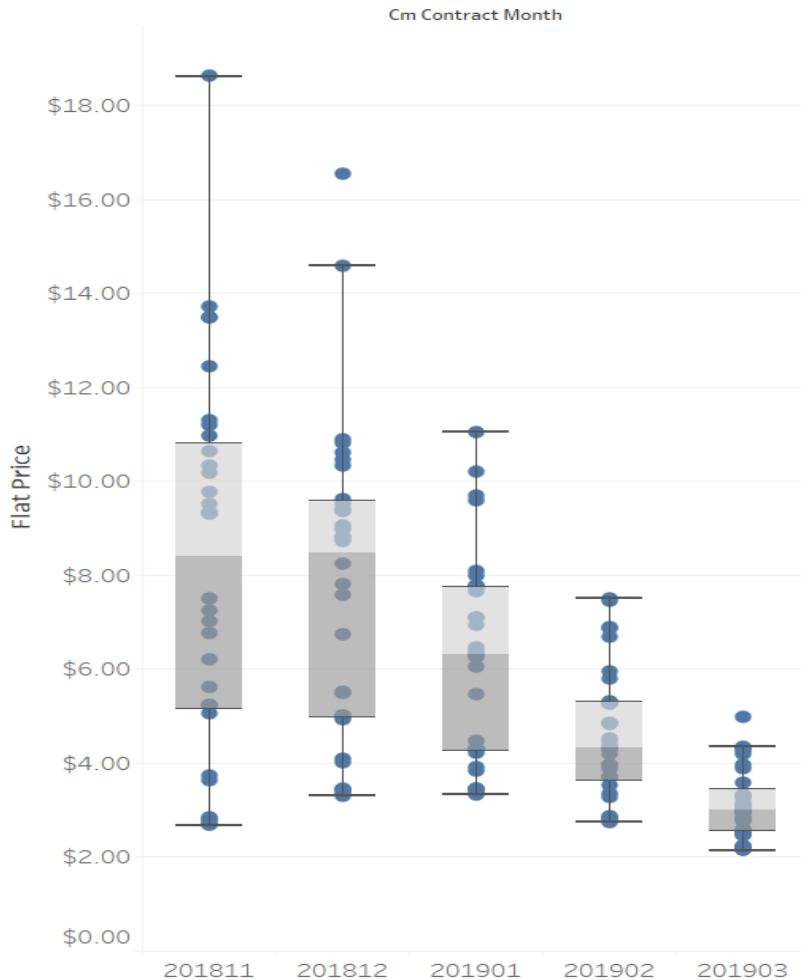
**\$ 4.83**

**\$ 1.99**

Avista Hedging Plan Exhibit 2

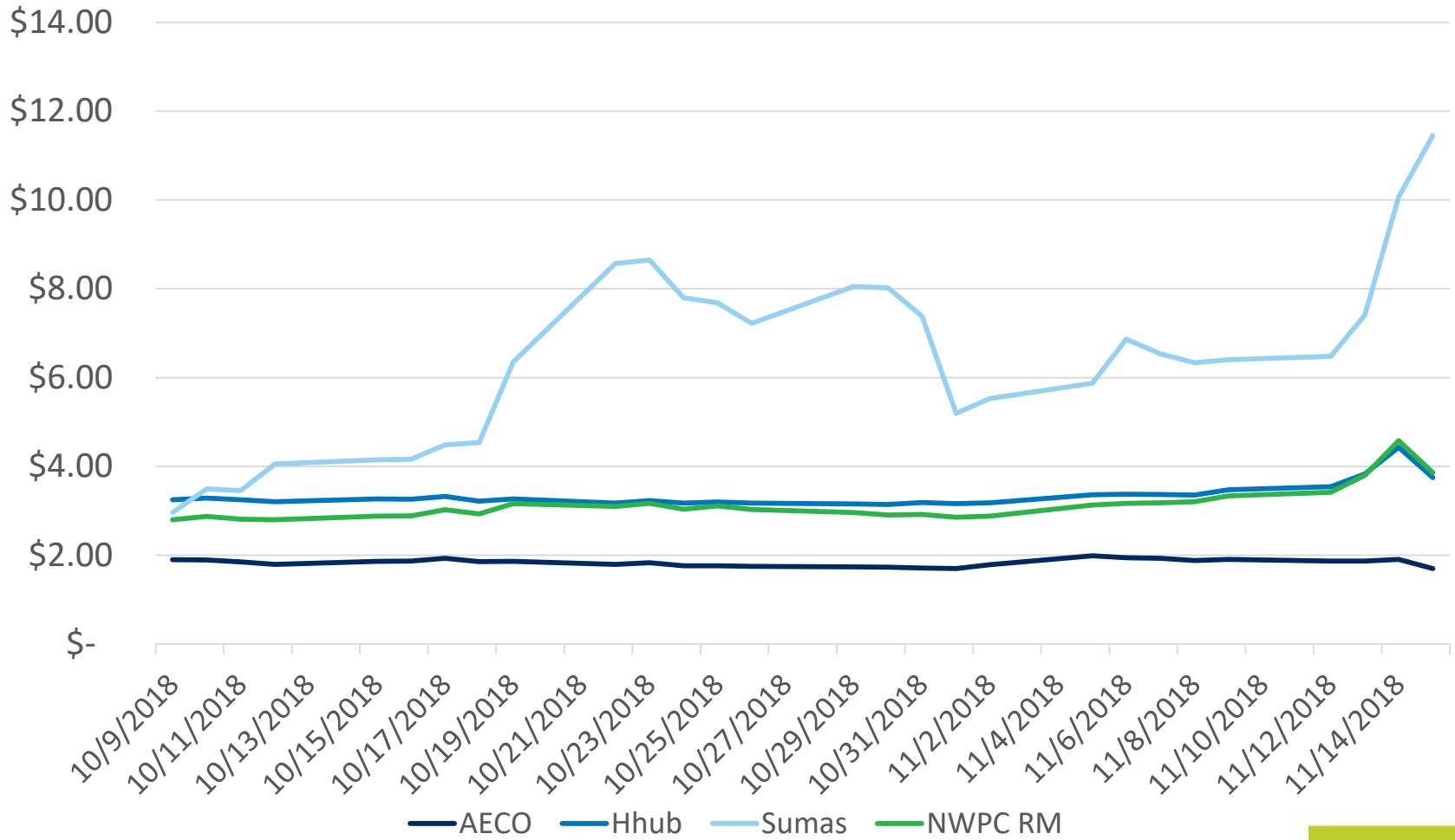


# Sumas (Oct. – Nov. 15, 2018)



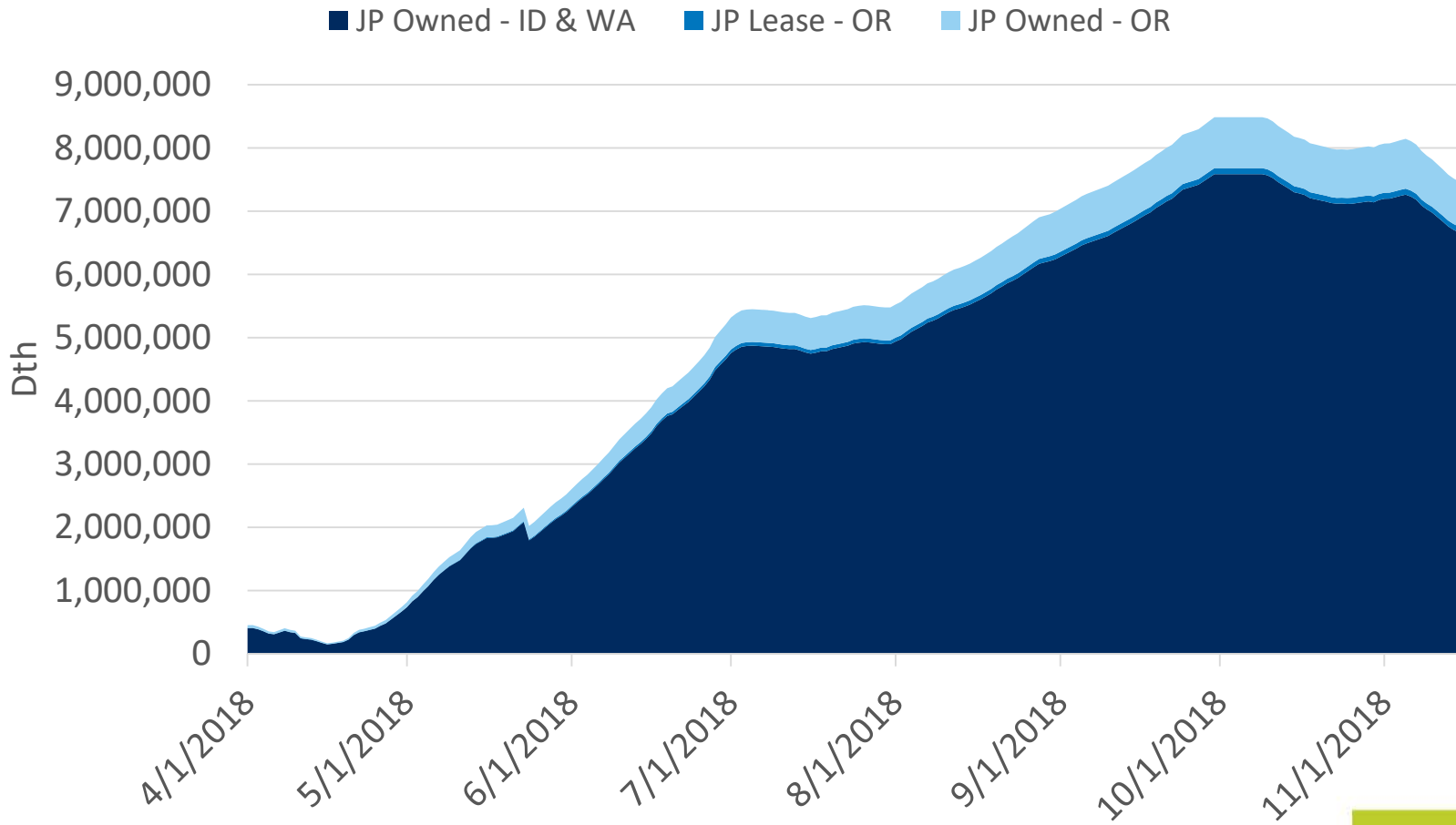
Day of Settle Date	Cm Contract Month				
	201811	201812	201901	201902	201903
October 3, 2018	2.77	3.45	3.46	2.83	2.21
October 4, 2018	2.69	3.35	3.35	2.76	2.15
October 5, 2018	2.68	3.31	3.33	2.74	2.16
October 8, 2018	2.82	3.43	3.42	2.83	2.22
October 9, 2018	2.84	3.43	3.44	2.86	2.24
October 10, 2018	3.63	4.08	3.90	3.36	2.49
October 11, 2018	3.72	4.01	3.83	3.27	2.45
October 12, 2018	5.06	4.93	4.21	3.52	2.58
October 15, 2018	5.23	5.02	4.29	3.70	2.52
October 16, 2018	5.22	5.02	4.30	3.72	2.55
October 17, 2018	5.62	5.52	4.48	3.97	2.85
October 18, 2018	6.20	5.50	4.33	3.89	2.77
October 19, 2018	7.50	7.81	7.09	5.80	3.58
October 22, 2018	10.64	10.81	9.69	7.46	4.26
October 23, 2018	10.96	10.89	9.60	7.51	4.28
October 24, 2018	10.17	9.63	8.09	6.90	4.19
October 25, 2018	11.20	9.41	7.97	5.95	3.89
October 26, 2018	12.44	8.73	6.94	4.86	3.16
October 29, 2018	13.49	10.45	7.76	5.28	3.29
October 30, 2018	13.49	10.34	7.74	5.26	3.28
October 31, 2018	11.31	9.51	7.79	5.28	3.02
November 1, 2018	7.01	6.74	5.48	3.97	2.79
November 2, 2018	6.77	7.58	6.06	4.29	2.94
November 5, 2018	7.24	8.25	6.26	4.52	3.10
November 6, 2018	9.76	9.36	7.08	4.84	3.31
November 7, 2018	10.33	8.82	6.33	4.19	3.03
November 8, 2018	9.32	8.79	6.29	4.31	2.95
November 9, 2018	9.31	8.98	6.38	4.37	2.98
November 12, 2018	9.32	9.05	6.46	4.46	3.09
November 13, 2018	9.52	10.60	7.65	5.32	3.96
November 14, 2018	13.71	14.59	10.20	6.87	4.97
November 15, 2018	18.62	16.54	11.04	6.70	4.35

# Winter '18 – '19 Forwards



# Jackson Prairie Storage

## 5.1 Days of max withdrawal remaining for entire field



Avista Hedging Plan Attachment 2

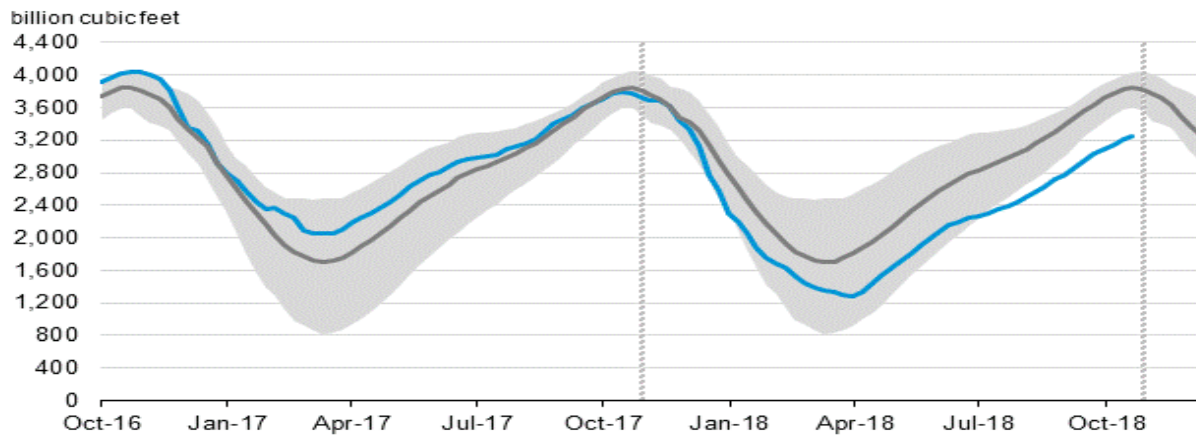
\*As of 11/15/2018

7,423,507 Dth of total Supply

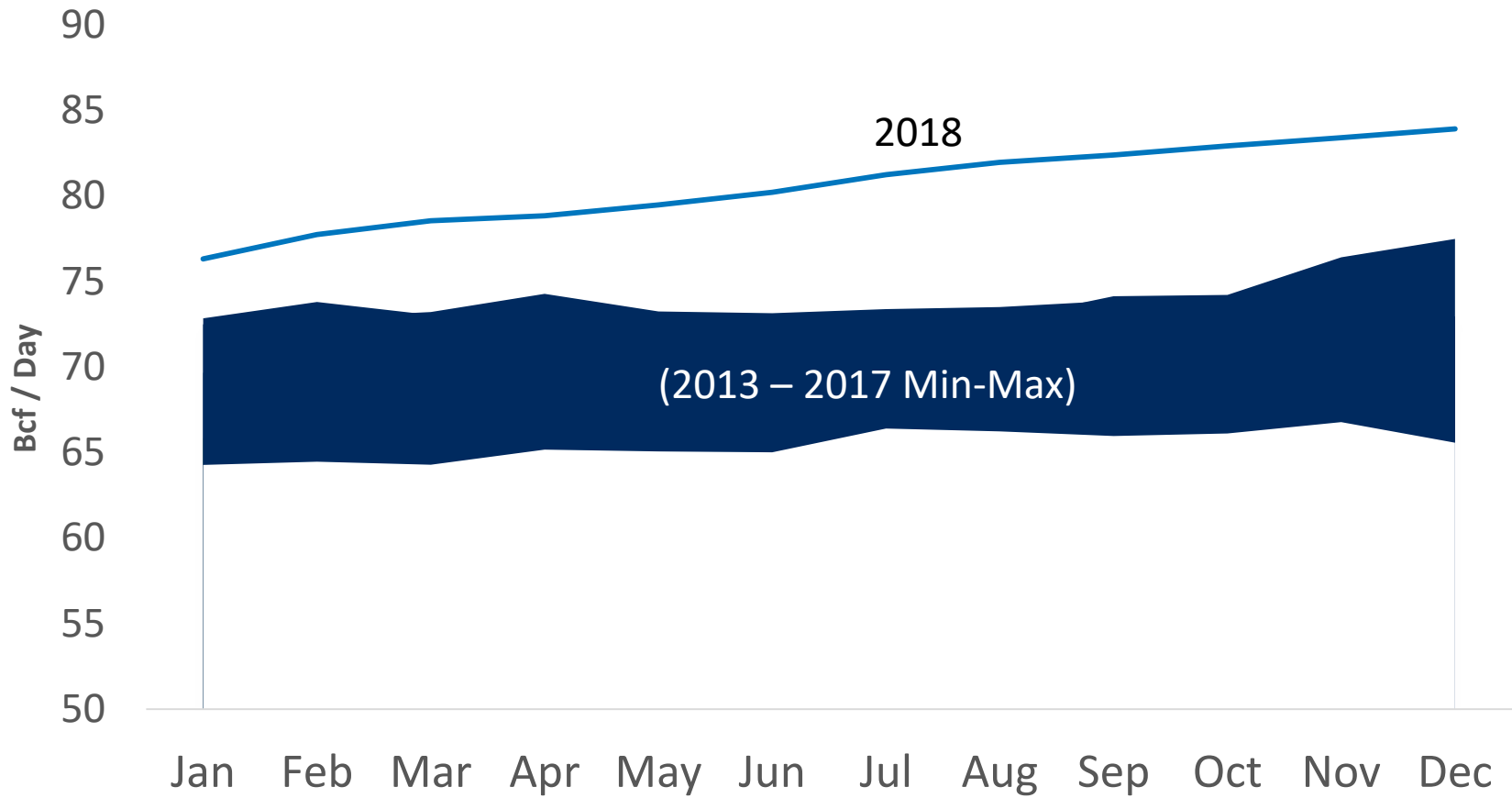
# US Storage

Region	Stocks billion cubic feet (Bcf)				Historical Comparisons			
	11/09/18	11/02/18	net change	implied flow	Year ago (11/09/17)		5-year average (2013-17)	
					Bcf	% change	Bcf	% change
East	835	831	4	4	916	-8.8	920	-9.2
Midwest	991	980	11	11	1,109	-10.6	1,098	-9.7
Mountain	181	182	-1	-1	221	-18.1	219	-17.4
<b>Pacific</b>	<b>266</b>	<b>265</b>	<b>1</b>	<b>1</b>	<b>315</b>	<b>-15.6</b>	<b>351</b>	<b>-24.2</b>
South Central	974	949	25	25	1,214	-19.8	1,259	-22.6
Salt	272	253	19	19	340	-20.0	353	-22.9
Nonsalt	702	696	6	6	873	-19.6	906	-22.5
<b>Total</b>	<b>3,247</b>	<b>3,208</b>	<b>39</b>	<b>39</b>	<b>3,775</b>	<b>-14.0</b>	<b>3,848</b>	<b>-15.6</b>

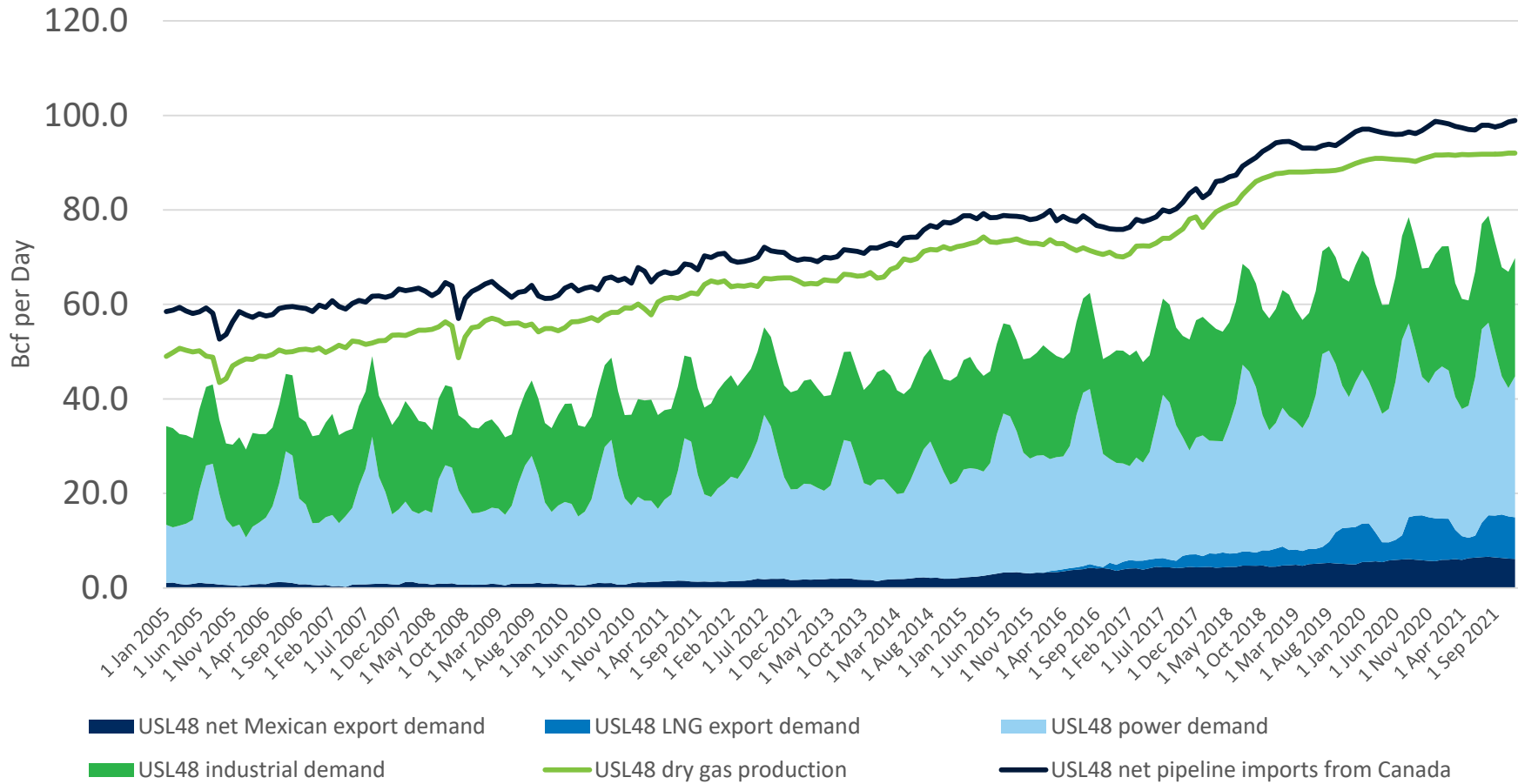
Working gas in underground storage compared with the 5-year maximum and minimum



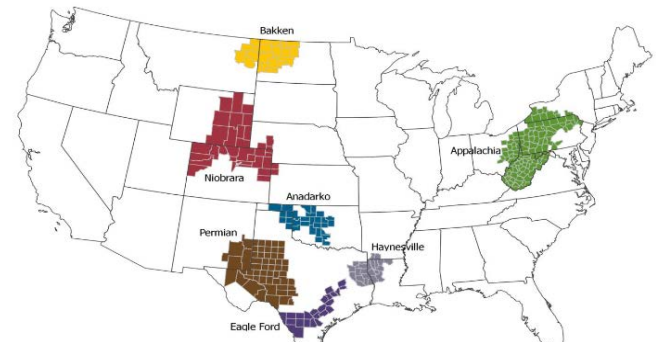
# US Production



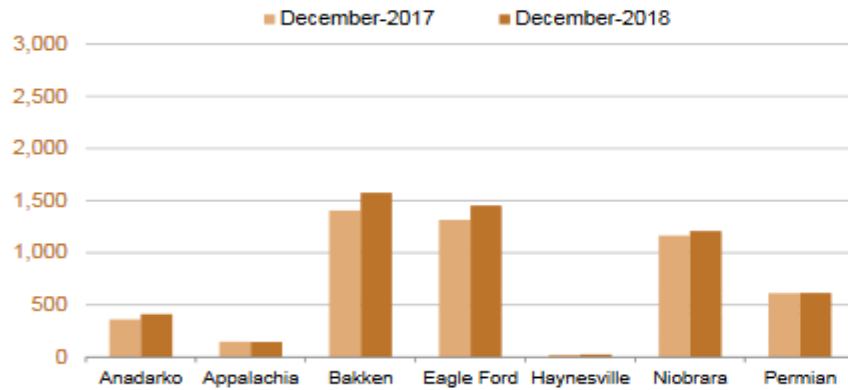
# Production vs primary demand



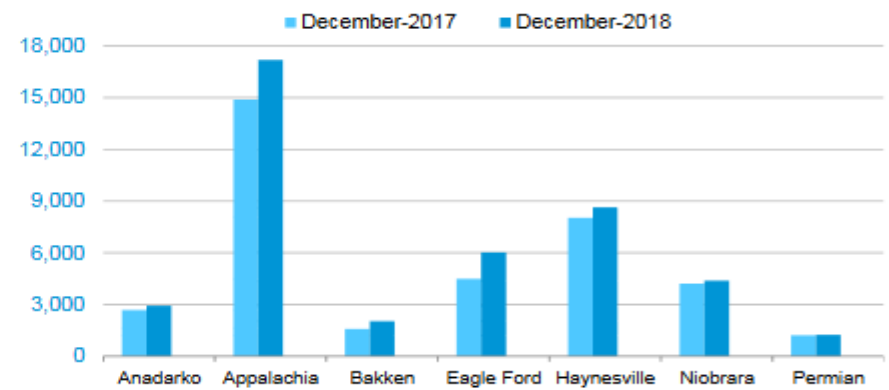
# Rigs vs. Production



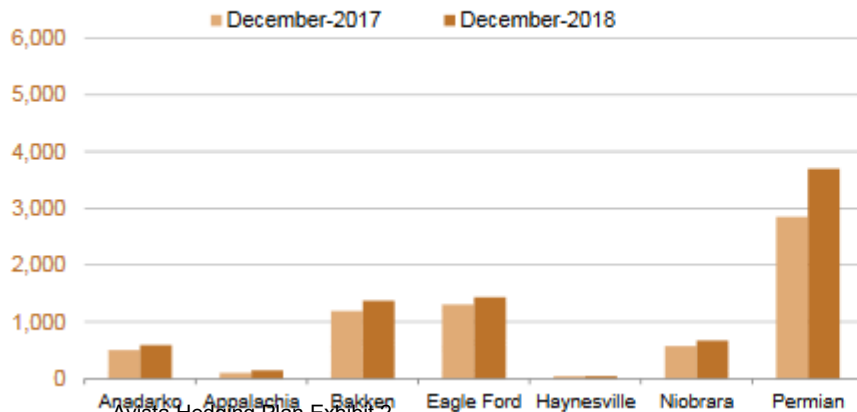
**New-well oil production per rig**  
barrels/day



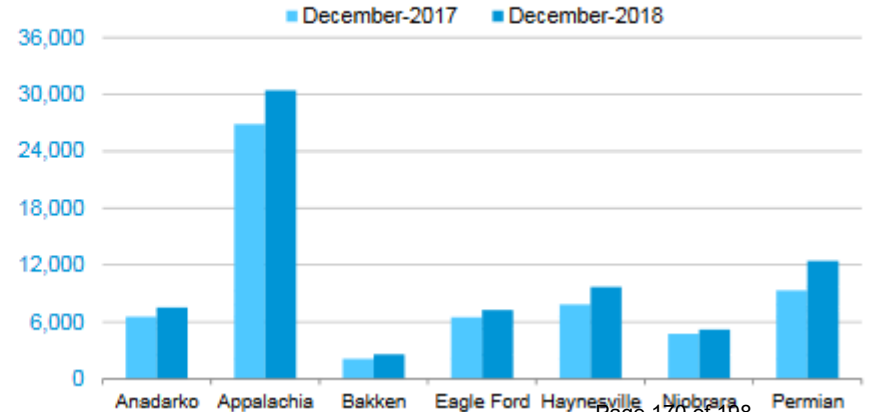
**New-well gas production per rig**  
thousand cubic feet/day



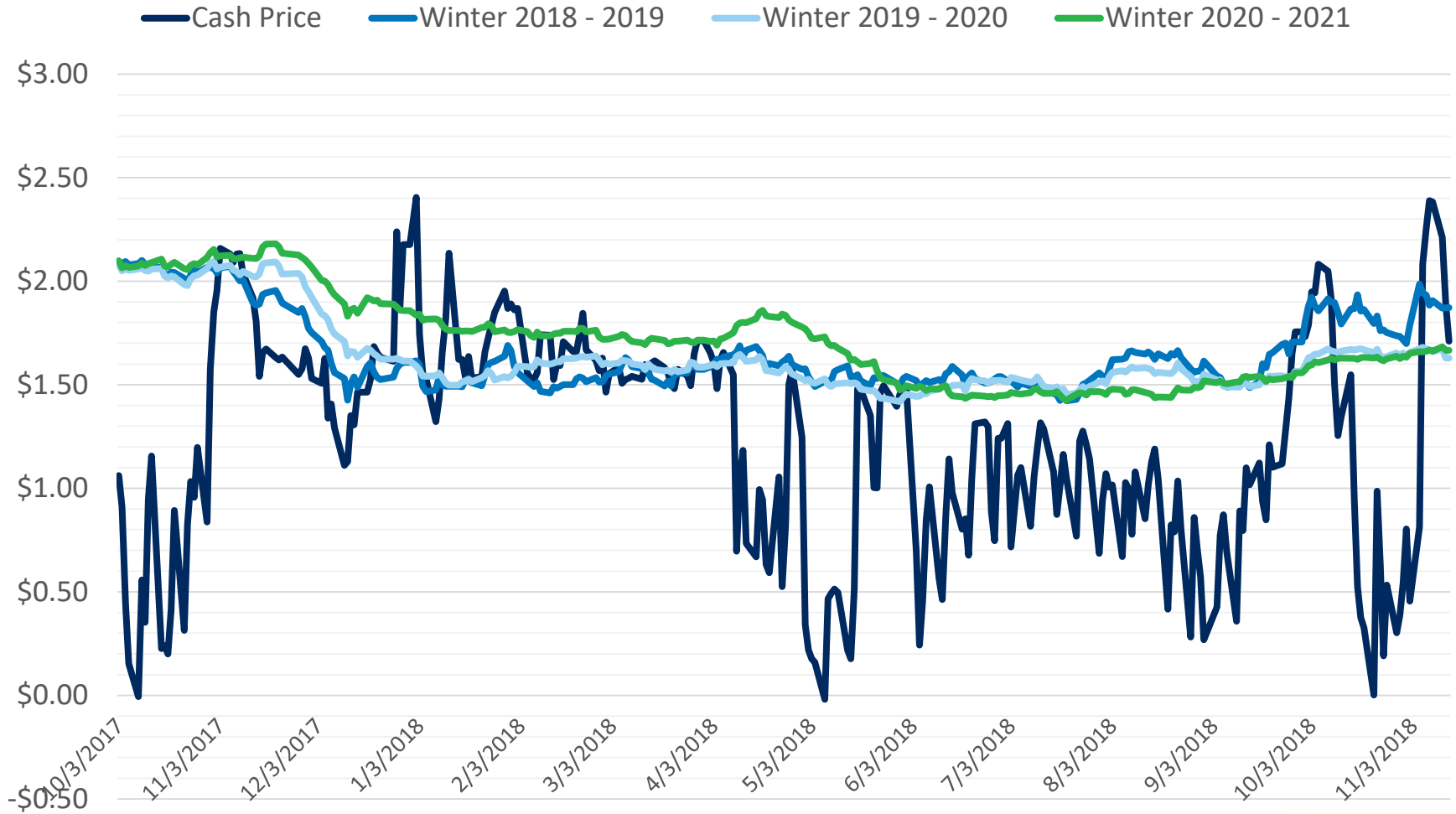
**Oil production**  
thousand barrels/day



**Natural gas production**  
million cubic feet/day



# AECO Forwards vs. Cash





# Procurement Plan


# Procurement Plan

- Presentation to commissions:
  - OR on Oct. 11<sup>th</sup>
  - WA on Oct. 18<sup>th</sup> & Nov. 8<sup>th</sup>
  - ID on Nov. 20<sup>th</sup>
- RMC approval to implement on Nov. 1<sup>st</sup>
  - Implement RRHT (30% Min – 60% Max)
  - LDC hedging to 40%

# LDC Hedges since Aug. 20<sup>th</sup>

Trade Date	Hedge	Hedge Price	Basin
8/21/2018	Winter2020	\$ 1.56	AECO
8/22/2018	October 2018	\$ 1.09	AECO
8/27/2018	December 2018	\$ 1.62	AECO
8/28/2018	Winter2020	\$ 1.48	AECO
9/4/2018	January 2019	\$ 1.70	AECO
9/5/2018	November 2018	\$ 5.62	AECO
9/6/2018	November 2018	\$ 1.30	AECO
9/10/2018	December 2018	\$ 1.54	AECO
9/21/2018	December 2018	\$ 1.71	AECO
9/21/2018	January 2019	\$ 1.84	AECO
9/25/2018	February 2019	\$ 1.83	AECO
9/25/2018	Winter2020	\$ 1.06	AECO
10/2/2018	December 2018	\$ 1.97	AECO
10/2/2018	Winter2020	\$ 1.59	AECO
10/3/2018	January 2019	\$ 2.13	AECO
10/9/2018	Winter2020	\$ 1.66	AECO
10/22/2018	January 2019	\$ 3.38	Rockies
10/23/2018	December 2018	\$ 3.48	Rockies
10/23/2018	February 2019	\$ 3.19	Rockies
11/15/2018	April 2019	\$ 0.90	AECO

VaR switched  
Dynamic Window Hedges  
to Rockies



# Dynamic Window Hedge

November 15, 2018													
	Physical Positions			Dynamic Window Hedging									
	Load Estimate (DTh/Day)	Completed Hedges (DTh/Day)	Net Position (DTh/Day)	Window Hedging Threshold	Load Hedged (%)	Hedges Left	Set Date	Expire Date	Low Price Trigger (\$/DTh)	Today's Price (\$/DTh)	High Price Trigger (\$/DTh)	Hedge Required (DTh/Day)	Preferred Basin
December-18	-188,164	87,500	-100,664	40%	47%	0							
January-19	-185,368	82,500	-102,868	40%	45%	0							
February-19	-163,647	72,500	-91,147	40%	44%	0							
March-19	-129,735	62,500	-67,235	40%	48%	0							
April-19	-83,834	12,500	-71,334	40%	15%	8	11/15/18	11/28/18	0.84	0.92	1.01		AECO
May-19	-47,612	10,000	-37,612	40%	21%	4	10/31/18	12/08/18	0.91	0.97	1.11		AECO
June-19	-32,415	10,000	-22,415	40%	31%	1	10/31/18	05/01/19	0.75	0.91	1.20		AECO
July-19	-28,940	10,000	-18,940	40%	35%	1	10/31/18	05/31/19	0.73	0.85	1.13		AECO
August-19	-29,051	10,000	-19,051	40%	34%	1	10/31/18	07/01/19	0.77	0.89	1.19		AECO
September-19	-33,914	10,000	-23,914	40%	29%	1	10/31/18	08/01/19	0.78	0.93	1.25		AECO
October-19	-75,051	10,000	-65,051	40%	13%	8	10/31/18	12/08/18	1.07	1.06	1.19	2,500	AECO
Nov19-Mar20	-164,068	52,500	-111,568	32%	32%	0							
Apr20-Oct20	-47,653	7,500	-40,153	25%	16%	2	09/25/18	06/14/19	0.86	1.01	1.28		AECO
Nov20-Mar21	-166,395	20,000	-146,395	32%	12%	14	10/02/18	11/23/2018	1.58	1.65	1.70		AECO
Apr21-Oct21	-48,316	0	-48,316	25%	0%	5	10/01/18	3/26/2019	1.14	1.26	1.44		AECO

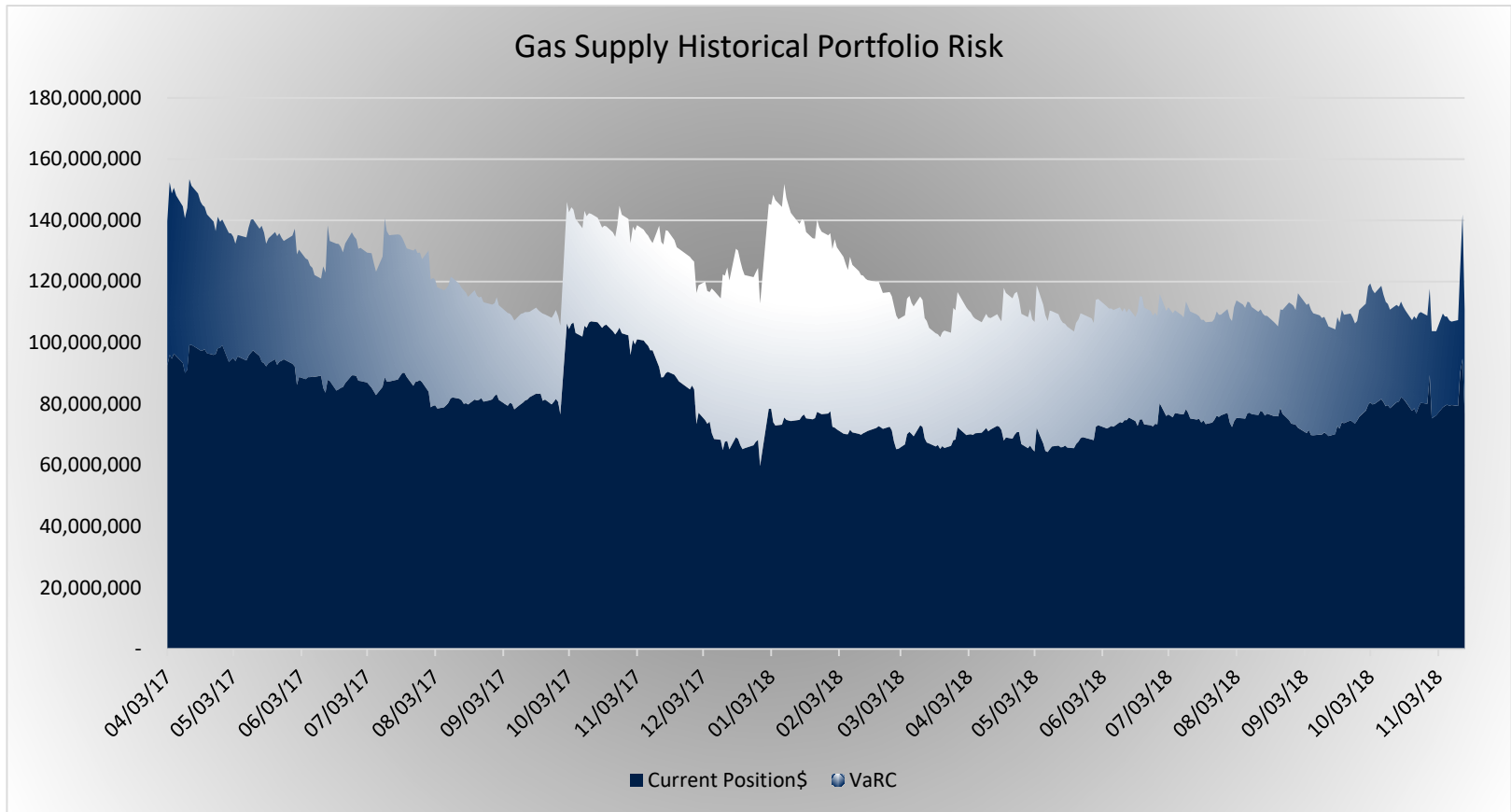


# RRHT

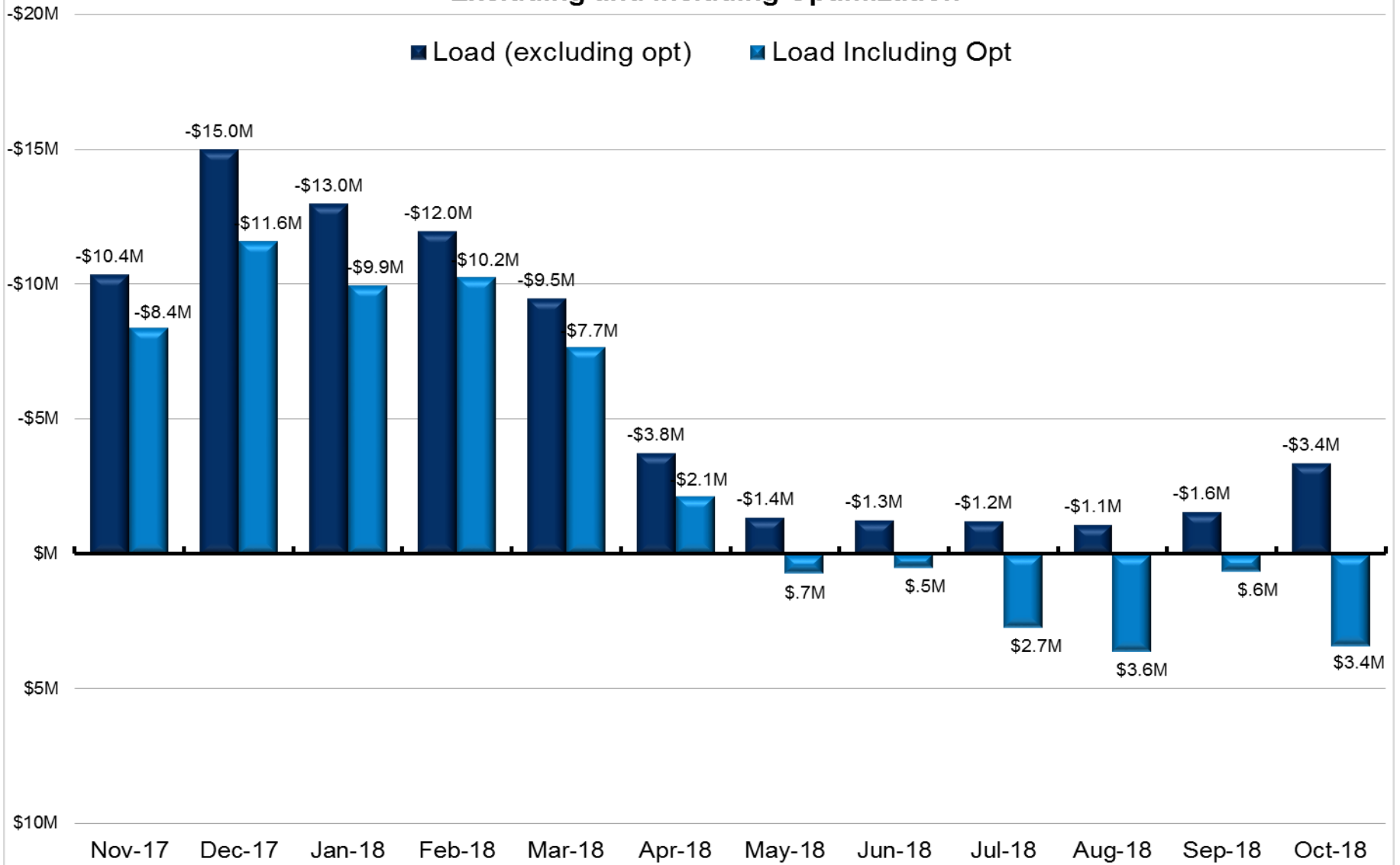
Parameters / Metrics Used	
Beg Period:	Dec-18
End Period:	Nov-20
Risk Responsive Ending	
Period:	Apr20-Oct20
Periods:	13
Report Date:	11/15/18
Current Position #:	-54,028,996
Natural Position \$:	\$103,600,573
Current Position(NPV)\$:	\$76,664,853
VaRC:	\$34,285,606
Cost @ 2 Sigma (\$):	\$110,950,459
Price @ 2 Sigma (\$/DTh):	\$2.054
Boundary (\$/DTh):	\$2.760
Financial Hedged %:	26.00%
Target Financial Hedge %:	#N/A



# RRHT Volatility



## 2017-2018 Monthly Total Load Benefit/(Cost) Excluding and Including Optimization



# GTN Settlement



# GTN Rate Settlement

- As result of Tax Cut and Jobs Act (Tax Act) and to satisfy FERC position on income tax allowances, on September 19<sup>th</sup>, 2018, GTN and shippers reached settlement in principle for rate decreases.
- Amended settlement ends December 31, 2021 with new rates required by January 1, 2022
- Settlement in principle provides for:
  - \$10,000,000 bill credit allocated to shippers - credited on December 2018 bill
  - 10% rate reduction for 2019 (mainline and laterals)
  - 9% rate reduction for 2020 and 2021 (mainline and laterals)
  - New rates must be in effect January 1, 2022

# Estimate of Benefits

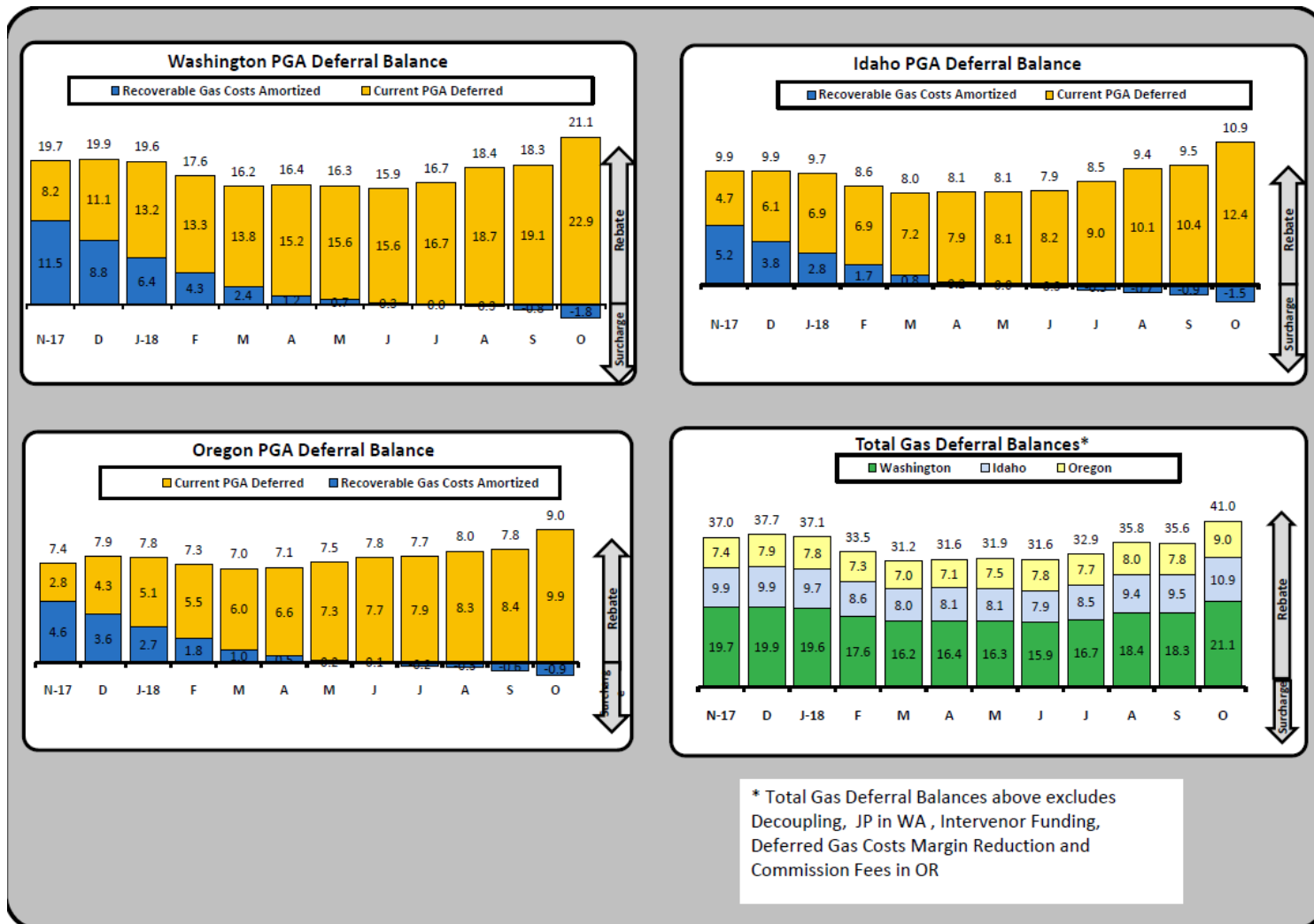
	2018 Bill Credit	2019	2020	2021	Total
WA/ID Core	\$116,000	\$261,000	\$216,000	\$215,000	\$808,000
OR Core	283,000	640,000	553,000	551,000	\$2,027,000
Thermal	<u>267,000</u>	<u>603,000</u>	<u>502,000</u>	<u>501,000</u>	<u>\$1,873,000</u>
Total Benefit	<u>\$666,000</u>	<u>\$1,504,000</u>	<u>\$1,271,000</u>	<u>\$1,267,000</u>	<u>\$4,708,000</u>

	2015	2016-2018	2019	2020-2021
Full-haul GTN	\$0.34	\$0.30	\$0.27	\$0.25

# Accounting Update

# Deferral Balances – October 2018

\$s in Millions: (+) Rebate; (-) Surcharge



## **Strategic Oversight Group – of Gas Procurement for Distribution Customers – Discussion Group**

### **Meeting on November 16, 2018**

#### Present at the meeting:

Jody Morehouse, Director Gas Supply – Natural Gas Resources  
Jason Lang, Manager of Risk, Energy Resources, Risk Management  
Todd Bryan, Manager Resource Optimization - Power Supply  
Tom Pardee, Natural Gas Planning Manager – Natural Gas Resources  
Kaylene Schultz, Natural Gas Analyst – Natural Gas Resources  
Leslie Filer, Natural Gas Acquisition Manager – Natural Gas Resources  
Erik Soreng, Natural Gas Acquisition Manager – Natural Gas Resources  
Eric Scott, Natural Gas Resources Manager – Natural Gas Resources  
Annette Brandon, Sr. Analyst Regulatory II – Rates & Tariffs  
Carolyn Groome, Accounting Analyst III – Resource Accounting  
Megan Thilo, Sr. Risk Analyst – Risk Management  
Marta Tomic Defenbach, Risk Analyst – Risk Management  
Lori Hamilton, FERC Compliance Manager, Compliance

#### Agenda:

- Enbridge Pipeline Rupture
- Market Overview
- Procurement Plan
- GTN Settlement
- Accounting, Credit/Risk, Rates

#### Presentations:

- November 16, 2018 SOG

#### **Enbridge Pipeline Rupture**

Tom Pardee provided an update on the Enbridge pipeline rupture. There are two parallel pipelines in the area of the rupture; a 36" line and a smaller 30" line. Both lines are now in operation but at reduced capacities. Maintenance and inspection of the ruptured line is ongoing. The Canadian transportation board is also conducting an investigation into the cause. Jackson Prairie came back up early to help with supply issues on the west side of the state following the rupture.

#### **Market Overview**

Tom Pardee provided an update on the current market activity. As a result of the rupture, we've seen significant volatility at Sumas recently. The Sumas cash price traded on average at \$70 yesterday, November 15<sup>th</sup>, and the December, January and February forwards are up considerably. At this time, March isn't looking as constrained, so price movement isn't as volatile out that far.

We've seen recent volatility of Henry Hub winter 18/19 forwards in reaction to the cold spell on the east coast. AECO forwards for the same time period have headed the opposite direction, dropping slightly.

As of November 15<sup>th</sup>, supply at Jackson Prairie totaled 7.4 Dth, including Fortis. As inventory comes down, we are able to withdraw less and less. Fortis has not started withdrawing yet. They are likely waiting until we see colder weather. There are 5.1 days of max withdrawal remaining for the entire field.

US working gas underground storage as of Friday, November 9, 2018 is lower than the 5-year average at 3,247 Bcf. Inventory is approximately 528 Bcf less than last year at this time.

Tom discussed US natural gas production. In 2018, we saw a significant increase in the amount of gas coming online, over previous years. Significant demand drivers for natural gas supply include Mexican exports, LNG exports, power demand and industrial demand.

### **Procurement Plan**

Tom Pardee discussed recent and upcoming presentations to the commissions regarding the changes to the procurement plan. The Risk Management Committee approved the changes to the procurement plan and the Energy Resources Risk Policy on October 29, 2018, effective November 1, 2018.

Since the last SOG meeting (August 20, 2018), 20 dynamic window hedges have been executed. The Apr19-Oct19 strip opened up on October 31, 2018, which added an additional 31 active hedge windows to the already 30 active hedge windows (61 total active hedge windows). However, the reduction of the hedge window threshold from 46% to 40% went into effect on November 1<sup>st</sup>, reducing the total number of active hedge windows from 61 to 46.

Tom Pardee then discussed the movement of the Risk Response Hedging Tool since implementation on November 1<sup>st</sup>.

Kaylene discussed the MTM/optimization results as of the end of October 2018. As of the end of October, there was a \$3.4 million net benefit for our optimization program over the market value (had we purchased in the spot market).

### **GTN Rate Settlement**

As result of Tax Cut and Jobs Act (Tax Act) and to satisfy FERC position on income tax allowances, on September 19<sup>th</sup>, 2018, GTN and shippers reached settlement in principle for rate decreases. The settlement provides for a \$10 million bill credit allocated to shippers, 10% rate reduction for 2019 and a 9% rate reduction for 2020 and 2021.

### **Accounting, Credit/Risk, Rates**

Carolyn Groome presented the power and gas deferral balances for Washington, Idaho and Oregon. The PGA year ended with a \$41 million rebate.

## **Strategic Oversight Group – of Gas Procurement for Distribution Customers – Discussion Group**

### **Meeting on December 12, 2018**

#### Present at the meeting:

Jody Morehouse, Director Gas Supply – Natural Gas Resources  
Jason Lang, Director Finance, Assistant Treasurer – Finance  
Todd Bryan, Manager Resource Optimization – Power Supply  
Tom Pardee, Natural Gas Planning Manager – Natural Gas Resources  
Kaylene Schultz, Natural Gas Analyst – Natural Gas Resources  
Leslie Filer, Natural Gas Acquisition Manager – Natural Gas Resources  
Erik Soreng, Natural Gas Acquisition Manager – Natural Gas Resources  
Eric Scott, Natural Gas Resources Manager – Natural Gas Resources  
Justin Dorr, Natural Gas Scheduling Manager – Natural Gas Resources  
Annette Brandon, Sr. Analyst Regulatory II – Rates & Tariffs  
Carolyn Groome, Accounting Analyst III – Resource Accounting  
Megan Thilo, Manager of Treasury – Treasury  
Lori Hamilton, FERC Compliance Manager – Compliance

#### Agenda:

- Rates Update
- Market Overview
- Procurement Plan
- Operational Flow Orders
- Accounting, Credit/Risk

#### Presentations:

- December 12, 2018 SOG

#### **Rates Update**

Annette Brandon provided an update on recent filings for Avista, as well as other utilities in the region.

#### **Market Overview**

Tom Pardee provided an update on the Enbridge pipeline rupture and current capacity of the pipe. Capacity has increased by about a 100,000 GJ's since the last SOG meeting and Sumas southbound flow continues to increase as well. The Canadian transportation board is still conducting an investigation into the cause.

We continue to see volatility with Sumas cash prices. As of December 10, 2018, the Sumas cash price was back down to around \$6.97, after reaching as high as \$69.60 on November 16<sup>th</sup>. The Sumas cash price is still sitting above that of AECO (\$0.97), Rockies (\$4.12) and Malin (\$5.62).

Tom discussed the forward curves. The winter (specifically December and January) months appear to be priced at a premium. Forward prices have recently dropped approximately \$0.25 cents for the close-in months. The AECO cal forwards are down for 2019 and 2020.

US working gas underground storage as of November 30, 2018 is lower than the 5-year average at 2,991 Bcf. Inventory is approximately 704 Bcf less than last year at this time.

Tom discussed the US long-term supply and demand outlook as per Wood Mackenzie. Wood Mackenzie forecasts that US production is going to ramp up more significantly in the coming years than it has in the past, doubling production rates of today by 2040. Production is coming on mainly in the Pennsylvania, Ohio, and Texas gulf coast areas. Demand is forecasted to increase for LNG and Mexican exports. Canadian production is also expected to increase dramatically. Demand increases are expected for LNG exports and industrial consumers.

As of December 12, 2018, current inventory of Jackson Prairie was 6,339,652 Dth. Tom discussed the forecast for drawdown. Inventory is estimated to be 2,108,152 Dth by February 15, 2019.

### **Procurement Plan**

Tom discussed the current procurement plan and recent hedges that have been executed. Since the last SOG meeting (November 16, 2018), 10 dynamic window hedges have been executed. The newly implemented risk responsive hedging tool also triggered during this timeframe due to the significant volatility within the market. As a result of the trigger, nine hedges were executed for a total of 3.12 MM Dth.

Additionally, a change was made to the minimum hedge percentage within the risk responsive hedging tool since the last SOG meeting. The minimum hedge percentage was adjusted down from 30% to 20%. The maximum hedge percentage remains at 60%. As such, the slope of the operative boundary has been reduced and allowing for a slightly less dramatic hedging need when the risk responsive hedging mechanism is triggered.

Tom discussed the MTM/optimization results as of the end of November 2018. As of the end of November, there was a \$2.4 million net benefit for our optimization program over the market value (had we purchased in the spot market).

### **Operational Flow Orders (OFO)**

Justin Dorr discussed the OFO orders from NWP because of the Enbridge rupture issue and Sumas. NWP is a bi-directional pipeline. Avista holds contracts from Sumas and JP that displace all of the volumes that other counterparties are flowing. Because of the OFO, we are required to flow certain amounts of gas. Thus far this winter we have seen the obligation range from 0 to 30,000 Dth. We have not seen a peak day as of yet while under the OFO. If we do, the amount of gas required to flow under the OFO could be much larger.

Jody Morehouse discussed the recent open meetings at the commissions and CEO roundtables. The commissions from all 3 states were complementary of the performance of the NW mutual assistance agreement in recent months. The utilities in the inland northwest have been fortunate that the recent temperatures have not been very cold. Jody also discussed the winter 2018-2019 pipeline outlook.

Eric Scott provided an update on the Dythyazine issue. The problem is still ongoing. Avista has been affected by the problem at both Rathdrum and CS2. Eric explained that they are still working with the pipeline to identify the route cause and seek a resolution.

### **Accounting, Credit/Risk, Rates**

Carolyn Groome presented the power and gas deferral balances for Washington, Idaho and Oregon. November ended with a \$44.1 million rebate.



## **Strategic Oversight Group – of Gas Procurement for Distribution Customers – Discussion Group**

### **Meeting on January 17, 2019**

#### Present at the meeting:

Jody Morehouse, Director Gas Supply – Natural Gas Resources  
Jason Lang, Director Finance, Assistant Treasurer – Finance  
Todd Bryan, Manager Resource Optimization – Power Supply  
Tom Pardee, Natural Gas Planning Manager – Natural Gas Resources  
Kaylene Schultz, Natural Gas Analyst – Natural Gas Resources  
Leslie Filer, Natural Gas Acquisition Manager – Natural Gas Resources  
Erik Soreng, Natural Gas Acquisition Manager – Natural Gas Resources  
Justin Dorr, Natural Gas Scheduling Manager – Natural Gas Resources  
Annette Brandon, Sr. Analyst Regulatory II – Rates & Tariffs  
Carolyn Groome, Accounting Analyst III – Resource Accounting  
Jenny Berg, Accounting Analyst III – Resource Accounting  
Megan Thilo, Manager of Treasury – Treasury  
Lori Hamilton, FERC Compliance Manager – Compliance  
Garrett Brown, Regulatory Policy Analyst- Rates & Tariffs

#### Agenda:

- Market Overview
- Procurement Plan
- Accounting, Rates, Credit/Risk

#### Presentations:

- January 17, 2019 SOG

#### **Market Overview**

Justin provided a winter weather update. The Midwest weather has been much colder than expected and the inland northwest temperatures are holding true to forecasted, warmer and wetter than we are accustomed to in January.

Justin provided an update on the southbound flow. We continue to see increased flow and warmer temperatures have helped during this time while the pipeline is at a reduced capacity. There is currently no new information on when the pipeline is expected to be back to full capacity.

The Sumas cash price has continued to come back down to around \$3.86. As of the last SOG meeting it was sitting around \$6.97, after reaching as high as \$69.60 on November 16<sup>th</sup>. The Sumas cash price is currently sitting above that of AECO (\$1.50) and Rockies (\$3.11) and is just about even with Malin (\$3.88). Justin discussed the forward curves. The winter (specifically December and January) months continue to appear to be priced at a premium.

US working gas underground storage as of January 11, 2019, is lower than the 5-year average at 2,533 Bcf. Inventory is approximately 77 Bcf less than last year at this time.

As of January 17, 2019, current inventory of Jackson Prairie was approximately 4,700,000 Dth. Justin discussed the forecast for drawdown. Inventory is estimated to be 3,033,696 Dth by February 15, 2019.

#### **Procurement Plan**

Tom discussed the current procurement plan and recent hedges that have been executed. Since the last SOG meeting (December 12, 2018), five dynamic window hedges have been executed. The newly implemented risk responsive hedging tool also triggered during this timeframe due to the significant volatility within the market. As a result of the trigger, three hedges were executed since the last SOG meeting.

Tom discussed the MTM/optimization results as of the end of December 2018. As of the end of December, there was a \$10.1 million net benefit for our optimization program over the market value (had we purchased in the spot market).

**Accounting, Credit/Risk, Rates**

Carolyn Groome presented the gas decoupling and deferral balances for Washington, Idaho and Oregon. For the deferral, December ended with a \$41 million rebate.

## Strategic Oversight Group – of Gas Procurement for Distribution Customers – Discussion Group

### Meeting on February 13, 2019

#### Present at the meeting:

Jody Morehouse, Director Gas Supply – Natural Gas Resources  
Jason Lang, Director Finance, Assistant Treasurer – Finance  
Todd Bryan, Manager Resource Optimization – Power Supply  
Tom Pardee, Natural Gas Planning Manager – Natural Gas Resources  
Kaylene Schultz, Natural Gas Analyst – Natural Gas Resources  
Leslie Filer, Natural Gas Acquisition Manager – Natural Gas Resources  
Erik Soreng, Natural Gas Acquisition Manager – Natural Gas Resources  
Justin Dorr, Manager Natural Gas Scheduling – Natural Gas Resources  
Annette Brandon, Sr. Analyst Regulatory II – Rates & Tariffs  
Carolyn Groome, Accounting Analyst III – Resource Accounting  
Jenny Berg, Accounting Analyst III – Resource Accounting  
Megan Thilo, Manager of Treasury – Treasury  
Lori Hamilton, FERC Compliance Manager – Compliance  
Garrett Brown, Regulatory Policy Analyst – Rates & Tariffs  
Austin Hagel, Risk Analyst – Risk Management

#### Agenda:

- Market Overview
- Procurement Plan
- Accounting, Rates, Credit/Risk

#### Presentations:

- February 13, 2019 SOG

#### **Market Overview**

Tom Pardee provided a winter weather update. While we experienced warmer temperatures and more than normal precipitation in January, the 2<sup>nd</sup> half of February is predicted to be much colder than normal with continued precipitation.

The AECO, Sumas, Rockies and Malin markets have been volatile since the last SOG meeting, mostly due to the current cold weather conditions. The continued Enbridge constraints are also contributing to the volatility at Sumas. Some scheduled pipeline maintenance for this timeframe has been postponed but other maintenance has not, which is compounding the constraint issue. Sumas imports remain 300 mcf/d below normal.

Jody Morehouse explained that there have been some restrictions effecting withdrawal capability at Jackson Prairie due to the loss of a compressor. They do not have a backup compressor at the plant so the broken compressor must be shipped off for repair. The last serious issue at JP was in 2009. They have not notified us as to the reason for failure at this time. In addition, several production wells are shut in or producing sand.

US working gas underground storage as of February 1, 2019, is lower than the 5-year average at 1,960 Bcf. Inventory is approximately 135 Bcf less than last year at this time.

New LNG facility will come on at around 1 BCF/day.

As of February 12, 2019, current inventory of Jackson Prairie was approximately 2,574,000 Dth with the Fortis balance sitting at 395,000 Dth of this supply. Tom discussed the forecast for drawdown.

A recent analysis by I.H.S. CERA estimates the overall amount of total North American natural gas resources at over 2,000 Tcf. Of this amount, over 1,300 Tcf is economic to extract at under \$4 per MMBtu and would supply the market for over 40 years at current supply/demand rates. Western Canada, where Avista purchases over 80% of its supply of natural gas, contains 27% of these overall resources.

Tom discussed the overall availability of gas in the US (lower 48) and Canada. Approximately 2,027Tcf of gas resources are available within this area.

**Procurement Plan**

Tom discussed the current procurement plan and recent hedges that have been executed. Since the last SOG meeting (January 17, 2019), six dynamic window hedges have been executed. The newly implemented risk responsive hedging tool also triggered during this timeframe due to the significant volatility within the market. As a result of the trigger, five hedges were executed since the last SOG meeting.

**Accounting, Credit/Risk, Rates**

Carolyn Groome presented the gas decoupling and deferral balances for Washington, Idaho and Oregon. For the deferral, January ended with a \$37.3 million rebate.

## **Strategic Oversight Group – of Gas Procurement for Distribution Customers – Discussion Group**

### **Meeting on March 14, 2019**

#### Present at the meeting:

Jody Morehouse, Director Gas Supply – Natural Gas Resources  
Jason Lang, Director Finance, Assistant Treasurer – Finance  
Todd Bryan, Manager Resource Optimization – Power Supply  
Tom Pardee, Natural Gas Planning Manager – Natural Gas Resources  
Kaylene Schultz, Regulatory Affairs Analyst – Rates & Tariffs  
Leslie Filer, Natural Gas Acquisition Manager – Natural Gas Resources  
Erik Soreng, Natural Gas Acquisition Manager – Natural Gas Resources  
Justin Dorr, Natural Gas Scheduling Manager – Natural Gas Resources  
Eric Scott, Natural Gas Resources Manager – Natural Gas Resources  
Annette Brandon, Sr. Analyst Regulatory II – Rates & Tariffs  
Carolyn Groome, Accounting Analyst III – Resource Accounting  
Jenny Berg, Accounting Analyst III – Resource Accounting  
Megan Thilo, Manager of Treasury – Treasury  
Austin Hagel, Risk Analyst – Risk Management

#### Agenda:

- Market Overview
- Procurement Plan
- Gas Quality / Dithiazine
- Accounting, Rates, Credit/Risk

#### Presentations:

- March 14, 2019 SOG

#### **Market Overview**

Tom Pardee provided a winter weather update. The 8-14 day outlook calls for neutral to slightly above normal temperatures and precipitation for our region.

The Sumas cash price has continued to come back down to around \$3.57 as of March 13th. Since the last SOG meeting, we saw Sumas price shoot up to approximately \$160 for the weekend of March 2nd, but prices came off quickly by Monday.

Tom discussed the pricing evolution of shale gas since 2005. Gas has become very economic in the recent years. Tom also discussed the oil production per rig from 2018 to 2019. Production has increased at all locations from 2018 to 2019.

US working gas underground storage as of March 8, 2019, is lower than the 5-year average at 1,186 Bcf. Inventory is approximately 359 Bcf less than last year at this time.

As of March 8, 2019, current inventory of Jackson Prairie was approximately 1,250,000 Dth. Tom discussed the forecast for drawdown. Inventory depletion is on track and estimated to be depleted by April.

#### **Procurement Plan**

Tom discussed the current procurement plan and recent hedges that have been executed. Since the last SOG meeting (February 13, 2018), four dynamic window hedges have been executed. The risk responsive hedging tool was not triggered during this timeframe.

#### **Gas Quality / Dithiazine**

Eric Scott provided a recap on the Dithiazine issue, describing what it is and how it's showing up on our system. In early 2017, Avista and Cascade started seeing it showing up on their systems. In 2018, Avista saw an increase in frequency of detection across the system. As of today, Avista has had 4 reportable conditions. Rathdrum has been forced offline three times now and the problem continues to be an important safety issue. The issue has only been reported on the WCSB gas stream from NGTL.

Avista has since had several meetings with TransCanada to discuss a resolution. There are a number of wells in Canada using Triazine so it's difficult to determine which well it's coming from. TransCanada is still developing detection techniques and is working towards real time monitoring so that they can deploy sensors up the pipeline to determine which well is causing the issue.

**Accounting, Credit/Risk, Rates**

Carolyn Groome presented the gas decoupling and deferral balances for Washington, Idaho and Oregon. For the deferral, December ended with a \$22.2 million rebate.

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## Strategic Oversight Group – of Gas Procurement for Distribution Customers – Discussion Group

### Meeting on May 15, 2019

#### Present at the meeting:

Jody Morehouse, Director Gas Supply – Natural Gas Resources  
Jason Lang, Director Finance, Assistant Treasurer – Finance  
Todd Bryan, Manager Resource Optimization – Power Supply  
Tom Pardee, Natural Gas Planning Manager – Natural Gas Resources  
Kaylene Schultz, Regulatory Affairs Analyst – Rates & Tariffs  
Leslie Filer, Natural Gas Acquisition Manager – Natural Gas Resources  
Erik Soreng, Natural Gas Acquisition Manager – Natural Gas Resources  
Justin Dorr, Manager of Natural Gas Scheduling – Natural Gas Resources  
Eric Scott, Natural Gas Resources Manager – Natural Gas Resources  
Kris Busko, Natural Gas Analyst – Natural Gas Resources  
Jenny Berg, Accounting Analyst III – Resource Accounting  
Lauren Pendergraft, Manager of Risk – Risk Management  
Austin Hagel, Risk Analyst – Risk Management

#### Agenda:

- Market Overview
- Procurement Plan
- JP Update
- Deferrals
- Rates Update
- Risk Update

#### Presentations:

- May 15, 2019 SOG

#### **Market Overview**

Tom Pardee provided a weather update. The 8-14 day outlook calls for colder temperatures and increased precipitation for our region than normal.

The Sumas cash price has continued to come back down and normalize from extreme volatility experienced in March. Cash prices are currently around the \$2.00 range.

Tom discussed the current AECO forward prices. There is a relatively flat outlook for the next couple years before rising prices in the outer years.

A US Storage update was provided with storage climbing back to normal mark of 1500 bcf, came into winter with lower than average storage supply. Filling at a faster rate than normal. Discussed the Canadian storage market with lower than average current storage and drivers.

US working gas underground storage as of May 3, 2019, is lower than the 5-year average at 1,547 Bcf. Inventory is approximately 303 Bcf less than last year at this time. Production has greatly increased year over year leaving more gas available to inject into the storage fields across the Lower 48 states. In April there were numerous record injections, which could help alleviate the low storage volumes and allowing storage to get back to an average level.

The current inventory at Jackson Prairie is approximately 4,000 Dth. Tom discussed that Jackson Prairie was never fully depleted this winter because of economics. Jackson Prairie is currently being filled at approx. 100,000 bcf/day and needs to be 85% full by end of August and 100% by end of September.

Tom then gave a general market update and discussed current prices of around \$2.00. Jody Morehouse then discussed the Enbridge Pipeline incident and reviewed the testing timeline and predictions for operating flows. There is a large maintenance scheduled for July/August resulting in expected decreased flows. Work on the pipeline is anticipated to be completed and approved by November 1. Leslie File

discussed the current plans to fill Jackson Prairie ahead of the July/August timeframe because of Enbridge maintenance.

### **Procurement Plan**

Tom discussed the current procurement plan and recent hedges that have been executed. Since the last SOG meeting (March 13, 2019), 4 dynamic window hedges have been executed. The Nov19-Mar20 is over the hedging threshold because of a previous risk responsive trigger. Tom reviewed historical risk responsive metrics. There was no risk responsive hedging tool triggered since the last meeting.

Tom discussed the acknowledgement of the 2018 Hedge Plan from the WUTC and was determined that we have made substantial progress in meeting the fundamental objective of the Commission's Policy Statement. The Commission commended us for our overall strategic approach and risk responsive strategies. Tom also reviewed and discussed the Commission's comments on other gas utilities.

### **Accounting, Credit/Risk, Rates**

Jenny Berg presented the gas decoupling and deferral balances for Washington, Idaho and Oregon. For the deferral, April ended with a \$22.2 million surcharge. With the previous high gas prices, as well as pipeline and storage restrictions, we saw our position change from a rebate to a surcharge position on our deferral balances. Kaylene Schultz gave a brief update on regulatory items and discussed PGA filings of other utilities due to commodity costs.

### **JP Update**

Jody Morehouse gave an update on Jackson Prairie and reviewed the challenges faced during the 2018-2019 winter. Challenges included the accelerated online schedule due to the Enbridge incident and postponement of maintenance to meet that schedule, two liner screen failures in wells in spring 2018, C8 compressor failure in December 2018, and C9 compressor failure in February 2019. The withdrawal availabilities due to the challenges faced and impacts of the C9 compressor failure were reviewed. Capital budget revisions for the failed compressors were reviewed with additional needs of approx. \$1.4M in 2019 and \$3.9M in 2020-2021. Future needs beyond 2025 were also discussed and are being evaluated further.



## Strategic Oversight Group – of Gas Procurement for Distribution Customers – Discussion Group

### Meeting on July 10, 2019

#### Present at the meeting:

Todd Bryan, Manager Resource Optimization – Power Supply  
Tom Pardee, Natural Gas Planning Manager – Natural Gas Resources  
Kaylene Schultz, Regulatory Affairs Analyst – Rates & Tariffs  
Leslie Filer, Natural Gas Acquisition Manager – Natural Gas Resources  
Erik Soreng, Natural Gas Acquisition Manager – Natural Gas Resources  
Justin Dorr, Manager of Natural Gas Scheduling – Natural Gas Resources  
Eric Scott, Natural Gas Resources Manager – Natural Gas Resources  
Kris Busko, Natural Gas Analyst – Natural Gas Resources  
Lauren Pendergraft, Manager of Risk – Risk Management  
Austin Hagel, Risk Analyst – Risk Management  
Lori Hamilton, FERC Compliance Manager - Compliance  
Marta Tasic, Resource Accounting Analyst – Resource Accounting

#### Agenda:

- Market Overview
- Procurement Plan
- JP Update
- Deferrals
- Rates Update
- Risk Update

#### Presentations:

- July 10, 2019 SOG

#### **Market Overview**

Tom Pardee provided a market overview update. The AECO cash price has experienced volatility resulting from maintenance on pipeline. The SUMAS and Rockies cash prices are tracking together. Cash prices are currently under \$2.00.

Tom discussed the current forward prices. AECO is a depressed market; and the unknowns of the planned maintenance on SUMAS is reflected in pricing. Forward prices are relatively flat and under \$3.50 for all markets for the '19-'20 winter strips. Additionally, Tom reviewed the Henry Hub forecasts showing the current forward prices are on bottom of forecasts. Current forecasts expect prices to remain below \$7 through 2040. Forecasted production levels were also reviewed.

Tom provided an update on LNG exports. There are currently ~5 Bcfd of LNG exports, ~10 Bcfd of approved and under construction terminals, and ~11 Bcfd of approved but not under construction terminals resulting in ~27Bcf per day of potential LNG exports.

A US Storage update was provided with storage continuing to climb. The 2019 refill season is a record fill year with the highest storage levels to date. Jackson Prairie is currently 98% full at 8,444,328 Dth with a WACOG of \$1.64. The accelerated fill schedule was due to low prices and the anticipated maintenance on pipeline in upcoming months.

#### **Procurement Plan**

Tom discussed the current procurement plan and recent hedges that have been executed. Since the last SOG meeting (May 15, 2019), 5 dynamic window hedges have been executed. There was an updated load forecast of ~1 bcf from the previous load forecast which resulted in an additional 2 hedges into the plan. The load forecast will be updated 2x per year (around June and November) to correspond with the budget updates when historically it has only been updated annually. The Risk Responsive Hedging Tool was reviewed and the total portfolio is 18% hedged financially. The historical volatility of prices were reviewed. Tom led a discussion on the procurement plan review and possible scenarios, assumptions, and targets to generate thoughts on the tool going forward.

**Accounting, Credit/Risk, Rates**

Marta provided an overview of the Gas Deferral report. PGA balances were reviewed for each state and the total gas deferral balance is in a surcharge position through June.

Kaylene provided a preliminary OR PGA forecast. As of 6/30/19, commodity costs are projected to decrease, demand is projected to decrease, and amortization is projected to increase with a projected overall cost increase of 5-7%.

Lauren provided an update on conversations occurring with Platts price reporting services in an attempt to expand available licenses to the company to make pricing data more accessible.

There were no new updates on the FERC audit.

## **Strategic Oversight Group – of Gas Procurement for Distribution Customers – Discussion Group**

### **Meeting on July 25, 2019**

#### Present at the meeting:

Todd Bryan, Manager Resource Optimization – Power Supply  
Tom Pardee, Natural Gas Planning Manager – Natural Gas Resources  
Kaylene Schultz, Regulatory Affairs Analyst – Rates & Tariffs  
Annette Brandon, Regulatory Affairs Analyst – Rates & Tariffs  
Erik Soreng, Natural Gas Acquisition Manager – Natural Gas Resources  
Eric Scott, Natural Gas Resources Manager – Natural Gas Resources  
Kris Busko, Natural Gas Analyst – Natural Gas Resources  
Lauren Pendergraft, Manager of Risk – Risk Management  
Austin Hagel, Risk Analyst – Risk Management  
Lori Hamilton, FERC Compliance Manager - Compliance  
Marta Tosic, Resource Accounting Analyst – Resource Accounting  
Carolyn Groome, Resource Accounting Analyst – Resource Accounting  
Jody Morehouse, Director of Gas Supply- Natural Gas Resources  
Jason Lang, Director of Finance- Finance  
Justin Dorr, Natural Gas Scheduling Manager- Natural Gas Resources

#### Agenda:

- Market Dynamics
- Procurement Plan Review

#### Presentations:

- July 25, 2019 SOG

#### **Market Dynamics**

Tom Pardee provided a market overview update. The AECO cash price has experienced volatility resulting from maintenance on pipeline. Cash prices are currently under \$0.34 for AECO. Tom reviewed the average, maximum, minimum, and standard deviation of prices for various strips of prices.

Tom provided a brief update on LNG exports and US Storage. Exports to Mexico increased 11% over the last year and storage levels continue to climb.

Tom reviewed expectations for winter 2019/2020 supply and demand. Current estimates show 4bcfd growth for supply and 5.4bcfd growth for demand as compared to the 2018/2019 winter. The Henry Hub cash price is expected to be down \$1.23 from last winter.

#### **Procurement Plan**

Tom discussed the current procurement plan and reviewed the mix of 40% hedge and 60% cash purchases. The current procurement plan's performance was reviewed along with the triggering events for transactions. As of 7/24, the overall plan has a mark to market of \$902,462 and a weighted average price of \$1.323. Tom reviewed the current LDC firm load plan and also reviewed different options of what the plan would look like at various hedge ratios including 30%, 35%, 45% and 50% hedge ratios. Discussion occurred on the appropriate hedge ratio after reviewing the scenarios. The operative boundary thresholds for the risk responsive tool were also reviewed and different alternatives were discussed. Gas supply recommendations of keeping the hedge ratio at 40% for the LDC hedges and using the same methodology for determination of the operative boundaries calculations for the risk responsive tool were supported and will be presented to RMC at the meeting.