



Energy Resources Quarterly Board Update

3rd Quarter 2018 • November 19, 2018

ENERGY PLANNING & TRADING

2018 Q3

Portfolio Overview

Operations and Planning

- » Snowpack, Streamflow and Pricing update
- » Net Wholesale Revenue Forecast update

Market Update

Energy Efficiency Update

KEY MESSAGE POINTS

The District's 2018 Net Wholesale Revenue and other energy-related revenues are forecasted to be \$126.4 million, which is \$10.1 million above budget.

Specified source energy sales are expected to contribute \$5.0 million to Net Wholesale Revenue, which is \$1.2 million higher than budget.

Energy Efficiency programs are working towards meeting both the compliance and stretch goals.

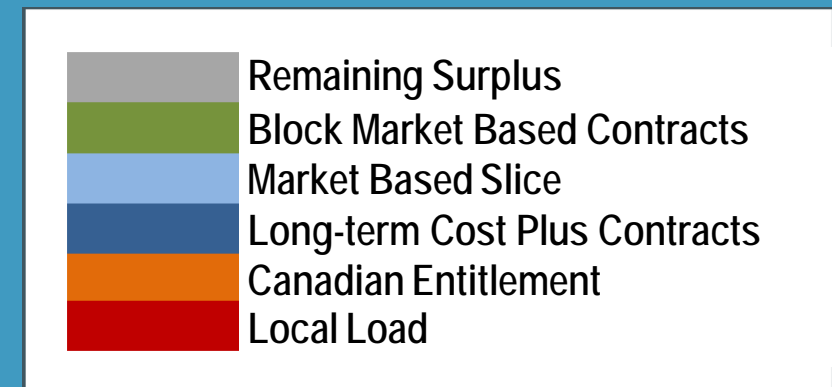
Installation of LED streetlights have begun.

Energy Resource Team is monitoring major changes in the western power market

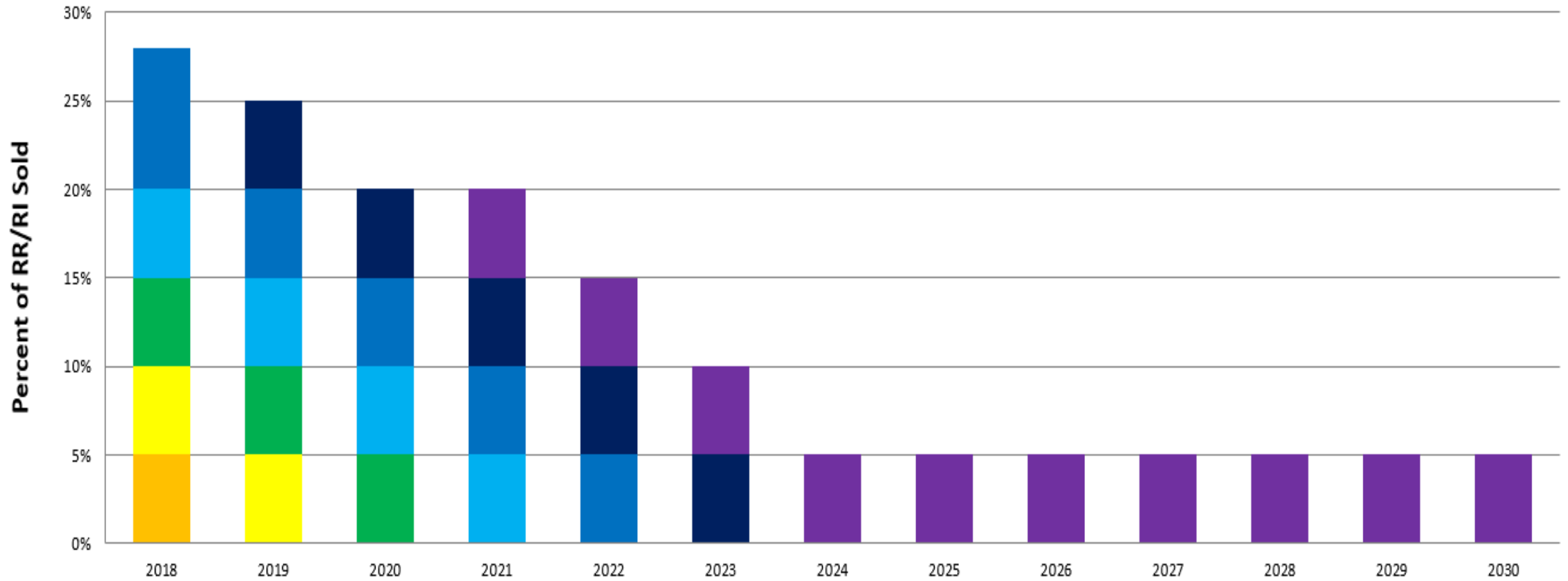
- **Reliability Coordination (RC) services**
 - Peak RC will stop providing services in 2019
 - California ISO (CAISO) will provide RC services for most
- **Short term markets (within hour → real-time → day ahead)**
 - Many utilities have joined CAISO Energy Imbalance Market (EIM) for within hour products
 - Discussions about expanding the EIM to the day ahead market
- **State carbon policies**
 - Washington state voters reject I-1631 initiative
- **Value of products and services changing**
 - Lower cost batteries

DISTRICT'S LOAD/RESOURCE BALANCE

(average MW)



Current Market Position - Market Based Slice Products



	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Long Term Slice - Avista				5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Slice Product 30 - Avangrid		5.0%	5.0%	5.0%	5.0%	5.0%							
Slice Product 29 - Morgan	8.0%	5.0%	5.0%	5.0%	5.0%								
Slice Product 26 - Morgan	5.0%	5.0%	5.0%	5.0%									
Slice Product 22 - Avista	5.0%	5.0%	5.0%										
Slice Product 18 - Exelon	5.0%	5.0%											
Slice Product 15 - Morgan	5.0%												

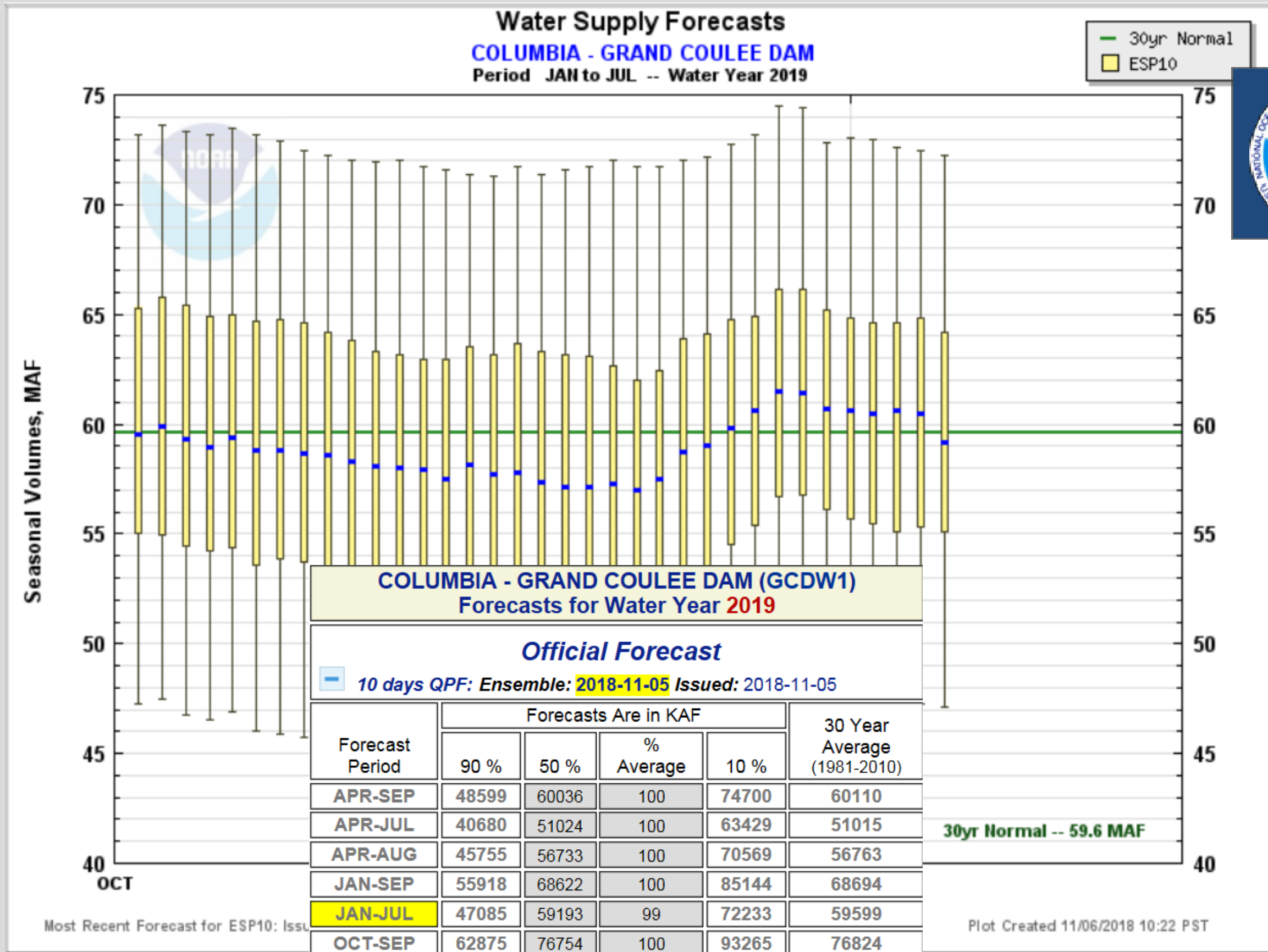
COLUMBIA RIVER FLOW

UPDATE FOR 2018

2018	Rocky Reach Flow (kcf)	Budget Rocky Reach Flow (kcf)	% of Budget
Jan	122	115	106%
Feb	150	110	137%
Mar	112	102	110%
Apr	144	114	126%
May	275	147	187%
Jun	177	167	106%
Jul	121	131	93%
Aug	97	106	91%
Sep	63	76	83%
Oct	63	78	81%
Nov			
Dec			
YTD Average	132	115	116%

* Budgeted Rocky Reach flow is the median year from the 1929-2011 data set

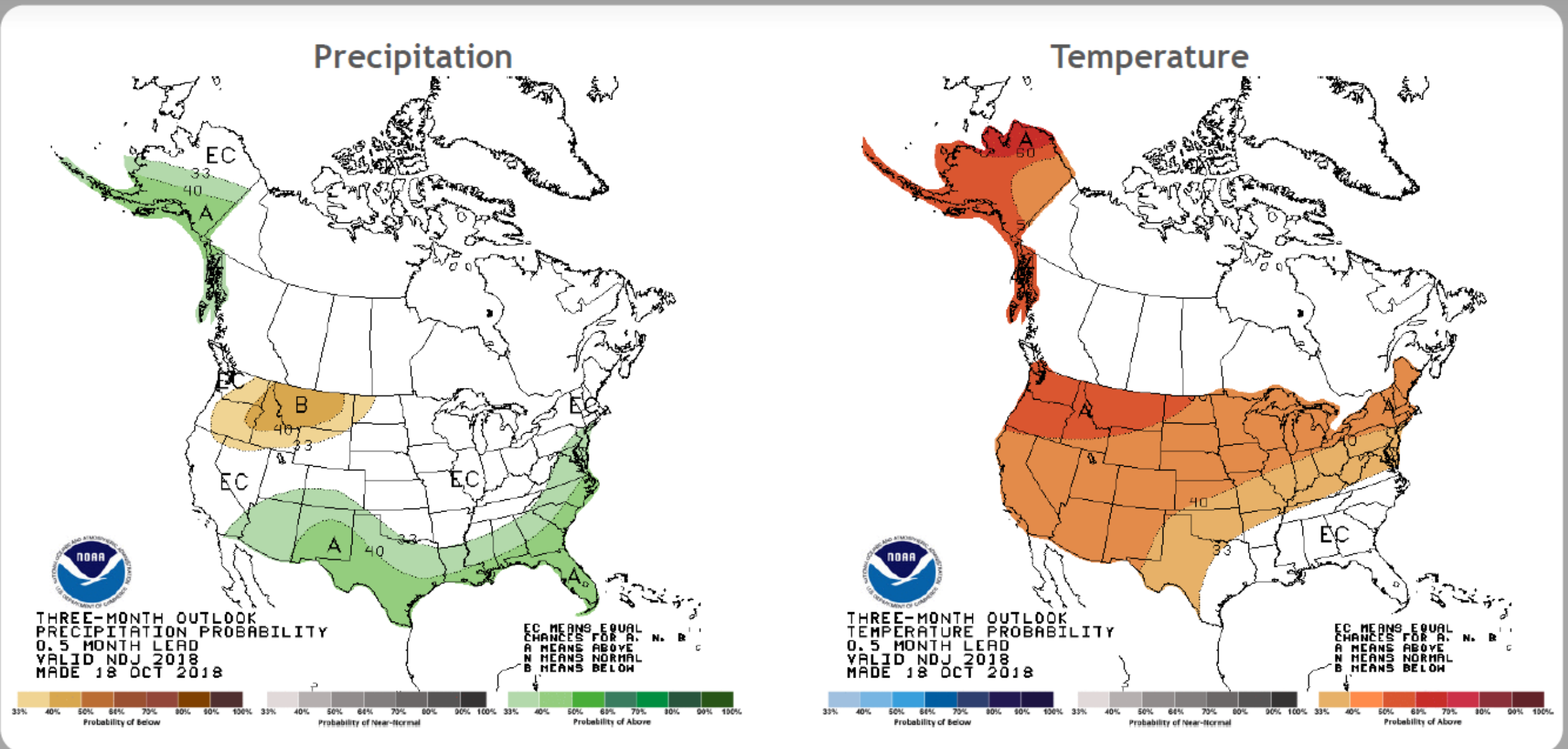
WATER SUPPLY FORECAST



U. S. Seasonal Outlooks

November-January 2018

The seasonal outlooks combine the effects of long-term trends, soil moisture, and, when appropriate, ENSO.

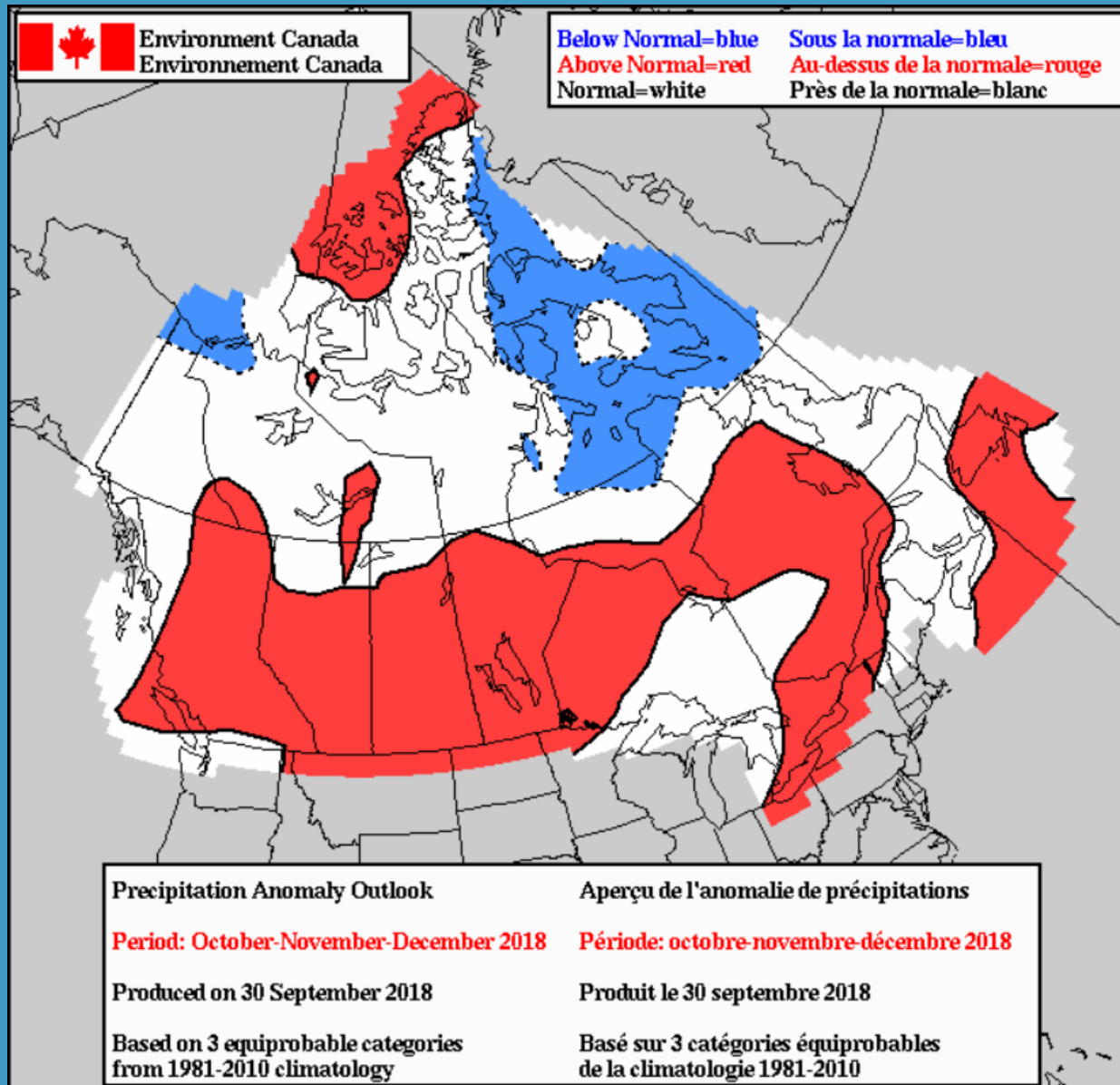


CANADIAN OCT – DEC FORECASTS

Temperature and Precipitation Deterministic Forecasts

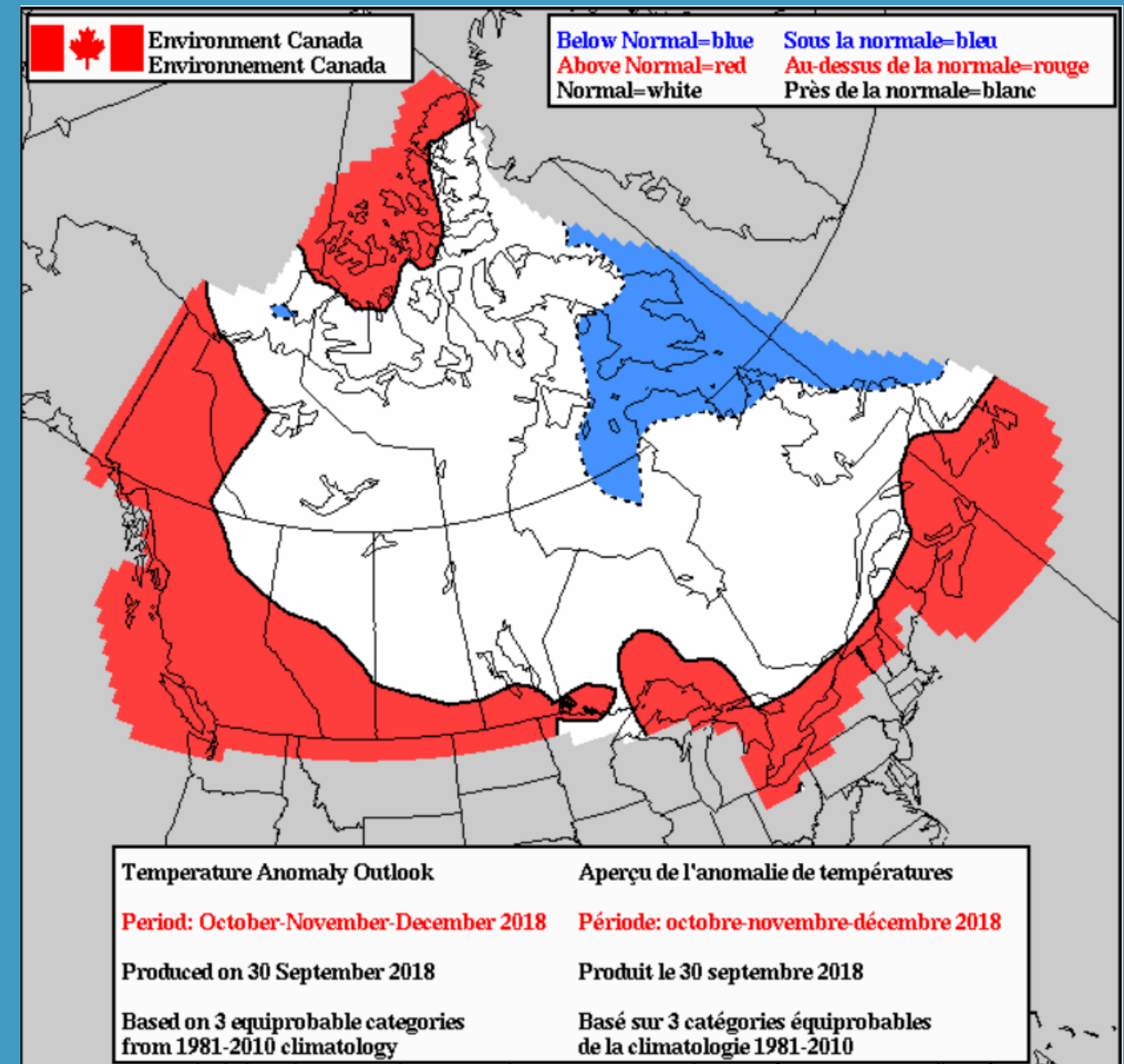
Precipitation

Red = Above (wetter)
Blue = Below (drier)



Temperature

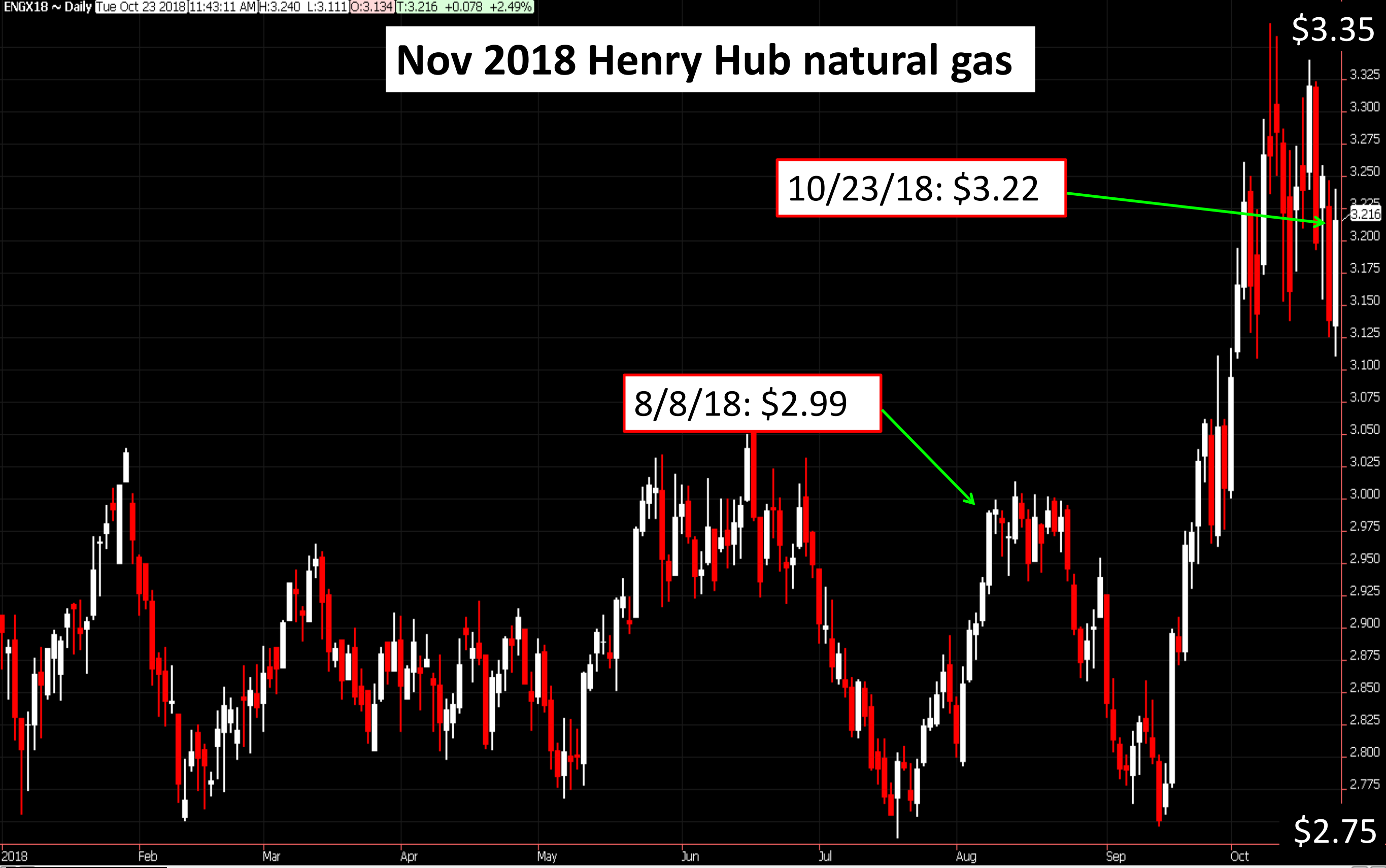
Red = Above (warmer)
Blue = Below (colder)



Nov 2018 Henry Hub natural gas

10/23/18: \$3.22

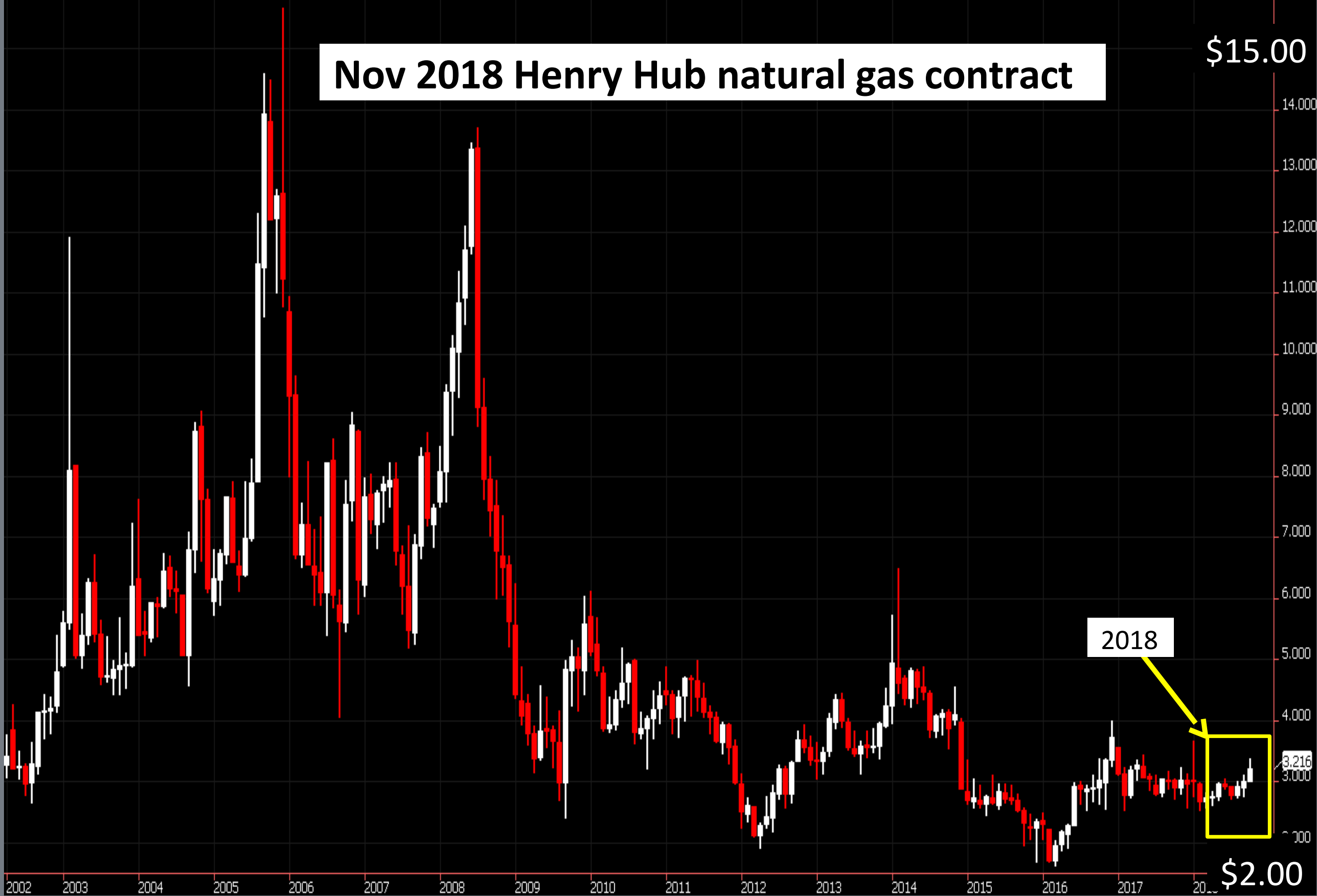
8/8/18: \$2.99



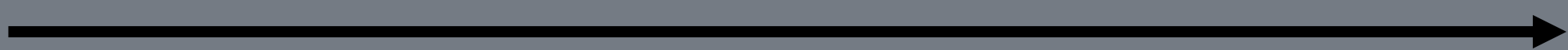
Jan 2018

Oct 2018

Nov 2018 Henry Hub natural gas contract

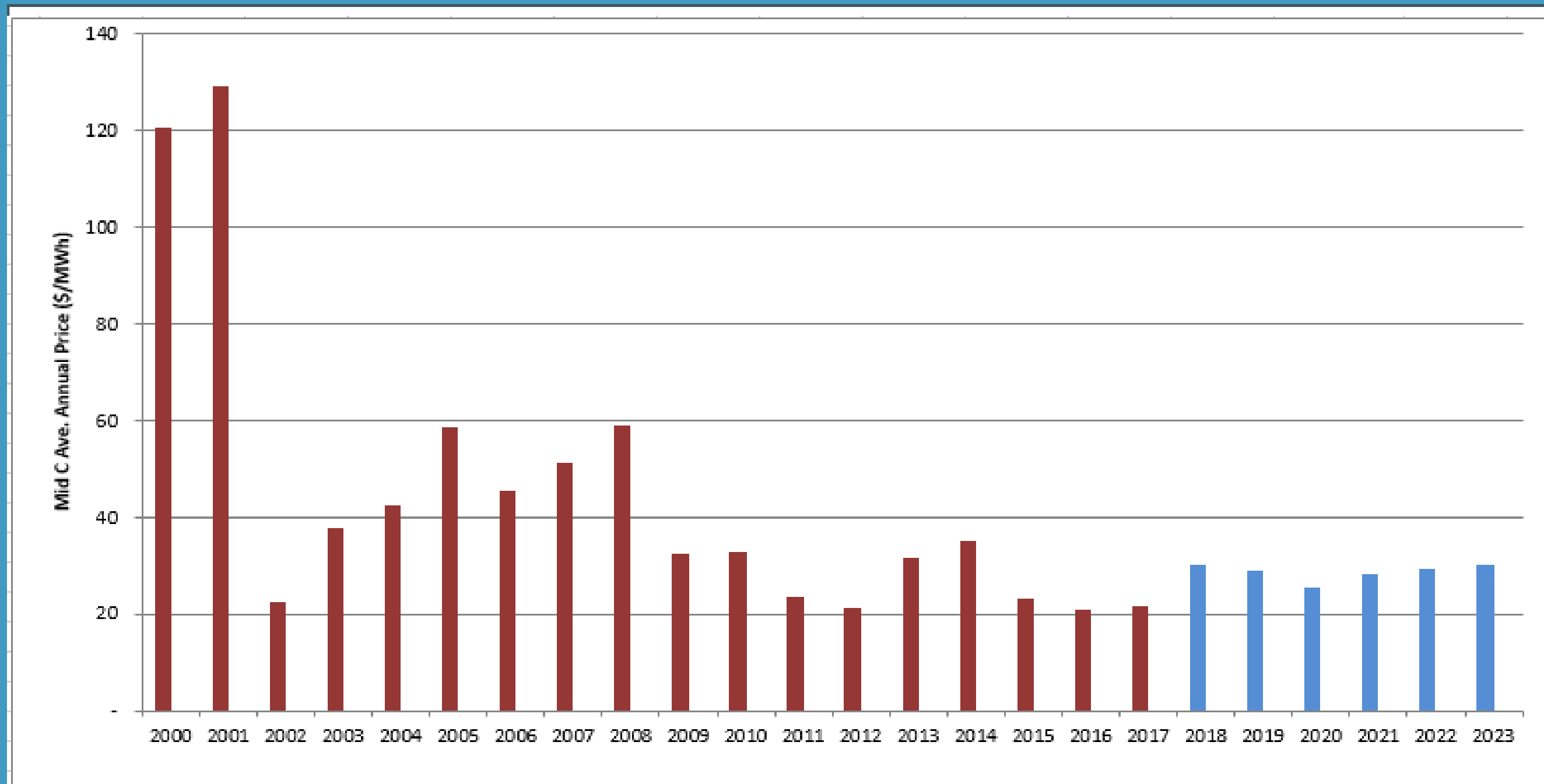


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2018 12

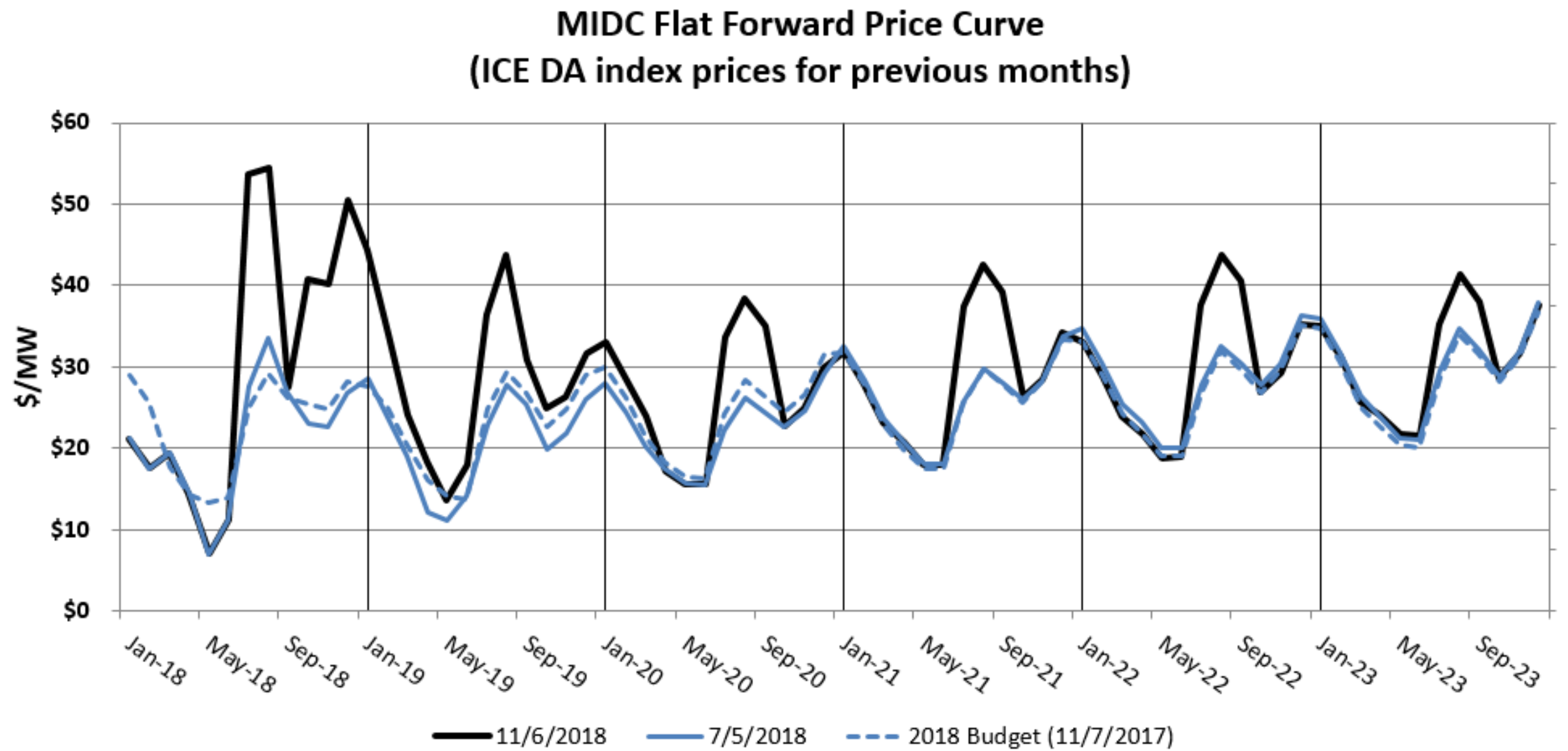
MID-C FLAT ANNUAL WHOLESALE ELECTRICITY PRICES



Red = Historical prices
Blue = Forward price curve

MIDC FLAT FORWARD PRICE CURVE

(ICE DA index prices for previous months)



2018 NWR and Other Energy-Related Revenue

	Budget	Forecast**	Variance
Net Wholesale Revenue*	\$ 108,000,661	\$ 105,251,232	\$ (2,749,429)
<i>Specified Source</i>	\$ 3,736,377	\$ 4,944,983	\$ 1,208,606
<i>Other</i>	\$ 560,214	\$ 584,052	\$ 23,838
Alcoa PSC Revenue***	\$ -	\$ 9,995,754	\$ 9,995,754
Frequency Response	\$ 638,314	\$ 638,314	\$ -
Renewables	\$ 675,764	\$ 651,630	\$ (24,134)
Real-Time Revenue	\$ 7,000,000	\$ 8,511,449	\$ 1,511,449
NWR and Other Energy-Related Revenue	\$ 116,314,739	\$ 125,048,379	\$ 8,733,640

*Net Wholesale Revenue (NWR) includes all premiums from specified source and other premium products as well as slice sales and standard forward / pre-schedule energy trading activity.

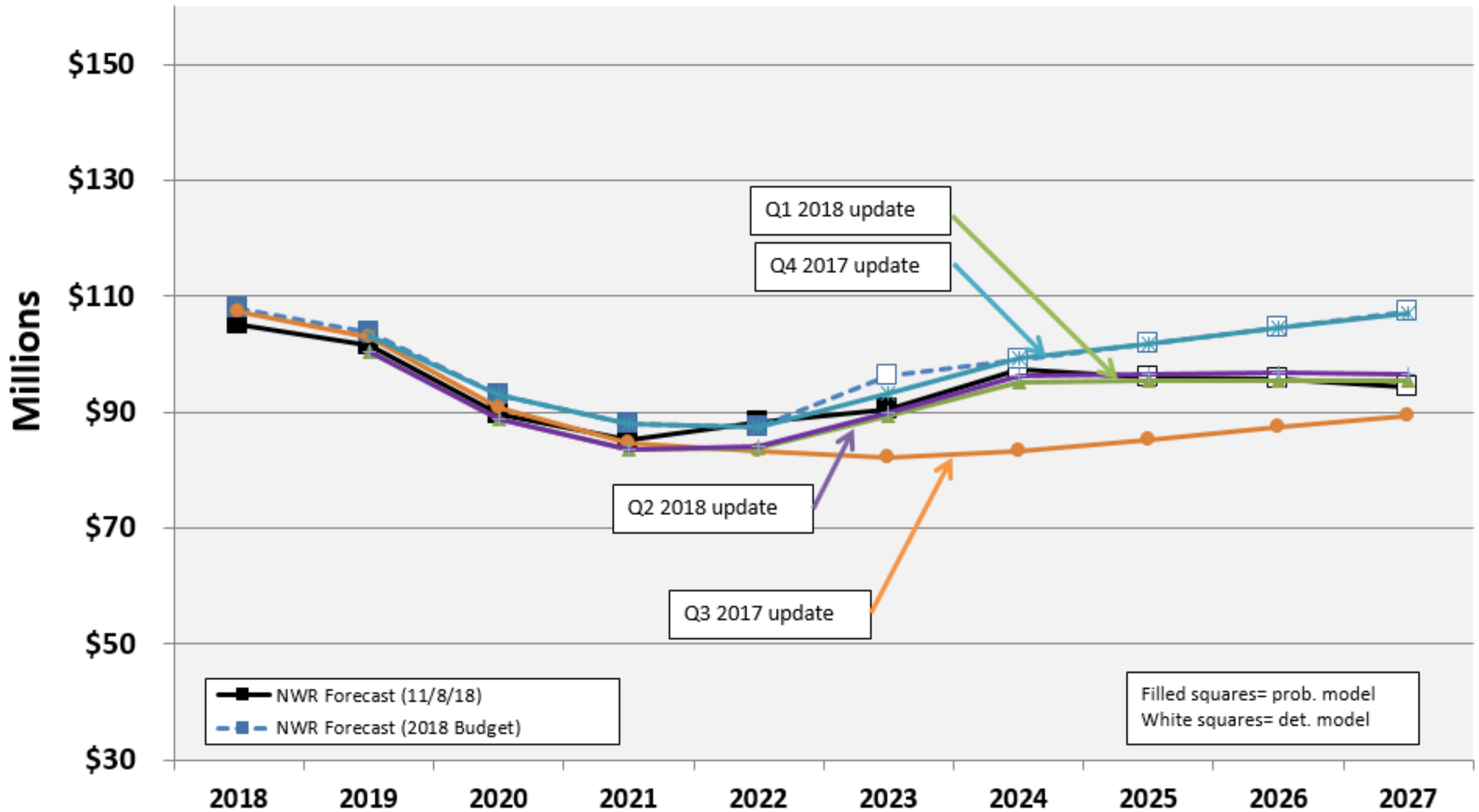
Other premium products include hubbing, system delivery, scheduling services, Lake Chelan reserves and super peak products

**2018 forecast based on Jan-Oct unaudited actuals and Nov-Dec estimates. (11/8/18 forecast)

***Alcoa PSC retained surplus revenue is "actuals to date" and does not include any forecasted revenue.

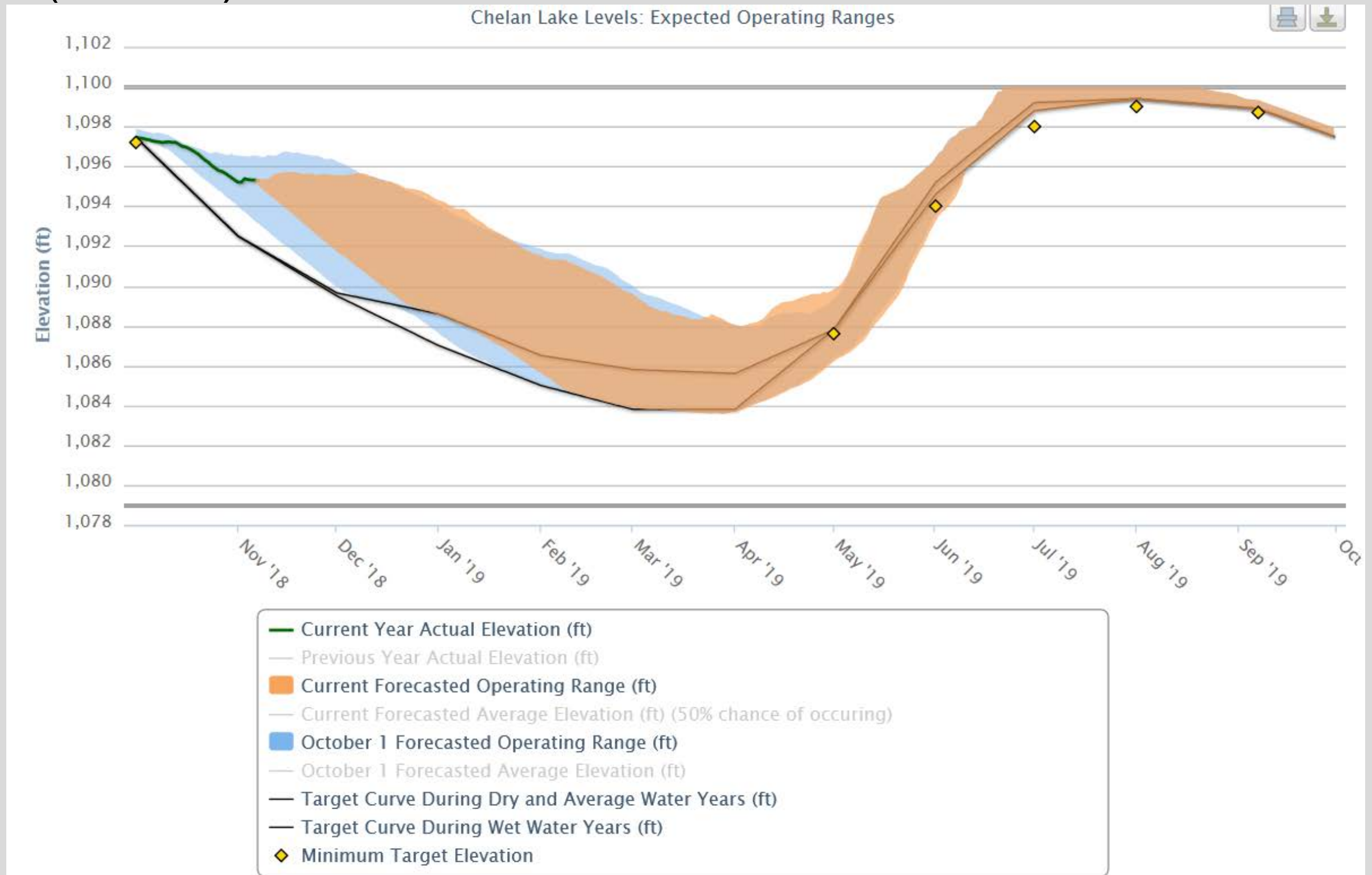
NET WHOLESALE REVENUE FORECAST

Net Wholesale Revenue Forecast



LAKE CHELAN LAKE LEVEL WEBPAGE

(11/6/18)



MARKET INFO

October high price event:

Pipeline rupture in Canada roils PNW natural gas prices

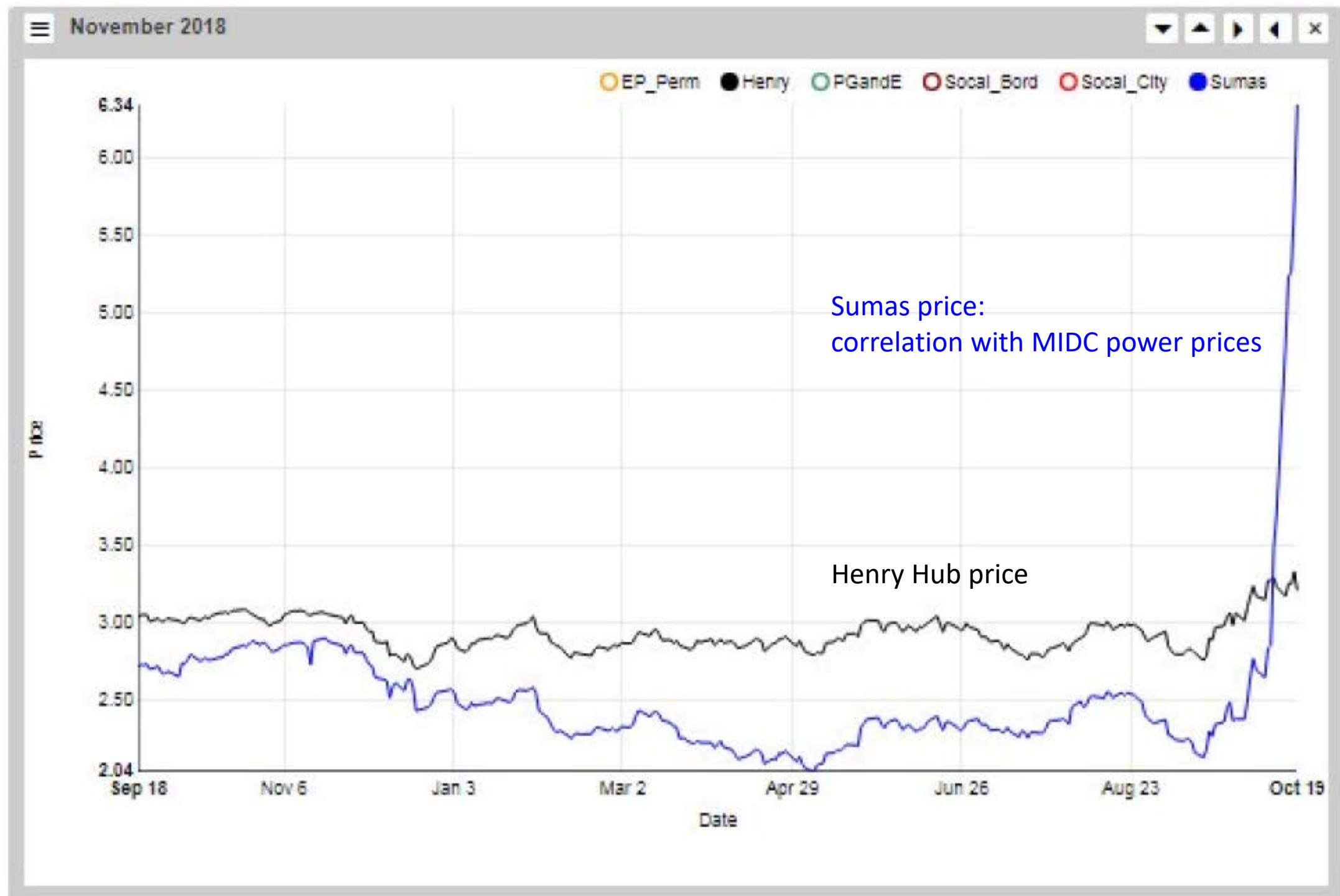
- Natural gas line rupture on Oct. 9th caused gas flows to Sumas to fall to zero
- The cut in flows had a bullish effect on natural gas and power prices in the Pacific Northwest
- After averaging in the low \$30s/MWh month to date, MIDC on-peak day-ahead prices jumped \$72 to trade in the low \$100s/MWh
- Repairs to the pipeline are expected to be done by mid November. Once complete, both pipes will be pressurized to 80% capacity

July/Aug high price event:

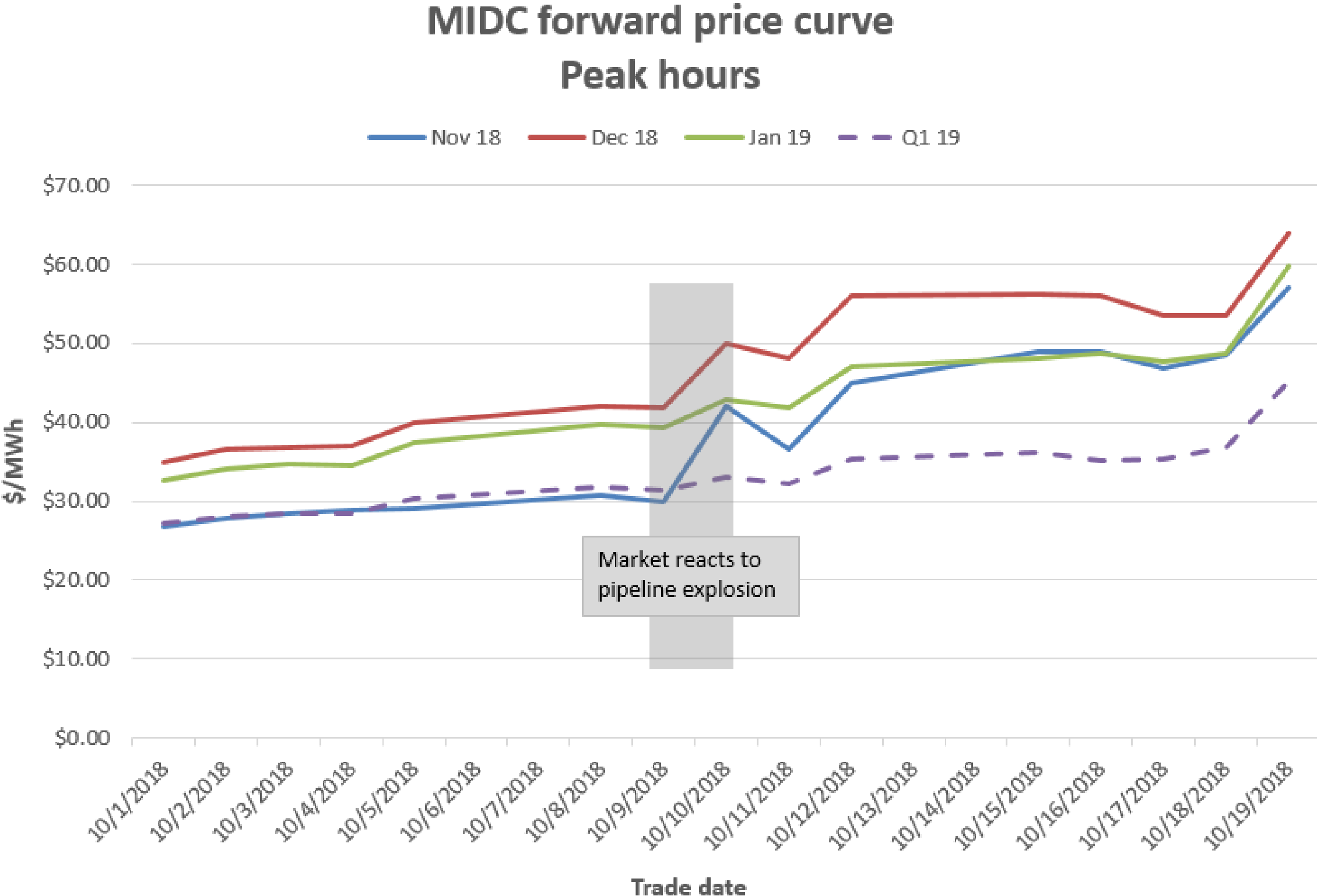
Southern California faces record natural gas prices

- Unusually hot temps, supply constraints, unplanned maintenance, reduced hydro generation and restricted activity at the Aliso Canyon storage facility cause SoCal Citygate natural gas prices to soar to \$39.31/MMBtu in July
- SoCal Citygate prices remained at elevated levels from mid July through mid Aug, bullishly impacting MIDC energy prices
- MIDC on-peak day-ahead prices averaged over \$100/MWh from Jul 23 to Aug 14

Natural gas pipeline explosion in B.C causes Sumas natural gas prices to increase



Pipeline explosion causes MIDC forward price curve to increase



Q3 ENERGY EFFICIENCY RESULTS

Two-Year Compliance Target is 2.42 aMW

Annual 2018 Stretch Target is 1.7 aMW

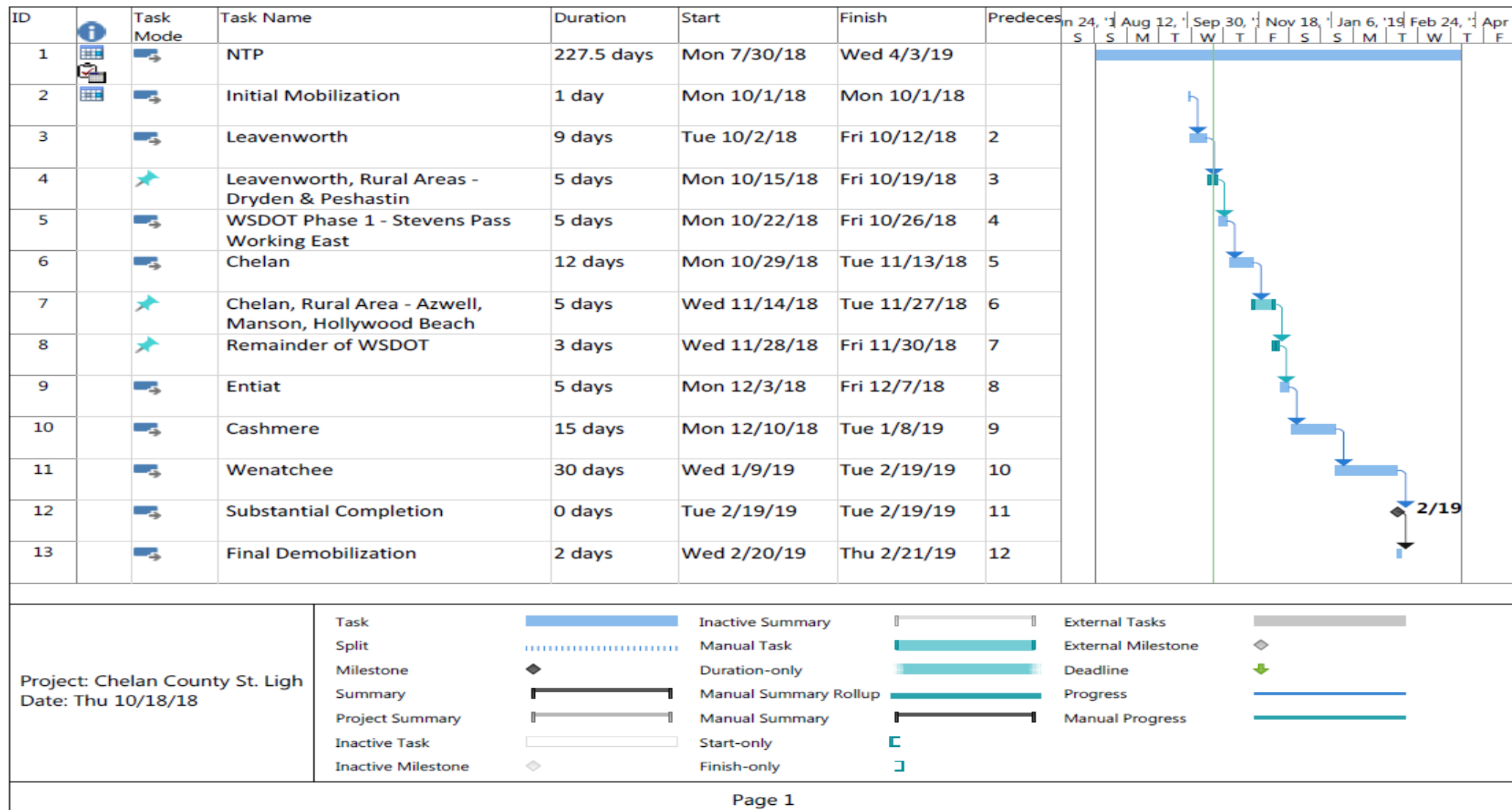
2018 Energy Savings (aMW) ¹	Incentive and Labor Cost	Levelized Cost ² (\$/MWh)	Estimated Value over Life ²
1.2	\$ 2,100,000	\$ 21.15	\$ 3,320,000

1 Pending metering and verification and based on expected NEEA savings

2 Based on weighted avg. life of measure and discounted at 7%

Streetlight Retrofit Update

- Retrofits began first of October
- Good progress is being made
- Adding additional scope (grounding work) and contractors support of hurricane efforts pushed back original 2018 completion date
- The updated completion date is February, 2019



SUMMARY

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QUESTIONS?



CHELAN COUNTY