

September 18, 2024

Ms. Lesley McCullough, Acting Chair
Yukon Utilities Board
Box 31728, Whitehorse, YT Y1A 6L3

Dear Ms. McCullough:

Re: 2023 Low Water Reserve Fund Report and Energy Reconciliation Adjustment Filing

This correspondence provides Yukon Energy Corporation's (YEC) Annual Report summarizing Low Water Reserve Fund (LWRF) and Energy Reconciliation Adjustment (ERA) for 2023.

The LWRF Annual Report and ERA Filing have been prepared pursuant to the LWRF Term Sheet as approved by the Yukon Utilities Board (Board) Order 2024-13.

The submission of this report was delayed due to the review process of the 2023/24 GRA which was finalized with the Board Order 2024-13 issued on September 13, 2024.

The following information is attached to this correspondence:

- **Attachment 1** – LWRF Calculations for 2023 and Balance Updates.
- **Attachment 2** – 2023 ERA Filing.
- **Attachment 3** – 2024/25 Water Conditions.

A summary of each of the documents attached to this correspondence follows.

Attachment 1: LWRF Calculations and Balance as of December 31, 2023

Table 1-1 of Attachment 1 provides LWRF calculations for 2023 actuals and Table 1-2 of Attachment 1 provides a LWRF Continuity Schedule in a revised format as directed by Board Order 2024-05. The interest on the LWRF balance is calculated in accordance with the revisions to the LWRF Term Sheet as approved by Board Order 2024-13.

The LWRF transfer calculations and balances for 2022 were approved by Board Order 2023-11.

In summary, the tables in Attachment 1 indicate as follows regarding the annual LWRF calculations and balance for 2023:

- Based on the actual annual load for 2023, and the LWRF Term Sheet, the LTA thermal for 2023 is 73.918 GW.h with 66.526 GW.h LNG which is about 90% of LTA thermal generation (Table 1-1, L16b).¹

¹ LNG is assumed to displace 90% of the expected long-term average thermal requirements, subject to not exceeding total thermal less estimated diesel at forecast load.

- The actual thermal generation requirement for 2023 was 43.628 GW.h, including 7.240 GW.h diesel and 36.389 GW.h LNG (Table 1-1, L17).
- The resulting overall gap between LTA and actual thermal generation for the 2023 load equals -30.290 GW.h (Table 1-1, L18), including -0.152 GW.h diesel and -30.138 GWh LNG. The resulting payment required to LWRP from YEC for 2023 is \$5.791 million (Table 1-1, L19).²
- LWRP balances [Table 1-2, Attachment 1]:
 - 2023 opening balance of \$9.895 million [2022 closing balance as approved by the Board Order 2023-11].
 - 2023 annual LWRP transfer of \$5.791 million [YEC transfers to LWRP, as per Table 1-1, Attachment 1].
 - Calculated interest on the balance at \$0.629 million.
 - No Rider E collections or rebates in 2023.
 - Closing balance on December 31, 2023 at \$16.314 million [the positive balance indicates a benefit to ratepayers].

The Board in its Order 2022-03 approved the change in the LWRP balance cap from +/- \$8 million to +/- \$16 million. Board Order 2019-02 set Rider E to 0.00 cents/kW.h effective April 1, 2019. The LWRP balance by end of 2023 exceeds the +/- \$16 million threshold by \$0.314 million, therefore, a Rider E rebate of 0.128 cents/kWh is proposed in this submission effective November 1, 2024. On April 1, 2025 Rider E would reduce to 0 cents/kWh.

The Amount Exceeding the \$16 million threshold, \$000	\$314
Total forecast retail sales for Nov 2024-March 2025, MWh	245,200
Rider E rider for November 1, 2024 through March 31, 2025	-0.128 cents/kWh

Attachment 2: 2021 ERA Filing

Attachment 2, Table 2-1 provides the 2023 actual ERA Filing and notes as follows:

- Approved wholesales for 2023 at 351.291 GW.h compared to actual wholesales at 347.704 GW.h. The Fish Lake generation adjustment at 0.044 GW.h.
- 2023 actual wholesales below the GRA forecast results in reduced YEC costs of \$0.426 million [Table 2-1, D1] and reduced YEC revenues of \$0.558 million [Table 2-1, D2] requiring no ERA payment for 2023.

Forecast Water Conditions for 2024/25

Attachment 3 provides a copy of the memorandum prepared on expected water conditions for 2024/25. The memorandum highlights low water conditions at Aishhik and maximized generations

² Based on 2023/24 GRA average fuel costs at \$0.1906 per kW.h for LNG and \$0.3069 per kW.h for diesel as approved by YUB in Order 2024-05.



#2 Miles Canyon Road
Box 5920, Whitehorse
Yukon Y1A 6S7
yukonenergy.ca

in Whitehorse and Mayo hydro generation facilities. The low water conditions are expected to impact thermal generation volumes for 2024 and 2025.

Requests

The LWRF Term Sheet, as approved by YUB Order 2024-13, requires the annual report to be filed with the Board for approval of the Board. Accordingly, YEC is seeking Board's approval of LWRF transfers for 2023 as well as LWRF balances as provided in Attachment 1 of this filing, and Rider E rebate of 0.128 cents/kWh effective November 1, 2024 to March 31, 2025.

If you have any questions regarding the above, please contact the undersigned.

Yours truly,

A handwritten signature in black ink, appearing to read "Jason Epp".

Jason Epp
Vice President, Finance and
Chief Financial Officer



ATTACHMENT 1: LWRP CALCULATIONS AND BALANCE UPDATES FOR 2023

Table 1-1: LWRP Calculations

Line No		2023 Annual	Notes
L1a	Diesel Fuel Cost per kW.h	30.686 cents/kW.h	
L1b	LNG Fuel Cost per kW.h	19.059 cents/kW.h	2023/24 GRA Average Fuel cost
L1c	GRA YIS firm Load forecast	525,454 MW.h	
L1d	GRA LTA Thermal Generation forecast	77,578 MW.h	
Calculation of Thermal Cost to Charge (Refund) LWRP			
L2	YEC Grid firm load	520,608 MW.h	Actual
L3	Fish Lake	8,686 MW.h	Actual
L4=L2+L3	Total Grid load	529,294 MW.h	
Assumed Actual Generation Sources			
L5	YECL Fish Lake	8,686 MW.h	Actual
L6	YEC Hydro	471,957 MW.h	Calculated as L2-L7-L8
L7	YEC Thermal	46,689 MW.h	Actual
	Diesel	10,300 MW.h	Actual
	LNG	36,389 MW.h	Actual
L7a	YEC Diesel/LNG charged to capital, RFID and maintenar	3,061 MW.h	Actual
L7a1	Diesel	3,061 MW.h	Actual
L7a2	LNG	- MW.h	Actual
L7b=L7-L7a	YEC Net Diesel/LNG	43,628 MW.h	Actual
L7b1	Diesel	7,240 MW.h	Actual
L7b2	LNG	36,389 MW.h	Actual
L7b3=L7b1/L7b	Diesel % of total net thermal	17%	
L8	IPPs	1,962 MW.h	Actual
L9	Total Grid load	529,294 MW.h	
LTA Expected Generation Sources			
L10	AEY Fish Lake (expected)	8,730 MW.h	Long-term average [Note 1]
L11	IPPs	1,962 MW.h	Expected at actual level [Note 2]
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and IPP	518,602 MW.h	
L13=L12-L1c+L11	Load Variance	-4,890 MW.h	
L14	LTA Thermal Generation at Actual Load	73,918 MW.h	Estimated based on LTA Thermal Calculation Table [please see below]
L15=L7b/L14	Actual Thermal Generation as % of LTA Thermal Generation	59%	
L16=L14	Expected YEC Thermal Generation in Rates	73,918 MW.h	
L16a	Diesel	7,392 MW.h	Total thermal less LNG below.
L16b	LNG	66,526 MW.h	90% of total thermal, subject to not exceeding total thermal less estimated diesel or actual diesel
L17=L7b	YEC Net Thermal Generation	43,628 MW.h	
L17a=L7b1	Diesel	7,240 MW.h	
L17b=L7b2	LNG	36,389 MW.h	
L18=L17-L16	YEC Thermal Generation to be included in LWRP	- 30,290 MW.h	
L18a=L17a-L16a	YEC Diesel Generation to be included in LWRP	- 152 MW.h	
L18b=L17b-L16b	YEC LNG Generation to be included in LWRP	- 30,138 MW.h	
L19=L1axL18a+L1bxL18b	Incremental YEC Thermal Generation Cost to Charge (Refund) LWRP (\$000s)	(\$5,791)	

Notes:

- The approved 2023 Fish Lake generation in AEY's 2023/24 GRA is 7.822 GWh. The OIC 2021/16 requires use of long-term average renewable resource energy for generation forecasting used to set rates. Therefore, Fish Lake expected generation assumed at 8.730 GWh which is based on long-average generation as approved by YUB Order 2014-06.
- As per LWRP Term-Sheet, the actual YIS load for this assessment is net of long-term average annual (i.e., expected) availability for all renewable sources other than YEC hydro generation, including Fish Lake hydro, and IPP renewable generation based on available information. As the number of IPP connections is evolving, the LTA availability from this renewable source will change each year. Therefore, for the purpose of the LWRP calculations the actual IPP deliveries are used, which is the best available information.

LTA Thermal Calculations for 2023 for Line 14 in Table 1-1

	MWh
1 YEC Grid load net of Fish Lake and IPPs [Table 1-1, L12]	518,602
2 Rounding to Lower Five Thousand	515,000
3 Expected LTA Thermal at Rounded Load [2023/24 GRA, App 2.1, Table 2.1-1]	71,216
4=1-2 Load above Rounded Load	3,602
5 LTA Thermal as % of Incremental Load [2023/24 GRA, App 2.1, Table 2.1-1]	75%
6=4*5 LTA Thermal above Rounded Load	2,702
7=3+6 Total LTA Thermal	73,918

Table 1-2: LWRF Continuity Schedule

Year (Note 1)	Opening Balance (Note 2)	Water Availability (LTA) Adjustment (+/-) (Note 3)	Finance Charge (+/-) (Note 4)	Adjustment for balances outside fund caps (Note 5)	Other Adjustments (Note 6)	Ending Balance	Active (A)/Inactive '(I) (Note 7)
1989	2,000					2,000	I
1990	2,000					2,000	I
1991	2,000	10				2,010	A
1992	2,010	290				2,300	A
1993	2,300				-400	1,900	I
1994	1,900				-1400	500	I
1995	500					500	I
1996	500	-1,458	189		3,540	2,771	A
1997	2,771	-191	85		170	2,835	A
1998	2,835	467	159		-1,225	2,236	A
1999	2,236	-1,132	43		-499	648	A
2000	648		35			683	I
2001	683		33			715	I
2002	715		19			734	I
2003	734		21			755	I
2004	755		16			772	I
2005	772		19			791	I
2006	791		30			821	I
2007	821		35			856	I
2008	856		27			883	I
2009	883		4			887	I
2010	887		4			891	I
2011	891		11			902	I
2012	902	3,715	11			4,628	A
2013	4,628	3,518	52			8,198	A
2014	8,198	1,342	87			9,627	A
2015	9,627	1,974	53	-759		10,895	A
2016	10,895	990	54	-2,454		9,485	A
2017	9,485	0	86	-2,861		6,710	A
2018	6,710	-534	76	-2,874		3,379	A
2019	3,379	-6,268	-7	-1,004		-3,900	A
2020	-3,900	-352	-20	0		-4,272	A
2021	-4,272	7,019	-3	0		2,744	A
2022	2,744	7,151				9,895	A
2023	9,895	5,791	629			16,314	A
2024	16,314						

Notes:

1. Year refers to the YEC calendar year, ending December 31.

2. Balance at start of fiscal year in YEC fund to address YEC thermal generation cost changes from forecast due to changes in water availability. This fund's name and terms have varied over the years, e.g., low water fund, Diesel Contingency Fund (DCF), Low Water Reserve Fund (LWRF). YEC's first GRA filing for the 1989/90 GRA indicated that a reserve of \$2 million had been established by YEC out of retained earnings in 1987 to assist in maintaining rate stability in the event of increased costs to produce electricity by diesel generation at times of low water conditions and shut downs of hydro facilities. Subsequent changes to the fund are due to factors as explained in the table based on the approach approved for the calculations in place at the time. A positive balance means owing to customers while a negative balance owing to YEC.

3. Water Availability Adjustment refers to the annual adjustment to the LWRF due to the difference between forecast renewable generation and actual renewable generation based on the approach approved for the calculations in place at the time. Long-term average (LTA) forecasts for water availability were first approved for setting rates in the 1996/97 GRA (Order 1996-7). Where relevant, adjustments address wind or other non-hydro variances in renewable energy availability.
4. Finance charge refers to the change in the LWRF due to interest or equivalent calculations.
5. When the fund is outside its caps (currently set at +/- \$16 million), YEC must request a rider to either charge or refund to customers amounts to bring the balance of the LWRF within the boundaries of the fund caps.
6. Other adjustments reflect the following:
 - a. In response to closure of the Faro mine and its impact on YEC rates and reserve requirements for potential low water conditions, Board Order 1993-8, section 5.1.4.3 approved a \$0.4 million allocation to 1993 and a \$1.4 million allocation to 1994 as an offset to the 1993 and 1994 revenue requirements.
 - b. The adjustment for 1996 reflects the Settlement approved in Order 1996-7 to replenish the DCF using funds from pre-1996 reserves related to the Faro mine bad debt payment and net recoveries related to reopening of the Faro mine.
 - c. The adjustments for 1997, 1998 and 1999 reflect credits applied as per Board Order 1997-7 related to Faro mine closure as well as adjustments related to Whitehorse Hydro Plant Fire and Forest Fires [RFID related transactions].
7. Indicate whether the LWRF was active or inactive for that given year. Inactive periods occurred when mine closures reduced hydro grid loads to levels where water availability was not expected to materially affect thermal generation costs. The table reflects years when actual renewable availability ended up impacting the LWRF/DCF (even if actual YUB decisions related to such changes to the fund were deferred until subsequent years).

ATTACHMENT 2: 2023 ERA FILING

Table 2-1: ERA Determination for 2023

	2023	
A Wholesales Variance for AEY (MW.h)		
Actual firm wholesales	347,704	A1
GRA approved wholesales assuming Fish Lake LTA generation	351,291	A2 [See note 1]
Fish Lake generation adjustment (expected LTA less actual)	44	A3 [See note 2]
Change in wholesales for ERA	-3,631	A4=A1-A2-A3
B YEC Cost Impact per kW.h change in Wholesales		
Losses (%)	8.65%	B1 [Actuals]
Total YEC's actual generation net of secondary (MWh)	518,602	B2 [See note 2]
GRA approved firm load forecast (MWh)	525,454	B3 [See note 1]
YEC incremental generation relative to GRA approved (MW.h)	-6,852	B4=B2-B3
YEC's actual LTA Thermal Generation (MWh)	73,918	B5 [See note 2]
GRA LTA Thermal Generation (MWh)	77,578	B6 [See note 1]
YEC Incremental thermal generation relative to GRA approved (MWh)	-3,660	B7=B5-B6
Incremental thermal generation for incremental total generation (%)	53.41%	B8=B7/B4
Thermal Generation cost per GRA (\$/kW.h)	0.2022	B9 [See note 2]
YEC thermal cost change (\$/kWh wholesales)	0.1174	B10=B9*B8*(1+B1)
C YEC Revenue Impact per kW.h change in Wholesales		
Rate Schedule 42 Energy Charge (\$/kW.h wholesales)	0.08298	C1
Average YEC rider applicable to AEY retails (\$/kWh wholesales)	0.07156	C2 [See note 3]
D Net thermal cost impact on YEC (\$000)		
Wholesale Change: Cost Impact (YEC thermal generation costs)	-426	D1=A4*B10
Wholesale Change: Revenue Impact (YEC revenues)	-558	D2=A4*(C1+C2)+A3*C1
Cost change>revenue change ("Yes"=1, "No"=0)	0	D3=1 if D1>D2 (absolute)
ERA Charge (rebate) to AEY [Net added cost (cost saving) for YEC]	0	D4=D3*(D1-D2)

Notes:

1. Based on 2023/24 GRA.

2. Please see LWRP calculations in Table 1-1 for generation numbers. The GRA thermal generation cost is based on 90% LNG and 10% diesel. Fish Lake generation adjustment reflects the variance between the approved LTA generation of 8,730 MWh and actual generation at 8,686 MWh.

3. The average Rider is estimated based on total Rider J revenues from AEY retail customers for 2023 as per YEC's 2023/24 GRA Compliance Filing, divided by wholesales.



MEMO

From: Kevin Maxwell
To: Chris Milner
Date: 18 September, 2024
Pages: 6
Subject: 2024/25 Water Availability Forecast

2 Miles Canyon Rd
Box 5920
Whitehorse, YT Y1A 3A1
Phone: (867) 393-5313
Fax: (867) 393-5322
www.yukonenergy.ca

Dear Mr. Milner,

1.0 Reservoir Water Levels

The historic and forecast reservoir water levels for the three Yukon Energy reservoirs Aishihik, Marsh and Mayo are shown in Figures 1-3. In addition to the figures a description of the current elevations relative to historical elevations are discussed below. These figures show actual water elevation to September 09, 2024 and the expected forecasted elevation based on average historic inflows¹ for the balance of the year shown with the orange dotted line. Historic water levels for each reservoir are shown in grey:

- The solid grey line shows the median historic water level
- The light grey shaded area shows the Min-Max range of water levels
- The medium grey shaded area shows the 25th-75th percentile water level

The following trends can be observed with the current water levels:

Aishihik Lake: The elevation of Aishihik Lake, as of September 09, 2024, was 914.045m or 1.12m below Full Supply Level. This water level is below the 25 Percentile (grey area in figure 1), due to low snow and dryer than normal May/June weather. The Aishihik watershed continues to experience below average summer and fall inflows. Given the below average inflows Aishihik is not expected return to Full supply in 2024 staying below 25 percentile for the balance of 2024. In 2025, we expect that Aishihik will draw-down below 913.6m elevation in May 2025.

Marsh Lake: The elevation of Marsh Lake, as of September 09, 2024, was 656.599m, or 0.22m above the Full Supply Line. Yukon Energy is maximizing Whitehorse generation to reduce the

¹ Marsh Lake and Aishihik Lake also includes a Hydrotel high inflow based on current snow conditions shown as a red dotted line.

dependence on Aishihik generation between now and the winter of 2024/25. Marsh Lake will stay at about the FSL level between now and Oct 2024 when Yukon Energy will start to close gates to maintain normal fall and winter operations. Marsh is forecasted to reach within 25 cm of LSL (653.80m) by May 2025.

Mayo Lake: The elevation of Mayo Lake, as of September 09, 2024, was 664.856m which is 0.984m below the Full Supply Line. Yukon Energy is maximizing Mayo generation to reduce the dependence on Aishihik generation between now and the winter of 2024/25. By maximizing Mayo generation, Mayo Lake will not reach full supply in the Fall of 2024. Not reaching full supply will not change Yukon Energy's winter 2024/25 Mayo operations but will increase risk in 2025 that Mayo will not reach full supply in 2025. Mayo Lake is forecasted to get down to 663.44m by May 2025.

Figure 1: Aishihik Lake Elevations

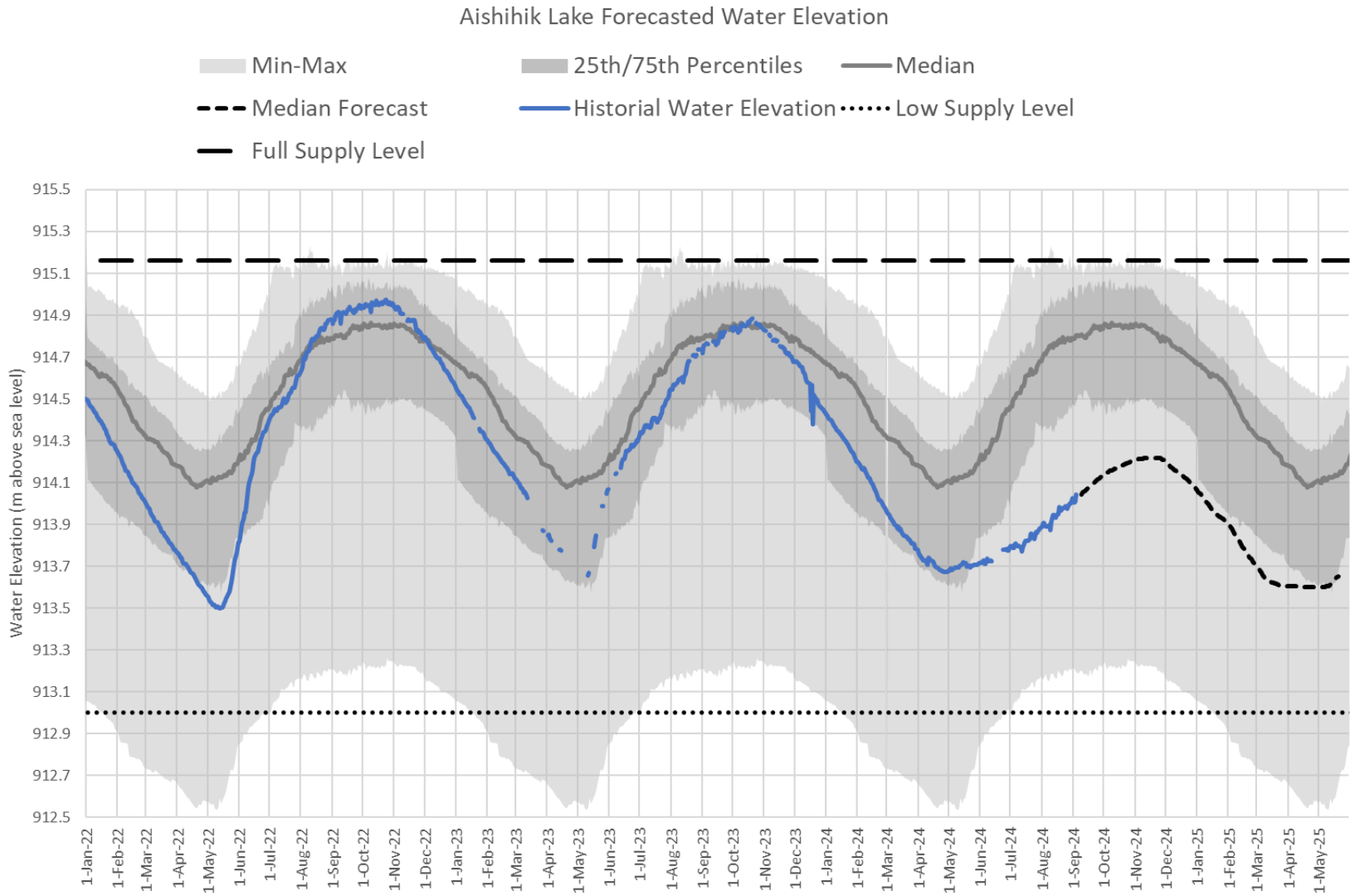


Figure 2: Marsh Lake Forecasted Elevations

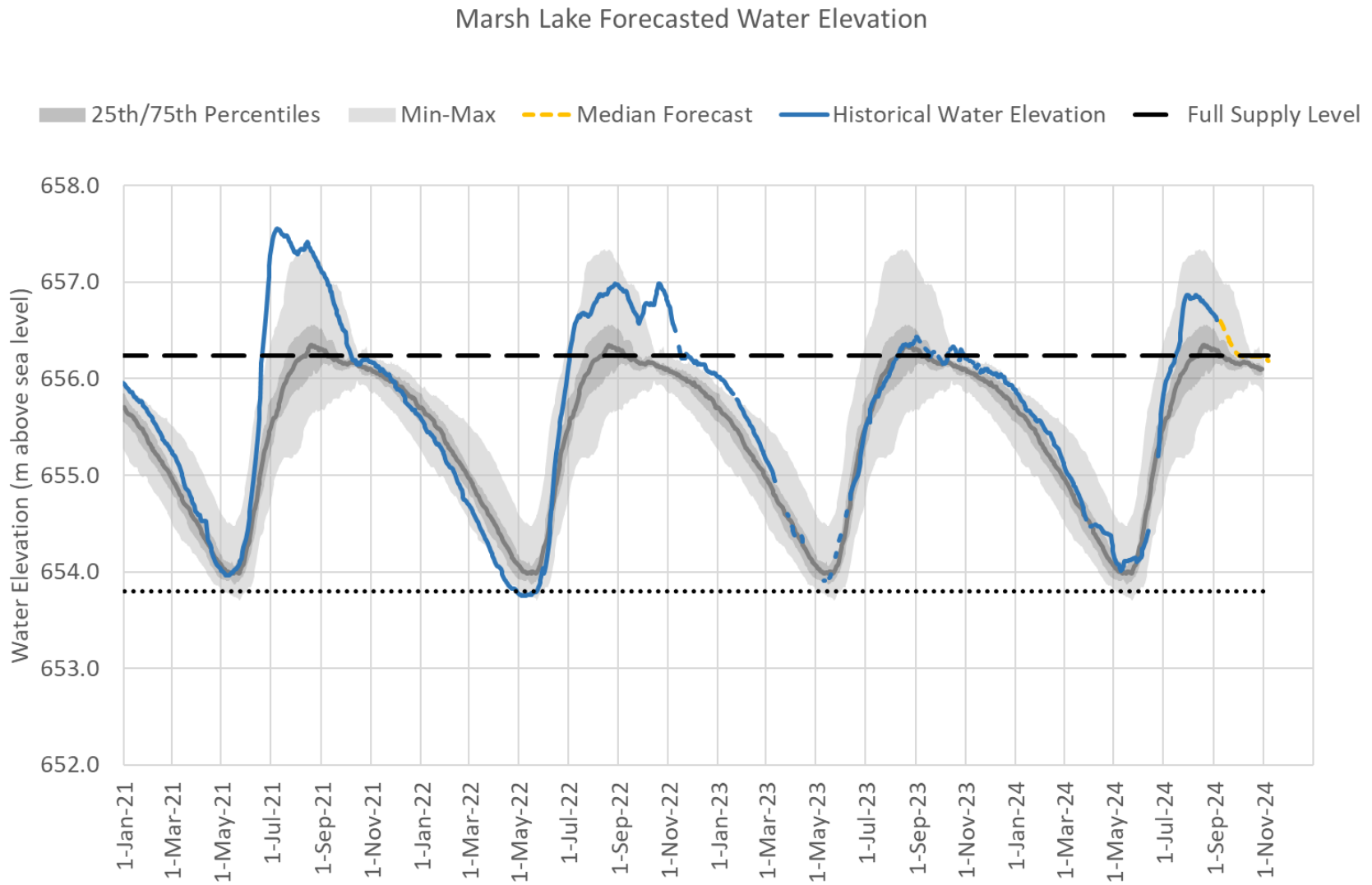
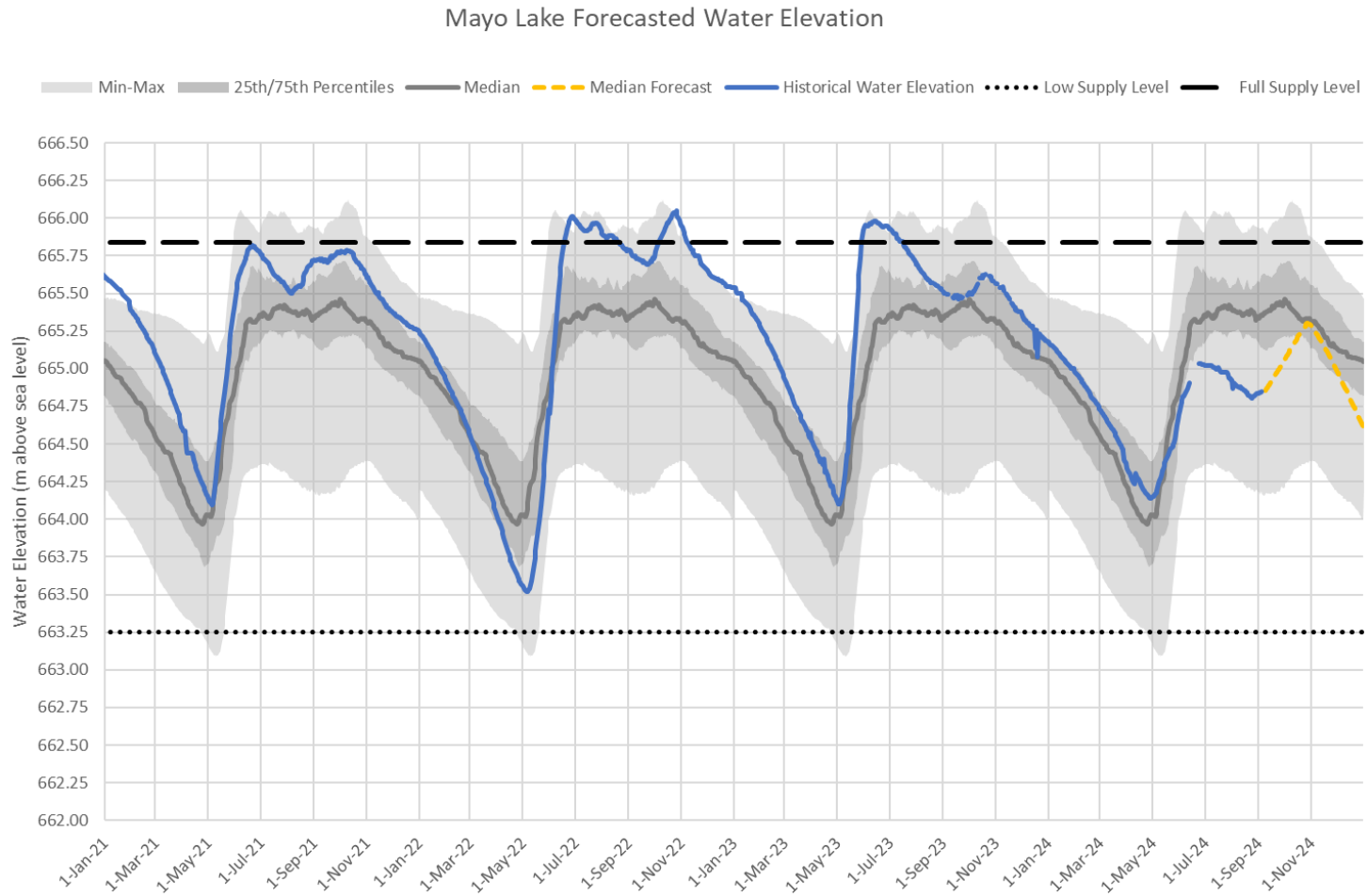


Figure 3: Mayo Lake Forecasted Elevations Mayo Lake Forecasted Elevations



2.0 Generation Forecast

Yukon Energy has experienced low inflows at both Aishihik and Mayo lakes in addition to unit outages has resulted in Yukon Energy to start to LNG starting in the summer of 2024 to to maximize Aishihik Lake winter generation. The present 2025 total Yukon Energy grid generation forecast is 503 GWh which is subject to refinements due to uncertainties around Victoria Gold mine. Of the 503 GWh 261.2 GWh will come from Whitehorse generation, 87.3 GWh will come from Aishihik generation, 53.9 GWh will come from Mayo Generation, 8.2 GWh will come from Diesel generation and 56.3 GWh will come from LNG generation, and 36.2 GWh will come from SOP. Yukon Energy always optimizes the system to maximize Hydro generation with the goal to minimize thermal generation.

Regards,

X

Kevin Maxwell

Kevin Maxwell
Resource Planner
Yukon Energy Corporation