



Yukon Energy Corporation
Box 5920
Whitehorse, Yukon Y1A 6S7

April 5, 2017

Mr. Robert Laking, Chair
Yukon Utilities Board
Box 31728
Whitehorse, Yukon Y1A 6L3

Dear Mr. Laking:

Re: Diesel Contingency Fund (“DCF”) 2016 Annual Report

Pursuant to Yukon Utilities Board (“YUB” or the “Board”) direction provided in Order 2015-01 and 2015-06, this correspondence provides Yukon Energy Corporation’s (“Yukon Energy” or “YEC”) Annual Report summarizing DCF activities up to December 31, 2016 based on preliminary actuals, and includes the following information:

- **Attachment 1** - DCF Calculations and Balance Updates.
- **Attachment 2** - Updated Rider E Rate Schedule (at \$0.14 c/kWh rebate effective May 1, 2017 and until March 31, 2018).
- **Attachment 3** - Update on Forecast Water Conditions for 2017.

A summary of each of the above documents follows.

DCF Calculations and Balance as of December 31, 2016

Attachment 1, Table 1 in this filing provides DCF calculations and balance as of December 31, 2016, and Attachment 1, Table 2 provides a DCF Continuity Schedule for the years 2012 to 2016. Attachment 1, Table 3 provides Rider E calculation. Monthly calculations for 2016 are provided in Table 4 of Attachment 1.

In summary, these attachments indicate as follows regarding the annual DCF calculations and balance for 2016:

- Based on actual annual load for 2016 and the approved DCF Term Sheet, the "expected" (i.e., based on long term average water conditions) thermal requirement for 2016 is 10.536 GW.h (Table 1, L15);
 - LNG is assumed to displace 100% of the 2016 expected long-term average thermal requirements.
- Actual annual thermal generation requirement for 2016 (net of LNG and diesel charged to capital and RFID) was 5.087 GW.h, including 2.293 GW.h diesel and 2.794 GW.h LNG.
- The resulting overall gap between expected and actual thermal generation for 2016 equals 5.449 GW.h.
- The resulting payment required from YEC into the DCF for 2016 is \$0.990 million.¹
- Based on the above, and the DCF balance at the end of the previous year net of the forecast impact of the current Rider E rebate applicable until April 30, 2017, the forecast DCF balance at 2016 year-end that affects determination of a new Rider E is \$8.520 million.²

Updated Rider E

In Order 2015-06, the Board directed that YEC refund DCF contributions in excess of the \$8.0 million cap through a rate rider applicable to all firm sales throughout the Yukon (Rider E). Based on the 2015 Annual filing, the Board's letter of April 6, 2016 reinstated the earlier DCF rebate at 0.68 cents/kWh on an interim basis, effective May 1, 2016.

The DCF calculations and balance update for 2016 (Attachment 1, Tables 1 and 2) forecast DCF contributions at \$0.520 million in excess of the \$8.0 million cap as of April 30, 2017,³ and indicate that retention of the current Rider E at 0.68 cents per kW.h beyond April 2017 would reduce the DCF below the \$8.0 million cap within a few months. Based on this forecast, a new Rider E refund to ratepayers is therefore proposed of 0.14 cents/kW.h is estimated for implementation from May 1, 2017 to March 31, 2018. For further detail regarding the Rider E calculation see Attachment 1, Table 3.

The updated Rider E Rate Schedule (based on Table 3) is provided as Attachment 2.

¹ Calculation assumes 100% LNG. The LNG price of \$0.1817 per kW.h is actual LNG cost from inventory for LNG generation in 2016 divided by kW.h of actual LNG generation in 2016 of 3.251 GW.h.

² See Attachment 1, Table 2. The DCF balance at December 31, 2016 net of refunds is \$9.485 million. Forecast refunds in 2017 for January through April equal \$0.965 million. The forecast DCF balance as at April 30, 2017 is therefore \$8.520 million.

³ Considering the implementation effective April 1, 2017 is not achievable, the new rates proposed to be effective May 1, 2017. The current Rider E at 0.68 cents/kW.h is assumed to continue until April 30, 2017.

Update on Forecast Water Conditions for 2017

An update on forecast water conditions for 2017 is provided as Attachment 3, including the complete preliminary March 1 snow survey results. Unofficial snow surveys indicate an overall below average snow water equivalent in all three of YEC's water basins.

The forecast notes that Marsh Lake is forecast to be at or near full supply by October 2017 if summer temperatures and precipitation are at or above normal, while Aishihik and Mayo are not forecast to reach operational full supply level by October 2017.

The refill for Aishihik and for Mayo by the fall is impacted by having to generate higher amounts in April, May and June due to the Whitehorse Unit #4 being out of service for a major overhaul, as well as by expected low snow pack.

As Aishihik Lake is a multi-year reservoir, not reaching full supply does not impact energy capability during the winter of 2017/18 but energy from Mayo GS will likely be constrained by spring of 2018.

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

Yours truly,

A handwritten signature in black ink, appearing to read 'Ed Mollard', written in a cursive style.

Ed Mollard, CGA
Chief Financial Officer
Yukon Energy Corporation

ATTACHMENT 1: DCF CALCULATIONS AND BALANCE UPDATES – 2016

Table 1: DCF Calculations for 2012-2016

Line No		2012 Actuals	2013 Actuals	2014 Actuals	2015 Actuals	2016 Preliminary Actuals	Notes
L1	Fuel Cost per kW.h, Diesel	28.71	28.71	28.71	28.71	28.71 cents/kW.h	2012/13 GRA Compliance Filing Average Fuel cost
	Fuel Cost per kW.h, LNG				18.83	18.17 cents/kW.h	
Calculation of Diesel or LNG Cost to Charge (Refund) DCF							
<i>Assumptions</i>							
L2	YEC Grid load	424,541	419,173	396,498	410,316	412,776 MW.h	Actual net of secondary sales (with losses) Fish Lake generation
L3	Fish Lake	3,388	3,687	10,247	9,180	8,033 MW.h	
L4=L2+L3	Total Grid load	427,929	422,860	406,745	419,495	420,809 MW.h	
<i>Assumed Actual Generation Sources</i>							
L5=L3	YECL Fish Lake	3,388	3,687	10,247	9,180	8,033 MW.h	Fish Lake generation
L6	YEC Hydro	421,039	416,987	394,595	404,797	406,136 MW.h	Residual as total generation less diesel and wind
L7	YEC Thermal	3,057	1,910	1,566	4,868	6,131 MW.h	Diesel and LNG
	Diesel	3,057	1,910	1,566	3,574	2,879	
	LNG				1,295	3,251	
L7a	YEC Diesel/LNG charged to capital	373	872	951	2,047	1,043	Includes charged to RFID
	Diesel	373	872	951	1,345	586	
	LNG				702	457	
L7b=L7-L7a	YEC Net Diesel/LNG	2,683	1,037	615	2,822	5,087	
	Diesel	2,683	1,037	615	2,229	2,293	
	LNG	-	-	-	593	2,794	
L8	YEC Wind	445	277	337	650	509 MW.h	Wind generation
L9=L5+L6+L7+L8	Total Grid load	427,929	422,860	406,745	419,495	420,809 MW.h	
<i>Expected Generation Sources</i>							
L10	YECL Fish Lake (expected)	4,380	4,380	8,730	8,730	8,730 MW.h	Unit #2 at 4.380 GW.h - no Unit #1 generation in 2012 and 2013.
L11	YEC Wind (expected)	239	238	238	238	238 MW.h	
L12=L9-L10-L11	YEC Grid load net of expected Fish Lake and Wind	423,310	418,242	397,777	410,527	411,841 MW.h	
L13a	YEC Grid Load amount per Column A of Approved DCF Term Sheet Table	420,000	415,000	395,000	410,000	410,000 GW.h	Table 1.1, Approved DCF Term Sheet (Order 2015-06)
L13b	Expected Base Thermal Generation at YEC Grid Load amount in row L13a	14,100	11,800	4,400	9,800	9,800 MW.h	Derived from Table 1.1, Approved DCF Term Sheet (Order 2015-06)
L14a	Incremental Expected Thermal Generation as percent of load above L13a (%)	46%	46%	32%	40%	40%	Table 1.1, Approved DCF Term Sheet (Order 2015-06)
L14b=(L12-L13a);L14a	Expected Incremental Thermal Generation above amount in L13b	1,522	1,491	889	211	736 MW.h	Derived from Table 1.1, Approved DCF Term Sheet (Order 2015-06)
L15=L13b+L14b	Total Expected YEC Thermal Generation	15,622	13,291	5,289	10,011	10,536 MW.h	
L16=L15	Expected YEC Thermal Generation in Rates	15,622	13,291	5,289	10,011	10,536 MW.h	100% of long-term average
	Diesel	15,622	13,291	5,289	8,509	- MW.h	
	LNG				1,502	10,536 MW.h	At 15% LNG displacement of expected diesel in 2015; 100% in 2016.
L17=L7b	YEC Thermal Generation	2,683	1,037	615	2,822	5,087 MW.h	Net of capital diesel (L7b)
	Diesel	2,683	1,037	615	2,229	2,293 MW.h	
	LNG				593	2,794 MW.h	
L18=L17-L16	YEC Thermal Generation to be Included in DCF	-	12,939 -	12,254 -	4,674 -	7,189 -	5,449 MW.h
	Diesel	-	12,939 -	12,254 -	4,674 -	6,281 -	- MW.h
	LNG				-	909 -	5,449 MW.h
L19=L1xL18	Incremental YEC Thermal Generation Cost to Charge (Refund) DCF (\$000s)	(\$3,715)	(\$3,518)	(\$1,342)	(\$1,974)	(\$990)	

Table 2: DCF Continuity Schedule

Line	Activity	2012 (\$000s)	2013 (\$000s)	2014 (\$000s)	2015 (\$000s)	2016 Preliminary (\$000s)
A	DCF Opening Balance ¹	\$902	\$4,628	\$8,198	\$9,627	\$10,895
B	Incremental Diesel Generation Cost to Charge/(Refund) ² to DCF	(\$3,715)	(\$3,518)	(\$1,342)	(\$1,974)	(\$990)
C=B	Total DCF operation for YEC					
	YEC pays to DCF Fund	\$3,715	\$3,518	\$1,342	\$1,974	\$990
	YEC withdraws from DCF Fund	\$0	\$0	\$0	\$0	\$0
D=A+C	DCF Balance after Total DCF Operation	\$4,617	\$8,146	\$9,540	\$11,601	\$11,885
E	Interest on DCF Balance ³	\$11	\$52	\$87	\$53	\$54
F=D+E	DCF Balance after Interest charge	\$4,628	\$8,198	\$9,627	\$11,654	\$11,939
G	DCF (Rebate)/Collections [January - December]	\$0	\$0	\$0	(\$759)	(\$2,454)
H=F+G	DCF Ending Balance	\$4,628	\$8,198	\$9,627	\$10,895	\$9,485
I	DCF (Rebate)/Collections January - April 2017 (forecast)					(\$965)
J=H+I	Forecast DCF Balance, After (Rebate)/Collections to April 30					\$8,520
K	DCF Cap Approved by Board ⁴					+/-8000
L=J-K	DCF Rebate/(Collections) Required					\$520

Notes:

1. 2012 DCF Opening Balance is 2011 actual ending balance of DCF.
2. Based on calculations in Table 1. 2016 DCF charge estimate is based on preliminary actuals.
3. Per the March 11, 1996 letter recording the settlements [provided as Exhibit B-16 in the 2008/2009 GRA] the DCF fund is to attract interest based upon the short/intermediate term bond rates in which the Companies may invest the fund and any negative balances would only attract interest at the lowest short-term borrowing rate available to the Companies through a line of credit.
4. Approved DCF Cap based on YUB Order 2015-01.

Table 3: Rider E Calculations

Line	Activity	Rider Estimate
A	DCF Rebate/(Collections) Required (\$000s)	\$520
B	Retail Sales for the previous 11 months (MW.h) ¹	360,562
C=A/B	DCF Rebate/(Collection) Rider (cents/kW.h)	0.14

Notes:

1. The total retail sales include YEC and AEY retail and industrial sales based on 2016 preliminary actuals. The rider expected to be effective May 1, 2017. Therefore, the sales information is for 11 months.

Table 4: DCF Quarterly Report (2016 Q4)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Preliminary Actual	Preliminary Actual	Preliminary Actual	
Generation Report													
L1	YEC Grid Load (MW.h)												418,051
L2	Less Secondary Sales with Losses (MW.h)												-5,275
L3	YECL Fish Lake (MW.h)												8,033
L4=Sum(L1:L3)	Total Grid Load excluding secondary sales (MW.h)												420,809
Actual Generation Sources													
L5	YECL Fish Lake (MW.h)												8,033
L6	YEC Hydro (MW.h) [residual: YEC Grid firm load less thermal and wind]												406,136
L7	YEC Diesel (MW.h)												2,879
L7a	YEC Diesel Charged to Capital and RFID												586
L7b=L7-L7a	YEC Net Diesel												2,293
L8	YEC LNG (MW.h)												3,251
L8a	YEC LNG Charged to Capital and RFID												457
L8b=L8-L8a	YEC Net LNG												2,794
L9	YEC Wind (MW.h)												509
L10=L5+L6+L7+L8+L9	Total Grid Load excluding secondary sales (MW.h)												420,809
Expected Generation Sources													
L11	YECL Fish Lake (expected) (MW.h)												8,730
L12	YEC Wind (expected) (MW.h)												238
L13=L10-L11-L12	YEC Grid Load net of expected Fish Lake and Wind (MW.h)												411,841
L14	Grid Load Benchmark (MW.h) (Col A of Table 1-1, Approved DCF Term Sheet)												410,000
L15	Diesel as % of incremental Grid Load above line 14 (%)												40%
L16	Expected Base Thermal Generation at Benchmark (MW.h)												9,800
L17=(L13-L14)xL15	Expected Incremental Thermal Generation (MW.h)												736
L18=L16+L17	Total Expected Thermal Generation (MW.h)												10,536
L19=L18	Expected Thermal Generation in Rates (MW.h)												10,536
	Diesel												-
	LNG												10,536.50
L20=L7b+L8b	Actual YEC Thermal Generation (net of capital & RFID Thermal) (MW.h)												5,087
	Diesel												2,293
	LNG												2,794
L21=L20-L19	Thermal Generation to be Included in DCF (MW.h)												-5,449
	Diesel												-
	LNG												5,449
L22	Thermal Fuel Cost per kW.h (\$/kW.h)												0.2871
	Diesel												0.1817
	LNG												(\$990)
L23=L21xL22	Incremental YEC Thermal Generation Cost to Charge (Refund) DCF (\$000s)												(\$990)
L24	DCF Balance at 2015 Year End (\$000)												10,895
L25	Rider E (Rebate) forecast by March 31, 2017												(2,454)
L26	Interest												54
L27=L24+L25+L26-L23	DCF Balance at 2016 Year End (\$000)												9,485

ATTACHMENT 2: UPDATED RIDER E RATE SCHEDULE

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Effective: 2017 05 01
Supercedes: 2016 05 01

RIDER E

DIESEL CONTINGENCY FUND RIDER

AVAILABLE: To all retail and major industrial electric services throughout the Yukon Territory.

APPLICABLE: To all retail and major industrial classes of service [not applicable to secondary sales].

RATE: Service will be rendered at the applicable rates with the following surcharge/(refund):

A refund of -0.14 ¢ per kW.h will be applied to all firm kWh consumed.

NOTE: Rider E will be applied to all firm kWh consumed for the period from May 1, 2017 to March 31, 2018.

Rider E does not apply to Rate Schedule 32 Secondary Energy.

ATTACHMENT 3: UPDATE ON FORECAST WATER CONDITIONS FOR 2017



Yukon Energy Corporation
Box 5920
Whitehorse, Yukon Y1A 6S7

Memo

To: Ed Mallard
From: Ronald Gee
Date: March 7, 2017
Re: 2017 Water Availability Forecast

The present generation forecast for 2017 on the total Yukon Energy grid is approximately 430.729 GW.h. The complete preliminary March 1 snow survey results are attached. Unofficial snow surveys indicate an overall below average snow water equivalent in all three of Yukon Energy's water basins. Snow survey station results specific to each basin are listed below:

Aishihik:

Station	March 2017 Snow Water Equiv (mm)	% of Normal	March 2016 SWE(mm)	5YrAvg SWE(mm)
Canyon Lake	76	94	50	75
Aishihik Lake	60	81	42	68

Whitehorse:

Station	March 2017 Snow Water Equiv (mm)	% of Normal	March 2016 SWE(mm)	5 Yr Avg SWE(mm)
Tagish	100	78	81	114
Montana Mt	110	84	76	125
Log Cabin	368	111	332	343
Atlin	85	77	87	87
Mt McIntyre	128	94	82	130
Whse Airport	52	56	63	83

Mayo:

Station	March 2017 Snow Water Equiv (mm)	% of Normal	March 2016 SWE(mm)	5Yr Avg SWE(mm)
MayoAirp	38	42	113	92
Calumet	150	86	202	177

The current level of Aishihik: Lake is 914.13m. The spring low in May is expected to be approximately 913.8m or 1.35m below full supply level. Spring low levels as forecasted have not been experienced since the start of the decade. With the expected low snow pack the lake is not expected to fully refill by fall. The refill will also be impacted by having to generate higher amounts in April, May, and June with the Whitehorse Unit #4 out of service for new rotor and overhaul. The fall peak level for Aishihik Lake is forecast to be in the range of 914.8m.

Marsh Lake reservoir is presently 654.54m. The spring low in May is expected to be near low supply level. A major shut down and repair program for the Unit #4 hydro plant is scheduled to begin in April 2017 but will have no impact on refill as all gates at Marsh Lake Control Structure need to be open by May 15. The loss of generation from Unit #4 in April, May, and June will have to be made up by Aishihik: and Mayo Generating Stations. The level of Marsh Lake is expected to be at full supply level by October 2017 if summer temperatures and precipitation are at or above normal.

Winter drawdown of Marsh Lake will begin in November and continue through to May 2018. Energy and capacity at Whitehorse Rapids will be constrained by the decreasing flow in the Yukon River as the winter progresses. This decrease in generating capability is the normal operating situation for Whitehorse Rapids. Scheduled hydro maintenance is not expected to impact the 2017/18 winter generating capability of Whitehorse Rapids Generating Station.

Mayo Lake is currently 663.92m. The spring low in May is expected to be approximately 663.25m or near the low supply level. With the low snowpack and having to generate higher levels in early summer with Whitehorse Unit #4 out of service, Mayo Lake is not expected to fully refill by fall unless significant summer precipitation occurs. The lake level will fall short of full supply by approximately 0.45m.

In summary, Marsh Lake is forecast to be at or near full supply by October 2017 while Aishihik and Mayo do not reach operational full supply level. Water level graphs for the three reservoirs are attached. As Aishihik Lake is a multi-year reservoir, not reaching full supply does not impact the energy capability during the winter of 2017/18 but energy from Mayo GS will likely be constrained by spring of 2018.

