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August 21, 2019

Via: upload to www.BCUC.com

Commission Secretary
Sixth Floor, 900 Howe Street
Vancouver, BC, V6Z 2N3

Commission.Secretary@bcuc.com

RE: Nelson Hydro – 2019 Rural Rate Application – Project No. 1598997 – Panel Information Request No. 1

In accordance with the Regulatory Timetable set for this proceeding, Nelson Hydro encloses for filing its Responses to Panel Information Request No. 1 with respect to the 2019 Rural Rate Application currently before the Commission. Additionally, two separate live excel spreadsheets files will follow by regular email consisting of the following:

Panel IR Spreadsheet Number One consisting of:

- IR 1.1 Customer Mix Table
- IR 1.1 Historical Revenue By Rate Class
- IR 1.1.1 Rate Calculation
- IR 1.2.2 2019 Revenue Forecast

Panel IR Spreadsheet Number Two consisting of:

- IR 1.2 Load Forecast Data
- IR 1.2 Power Purchase Report
- IR 1.2 Energy Demand Graph
- IR 1.2 Consumption by Month

Please do not hesitate to contact us with any questions.

Respectfully submitted,

Gabriel Bouvet-Boisclair
Deputy Corporate Officer, City of Nelson

On behalf of Alex Love, General Manager, Nelson Hydro

cc: Alex Love, General Manager, Nelson Hydro

Nelson Hydro

2019 Rural Rate Application - Project No. 1598997

NELSON HYDRO – RESPONSE TO PANEL INFORMATION REQUEST NO. 1

INTRODUCTION

Preliminarily, Nelson Hydro notes that it is not seeking a blended rate increase for the whole utility. Rather, the Application before the Commission is an application for a rural rate increase only. Nelson Hydro reiterates this as a number of the Information Requests seek information on a blended rate.

It should also be noted that in the Application Nelson Hydro sought a rural rate increase of 2.94%. If Nelson Hydro had all the information it now has, the Application would have sought a rural rate increase of 2.69%.

1.0 Reference: ALLOCATION BETWEEN RURAL AND URBAN
Exhibit B-3, BCUC IR 11.3.1 Attachment, BCUC IR 11.4 Attachment
Urban and rural rates

In response to BCUC IR 11.3 and 11.4, Nelson Hydro provided the following tables:

BCUC IR 1 - IR 11.3.1 Attachment

Filing	Rural R.C. Apr 01	Urban R.C. Apr 01		Urban Residential	Rural Residential	Urban Commercial	Rural Commercial	Urban Municipal	Urban Streetlight	Rural Streetlight	Total
			Customer Count	5,055	4,209	901	307	86	23	33	$10,614
			Metered Energy (kWh)	46,723,686	57,147,955	43,768,804	9,129,137	4,906,857			$161,676,439
Mar 08, 2019 Application	2.94%	1.50%	Revenue ($)	$5,395,089	$6,180,912	$5,171,512	$1,091,687	$283,674	$76,785	$31,342	$18,231,001
Supp Info.	0.00%	1.50%	Revenue ($)	$5,395,089	$6,055,439	$5,171,512	$1,069,526	$283,674	$76,785	$30,705	$18,082,730
BCUC IR 1 11.3.1	0.00%	0.00%	Revenue ($)	$5,339,520	$6,055,439	$5,118,245	$1,069,526	$280,752	$75,995	$30,705	$17,970,182

*This table contains updated information from original submitted March 8, 2019.

BCUC IR 1 - IR 11.4 Attachment

	Application Page 8 information (December 2018)			Appendix B updated information
	Rural	Urban	Nelson Hydro 2019	Nelson Hydro 2019
Debt Serv. Total	**$169,660**	**$329,704**	**$499,364**	**$499,364**
Op Exp. Total	**$2,293,016**	**$2,803,645**	**$5,096,661**	**$5,074,202**
Power Purchase Total	**$5,032,846**	**$1,667,154**	**$6,700,000**	**$6,698,722**
Transfers				
Transfer - Dividend Pymt.		$2,837,000	$2,837,000	$2,836,000
Transfer - Major Capital Reserve		$3,000,000	$3,000,000	$2,877,100
transfer - Water License Reserve		$658,000	$658,000	$658,266
Contribution to Community Complex		$90,000	$90,000	$90,000
Transfers total	**$0**	**$6,585,000**	**$6,585,000**	**$6,461,366**
Expense total	**$7,495,522**	**$11,385,503**	**$18,881,025**	**$18,733,654**
Revenue - Other total	**-$159,909**	**-$340,091**	**-$500,000**	**-$502,653**
Revenue - Rates Fcst. (pre rate change)	**-$7,171,071**	**-$11,075,929**	**-$18,247,000**	**-$17,970,182**
Revenue total	**-$7,330,980**	**-$11,416,020**	**-$18,747,000**	**-$18,472,835**
2018 Dividend Adjustment	**-$19,220**		**-$19,220**	**-$19,220**
Grand Total Shortfall (Surplus)	**$145,322**	**-$30,517**	**$114,805**	**$241,598**
Revenue from Rates Rqd.	**-$7,316,393**	**-$11,045,412**	**-$18,361,805**	**-$18,211,780**
Revenue from Rates Change Rqd.	**2.03%**	**-0.28%**	**0.63%**	**1.34%**
Rate Change Rqd. (Apr 01)	**2.94%**	**-0.40%**	**0.91%**	**1.95%**

Notes:

1. The table is prepared based on information used for table on Page 8 of the application that was developed in December 2018 [consistent with the data that was used for rate setting with City of Nelson Council].
2. The rate calculation for Urban service area was -0.40%, however, the City Council agreed and decided to implement a rate smoothing option by approving the 2019 rate change 1.5% so potential future rate increases are smoothed.

1.1 Please provide the detailed calculations that support the last line of the table provided in response to BCUC IR 11.3.1, along with all the inputs (such as, each of the rate components, customer count, metered energy, forecast load, demand charge calculations, etc.) used to arrive at the revenue total for each rate class. Please provide sufficient detail and the remaining data required (such as forecast demand volumes for each rate group and data required for the street lighting category), in a live excel spreadsheet with formulas intact showing the calculations to derive the total revenue of $17,970,182. Please explain any assumptions in detail.

RESPONSE: Please see Panel IR No. 1 –Attachment 1 – IR 1.1. The Attachment provides detailed calculations below the table. Each rate class percent of total is based on historic averages. Customer count and metered energy are for information only, not calculation inputs.

In Nelson Hydro's original submission to BCUC IR 1-11.3.1, the attachment contained a data entry error resulting in the use of 2.07% instead of 2.0307% under the "rural" input for full year rate change. This resulted in a calculation error of $3,404 (see IR 1.1 Attachment 1, Columns F and F*). The revised attachment shows both the error and the corrected calculation.

1.1.1 If any of the totals in the response to IR 1.1 above are different than that provided in the table in the IR 11.3.1 Attachment, please provide an updated version of the IR 11.4 Attachment table and explain in detail why the totals do

not equal those in the original IR 11.4 Attachment.

RESPONSE: Please see Panel IR No. 1 – IR 1.1.1 Attachment 2.

The updated table in IR 1.1 changed the Column C total by $3,404, however an error was also noticed in the table provided to BCUC IR 11.4. The Revenues – Rates Fcst. (pre rate change) Nelson Hydro 2019 column is $18,247,000, not $17,970,182.

The 69% allocation factor for an April 1 rate change is derived from historical consumption by month (supporting data provided in Spreadsheet No. 2 IR 1.2 Consumption By Month).

Nelson Hydro notes that BCUC IR 11.4 asked for total utility budget and blended rate calculation even though the Application is for a rural rate increase only. For clarity, the rural, urban and total utility rate change requirements are shown in the corrected response.

Even though the urban utility revenue requirement was for a -1.95% (-0.40% when calculated in December 2018) rate decrease, Council approved Nelson Hydro implementing a 1.5% increase on April 1, 2019 as a rate smoothing measure.

If the data in the April 10, 2019 Supplementary Filing had been know at the time of rate setting, Nelson Hydro would have applied for a 2.69% rural rate increase rather than a 2.94% rural rate increase. The updated figures show a rural rate increase of 2.69%, (changed from the 2.94% at the time of rate setting).

1.2 Please provide the detailed calculations that support the Power Purchase Total of $6,698,772 as shown in the last column of the IR 11.4 Attachment. Please provide the detailed inputs and calculations which support the total of $6,698,772. Please explain any assumptions in detail.

1.2.1 If the total in the response to IR 1.2 above is different than $6,698,772, please provide an updated version of the IR 11.4 Attachment and explain in detail why the total does not equal $6,698,772.

RESPONSE:

Power Purchase Forecast

Power Purchase is forecast using a load forecasting spreadsheet. The spreadsheet is complex and is really a series of monthly forecasts – each month using the same methodology. The 2019 Forecast is the sum of the 12 monthly forecasts for 2019. The methodology is as follows;

Inputs are the expected rate changes from FortisBC actual monthly energy, and growth factors for both energy and demand.

The Outputs are Gross utility load (kWh), Own Generation (kWh), Purchase from FortisBC (kWh), Capacity purchase form FortisBC (kVA), and total power Purchase cost from FortisBC ($).

Energy (kWh)

Gross utility load is forecast by using the average actual of the previous 5 years plus escalation for the growth factor (0.25%).

Nelson's own generation from Bonnington Falls is forecast as the average of the previous 5 years. This forecast had to be "hard reset" from 2015 to 2017 because 3 sequential extraordinary years of freshet generation were causing the average to rise to levels that could not realistically be sustained.

Energy purchases from FortisBC are forecast as gross utility load – Nelson own generation.

Capacity (kVA)

Gross capacity purchased from FortisBC is forecast as the maximum of the previous three years plus escalation for the demand growth factor (0.10%).

Demand ratchet is calculated as 80% of the peak demand from the prior year – as per rate tariff.

Power Purchase costs ($)

All power purchase costs are forecast using the best estimate of FortisBC rates available at the time.

POD: Basic monthly POD charge $71,772

Energy: Energy purchase forecast (from above) multiplied by expected energy rate (**$3,518,236)**.

Wires Charge: Maximum of the demand ratchet or demand for the month multiplied by the Wires rate (**$1,928,977)**.

Power Supply: month demand multiplied by the Power Supply Rate **($1,170,262).**

Interim rate charges: The sum of the POD, Energy, wires and power supply charges multiplied by any expected interim rate increase **($0)**.

Nelson Hydro also has a small hydro IPP who we purchase power from. In 2019 this was expected to amount to **$11,475**.

POD	$71,772		
Energy (FBC)	$3,518,236		
Energy (IPP)	$11,475		
Wires (FBC)	$1,928,977		
Power Supply (FBC)	$1,170,262		
Interim Rates (FBC)	$0		
Correction for Typo	-$2,000	Typo on data entry between Load Forecast and Budget	
Total 2019 Power Purchase Forecast	**$6,698,722**		

Total Power Purchase Forecast

Total FortisBC invoice is forecast as the sum of the above components – this is pre tax.

Attached table, for information, shows the Power purchase forecast for 2019 when run at the end of 2018. Note:

- Expected rate change from FBC was 0%
- POD forecast unchanged from 2018
- FortisBC Demand Charge have been replaced with Wires and Power Supply charges but the column is preserved for holding the actual costs in prior years.

Power Purchase Forecast (Actuals and Forecast)

Year	Month	Act/ Fcst	Net Purchase (kWh)	Util Purch Fcst. (kWh)	FBC Basic ($)	FBC Energy ($)	FBC Dmd ($)	FBC Wires ($)	FBC Pwr Sup ($)	FBC Interimi Rate ($)	Sum of FBC Invoice
2018	1	A	11,742,928	12,231,313	$5,981	$529,083	$0	$167,178	$125,686	$0	$827,928
	2	A	11,158,358	10,340,795	$5,981	$502,745	$0	$172,170	$129,439	$0	$810,335
	3	A	9,490,669	9,042,508	$5,981	$427,606	$0	$137,736	$93,910	$0	$665,233
	4	A	7,324,413	5,367,648	$5,981	$330,005	$0	$146,207	$109,920	$0	$592,112
	5	A	984,054	1,402,257	$5,981	$44,337	$0	$137,736	$53,458	$0	$241,512
	6	A	-621,870	361,651	$5,981	-$28,019	$0	$137,736	$17,399	$0	$133,098
	7	A	3,837,514	2,936,929	$5,981	$172,901	$0	$137,736	$51,195	$0	$367,813
	8	A	3,913,548	3,954,371	$5,981	$176,327	$0	$137,736	$51,138	$0	$371,181
	9	A	3,996,950	3,995,380	$5,981	$180,084	$0	$137,736	$56,447	$0	$380,249
	10	A	6,574,914	5,685,925	$5,981	$296,236	$0	$137,736	$82,059	$0	$522,012
	11	F	0	9,176,591	$5,981	$413,455	$0	$153,844	$108,164	$0	$681,445
	12	F	0	12,376,235	$5,981	$557,617	$0	$153,844	$134,994	$0	$852,436
2018 Sum			**58,401,478**	**76,871,603**	**$71,772**	**$3,602,376**	**$0**	**$1,757,394**	**$1,013,811**	**$0**	**$6,445,354**
2019	1	F	0	12,249,296	$5,981	$551,897	$0	$179,559	$144,577	$0	$882,015
	2	F	0	10,193,387	$5,981	$459,267	$0	$192,305	$129,698	$0	$787,252
	3	F	0	9,098,444	$5,981	$409,934	$0	$172,514	$98,409	$0	$686,838
	4	F	0	5,588,311	$5,981	$251,784	$0	$153,844	$110,140	$0	$521,749
	5	F	0	1,203,348	$5,981	$54,217	$0	$153,844	$53,565	$0	$267,608
	6	F	0	445,525	$5,981	$20,073	$0	$153,844	$45,284	$0	$225,182
	7	F	0	3,630,850	$5,981	$163,590	$0	$153,844	$100,102	$0	$423,517
	8	F	0	4,018,251	$5,981	$181,044	$0	$153,844	$95,366	$0	$436,235
	9	F	0	4,092,679	$5,981	$184,397	$0	$153,844	$67,253	$0	$411,476
	10	F	0	5,955,124	$5,981	$268,311	$0	$153,844	$82,223	$0	$510,359
	11	F	0	9,099,602	$5,981	$409,986	$0	$153,844	$108,380	$0	$678,192
	12	F	0	12,512,024	$5,981	$563,735	$0	$153,844	$135,264	$0	$858,824
2019 Sum			**0**	**78,086,841**	**$71,772**	**$3,518,236**	**$0**	**$1,928,977**	**$1,170,262**	**$0**	**$6,689,248**

1.2.1 Please demonstrate that the same forecast load that is used in calculating the revenue of $17,970,182 is also used in calculating the Power Purchase Total of $6,698,772 and show how the forecast load is used in the Power Purchase calculation. If not confirmed, please explain why.

RESPONSE: The revenue forecast and Power purchase forecast are independent though compared after the fact to see if trends support each other.

The reason they are independent is because in the past Nelson Hydro tried to tie the revenue and load forecasts together and found while there is a basic correlation (Cold winters resulting in larger loads which result in increased revenues) there was not a clear enough correlation to compute. Changes in revenues only loosely corresponded to changes in loads. We attribute this to the fact that there are other factors that affect revenues – like customer mix, temperature, seasonal and business variations.

Therefore Nelson Hydro forecasts Power purchase and Revenue separately, but with a somewhat similar methodology. The similarity is to look at the prior revenue history and attempt to normalize the data to forecast for an average year. Revenue needs to be adjusted to account for rate changes. The attached memo (Panel IR. No. 1 Attachment 3 – IR 1.2.1) describes the revenue forecasting method and how a forecast of $18,247,000 was arrived at. Further, a spreadsheet is included along with the live excel spreadsheet submission showing detailed calculations for the forecast of $18,247,000.

	Filing	Rural R.C. Apr 01	Urban R.C. Apr 01		Urban Residential	Rural Residential	Urban Commercial	Rural Commercial	Urban Municipal	Urban Streetlight	Rural Streetlight	Rural Total	Urban total	Total
				Customer Count	5,055	4,209	901	307	86	23	33			$10,614
				Metered Energy (kWh)	46,723,686	57,147,955	43,768,804	9,129,137	4,906,857					$161,676,439
(A)	Mar 08, 2019 Application	2.94%	1.50%	Revenue ($)	$5,395,089	$6,180,912	$5,171,512	$1,091,687	$283,674	$76,785	$31,342	$7,303,941	$10,927,060	$18,231,001
(B)	Supp Info.	0.00%	1.50%	Revenue ($)	$5,395,089	$6,055,439	$5,171,512	$1,069,526	$283,674	$76,785	$30,705	$7,155,670	$10,927,060	$18,082,730
(C)	BCUC IR 1 11.3.1	0.00%	0.00%	Revenue ($)	$5,339,520	$6,055,439	$5,118,245	$1,069,526	$280,752	$75,995	$30,705	$7,155,670	$10,814,512	$17,970,182

(D)	April 01 Rate Change	Planned	1.50%	2.94%	1.50%	2.94%	1.50%	1.50%	2.94%				
(E)	April 01 as % of Full Year	Historical Data	69.07%	69.07%	69.07%	69.07%	69.07%	69.07%	69.07%				
(F)	Effective Full Rate Change	(F) = (D) x (E)	1.0361%	2.0307%	1.0361%	2.0307%	1.0361%	1.0361%	2.0307%				
(G)	C Calculated	(G) = (A) / (F+1)	$5,339,766	$6,057,897	$5,118,482	$1,069,960	$280,765	$75,998	$30,718				$17,973,586
(H)	Difference	(G) - (C)	$246	$2,458	$237	$434	$13	$3	$13				$3,404
(I) Rate class as % of Total		(A) / $18,231,001	29.59%	33.90%	28.37%	5.99%	1.56%	0.42%	0.17%	40.06%	59.94%		

Notes
1) This table updated information for Panel IR Aug 2019
2) Original table values calculated by hand with rounding difference of $3,404
3) Table "backs out" rate changes for illustration. $18,231,0001 revenue did not inlclude Urban R.C. of 1.50%, but does include the Rural 2.94% R.C

Panel IR No. 1 Attachment 1 - IR 1.1

Act / Bud	Year	Urban Residential	Rural Residential	Urban Commercial	Rural Commercial	Municipal	Urban Streetlight	Rural Streetlight	Total Revenue	Rural Total	Urban Total
Act.	2010	$3,519,967	$4,104,411	$3,975,391	$768,968	$180,198	$67,539	$24,754	$12,641,228	$4,898,132	$7,743,095
Act.	2011	$3,906,746	$4,608,656	$4,342,380	$841,181	$195,937	$70,181	$26,449	$13,991,530	$5,476,286	$8,515,244
Act.	2012	$4,159,517	$4,806,930	$4,563,845	$931,266	$203,594	$76,833	$27,532	$14,769,517	$5,765,728	$9,003,789
Act.	2013	$4,308,702	$4,708,462	$4,730,090	$964,287	$231,052	$82,732	$27,945	$15,053,270	$5,700,694	$9,352,576
Act.	2014	$4,333,186	$5,275,604	$4,886,177	$1,046,084	$257,365	$84,788	$29,523	$15,912,727	$6,351,210	$9,561,516
Act.	2015	$4,344,344	$5,128,156	$5,047,903	$1,093,281	$248,474	$86,230	$30,440	$15,978,829	$6,251,878	$9,726,951
Act.	2016	$4,784,471	$5,490,435	$5,019,681	$1,157,644	$273,805	$90,880	$32,024	$16,848,939	$6,680,102	$10,168,836
Act.	2017	$4,886,277	$6,192,364	$5,379,488	$1,241,578	$359,601	$95,427	$32,346	$18,187,081	$7,466,287	$10,720,794
Act.	2018	$5,288,174	$6,228,641	$5,444,787	$1,223,486	$364,260	$94,963	$32,202	$18,676,512	$7,484,329	$11,192,184
Bud.	2019	$5,395,089	$6,180,912	$5,171,512	$1,091,687	$283,674	$76,785	$31,342	$18,231,001	**$7,303,941**	**$10,927,060**

Act.	2010	27.8%	32.5%	31.4%	6.1%	1.4%	0.5%	0.2%		38.7%	61.3%
Act.	2011	27.9%	32.9%	31.0%	6.0%	1.4%	0.5%	0.2%		39.1%	60.9%
Act.	2012	28.2%	32.5%	30.9%	6.3%	1.4%	0.5%	0.2%		39.0%	61.0%
Act.	2013	28.6%	31.3%	31.4%	6.4%	1.5%	0.5%	0.2%		37.9%	62.1%
Act.	2014	27.2%	33.2%	30.7%	6.6%	1.6%	0.5%	0.2%		39.9%	60.1%
Act.	2015	27.2%	32.1%	31.6%	6.8%	1.6%	0.5%	0.2%		39.1%	60.9%
Act.	2016	28.4%	32.6%	29.8%	6.9%	1.6%	0.5%	0.2%		39.6%	60.4%
Act.	2017	26.9%	34.0%	29.6%	6.8%	2.0%	0.5%	0.2%		41.1%	58.9%
Act.	2018	28.3%	33.4%	29.2%	6.6%	2.0%	0.5%	0.2%		40.1%	59.9%
Bud.	2019	29.6%	33.9%	28.4%	6.0%	1.6%	0.4%	0.2%		40.1%	59.9%

Note:

1) Historical Revenue Data for reference - not used for 2019 rate design

	Application Page 8 Information (December 2018)			Panel IR 1.1.1 (Corrected IR 11.4)		
	Rural (December 2018)	**Urban (December 2018)**	**Nelson Hydro (December 2018)**	**Rural (Aug 2019)**	**Urban (Aug 2019)**	**Nelson Hydro (Aug 2019)**
Debt Serv. Total	**$169,660**	**$329,340**	**$499,000**	**$171,382**	**$327,982**	**$499,364**
Op Exp. Total	**$2,293,016**	**$2,803,645**	**$5,096,661**	**$2,279,534**	**$2,794,668**	**$5,074,202**
Power Purchase Total	**$5,032,846**	**$1,667,154**	**$6,700,000**	**$5,032,143**	**$1,666,579**	**$6,698,722**
Transfers						
Transfer - Dividend Pymt.	$0	$2,837,000	$2,837,000	$0	$2,836,000	$2,836,000
Transfer - Major Capital Reserve	$0	$3,000,000	$3,000,000	$0	$2,877,100	$2,877,100
transfer - Water License Reserve	$0	$658,000	$658,000	$0	$658,266	$658,266
Contribution to Community Complex	$0	$90,000	$90,000	$0	$90,000	$90,000
Transfers total	**$0**	**$6,585,000**	**$6,585,000**	**$0**	**$6,461,366**	**$6,461,366**
Expense total	**$7,495,522**	**$11,385,139**	**$18,880,661**	**$7,483,059**	**$11,250,595**	**$18,733,654**
Revenue - Other total	**-$159,909**	**-$340,091**	**-$500,000**	**-$159,898**	**-$342,755**	**-$502,653**
Revenue - Rates Fcst. (pre rate change)	**-$7,171,071**	**-$11,075,929**	**-$18,247,000**	**-$7,171,071**	**-$11,075,929**	**-$18,247,000**
Revenue total	**-$7,330,980**	**-$11,416,020**	**-$18,747,000**	**-$7,330,969**	**-$11,418,684**	**-$18,749,653**
2018 Dividend Returned	**-$19,220**		**-$19,220**	**-$19,220**	**$19,220**	**$0**
Grand Total Shortfall (Surplus)	**$145,322**	**-$30,881**	**$114,441**	**$132,870**	**-$148,869**	**-$15,999**
Revenue from Rates Rqd.	**-$7,316,393**	**-$11,045,048**	**-$18,361,441**	**-$7,303,941**	**-$10,927,060**	**-$18,231,001**
Revenue from Rates Change Rqd.	**2.03%**	**-0.28%**	**0.63%**	**1.85%**	**-1.34%**	**-0.09%**
Rate Change Rqd. (Apr 01)	**2.94%**	**-0.40%**	**0.91%**	**2.69%**	**-1.95%**	**-0.13%**
	$19,220	$0	$19,220	$19,220	-$19,220	$0

Notes:

1. The table is prepared based on information used for table on Page 8 of the application that was developed in December 2018 (consistent with the data that was used for rate setting with City of Nelson Council).

2. The rate calculation for Urban service area was -.40%, however, the City Council agreed and decided to implement a rate smoothing option by approving the 2019 rate change 1.5% so potential future rate increases are smoothed.

3. This table uses budget data from the April 10, 2019 supplementary filing being operating budget Appendix B.

4. Data in this table has been corrected to show pre rate change forceast of $18,247,000 instead of $17,970,182.

MEMORANDUM

Date: December 4, 2018

To: File

From: C. Jury

Subject: 2018 Q3 and 2019 revenue forecasts

File: 2019 revenue forecast model.xlsx

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1) The Excel based model noted above was used to forecast 2018 year end rate revenues of **$18,500,000.**
2) The same model was also used to forecast 2019 full year rate revenues of **$18,247,000** (assuming a 0% increase**)**.

As background, this model is based on the prior 5 years of rate revenue. Those historical dollar amounts are converted to current year dollars by "inflation" adjusting them using the corresponding annual rate increases. To minimize the impact that an abnormally cold or warm period would have on the average, the median value is used, effectively taking the middle result from the 5 year data set. This median value (which is in today's dollars becomes the projected revenue for the subsequent year, assuming no rate increase. A rate increase can be applied to this number if required.

We tested this model on 2016 and 2017 to gauge its reasonableness.

The model would have forecasted revenue of $17,102,763 for 2016. Actual revenue for 2016 was $16,778,032. So we would have over projected by $324,731, or -1.9%. Actual consumption for that year was also below forecast that year by -3.03%.

For 2017, the model would have forecasted revenues of $17,711,529. Actual revenues were $18,353,665 that year, so it would have under projected by 3.63%. The consumption model also shows the same trend, with actual consumption being 5.73% above forecast.