BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

DOCKET NO. UE-170485

DOCKET NO. UG-170486

EXH. CGK-5

CLINT G. KALICH

REPRESENTING AVISTA CORPORATION

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	08/28/2017
CASE NO:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	UTC Staff - Gomez	RESPONDER:	James Gall
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	Staff - 095	TELEPHONE:	(509) 495-2189
		EMAIL:	James.gall@avistacorp.com

REQUEST:

Using the updated results from AURORA, please update Table No. 1: Summary of Changes to Power Supply Cost contained in Mr. Clint Kalich's Supplemental Direct Testimony, Exh. CGK-3T, page 5.

RESPONSE:

Please see Avista's **CONFIDENTIAL** response to data request Staff_DR_095C. Please note that Avista's response to Staff_DR_095C is **Confidential per Protective Order in UTC Dockets UE-170485 and UG-170486**.

The total change from power cost is a reduction of $43,516 in total power supply cost, or $28,603 for Washington customers. Further, the Table No. 1: Summary of Changes to Power Supply Cost is now revised. The previous version did not include all the contracts in "Other Long Term Wholesale Contracts" as thought due to an excel reference error, these costs were therefore included in the "other" category. Below is the corrected table and the requested table for this data request. Also included in this response are the following files to create this response (Staff_DR_095C Confidential Attachments). Due to the size of these reports, they are is being provided in electronic format only.

List of files included:
AURORA Power Cost Results Summary_DR_95.xlsx
AVA_WA_GRC_2018-19_May18-Aug17_NG_CS1.xdb
AVA_WA_GRC_2018-19_May18-Aug17_NG_CS3.xdb
AVA_WA_GRC_2018-19_May18-Aug17_NG_CS4.xdb
AVA_WA_GRC_2018-19_May18-Aug17_NG_CS5.xdb
AVA_WA_GRC_2018-19_May18-Aug17_NG_CS6.xdb
AVA_WA_GRC_2018-19_May18-Aug17_NG_CS7.xdb
AVA_WA_GRC_2018-19_May18-Aug17_NG_CS8.xdb
AVA_WA_GRC_2018-19_May18-Aug17_NG_CS10.xdb
XDB WA 2018-19 DR_94_80 Years_Test_Year_Load_CS1.xlsx
XDB WA 2018-19 DR_94_80 Years_Test_Year_Load_CS3.xlsx
XDB WA 2018-19 DR_94_80 Years_Test_Year_Load_CS4.xlsx
XDB WA 2018-19 DR_94_80 Years_Test_Year_Load_CS5.xlsx
XDB WA 2018-19 DR_94_80 Years_Test_Year_Load_CS6.xlsx
XDB WA 2018-19 DR_94_80 Years_Test_Year_Load_CS7.xlsx
XDB WA 2018-19 DR_94_80 Years_Test_Year_Load_CS8.xlsx
XDB WA 2018-19 DR_94_80 Years_Test_Year_Load_CS9.xlsx

Corrected Table 1: Summary of Changes to Power Supply Cost

Row	Item	Kalich	Johnson	Cost
1	Authorized 2016 System Power Costs (prior to adjustments)			139,148,766
2				
3	Palouse Wind		870,000	870,000
4	Energy America Reduction/COB Optimization	-2,119,527	3,314,595	1,195,068
5	PGE Exchange Expiration	-3,209,144	19,278,000	16,068,856
6	Lancaster Payments		490,642	490,642
7	Natural Gas & Power Hedges		462,000	462,000
8	Other Long Term Wholesale Contracts	1,638,289	3,215,640	4,853,929
9	Ancillary Services Sales		-25,000	-25,000
10	Natural Gas Transport		-1,107,000	-1,107,000
11	Electric Transmission		167,000	167,000
12	Reduction in Load	-1,629,043		-1,629,043
13	Coyote Springs 2 Upgrade	-615,342		-615,342
14	Allow Noxon Rapids to Spill	-83,930		-83,930
15	Resource outages, KF/Colstrip fuel, and other resources	2,169,562		2,169,562
16	Changes to Natural Gas/Power Prices	-3,089,848	68,566	-3,021,282
17	Other	-213,287	-485,462	-698,750
18	Total System Power Supply Cost Changes	-7,152,270	26,248,980	19,096,710
19				
20	Transmission Revenues			652,790
21	Total Power Supply Cost Changes			19,749,500
22	2018-19 Power Supply Cost Forecast			158,898,266
23				
24	Authorized Washington Power Supply Costs (64.71% of Row 1 minus $1.5 million)			88,543,166
25	Proposed Washington Power Supply Costs (65.73% of 22)			104,443,830
26	Proposed Washington Power Cost Adjustment			15,900,664

Data Request 95: Table 1: Summary of Changes to Power Supply Cost

Row	Item	Kalich	Johnson	Cost	Total Change
1	Authorized 2016 System Power Costs (prior to adjustments)			139,148,766	
2					
3	Palouse Wind		870,000	870,000	0
4	Energy America Reduction/COB Optimization	-2,324,561	3,568,987	1,244,427	49,358
5	PGE Exchange Expiration	-3,259,954	19,278,000	16,018,046	-50,810
6	Lancaster Payments		396,279	396,279	-94,363
7	Natural Gas & Power Hedges		-16,000	-16,000	-478,000
8	Other Long Term Wholesale Contracts	2,059,939	3,068,444	5,128,383	274,454
9	Ancillary Services Sales		-25,000	-25,000	0
10	Natural Gas Transport		-1,107,000	-1,107,000	0
11	Electric Transmission		167,000	167,000	0
12	Reduction in Load	-1,243,627		-1,243,627	385,416
13	Coyote Springs 2 Upgrade	-618,617		-618,617	-3,275
14	Allow Noxon Rapids to Spill	-139,601		-139,601	-55,670
15	Resource outages, KF/Colstrip fuel, and other resources	1,705,671		1,705,671	-463,891
16	Changes to Natural Gas/Power Prices	-2,668,198	68,566	-2,599,632	421,650
17	Other	-241,673	-485,462	-727,135	-28,386
18	Total System Power Supply Cost Changes	-6,730,620	25,783,814	19,053,194	-43,516
19					
20	Transmission Revenues			652,790	0
21	Total Power Supply Cost Changes			19,705,984	-43,516
22	2018-19 Power Supply Cost Forecast			158,854,749	-43,516
23					
24	Authorized Washington Power Supply Costs (64.71% of Row 1 minus $1.5 million)			88,543,166	0
25	Proposed Washington Power Supply Costs (65.73% of 22)			104,415,227	-28,603
26	Proposed Washington Power Cost Adjustment			15,872,061	-28,603

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	09/18/2017
CASE NO.:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	UTC Staff	RESPONDER:	James Gall
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	Staff - 224	TELEPHONE:	(509) 495-2189
		EMAIL:	james.gall@avistacorp.com

REQUEST:

In Mr. Kalich's supplementary testimony Exhibit CGK-3T at 7:15-16, he states, "Aligning AURORA$_{XMP}$ market price forecasts to forward prices ensures the model values Company resources and load obligations based on current market conditions."

Referring to the tables below, derived from the AURORA Model Mid-C Price comparison to market forwards provided in Mr. Kalich's workpapers and testimony in UE-140188, UE-150204 and UE-160228, please provide the AURORA generated monthly Mid-C market prices (both On and Off Peak) before adjustments were made to match model prices to forward prices. (Please note: The "adjustments" referenced in this data request refer to the "market adjustments" discussed in Mr. Kalich's supplemental testimony in Exh. CGK-3T at 9:14 through 12:10 and not the negative "VAR Cost Mod1" values Avista uses to capture the impacts of negative prices when the Northwest is oversupplied.)

RESPONSE:

Please see Avista's **CONFIDENTIAL** response to data request Staff_DR_224C. Please note that Avista's response to Staff_DR_224C is **Confidential per Protective Order in UTC Dockets UE-170485 and UG-170486**.

Avista does not retain intermediate AURORA studies requested. Avista recreated these files by re-running the model with existing project files and the corresponding version of the model. The information provided is Avista's best estimate of the prices without the market adjustments discussed in CGK-3T at 9:14 through 12:10. The confidential project file archive and result files are attached as (Staff_DR_224C Confidential Attachments):

UE-160228
- Avista_2017_RC_Archive_UE-160228.zip
- AVA_2016RC_102016_Compliance_NoMrkAdjustments.xdb

UE-150204
- Avista_2016_RC_Archive_UE_150204.zip
- AVA_2016RC_101615_Compliance Filing_TestPeriodLoad_DR_225.xdb

UE-140188:
- Avista_RC_2015_Archive_UE-140188.zip
- DR_225_NoMrktAdjustments.xdb

Due to the size of these reports, they are being provided in electronic format only.

UE-160228 (final update)				
Month/Year	**Aurora On-Peak (after adjustment)**	**Aurora Off-Peak (after adjustment)**	**Aurora On-Peak (before adjustment)**	**Aurora Off-Peak (before adjustment)**
Jan-17	$ 32.84	$ 27.92	31.58	26.31
Feb-17	$ 31.07	$ 26.41	30.44	25.59
Mar-17	$ 25.38	$ 22.04	26.28	23.50
Apr-17	$ 21.10	$ 15.29	20.31	18.65
May-17	$ 19.51	$ 11.07	18.43	11.45
Jun-17	$ 20.75	$ 10.52	19.39	9.75
Jul-17	$ 30.79	$ 19.56	30.50	19.89
Aug-17	$ 32.65	$ 23.46	32.63	22.89
Sep-17	$ 30.87	$ 25.10	31.80	25.25
Oct-17	$ 27.70	$ 24.37	31.53	25.26
Nov-17	$ 30.89	$ 24.84	31.00	24.72
Dec-17	$ 33.02	$ 26.76	32.70	26.76

UE-150204 (final update)				
Month/Year	**Aurora On-Peak (after adjustment)**	**Aurora Off-Peak (after adjustment)**	**Aurora On-Peak (before adjustment)**	**Aurora Off-Peak (before adjustment)**
Jan-16	$ 30.41	$ 25.26	29.12	24.01
Feb-16	$ 28.74	$ 24.52	27.40	23.40
Mar-16	$ 25.96	$ 21.76	23.93	21.48
Apr-16	$ 23.51	$ 16.22	19.17	18.17
May-16	$ 19.90	$ 10.08	13.59	10.91
Jun-16	$ 20.76	$ 11.82	16.74	9.99
Jul-16	$ 30.98	$ 19.52	26.57	20.57
Aug-16	$ 32.75	$ 23.28	29.52	22.35
Sep-16	$ 29.96	$ 24.89	29.06	23.38
Oct-16	$ 29.68	$ 25.23	29.16	23.70
Nov-16	$ 29.92	$ 25.75	29.23	24.07
Dec-16	$ 31.87	$ 27.36	30.83	25.80

UE-140188				
Month/Year	**Aurora On-Peak (after adjustment)**	**Aurora Off-Peak (after adjustment)**	**Aurora On-Peak (before adjustment)**	**Aurora Off-Peak (before adjustment)**
Jan-15	$ 38.62	$ 30.94	39.18	27.05
Feb-15	$ 38.61	$ 31.64	38.60	27.65
Mar-15	$ 36.38	$ 30.52	34.81	25.88
Apr-15	$ 32.23	$ 19.50	29.47	18.43
May-15	$ 27.58	$ 13.33	26.20	9.14
Jun-15	$ 23.78	$ 11.12	28.72	7.46
Jul-15	$ 43.07	$ 20.84	41.15	20.01
Aug-15	$ 43.39	$ 28.75	41.93	24.88
Sep-15	$ 43.46	$ 36.72	40.64	28.25
Oct-15	$ 39.95	$ 32.50	40.29	28.90
Nov-15	$ 38.28	$ 31.89	38.75	28.02
Dec-15	$ 41.07	$ 31.89	41.50	28.15

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	09/18/2017
CASE NO.:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	UTC Staff	RESPONDER:	James Gall
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	Staff - 225	TELEPHONE:	(509) 495-2189
		EMAIL:	james.gall@avistacorp.com

REQUEST:

Please provide the AURORA generated monthly Mid-C market prices (both on and off Peak) before adjustments were made to match model prices to forward prices. (Please note: The "adjustments" referenced in this data request refer to the "market adjustments" discussed in Mr. Kalich's supplemental testimony in Exh. CGK-3T at 9:14 through 12:10 and not the negative "VAR Cost Mod1" values Avista uses to capture the impacts of negative prices when the Northwest is oversupplied.)

RESPONSE:

Please see Avista's **CONFIDENTIAL** response to data request Staff_DR_225C. Please note that Avista's response to Staff_DR_225C is **Confidential per Protective Order in UTC Dockets UE-170485 and UG-170486**.

Avista does not retain intermediate AURORA studies requested. Avista recreated these files by re-running the model without the adjustments discussed in CGK-3T at 9:14 through 12:10. Avista's response to DR 94 with these adjustments results in system Power Supply Cost to be $731,073 lower than the results of this study without the price adjustments. The following confidential files are included in this response (Staff_DR_225C Confidential Attachments).

XDB WA 2018-19 DR_225_80 Years_Test_Year_Load.xlsx
Forward to Aurora Mid-C Price DR_225_Comparison_2018-19.xlsx
AVA_WA_GRC_2018-19_DR_225.xdb
AVA_WA_2018-2019_GRC_DR_225_WithChangeSets_Archive.zip
Proforma_DR 225_May-18 to Apr 19_Test Year Load.xlsx

Due to the size of these reports, they are being provided in electronic format only.

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	10/09/2017
CASE NO.:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	UTC Staff	RESPONDER:	James Gall
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	Staff - 247	TELEPHONE:	(509) 495-2189
		EMAIL:	james.gall@avistacorp.com

REQUEST:

Please provide an updated AURORA Project File[1] titled: AVA_WA_2018-2019_GRC_WithChangeSets Staff.apz along with the attached input database, template file, Computational Dataset file, and Change Set file and/or network definition dataset (if applicable) in a single .ZIP file (Archive), using the load values and hourly load shapes provided by Staff in the attached Excel worksheet.

As well as using Staff loads and hourly load shapes in the AURORA study, please also remove all adjustments, inputs, settings and parameters the Company employs to match model prices to forward prices. (Please note: The "adjustments, inputs, settings and parameters" referenced in this data request refer to the "market adjustments" discussed in Mr. Kalich's supplemental testimony in Exh. CGK-3T at 9:14 through 12:10 and not the negative "VAR Cost Mod1" values Avista uses to capture the impacts of negative prices when the Northwest is oversupplied.)

Please also include the output database and templates and/or modify AURORA project settings in the updated AURORA Archive above to enable Staff and other parties to view the results of the study.

RESPONSE:

Please see Avista's **CONFIDENTIAL** response to data request Staff_DR_247C. Please note that Avista's response to Staff_DR_247C is **Confidential per Protective Order in UTC Dockets UE-170485 and UG-170486**.

Avista performed the AURORA study using Staff loads. The following files are included in this study per staff request. A summary of the Power Supply cost changes are:

Study	Power Cost ($000)	Change ($000)
Filed Case	$174,612	
DR 151c	$175,005	+$393
DR 247	$176,660	+$1,655

Staff_DR_247C Confidential Attachments:

AVA_WA_2018-2019_GRC_WithChangeSets_Staff.zip
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment.xdb
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load.xlsx

[1] The AURORA project file should be based on the latest AURORA run which Avista provided in response to UTC Staff Data Request No. 151C which corrected an input error made by the Company and includes the update for natural gas and power market prices provided in response to UTC Staff Data Request Nos. 94 and 95.

Proforma_DR 247_May-18 to Apr 19_Test Year Load.xlsx
Staff AURORA Load DR.xlsx

All files provided in electronic format only.

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	10/09/2017
CASE NO.:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	UTC Staff	RESPONDER:	James Gall
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	Staff - 248	TELEPHONE:	(509) 495-2189
		EMAIL:	james.gall@avistacorp.com

REQUEST:
Using the updated results from AURORA, from the data request above, please update Table No. 1: Summary of Changes to Power Supply Cost contained in Mr. Clint Kalich's Supplemental Direct Testimony, Exh. CGK-3T, page 5.

RESPONSE:
Below is an updated version of Table 1 using the study from Staff DR 247 and running it through the same change sets as provided in the supplemental testimony. At the bottom of this response is a list of the files to calculate these costs and are to be used with data provided in Staff DR 247.

Row	Item	Kalich	Johnson	Cost
1	Authorized 2016 System Power Costs (prior to adjustments)			139,148,766
2				
3	Palouse Wind		870,000	870,000
4	Energy America Reduction/COB Optimization	-1,837,266	4,004,177	2,166,911
5	PGE Exchange Expiration	-3,706,411	19,278,000	15,571,589
6	Lancaster Payments		262,889	262,889
7	Natural Gas & Power Hedges		-914,000	-914,000
8	Other Long Term Wholesale Contracts	1,637,641	2,954,256	4,591,897
9	Ancillary Services Sales		-25,000	-25,000
10	Natural Gas Transport		-1,107,000	-1,107,000
11	Electric Transmission		167,000	167,000
12	Reduction in Load	-173,016		-173,016
13	Coyote Springs 2 Upgrade	-430,580		-430,580
14	Allow Noxon Rapids to Spill	-65,228		-65,228
15	Resource outages, KF/Colstrip fuel, and other resources	2,213,420		2,213,420
16	Changes to Natural Gas/Power Prices	-3,913,698	64,866	-3,848,832
17	Other	2,347,053	-1,347,410	999,643
18	Total System Power Supply Cost Changes	-3,928,085	24,207,778	20,279,693
19				
20	Transmission Revenues			652,790
21	Total Power Supply Cost Changes			20,932,483
22	2018-19 Power Supply Cost Forecast			160,081,249

23				
24	Authorized Washington Power Supply Costs (64.71% of Row 1 minus $1.5 million)			88,543,166
25	Proposed Washington Power Supply Costs (65.73% of 22)			105,221,405
26	Proposed Washington Power Cost Adjustment			16,678,239

AURORA Power Cost Results Summary_DR_248.xlsx
Proforma_DR 248_with Authorized Gas.xlsx
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment_CS_3.xdb
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment_CS_4.xdb
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment_CS_5.xdb
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment_CS_6.xdb
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment_CS_7.xdb
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment_CS_8.xdb
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment_CS_9.xdb
AVA_WA_GRC_2018-19_Filed Case-Staff Load Adjustment_CS_10.xdb
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load_CS_3.xlsx
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load_CS_4.xlsx
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load_CS_5.xlsx
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load_CS_6.xlsx
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load_CS_7.xlsx
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load_CS_8.xlsx
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load_CS_9.xlsx
XDB WA 2018-19 DR_247_80 Years_Test_Year_Load_CS_10.xlsx

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	08/28/2017
CASE NO:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	David Gomez	RESPONDER:	Clint Kalich
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	UTC_Staff_151	TELEPHONE:	(509) 495-4532
		EMAIL:	clint.kalich@avistacorp.com

REQUEST:

Referring to the workpaper of Mr. Clint Kalich titled Load Table_2017-19.xlsx, describe how Mr. Kalich arrived at the hourly load shapes "% of month" for the pro forma periods used in the AURORA model using actual 2016 hourly load data in the worksheet tab titled 2016 Actual.

Explain why the "% of Month" is based on 2016 actual hourly data and not normalized to account for inter-year hourly temperature and weather variation.

RESPONSE:

Please see Avista's **CONFIDENTIAL** response to data request Staff_DR_151C. Please note that Avista's response to Staff_DR_151C is **Confidential per Protective Order in UTC Dockets UE-170485 and UG-170486**.

Avista loads included in AURORA are weather normalized on a monthly basis, but use test year hourly load levels using the test year load shapes. These load shapes are calculated using the test period hourly loads and calculating the hourly load shape by dividing the hourly load by the monthly average load.

Weather normalization is not performed on an hourly, or even daily basis. Hourly load weatherization would not be very accurate to do such analysis on an hourly basis as it would remove weather variation within the month. Instead we perform monthly weather normalization and reduce each hour's load level by its share of the monthly normalization value. Therefore the 2016 hourly shapes remain the same and are used in the proforma consistent with the data and with previous cases.

During review of the load data in the initial filing, Avista discovered the loads are incorrect due to an incorrect accounting for 2016 being a leap year. The load calculation worksheet was not modified to include the extra day. Therefore this error affects monthly load levels in February and December, and also impacts the hourly load shape after February. The table below should replace Table No. 2- Historical Loads in Kalich's direct testimony (CGK-1T). In addition, Staff_DR_151C Confidential Attachment A - Load Table_2017-19_Fixed.xlsx is provided with the corrected data. Avista conducted a study in the AURORA model with this change, the results of this study is an increase of power costs of $392,522 system. In addition the following files are included in Staff_DR_151C Confidential Attachment B. They are AURORA input, output, and proforma result files including the corrected load data.

AVA_WA_2018-2019_GRC_DR_151_Archive.zip
AVA_WA_GRC_2018-19_Filed Case with Load Adjustment.xdb
XDB WA 2018-19 Filing_80 Years_Test_Year_Load.xlsx

Due to the size of these reports, they are being provided in electronic format only.

Month	Actual Load	Weather Adjustment	Modeled Load		Month	Actual Load	Weather Adjustment	Modeled Load
May-18	910.0	29.0	939.0		Nov-18	1,018.3	55.7	1,074.0
Jun-18	979.6	-35.7	944.0		Dec-18	1,284.7	-49.4	1,235.4
Jul-18	1,017.9	31.2	1,049.1		Jan-19	1,187.2	18.7	1,205.9
Aug-18	1,063.2	-25.2	1,038.0		Feb-19	1,091.5	51.8	1,143.3
Sep-18	918.0	23.4	941.4		Mar-19	1,021.8	28.0	1,049.8
Oct-18	952.3	4.4	956.6		Apr-19	921.2	50.4	971.6

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	10/19/2017
CASE NO.:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	Public Counsel	RESPONDER:	James Gall
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	PC-016 Revised	TELEPHONE:	(509) 495-2189
		EMAIL:	james.gall@avistacorp.com

REQUEST:

Please provide an economic dispatch of Avista's Washington system using the AURORAxmp model with the following:

a) current actual forecasts of generator attributes and running costs; and
b) actual load forecasts.

The output under these assumptions should be a forecast of hourly electricity prices, rather than matching the Aurora modeling to forward prices for energy. Please confirm that the output of the requested modeling is not matched to forward prices for energy.

RESPONSE:
Please see Avista's **CONFIDENTIAL** response to data request PC_DR_016C. Please note that Avista's response to PC_DR_016C is **Confidential per Protective Order in UTC Dockets UE-170485 and UG-170486**.
All attachments are provided in electronic format only.
Avista re-ran AURORAxmp with the following changes, the workpaper files are shown in brackets

1. update to most recent variable O&M estimates [AURORA Screen shots.docx]
2. update to forecasted forced outage rates rather than prior commission approved 5 year average [AURORA Screen shots.docx]
3. Update to the maintenance schedule rather than prior commission approved 5/6 year average. [CS_Compare PC_16_Maintenance.xlsx]
4. Update to most recent 3 month average of natural gas price forward prices [CS_Compare PC_16_Natural Gas Prices.xlsx and Natural_Gas_2017-19_101817.xlsx]
5. Update to most recent Kettle Falls fuel price [AURORA Screen shots.docx and Kettle Falls Fuel Prices.xlsx]
6. Update to most current forecast of future loads, rather than prior commission approved weather adjusted test year loads [Load Table_2017-19_Fixed_newForecast.xlsx]
7. Removed adjustments to align modeled price to match forward prices.

The results of this study increases power costs $5,583,640 as compared to the filed power costs.

Other files included in this request.
Proforma May-18 to Apr 19_PC_16.xlsx
XDB WA 2018-19_80 Years_PC_16.xlsx
Forward to Aurora Mid-C Price Comparison_2018-19_PC16.xlsx
AVA_WA_2018-2019_GRC_WithChangeSets_Archive.zip
AVA_WA_GRC_2018-19_PC_16.xdb

AVISTA CORP.
RESPONSE TO REQUEST FOR INFORMATION

JURISDICTION:	WASHINGTON	DATE PREPARED:	09/18/2017
CASE NO:	UE-170485 & UG-170486	WITNESS:	Clint Kalich
REQUESTER:	UTC Staff - Gomez	RESPONDER:	James Gall
TYPE:	Data Request	DEPT:	Energy Resources
REQUEST NO.:	Staff 200	TELEPHONE:	(509) 495-2189
		EMAIL:	James.gall@avistacorp.com

REQUEST:

Referring to the values in the Resource Table in the AURORA model project file used in this case and the AURORA project files from the last two General Rate Cases:

a. Please explain how Avista arrived at the forced outage values in Table 1 below. Provide all analysis, workpapers, formulae and any other materials and documents which Avista relied on to calculate these values.[1]
b. Explain why Boulder Park values were updated and not the other Peaker Plants.
c. Explain why the over $2.0 million in capital costs Avista expended in the Peaking Generation Business Case from 2012-2016 included in Mr. Kinney's Exhibit SJK-4, Pages 64 to 66, has not resulted in a decrease in forced outage rates for peaker plants.[2]
d. Explain why most wind, solar and geothermal resource forced outage rate values in the model refer to separate time-series sub hourly tables instead of individual forced outage values.
e. In the separate time-series sub hourly tables used to calculate forced outage values, identify which column and values apply to the resources listed in the Resource Table. Describe how the forced outage values are calculated in the study using a time-series sub hourly table.[3]
f. Explain the presence and source of generic forced outage values in the Resource Tables of in this rate case and in UE-150204.[4] Explain why these values remain unchanged.

RESPONSE:

Please see Avista's **CONFIDENTIAL** response to data request Staff_DR_200C. Please note that Avista's response to Staff_DR_200C is **Confidential per Protective Order in UTC Dockets UE-170485 and UG-170486**.

a) The Boulder Park forced outage rate was calculated using data in the "station service.xlsx" spreadsheet provided in working papers with this case. We did not retain the specific calculations,

[1] Mr. Kalich's workpapers supporting his thermal resource settings in AURORA for forced outages relies on a 5-year rolling average for Coyote Springs 2, Lancaster and Kettle Falls and 6-years for Colstrip. No such workpapers appear to exist for the resources listed in the table.
[2] In Docket No. UE-100749, Mr. Kalich's Exhibit No. CGK-1T, page 24, Table 4 – Equivalent Forced Outage Rates (EFOR) of Avista Thermal and Gas Plants show values for Northeast and Rathdrum identical to values in Table 1 above. Boulder Park EFORs appear to have worsened since then.
[3] For example, Palouse Wind refers to a table titled; SH_Avista|Palouse|2017 which contains 70 columns with values for hours 1-23 for the year 2017. Referring to the last column; Palouse, the forced outage value for hour 1 on January 1, 2017 would be equal to (105.3 MW * (1-45.2/100)) = 47.5956.
[4] For example, Wattenberg Field CG 1 is reported to have in both this case and UE-150204, a forced outage factor of 21.14 percent.

but have re-created the work arriving at 13.65 percent, see Staff_DR_200C Confidential Attachment A.

b) The Northeast and Rathdrum plant forced outage rates of 5 percent are an assumption used for these plants since the 2005 rate case. Limited operations of the plants does not give a good sample size to base forced outages rates upon, and so we use the same rate as in our energy position report.

The 5 percent forced outage rates for Northeast and Rathdrum are much lower than data reported by NERC's GADS database attached as Staff_DR_200C Confidential Attachment B, which can also be found at the web address below. In other words, the output, and value to customers, of these plants in the rate case is higher than they would be if the higher GADS rates were used.

http://www.nerc.com/pa/RAPA/gads/Pages/Reports.aspx

In this file NERC averages forced outage rates for similar technologies, in this case they find the forced outage rates for Gas Turbines at an EFORd rate of 8.4 percent for above 49 MW (i.e. Rathdrum). For 20 plus MW Jet Engines, the technology for Northeast, the rate is 8.4 percent. Reciprocating Engines, the technology of Boulder Park, is not tracked by GADS in this report.

The Company for this case chose to update Boulder Park's forced outage rate to a 5-year actual, lowering its rate from 15.00 percent. Similar to Northeast and Rathdrum, this lower forced outage rate benefits customers in the case by making the plant more available then it would be with a higher forced outage rate.

c) Capital projects frequently are not always intended to improve a plant's reliability. Instead, capital deployed may retain reliability, improve plant capability, improve or restore plant efficiency, and/or or comply with regulatory requirements. Below is a list of peaking plant projects not directly impacting plant reliability:

a. replace equipment obsolescence such as replacing an outdated control system,
b. adding mandatory environmental requirements such as adding emission monitoring equipment,
c. Replacing station batteries, so the facilities can maintain its reliability,
d. Add fast start systems at Rathdrum to allow the unit to start faster to provide 10 minute reserve products,
e. Replacing blade sections based on OEM recommendations so the units prior to forced outages take place.

d) In AURORA, forced outage rates for variable generating resources like wind and solar are used to reflect the expected hourly generation shape of these resources. It is common practice with AURORA to use the forced outage column to represent the hourly shape of these resources by an hourly de-rate to the capacity, as there is no other way to properly model hourly profiles for renewables. For geothermal resources, an annual vector is used to represent efficiency changes in the projects as well production levels depreciate over time.

e) Within the resource table, the column "forced outage" shows the resources that use the sub hourly data. This is found by searching for the "SH_" in the beginning of the text string. The column used in the corresponding sub hourly table is found by the work between the "| |", for example "|NW|". These values are calculated by using regional wind and solar data. For example the solar data is

calculated from a study by the NPCC using NREL data, and the wind data is calculated using NREL data by Avista.

It is important to recall that, because of the methodology used to match AURORA prices to the forward markets, these datasets do not materially affect power supply costs in this case. The only wind resource Avista controls using the sub hourly table is Palouse Wind. In this case the data used is based on the 12x24 estimated delivery provided by the developer of the project and is in the sub hourly table "Palouse". As explained above, wind output is input into AURORA using forced outage rates.

f) The forced outages rates used in this case and prior cases are derived from NERC's GADS data or from the default AURORA database. The forced outage rates for regional resources are unchanged from the prior case because this information was not updated. Avista periodically updates this data with new GADS data, but these estimates generally do not change much year to year and are not always updated each year. Because the data in question is for non-Avista resources, it has no impact on the results of this case; electricity market prices are trued up to forward prices.