Exh. JL-6 Docket UG-181053 Witness: Jing Liu

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,

DOCKET UG-181053

Complainant,

v.

NORTHWEST NATURAL GAS COMPANY, d/b/a NW NATURAL,

Respondent.

EXHIBIT OF

Jing Liu

STAFF OF WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

NW Natural's Revised Estimate on Incremental Cost of Serving New Customers

July 18, 2019

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NW Natural[®] Rates & Regulatory Affairs UG-181053 2018 WA General Rate Revision Data Request Response

DR Request: May 21, 2019 Date of Amended Response: July 12, 2019 Responder: Kyle T. Walker Telephone: (503) 226-4211 ext. 5858 Email: kyle.walker@nwnatural.com Witness: Kyle Walker

Request No.: UG-181053 WUTC DR 202

Does the Company have any internal cost estimates for serving new residential or commercial customers, including capital expenditures and annualized expenses? If so, please provide the cost estimate and any relevant analyses. The cost estimate can include but is not limited to general budget guidelines, recent business case analyses associated with serving a particular new development, or cost information based on historical records. To the extent that the Company analyzed the future revenue associated with such new customers, please provide revenue projection, as well.

Response:

Please see "UG-181053 WUTC DR 202 Attachment 1 - Amended.xlsx" for the Company's most up to date analysis related to new residential meter sets in Washington. We have been able to isolate the residential data and remove commercial capital costs for a more precise estimate. This analysis focuses on the capital expenditures needed to add new residential customers onto our system. The final costs are net of customer contributions received. Our current internal analysis combines industrial and commercial new customers. Under the Company's initial filing and the Partial Multi-Party Settlement Agreement on Decoupling, industrial customers are not subject to Decoupling. Therefore, for the purpose of this data request relating to Decoupling, we have removed those figures from the analysis.

See "UG-181053 WUTC DR 202 Attachment 2 - Amended.xlsx" for the cost of service for a new residential customer which includes the average capital investment from 2018 found in Attachment 1. The cost of service for a newly added residential customer in year one is \$508¹.

Last, see previously submitted "UG-181053 WUTC DR 202 Attachment 3.xlsx" for a per customer revenue projection for newly added customers. The revenue per year

¹ This analysis uses the capital structure and cost of capital from the all-party settlement in UG-181053

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amounts to \$225.93 and \$411.55 for rate schedule 1 and 2, respectively, per newly added residential customer.

Number of Meter Sets - Washington

		2013	2014	2015	2016	2017	2018	
	Total Residential Meter Sets (Washington Only)	1,809	1,527	1,869	2,141	2,487	2,660	
	Total Residential Weter Sets (Washington Only)	1,005	1,327	1,009	2,141	2,407	2,000	
umber of Ord	ers - Washington							
		2013	2014	2015	2016	2017	2018	
/ashington SM01	MX SYSTEM EXPANSION	62	84	110	116	156	159	
/ashington SM01	MX RESIDENTIAL MAIN	14	11	14	8	30	20	
/ashington SM02	NEW RESIDENTIAL SERVICE	1,252	1,296	1,527	1,885	2,181	2,355	
ashington SM03	NEW RESIDENTIAL SERVICE	87	19	26	22	33	43	
ashington SM02	CONVERSION RESIDENTIAL SERVICE	142	131	138	154	176	144	
ashington SM03	CONVERSION RESIDENTIAL SERVICE	9	9	82	3	15	9	
	Total SM01	76	95	124	124	186	179	
	Total SM02	1,394	1,427	1,665	2,039	2,357	2,499	
	Total SM03	96	28	108	25	48	52	
	Addsets Meter Sets - (Total SM02+SM03)	319	72	96	77	82	109	
otal Cost of Se	rvice Line, Meter, Permit, Indirect Mat	erials (Including A	dd Sets Only) - W	ashington				
		2013	2014	2015	2016	2017	2018	
ashington SM01	MX SYSTEM EXPANSION	\$563,396	\$664,396	\$1,024,378	\$1,463,417	\$1,728,780	\$2,191,880	
	MX RESIDENTIAL MAIN		\$163,181	\$228,429	\$209,634	\$638,111		
ashington SM01		\$116,522					\$1,203,996	
ashington SM02	NEW RESIDENTIAL SERVICE	\$1,362,392	\$1,529,851	\$1,762,505	\$2,228,036	\$2,619,402	\$2,856,288	
ashington SM03	NEW RESIDENTIAL SERVICE	\$171,610	\$35,237	\$40,046	\$28,623	\$66,046	\$70,364	
ashington SM02	CONVERSION RESIDENTIAL SERVICE	\$373,446	\$353,405	\$398,991	\$390,985	\$513,658	\$535,323	
ashington SM03	CONVERSION RESIDENTIAL SERVICE	\$25,813	\$19,312	\$139,681	\$7,216	\$40,081	\$53,041	_
	Total SM01	\$679,918	\$827,577	\$1,252,807	\$1,673,051	\$2,366,891	\$3,395,876	
	Total SM02	\$1,735,838	\$1,883,256	\$2,161,496	\$2,619,021	\$3,133,060	\$3,391,611	
	Total SM03	\$197,424	\$54,549	\$179,727	\$35,839	\$106,128	\$123,405	Meter Add Set Costs \$22
	Total Addset Costs	\$72,094	\$16,272	\$21,696	\$17,402	\$18,532	\$24,634	
otal Customor	Contribution - Washington							
otal Customer	Contribution - wasnington							
		2013	2014	2015	2016	2017	2018	
ashington SM01	MX SYSTEM EXPANSION	\$0	\$0	\$0	\$0	\$0	\$0	
ashington SM01		\$0	\$0	\$0	\$0	\$0	\$0	
asinington sivior	MX RESIDENTIAL MAIN			\$7,228	\$16,259	\$14,037	\$25,212	
	NEW RESIDENTIAL SERVICE	\$1,343	\$9,696	\$7,228				
ashington SM02		\$1,343 \$11,492	\$9,696 \$1,355	\$1,380	\$0	\$5,378	\$21,049	
ashington SM02 ashington SM03	NEW RESIDENTIAL SERVICE		\$1,355					
ashington SM02 ashington SM03 ashington SM02	NEW RESIDENTIAL SERVICE NEW RESIDENTIAL SERVICE	\$11,492		\$1,380	\$0	\$5,378 \$110,961 \$2,830	\$21,049 \$130,051 \$0	
lashington SM02 lashington SM03 lashington SM02 lashington SM03	NEW RESIDENTIAL SERVICE NEW RESIDENTIAL SERVICE CONVERSION RESIDENTIAL SERVICE CONVERSION RESIDENTIAL SERVICE	\$11,492 \$51,558 \$16,192	\$1,355 \$51,241 \$4,061	\$1,380 \$78,904 \$5,042	\$0 \$93,007 \$2,434	\$110,961 \$2,830	\$130,051 \$0	-
ashington SM02 ashington SM03 ashington SM02	NEW RESIDENTIAL SERVICE NEW RESIDENTIAL SERVICE CONVERSION RESIDENTIAL SERVICE	\$11,492 \$51,558	\$1,355 \$51,241	\$1,380 \$78,904	\$0 \$93,007	\$110,961	\$130,051	7

	Total Cost per New Meter Set	\$1,987	\$2,454	\$2,601	\$2,729	\$3,047	\$3,507
	Overhead Rate Est.	38%	38%	38%	38%	38%	38%
	Total Construction Cost/Customer	\$1,440	\$1,778	\$1,885	\$1,977	\$2,208	\$2,541
	Total Meter Sets - Washington	1,809	1,527	1,869	2,141	2,487	2,660
	Total Costs (Washington)	\$2,604,689	\$2,715,301	\$3,523,173	\$4,233,613	\$5,491,405	\$6,759,213
	Addsets	\$72,094	\$16,272	\$21,696	\$17,402	\$18,532	\$24,634
	Total	\$2,532,595	\$2,699,029	\$3,501,477	\$4,216,211	\$5,472,873	\$6,734,579
	Total SM03	\$169,740	\$49,133	\$173,305	\$33,405	\$97,920	\$102,356
	Total SM01	\$1,682,937	\$1,822,319	\$2,075,364	\$2,509,755	\$3,008,062	\$3,236,348
ton SM03	CONVERSION RESIDENTIAL SERVICE Total SM01	\$9,621 \$679,918	\$15,251 \$827,577	\$134,639 \$1,252,807	\$4,782 \$1,673,051	\$37,251 \$2,366,891	\$53,041 \$3,395,876
ton SM02	CONVERSION RESIDENTIAL SERVICE	\$321,888	\$302,164	\$320,087	\$297,978	\$402,697	\$405,272
ton SM03	NEW RESIDENTIAL SERVICE	\$160,118	\$33,882	\$38,666	\$28,623	\$60,668	\$49,315
ton SM02	NEW RESIDENTIAL SERVICE	\$1,361,049	\$1,520,155	\$1,755,277	\$2,211,777	\$2,605,365	\$2,831,076
ton SM01	MX RESIDENTIAL MAIN	\$116,522	\$163,181	\$228,429	\$209,634	\$638,111	\$1,203,996
ton SM01	MX SYSTEM EXPANSION	\$563,396	\$664,396	\$1,024,378	\$1,463,417	\$1,728,780	\$2,191,880

UG 181053 WUTC DR 202 Attachment 2 - Amended

NW Natural Determination of Cost of Service

Input Capital Costs and Rates

			Weighted
Cost of Capital	% of Capital	Cost	Cost
Debt	50.00%	5.066%	2.533%
Short Term Debt	1.00%	2.186%	0.022%
Common Equity	49.00%	9.400%	4.606%
	100.00%	=	7.161%
State Tax Rate			0.00%
Federal Tax Rate			21.00%
Revenue Sensitive Rate (held to francl	hise rate/reg com fee)		4.05%
Depreciation Rate			2.60%
Property Tax Rate			1.50%
Incremental O&M			\$ 54.05
Inflation Rate			2.50%
Bonus Tax Depreciation toggled (1 =)	/es, 2 = no)		2
Investment			\$ 3,507

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18
1 Depreciation	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91
2 0&M	54	55	57	58	60	61	63	64	66	68	69	71	73	75	76	78	80	82
3 Property Taxes	52	51	49	48	46	45	44	42	41	40	38	37	36	34	33	31	30	29
Taxes on Equity Return																		
4 State	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 Federal	43	41	40	38	37	35	34	33	31	30	29	28	26	25	24	22	21	20
6 Total Taxes	43	41	40	38	37	35	34	33	31	30	29	28	26	25	24	22	21	20
Return on Rate Base																		
7 Debt	88	85	82	79	76	73	70	67	65	62	59	57	54	51	49	46	43	41
8 Short Term Debt	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
9 Common Equity 10 Total Return	159	154 240	148	143	138	132	127	122	118	113	108	103 160	98	93	89 138	84	79	74
10 Iotal Return	248	240	231	222	214	206	198	190	183	175	168	160	153	145	138	130	123	115
11 Subtotal Cost of Service	487	478	467	458	448	439	430	421	412	404	395	387	378	370	362	353	345	337
12 Revenue Sensitive Items	21	20	20	19	19	19	18	18	17	17	17	16	16	16	15	15	15	14
13 Total Cost of Service	\$508	\$498	\$487	\$477	\$467	\$457	\$448	\$439	\$430	\$421	\$412	\$403	\$394	\$386	\$377	\$368	\$360	\$351
14 Annual Cost of Service as % of Investment	14.48%	14.20%	13.89%	13.60%	13.31%	13.03%	12.77%	12.51%	12.25%	12.00%	11.74%	11.49%	11.24%	11.00%	10.75%	10.50%	10.26%	10.02%
Rate Base - net of deprec. & def. tax	\$3,457	\$3,345	\$3,222	\$3,102	\$2,986	\$2,874	\$2,764	\$2,658	\$2,553	\$2,448	\$2,343	\$2,238	\$2,133	\$2,028	\$1,923	\$1,818	\$1,713	\$1,609
	\$3,457	\$3,345	\$3,222	\$3,102	\$2,986	\$2,874	\$2,764	\$2,058	\$2,553	\$2,448	\$2,343	\$2,238	\$2,133	\$2,028	\$1,923	\$1,818	\$1,713	\$1,609
Income Taxes																		
Gross up of Equity Return	203	196	189	182	175	168	162	156	150	143	137	131	125	119	113	107	100	94
Less: State tax Federal Taxable Income	203	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94
Less: Federal Tax	43	41	40	38	37	35	34	33	31	30	29	28	26	25	24	22	21	20
Return	160	155	149	144	138	133	128	123	118	113	108	104	99	94	89	84	79	74
Deferred Taxes																		
Book Depreciation	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91
Tax Depreciation	132	253	234	217	200	185	171	159	156	156	156	156	156	156	156	156	156	156
Book-Tax Difference	40	162	143	125	109	94	80	67	65	65	65	65	65	65	65	65	65	65
Tax Effect	8	34	30	26	23	20	17	14	14	14	14	14	14	14	14	14	14	14
MACRS Depreciation - 20	3.75%	7.22%	6.68%	6.18%	5.71%	5.29%	4.89%	4.52%	4.46%	4.46%	4.46%	4.46%	4.46%	4.46%	4.46%	4.46%	4.46%	4.46%
Property Tax Base	3,461	3,370	3,279	3,188	3,097	3,005	2,914	2,823	2,732	2,641	2,550	2,458	2,367	2,276	2,185	2,094	2,002	1,911
Tax Calculation Check	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MACRS Depreciation - 20 MACRS Depreciation - 20 - Bonus	3.75% 51.88%	7.22% 3.61%	6.68% 3.34%	6.18% 3.09%	5.71% 2.86%	5.29% 2.64%	4.89% 2.44%	4.52% 2.26%	4.46% 2.23%									
Federal Tax Rate Tax Gross Up	21.00% 0.79																	

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Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Year 31	Year 32	Year 33	Year 34	Year 35	Year 36	Year 37
91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91
84	86	89	91	93	95	98	100	103	105	108	111	113	116	119	122	125	128	131
27	26	25	23	22	20	19	18	16	15	14	12	11	10	8	7	5	4	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	17	16	15	14	13	12	11	11	10	9	8	7	6	5	4	4	3	2
18	17	16	15	14	13	12	11	11	10	9	8	7	6	5	4	4	3	2
38	35	33	31	29	27	25	24	22	20	18	16	15	13	11	9	7	5	4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69 108	64 100	60 93	56 87	53 82	50 77	46	43	40 62	36 57	33 51	30 46	26 41	23	20	16 26	13 20	10	7
108	100	93	8/	82	//	72	67	62	57	51	46	41	30	31	26	20	15	10
329 14	321 14	314 13	308 13	303 13	297 13	292 12	287 12	283 12	278 12	273 12	268 11	264 11	259 11	254 11	250 11	246 10	241 10	237 10
\$343	\$334	\$327	\$321	\$315	\$310	\$305	\$300	\$294	\$289	\$284	\$280	\$275	\$270	\$265	\$261	\$256	\$252	\$247
9.78%	9.54%	9.32%	9.14%	8.99%	8.84%	8.69%	8.54%	8.40%	8.25%	8.11%	7.97%	7.83%	7.70%	7.56%	7.43%	7.30%	7.17%	7.05%
\$1,504	\$1,399	\$1,302	\$1,222	\$1,150	\$1,078	\$1,006	\$934	\$862	\$790	\$718	\$646	\$573	\$501	\$429	\$357	\$285	\$213	\$141
88 0	82 0	76 0	72 0	67 0	63 0	59 0	55 0	50 0	46 0	42 0	38 0	34 0	29 0	25 0	21 0	17 0	12 0	8 0
88	82	76	72	67	63	59	55	50	46	42	38	34	29	25	21	17	12	8
18	17	16	15	14	13	12	11	11	10	9	8	7	6	5	4	4	3	2
70	65	60	57	53	50	47	43	40	37	33	30	27	23	20	17	13	10	7
91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91
156	156	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	65	(13)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)	(91)
14	14	(3)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(19)
4.46%	4.46%	2.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1,820	1,729	1,638	1,547	1,455	1,364	1,273	1,182	1,091	999	908	817	726	635	544	452	361	270	179
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.46% 2.23%	4.46% 2.23%	2.23% 1.12%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1