Exhibit No. VN-4
Dockets UE-090704 and UG-090705
Witness: Vanda Novak

**BEFORE THE WASHINGTON STATE
UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, Complainant, v. PUGET SOUND ENERGY, INC., Respondent.	DOCKET UE-090704 DOCKET UG-090705

EXHIBIT TO TESTIMONY OF

VANDA NOVAK

**STAFF OF
WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION**

Company Response to Staff Data Request No. 188

November 17, 2009

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Docket Nos. UE-090704 and UG-090705
Puget Sound Energy, Inc.'s
2009 General Rate Case

WUTC STAFF DATA REQUEST NO. 188

WUTC STAFF DATA REQUEST NO. 188:

Re: Weather Normalization

On pages 12-13 of Ms. Molander's direct testimony, Exhibit (LIM-1T), she explains a modification to the gas rate schedule equations in the 2006 weather normalization methodology, which "allows the estimated seasonal coefficient to be more robust by including more observations per seasonal coefficient." (Page 13, Lines 3-4.) Please provide a representative sample of the analysis the Company conducted to reach this conclusion and a written narrative describing the analysis.

Response:

Attached as Attachment A to Puget Sound Energy, Inc.'s ("PSE") Response to WUTC Staff Data Request No. 188, please find an MS Excel file that contains regression results and statistics supporting the modification of the individual monthly weather variables to seasonal weather variables in the gas rate schedule model. Regression results and statistics for residential Schedule 23 and commercial Schedule 31 are provided.

In the weather normalization methodology approved in PSE's general rate case ("GRC"), WUTC Docket Nos. UE-060266 and UG-060267, the gas rate schedule equations allowed the estimated coefficients on weather variables to vary uniquely by each calendar month. PSE modified this methodology for this proceeding by restricting the weather sensitivity coefficients to be identical across months in the same season, such as a winter coefficient and a shoulder season coefficient. The benefit of restricting the weather coefficients to be equal across a set of months is to increase the number of observations per coefficient that the gas rate schedule model has to estimate the relationship between weather and load. Increasing the number of observations per coefficient in this way is particularly useful for the gas rate schedule model because it is based on monthly data.

Support for the use of restricting the weather coefficients to be equal across seasons versus using unique monthly weather variables rests on the following set of statistical assumptions: 1) the coefficients on the seasonal weather variables are statistically significant or if a coefficient is insignificant, it is more significant than the unique monthly coefficients it has replaced, 2) the seasons display the expected sign and relationships between season. For example, winter coefficients would be expected to be positive, and greater than shoulder season coefficients.

Please see the tab 'Schedule 23' in Attachment A to PSE's Response to WUTC Staff Data Request No. 188 to compare the 2006 GRC methodology and the revised methodology. Using the 2006 GRC methodology updated with load and temperature information for this proceeding, the model has estimated inconsistent coefficients on the HDD variables (in column H). For example, the coefficient on January HDDs, 0.117, is statistically significant and has the expected sign (positive), implying that colder weather leads to greater load. However, the coefficient on February, -0.09385, is statistically insignificant and has a counter-intuitive negative sign.

Using the revised methodology, it can be seen that the winter coefficient (WIN2HDD) has the expected sign (positive), and is highly significant. The "Std. Error" column reports the estimated standard errors of the coefficient estimates. The standard errors measure the statistical reliability of the coefficient estimates—the larger the standard errors, the more statistical noise are in the estimates. The WIN2HDD variable has lower standard error, 0.0098, than any of the monthly weather coefficients in the 2006 GRC model (column I). Although the SHLD2HDD variable does not pass the 5% significance test, it has a lower standard error than the two variables it replaced, the June and September HDD coefficients in the 2006 GRC model, implying a better estimate of fit. Similar results are shown for the Schedule 31 commercial model.

ATTACHMENT A to PSE's Response to WUTC Staff Data Request No. 188

Gas Schedule 23 Load (Use-per-Customer) Equation

Revised Methodology (Using Seasonal Coefficients)
Dependent Variable: S23RU
Method: Least Squares
Date: 10/20/09 Time: 16:23
Sample: 2004M01 2008M09
Included observations: 57
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.86414	1.142772	17.38242	0.0000
JAN	37.41374	7.514054	4.979168	0.0000
FEB	24.57903	6.375083	3.855484	0.0004
MAR	15.66746	6.058498	2.586031	0.0132
APR	0.785559	4.87174	0.161248	0.8727
MAY	-6.46814	3.281137	-1.97131	0.0551
JUN	2.43282	4.165132	0.584092	0.5622
SEP	4.454915	4.240582	1.050543	0.2993
OCT	1.236999	4.384733	0.282115	0.7792
NOV	19.53984	6.519624	2.99708	0.0045
DEC	35.87517	7.493119	4.787748	0.0000
WIN2HDD	0.099745	0.009877	10.09878	0.0000
SHLD2HDD	0.030999	0.022694	1.365965	0.1791
AR(1)	0.32039	0.139324	2.299595	0.0264

R-squared	0.995976	Mean dependent v	67.6893
Adjusted R-s	0.994759	S.D. dependent va	41.1512
S.E. of regre	2.979105	Akaike info criterion	5.2305
Sum squared	381.6278	Schwarz criterion	5.7323
Log likelihoo	-135.069	Hannan-Quinn crit	5.4255
F-statistic	818.6285	Durbin-Watson stat	2.0093
Prob(F-statist	4.92E-47		

Inverted AR 0.32

2006 GRC Methodology
Dependent Variable: S23RU
Method: Least Squares
Date: 10/20/09 Time: 16:23
Sample: 2004M01 2008M09
Included observations: 57
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	78.21211	25.91127	3.01846	0.0048
JAN	-30.1305	24.33031	-1.2384	0.2241
FEB	86.28241	49.87253	1.730059	0.0927
MAR	-22.2044	27.86693	-0.7968	0.4311
APR	-63.8412	27.11451	-2.3545	0.0245
MAY	-79.6981	29.68893	-2.68444	0.0111
JUN	-55.4483	26.14737	-2.12061	0.0413
JUL	-58.3395	25.95021	-2.24813	0.0312
AUG	-58.3841	25.94681	-2.25015	0.0310
SEP	-51.8406	26.81253	-1.93345	0.0615
OCT	-42.9347	28.43433	-1.50996	0.1403
NOV	-62.8576	43.74078	-1.43705	0.1598
JANHDD	0.1117	0.012885	8.66904	0.0000
FEBHDD	-0.09385	0.066362	-1.41415	0.1664
MARHDD	0.064535	0.019433	3.320803	0.0022
APRHDD	0.113171	0.018829	6.010546	0.0000
MAYHDD	0.152273	0.052492	2.900899	0.0065
JUNHDD	0.028113	0.023201	1.211696	0.2340
SEPHDD	0.019126	0.037609	0.508549	0.6144
OCTHDD	0.064355	0.030576	2.104732	0.0428
NOVHDD	0.1378	0.051811	2.659687	0.0118
DECHDD	0.069052	0.035289	1.956735	0.0586
AR(1)	0.522626	0.151027	3.460488	0.0015

R-squared	0.997276	Mean dependent v	67.68934
Adjusted	0.995513	S.D. dependent va	41.1512
S.E. of reg	2.756525	Akaike info criterion	5.156145
Sum squa	258.3466	Schwarz criterion	5.980534
Log likelih	-123.95	Hannan-Quinn crit	5.476531
F-statistic	565.7463	Durbin-Watson stat	1.666607
Prob(F-st	2.06E-37		

Inverted A 0.52

Equation Variables Key
S23RU = Schedule 23 (residential) Use-per-Customer
JAN, FEB, ... , NOV = Monthly Dummy Variables
JANHDD, FEBHDD, ... , DECHDD = Monthly Total of Heating degree Days with a 65 F cut point
WIN2HDD = [Winter Seasonal Dummy (Oct, Nov, Dec, Jan, Feb, Mar, Apr, May)] * [Monthly Total of Heating Degree Days with a 65 F cut point]
SHLD2HDD = [Shoulder Seasonal Dummy (June, September)] * [Monthly Total of Heating Degree Days with a 65 F cut point]

Gas Schedule 31 Load (Use-per-Customer) Equation

Revised Methodology (Using Seasonal Coefficients)
Dependent Variable: S31CU
Method: Least Squares
Date: 10/20/09 Time: 16:23
Sample: 2004M01 2008M09
Included observations: 57
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	124.910201	6.973428	17.91231	0.0000
JAN	87.039073	28.175	3.089231	0.0036
FEB	51.2705743	23.41331	2.189804	0.0343
MAR	7.93396099	22.69628	0.349571	0.7284
APR	-39.168198	18.24629	-2.14664	0.0378
MAY	-10.7693193	27.05491	-0.39805	0.6927
JUN	20.7505476	5.215507	3.978625	0.0003
AUG	1.16099919	5.214816	0.222635	0.8249
SEP	25.855663	6.785019	3.810699	0.0005
OCT	10.4317297	38.20622	0.273038	0.7862
NOV	7.24571365	24.30156	0.298158	0.7671
DEC	78.4922703	27.8564	2.817746	0.0074
WINHDD	0.41641608	0.035985	11.57198	0.0000
SHLD3HDD	0.27774881	0.092811	2.992612	0.0047
D0502	-46.9679043	10.53566	-4.45799	0.0001
AR(1)	0.70884539	0.111593	6.352044	0.0000

R-squared	0.9960	Mean dependent va	286.0960
Adjusted R-squ	0.9945	S.D. dependent var	146.2833
S.E. of regressi	10.8135	Akaike info criterion	7.8314
Sum squared r	4794.1937	Schwarz criterion	8.404878
Log likelihood	-207.1946	Hannan-Quinn criter	8.054267
F-statistic	680.4776	Durbin-Watson stat	2.221837
Prob(F-statistic	0.0000		

Inverted AR Ro 0.71

2006 GRC Methodology
Dependent Variable: S31CU
Method: Least Squares
Date: 10/20/09 Time: 16:23
Sample: 2004M01 2008M09
Included observations: 57
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	309.85916	104.5378	2.964088	0.0055
JAN	-113.656766	95.3095	-1.1925	0.2413
FEB	252.847562	197.9411	1.277388	0.2101
MAR	-59.5930179	112.4249	-0.53007	0.5995
APR	-206.202073	109.5803	-1.88174	0.0685
MAY	-230.924093	119.7275	-1.92875	0.0621
JUN	-171.405932	105.3497	-1.62702	0.1130
JUL	-184.84901	104.3667	-1.77115	0.0855
AUG	-183.711261	104.3612	-1.76034	0.0873
SEP	-163.046504	107.8758	-1.51143	0.1399
OCT	-151.502507	113.9474	-1.32958	0.1925
NOV	-144.342286	175.4429	-0.82273	0.4164
JANHDD	0.43836166	0.051829	8.457904	0.0000
FEBHDD	-0.21984574	0.26106	-0.84213	0.4056
MARHDD	0.21687187	0.074503	2.910904	0.0063
APRHDD	0.37791128	0.076177	4.960954	0.0000
MAYHDD	0.40312308	0.211054	1.910044	0.0646
JUNHDD	0.04303753	0.089932	0.478554	0.6353
SEPHDD	0.02305908	0.151832	0.151872	0.8802
OCTHDD	0.22114872	0.12126	1.823751	0.0770
NOVHDD	0.36389858	0.205449	1.771239	0.0855
DECHDD	0.27144142	0.14179	1.914393	0.0640
AR(1)	0.80405634	0.106937	7.518948	0.0000

R-squared	0.9957	Mean dependent va	286.0960
Adjusted R-sq	0.9929	S.D. dependent var	146.2833
S.E. of regres	12.3510	Akaike info criterion	8.1557
Sum squared	5186.6155	Schwarz criterion	8.980069
Log likelihood	-209.4369	Hannan-Quinn criter	8.476066
F-statistic	355.5218	Durbin-Watson stat	1.958816
Prob(F-statisti	0.0000		

Inverted AR R 0.8

Equation Variables Key
S31CU = Schedule 31 (commercial) Use-per-Customer
JAN, FEB, ..., NOV = Monthly Dummy Variables
JANHDD, FEBHDD, ..., DECHDD = Monthly Total of Heating degree Days with a 65 F cut point
WINHDD = [Winter Seasonal Dummy (Nov, Dec, Jan, Feb, Mar, Apr)] * [Monthly Total of Heating Degree Days with a 65 F cut point]
SHLD3HDD = [Shoulder Seasonal Dummy (May, October)] * [Monthly Total of Heating Degree Days with a 65 F cut point]