EXHIBIT NO. \_\_\_(DEM-1CT)
DOCKET NO. UE-07\_\_\_
2007 PSE PCORC
WITNESS: DAVID E. MILLS

# BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION,	
Complainant,	
<b>v.</b>	Docket No. UE-07
PUGET SOUND ENERGY, INC.,	
Respondent.	

# PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF DAVID E. MILLS ON BEHALF OF PUGET SOUND ENERGY, INC.

REDACTED VERSION

**MARCH 20, 2007** 

### PUGET SOUND ENERGY, INC.

# PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF DAVID E. MILLS

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#### **PUGET SOUND ENERGY, INC.**

# PREFILED DIRECT TESTIMONY (CONFIDENTIAL) OF DAVID E. MILLS

#### I. INTRODUCTION

- Q. Please state your name, business address, and position with Puget Sound Energy, Inc.
- A. My name is David E. Mills. My business address is 10885 NE Fourth Street

  Bellevue, WA 98004. I am the Director, Power & Gas Supply Operations for Puget

  Sound Energy, Inc. ("PSE" or "the Company").
- Q. Have you prepared an exhibit describing your education, relevant employment experience, and other professional qualifications?
- A. Yes, I have. It is Exhibit No. \_\_\_(DEM-2).

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- Q. What are your duties as Director, Power & Gas Supply Operations for PSE?
- A. My responsibilities include oversight of the Company's Power Supply Operations and Gas Supply Operations Departments, including the following: (i) managing all PSE short-term (intra-month) and medium-term (up to three years) wholesale power and natural gas portfolios; and (ii) working with the Company's Energy Resources Department to plan for long-term hedging requirements. My responsibilities also include developing strategies to address risks related to PSE's electric and gas

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portfolios. Specifically, my focus tends to be more the operational and implementation side of portfolio risk management. In other words, I focus on the wholesale energy market transactions that the Company enters into to implement its hedging strategies and policies.

#### Q. What is the nature of your testimony in this proceeding?

A. My testimony focuses on the risks facing the Company as a result of the electric portfolio.<sup>1</sup> I also address the structures and policies the Company has in place to manage these risks and the manner in which these policies are implemented.

Among other things, I describe the robust hedging program that the Company has in place for its electric portfolio that is based on sound analyses and is reexamined and adjusted, as needed, in response to updated information. In short, the Company strives to further reduce the volatility of energy costs associated with its wholesale market purchases of power and natural gas for generation.

I describe PSE's progress towards revising the existing hedging strategies. The prefiled direct testimony of Mr. Donald E. Gaines, Exhibit No. \_\_\_(DEG-1CT), describes the Company's efforts to establish a separate line of credit to support the Company's hedging activities.

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<sup>&</sup>lt;sup>1</sup> The electric portfolio includes generation facilities, purchased power and transmission capacity. For a further discussion, please see the prefiled direct testimony of Mr. Eric M. Markell, Exhibit No. \_\_\_(EMM-1HCT).

My testimony then describes and presents the Company's projection of rate year power costs for this proceeding, noting changes to PSE's power supply portfolio since Company's 2006 general rate case, Docket No. UE-060266 and UG-060267 (the "2006 GRC"). I explain how key assumptions used in projecting those costs are consistent with the methodologies approved by the Commission, and implemented by the Company, in the 2006 GRC, in the Company's 2004 general rate case, Docket No. UG-040640, *et al.* (the "2004 GRC"), and in the Company's last Power Cost Only Rate Case, Docket No. UE-050870 (the "2005 PCORC").

I also compare the projected rate year power costs in this proceeding to the projected rate year power costs approved in the 2006 GRC. Altogether, PSE's projected rate year net power costs for this case are \$1.047 billion, which is approximately \$112.7 million higher than the power costs used in establishing PSE's Power Cost Adjustment Mechanism ("PCA") Baseline Rate for the 2006 GRC.

# II. PSE'S MANAGEMENT OF POWER AND GAS COST RISKS

#### Q. Is energy risk management a concern to the Company?

A. Yes, absolutely. PSE's resource portfolio is subject to significant volatility and risk that ultimately have a substantial impact on energy costs, which is one of the reasons the Company has dedicated an entire department to energy risk management.

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#### Q. What drives volatility and risk in the power portfolio?

A. PSE's power supply portfolio contains a diverse mix of resources with widely differing operating and cost characteristics. Mr. Eric Markell describes PSE's power supply portfolio in his direct testimony. Although there are many complex variables embedded in the portfolio, the major drivers of power cost volatility are: (1) streamflow variation affecting the supply of hydroelectric generation; (2) weather uncertainty affecting power usage; (3) variations in market conditions such as wholesale gas and electric prices; (4) risk of forced outages; and (5) transmission and transportation constraints. All of these have an impact on load and resource volatility, which PSE balances with wholesale market purchases and sales.

#### Q. Please describe the volatility related to variations in hydroelectric supply.

During an average streamflow year, approximately one-third of PSE's electric A. energy production comes from hydroelectric resources. During poor streamflow conditions, PSE may need to acquire replacement power to serve its customer load. During favorable streamflow conditions, PSE may need to sell surplus power to balance its supply portfolio. These balancing transactions are conducted in the wholesale power markets. Because the market price of power is quite volatile, hydroelectric shortfalls or surpluses can greatly affect PSE's power costs.

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 Q. Please describe the volatility that is related to load and temperature uncertainty.

A. The Pacific Northwest region has a high saturation of electric heating relative to other areas of the country. As a result, the level of PSE's retail electric load is closely related to temperature – meaning that during the winter heating season PSE's load increases as the weather gets colder. In light of the significant electric heating load in PSE's service territory, PSE's cost of load/temperature uncertainty can be significant. While still a winter peaking region, the Pacific Northwest is also experiencing a summer peaking load, such as was experienced on July 24, 2006. This is evidence of a higher saturation of electric air conditioning and presents another example of electric load volatility attributable to temperature.

### Q. Please describe the risks related to market price volatility.

- A. The foregoing volume-related risks affect the amount of PSE's exposure to market prices. PSE also has significant price-related risk associated with the expected volume of its purchases and sales of power in the wholesale markets and its need to purchase or dispose of natural gas in connection with the operation of its gas-fueled generating units.
- Q. Please describe the volatility related to forced outages.
- A. As shown below, PSE relies on nearly 2,400 MW (nameplate) of thermal generating units to help meet its customer loads. These units include approximately

680 MW of large base load coal generators with low variable fuel costs; approximately 1,100 MW of gas combined-cycle combustion turbine co-generators with moderate heat rate conversions; and approximately 600 MW of relatively less-efficient, simple-cycle gas and oil-fired combustion turbine generators.

<b>Thermal Generation Units</b>		
	Capacity	
	(MW)	
Coal	681	
Goldendale	277	
Fredrickson	134	
Encogen	170	
NUGS	523	
Simple Cycle CTs	596	
	2,381	

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Forced outages at any of these units can expose PSE to significant price volatility in its power supply portfolio. Material or equipment failure, fire, electrical disturbances, or other force majeure events typically cause forced outages.

### Q. What risks are related to transmission and transportation constraints?

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A. Pipeline outages, curtailment of transmission rights due to deratings,<sup>2</sup> and forced outages are examples of transmission and/or transportation risk. For example, if power cannot be wheeled<sup>3</sup> from the Mid-Columbia trading hub ("Mid-C"), the Company may dispatch resources that are less economic in order to meet load.

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<sup>&</sup>lt;sup>2</sup> Derating refers to a decrease in the rated electric capability of an electric transmission line.

<sup>&</sup>lt;sup>3</sup> Wheeling means using the transmission facilities of one power system to transmit power of and for another system. This term is often used colloquially to mean transmission.

1 2		maximum amount of commodity exposure allowed under the Company's Energy Hedging and Optimization Procedures.
3		The revised plan requires that on or before months ahead of delivery, the bulk of
4		the hedging strategies and transactions have been made per this programmatic plan
5		Beyond the months prior to delivery, the revised strategy then employs a
6		"Rolling Month Hedging Plan", making the cumulative term a total of
7		months.
8	Q.	Why is the Company planning to make revisions to its existing hedging strategy?
10	A.	These revisions will enable the Company to monitor and more actively address the
11		exposure associated with PSE's power portfolio position months ahead of the
12		time the power would be needed to meet load, thus enabling staff to more actively
13		manage the next rolling months. We are able to expand our hedging strategy
14		with the flexibility allowed by our new line of credit facility discussed in he
15		prefiled direct testimony of Mr. Donald E. Gaines, Exhibit No(DEG-1CT).
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A. OVERVIEW OF PROJECTED POWER COSTS FOR THIS PROCEEDING

Q. Please describe how PSE projected its pro forma net power costs in this filing.

A. Consistent with prior rate cases, PSE developed projected power costs for the rate year, which for this filing is September 1, 2007 through August 31, 2008. These projections are based on the information available to the Company while preparing this case for filing. As discussed by Mr. John Story in his testimony, Exhibit No. \_\_\_(JHS-1T), the resulting rate year forecast power costs were then adjusted to test year levels by multiplying by an adjustment factor. This adjustment factor represents the ratio of weather normalized delivered energy loads for the test year to the rate year. Mr. Story then used that and other data to develop the revenue deficiency for the rate year.

### Q. How did the Company project its power costs for the rate year?

A. As in prior cases, PSE used the AURORA hourly dispatch model to project a portion of its net power costs for the rate year. The AURORA model is a fundamentals-based production cost model that simulates hourly economic dispatch of the Company's generation resource portfolio within the Western Electricity Coordinating Council ("WECC") region. AURORA thereby produces a forecast of the variable operating costs for the Company's generating resources. As described below, the Company's inputs to AURORA for projecting rate year power costs for

this case are consistent with the Commission's power cost determinations in the Company's 2004 and 2006 general rate cases and 2005 PCORC.

Consistent with prior cases, the Company's projected power costs also include costs not calculated within the AURORA model. Costs projected outside of the AURORA model include items such as contract costs for the Mid-C hydroelectric projects, transmission expenses, fixed pipeline charges, amortization of regulatory assets, mark-to-market for fixed-price contracts, fixed coal supply costs, peaking capacity and exchange costs, fixed capacity charges, wind integration and other power supply costs.

#### Q. Were there any changes in the AURORA model?

- A. Yes, EPIS, Inc., the AURORA model's developer, provides periodic software and database updates. The version of AURORA used in this filing includes the most recent updates from EPIS.
- Q. Has the Company used forward market electric prices in determining the rate year power costs?
- A. No. For this proceeding, the Company used the forward electric market prices determined by AURORA. Consistent with the Commission's order in the 2006 GRC, the Company will investigate the possibility of using forward electric market prices to determine power costs and will advise the Commission of its findings on or before the Company's next general rate case.

David E. Mills

David E. Mills

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#### 2. **Natural Gas Prices**

### Q. What natural gas prices did the Company use for the rate year in running its **AURORA** model?

- A. As the Commission noted in the 2006 GRC order, the update for gas costs is "wellestablished" and should be "straightforward, mechanical and non-controversial." See WUTC v. PSE, Docket No. UE-060266 and UG-060267, Order No. 08, ¶104 (Jan. 5, 2007). Consistent with this order, the Company used a three-month average of daily forward market prices for the rate year for each trading day in the threemonth period ending February 27, 2007. These data were input into the AURORA model for each of the months in the rate year. To the extent the Company has fixed-priced contracts in place for power or natural gas for its power portfolio for the rate year, the Company adjusted for those fixed-priced contracts outside of the AURORA model.
- Q. Please explain the fixed-priced contracts adjustment.
- A. The gas price input to AURORA represents a three-month average of the forecast market rate year gas prices at a certain point in time, e.g., February 27, 2007. Given the Company's extensive hedging protocol, which includes a programmatic component that requires a specified amount of hedging be done each month, it is required to reflect the actual fixed priced gas and power rate year contracts the Company has transacted as of that date. This is the correct methodology for reflecting these hedges because forecast rate year power costs consist of two

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components: first, costs related to actual commitments, and second, forecast market costs that are dependent upon the AURORA modeled operational and market fluctuations. This methodology is consistent with the 2005 PCORC (including the second compliance filing to the 2005 PCORC, Docket No. UE-060783) and the 2006 GRC.

- Q. How do projected gas prices for this proceeding compare with the projected gas prices for the 2006 GRC?
- A. Use of a single price can be misleading in that there are different projected gas prices for each month of the rate year and for the different trading hubs from which PSE purchases gas. However, for purposes of comparison, the average price at Sumas (for the three months ended February 27, 2007) for this proceeding's rate year is \$7.57/MMBtu compared to the average rate year price at Sumas of \$7.41/MMBtu (for the three months ended November 30, 2006) for the 2006 GRC.
- Q. Please explain the Company's source of these inputs.
- A. For this proceeding, consistent with the 2006 GRC, the Company made use of forward price data supplied by a third party service for energy and commodity market data known as the Kiodex Global Market Data ("Kiodex"). The Company has contracted with Kiodex for forward market price data for specific gas and power trading points. The Company was able to use the Kiodex forward prices for the rate year at each of the trading hubs that are input into AURORA.

Q. Does PSE intend to update its projected power costs with updated gas price projections?

A. Yes. Because the factors that impact natural gas prices are constantly changing, forward market prices quickly become "stale" and their predictive power with respect to actual future prices decreases. Establishing rate year gas prices based on the average of the forward prices for the rate year for a three-month period of time closer to the beginning of the rate year will provide a more accurate projection of rate year gas prices. Therefore, while PSE used the three-month average of the forward marks ending February 27, 2007, for its direct testimony, it would be appropriate for the Company to adjust its requested rate relief with updated forward market data prior to rates becoming effective.

#### 3. <u>Production Operation and Maintenance</u>

- Q. How has PSE developed its forecast of production operation and maintenance costs in this filing?
- A. In estimating rate year power costs, PSE has made the following adjustments to its test year (calendar year 2006) production operation and maintenance costs:
  - i) Projected the operation and maintenance costs of the Goldendale Generating Station (as discussed in the testimony of Mr. Roger Garratt);
  - ii) Projected the operation and maintenance costs of the Wild Horse and Hopkins Ridge wind projects;

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Q. How does the inclusion of the Goldendale Generating Station as a resource affect projected power costs for the rate year?

A. PSE ran the AURORA model with the same assumptions as for the rate year power costs presented in this case, removing the Goldendale Generating Station. The model showed that, with the forecast generation from Goldendale Generating Station, PSE would need to purchase less market power, or would sell more excess power in the market, than would have been the case without Goldendale. Even so, for the rate year, the inclusion of Goldendale increases power costs by \$10.8 million, with \$9.3 million of this increase due to incremental production operations and maintenance costs. *See* Exhibit No. \_\_\_(DEM-6). However, over the life of this generating asset, the savings related to the acquisition of Goldendale is in excess of \$100 million, as discussed by Mr. Elsea in his prefiled direct testimony, Exhibit No. \_\_\_(WJE-1HCT).

#### V. CONCLUSION

### Q. Please summarize your testimony.

A. PSE is actively managing the power and gas cost risks faced by its customers. The updated hedging strategies, coupled with the new hedging line of credit, will allow the Company to further reduce exposure to power cost risks. Finally, the Company's projection of rate year power costs for this proceeding – although higher than the power costs incorporated in the 2006 GRC Power Cost Baseline Rate – are consistent with and based on sound assumptions using methodologies

A. Yes, it does.

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