EXHIBIT NO. ___(WJE-1HCT)
DOCKET NO. UE-07___/UG-07___
2007 PSE GENERAL RATE CASE
WITNESS: W. JAMES ELSEA

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-07____** **Docket No. UG-07____**

PREFILED DIRECT TESTIMONY (HIGHLY CONFIDENTIAL) OF W. JAMES ELSEA ON BEHALF OF PUGET SOUND ENERGY, INC.

REDACTED VERSION

DECEMBER 3, 2007

PUGET SOUND ENERGY, INC.

PREFILED DIRECT TESTIMONY (HIGHLY CONFIDENTIAL) OF W. JAMES ELSEA

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PUGET SOUND ENERGY, INC.

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I. INTRODUCTION

Q. Please state your name, business address, and position with Puget Sound Energy, Inc.

A. My name is W. James Elsea. My business address is 10885 N.E. Fourth Street Bellevue, WA 98004. I am the Financial Analysis Manager of Energy Resources 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. ___(WJE-2).

Q. What are your duties as Financial Analysis Manager of Energy Resources for PSE?

A. My present responsibilities include oversight of analysis of individual power resources and portfolios of power resources for the Company's Least Cost Plan, Integrated Resource Plan, and resource acquisition processes.

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

A. My testimony describes the modeling tools and quantitative analyses utilized by the Company to evaluate the various resource alternatives presented for cost recovery in this case. In my testimony, I describe the quantitative models, assumptions, and analysis undertaken by the Company in Phases I and II of its 2005 Request for Proposals (the "2005 RFP") to determine the project short list. My testimony further describes the quantitative analysis of the following acquired resources:

(i) a 50 MW power purchase agreement ("PPA") with Klondike Wind Power III, LLC;

(ii) a 150 MW winter on-peak PPA with [redacted] ("[redacted]");

(iii) a 50 MW PPA with [redacted] Brothers;

(iv) a 75 MW/25 MW PPA with Sempra Energy;

(v) the Hopkins Ridge Infill Wind Project, which adds 7.2 MW of additional wind generating capacity to PSE's Hopkins Ridge Wind Project;

(vi) the lease buyout of Whitehorn Units 2 and 3 from Public Service Resources Corporation; and

(vii) the acquisition of the Sumas Cogeneration Station from Sumas Cogeneration Company, LP.

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II. MODELING TOOLS AND 2005 RFP PHASE I & PHASE II QUANTITATIVE ANALYSIS OVERVIEW

A. Overview of the Company's Resource Planning and Acquisition Models

Q. Please describe the Company's quantitative analysis of potential resources.

A. Please see Exhibit No. ___(WJE-3HC) for a description of the Company's modeling tools and process of analyzing resource projects proposals received in response to the Company's 2005 RFP.

Q. What quantitative models did the Company use in evaluating potential resource alternatives?

A. PSE used two quantitative models in evaluating potential resource alternatives: the AURORA model and the Portfolio Screening Model. The AURORA model is a fundamentals-based production costing model that calculates regional wholesale power market prices through simulation of the supply of resources, the demand for power, and transmission constraints. PSE inputs these AURORA prices into the Portfolio Screening Model. The Portfolio Screening Model is a Microsoft Excel-based model, specific to PSE, which allows the Company to evaluate alternative portfolios of existing and new resources to serve load.

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Q. Please describe how the Portfolio Screening Model is used to evaluate resources.

A. The Portfolio Screening Model calculates the Company's incremental portfolio costs of resources required to serve load. Incremental cost includes: (i) the variable fuel cost and emissions for PSE's existing fleet, (ii) the variable cost of fuel emissions and operations and maintenance for new resources, (iii) the fixed depreciation and capital cost of investments in new resources, (iv) the book cost and offsetting market benefit remaining at the end of the 20 year model horizon, and (v) the market purchases or sales in hours when resources are deficient or surplus to PSE's need.

The benefit of a resource to PSE's portfolio is calculated as the difference in the total portfolio cost between (i) Portfolio Screening Model runs using the subject resource or resources under evaluation and (ii) Portfolio Screening Model runs using the mix of generic resources. The base Portfolio Screening Model contains PSE's existing fleet of resources as well as an assumed fleet of generic resources needed to meet the planning standard for energy and capacity. The generic resource mix in the Portfolio Screening Model reflects the low cost scenario from the 2005 Least Cost Plan. When a resource or group of resources is evaluated in the Portfolio Screening Model, that resource or group of resources displaces some or all of the generic resources. Thus, the Portfolio Screening Model compares a resource or group of resources offered in the 2005 RFP was against the low cost Least Cost Plan portfolio.

Q. What are the primary metrics resulting from the Portfolio Screening Model?

A. The key output metrics from the Portfolio Screening Model are:

1. Levelized Cost – The average annual cost per MWh produced during a 20-year period for each project;

2. Portfolio Benefit – The 20-year present value of all portfolio benefits derived from each project in comparison to the 2005 Least Cost Plan generic portfolio;

3. Portfolio Benefit Ratio – The present value of Portfolio Benefit divided by the present value of project revenue requirements; and

4. Ten Worst Trials Cost – The average of the incremental portfolio cost for the 10 worst trial runs amongst 100 total trial runs is used as a metric of risk.

These metrics are described in more detail in Exhibit No. ___(WJE-3HC). From a quantitative perspective, the Company prefers projects with lower levelized costs, higher portfolio benefits, and higher benefit ratios.

B. Overview of Phase I Quantitative Evaluation Process

Q. Please provide a summary of PSE's quantitative evaluation process in Phase I of the 2005 RFP.

A. Please see Exhibit No. ___(WJE-3HC) for a general explanation of PSE's quantitative evaluation process in Phase I of the 2005 RFP. PSE received 48 project proposals in responses to its 2005 RFP in January of 2006 and seven "unsolicited" project proposals outside of the RFP process. In total, PSE evaluated 120 individual resource alternatives with the Portfolio Screening Model

in Phase I of the 2005 RFP resulting in a short list with the top resource offers from each fuel category. The categories included (i) renewable resources, (ii) natural gas resources, (iii) coal resources, (iv) capacity resources, and (v) system PPAs. The Phase I process culminated in the creation of the candidate short list in April of 2006.

Q. What were the results of the Phase I quantitative evaluation of resources?

A. The Phase I evaluation process resulted in the following recommendations for the short list:

- Renewable Resources category included four wind projects, a hydroelectric project, and a geothermal PPA. Please see Exhibit No. ___(WJE-4HC) for the levelized cost, absolute portfolio benefit (or cost), and the benefit ratio for resources in the Renewable Resources category.

- Natural Gas Resources category included four natural gas-fired projects, ranging from ownership to tolling PPAs. Of these natural gas-fired alternatives on the short list, the Goldendale Generating Station had the lowest levelized cost. Please see Exhibit No. ___(WJE-5HC) for the levelized cost, absolute portfolio benefit (or cost), and the benefit ratio for resources in the Natural Gas Resources category.

- Coal Resources category included one PPA and one proposed development in Montana. Please see Exhibit No. ___(WJE-6HC) for the levelized cost, absolute portfolio benefit (or cost), and the benefit ratio for resources in the Coal Resources category.

- Capacity Resources category included only one resource. Please see Exhibit No. ___(WJE-7HC) for the levelized cost, absolute portfolio benefit (or cost), and the benefit ratio for resources in the Capacity Resources category.

- System PPA category included three PPAs. Please see Exhibit No. ___(WJE-8HC) for the levelized cost, absolute portfolio

benefit (or cost), and the benefit ratio for resources in the system PPA category evaluated in the Portfolio Screening Model.

C. Overview of Phase II Quantitative Analysis

Q. Please summarize the Phase II quantitative analysis.

A. The Phase II quantitative analysis evaluated the 16 projects from the revised short list and seven portfolios of resource combinations. As discussed in more detail in Exhibit No. ___(WJE-3HC), the Phase II analysis was done using four different pricing scenarios in both (i) the static, point price forecast mode and (ii) a dynamic, Monte Carlo simulation of price hydro and wind variability mode. Please see Exhibit No. ___(RG-7HC) for a general explanation of the 2005 RFP Phase II analysis. Please see Exhibit No. ___(WJE-9HC) for a scatter-plot graph showing the portfolio benefit and portfolio benefit ratio for each of the short listed projects for each of the four scenarios. A redacted version of the same graph, indicating the results for the [redacted] PPA, the Klondike III Wind PPA and Goldendale Generation Station is shown below.

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A. The portfolio benefit axis represents the 20-year present value of all portfolio benefits derived from each project in comparison to the 2005 Least Cost Plan generic portfolio. The portfolio benefit ratio axis represents the present value of portfolio benefit divided by the present value of project revenue requirements. In general, PSE prefers projects that both provide significant portfolio benefits and are cost effective in delivery of those benefits.

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Q. What conclusions do you draw from the scatter-plot graph?

A. Based upon the metrics of portfolio benefit and portfolio benefit ratio for all price scenarios, the best resources were gas, wind and PPAs. Of the PPAs, the fixed price winter on-peak [redacted] PPA had the highest portfolio ratio. Of the wind resources, the Klondike III Wind PPA had the highest portfolio benefit and benefit ratio. The Goldendale Generating Station had the highest portfolio benefit of any of the resources tested in Phase II.

Other more general conclusions are that each project had a range of outcomes. Based on the price scenario, some types of projects have more variability in projected outcomes than others. For example, the results for coal vary widely because coal projects do not perform as well in the Low Gas Price and Green World scenarios as they do in the Current Trends scenario. Another type of project with wide variability was hydroelectric projects. In the Green World scenario, hydroelectric projects perform well and contribute portfolio benefit and a high benefit ratio. In a Low Gas Price scenario, however, the relatively high fixed price of hydroelectric projects does not perform as well.

Q. How do the short list projects compare on a levelized cost basis?

A. Please see Exhibit No. ___(WJE-10HC) for the levelized cost of the short list resources. The Goldendale Generating Station has the lowest cost of the four-gas fired resources. The Klondike III Wind PPA has the second lowest overall levelized cost, and the [redacted] PPA has a levelized cost just above Goldendale's

levelized cost. The higher levelized cost of the [redacted] PPA reflects the market pricing for power deliveries during heavy load hours December through February.

III. MODEL UPDATE OF AUGUST 2006-- SUBSEQUENT TO PHASE II ANALYSIS OF THE 2005 RFP

Q. Please explain the model update made in August 2006.

A. The Company periodically updates the gas price input in its AURORA price forecast. In August 2006, the Company received a new Global Insight Reference Price Forecast that was an update to the prior gas price forecast, dated December 2005, used in the 2005 RFP. The August update of market prices in the first five years was based on a three-month average from May 26, 2006 through August 25, 2006.[1]

In addition to the gas price update, PSE received a new release of AURORA in July 2006. In AURORAxmp v8.2, EPIS added a feature to build to zone and pool reserve margins. In early September 2006, PSE started including a zone reserve margin of 15% in its runs. This new release of AURORA also included a new database, North American DB 2006.01. The reduction in annual market heat rates occurred with the introduction of the new database and reserve margins.

[1] For the first five years of the forecast (e.g., calendar years 2007 through 2011 in this proceeding), the Company uses a three-month average of Kiodex forward prices.

Please see Exhibit No. ___(WJE-11C) for a comparison of the power and gas prices in the August price update with power and gas prices from the 2005 RFP Phase II analysis.

Q. How did these updated prices affect the Portfolio Screening Model metrics?

A. Compared with the four price scenarios from Phase II of the 2005 RFP, the updated gas prices in August 2006 resulted in somewhat lower absolute portfolio benefits, but the short listed projects stayed in relative quantitative ranking, with the Goldendale Generating Station showing the highest portfolio benefit and [redacted] PPA showing the highest portfolio benefit ratio.

In addition to making changes in power and gas prices, the quantitative team also updates project terms such as capacity and price. The scatter-plot graph below, supported by Exhibit No. ___(WJE-12HC), reflects the projects with terms and pricing as of March 2007. For example, one change in terms is that the Klondike III Wind PPA shown in the scatter-plot graph below reflects the updated final PPA capacity of 50 MW rather than the original 2005 RFP proposal of approximately 226 MW.

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Q. Please interpret the portfolio benefit and portfolio benefit ratio results that are shown on the plot above.

A. The portfolio benefit axis represents the 20-year present value of all portfolio benefits derived from each project in comparison to the 2005 Least Cost Plan (the "2005 LCP"). The [redacted] PPA for 150 MW on peak and the Klondike III Wind PPA for 50 MW each produces about $20 million of portfolio benefit compared with the generic resources from the 2005 LCP. In addition, these PPAs also have the highest portfolio benefit ratio, which is defined as the portfolio benefit for a project divided by the total present value of revenue requirements for that project.

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Q. Please explain why PSE did not follow through with the 15 year tolling PPA that is shown on the above scatter-plot graph.

A. The project for a 15-year tolling beginning in 2012 is a gas-fired generation PPA with a contract heat rate less efficient than the Sumas Cogeneration Station. The overall levelized cost, including the fixed tolling, fuel, start-up, emission costs, and variable charge for O&M, results in a levelized unit cost of over $[redacted]/MWh. While that is competitive as a capacity resource, it is not competitive with the alternative energy resource on the 2005 RFP short list. The following scatter-plot graph, similar to the one above in that it uses terms and pricing as of March 2007, shows the levelized cost of the 2005 RFP short list projects, plus the Sumas Cogeneration Station.

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Q. Did the Company make any additional changes to the Portfolio Screening Model subsequent to the August 2006 Update?

A. Yes. For the 2007 Integrated Resource Plan ("IRP"), the Company used AURORAxmp (v. 8.3), which EPIS released in 2006. This was an updated version from AURORAxmp v. 8.2 that the Company used in the August 2006 update. For the 2007 IRP, PSE used a combination of forward market prices and fundamental forecasts from Global Insight as fuel input assumptions to AURORA. PSE used a 3-month average (August 1, 2006 to October 31, 2006) of natural gas prices based on (i) forward price marks through 2011 and (ii) Global Insight Reference case, dated November 2006, for calendar years 2012 through 2027. The Company used the resulting power prices from this AURORA update in Portfolio Screening Model ("PSM") 9-9-2.

Q. How did the power and gas prices in the PSM 9-9-2 compare with the PSM August update?

A. The gas and power prices in PSM 9-9-2 were generally lower than the prices in the August 2006 update. On a 20-year levelized basis, gas prices are $7.80 per MMBTU, lower by $.40 per MMBtu, and average MidC power prices are $63.20, lower by $2.10 per MWh. On a relative basis, gas prices dropped more than power prices, resulting in a forecast of heat rates in PSM 9-9-2 that is higher than in the August 2006 update. Please see Exhibit No. ___(WJE-13C) for comparison charts of gas prices, power prices, and resulting heat rates.

IV. QUANTITATIVE EVALUATION OF RESOURCES

A. [redacted] PPA

Q. Did PSE perform additional analysis of the [redacted] PPA, other than the analysis described above?

A. Yes. As discussed in the prefiled direct testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT), the price for the [redacted] PPA offer changed with changing market conditions. In addition to the change in pricing, the PPA start date was delayed to December of 2008 to accommodate the fact that PSE's programmatic hedging had already filled the Company's energy needs for the winter of November 2007 through February 2008.

Because the pricing and term had changed from the original offer, PSE solicited bids from two market counterparties and used these to compare with [redacted] PPA to ensure that the current offer was beneficial to customers. PSE re-ran the Portfolio Screening Model for the [redacted] update and the two market alternatives.

The market comparison done on May 1, 2007 showed that the [redacted] PPA was less than $[redacted] per MWh, including imputed debt, and less costly than other market alternatives. Please see Exhibit No. ___(RG-18HC) for presentations to the Energy Management Committee ("EMC") regarding the results of the analyses. Please also see Exhibit No. ___(WJE-14HC) for the email approval of the EMC of the [redacted] PPA.

May 1 Market Comparison

Counterparty	Levelized Cost delivered to PSE	Portfolio Benefit	Portfolio Benefit Ratio
[redacted]	$[redacted]/MWh	$11.9 million	0.245
Citigroup	$[redacted]/MWh	$11.2 million	0.229
[redacted]	$[redacted]/MWh	$10.4 million	0.209

B. Klondike III Wind PPA

Q. Did the Company update the analysis of the Klondike III Wind PPA for changes in the PPA price?

A. No. The Klondike III Wind PPA pricing was constant over the period of negotiations. However, during the period of analysis and negotiations, the size of the Klondike III Wind PPA offer was reduced to 50 MW, less than 25% of the entire output of the Klondike III Wind Project. The reduction resulted from increased demand for, and market pressure on, renewable generation, as further described in the prefiled direct testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT).

Portfolio Screening Model version 8-4 with the August 2006 gas price update reflected this capacity reduction. Even with the size reduction, the portfolio benefit of the Klondike III Wind PPA was approximately $22 million present value over the 20-year study horizon. *See* Exhibit No. ___(WJE-12HC). The quantitative analysis of the Klondike III PPA performed in Portfolio Screening Model version 8-4 served as the quantitative basis of the presentation to the EMC

on March 15, 2007, and ultimate approval at the EMC meeting on April 30, 2007. *See* Exhibit No. ___(RG-11HC).

Q. Did the Company perform any additional quantitative analysis of the Klondike III PPA?

A. Yes. The Company updated the Portfolio Screening Model from version 8-4, which reflects the August 2006 gas price update, to version 9-9-2, which reflects the power and gas prices from the 2007 IRP.[2] Please see Exhibit No. ___(WJE-15) for a list of edits and improvements to the Portfolio Screening Model.

Q. What were the quantitative results for the Klondike III Wind PPA using the updated PSM 9-9-2?

A. The following table presents the portfolio benefit, benefit ratio and levelized cost of the Klondike III Wind PPA for the August 2006 Update and for Portfolio Screening Model version 9-9-2.

	PSM 8-4 Aug 2006 Update	**PSM 9-9-2 2007 IRP update**
Portfolio Benefit $mm	$22.8	$21.7
Portfolio Benefit Ratio	.2068	.1751
Levelized Cost $/MWh	$[redacted]	$[redacted]

[2] In addition, the Company continues to refine the Portfolio Screening Model with improvements to reflect the calculation of renewable energy necessary to meet the Washington State renewable portfolio standard, improve output formatting, and other improvements related to calculation of end effects. The Company is currently using PSM version 10-2 and working on version number 10-3 in preparation for the upcoming 2008 RFP. The Company uses these interim Portfolio Screening Models to evaluate energy opportunities that are in various stages of development, prior to receipt of offers responding to the PSE's 2008 RFP.

The data in the table above indicate that the portfolio benefit and benefit ratio of the Klondike III Wind PPA are slightly lower for the Portfolio Screening Model version 9-9-2. When compared with other renewable projects in various stages of development, the Klondike III Wind PPA continues to have favorable portfolio benefits.

C. Acquisition of Whitehorn Generating Station Units 2 and 3

Q. Was the proposed purchase of Units 2 and 3 of the Whitehorn Generating Station submitted in response to the 2005 RFP?

A. No. In November 2003, the owners of the Whitehorn plant made an offer to sell the generating units to PSE and cancel the lease.

Q. What did the quantitative analysis indicate about this 2003 offer to sell?

A. PSE analyzed the 2003 offer by comparing (i) an option of continuing the lease and deferring purchase until February 2009 and (ii) an option of purchasing the plant in December 2003. The analysis completed in 2003 showed that the present value of revenue requirements for continuing the lease and deferring the purchase were about $2 million less than the present value revenue requirements for a 2003 plant purchase. Additionally, the revenue requirement costs in the first five years through 2009 were significantly lower under the lease and defer option. For these reasons, PSE declined the 2003 purchase offer and elected to continue with the lease through 2009. Please see Exhibit No. ___(WJE-16C) for a copy of the Company's 2003 analysis of the option to purchase the Whitehorn units.

Q. Did PSE receive another offer to sell the Whitehorn units?

A. Yes. In April 2006, PSE received a letter of intent from the owner trustee, Public Services Resources Corporation ("PSRC"), which contained an offer to cancel the lease and sell the Whitehorn units to PSE for $[redacted] with a closing date of August 2, 2006.

Q. How did the Company approach the quantitative analysis of this offer?

A. To evaluate this offer, PSE looked at several alternatives that included:

- Alternative A: Purchase the plant for $[redacted] million in August 2006 based on the April 2006 PSRC offer to cancel the lease and sell the units;
- Alternative B: Comply with the lease terms through February 2, 2009, including General Electric recommended maintenance plus rewind, then replace capacity for the time period of February 2009 through December 2016;
- Alternative C: Comply with the lease terms through February 2, 2009 (similar to Alternative B but excludes generator rewind);
- Alternative D: Purchase the plant at the negotiated purchase price of $[redacted] million, with a closing in February 2009;
- Alternative D-2: Purchase the plant at the end of the lease for $16.15 million, based on PSE's counteroffer of June 12, 2006; and
- Alternative E: Purchase the plant in August 2007 for $25.06 million with an early lease termination.

Please see Exhibit No. ___(WJE-17HC) for the report on the Whitehorn Generating Station provided to the EMC on September 8, 2006, and Exhibit No. ___(WJE-18HC) for the presentation to the EMC.

Q. What models did the Company use to analyze these alternatives?

A. PSE used two models to evaluate the alternatives. The first model was an MS Excel-based resource cost model called Project Analyzer. The Project Analyzer model produces a cost comparison of each alternative by calculating the revenue requirements of each. The second model was PSE's Portfolio Screening Model, which the Company used to evaluate the four lowest cost alternatives of the six alternatives as determined by the Project Analyzer model. *See* Exhibit No. ___(WJE-17HC) and Exhibit No. ___(WJE-18HC).

Q. What was the result of this analysis?

A. The analysis indicates that purchase of Whitehorn Units 2 and 3 at the end of the lease term has a lower cost than complying with the lease and purchasing alternative capacity when the lease term ends. Purchasing at the end of the lease in February 2009 is preferred because the current lease is cost effective, confirming the conclusions from the 2003 analysis. *See* Exhibit No. ___(WJE-17HC) and Exhibit No. ___(WJE-18HC).

	Alternatives:	**PV Revenue Requirement 2006-2016 $000**
Alt. A	April 2006, PSRC offer to cancel lease and sell units for $26.85 million in August 2006	$ 39,570
Alt. B	Comply with Lease Terms through Feb 2, 2009, including GE maintenance & rewind, then replace capacity 2/2009-12/2016	$ 45,953
Alt. C	Comply with Lease Terms through Feb 2, 2009, like Alternative B but excluding generator rewind,	$ 39,576
Alt. D	**Negotiated purchase price of $22.650 million closing February 2009 (at end of lease)**	**$ 37,216**
Alt D-2	PSE counter offer June 12, 2006, to purchase plant at end of lease for $16.15 million	$ 30,681
Alt. E	Purchase plant in August 2007 for $25.06 million with early lease termination	$ 42,240

Q. Was the Whitehorn purchase compared with any of the capacity offers received in response to the 2005 RFP?

A. Yes. In addition to the cost and portfolio analysis discussed above, the Company compared several Whitehorn alternatives with capacity bids received in response to the 2005 RFP. The alternatives to purchase Whitehorn compare favorably on a cost basis to the capacity offers received in response to the 2005 RFP, as displayed in the following scatter plot of portfolio benefit.[3]

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A. Purchase of the Whitehorn Generating Station in February 2009 for $[redacted] million is the lowest resource cost through 2016 and the lowest portfolio

[3] The portfolio benefit or (cost) is the difference between the 20-year present value of the portfolio cost without Whitehorn and the same measure of portfolio cost with Whitehorn.

cost, levelized over 20 years, for dealing with the disposition of this plant at the end of the lease. Additionally, the acquisition in 2009 is a lower cost, on a 20-year portfolio basis, than the capacity bids received in response to the 2005 RFP.

D. <u>Market PPAs for 2009-2013</u>

Q. Why were market PPAs acquired for the period January 2009 through March 2013.

A. As discussed in the prefiled direct testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT), Sumas Cogeneration Company LP ("SCCLP") sent notice that it intended to breach its PPA with PSE. PSE acquired two market priced PPAs to replace the fixed price energy from January 2009 through March 2013. As part of the process to replace that energy, PSE staff solicited counterparties for replacement power for up to 125 MW based on PSE's power position between 2009 and the first quarter of 2013.

As described in the prefiled direct testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT), the Company acquired

(i) one PPA of 50 MW flat and

(ii) a second PPA of 75 MW flat for the months July through March (Q1, Q3 and Q4) and 25 MW for the months April through June (Q2).

The net energy was 125 MW (50 MW + 75 MW) in the first, third, and fourth quarters of each year and 75 MW (50 MW + 25 MW) in the second quarter of each year during this period.

Q. Please explain why the Company purchased 75 MW for the second quarter and 125 MW for the remainder of each year.

A. The Company acquired 75 MW for the second quarter and 125 MW for the remainder of each year because such amounts were substantially similar to the historical generation from the Sumas Cogeneration Station, as shown in the following table.

	Q1	Q2	Q3	Q4
1994-2005 aMW	112	69	115	120
PPAs 2009 - 2013	125	75	125	125

PSE's quantitative analysis team also evaluated various levels of PPA replacement to minimize risk of higher power costs than the SCCLP PPA. The following histogram graph shows that the purchase of 75 MW in the second quarter of a calendar year minimized incremental risk of higher power costs when compared with the original SCCLP PPA.

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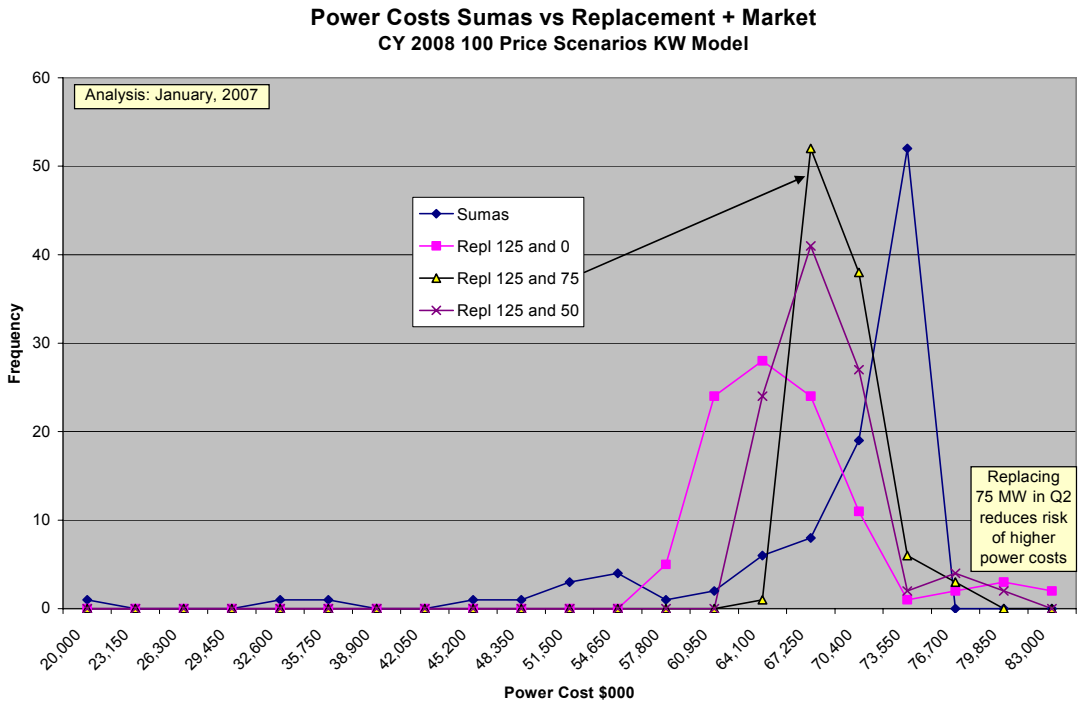

Q. Please explain the quantitative analysis of the two market PPAs purchased for the period January 2009 through March 2013.

A. As explained in the prefiled direct testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT), PSE held four informal solicitations to procure the necessary replacement power up to 125 MW. PSE selected the lowest cost offer from the first round of bidding, an offer of 50 MW flat at $[redacted]/MWh. This offer was lower than the next closest offer by $0.97 per MWh.

In the fourth round of bidding, PSE purchased the remaining quantities of 75 MW for first, second and fourth quarters of each year and 25 MW for the second quarter of each year at a flat price of $[redacted]/MWh. This offer was $0.16 per MWh lower than the next best offer.

In each round of bidding, PSE compared the offers with the forward prices obtained from Kiodex that are used in the Company risk controls. Please see Exhibit No. ___(WJE-19HC) for a summary comparison of replacement energy offers from round one and round four of the bidding.

E. Hopkins Ridge Wind Infill Project

Q. Please explain the quantitative analysis of the Hopkins Ridge Wind Infill Project.

A. As explained in the prefiled direct testimony of Mr. Roger Garratt, Exhibit No. ___(RG-1HCT), the Company is installing an additional four wind turbines within the Company's existing Hopkins Ridge Wind Project. The Company's quantitative analysis is similar to the quantitative analysis performed for the short listed projects resulting from the 2005 RFP. Please see Exhibit No. ___(RG-25HC) at 6 for a scatter-plot graph that displays the Hopkins Ridge Wind Infill Project's portfolio benefit of approximately $5 million and its benefit ratio of 0.355. Compared with a generic wind project of 7.2 MW, the Hopkins Ridge Wind Infill Project provides about $5 million of portfolio benefit over 20 years, and that benefit is 35.5% of the total cost of the project. (Please note that these metrics reflect the transmission limit of 150 MW.)

Q. How was the transmission constraint of 150 MW factored into the analysis?

A. The infill addition of 7.2 MW to the existing Hopkins Ridge Wind Project of 149.4 MW results in a new total project capacity of 156.6 MW. Using actual

hourly generation data from [January through May 2006], the Company analyzed the amount of time that the generation from the four additional turbines would exceed transmission constraints. Taking line restrictions and the frequency of project output exceeding 150 MW into account, PSE anticipates the actual capacity factor will be reduced to [redacted]% from the expected capacity factor of the four additional turbines of [redacted]%.

PSE ran the Portfolio Screening Model with the lower expected capacity. The model assumes that the wind generation in excess of 150 MW is "spilled" and is not brought to load or sold. The analysis conservatively assumes that no additional transmission is available throughout the 20-year study horizon. However, additional firm transmission capacity may be available when BPA completes the West of McNary system upgrades.

Q. Were there other modeling constraints for the Hopkins Ridge Wind Infill Project?

A. Yes. The use of renewable production tax credits ("PTC") is limited by the Internal Revenue Service to a portion of the current tax liability of a company. With two existing wind projects earning PTCs, PSE has a limited ability to use these tax credits; however, PTCs can be used on a 20-year carry forward basis to reduce tax payments in the future. For modeling purposes, PSE generally assumes that future investments in renewable projects will be financed with a tax

investor partner and that partnership will effectively reduce the net benefits from PTCs by approximately 14%--or about $3.35/MWh levelized over 20 years.

However, the Hopkins Ridge Wind Infill Project is not a candidate for a tax investor because it is located within a wind farm wholly owned by PSE. Thus, the Company assumed that PSE would exceed its tax credits, which would then be carried forward. PSE estimated the carrying cost of this PTC deferral at about $7.30/MWh.

Q. Please summarize the quantitative analysis of the Hopkins Ridge Wind Infill Project.

A. Using the Portfolio Screening Model version 8-4 with the August 2006 updated prices, the Hopkins Ridge Infill Wind Project provides a present value $5 million of portfolio benefit over 20 years. The levelized cost of approximately $[redacted]/MWh is competitive with (and over $3/MWh less than) the $[redacted]/MWh levelized cost of the Klondike PPA.

F. Acquisition of the Sumas Cogeneration Station

Q. [redacted]

[redacted]**?**

A. [redacted]

[redacted]

Q. [redacted]

A. [redacted]

Q. [redacted]

A. [redacted]

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[redacted]

Q. [redacted]

[redacted]

A. [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Q. [redacted]

[redacted]

A. [redacted]

[redacted]

[redacted]

Q. [redacted]

A. [redacted]

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REDACTED

Q. [redacted]

A. [redacted]

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Q. [redacted]

A. [redacted]

Q. [redacted]

A. [redacted]

[redacted]

[redacted]

/////

Q. [redacted]

[redacted]

A. [redacted]

PSM 10-2			
Resource Name	Benefit Ratio	Benefit $000	Levelized $/MWh
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

[redacted]

[redacted]

[redacted]

/////

[redacted]

V. CONCLUSION

Q. Please summarize your conclusions.

A. For the 2005 RFP, PSE evaluated approximately 120 different resource alternatives that included unsolicited proposals and offers from the 2005 RFP. Cost and portfolio benefit measures helped screen these proposals down to 16 projects on the short list. PSE evaluated the short list projects and portfolio combinations (i) in four different price scenarios and (ii) using a Monte Carlo simulation testing power price, gas price, hydro and wind variability.

All projects on the short list lowered PSE's portfolio cost relative to the combination of generic resources that were determined in the 2005 LCP to be the

low cost portfolio. PSE acquired the [redacted] PPA and the Klondike III Wind PPA as a result of the 2005 RFP process.

PSE evaluated the purchase of Whitehorn Generating Station Units 2 and 3 at the end of the lease term in February 2009 by comparing such purchase to the capacity resource proposals submitted in the 2005 RFP. The acquisition of Whitehorn Generating Station Units 2 and 3 was the lowest cost capacity option.

PSE acquired the [redacted] and Sempra PPAs to replace the fixed price energy that PSE had been purchasing pursuant to the now terminated SCCLP PPA. The [redacted] and Sempra PPAs were the lowest cost alternatives resulting from four rounds of competitive bids for replacement power.

The Hopkins Ridge Wind Infill Project was a low cost opportunity to add to PSE's renewable resource base.

[redacted]

Q. Does that conclude your testimony?

A. Yes, it does.