EXHIBIT NO. ___(RG-6HC)
DOCKET NO. UE-06___/UG-06___
2006 PSE GENERAL RATE CASE
WITNESS: ROGER GARRATT

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY, INC.,** **Respondent.**	**Docket No. UE-06____** **Docket No. UG-06____**

FIFTH EXHIBIT (HIGHLY CONFIDENTIAL) TO THE PREFILED DIRECT TESTIMONY (HIGHLY CONFIDENTIAL) OF ROGER GARRATT ON BEHALF OF PUGET SOUND ENERGY, INC.

REDACTED VERSION

FEBRUARY 15, 2006

PUGET SOUND ENERGY, INC.

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I. INTRODUCTION TO THIS EXHIBIT

Q. What is the purpose of this exhibit to your prefiled direct testimony?

A. This exhibit to my prefiled direct testimony describes the modeling tools and analyses the Company utilized to evaluate the various resource alternatives that were proposed in response to its 2004 Requests for Proposals ("RFPs") process for additional power resources. That 2004 RFP process led to the acquisition of the Hopkins Ridge Wind Project, the prudence of which was approved in PSE's 2005 Power Cost Only Rate Case, Docket Number UE-050870 ("2005 PCORC"). It also led to the selection and acquisition of the Wild Horse Wind Project and ORMAT PPA that are presented for recovery and prudence determination in this proceeding.

Q. What is the purpose of this exhibit to your prefiled direct testimony?

A. This exhibit to my prefiled direct testimony describes how the Company evaluated the many different resource alternatives that were proposed in response to the requests for proposals for additional power resources that the Company issued in 2004 under the Commission's WAC Chapter 480-107 competitive

bidding rules (the "2004 RFP Process"). That 2004 RFP Process led to the acquisition of the Hopkins Ridge Wind Project, the prudence of which was approved in PSE's 2005 Power Cost Only Rate Case, Docket Number UE-050870 ("2005 PCORC"). It also led to the selection and acquisition of the Wild Horse Wind Project and ORMAT purchased power agreement that are presented for recovery and prudence determination in this proceeding.

Because the Company's 2004 RFP Process has already been extensively described to the Commission and other stakeholders in the context of the 2005 PCORC, the Company wanted to avoid burdening my prefiled direct testimony with the same materials that were presented in the 2005 PCORC. Thus, my direct testimony in this case focuses instead on the additional evaluation that the Company completed after the Hopkins Ridge acquisition and the Company's 2005 PCORC filing. PSE is providing the following materials about earlier stages of the 2004 RFP Process as an exhibit to my testimony to complete the record in this case.

II. PSE'S 2004 RFP PROCESS

A. Overview

Q. How did the Company approach its evaluation of acquiring potential resources to meet its need?

A. The Company evaluated the proposals submitted in response to its 2004 requests for proposals for wind generating resources ("Wind RFP") and for all generating

resources ("All-Source RFP") based on both qualitative and quantitative factors that the Company believed should be considered in deciding whether to acquire a potential resource. The RFP proposals were evaluated in two stages.

The short list of projects that best met the criteria during Stage One of the process advanced to Stage Two, where they were subjected to additional analyses and due diligence. The Company also evaluated a potential self-build option. In Stage Two of the process, the Company identified a slate of projects that it would seek to acquire by reaching definitive agreements through additional negotiations and due diligence.

Q. How did the Company approach evaluation of responses to its Wind RFP versus its All-Source RFP?

A. PSE received the responses to its Wind RFP first, in January 2004, well before it received responses to the All-Source RFP on March 12, 2004. Thus, the Company's initial evaluation efforts focused on the responses to the Wind RFP. PSE identified a short list through its Stage One analysis and proceeded into Stage Two evaluation of the wind projects. *See* Exhibit No. ___(RG-7HC); Exhibit No. ___(RG-8HC) at 6; Exhibit No. ___(EMM-9HC) at 51-72; Exhibit No. ___(EMM-10HC) at 12-22.

However, all of the short-listed projects from Stage One of the Wind RFP evaluation process were resubmitted in response to the All-Source RFP, some with revisions. In addition, all but two of the respondents to the Wind RFP that

did not make the Wind Stage One shortlist resubmitted their proposals in response to the All-Source RFP. Thus, the Company merged the two evaluation processes into a single combined evaluation effort at the time it selected the short list of proposals to take into Stage Two of the All-Source RFP evaluation. *See* Exhibit No. ___(RG-9HC) at 5; Exhibit No. ___(RG-10HC) at 2-3.

For these reasons, the discussion below focuses on the Company's evaluation of the responses to the All-Source RFP. However, some of the analysis with respect to wind power projects was undertaken prior to the time the Company received responses to its All-Source RFP.

Q. What processes did the Company put in place to organize and document its efforts?

A. Company staff responsible for this evaluation worked almost continuously on the evaluation process from the time responses to the Wind RFP were submitted in January 2004 until the Wild Horse Project acquisition was finalized. Personnel involved in the evaluation met weekly to review and document progress and to discuss any issues or questions that had arisen. In addition to its own staff, PSE used outside consulting firms to evaluate the technical and environmental attributes of the proposals.

During the course of the evaluation process, Energy Resources staff periodically updated the Company's officers and the Commission Staff on the status of the evaluation and any preliminary conclusions. The exhibits to my testimony

include PowerPoint slides documenting several such presentations. The Company's management, in turn, regularly apprised PSE's Board of Directors of the status of the evaluation process. *See* Exhibit No. ___(EMM-9HC) through Exhibit No. ___(EMM-13HC).

The Company's evaluation process and conclusions reached at various stages of its analysis are further explained below, and were documented in reports prepared during the course of the evaluation. *See* Exhibit No. ___(RG-7HC) (March 26, 2004 Wind RFP Stage 2 Evaluation Process & Review); Exhibit No. ___(RG-9HC) (May 13, 2004 All-Source RFP Stage 1 Evaluation Process & Review); and Exhibit No. ___(EMM-9HC) at 74-92 (Dec. 2004 All-Source RFP Evaluation Stages One and Two).

B. Stage One of the RFP Evaluation

1. The Proposals

Q. What proposals did the Company evaluate in Stage One?

A. In response to the All-Source RFP, PSE received 47 unique proposals from 39 different owners/developers. Many of the proposals contained multiple options such as power purchase agreements ("PPAs"), asset ownership, and a combination of a PPA and a partial ownership. Considering all the options offered under each proposal, the Company had to evaluate more than 80 different proposals. With respect to fuel source, 38% of the proposals were for natural gas

fired facilities, 28% were for wind, 9% each for hydro and coal, and the rest were for biomass, geothermal, recovered heat, or were PPAs that did not specify a fuel source. *See* Exhibit No. ___(RG-9HC) at 3; Exhibit No. ___(RG-10HC) at 4-7.

2. <u>The Criteria</u>

Q. What criteria did the Company apply during Stage One of the evaluation process?

A. During Stage One, PSE applied the following general criteria to the proposals:

- Compatibility with PSE Resource Need;
- Cost Minimization;
- Risk Management;
- Public Benefits; and
- Strategic and Financial concerns.

These criteria are described in greater detail below, as well as in Exhibit No. ___(EMM-9HC) at 96-99; s*ee also* Exhibit No. ___(RG-11HC) at 7-13.

Q. What considerations were included under the "Compatibility with Need" criterion?

A. This criterion focused on the Company's interest in meeting its long-term energy need while reducing the risk of excess capacity. The Company was interested in projects that would come on line sooner rather than later because of its ongoing

exposure to wholesale market risks. Because the Company's loads are much higher in winter than in summer months, as described in Mr. Markell's testimony, the Company was very interested in resources that were or could be shaped to balance the seasonality of its loads. The Company also considered its need to diversify its portfolio, pursuant to the conclusions of its 2003 Least Cost Plan.

Q. What considerations were included under the "Cost Minimization" criterion?

A. The Company sought to identify the lowest cost alternatives that would meet its energy and capacity needs, looking not only at prices that might be stated in proposals but at other factors that would ultimately impact the cost of the resource. Examples of such costs include the costs of transmission upgrades and load balancing.

Q. What considerations were included under the "Risk Management" criterion?

A. The Company considered many risks, particularly those that could threaten the feasibility of a project or the timing of completion. Such risks included environmental and permitting risks. The Company also evaluated risks associated with whether a potential counterparty would actually be able to perform its obligations related to a project proposal. Other considerations included the desirability of long-term flexibility in order to better respond to future changes in

the industry or PSE's portfolio. An example of such flexibility might be a provision in a long-term power purchase agreement that gave PSE the option to purchase the underlying asset for a specified price (or scheduled set of prices) in the future.

Q. What considerations were included under the "Public Benefits" criterion?

A. The Company considered whether projects would contribute to regional energy adequacy and contribute to environmental and efficiency interests such as reducing portfolio emission levels. Community impacts were also considered. For example, projects with low environmental impacts would evaluate well under this criterion, whereas projects with greater environmental impacts would not. Likewise, projects with community support would evaluate better than those with community opposition.

Q. What considerations were included under the "Strategic & Financial" criterion?

A. These considerations included potential exposure to future environmental regulations or to future legislative determinations that might effectively strand an asset by making it uneconomic to continue to operate. They also included balance sheet impacts and potential degradation of the Company's credit quality or ability to fund ongoing operations due to factors such as credit support requirements and imputed debt.

3. PSE's Initial Screening and Application of the Criteria

Q. How did the Company apply these criteria?

A. The Company first screened the 47 proposals to identify any that appeared clearly unsatisfactory because the project lacked viability. Several proposals were identified as clearly not feasible for a variety of reasons. PSE initially moved 17 such projects to a "constrained list". PSE later removed two projects from the constrained list due to improved transmission conditions so that they could be further considered. PSE sent two other such projects – involving short-term opportunities -- to the Energy Risk Management Department for consideration.

The Company then performed technical analyses using the Company's Acquisition Screening Model, as explained in Mr. W. James Elsea's Exhibit No. ___(WJE-8HC). Information from the Acquisition Screening Model was used to develop a cost ranking for each individual resource proposal. *See* Exhibit No. ___(RG-9HC) at 7-9; Exhibit No. ___(RG-10HC) at 10-16; Exhibit No. ___(RG-11HC) at 18-25.

Q. Did the Company do anything in addition to this initial Acquisition Screening Model screening?

A. The Company also conducted an extensive evaluation of qualitative factors related to its evaluation criteria. Such factors included availability and potential problems regarding fuel supply and transmission. The Company also evaluated

whether the bidders' projections regarding their proposal appeared to be realistic, as the Company had concerns regarding the likely ability of bidders to actually deliver what they proposed. Subject matter experts within the Company were assigned to closely review various project proposals or aspects of proposals with which they had expertise and then provide their proposed rating based on that review. *See* Exhibit No. ___(RG-10HC) at 8-10; Exhibit No. ___(EMM-10HC) at 11.

Q. Please describe the evaluation teams.

A. In both Stage One and Stage Two of the evaluations, subject matter experts within the Company were assigned to review project proposals and perform due diligence in order to assess the proposals or aspects of proposals within their specialized area. Typically, several people were assigned within each team area. Each team was also responsible for evaluating several of the evaluation criteria discussed above. The subject matter teams consisted of the following:

- Quantitative Analysis;
- Business & Commercial Issues;
- Environmental & Permitting;
- Transmission & Integration;
- Real Estate;
- Fuel Supply;
- Credit; and
- Community Affairs.

See Exhibit No. ___(RG-8HC) at 11-13 and Exhibit No. ___(RG-11HC) at 8-13 for examples of the evaluation criteria and associated subject matter teams. In addition, Company staff were assigned to evaluate technological matters that were relevant to a number of the subject areas listed above.

Q. How did the work of the evaluation teams feed into the overall evaluation process?

A. After each team performed its evaluations, positive and negative comments were documented. Then through the weekly evaluation meetings, the teams summarized their evaluations by assigning a qualitative evaluation rating for each of the proposals using a rating system of "Low," "Medium," and "High," with "High" being considered more favorable and "Low" being considered less favorable. This qualitative rating system was applied in order to help begin to sort the most favorable proposals. *See* Exhibit No. ___(RG-10HC) at 18-25.

Q. Would you please provide some examples of the teams' evaluation process and analysis?

A. Some examples of the work, process and results of the evaluation teams are:

- The community affairs team visited the local community where a proposal project was located or potentially would be located. The team talked with community stakeholders and assessed local support. Information was gathered from public, local, state and federal government entities and Native American nations. The team collected local newspaper editorials and letters to the editor that discussed project proposals. One example of the results of

such efforts was the discovery that the Wild Horse project proposal was favored by local community members over two other project proposals within the same county. This allowed PSE to differentiate Wild Horse from the other proposals and understand and address the concerns of the local community regarding Wild Horse. It helped position PSE for further development of the project.

- The real estate team engaged in extensive review of the site control documents presented in the proposals. As additional information was needed, particularly in the Stage Two evaluations, the real estate team visited project proposal sites, walked or drove the sites, and "ground truthed" the representations contained in the proposals. This helped PSE identify potential issues that were not described in the proposal documents.

- The environmental team researched the web sites of local, state, and federal agencies in order to determine whether there were any environmentally sensitive issues and to uncover any assessment documents that had been produced. This allowed PSE to more fully evaluate environmentally sensitive issues that needed to be addressed within the proposals.

- On the permitting side of the environmental team, local, state, and federal permitting processes were outlined in order to ascertain the status of the project proposals' permits. An evaluation of the process and risks of acquiring such permits were also addressed by the team's efforts.

Q. Would you please provide some examples of how the Company applied these qualitative factors?

A. As described above, the Company's real estate department reviewed the proposals with an eye toward the status and documentation of real estate rights related to a project. Projects at the earliest stages of real estate execution and/or with no real estate documentation provided for review received a "low" ranking with respect to this factor, proposals containing plans and/or discussion of real estate rights but

with incomplete or insufficient documentation received a "medium" ranking and those with fee ownership and/or signed real estate documentation (or where a plant was operational and assumed to have valid operating rights) received a "high" ranking.

Transmission issues provide another example. Company staff evaluated the location of proposed projects in relation to PSE's system as well as transmission paths and known transmission constraints. Proposals that were not to be delivered directly to PSE's system were reviewed to determine whether the developer had already submitted a request for transmission rights and the status of that request in the transmission provider's queue.

Company engineers also evaluated the technologies proposed to be used for each project. They noted positive attributes such as the reliability or efficiency of a type of turbine as well as negative attributes such as lack of information on the type of equipment proposed to be used for a project. After the evaluation, they assigned high, medium or low ratings to each project with respect to the technology evaluation.

Q. Did the Company do all of the Stage One evaluation in-house?

A. No. The Company also retained the consulting firm Garrad Hassan Americas, Inc. ("Garrad Hassan"), a leading authority on wind energy, to assist PSE in evaluating the various potential wind resource proposals. *See* Exhibit

No. ___(RG-7HC) at 5, 8; Exhibit No. ___(RG-8HC) at 14; Exhibit No. ___(EMM-14HC) at 68.

Q. Why did the Company hire Garrad Hassan?

A. The Company believed that it needed external assistance in evaluating wind projects because of its lack of experience with wind energy. Garrad Hassan is recognized internationally as a leading authority on all aspects of wind energy. Garrad Hassan has acted as project engineer for many projects on behalf of lenders, insurers and owners. As part of this work, Garrad Hassan has performed due diligence with respect to wind turbine technology, wind resource assessment, and consulted with respect to various aspects of project design and construction including economic modeling. Garrad Hassan maintains its independence by taking no equity stake in any development or technology and works purely on a consultancy basis.

Q. What did Garrad Hassan do?

A. Garrad Hassan undertook its own evaluation of the wind projects. It applied PSE's Stage One criteria to the projects based on its knowledge of the wind generation industry. Its most significant contribution to the evaluation process was to look at each proposed project from the perspective of an independent engineer. By providing PSE feedback on the engineering and financial viability of the proposal – i.e., was the information presented in the proposal sufficient for

a lender or equity investor to proceed – Garrad Hassan provided PSE with expert advice to supplement the Company's own judgment. Garrad Hassan also employed their proprietary software for analyzing topographic and wind turbine wake effects on project output.

Additional detail regarding the Company's analysis of issues specific to the wind power proposals is discussed below.

Q. What did the Company do with all of this information?

A. The qualitative evaluation and rating, combined with the Acquisition Screening Model ranking, eliminated certain proposals with high costs, unacceptable risks, and/or feasibility constraints. *See, e.g.* Exhibit No. ___(RG-10HC) at 17-25, 27-30.

4. The "Most Favorable Proposals" List and Ultimate Stage One Short List

Q. How did the Company then proceed?

A. PSE determined at this time that a selection of proposals should be included in a preliminary list of "most favorable" proposals, and selected 18 proposals for the "most favorable proposals" list. Exhibit No. ___(RG-9HC) at 10; Exhibit No. ___(RG-10HC) at 26.

Q. How did the Company proceed with respect to the "most favorable proposals" list?

A. From that list, PSE then identified the proposals that – although attractive at some levels – faced obstacles such as transmission constraints, high fuel costs, premature development status, permitting obstacles, and other issues. The seven proposals from the "most favorable proposals" list that appeared to face the fewest such obstacles, or for which the obstacles appeared more manageable, and that appeared to offer the lowest cost and lowest acceptable risk for obtaining additional electric supply were placed on the formal Stage One short list to proceed to Stage Two in-depth analysis.

The proposals selected to the short list included a diverse mix of ownership types and fuel sources, specifically: three wind projects, two coal PPAs, one hydro-backed PPA, and one project that would recover heat from natural gas-fired combustion turbines driving gas compressors on the Northwest Pipeline. The short-listed proposals and their ratings under the Stage One evaluation criteria were as follows:

PROPOSAL		STAGE 2 EVALUATION CRITERIA RATINGS				
Code	Project Name Owner/Developer	Compatibility with Need	Cost Minimization	Risk Management	Public Benefit	Strategic & Financial
A02b	Wild Horse Wind Project Zilkha Renewable Energy	High	High	Medium	High	Medium
A03	Hopkins Ridge Wind Project RES North America, LLC (RES)	Medium	High	High	High	Medium

PROPOSAL		STAGE 2 EVALUATION CRITERIA RATINGS				
Code	Project Name Owner/Developer	Compatibility with Need	Cost Minimization	Risk Management	Public Benefit	Strategic & Financial
A06	150 MW Wind Project	High	High	Medium	Medium	Medium
A19	2-yr PPA (Centralia Coal Plant) Arizona Public Service (APS)	High	High	High	High	High
A24b	10-yr PPA (Coal Plant)	High	High	High	High	Low
A30	22-yr Seasonal On-Peak PPA	High	High	Medium	High	Medium
A39	NWPL Sumas Recovered Heat Project/ORMAT Nevada, Inc.	High	High	Medium	High	High

See Exhibit No. ___(RG-9HC) at 11-12; Exhibit No. ___(RG-10HC) at 35-36.

Q. Why did some of these projects rate only "medium" or "low" on some of the evaluation criteria?

A. The short list as a whole was rated medium to high in all categories; however, the 10-year Coal PPA rated low in Criteria 'E' due to certain credit and accounting issues, described below. Some concern with regard to permitting risks caused the Wild Horse and Project A06 150 MW Wind projects to receive a medium rating in Criteria 'C'. The Hopkins Ridge Project rated medium in Criteria 'A' due to the uncertainty of securing firm transmission. Further analysis during the due diligence phase of Stage Two, coupled with greater knowledge of the credit and accounting issues, enabled PSE to evaluate these issues more thoroughly at that time.

Q. Were the projects from the "most favorable proposals" list that faced obstacles then rejected by the Company?

A. No. PSE determined that the proposals facing obstacles should be placed on a "continuing investigation" list so that PSE could continue to monitor their status during Stage Two and potentially reconsider whether any of these proposals should be pursued. *See* Exhibit No. ___(RG-9HC) at 11; Exhibit No. ___(RG-10HC) at 33-34; Exhibit No. ___(RG-11HC) at 42-43.

Q. Why did the Company wish to continue to investigate such options?

A. Among other things, PSE observed that given the high level of current and forecasted natural gas prices, no natural gas-fired projects were included in the formal short list. While no natural gas-fired option made the "most favorable proposals" list as a stand-alone resource, the Company believed it was still important to consider a gas-fired option in the context of PSE's portfolio. Therefore, PSE decided it would analyze representative natural gas-fired proposals – drawn from the continuing investigation list – in the Portfolio Screening Model analysis during Stage Two that is described in Mr. Elsea's Exhibit No. ___(WJE-8HC). Then, if Portfolio Screening Model runs indicated that gas projects would comprise all or a portion of the least cost PSE portfolio in the near term, PSE would reconsider such projects. *See* Exhibit No. ___(RG-9HC) at 12.

C. Stage Two of the RFP Evaluation

1. The Criteria

Q. What criteria did the Company apply during Stage Two of the evaluation process?

A. During Stage Two, PSE continued to apply the Stage One evaluation criteria and placed further emphasis on the following qualitative factors:

- Transmission and Integration Alternatives;
- Comparison of PPAs and Ownership Alternatives;
- Ability to Deliver;
- Experience of Developers;
- Guarantees and Security; and
- Environmental and Public Benefit.

The Stage Two criteria are described in further detail in Exhibit No. ___(EMM-9HC) at 100-103.

Q. How did the Company apply these criteria?

A. The Company reevaluated the proposals against each other by combining quantitative cost rankings with extensive evaluation of qualitative criteria, which were again summarized in "High," "Medium," and "Low" qualitative ratings. The Company based this evaluation on information that had been provided in the

initial proposals as well as on responses to information requests that PSE sent to the owners and developers of the short-listed projects. The Company also considered information discovered through its due diligence efforts. *See generally* Exhibit No. ___(EMM-9HC) at 86-92, 119-137.

Q. What additional information did the Company request?

A. PSE requested information such as copies of existing permits or applications for permits, a list of agreements contemplated between PSE and the developer, information about contingency plans in the event certain assumptions did not materialize, and preliminary information about the commercial agreements and terms the bidder anticipated requesting of PSE. PSE also inquired as to certain projects whether the bidder would be willing to agree to terms such as price guarantees or date certainty to the extent such terms were not addressed in the original proposal.

2. PSE's Quantitative Evaluation of Proposals

Q. Did the Company evaluate quantitative issues in Stage Two?

A. Yes. Mr. Elsea's Exhibit No.___(WJE-8HC) describes how the Company performed the Stage Two Quantitative analysis. *See also* Exhibit No. ___(RG-11HC) at 50.

3. PSE's Qualitative Evaluation of Proposals

Q. What qualitative evaluation did the Company undertake in Stage Two?

A. The Company's qualitative evaluation included continuing efforts such as those described above for Stage One. In addition, the Company conducted the due diligence described below and considered information regarding qualitative factors that resulted from those investigations. The Company also evaluated the creditworthiness of the bidders as potential counterparties to long-term transactions, for the reasons described below. *See* Exhibit No. ___(RG-11HC) at 48-49; Exhibit No. ___(EMM-9HC) at 85-87, 91-92.

4. Due Diligence

a. Overview

Q. Please explain what is meant by "due diligence"?

A. Due diligence is the process by which a party investigates and evaluates a potential investment. This often involves the examination of business operations, engineering design, equipment performance, environmental conditions, permit status, real estate and other necessary property rights status, and the verification of other material facts. Due diligence may also assess factors that affect the future operation of a potential acquisition and the prospects that the acquisition will perform as expected.

Q. What due diligence did the Company perform with respect to the potential projects?

A. The Company conducted due diligence with respect to environmental issues and concerns, permitting status and conditions, real estate matters, counterparty credit, the wind resource projections made by project developers, and technical matters associated with the engineering, construction and operation of potential projects that were asset based.

Q. How did the Company go about performing this due diligence?

A. PSE conducted much of this review in-house, through personnel experienced in legal, environmental and real estate matters, but also relied upon outside expertise on environmental and permitting matters, real estate issues, and technical matters. With respect to wind projections, wind project feasibility, and technical compatibility, the Company continued to work with Garrad Hassan, as described above.

The Company's due diligence efforts began during its Stage Two evaluation process and continued thereafter as to projects that ultimately were selected to the Stage Two short list as well as projects on the continuing evaluation list.

Q. What were some of the results of these due diligence efforts?

A. These efforts caused PSE to decide not to pursue certain projects on the short list, and also confirmed the attractiveness of certain projects. For example, based on

the Stage Two analysis undertaken by Garrad Hassan, PSE determined that the wind energy resource assessment for one of the wind projects was less than claimed in the proposal. This meant that the project's economics and overall viability – as originally represented by the developer – could not be supported. PSE therefore decided to place that project "on hold" until such time as the developer submits a more viable proposal. *See* Exhibit No. ___(RG-12HC) at 26; Exhibit No. ___(EMM-9HC) at 91**.** By contrast, the wind assessments of the Hopkins Ridge and Wild Horse Projects were very favorable and substantially confirmed the developer's projections in the proposal.

Q. In what respects were the wind assessments of the Hopkins Ridge and Wild Horse Projects favorable?

A. Garrad Hassan's analysis confirmed that the Projects possessed very energetic wind resources. In particular, the Wild Horse project has strong winds in every month of the year. Garrad Hassan's analysis with respect to the Wild Horse Project is described in greater detail below.

b. Additional Details Regarding Wind Energy Production and Due Diligence for Wind Resources

Q. What is involved in producing an estimate of the energy production of an entire wind project?

A. Wind varies from place to place and year to year. The project developer typically installs one or more masts with wind instruments at several levels to collect data at several locations across a site for a period of one or more years. Generally, the more data that are collected, the more confidence one has in a long-term energy estimate for the project. The developer makes an estimate of the long-term average wind behavior for each prospective turbine site and from this, estimates the energy production from each wind turbine.

Included in this estimate are effects of topography on the wind, and the effect of wind turbine wakes and their effect on downstream wind turbines. In some cases, where wind turbines are placed very close to one another, at least for certain wind directions, a wind turbine manufacturer will prescribe what is called "sector management". Sector management is where the turbine operating system limits the operation of certain machines when the wind is blowing from directions that would place some machines too close to an upwind machine. In this case, the turbulence of an upwind machine might reduce the operating life of a machine operating in its wake. This is akin to not allowing small aircraft to land too soon after a large aircraft has landed due to the residual turbulence from the large aircraft wings. The lost energy that results from any machine that is shut down

for reasons of sector management is taken into account in the long-term energy assessment.

The developer will also estimate the amount of time a wind turbine does not operate because winds are too high, a wind turbine must be shut down as a result of ice on the blades, and a wind turbine does not operate because it is mechanically or electrically not available. Further, the amount of energy delivered to the interconnection point is less than the sum of the energies generated by all wind turbines due to electrical losses in the collection system.

Q. Please describe briefly how a wind turbine performs and the measures used to quantify performance.

A. There are several key words used to describe wind turbine performance, including cut-in and cut-out wind speeds, rated wind speed, rated power, availability, and capacity factor.

Under normal conditions, a wind turbine is connected to the power grid such that if the wind is blowing at speeds within the operating range of the wind turbine, it will produce power. For the Vestas wind turbine used at Hopkins Ridge and Wild Horse, if the winds are less than about nine miles per hour, the wind turbine will produce no power. As the winds increase above nine miles per hour, a speed known as the "cut-in" wind speed, the turbine will begin to produce power. The power will increase to full output of 1.8 MW, or 1,800 kW, in winds of approximately 31 mph, and these conditions are known as the "rated wind speed"

and the "rated output". In winds between 31 mph and about 56 mph, the wind turbine will produce its rated output. Should the winds exceed 56 mph, a speed known as the "cut-out" wind speed, the machine will stop producing power.

Q. How do these cut-in, cut-out and rated wind speeds relate to the wind speeds at the Wild Horse Project?

A. To understand how much energy a wind turbine will produce, it is essential to know how often the wind blows at each speed in the operating range of the wind turbine. At the Wild Horse Project, the average wind speed is approximately [redacted] mph. Approximately one-fourth of the time ([redacted]%) the winds are below cut-in and two-thirds of the time ([redacted]%) the winds are between cut-in and rated wind speeds. At other times, the winds are between rated and cut-out wind speed ([redacted]%) or, very rarely, above the high speed cut-out wind speed ([redacted]%).

From this, we see that the wind turbine will be producing some amount of power all but about one-fourth of the time ([redacted]%). It will not produce its rated power all the time, since most of the time the winds are below the rated wind speed. In fact, the average output would be approximately [redacted]% of its peak output at a typical Wild Horse wind site if the machine were available to run 100% of the time. However, a wind turbine will not be available to run 100% of the time.

Q. Why are the wind turbines not available to run 100% of the time?

A. There is a certain amount of time that wind turbines are not available to operate due to routine maintenance or forced outages of some kind. "Availability" is the term used to describe the readiness of a machine to respond to winds. After the first six months, during which Vestas guarantees [redacted]% availability, Vestas will guarantee that the turbines will be available to operate [redacted]% of the time, after providing for [redacted] of planned maintenance each year. Thus, in the course of a year (8,760 hours), after removing [redacted] for planned maintenance, Vestas will guarantee the machines will be available for [redacted] hours = [redacted]% * (8,760 – [redacted]). Thus, PSE projects an availability of the turbines of [redacted]% (= [redacted]/8,760).

Q. Are there other factors that reduce the amount of energy that can be delivered from wind turbines?

A. Yes. The energy produced by any wind turbine is first transmitted through underground cables that are primarily underground, known as the "collection system", to a substation where the voltage is increased to the transmission voltage. From there, the power is transmitted at high voltage to the point of interconnection with the transmission system. There are electrical resistance losses throughout the collection and project transmission facilities that reduce the amount of energy actually delivered to the point of interconnection.

Q. How do the above limitations factor into projections of energy that will be available from a wind generation facility?

A. One estimates the net energy to be delivered by the wind farm after accounting for prevailing wind, electrical losses and the effects of availability. This energy, expressed as a fraction of the rated output of the windfarm, is known as the "Capacity Factor". Thus, the typical wind turbine described above is designed to be capable of producing 1,800 kW, but is expected to produce [redacted] kW. The fraction [redacted]/1,800 equals [redacted]%, the Capacity Factor estimated for the Wild Horse Project. For the first year of plant operations, due to the decreased availability as described above, the Capacity Factor is estimated to be [redacted]%.

Q. How does the above information relate to what Garrad Hassan projected in their analysis?

A. Garrad Hassan's analysis of the Wild Horse Project site showed that average annual wind speed is [redacted] m/s (approximately [redacted] mph). Garrad Hassan projected a capacity factor of [redacted]%, with electrical collection system losses assumed to be [redacted]%. The Wild Horse developer, Horizon,[1] assumed [redacted]% for electrical collection system losses and has agreed to specifications within the Balance of Plant, Engineering, Procurement and Construction Agreement that will enable the Project to achieve this lower level of electrical losses. Assuming [redacted]% for

electrical system losses, the resulting capacity factor is [redacted]%. This is one of the highest capacity factors for a wind resource in Washington State.

Garrad Hassan also estimated the monthly distribution of power from the Project. Significantly, the project was projected to produce over 70 aMW ([redacted] aMW) annual average energy, with average energy production even higher than that ([redacted] aMW) in January of each year, and with significant production during the months of November through March. This is somewhat unusual for a Pacific Northwest wind facility, because winds tend to be lighter during winter months (when PSE most needs power) and stronger during summer months (when PSE has lighter loads). *See, e.g.,* Exhibit No. ___(EMM-14HC) at 10.

Q. How did the Wild Horse Project developer's estimate of energy production and Garrad Hassan's estimate of energy production compare?

A. The estimates were very close but differed in minor respects. Both parties agreed to a remarkable degree on the long-term wind resource estimate at the three sites instrumented on site. However, they differed in their method of extrapolating these estimates to each turbine site. In the judgment of PSE, both methods were reasonable. The estimate used in PSE's projection is the lower of the two estimates.

[1] The developer of Wild Horse was named Zilkha Renewable Energy at the time the Wild Horse project was proposed in response to PSE's RFPs. Zilkha's name was later changed to Horizon Wind Energy, LLC ("Horizon").

Q. What about with respect to turbine availability and collection system losses?

A. The V80 fleet reliability has risen to an average availability of over [redacted]%. This is consistent with PSE's projected availability of [redacted]%, as described above.

Garrad Hassan, not having a specific design of the collection system, made a conservative estimate of three percent for the electrical losses, whereas Horizon assumed, based on their design experience and experience of operating sites they designed, an estimate of 2.15 percent. PSE accepted the 2.15 percent loss estimate of Horizon, subject to confirmation of the loss calculation in the engineering phase. This loss calculation depends on such things as the conductor size and the amount of time the Project is generating at each level of output.

Q. Did the Company conduct other analysis related to wind resource assessment?

A. Yes, the Company also retained 3Tier Environmental Forecast Group, Inc. ("3Tier"), a Seattle-based firm with expertise in wind energy and atmospheric analysis, to provide an analysis of the long-term variability of energy production characteristics of several of the wind project proposals. 3Tier based its projections on an analysis of the last several decades using historical National Weather Service weather data, on-site data, and numerical modeling techniques. The 3Tier analysis was used to provide additional assurance to PSE that the wind resource assessments would be indicative of longer-term performance from the project. *See, e.g.,* Exhibit No. ___(EMM-14HC) at 68-69.

5. Wind Integration Issues

Q. Did the Company undertake any specialized review of factors it believed should be considered in the evaluation process?

A. Yes. The wind projects on the Stage One short list appeared to be very favorable. However, the Company was aware that wind energy poses challenges to a portfolio with respect to scheduling and firming.

Q. What challenges are posed by wind power projects?

A. Wind is a resource that varies from minute to minute, hour to hour, and year to year. Since the power system must precisely balance loads and generation at any given time, other parts of the power system must compensate as wind generated power increases or decreases, in much the same way as the power system must compensate as loads increase or decrease. On a very short time scale, this load balancing is called regulation. Wind powered generation also presents challenges with respect to operating reserves because wind generation is not dispatchable on command.

Wind generation also presents challenges with respect to scheduling. The standard scheduling increment for power is one clock hour in length. Power purchases, sales, and resource dispatch are generally prescheduled on a day-ahead basis, 24 hours prior to the hour the energy is anticipated to be used (except for weekends and holidays, which are scheduled two or more days in advance).

Since wind generation will be variable within a scheduled hour, there is a need for other resources to provide intra-hourly "load following" in order to offset the changes in wind generation.

Q. How did the Company address these challenges?

A. In order to better understand how energy production from wind projects would fit into PSE's future operations, the Company retained Golden Energy Service, Inc. ("Golden") to conduct analyses regarding operational and cost issues associated with integrating wind energy into PSE's portfolio.

Q. Please describe the analyses that the Company had Golden perform.

A. Golden's Phase 1 analysis was conducted in 2003, when the Company was considering how it might add wind powered resources to its portfolio but had not yet issued its Wind RFP. Phase 1 focused on the short-term operational characteristics of wind generation specifically for PSE's system. It studied the issues described above with respect to regulation, scheduling and operating reserves and estimated the cost to integrate wind onto the PSE system based on wind data from a single developer that was used as a proxy generic wind resource in the Ellensburg area. Wind generation data was simulated based on the wind data.

The Company subsequently requested that Golden perform additional wind generation related analysis in order to: (1) expand upon and refine the results of

the previously completed Phase 1 studies, and (2) to develop information that would assist PSE in evaluating wind resource bids. The Phase 2 analysis was based on actual wind generation data from an operating wind farm that had become available since the Phase 1 studies, including wind generation and day-ahead and hour-ahead forecasts. Company staff worked with Golden to develop and refine its wind integration analysis. A public version of Golden's Phase 2 report is found in the Company's 2005 LCP at 670.

In Phase 3, Golden undertook a more detailed look at the cost of adding increased quantities of wind to the Company's portfolio while losing the ability to follow with hydro due to the reduction over time of Mid-Columbia (Mid-C) contract rights.

Q. How did the Company use these studies?

A. The earlier Golden studies were factored into the quantitative evaluations for the wind projects; that is, the Company compared proposals on a delivered-cost basis, which for wind projects, included estimated integration costs. Preliminary results from Phase 3 were used to further refine Wild Horse pro forma costs prior to making a final decision to acquire the Project.

Q. What did the Company conclude with respect to wind integration costs?

A. The Company concluded that for the Wild Horse Project it could use its Mid-Columbia (Mid-C) hydro resources to cover both its hour-ahead and day-ahead

firming of prescheduled resources. To do so, the Company would build into its scheduling of Mid-C hydro resources additional "reserve" amounts in order to manage inherent wind generation variations.

In order to project the costs associated with this balancing, the Company utilized Golden's estimate of the opportunity costs associated with the holdback of Mid-C resources described above.

Q. Is this the same wind integration method utilized in the Hopkins Ridge Project?

A. No. The energy produced by the Hopkins Ridge Project is delivered to the PSE load center via Bonneville Power Administration's ("BPA") transmission system. Therefore, hour-ahead firming for the Hopkins Ridge Project is provided by BPA, subject to any imbalance charges that might apply. In contrast, energy produced by the Wild Horse Project will be directly interconnected to the Company's electrical control area via the Company's existing Intermountain Power (IP) transmission line. The Company is upgrading the IP line to accommodate this generation addition as well as to address future transmission needs. The Company will be responsible for managing all of the short-term generation variations associated with the Project. As stated above, the Company will utilize its Mid-C hydro resources for short term firming.

Q. Are the Company's Mid-C resources the only reserves available to the Company to meet its required short term operational flexibility?

A. No. Given that the Company's current Mid-C maximum generating capacity is 1,203 MW, the Company can physically maintain the required amount of additional short-term system flexibility on the Mid-Columbia plants approximately 90% of the time. During the 10% of the time that the Mid-C plants cannot provide the entire amount of required additional system flexibility, the Company will utilize other means in order to manage the Project's generation variations.

Q. Did the Company include these wind integration costs in its analyses of the costs and benefits of wind projects?

A. Yes, as described in Mr. Elsea's Exhibit No. ___(WJE-8HC). *See also* Exhibit No. ___(EMM-14HC) at 11.

6. <u>Credit and Balance Sheet Issues With Respect to PPAs</u>

Q. Do you have additional comments on other factors considered in the Company's evaluation?

A. Yes. Creditworthiness, credit support and credit quality issues were of particular importance in evaluating PPAs as compared to ownership options. *See, e.g.,* Exhibit No. ___(RG-13) at 2-16; Exhibit No. ___(EMM-12HC) at 7-8, 17.

Q. What were the Company's concerns about creditworthiness and credit support?

A. The Company's concerns regarding the financial condition of potential counterparties and the credit required to support long-term, fixed price energy contracts were extensively documented in the Company's 2004 general rate case. *See, e.g.*, Docket Nos. UG-040640 et al., Exhibit No. 71 at 16-20 (Ryan); Exhibit No. 171C at 28-30 (D. Gaines).

Generally, the bankruptcies of a number of companies in the wake of the 2000-01 Western Power Crisis highlighted the importance of taking into account creditworthiness in considering whether the Company should transact with a potential counterparty.

In addition, it has become very common for companies to include in energy contracts a requirement that credit assurances be provided to better protect a party from the risk that the other will not perform its obligations under the contract. Credit provisions are generally reciprocal, that is, the counterparty or PSE would provide to the other contractual access to immediately available funds in the form of a letter of credit or cash to cover the daily marked-to-market exposure (above a certain threshold level).

Q. Did bidders of PPAs request such credit support from PSE?

A. Yes. Among various proposed terms and conditions, bidders of PPAs requested that the Company post credit support to secure its obligations to pay for purchased power under the long-term PPAs. Potential counterparties requested credit support from PSE in the form of a demand letter of credit or cash.

Q. Would you give specific examples of supplemental credit demands made by PPA bidders?

A. Yes. In connection with the 10-year Coal PPA, the proposal required a credit facility capped at $125 million to cover marked-to-market exposure that could be potentially greater. *See* Exhibit No. ___(RG-12HC) at 31. Similarly, the 22-year Seasonal On-Peak PPA proposal initially required supplemental credit support in an amount sufficient to cover the marked-to-market exposure of that PPA. PSE estimated this exposure to be $100-$150 million. These credit requirements greatly reduced the attractiveness of these potential resources compared to other options.

Q. Did the Company have concerns about the creditworthiness of any counterparties?

A. Yes. As one example, in the case of the 10-year Coal PPA mentioned above, PSE had the following credit concerns:

- The parent company had experienced a recent two-notch corporate credit downgrade in 2003 from BBB+ to BBB- (the lowest rating to be classified investment grade). In 2004, S&P had indicated a deteriorating financial profile over the last five years.

- PSE's credit analysis of the proposer indicated negative cash flow by the end of 2005 without new incoming sources, or renewal of bank lines. PSE was becoming increasingly concerned about the entity's long-term viability.

- Given the entity's weakening credit picture, PSE was concerned about the entity's ability to post up to $125 million in credit support for marked-to-market movements pursuant to the proposed credit provisions, and to maintain that credit support for the life of the contract. Further, the collateral cap covered only $125 million. For any amount above $125 million, PSE and its ratepayers would have exposure. PSE was also concerned about its own alternative sources of liquidity. Although the Company was able to renew and extend its 364-day credit line with a three–year facility, a ten-year facility was unavailable from the Company's bank lenders.

See, e.g., Exhibit No. ___(RG-12HC) at 31.

Q. Did the Company seek to address these concerns without rejecting the resource proposal?

A. Yes, both entities explored credit alternatives with certain investment banks such as credit default swaps (CDS) and various letter of credit structures. These alternatives added additional cost and did not provide risk coverage for the full exposure or for non-delivery performance. Further, PSE was concerned about the impact of the additional leverage (i.e. letter of credit) on its capital structure, which could potentially result in a possible ratings downgrade. While the ratings agencies do not impute these amounts as debt today, there is the potential for them to do so in the future.

Q. Did the Company have other concerns about PPAs?

A. Yes. Credit rating agencies view electric utility PPAs as debt-like in nature and, in their analysis of the Company's financial strength and risk factors, treat a portion of the Company's obligation under such contracts as debt. This "imputed debt" is a significant concern for the Company because of its impact on the Company's credit quality. Moreover, the Commission has expressly instructed the Company to consider "rating agencies' [i.e., Standard & Poor's and Moody's] views of purchased power" and "to quantify the impact of future resource acquisitions on capital cost and capital structure."[2]

[2] *WUTC v. Puget Sound Power & Light Co.,* Docket No. UE-921262, *et al.,* Nineteenth Supplemental Order (September 27, 1994) at 35-36.

Q. Did the Company consider the impact of imputed debt when comparing PPAs to ownership options?

A. Yes. The Company's quantitative analysis of the competing resource proposals took into account costs related to debt that would be imputed to the Company if it entered into various proposed PPAs, as described in Mr. Elsea's Exhibit No. ___(WJE-8HC). *See also* Exhibit No. ___(EMM-9HC).

D. PSE Also Considered a Self-Build Option

Q. Did the Company analyze a self-build option in addition to the projects proposed in response to the RFPs?

A. Yes. The Company updated the self-build analysis that was performed for the Company in the fall of 2002 by Tenaska, Inc., based on current information available to the Company from a variety of sources.

Q. Please describe the self-build analysis that was performed in 2002.

A. In the fall of 2002, PSE asked Tenaska, Inc. to assess and report on alternatives for self-development of a generation project or projects. Tenaska prepared a report titled *Assessment and Report on Self-Build Generation Alternative for Puget Sound Energy's 2002-2003 Least Cost Plan* ("Tenaska Report"). PSE included the Tenaska Report as Appendix H to the April 2003 LCP.

The Tenaska Report included detailed information on the various aspects of project self-development – including design, siting, permitting, equipment procurement, construction, startup, operation, and maintenance – for a gas-fired combined cycle combustion turbine ("CCCT") facility. The Report also provided estimates of generic project development costs and time schedules as well as an overview of then-current market conditions that affected the price and availability of combustion turbines and engineering, procurement, and construction ("EPC") services.

Q. What were some of the other conclusions that Tenaska drew?

A. The Tenaska Report determined that certain design and construction issues significantly drive specific cost components. For example, EPC costs – typically the single largest cost component of a construction project – vary considerably under different conditions. Tenaska also determined that permitting issues, project scheduling, gas transportation, and interconnection costs are unique for each facility and site.

Q. How did PSE update the Tenaska Report?

A. The Company revisited the assumptions and findings of the Tenaska Report based on current information available to the Company from a variety of sources. In particular, the Company reviewed: (1) the potential sites for the self-build, including access to fuel supply, water and wastewater, the transmission grid, and

potential permitting issues; (2) potential equipment and configuration options and costs; and (3) estimated costs for other expenses including transmission access, engineering, construction, capital and the like. High-level documentation of the Company's analysis and conclusions, described below, can be found at Exhibit No. ___(EMM-9HC) at 41-44.

Q. What information did PSE draw from to perform this update?

A. PSE's acquisition of a 49.85% interest in the Frederickson I CCCT generating station in 2004 provided PSE with access to actual plant operating cost and performance data, which provided a new set of reference points to use to check the Tenaska assumptions. Plant cost data that PSE was able to obtain from other industry sources provided other sets of reference points.

With respect to equipment configuration and costs, PSE obtained updated information through its All-Source RFP and through a proposal made by a potential supplier outside the RFP process.

Q. What did PSE do to investigate potential sites for a self-build option?

A. The 2002 Tenaska Report identified and screened a total of 24 potential CCCT sites, all selected based on being relatively close to power transmission and gas transportation infrastructure. It ultimately focused on two sites as having the greatest potential: (1) Frederickson, which appeared to offer advantages for interconnection for fuel gas supply and transmission access, but could be more

expensive to construct due to its layout; and (2) Dieringer, due to its proximity to PSE's White River hydroelectric station and probable ease in laying out the project, but where off-site services were limited.

For PSE's updating of potential sites for a self-build option, PSE focused on three potential sites: Frederickson, Dieringer, and Fredonia. Ultimately, the Frederickson site appeared to be the best site for a potential self-build CCCT development. Advantages included the ability to further develop an existing site that would need very little additional infrastructure, direct access to the main line of Northwest Pipeline (NWP), and a 100,000-barrel liquid fuel storage tank that is already available for fuel diversity and backup to natural gas.

Q. How did PSE update the equipment and configuration information?

A. The Tenaska report provided cost and performance data for CCCT plants based on both the General Electric ("GE") Frame 7EA and Frame 7FA combustion turbines. This choice of key equipment was reviewed to determine if other manufacturers or newer technologies would markedly improve the performance, reliability, or economics of a self-build CCCT plant.

After the collapse of high electric power prices during 2000-2001, developers cancelled many of their plans to construct new CCCT projects. Some developers have been seeking to sell this equipment in the broker market or by marketing directly to utilities. One such proposal was made to PSE in response to its All-Source RFP. In Proposal A17, the developer offered to sell new combined-cycle

power island equipment (GE Frame 7FA combustion turbine, heat recovery boiler, and steam turbine) to PSE that is in storage and has never been installed. The offer included assistance in the development of a new CCCT plant tailored to meet PSE's energy needs. The proposal did not include the cost of off-site interconnections, changes to the developer's standard plant layout, warranty wrap, and/or other unknown conditions. PSE considered the Proposal A17 option to be a good candidate to develop self-build option pricing around, given its reliable design parentage and discounted price for the equipment.

The Company also investigated potential use of the new GE LMS100 combustion turbine. PSE obtained cost and performance information for PSE's use to determine if the new turbine could be competitive with other RFP responses, if self-built. *See* Exhibit No. ___(RG-11HC) at 52.

Q. How did PSE update other cost assumptions made in the 2002 Tenaska Report?

A. PSE updated the projected cost to connect transmission access to a self-built Frederickson CCCT plant based on an interconnection study performed by PSE's Transmission Planning group after transmission access was requested on OASIS. PSE also updated the anticipated costs associated with water and sewer connections that would be required for a plant. It then compared these updated costs with the additional cost data available to it from other sources, as described above.

Q. What did the Company conclude from this self-build option analysis?

A. PSE's analysis showed that the PSE self-build options were more expensive and would take longer than the alternatives available to PSE in the RFP process. Ultimately, PSE concluded that the leading RFP candidates were equal or superior to the self-build options, and did not carry the risks that were associated with the self-build alternatives.

E. Results of the Stage Two Evaluation

Q. What did the Company do with the qualitative, quantitative, and due diligence analyses discussed in your preceding testimony?

A. Combining the qualitative, quantitative, and due diligence analyses led PSE to develop a list of proposals that combined low projected levelized costs and beneficial portfolio impacts as compared to other proposals with acceptable evaluations with respect to qualitative factors. Exhibit No. ___(EMM-9HC) at 85-92 provides a high-level overview of how the Company's analysis led to selection of the short list.

Q. What did the Company conclude as a result of the Stage Two evaluation?

A. PSE ultimately selected the following portfolio of potential resources from the short list as a group of potential acquisition opportunities.

Code	Project Name Owner/Developer
A02b	Wild Horse Wind Project Zilkha Renewable Energy[3]
A03	Hopkins Ridge Wind Project RES North America, LLC
A19	2-yr PPA (Centralia Coal Plant) Arizona Public Service (APS)
A30	22-yr Seasonal On-Peak PPA
A39	NWPL Sumas Recovered Heat Project ORMAT Nevada, Inc.

Q. Please describe why the Company determined that it should pursue these resources?

A. That determination resulted from the full range of analysis conducted in Stage Two. However, I describe certain favorable aspects of each project below.

1. *2-year APS PPA.* This short-term PPA consistently ranked as the lowest cost project among the proposals. Further benefits were identified through analysis that was conducted by the Company's staff responsible for short-term resource acquisitions, as was described in PSE's 2005 PCORC case that approved the prudence of this acquisition.

[3] As described above, Zilkha Renewable Energy's name was later changed to Horizon Wind Energy LLC ("Horizon").

2. *22-year Seasonal On-Peak PPA*. This PPA offered the benefit of a seasonally-shaped (winter energy only), heavy-load hour only, system-delivered product. The portfolio analysis showed that this PPA lowered PSE's portfolio costs over 20 years compared to the generic portfolio analyzed in PSE's 2003 Least Cost Plan. At the time PSE selected its portfolio to pursue, it appeared that the supplier was open to foregoing any requirement that PSE provide credit support for the transaction.

3. *Hopkins Ridge Project*. During Stage One, the Hopkins Ridge wind project was the lowest-cost wind project according to the Acquisition Screening Model. All of the project's qualitative ratings were high with the exception of the inability to secure firm transmission. The subsequent portfolio analysis in Stage Two showed that the Hopkins Ridge project lowers PSE's portfolio costs over 20 years compared to the generic portfolio analyzed in PSE's 2003 Least Cost Plan. Further analysis of the transmission constraints at that time showed that the potential for transmission congestion would likely be manageable. In addition, the Hopkins Ridge project had the greatest potential to reach commercial operations by the end of 2005, which would qualify the project for production tax credits ("PTCs").

4. *Wild Horse Wind Project*. PSE's due diligence showed that the Wild Horse wind project is a viable project, with a desirable location in Kittitas County and a strong potential for receiving timely permits. The portfolio

analysis showed that the Wild Horse project lowers PSE's portfolio costs over 20 years compared to the generic portfolio analyzed in PSE's 2003 Least Cost Plan. Although the Wild Horse project required acceleration of planned long-term upgrades to one of the Company's transmission lines (which involve cost and schedule risks), the permitting and engineering for the transmission line upgrades were underway.

5. *NWPL Sumas Recovered Heat Project*. The NWPL Sumas recovered heat project showed an attractive 20-year levelized-cost. The project's qualitative ratings were also favorable. Among other things, the project produces power through heat that is already being generated by existing industrial operations, thus produces virtually no additional emissions.

Q. Why didn't the Company further pursue the 10-year Coal PPA?

A. As described above, the Company had significant concerns about the proposer's overall financial health and its ability to provide adequate performance assurance both operationally and financially. Equally concerning were the credit support that both the Company and the proposer would be required to post as well as the debt that would be imputed to PSE's balance sheet if it entered into that PPA. Further, the quantitative analysis performed in Stage Two indicated that the resource was not as attractive as the other alternatives. In fact, the resource came at a cost rather than a benefit as compared to PSE's generic portfolio as shown in Mr. Elsea's Exhibit No. ___(WJE-8HC).

F. PSE's Efforts to Finalize Contracts

Q. How did the Company proceed with respect to the potential acquisitions that made the Stage 2 short list?

A. With respect to the two-year APS PPA, the Company's Energy Resources staff worked jointly with the Company's Energy Trading staff, who are responsible for short-term resource acquisitions, to analyze that potential acquisition. Further benefits were identified through analysis that they conducted, as described in Ms. Ryan's direct testimony. After approval by the Company's Risk Management Committee, PSE and APS signed definitive contracts. PSE began receiving energy from this contract on January 1, 2005.

With respect to the other resources on the short list, the Company then began negotiations with the counterparties of the key commercial terms and conditions. Such terms and conditions were then set forth in a non-binding Letter of Intent as an initial step prior to negotiating definitive agreements and recommending approval from PSE's Board of Directors to execute the definitive agreements and proceed with the particular project.

Q. What were the results of those efforts?

A. PSE ultimately acquired the Hopkins Ridge Project, which was presented to and approved by the Commission in the Company's 2005 PCORC proceeding. The Hopkins Ridge Project began commercial operation on November 27, 2005.

PSE and Zilkha, now known as Horizon, signed a Letter of Intent on September 1, 2004, for acquisition of the Wild Horse Project by PSE. PSE completed the acquisition on October 4, 2005, after finalization of commercial terms and Board approval, leading to the acquisition that is presented for Commission approval in this proceeding. Progress on construction of the project has been continuing, as described in my prefiled direct testimony.

PSE issued a Letter of Interest to ORMAT for the NWPL Sumas recovered heat project on August 18, 2004. Following further discussion, the parties entered into a non-binding Letter of Intent on April 14, 2005. PSE conducted additional due diligence and executed a 20-year PPA with ORMAT for all of the output of the ORMAT project (the "ORMAT PPA") on January 18, 2006. Details regarding the ORMAT PPA are also presented in my prefiled direct testimony.

The Company also pursued acquisition of the On-Peak Utility PPA, but those efforts proved unsuccessful.

Q. What happened with respect to the 22-year Seasonal On-Peak PPA?

A. After negotiations with the counterparty supplier, PSE understood that the counterparty would not require any credit support or collateral of PSE, and that the counterparty's obligations would be backed by its parent, a utility with an excellent credit rating and substantial system resources. *See* Exhibit No. ___(RG-12HC) at 29-30; Exhibit No. ___(EMM-9HC) at 15, 18, 22-24.

PSE management prepared a recommendation to the Board of Directors that the Board approve PSE's entry into this PPA at their December 15, 2004, meeting. The presentation recognized the benefits and risks associated with the acquisition and, on balance, recommended Board approval. *See* Exhibit No. ___(EMM-9HC) at 4-25.

However, by the time of the Board meeting, the supplier had withdrawn the credit support of its parent entity from the transaction. This introduced significant additional risk to the proposed acquisition because of the risk that the supplier would default in later years of a long-term fixed price contract, after PSE had potentially paid a relatively favorable price to the supplier compared to market for several years. Thus, PSE management recommended that the Board not act at that time on the recommendation that had been proposed in advance of the meeting. *See* Exhibit No. ___(EMM-9HC) at 2-3.

G. Additional Evaluation Subsequent to Stage 2 of the 2004 RFP Process

Q. Did the Company's analysis of the Wild Horse and ORMAT projects end with the steps described above?

A. No. The due diligence and contract finalization stage of the 2004 RFP process extended for a number of months after the selection of the Stage 2 shortlist and initial commercial discussions. The Company again updated its modeling and quantitative analyses related to these projects prior to deciding to acquire them, as described in Mr. Elsea's Exhibit No. ___(WJE-8HC). The Company also

undertook additional due diligence and evaluation of qualitative factors related to these projects prior to deciding to acquire them, as described in my prefiled direct testimony in this case.

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