Q. Please state your name, business address and present position with PacifiCorp dba Rocky Mountain Power Company ("the Company").

A. My name is Gregory N. Duvall. My business address is 825 NE Multnomah Street, Suite 600, Portland, Oregon 97232. My present position is Director, Net Power Costs.

QUALIFICATIONS

Q. Briefly describe your education and professional experience.

A. I received a degree in Mathematics from University of Washington in 1976 and a Masters of Business Administration from University of Portland in 1979. I was first employed by PacifiCorp in 1976 and have held various positions in resource and transmission planning, regulation, resource acquisitions and trading. From 1997 through 2000 I lived in Australia where I managed the Energy Trading Department for Powercor, a PacifiCorp subsidiary at that time. After returning to Portland, I was involved in direct access issues in Oregon and was responsible for directing the analytical effort for the Multi-State Process ("MSP"). Currently, I direct the work of the load forecasting group, the net power cost group, and the renewable compliance area.

PURPOSE OF TESTIMONY AND RECOMMENDATION

Q. What is the purpose of your testimony?

A. My testimony is provided in support of the Company's May 7, 2014, filing to update Schedule 37, Avoided Cost Purchases from Qualifying Facilities. In its May 2014 filing, the Company updated the inputs to the calculation of Schedule 37 rates and proposed several changes to the way avoided costs are calculated for Schedule

37. My testimony provides support for each change proposed by the Company. In addition, I describe a potential issue identified in the Company's original filing related to the availability of transmission required to integrate qualifying facilities ("QFs") locating in southern Utah into the Company's system.

Q. Please describe the specific changes to the calculation of Schedule 37 rates as proposed by the Company.

A. The Company proposed the following changes to the calculation of avoided cost rates in Schedule 37:

- Integration costs for wind and solar QFs should be included as a reduction to avoided costs.
- Avoided capacity costs should be adjusted for the capacity contribution of intermittent QF resources.
- Avoided costs during the sufficiency period should not include capacity costs related to the deferral of a simple cycle combustion turbine ("SCCT").

In addition to the above changes to the method for calculating avoided costs, the Company adjusted its official forward price curve "(OFPC") for electricity to exclude a specific adder for an assumed future tax on carbon dioxide. Finally, the Company proposed to continue offering QF rates on a volumetric basis (i.e. dollars-per-megawatt-hour, or $/MWh) but to eliminate the option of having rates paid as a fixed capacity payment plus a flat energy rate.

Q. Was the Company required to update the Schedule 37 avoided cost rates irrespective of the proposed changes?

A. Yes. In its order February 12, 2009, in Docket No. 08-035-78 on Net Metering

Service, the Utah Commission directed the Company to calculate and file Schedule 37 avoided costs annually in order to establish the value or credit for net excess generation of large commercial customers under Schedule 135. Then, in its November 28, 2012, order in Docket No. 12-035-T10, the Commission directed that future annual filings should be made within 30 days of filing the Company's Integrated Resource Plan ("IRP") or IRP Update, or by April 30 of each year, whichever occurs first. On April 29, 2014, at the request of the Company, the Commission granted a one-time delay extending the deadline for this year's filing to May 7, 2014.

Q. Why did the Company propose changes to the way Schedule 37 is calculated?

A. The proposed changes are required to account for the unique characteristics of renewable QF resources and to eliminate unnecessary differences between the calculation of avoided costs for small QFs under Schedule 37 and large QFs under Schedule 38. The changes proposed to the calculation of avoided costs were addressed for large renewable QFs in Docket No. 12-035-100 (the "Renewable QF Docket") and, despite the use of a simplified avoided cost method for Schedule 37, should be consistently applied to the calculation of avoided costs for small QFs as well. In the Company's May 2013 filing to update Schedule 37, it highlighted that several issues were under consideration in the Renewable QF Docket and that the Company would request that the relevant conclusions reached in that docket be incorporated into Schedule 37 in a future filing,[1] which we are now doing in this docket.

[1] Advice 13-08, Docket 13-035-T09

Without changes to the Schedule 37 methodology, retail customers will pay prices for QFs that are higher than the avoided cost of energy and capacity from other sources and higher than the avoided costs paid under Schedule 38. Since the Public Utility Regulatory Policies Act of 1978 ("PURPA") objective of avoided cost pricing is that customers remain indifferent as to whether the energy is purchased from a QF or from other resources, it is expedient for this Commission to adopt changes to the calculation of avoided costs under Schedule 37.

Q. How is your testimony organized?

A. I first provide background information regarding the current method approved by the Commission for calculating avoided cost rates under Schedule 37. Next, I discuss each of the proposed changes and provide support for each. Finally, I describe the potential transmission constraint issue and the Company's proposal for addressing its impact on avoided costs.

SCHEDULE 37 BACKGROUND

Q. Please describe the currently-approved method for calculating avoided costs for small QFs qualifying for published rates under Schedule 37.

A. The framework for the calculation of rates under Schedule 37 was first approved by the Commission in Docket No. 94-2035-03. In its July 1995 order, the Commission approved a combined differential revenue requirement and proxy method for determining avoided costs. Since that time various adjustments have been made to the calculation details, but the basic structure has remained in place. Published rates under Schedule 37 are available to cogeneration facilities up to 1 MW and other small power production facilities, including wind and solar resources, up to 3 MW.

The determination of avoided costs is divided into two periods: resource sufficiency and resource deficiency. During the sufficiency period, avoided costs are calculated using the Company's production cost model GRID. Net power costs ("NPC") are calculated using two system dispatch simulations, one without any new QF resources and one with an additional 10 MW QF resource included at zero cost. The difference in NPC between the two GRID runs is the avoided energy cost. The current method also calls for additional capacity costs to be added to avoided costs during the sufficiency period based on the fixed costs of a SCCT. Capacity costs of the SCCT are included for the portion of each year the GRID model is determined to be 'capacity deficient,' i.e. the model projects available resources are less than forecasted peak load.

The period of resource deficiency begins coincident with the next deferrable resource identified in the Company's most recent IRP or IRP Update. During the deficiency period avoided costs are equal to the fixed and variable costs of a proxy resource, currently a combined cycle combustion turbine ("CCCT").

Q. Is this same method used to calculate avoided costs for large QFs under Schedule 38?

A. No. Avoided costs for large QFs are calculated using the Proxy/Partial Displacement Differential Revenue Requirement ("PDDRR") method. The methods are similar in that both utilize the GRID model to determine avoided costs during the sufficiency period and both include capacity costs of a CCCT beginning with the next deferrable resource in the Company's IRP. The Proxy/PDDRR method, however, continues to use a combination of the GRID model and partial displacement of a CCCT during the deficiency period rather than basing avoided costs solely on the proxy CCCT. Furthermore, the Proxy/PDDRR method accounts for the specific characteristics of a proposed QF, including geographic location and any transmission constraints, and prices are prepared for individual QF projects rather than providing the same published prices for all QFs.

As described earlier, the Commission recently adopted modifications to the Proxy/PDDRR calculation in the Renewable QF Docket. Despite the simplicity of the method used to calculate avoided costs under Schedule 37, the concepts adopted by the Commission for large QFs are equally applicable to small QFs and should be incorporated into Schedule 37 rates.

Q. Will the changes proposed by the Company make Schedule 37 unnecessarily complicated?

A. No. The changes proposed by the Company are discrete and easy to administer. Distinct rates will be published for base load, solar, and wind resources, and the mechanics of the avoided cost calculation will largely remain intact. The benefits of transparency and ease of use afforded by Schedule 37 will not be diminished by the Company's proposals in this filing.

<u>PROPOSED CHANGES</u>

Integration Costs

Q. Has the Commission addressed how wind integration costs should be included in the calculation of avoided costs for intermittent resources?

A. Yes. In its Order dated October 31, 2005, in Docket No. 03-035-14 the Commission adopted the recommendation by the Division of Public Utilities (the "Division") to use a $3.00 per megawatt hour as the starting point for integration costs when determining avoided costs for large QFs. It also adopted the Division's recommendation to revisit the issue of wind integration as real data became available.[2] Since the 2005 Order, PacifiCorp has performed several wind integration analyses including the 2010 Wind Integration Study, and the 2012 Wind Integration Study. The Company's studies are developed using a collaborative process involving input from various stakeholders and are used in the IRP and to set rates in general rate cases.

In the Renewable QF Docket, the Commission approved use of the Company's GRID model to calculate wind integration costs, relying on the wind integration studies as inputs, to be applied against the avoided costs for large QFs. The Commission also adopted solar integration charges of $2.83 per MWh for Fixed Solar resources and $2.18 per MWh for Tracking Solar resources, with these values to remain in effect pending the Company completing and filing a solar integration study.

Q. Do current Schedule 37 rates include an adjustment for integration costs?

A. No.

Q. Are retail customers indifferent if integration costs are not included in the calculation of avoided costs?

A. No. If no adjustment is made to avoided costs to account for the cost to integrate intermittent resources, retail customers must bear the cost of integrating these

[2] 2005 Order, p.24

resources into the Company's system, violating the ratepayer indifference objective prescribed by PURPA.

Q. What does the Company propose with regard to integration costs in Schedule 37?

A. Avoided cost rates in Schedule 37 should be adjusted for integration costs of wind and solar resources. Consistent with the Commission's order in the Renewable QF Docket, the Company proposes to publish distinct price streams for base load, wind, Fixed Solar, and Tracking Solar resources. Prices for wind and solar resources are adjusted (i.e. reduced) for integration costs consistent with the method approved in the Renewable QF Docket. In the current Schedule 37 filing, the Company used its most recent wind integration costs as filed in its 2013.Q2 Schedule 38 compliance filing. Solar integration costs were included as described in the Renewable QF Docket. When a solar integration study is available, the Company will use it to determine future adjustments for solar integration. Tables 6a through 6d in Appendix 1 of the Company's Schedule 37 filing show how the adjustment for integration costs is made to the avoided cost rates.

Capacity Contribution

Q. Has the Commission addressed how capacity contribution should be reflected in the calculation of avoided costs for intermittent resources?

A. Yes. In the Renewable QF Docket the Commission approved an adjustment to recognize the capacity contribution of intermittent resources in the determination of avoided costs. The Commission adopted interim values for capacity contribution, setting wind at 20.5 percent, and Fixed and Tracking Solar at 68 percent and 84 percent, respectively. These capacity contribution values are applied to the fixed costs of the deferred capacity resource included in avoided costs. These interim values are in effect until the Company calculates the capacity contribution of wind and solar resources using either the effective load carrying capability ("ELCC") method or the capacity factor allocation methodology ("CF Method") considering loss of load probability.

Q. Do current Schedule 37 rates recognize a reduced level of capacity payments for intermittent resources?

A. Yes. Schedule 37 currently includes a provision reducing the capacity payment available to wind resources to 20 percent of the value available for all other QF resources. No reduction to the capacity payment is made for solar resources.

Q. Are retail customers indifferent if the capacity contribution of intermittent solar and wind QFs is not reflected in the calculation of avoided costs?

A. No. As described earlier, during the deficiency period Schedule 37 rates are calculated as the all-in cost of a base load CCCT. If no adjustment is made to reflect the capacity contribution of a QF, rates paid to intermittent solar and wind QFs would reflect deferral of a base load resource the same size as the QF even though the QF only provides a portion of the capacity provided by the CCCT.

Q. What does the Company propose with regard to capacity contribution in Schedule 37?

A. Capacity costs included in the calculation of Schedule 37 rates should be adjusted for the capacity contribution of intermittent wind and solar resources. Consistent with the Commission's order in the Renewable QF Docket, the Company applied the interim capacity contribution values for wind and solar resources to the avoided capacity costs. The Company is currently working on a capacity contribution study using the CF Method in support of its 2015 IRP. When the Company completes the calculation of capacity contribution based on the CF Method, presently expected to be completed in August 2014, the Company will file the study with the Commission and the corresponding values will be used in future Schedule 37 filings.

Tables 6a through 6d in Appendix 1 of the Company's Schedule 37 filing show how the adjustment for capacity contribution is made to the avoided cost rates. Without an adjustment for capacity contribution, intermittent wind and solar QFs would be compensated similar to a base load generator and payments to these QFs would not accurately reflect the Company's avoided costs.

Capacity Costs During Sufficiency Period

Q. Has the Commission addressed inclusion of capacity costs during the sufficiency period?

A. Yes. In the Renewable QF Docket the Commission ordered that the Proxy/PDDRR method properly reflects avoided capacity costs during the sufficiency period based on the costs associated with front office transactions. The Commission rejected proposals to include avoided capacity based on a CCCT stating, "the inclusion of additional capacity value when a FOT is displaced would over-compensate the QF and violate the ratepayer neutrality objective."[3]

Q. Do current Schedule 37 rates include additional capacity costs during the sufficiency period?

[3] Docket No. 12-035-100, August 16, 2103 Order at 35.

A. Yes. In its December 14, 2009, order in Docket 09-035-T14 the Commission explained, "In Docket No. 03-035-T10, we approved inclusion of capacity payments based on the fixed costs of a simple cycle combustion turbine ("SCCT") proxy resource for months during the resource sufficiency period in which the Company is capacity deficit *and the Company plans to purchase this capacity*." (Emphasis added).

Q. Are the Company's resource procurement plans an important consideration in the determination of Schedule 37 rates?

A. Yes. The current method for calculating Schedule 37 rates is directly dependent upon the Company's IRP, including the demarcation of the resource deficiency period and the type and cost of the deferrable resource. The Commission has consistently referred back to the Company's IRP when determining whether proposed avoided cost rates are appropriate. Most recently, when the Commission found in the Renewable QF Docket that additional capacity costs should not be added in the sufficiency period for the Proxy/PDDRR method it concluded, "The evidence proffered by the Company and the Office shows a QF's displacement of FOTs, as determined within the GRID model, results in what PacifiCorp would have otherwise paid for capacity purchases."

Q. What does the Company propose with regard to capacity payments during the sufficiency period?

A. Capacity payments based on a SCCT during the sufficiency period should be removed from the calculation of Schedule 37 avoided costs, consistent with the Commission's order in the Renewable QF Docket and consistent with the

Company's 2013 IRP and IRP Update. Prior to the start of the deficiency period in 2027, the Company will not procure additional thermal capacity resources; rather, it will utilize FOTs, or wholesale market purchases, to meet its needs. Avoided cost prices during this period must be consistent with the Company's resource procurement plans to avoid burdening retail customers with QF costs that are higher than the costs actually avoided by the Company. Based on the Commission's order in the Renewable QF Docket, it does not make sense to include additional capacity payments during the sufficiency period for a QF under 3 MW when it is clearly not appropriate for a QF larger than 3 MW.

Carbon Costs

Q. Please explain the adjustment made to remove a carbon tax adder from the Company's OFPC for electricity.

A. The OFPC for electricity is one of the many inputs to the GRID model used to calculate avoided costs during the sufficiency period under Schedule 37. In recent years, the Company has included in its OFPC for electricity an adder for an assumed tax on carbon dioxide emissions. The March 2014 OFPC, the most recent OFPC at the time of the Company's filing, included a $16 per ton carbon tax beginning in 2022. To calculate Schedule 37 avoided costs, the Company used the March 2014 OFPC, but adjusted it to remove the assumed carbon tax beginning in 2022. Because the resource deficiency period begins in 2027, removing the carbon tax from the OFPC only impacts the Schedule 37 rates from 2022 to 2026.[4]

[4] The Company's OFPC consists of available market quotes for the first 72 months, a blend of market quotes and modeled market prices for 12 months, and modeled prices thereafter. The blend of modeled prices and market quotes occurs during 2021; consequently, adjusting the modeled prices beginning in 2022 also impacts the blended prices in 2021.

Q. Has the Commission addressed whether a carbon tax should be included in the calculation of avoided costs?

A. Yes. In Docket 09-035-T14 the Company inadvertently included the cost of a potential carbon tax in the estimate of non-fuel variable operation and maintenance costs of the proxy CCCT for Schedule 37. The Commission affirmed that such a cost should not be included in avoided costs, and it was corrected by the Company.

Q. Is it inconsistent with the Company's IRP to use an OFPC excluding a carbon tax for avoided cost purposes?

A. No. The Company considers the cost and risk of potential carbon regulation in its IRP, and several different variations of its OFPC are included in the IRP. In its September 30, 2009, order in Docket 09-035-T14 the Commission stated, "While in our June 28, 1992, Report and Order on Standards and Guidelines in Docket No. 90-2035-01 [In the Matter of Analysis of an IRP for PacifiCorp] we directed the Company to include an assessment of environmental risks in the IRP planning process, we have not approved the inclusion of an estimate of the cost of complying with future carbon legislation in the avoided cost calculation."

Similarly, in the Renewable QF Docket the Commission rejected proposals to increase avoided costs to recognize a QF's ability to reduce potential future costs related to environmental regulation. In the Renewable QF Docket the Commission found:

> "Rather, to the extent potential costs associated with environmental risks and hedging can be projected and factored into Company decision making, they should be accounted for in PacifiCorp's IRP modeling and resource portfolio evaluation process where cost, risk

and uncertainty are evaluated to identify a least-cost, risk-adjusted, long-term resource plan."[5]

Volumetric Rates

Q. Please explain the Company's proposal related to the payment structure available to QFs under Schedule 37.

A. The Company proposes to continue to offer payments under Schedule 37 based on the energy produced by the QF (i.e. the volumetric winter and summer prices for on-peak and off-peak hours) and to eliminate the option for the QF to receive separate payments for capacity and energy. Under the current Schedule 37 the two pricing options offered do not produce the same total payments to an individual QF. Furthermore, the separate capacity and energy payment structure may result in payments to low-capacity factor resources, such as wind and solar QFs that are inconsistent with the Company's ability to avoid capacity costs.

Q. How are the separate capacity and energy prices calculated under the current Schedule 37 tariff?

A. Under the current Schedule 37, a QF has the option of choosing separate capacity payments calculated based on the fixed costs of the deferrable capacity resource. A flat energy price is paid based on the GRID model during the sufficiency period and the energy costs of the proxy CCCT during the deficiency period. The separate capacity payments are stated as a fixed dollars-per-KW-month amount, and are paid based on the QF's maximum 15 minute generation during peak hours.

Q. How are the volumetric prices currently calculated for Schedule 37?

[5] Docket No. 12-035-100, August 16, 2013 Order at 41.

A. Schedule 37 currently includes volumetric prices differentiated by season (summer and winter) and by on- and off-peak hours. Off-peak prices are equal to the avoided energy costs calculated in GRID during the sufficiency period and the cost of fuel for the proxy CCCT during the deficiency period. To calculate on-peak prices, the avoided capacity costs are spread to the on-peak hours using the capacity factor of the proxy resource as defined in the IRP. On-peak prices are equal to the off-peak (avoided energy rates) plus the capacity costs spread to on-peak hours. Table 6a in Appendix 1 of the Company's Schedule 37 filing shows the calculation for a base load resource.

Q. Has the Commission approved this method for calculating volumetric prices?

A. Yes. In its December 14, 2012, order in Docket No. 09-035-T14 the Commission approved the calculation of on-peak energy prices using the on-peak capacity factor of the proxy resource as defined in the IRP.

Q. What is the outcome of continuing to offer two separate pricing options?

A. Under the capacity and energy payment structure, the QF is paid the same total dollars for capacity regardless of its generation output. Under the volumetric option, the QF will receive the total capacity dollars only if it generates an equivalent amount of energy during on peak hours as the avoided resource. An intermittent resource, such as a wind or solar project projected to have a relatively low annual capacity factor, would certainly select the capacity and energy design. The table below compares the Company's proposed rates on a $/MWh basis for various QF types under the capacity and energy payment structure versus a volumetric rate design.

Table 1
Company Proposed Rates

	Capacity Factor	Capacity/Energy Structure	Volumetric
Base Load	85.0%	$45.90	$45.46
Wind	40.0%	$37.57	$35.79
Fixed Solar	18.5%	$54.39	$43.77
Tracking Solar	29.0%	$51.51	$45.81

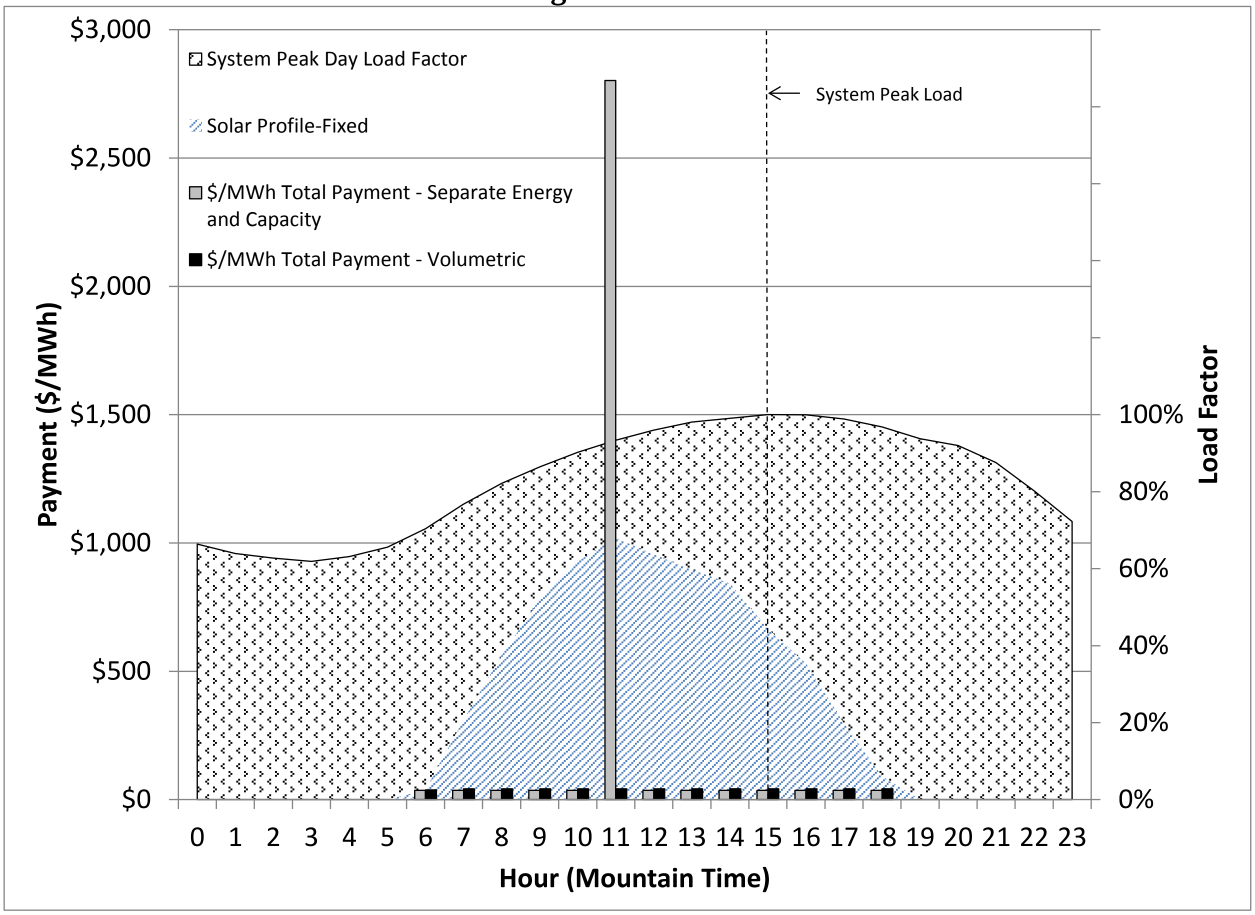
Q. Are there any issues with paying a QF the capacity payment based on its maximum 15-minute generation during on-peak hours?

A. Yes. Using the maximum 15-minute on-peak generation to determine the capacity payment for intermittent resources may result in capacity payments to a QF even though the Company cannot actually avoid capacity costs. For example, a 3 MW solar QF will likely generate its maximum output during July between 11:00 AM and 12:00 PM and will receive its monthly capacity payment based on its nameplate capacity of 3 MW. However, the Company's system load likely will not reach its peak until between 3:00 PM and 4:00 PM when the generation from the solar resource is significantly lower.

Under volumetric rates, the compensation for capacity is spread to all on peak hours based on the expected output of the deferred resource. Figure 1 below illustrates the difference between the two pricing structures.[6]

[6] Figure 1 reflects the forecasted system peak day in July 2015.

Figure 1



Q. Has the Commission previously considered whether the separate capacity payment over-compensates QFs with a low capacity factor?

A. Yes. In its June 2004 order in Docket 03-035-T10 the Commission eliminated the capacity and energy payment option for wind QFs, finding that it systematically overpays low-capacity-factor resources. On reconsideration, the Commission reversed its decision and reinstituted the capacity and energy payment option for wind QFs "in order to remove a stated impediment to wind resource development and to address concerns of discrimination."[7] However, the Commission determined that the capacity payments to wind QFs would only be 20 percent of the stated rate

[7] July 20, 2004 Order on Reconsideration, Docket No. 03-035-T10, at 3.

for all other QF types.

<u>TRANSMISSION CONSTRAINT</u>

Q. Please describe the potential issue related to transmission constraints for QFs located in southern Utah.

A. On April 29, 2014, PacifiCorp Transmission identified on its Open Access Same-time Information System (OASIS) that there was no remaining south-to-north transmission capacity across the Huntington/Sigurd cutplane in the area of central Utah. Such a transmission constraint is relevant to avoided costs because many of the recently-proposed QF projects in Utah are located south of the cutplane while most of the Company's Utah retail load is north of the cutplane. QFs located south of the cutplane must be integrated along with other network resources and may cause the Company to back down its existing thermal resources if transmission capacity is not sufficient. At the time of the Company's May 7, 2014, filing it was evaluating what impact this may have on Schedule 37 avoided costs.

Upon further review the Company believes the transmission constraint will be an issue for all QFs (Schedule 37 and Schedule 38) once enough resources are located south of the cutplane and the capacity constraint is reached. However, the Company does not anticipate this will occur before the 25 MW cumulative cap on Schedule 37 is reached again.[8] Consequently, the Company does not propose any changes to Schedule 37 in this filing to address the issue of transmission constraints, but the Company may address this issue further in subsequent updates to Schedule

[8] For large QFs priced under Schedule 38, it is important that the GRID model reflect the constraint in the transmission topology to calculate the avoided cost of energy including the impact of backing down existing thermal resources south of the constraint.

37 prices. Notably, the 25 MW cumulative cap on the availability of Schedule 37 rates provides meaningful ratepayer protection in the event issues do arise after avoided cost rates are determined, and it provides opportunity for the Company to address potential impacts from transmission constraints in the future if warranted.

Q. Does this conclude your testimony?

A. Yes.