

September 27, 2022

***VIA ELECTRONIC FILING***

Public Utility Commission of Oregon  
Attn: Filing Center  
201 High Street SE, Suite 100  
Salem, OR 97301-3398

**Re: UE 407—PacifiCorp's Direct Testimony for its Automatic Adjustment Clause for Wildfire Protection Costs**

PacifiCorp d/b/a Pacific Power hereby submits for filing the Direct Testimony and Exhibits of Mr. Matthew McVee, Mr. Allen Berreth, and Ms. Judith M. Ridenour in the above captioned proceeding. Included with this filing are electronic workpapers.

The Company respectfully requests that all formal information requests regarding this filing be emailed to [datarequest@pacificorp.com](mailto:datarequest@pacificorp.com). Informal questions regarding this advice filing may be directed to Cathie Allen, Regulatory Affairs Manager, at (503) 813-5934.

Sincerely,



Shelley McCoy  
Director, Regulation

Enclosures

Docket No. UE 407  
Exhibit PAC/100  
Witness: Matthew McVee

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**PACIFICORP**

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Direct Testimony of Matthew McVee

September 2022

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1                                   **I. INTRODUCTION AND QUALIFICATIONS**

2   **Q. Please state your name, business address, and present position with PacifiCorp**  
3   **d/b/a Pacific Power (PacifiCorp or the Company).**

4   A. My name is Matthew McVee, and my business address is 825 NE Multnomah Street,  
5   Suite 2000, Portland, Oregon 97232. I am currently employed as Vice President,  
6   Regulatory Policy and Operations.

7   **Q. Please describe your education and professional experience.**

8   A. I have a Bachelor of Science Degree in Biology from Lewis and Clark College and a  
9   Juris Doctorate Degree from Lewis and Clark Law School. I have provided legal  
10   counsel to various clients in regulatory matters at both state regulatory commissions  
11   and the Federal Energy Regulatory Commission, and acted as administrative attorney  
12   to a commissioner at the Nevada Public Utilities Commission. I joined PacifiCorp in  
13   2005 as senior legal counsel for transmission. I became General Counsel for the  
14   Western Electricity Coordinating Council in 2008 and joined the law firm Troutman  
15   Sanders P.C. as a partner in 2010. I rejoined the PacifiCorp legal department in  
16   2013. Before taking my current position in November 2021, I was Chief Regulatory  
17   Counsel for PacifiCorp. My current responsibilities include managing regulatory  
18   relations with the California, Oregon, and Washington state regulatory commissions,  
19   staffs, and stakeholders; developing regulatory policy strategies for PacifiCorp; and  
20   managing PacifiCorp's regulatory discovery and filings group.

21   **Q. Have you testified in other regulatory proceedings?**

22   A. Yes. I have testified on various matters in Oregon and California.

1 **II. SUMMARY OF TESTIMONY**

2 **Q. Please summarize your testimony.**

3 A. Due to the growing threat of catastrophic wildfire in the western United States,  
4 PacifiCorp has developed a comprehensive plan for wildfire mitigation efforts in all  
5 its western service territories. The Public Utility Commission of Oregon  
6 (Commission) has approved PacifiCorp’s Oregon Wildfire Protection Plan (WPP).<sup>1</sup>  
7 The WPP describes PacifiCorp’s comprehensive plan for wildfire mitigation in  
8 compliance with the requirements in Oregon Administrative Rule (OAR)  
9 860-300-0002.

10 On July 12, 2022, PacifiCorp filed an application for approval of an automatic  
11 adjustment clause for recovery of incremental costs and capital investments  
12 associated with its WPP.<sup>2</sup> I recommend that the Commission approve the automatic  
13 adjustment clause, identified as the Wildfire Protection Plan Cost Recovery  
14 Adjustment (WPP Adjustment), as proposed in the Company’s application.

15 **Q. Please identify the other PacifiCorp witnesses supporting the WPP Adjustment.**

16 A. PacifiCorp’s filing is supported by testimony and exhibits from the following  
17 witnesses:

18 **Mr. Allen Berreth**, Vice President of Transmission and Distribution  
19 Operations, provides testimony and exhibit to support the recovery of PacifiCorp’s  
20 incremental costs and capital investments that were included in the 2022 WPP.

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<sup>1</sup> *In the Matter of PacifiCorp d/b/a Pacific Power 2022 Wildfire Mitigation Plan*, Docket No. UM 2207, Order No. 22-131 (April 28, 2022).

<sup>2</sup> *In the Matter of the Application of PacifiCorp d/b/a Pacific Power, For Approval of an Automatic Adjustment Clause for recovery of costs associated with PacifiCorp’s Wildfire Protection Program*, Docket No. UE 407, Application (July 12, 2022).

1                   **Ms. Judith M. Ridenour**, Specialist, Pricing and Cost of Service, provides  
2                   testimony and exhibits on the calculation of the proposed Schedule 190 rate spread  
3                   and rates.

4                   **III. WILDFIRE PROTECTION PLAN COST RECOVERY ADJUSTMENT**

5                   **Q. Are public utilities that provide electric service in Oregon required to have and**  
6                   **operate in compliance with a WPP?**

7                   A. Yes. Oregon Revised Statute (ORS) 757.963(1) provides that “A public utility that  
8                   provides electricity must have and operate in compliance with a risk-based wildfire  
9                   protection plan that is filed with the Public Utility Commission and has been  
10                  evaluated by the commission.”

11                  **Q. Has PacifiCorp filed a WPP with the Commission?**

12                  A. Yes. On December 30, 2021, PacifiCorp filed its 2022 WPP with the Commission.<sup>3</sup>  
13                  The 2022 WPP describes PacifiCorp’s comprehensive plan for wildfire mitigation in  
14                  compliance with the requirements in OAR 860-300-0002.

15                  **Q. Did the Commission approve PacifiCorp’s WPP?**

16                  Yes. The Commission approved PacifiCorp’s 2022 WPP on April 28, 2022.<sup>4</sup> An  
17                  updated WPP will be filed annually by December 31. A copy of the 2022 WPP is  
18                  provided in the application filed to this docket on July 12, 2022.

19                  **Q. Are public utilities allowed to recover costs associated with a WPP?**

20                  A. Yes. ORS 757.963(8) allows for public utilities to recover through rates “[a]ll  
21                  reasonable operating costs incurred by, and prudent investments made by, a public

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<sup>3</sup> *In the Matter of PacifiCorp d/b/a Pacific Power 2022 Wildfire Mitigation Plan*, Docket No. UM 2207, Wildfire Mitigation Plan (Dec. 30, 2021).

<sup>4</sup> *In the Matter of PacifiCorp d/b/a Pacific Power 2022 Wildfire Mitigation Plan*, Docket No. UM 2207, Order No. 22-131 (April 28, 2022).

1 utility to develop, implement or operate a wildfire protection plan under this  
2 section[.]” Recovery of ‘all’ costs is generally addressed through deferred  
3 accounting. PacifiCorp filed its application for deferred accounting to track the  
4 incremental operating costs and capital investments made to implement and operate  
5 PacifiCorp’s WPP on January 5, 2022.<sup>5</sup> As noted in the application, PacifiCorp  
6 indicated that the Company would make a subsequent filing in 2022 for approval of a  
7 rate schedule and automatic adjustment clause to begin recovery of these costs.

8 **Q. Why did PacifiCorp plan to file an automatic adjustment clause in addition to**  
9 **the deferral application?**

10 A. In ORS 757.963(8), the Oregon legislature explicitly stated that the Commission  
11 “shall establish an automatic adjustment clause, as defined in ORS 757.210, or  
12 another method to allow timely recovery of the costs.” An automatic adjustment  
13 clause allows for an annual update to the rate based on a future forecast and  
14 amortization of deferred costs, either as an additional surcharge or surcredit.

15 **Q. Does a deferral alone provide for timely recovery of those deferred costs?**

16 A. No. Deferred costs may not be fully recovered until the utility’s next rate case or be  
17 subject to earnings test or caps on amortization.

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<sup>5</sup> *In the Matter of PacifiCorp d/b/a Pacific Power, Application for Approval of Deferred Accounting for Operating Costs and Capital Investments Made to Implement and Operate the Company’s Oregon Wildfire Protection Plan*, Docket No. UM 2221, Application (Jan. 5, 2022).

1 **Q. Has the Commission approved the deferred accounting of costs associated with**  
2 **PacifiCorp’s WPP?**

3 A. Yes. On July 13, 2022, the Commission adopted Staff’s recommendation to approve  
4 the Company’s application.<sup>6</sup>

5 **Q. Is the Commission required to establish an automatic adjustment clause to**  
6 **facilitate the recovery of costs associated with a public utility’s WPP?**

7 A. No, but an alternative must still provide for recovery of all prudently incurred costs in  
8 a timely manner as explicitly stated in ORS 757.963(8).<sup>7</sup> An automatic adjustment  
9 clause is the best method to meet the requirements of the statute.

10 **Q. Has PacifiCorp proposed an automatic adjustment clause?**

11 A. Yes. In the application filed to this docket on July 12, 2022, PacifiCorp requested  
12 that the Commission approve its proposed WPP Adjustment. This application  
13 provides a description of the WPP Adjustment. The application also provides the  
14 WPP revenue requirement, calculation of the proposed Schedule 190 rates, estimated  
15 effect of proposed rates, proposed and revised tariff sheets, and a copy of PacifiCorp’s  
16 2022 WPP.

17 **Q. Can you provide a description of the WPP Adjustment?**

18 A. If the Commission approves the application in this docket, the Company will make an  
19 annual advice filing adjusting Schedule 190 rates to reflect collection for the  
20 Company’s projections of the WPP incremental expense and capital investment for

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<sup>6</sup> *In the Matter of PacifiCorp d/b/a Pacific Power, Application for Approval of Deferred Accounting for Operating Costs and Capital Investments Made to Implement and Operate the Company’s Oregon Wildfire Protection Plan*, Docket No. UM 2221, Order (July 13, 2022).

<sup>7</sup> “The Commission shall establish an automatic adjustment clause, as defined in ORS 757.210, or another method to allow timely recovery of the costs.”



1 the coming year, as well as incorporating any variances from the previous year. The  
2 forecast WPP expense for the next calendar year will be based on the annual WPP.  
3 The residual amounts in the balancing account may result in an increase or a decrease  
4 in the amounts to be collected through the adjustment schedule. The combined  
5 forecast amounts plus residual balance amount will be the total amount to be  
6 collected through Schedule 190 rates for the year. The Company proposes to collect  
7 the proposed revenue requirement through non-bypassable, per kilowatt-hour rates  
8 calculated on a distribution rate spread. The calculation of the proposed Schedule  
9 190 rate spread and rates are provided in the testimony and exhibits of Ms. Ridenour.

10 **Q. Does the WPP Adjustment provide for timely recovery of all costs associated**  
11 **with PacifiCorp's WPP?**

12 A. Yes.

13 **Q. Are the costs covered by the WPP Adjustment subject to recovery under any**  
14 **other mechanism?**

15 A. No. While there will be costs associated with the WPP included in base rates  
16 beginning in 2023, those costs will be tracked under the WPP deferral and the WPP  
17 Adjustment. They will not be subject to PacifiCorp's Wildfire Mitigation and  
18 Vegetation Management (WMVM) Mechanism because recovery under that  
19 mechanism is tied to PacifiCorp's vegetation management program audit results and  
20 not the activities under the WPP.

21 **Q. Can you please explain how the WPP Adjustment is different from PacifiCorp's**  
22 **existing WMVM?**

23 A. Yes. In order to implement this legislation, PacifiCorp proposed to separate the

1 wildfire mitigation (including wildfire related vegetation management costs)  
2 component from PacifiCorp's normal vegetation costs through the creation of this  
3 new mechanism, the WPP Adjustment. The costs covered in the WPP Adjustment  
4 relate only to the activities addressed in PacifiCorp's WPP. On August 25, 2022,  
5 PacifiCorp filed a stipulation on the WMVM in its current general rate case,  
6 docket UE 399. That stipulation specified that treatment of the difference between  
7 the WMVM and this proceeding.<sup>8</sup>

8 **Q. Do you recommend that the Commission approve the WPP Adjustment?**

9 A. I recommend that the Commission approve the WPP Adjustment as proposed in the  
10 Company's application filed to this docket on July 12, 2022.

11 **Q. Does this conclude your testimony?**

12 A. Yes.

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<sup>8</sup> *In the Matter of PacifiCorp, d/b/a Pacific Power, Request for A General Rate Revision*, Docket No. UE-399, Partial Stipulation on Wildfire Mitigation and Vegetation Management Issues at 13 (Aug. 25, 2022).

Docket No. UE 407  
Exhibit PAC/200  
Witness: Allen Berreth

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**PACIFICORP**

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Direct Testimony of Allen Berreth

September 2022

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**ATTACHED EXHIBITS**

Exhibit PAC/201—PacifiCorp Service Territory with FHCA

1                                   **I. INTRODUCTION AND QUALIFICATIONS**

2   **Q. Please state your name, business address, and present position with PacifiCorp**  
3   **d/b/a Pacific Power (PacifiCorp or the Company).**

4   A. My name is Allen Berreth. My business address is 825 NE Multnomah Street, Suite  
5   1700, Portland, Oregon 97232. My present position is Vice President of  
6   Transmission and Distribution Operations for PacifiCorp. I am responsible for the  
7   departments that support the operations, maintenance, and construction of  
8   PacifiCorp’s transmission and distribution systems; such as Asset Management,  
9   Investment Delivery, Finance, Real Estate, GIS, Facilities, Vegetation Management,  
10   and Wildfire Mitigation Planning.

11   **Q. Briefly describe your education and professional experience.**

12   A. I have a Bachelor of Science degree in Electrical Engineering with a focus in electric  
13   power systems from the University of Idaho and a Masters of Business  
14   Administration from Utah State University. I have been Vice President of  
15   Transmission and Distribution Operations since October 2020. Prior to my current  
16   position, I have held positions in delivery assurance, asset management, work  
17   planning, business improvement, and field engineering since joining PacifiCorp in  
18   1998.

19   **Q. Have you testified in previous regulatory proceedings?**

20   A. Yes, I have testified previously in Oregon, Washington, and California.

21                                   **II. PURPOSE OF TESTIMONY**

22   **Q. What is the purpose of your testimony?**

23   A. The purpose of my testimony is to support the recovery of PacifiCorp’s incremental

1 costs and capital investments that were included in the 2022 Wildfire Protection  
2 Plan (WPP). Through my testimony, I describe how these investments are prudent  
3 and supported by the WPP.

4 **III. BACKGROUND ON WILDFIRE RISK IN OREGON**

5 **Q. How have the risks associated with wildfires evolved in PacifiCorp's service**  
6 **territories?**

7 A. There has always been some degree of wildfire risk across PacifiCorp's service  
8 territories, including in Oregon. This risk is inherent to operating an electric utility  
9 and is elevated for utilities in the Western United States where climates are arid year-  
10 long in some areas, or seasonally in others. However, the frequency, severity, and  
11 costs of catastrophic wildfires are increasing across the West. Recent experiences  
12 with catastrophic and tragic wildfires have resulted in an even greater focus on  
13 wildfire risk mitigation by public utilities in the region.

14 **Q. What are the elements of the WPP?**

15 A. PacifiCorp is adapting to the changes in wildfire risk through adoption of accelerated  
16 and enhanced wildfire mitigation measures that conform with Oregon legislation,  
17 including Senate Bill 762, for utility wildfire mitigation. PacifiCorp identified key  
18 goals to help inform its wildfire mitigation approach: 1) minimize the risk of wildfires  
19 from PacifiCorp equipment; 2) promptly address any problems attributed to  
20 PacifiCorp equipment if they do occur; 3) be prepared to address wildfires from other  
21 sources; and 4) respond when a wildfire puts utility equipment at risk. PacifiCorp  
22 took these goals and engaged in an extensive modeling process to develop a risk-  
23 based approach to achieving them. This risk-based approach facilitates smart

1 investments targeted to places on PacifiCorp's system where they will have the most  
2 impact and ensures that PacifiCorp's human capital is also deployed in areas where  
3 they will have the greatest impact. These targeted investments are incremental to  
4 PacifiCorp's investment in the ordinary course of its business and will meaningfully  
5 reduce the wildfire risk on the Company's system.

6 **Q. Please describe how the risk of wildfire has been modeled in PacifiCorp's service**  
7 **territory.**

8 A. PacifiCorp recognizes that if certain weather and fuel conditions are present, a  
9 disruption of normal operations on the electrical network, called a "fault", can result  
10 in the ignition of a fire. Under certain weather conditions and in the vicinity of  
11 wildland fuels, such an ignition can grow into a harmful wildfire, potentially even  
12 growing into a catastrophic wildfire causing great harm to people and property.  
13 PacifiCorp's risk analysis reviews fire history, the recorded causes of the fires, the  
14 acreage impact of the fires, and when in the year the fires typically occur. Using that  
15 information, the risk analysis identifies the logic for a risk-informed method to  
16 strategically address utility wildfire risks. PacifiCorp patterned its wildfire risk  
17 modeling on the methodology developed after a long and iterative process in  
18 California. To take advantage of the experience learned through that process,  
19 PacifiCorp engaged REAX Engineering Inc., a fire-science engineering firm, to  
20 identify areas of elevated wildfire risk, designated as Fire High Consequence Areas  
21 (FHCA).

22 The data and process used in PacifiCorp's analysis are as follows:

23 1) Topography of the land, including elevation, slope, and aspect;

- 1           2) Fuel data which quantify fuel loading, fuel particle size, and other
- 2                   quantities needed by fire models to calculate the rate of spread;
- 3           3) Weather Research and Forecasting, which is a hybrid of weather
- 4                   modeling and surface weather observations (including temperature,
- 5                   relative humidity, wind speed/direction, and precipitation);
- 6           4) Historical fire weather days spanning the period from January 1,
- 7                   1979, through December 31, 2017;
- 8           5) Estimated live fuel moisture;
- 9           6) Ignition modeling, using Monte Carlo simulated ignition scenarios;
- 10                   and
- 11           7) Fire spread modeling.

12           In addition, potential impact was considered by factoring population density.

13           In general, if population density did not correlate to fuel and fire weather history, an  
14           area would not be considered a candidate for FHCA designation. A final confirmation  
15           exercise was completed by evaluating the FHCA against historical fire perimeters  
16           (which are the final recorded footprint for any given fire), existing Company facility  
17           equipment, and the Company's service territories. The resulting FHCA and  
18           PacifiCorp's service territories are shown in Exhibit PAC/201.

19   **Q.   Based on this wildfire risk modeling, what components of PacifiCorp's system**  
20   **have been identified as existing in a FHCA?**

21   A.   Based on the wildfire risk modeling conducted in PacifiCorp's service area, a large  
22   portion of PacifiCorp's service territory in southern Oregon, northern California and



1 parts of Washington and Utah are identified as having sections inside the FHCA and  
2 are candidates for wildfire mitigation project investments.

3 **Q. What are the planned incremental capital investment and incremental expense**  
4 **that are resulting from the Wildfire Mitigation Plan?**

5 A. The 2022 Wildfire Mitigation Plan has identified \$23.7 million in incremental capital  
6 investment and \$19.7 million in incremental expense for 2022. The tables below  
7 from PacifiCorp’s wildfire protection plan provide a detailed breakdown of costs.

*Excerpt from 2022 WPP Table 1:*

*Planned Incremental Capital Investment by Program Category (\$millions)*

<b>Program Category</b>	<b>2022</b>
System Hardening	\$ 16.8
<i>FHCA Line Rebuild</i>	<i>\$ 5.7</i>
<i>System Automation</i>	<i>\$ 8.6</i>
<i>Fuse Replacement</i>	<i>\$ 2.5</i>
Situational Awareness <sup>5</sup>	\$ 5.3
<i>Weather Station Installs</i>	<i>\$ 3.6</i>
<i>Fire Impact Modelling</i>	<i>\$ 1.7</i>
System Operations	\$ 1.3
Public Safety Partner Coordination	\$ 0.3
<b>Grand Total</b>	<b>\$ 23.7</b>

*Excerpt from 2022 WPP Table 2:*

*Planned Incremental Expense by Program Category (\$millions)*

<b>Program Category</b>	<b>2022</b>
Risk Modeling and Drivers	\$ 0.1
Inspection & Correction	\$ 0.7
Vegetation Management	\$ 15.6
Situational Awareness	\$ 0.9
System Operations	\$ 0.2
PSPS Program	\$ 0.9
Public Safety Partner Coordination	\$ 0.1
Wildfire Plan Engagement Strategy	\$ 0.1
Education and Awareness	\$ 0.5
Industry Collaboration	\$ 0.1
Plan Monitoring & Implementation <sup>6</sup>	\$ 0.7
<b>Grand Total</b>	<b>\$ 19.7</b>

8 My testimony below describes the importance of these individual elements as part of  
9 PacifiCorp’s overall wildfire mitigation plan.

1 **IV. 2022 WILDFIRE PROTECTION PLAN INCREMENTAL CAPITAL COSTS**

2 **A. System Hardening**

3 **Q. How much incremental capital investment is PacifiCorp proposing to spend on**  
4 **system hardening in 2022?**

5 A. PacifiCorp is proposing to spend \$16.8 million on system hardening, which includes  
6 line rebuilds, system automation and fuse replacement.

7 **Q. Please explain what system hardening is in the context of the Company's wildfire**  
8 **mitigation efforts.**

9 A. System hardening is an engineered response to an identified risk to the electrical  
10 system. System hardening includes retrofitting specific devices or components within  
11 the system to make it more resilient and may also include the wholesale replacement  
12 of legacy equipment when retrofitting is not a viable solution. I will describe some of  
13 the system hardening that PacifiCorp is and will be engaging in to mitigate wildfire  
14 risks in more detail below.

15 **Q. How do these system hardening projects reduce the threat of wildfire?**

16 A. PacifiCorp's system hardening projects focus on reducing the potential that the power  
17 system is the source of ignition by creating a spark during a fault event. A significant  
18 ignition driver on electrical systems is contact from foreign objects (trees, wildlife,  
19 mylar balloons, etc.) that can result in high-energy and high-temperature arcing  
20 between two conductors or between one conductor and the ground.

21 **Q. What hardening efforts on distribution systems reduce potential ignitions?**

22 A. All of the Company's wildfire mitigation programs applied to distribution systems  
23 work to either prevent ignitions or control the potential events to limit overall impact.

1 The key programs included in system hardening of distribution systems include the  
2 line rebuild project, implementation of advanced protection and control schemes  
3 through equipment upgrades, and the replacement of pole mounted overcurrent and  
4 overvoltage protection equipment such as expulsion fuses.

5 **B. Line Rebuild Program**

6 **Q. Please explain what the line rebuild program is in the context of wildfire**  
7 **mitigation.**

8 A. A key hardening effort for wildfire mitigation is the line rebuild program where  
9 targeted lines or portions of lines are either moved, removed, transitioned to  
10 underground, or retrofitted with more resilient materials such as covered conductor to  
11 mitigate the risk of contact related faults on overhead conductor. Currently, the  
12 majority of the program includes retrofitting existing lines with covered conductor.  
13 Covered conductor, unlike bare conductor, is designed to withstand incidental contact  
14 with vegetation, other debris, and even the ground in a wire down event. The  
15 program will involve more than replacing existing bare conductor with covered  
16 conductor. Poles will be replaced as necessary based on loading assessments of  
17 existing poles where covered conductor is to be installed. This is because covered  
18 conductor is heavier than bare conductor and, under the combination of ice and wind,  
19 has a larger diameter which results in further additional pole loading. A secondary  
20 benefit to covered conductor is an improvement in reliability. In certain applications  
21 standard pole mounted overcurrent and overvoltage protection equipment, such as  
22 fuses, lightning arrestors, and cutouts, will be replaced within the FHCA with non-

1           expulsion type equipment to eliminate any melted fuse material from falling to the  
2           ground when operated.

3   **Q.    Is it standard practice for PacifiCorp to install covered conductor, non-expulsion**  
4   **fuses, or composite material distribution poles?**

5   A.    No. Standard overhead circuit construction uses bare conductor and wood poles that  
6           balance safety, reliability, and costs. The installation of covered conductor, non-  
7           expulsion fuses, and composite material poles are in direct response to increased  
8           wildfire risk and are specifically designed to accelerate and improve mitigation of  
9           catastrophic wildfires associated with PacifiCorp's system.

10 **Q.    What criteria did the Company use to select areas in the FHCA to replace**  
11 **existing conductor with covered conductor?**

12 A.    PacifiCorp targeted areas within the FHCA to determine what areas in its system were  
13           at elevated risk based on proximity to population centers, historic weather patterns,  
14           and vegetation. Covered conductor was selected for use where there is risk of  
15           incidental contacts, such as large branches or trees striking the phase conductors.

16 **Q.    Are there reliable measurements or metrics the Company can use to determine**  
17 **how successful the use of covered conductor is in mitigating wildfire risks over**  
18 **time?**

19 A.    Yes, although such measurements will not be immediately informative. Over time,  
20           the Company anticipates that comparisons of fault rates resulting from incidental tree  
21           contacts for the areas where covered conductor is employed versus the same areas  
22           before replacement with the covered conductor will demonstrate the effectiveness of  
23           this measure.

1 **Q. What kind of monitoring does the Company plan to use to ensure that the use of**  
2 **covered conductor is meeting expectations in the absence of such metrics?**

3 A. As noted in my response to the preceding question, the Company will track fault rates  
4 resulting from incidental tree contacts on rebuilt sections. This information will  
5 enable the Company to compare faults both before and after installation of covered  
6 conductor to better understand how successful it has been in mitigating wildfire risks  
7 over time. Unfortunately, the data needed to quantitatively provide useful metrics for  
8 such a comparison will not be available for several years.

9 **C. Advanced Protection and Control**

10 **Q. Please explain what advanced protection and control measures are in the context**  
11 **of wildfire mitigation.**

12 A. Advanced protection involves the deployment of sophisticated protection control  
13 strategies, particularly advanced relay technologies on distribution and transmission  
14 lines. In the context of wildfire risk mitigation, these protection control strategies  
15 involve the device operations that take place when fault events occur. In contrast to  
16 the wildfire mitigation strategies discussed above, which relate to limiting the  
17 occurrence of fault events, advanced protection and control strategies relate to  
18 limiting the length and magnitude of a fault event. Specifically, the window of time  
19 after fault events represents the time when electrical system facilities pose the highest  
20 risk of igniting adjacent fuel, which could result in a wildfire. Reducing the time  
21 between when a fault occurs and that fault condition is cleared may reduce the risk of  
22 igniting adjacent fuel.

1 **Q. Please describe the differences between legacy electro-mechanical relays and**  
2 **modern microprocessor relays.**

3 A. Unlike an electro-mechanical relay, microprocessor relays are able to exercise  
4 programmed functions nearly immediately (near the speed of light), which results in  
5 much faster device response during fault conditions. Microprocessor relays also  
6 allow for greater customization to address environmental conditions through multiple  
7 settings groups; they are also better able to incorporate complex logic to execute  
8 specific operations. Also, in contrast to electro-mechanical relays, microprocessor  
9 relays retain event logs that provide data for fault location and later analysis.

10 **Q. Will these modern microprocessor relays provide the Company more data**  
11 **regarding line contacts and other faults on the system than the electro-**  
12 **mechanical relays currently used on PacifiCorp's system?**

13 A. Yes. These new relays will capture a variety of event logs, including waveforms  
14 during fault events.

15 **Q. How will the additional data provided by these new relays help the Company in**  
16 **its wildfire mitigation efforts?**

17 A. In addition to faster fault clearing schemes, these relays improve response times since  
18 they can identify locations where disturbances emanate from, which will be used by  
19 field and office teams to assess these situations. PacifiCorp will also use this data  
20 during investigations of events to ensure that the devices performed consistent with  
21 the programmed settings and to evaluate other wildfire mitigation technologies.

1           **D.     Replacement of Pole Mounted Overcurrent and Overvoltage Protection**  
2           **Equipment**

3   **Q.     Please explain what the replacement of pole mounted overcurrent and**  
4           **overvoltage protection equipment means in the context of wildfire mitigation.**

5   A.     The replacement of pole mounted overcurrent and overvoltage protection equipment  
6           includes the proactive replacement of all expulsion type fuses, lightning arrestors, and  
7           cutouts in the FHCA.

8   **Q.     Is it standard practice to use non-expulsion type fuses and lightning arrestors?**

9   A.     No. Non-expulsion type fuses and lightning arrestors are not standard practice.

10 **Q.     How does the replacement of expulsion type fuses and lightning arrestors help**  
11 **mitigate and protect against wildfire risk?**

12 A.     Overhead expulsion fuses serve as one of the primary system protection devices on  
13           the overhead system. The expulsion fuse has a small metal element within the fuse  
14           body that is designed to melt when excessive current passes through the fuse body,  
15           interrupting the flow of electricity to the downstream distribution system. Under  
16           certain conditions, the melting action and interruption technique will expel an arc out  
17           of the bottom of the fuse tab. To reduce the potential for ignition as a result of fuse  
18           operation, PacifiCorp has identified alternate methodologies and equipment that do  
19           not expel an arc for installation within the FHCA.

20           **E.     Situational Awareness**

21 **Q.     Please explain what situational awareness is in the context of the Company's**  
22 **wildfire mitigation efforts.**

23 A.     Having a sophisticated, dynamic risk model grounded in situational awareness is  
24           pertinent to ensure electric utilities know when, where, how, and why to take action to

1 mitigate the risk of wildfire. PacifiCorp's approach to situational awareness includes  
2 the acquisition of data to run real time, daily simulations, forecast and assess the risk  
3 of potential or active events to inform operational strategies, response to local  
4 conditions, and influence decision making. Decision making could include the  
5 implementation of augmented protection and control schemes or activation of  
6 additional resources for supplemental patrols to assess local conditions.

7 **Q. What key investments need to be made to support this approach toward**  
8 **situational awareness?**

9 A. To support the development of a robust, repeatable, dynamic risk assessment tool, a  
10 combination of investments must be made including the acquisition of data, collection  
11 of Company owned data through new devices, storage and processing of data, and  
12 mapping or visualization of data into dashboards and tools. Software, hardware, data  
13 storage, data management, and data processing tools must be purchased to move  
14 forward an enterprise type solution with built in redundancy.

15 **Q. Please describe the benefits of PacifiCorp's wildfire mitigation investments.**

16 A. Proactively investing in wildfire mitigation projects reduces the risk of catastrophic  
17 fire caused by PacifiCorp's facilities, directly benefiting PacifiCorp customers. In  
18 addition, reducing the risk of catastrophic fire benefits fire response agencies,  
19 preserves customer property and Company facilities, and minimizes the cost of  
20 rebuilding.

21 **Q. How do PacifiCorp's wildfire mitigation efforts relate to the Company's**  
22 **standard safety and compliance activities?**

23 A. Many of the wildfire mitigation strategies I discuss above go beyond standard utility



1 practice. For example, PacifiCorp does not, in the normal course, install covered  
2 conductor. These measures are in direct response to changing best practices for  
3 mitigating wildfire and are incremental to work PacifiCorp would do in the ordinary  
4 course of its business. Similarly, activities such as replacement of existing equipment  
5 (replacing distribution poles with composite material poles, replacing electro-  
6 mechanical relays, etc.) are now informed by the potential for the replacement to  
7 mitigate wildfire risk, location of the existing equipment relative to risk, and may  
8 involve accelerated replacements.

9 **V. WILDFIRE MITIGATION INCREMENTAL EXPENSE**

10 **Q. Are the capital investments described above the only type of investments being**  
11 **made in Oregon to mitigate wildfire risk?**

12 A. No, PacifiCorp will have an incremental \$19.7 million in expenses in order to  
13 implement the WPP. The largest single category of this incremental expense is  
14 vegetation management with an additional \$15.6 million in incremental expense.

15 **A. Wildfire Mitigation Vegetation Management**

16 **Q. How does vegetation management relate to reducing wildfire risks?**

17 A. Vegetation management is generally recognized as a significant strategy in any WPP.  
18 Vegetation contacting a power line is a potential source of fire ignition. Thus,  
19 reducing vegetation contacts reduces the potential of an ignition originating from  
20 electrical facilities. While it is impossible to eliminate vegetation contacts  
21 completely, at least without radically altering the landscape near power lines, a  
22 primary objective of PacifiCorp's existing vegetation management program is to  
23 minimize contact between vegetation and power lines by addressing grow-in and fall-

1 in risks. This objective is in alignment with core WPP efforts, and continuing  
2 dedication to administering existing programs is a solid foundation for PacifiCorp's  
3 WPP efforts. To supplement the existing program, PacifiCorp vegetation  
4 management is implementing additional WPP strategies in Oregon.

5 **Q. What are these strategies being implemented?**

6 A. The focus of PacifiCorp's vegetation management efforts generally includes pruning  
7 and tree removals. PacifiCorp prunes trees to maintain a safe distance between tree  
8 limbs and power lines. PacifiCorp also removes trees that pose an elevated risk of  
9 falling into a power line. In Oregon, this has traditionally been completed on  
10 distribution facilities with a four-year cycle. To address the growing risk of wildfires  
11 in Oregon, PacifiCorp is transitioning to a three-year cycle for all vegetation  
12 management work.

13 In addition to the transition to a three-year cycle discussed above, PacifiCorp's  
14 vegetation management specifically targets risk reduction in the FHCA with three  
15 distinct strategies. First, PacifiCorp vegetation management will conduct annual  
16 vegetation inspections on all lines in the FHCA, with correction work also completed  
17 based on inspection results. Second, PacifiCorp will use increased minimum  
18 clearance distances for distribution cycle work completed in the FHCA. Third,  
19 PacifiCorp plans to complete annual pole clearing on subject equipment poles located  
20 in the FHCA.

21 **Q. How does this compare to PacifiCorp's existing or legacy vegetation  
22 management program?**

23 A. Prior to the development of the WPP, PacifiCorp already had a vegetation

1 management program in place. While the legacy program contained similar elements  
2 and objectives to the strategies just described, the incremental efforts reflect a shift  
3 change in strategy and the costs reflect the incremental spend needed to accomplish  
4 the new tasks and work to meet the objectives of the increase in scope. As such, it  
5 should be viewed as incremental to baseline or legacy vegetation management  
6 programs.









7 **B. Other Elements of the Incremental Expense**








8 **Q. Beyond the incremental Wildfire Vegetation Management expense, how much**  
9 **other incremental expenses are included in this mechanism for 2022?**

10 A. PacifiCorp is including \$4.1 million other incremental expenses in this mechanism.

11 **Q. Can you briefly describe those program categories?**

12 A. Yes, the table below identifies and provides an overview of the additional program  
13 categories.

Program Category		Program Objectives & Key Deliverables		
Risk Modeling & Drivers		Maintain baseline risk maps to identify areas that are subject to a heightened risk of wildfire and inform longer term, multi-year investment and program shifts.		
Inspection & Correction		Continue targeted changes in the FHCA including more frequent inspections (5-yr Detail, Annual Visual Assurance), accelerated correction timeframes for fire threat conditions (12 months or less), and implementation of annual IR inspections on transmission.		
Vegetation Management		Transition to a 3-yr trim cycle system wide, increase post trim clearances in the FHCA, implement annual pole clearing of subject poles in the FHCA, and perform annual inspections in the FHCA.		
System Hardening		Complete targeted line rebuilds in PSPS Zones, implement advanced protection and control schemes through equipment upgrades, and replace OH expulsion fuses/adjacent hardware in the FHCA.	<u>TOTAL SCOPE</u> 1,200 miles of covered conductor; 138 relays, 151 reclosers; 26,780 fuses	<u>5 YEAR TARGET</u> 650 miles of covered conductor; 138 relays, 151 reclosers; 26,780 fuses
Situational Awareness		Install and operate a company owned weather station network, implement a risk forecasting and impact-based fire weather model, and inform key decision making and protocols.		120 weather stations operational by EOY 2022
System Operations		Implement the use of fast trip settings and risk-based re-energization practices and install CFCLs in the FHCA to balance risk mitigation with potential impacts to customers.		CFCLs installed on all FHCA Circuits by EOY 2022
Field Operations & Work Practices		Acquire and maintain key equipment (water trucks and personal suppression equipment) and implement risk-based work practices and resource adjustments.		
PSPS Program		Maintain the ability to actively monitor conditions, assess risk, and implement a PSPS as a measure of last resort in a manner that limits the impacts to customers and communities consistent with regulatory requirements.		

Program Category		Program Objectives & Key Deliverables		
Public Safety Partner Coordination		Develop and maintain a web based secure portal and host 5 Tabletop exercises annually to ensure consistent proactive coordination and collaboration with Public Safety Partners.	 Implement a Secure Public Safety Partner Portal in 2022	Host 5 Tabletop Exercises in 2022 
Wildfire Protection Plan Engagement		Inform, engage, and solicit feedback from customers and communities through 5 annual public engagement and feedback sessions, focused on plan elements and future improvements.		Host 5 Public Engagement and Information Sessions in 2022
Education and Awareness		Manage a multiprong approach including targeted social media and radio advertisements, website updates and improvements, educational webinars, digital and print brochures, and an annual customer survey to assess impacts.		
Industry Collaboration		Actively participate in consortiums, forums, and advisory boards to collaborate with industry experts, maintain expertise in leading edge technologies and operational practices, and continue to improve and advance the Wildfire Protection Plan and its programs.		
Plan Monitoring & Implementation		Leverage a centralized, dedicated team to develop, monitor, implement, and continuously improve the Wildfire Protection Plan.		

1 **VI. CONCLUSION**

2 **Q. Please summarize your recommendation to the Commission.**

3 A. My testimony demonstrates that PacifiCorp has prudently incurred additional costs in  
4 order to implement the elements of the wildfire protection plan. I recommend the  
5 Commission allow the recovery of these incremental costs through this new  
6 automatic adjustment clause.

7 **Q. Does this conclude your direct testimony?**

8 A. Yes.

Docket No. UE 407  
Exhibit PAC/201  
Witness: Allen Berreth

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**PACIFICORP**

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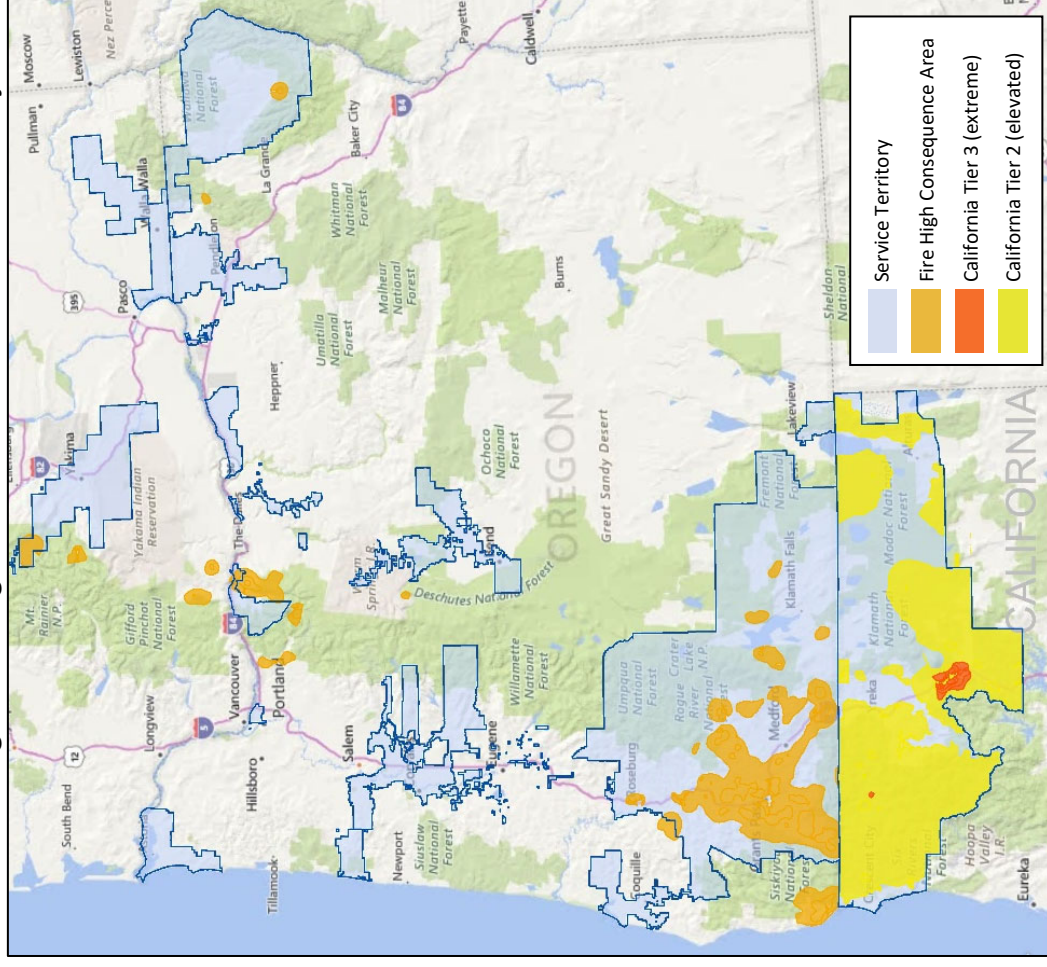
Exhibit Accompanying Direct Testimony of Allen Berreth  
PacifiCorp Service Territory with FHCA

September 2022

## RISK-BASED APPROACH: Fire High Consequence Areas (FHCA)

- Utilizing the same modeling concepts used in California, areas were identified in Oregon and Washington where there is an elevated risk of utility-associated wildfires to **occur** and **spread rapidly**, and where communities face an elevated risk of damage or harm from wildfires
- Per state requirement in California, Tier 3 and Tier 2 are shown regardless if facilities exist in the area; making the impact of Tier 2 seem larger than it is
- In Oregon and Washington, a similar methodology was used to identify FHCAs
- FHCAs are used to prioritize wildfire mitigation initiatives, such as, increased inspections, system hardening and proactive de-energization

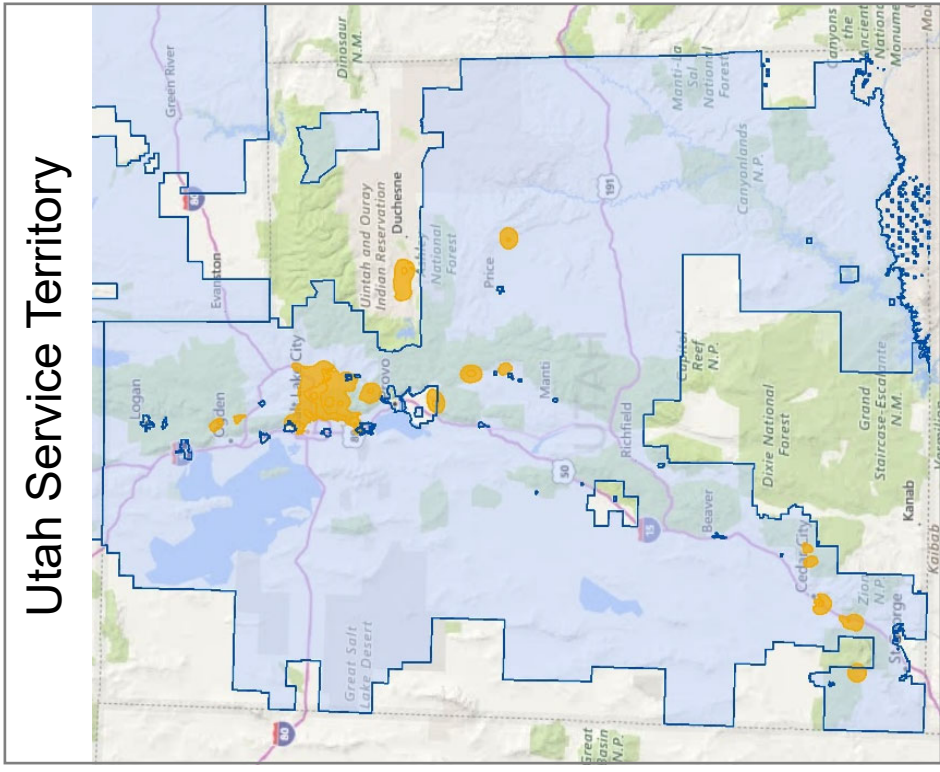
Washington, Oregon, California Service Territory



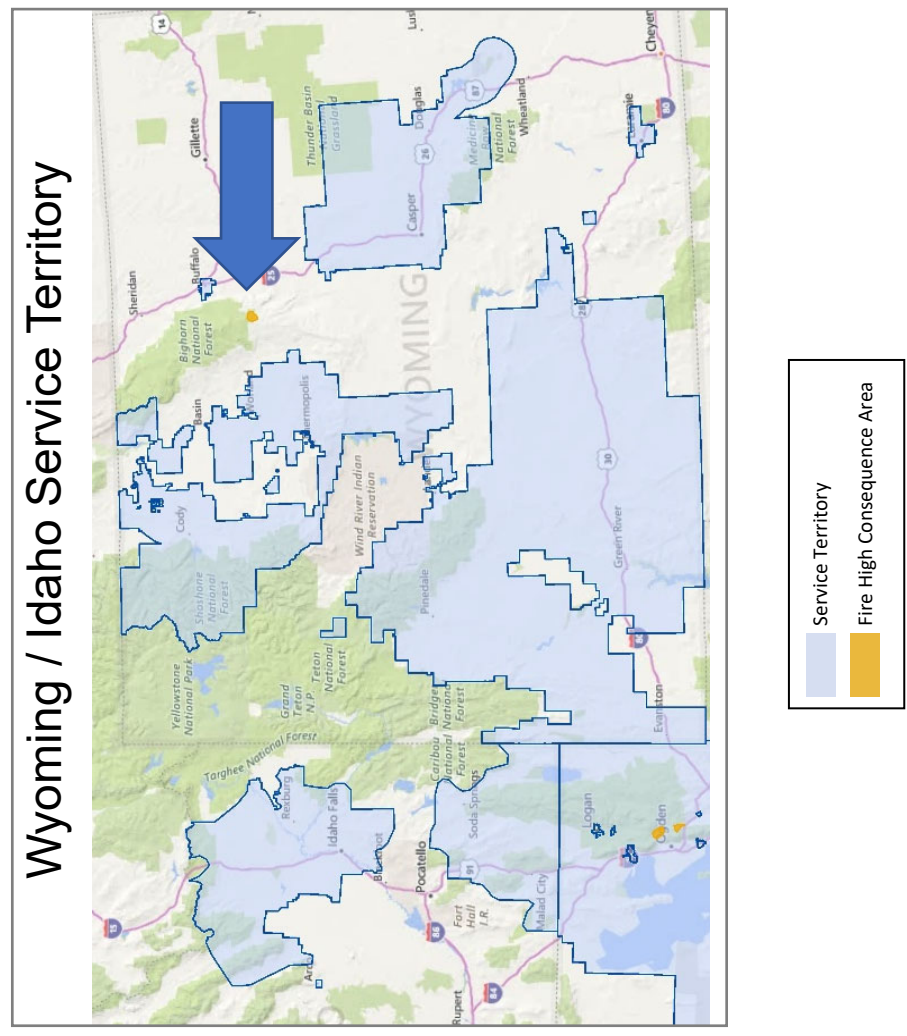


# RISK-BASED APPROACH: Fire High Consequence Areas (FHCA)

## Utah Service Territory



## Wyoming / Idaho Service Territory



Legend:

- Service Territory (light blue box)
- Fire High Consequence Area (orange box)



Docket No. UE 407  
Exhibit PAC/300  
Witness: Judith M. Ridenour

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**PACIFICORP**

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Direct Testimony of Judith M. Ridenour

September 2022

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**ATTACHED EXHIBITS**

Exhibit PAC/301—Proposed WPP Rate Spread and Rates

Exhibit PAC/302—Estimated Effect of Proposed Price Change

1                                   **I. INTRODUCTION AND QUALIFICATIONS**

2   **Q. Please state your name, business address, and present position with PacifiCorp**  
3   **d/b/a Pacific Power (PacifiCorp or the Company).**

4   A. My name is Judith M. Ridenour. My business address is 825 NE Multnomah Street,  
5   Suite 2000, Portland, Oregon 97232. My current position is Specialist, Pricing and  
6   Cost of Service, in the regulation department.

7   **Q. Briefly describe your education and professional experience.**

8   A. I have a Bachelor of Arts degree in Mathematics from Reed College. I joined the  
9   Company in the regulation department in October 2000. I assumed my present  
10   responsibilities in May 2001. In my current position, I am responsible for the  
11   preparation of rate design used in retail price filings and related analyses. Since 2001,  
12   with levels of increasing responsibility, I have analyzed and implemented rate design  
13   proposals throughout the Company's six-state service territory.

14                                   **II. PURPOSE OF TESTIMONY**

15   **Q. What is the purpose of your testimony?**

16   A. I present PacifiCorp's proposed rate spread, rates, and rate impact for the Schedule  
17   190, Wildfire Protection Plan Cost Recovery Adjustment (WPP Adjustment) filed as  
18   part of the initial application in this docket on July 12, 2022.

19                                   **III. PROPOSED RATE SPREAD AND RATES**

20   **Q. Please describe the Company's proposed rate schedule which will recover the**  
21   **annual revenue requirement for the projected incremental expense and capital**  
22   **investment costs of the Wildfire Protection Plan (WPP).**

23   A. PacifiCorp has proposed a new, non-bypassable WPP Adjustment to recover annual

1 revenue requirement for the projected incremental expense and capital investment  
2 costs of PacifiCorp's WPP. The initial tariff will recover the 2022 proposed revenue  
3 requirement of \$19.9 million for the incremental costs presented in Attachment 1  
4 from the initial application in this docket. The rate schedule will be updated annually  
5 through an Automatic Adjustment Clause to incorporate projections for the following  
6 year and adjust for any residual amounts in the balancing account from previous  
7 years.

8 **Q. What rate spread and rate design has the Company proposed for the new rate**  
9 **schedule?**

10 A. Since the costs proposed for recovery are mainly distribution related costs, the  
11 Company has proposed a distribution rate spread to all delivery service schedules.  
12 Proposed tariff rates will collect costs from all customers through kilowatt-hour based  
13 charges applicable to each delivery service schedule.

14 **Q. Did you prepare an exhibit showing the proposed rate spread and rates?**

15 A. Yes. Exhibit PAC/301 is a copy of Attachment 2 from the initial application in this  
16 docket and shows the proposed rate spread and calculation of proposed Schedule 190  
17 rates.

18 **Q. Has the Company filed proposed tariffs?**

19 A. Yes. The Company's proposed tariff changes were included with the initial  
20 application in this docket as Attachment 4. Following a final order in this docket, the  
21 Company will file a compliance filing with the final approved tariffs and correct  
22 effective date.

1           **IV.    COMPARISON OF PRESENT AND PROPOSED CUSTOMER RATES**

2   **Q.    What are the overall rate effects of the changes proposed in this filing?**

3   A.    The overall proposed effect is a rate increase of 1.6 percent, on a net basis. The rate  
4       change varies by customer type. Page one of Exhibit PAC/302 shows the estimated  
5       effect of PacifiCorp's proposed prices by delivery service schedule both excluding  
6       (base) and including (net) applicable adjustment schedules.<sup>1</sup> The net rates in  
7       Columns 7 and 10 exclude effects of the Low Income Bill Payment Assistance  
8       Charge (Schedule 91), the Adjustment Associated with the Pacific Northwest Electric  
9       Power Planning and Conservation Act (Schedule 98), the Public Purpose Charge  
10      (Schedule 290), and the System Benefits Charge (Schedule 291).

11 **Q.    Did you prepare an exhibit that shows the impact on customer bills as a result of**  
12 **the proposed rate change?**

13 A.    Yes. Exhibit PAC/302, beginning on page two, contains monthly billing comparisons  
14      for customers at different usage levels served on each of the major delivery service  
15      schedules. Each bill impact is shown in both dollars and percentages. These bill  
16      comparisons include the effects of all adjustment schedules including the Low  
17      Income Bill Payment Assistance Charge (Schedule 91), the Adjustment Associated  
18      with the Pacific Northwest Electric Power Planning and Conservation Act  
19      (Schedule 98), the Public Purpose Charge (Schedule 290), and the System Benefits  
20      Charge (Schedule 291).

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<sup>1</sup> Page one of Exhibit PAC/302 is a copy of Attachment 3 to the initial application in this docket.

1 **Q. What is the estimated monthly impact to an average residential customer?**

2 A. The estimated average monthly impact to the average residential customer using

3 900 kilowatt-hours per month is a bill increase of \$1.85.

4 **Q. Does this conclude your direct testimony?**

5 A. Yes.

Docket No. UE 407  
Exhibit PAC/301  
Witness: Judith M. Ridenour

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**PACIFICORP**

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Exhibit Accompanying Direct Testimony of Judith M. Ridenour  
Proposed WPP Rate Spread and Rates

September 2022

**PACIFIC POWER**  
State of Oregon  
Proposed Wildfire Protection Plan Cost Recovery Adjustment - Schedule 190

**FORECAST 12 MONTHS ENDED DECEMBER 31, 2023**

Line No.	Description (1)	Sch No. (2)	No. of Cust (3)	Distribution MW/h* (4)	Present Distribution Revenues (5)	Distribution Rate Spread (6)	Proposed WPP	
							Rates (7)	Revenues (8)
<b>Residential</b>								
1	Residential	4	535,059	5,633,856	\$257,562	56.970%	0.201	\$11,324
2	<b>Total Residential</b>		535,059	5,633,856	\$257,562			\$11,324
<b>Commercial &amp; Industrial</b>								
3	Gen. Svc. < 31 kW	23	84,329	1,137,011	\$60,110	13.296%	0.233	\$2,649
4	Gen. Svc. 31 - 200 kW	28	10,462	1,992,271	\$49,074	10.855%	0.108	\$2,152
5	Gen. Svc. 201 - 999 kW	30	797	1,281,581	\$22,730	5.028%	0.078	\$1,000
6	Large General Service >= 1,000 kW	48	190	3,555,464	\$39,937		0.049	\$1,742
7	Partial Req. Svc. >= 1,000 kW	47	6	29,109	\$1,712	9.612%	0.049	\$14
8	Dist. Only Lg Gen Svc >= 1,000 kW	848	1	286,471	\$1,805		0.049	\$140
9	Agricultural Pumping Service		7,997	263,565	\$15,064	3.332%	0.252	\$664
10	<b>Total Commercial &amp; Industrial</b>		103,782	8,545,471	\$190,434			\$8,362
<b>Lighting</b>								
11	Outdoor Area Lighting Service	15	5,809	2,108	\$737	0.163%	1.540	\$32
12	Street Lighting Service Comp. Owned	51	1,108	8,373	\$2,812	0.622%	1.479	\$124
13	Street Lighting Service Cust. Owned	53	314	11,452	\$489	0.108%	0.188	\$22
14	Recreational Field Lighting	54	102	1,141	\$63	0.014%	0.244	\$3
15	<b>Total Public Street Lighting</b>		7,333	23,074	\$4,102			\$181
16	<b>Subtotal</b>		646,174	14,202,402	\$452,097	100.000%		\$19,866
17	Employee Discount		966	13,030	(\$142)		(0.050)	(\$7)
18	<b>Total</b>		646,174	14,202,402	\$451,955			\$19,860

\* Includes Distribution Only consumer MW/h and lighting tariff MW/h.



Docket No. UE 407  
Exhibit PAC/302  
Witness: Judith M. Ridenour

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF OREGON**

**PACIFICORP**

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Exhibit Accompanying Direct Testimony of Judith M. Ridenour  
Estimated Effect of Proposed Price Change

September 2022

**PACIFIC POWER**  
**ESTIMATED EFFECT OF PROPOSED PRICE CHANGE**  
**ON REVENUES FROM ELECTRIC SALES TO ULTIMATE CONSUMERS**  
**DISTRIBUTED BY RATE SCHEDULES IN OREGON**  
**FORECAST 12 MONTHS ENDED DECEMBER 31, 2023**

Line No.	Description (1)	Pre Sch No.	Pro Sch No.	No. of Cust (4)	MWh (5)	Present Revenues (\$000)			Proposed Revenues (\$000)			Change			Line No.
						Base Rates (6)	Adders <sup>1</sup> (7)	Net Rates (8)	Base Rates (9)	Adders <sup>1</sup> (10)	Net Rates (11)	Base Rates (\$000) (12)	% <sup>2</sup> (13)	Net Rates (\$000) (14)	
<b>Residential</b>															
1	Residential	4	4	535,059	5,633,856	\$597,063	\$9,738	\$606,801	\$597,063	\$21,062	\$618,125	\$0	0.0%	\$11,324	1.9%
2	<b>Total Residential</b>			535,059	5,633,856	\$597,063	\$9,738	\$606,801	\$597,063	\$21,062	\$618,125	\$0	0.0%	\$11,324	1.9%
<b>Commercial &amp; Industrial</b>															
3	Gen. Svc. < 31 kW	23	23	84,329	1,137,011	\$124,438	\$1,015	\$125,453	\$124,438	\$3,664	\$128,102	\$0	0.0%	\$2,649	2.1%
4	Gen. Svc. 31 - 700 kW	28	28	10,462	1,992,271	\$163,732	\$9,197	\$172,929	\$163,732	\$11,348	\$175,080	\$0	0.0%	\$2,152	1.2%
5	Gen. Svc. 201 - 999 kW	30	30	797	1,281,581	\$94,197	\$4,696	\$98,893	\$94,197	\$5,696	\$99,893	\$0	0.0%	\$1,000	1.0%
6	Large General Service ≥ 1,000 kW	48	48	190	3,555,464	\$224,400	(\$15,394)	\$209,007	\$224,400	(\$13,651)	\$210,749	\$0	0.0%	\$1,742	0.8%
7	Partial Req. Svc. ≥ 1,000 kW	47	47	6	29,109	\$3,974	(\$120)	\$3,854	\$3,974	(\$106)	\$3,868	\$0	0.0%	\$14	0.8%
8	Dist. Only Lg. Gen. Svc. ≥ 1,000 kW	848	848	1	0	\$1,805	\$10	\$1,815	\$1,805	\$150	\$1,955	\$0	0.0%	\$140	7.7%
9	Agricultural Pumping Service	41	41	7,997	263,565	\$29,194	(\$3,645)	\$25,549	\$29,194	(\$2,981)	\$26,213	\$0	0.0%	\$664	2.6%
10	<b>Total Commercial &amp; Industrial</b>			103,782	8,259,000	\$641,740	(\$4,241)	\$637,499	\$641,740	\$4,121	\$645,861	\$0	0.0%	\$8,362	1.3%
<b>Lighting</b>															
11	Outdoor Area Lighting Service	15	15	5,809	8,260	\$915	\$74	\$989	\$915	\$107	\$1,022	\$0	0.0%	\$32	3.3%
12	Street Lighting Service Comp. Owned	51	51	1,108	23,893	\$3,498	\$387	\$3,885	\$3,498	\$511	\$4,009	\$0	0.0%	\$124	3.2%
13	Street Lighting Service Cust. Owned	53	53	314	11,452	\$657	\$210	\$867	\$657	\$231	\$888	\$0	0.0%	\$22	2.5%
14	Recreational Field Lighting	54	54	102	1,141	\$82	\$27	\$108	\$82	\$29	\$111	\$0	0.0%	\$3	2.6%
15	<b>Total Public Street Lighting</b>			7,333	44,746	\$5,151	\$698	\$5,849	\$5,151	\$879	\$6,030	\$0	0.0%	\$181	3.1%
16	<b>Subtotal</b>			646,174	13,937,602	\$1,243,954	\$6,196	\$1,250,150	\$1,243,954	\$26,062	\$1,270,016	\$0	0.0%	\$19,866	1.6%
17	Employee Discount			966	13,030	(\$341)	(\$6)	(\$346)	(\$341)	(\$12)	(\$353)	\$0		(\$7)	
18	AGA Revenue					\$3,521		\$3,521	\$3,521		\$3,521	\$0		\$0	
19	COOC Amortization					\$1,767		\$1,767	\$1,767		\$1,767	\$0		\$0	
20	<b>Total Sales with AGA</b>			646,174	13,937,602	\$1,248,901	\$6,190	\$1,255,091	\$1,248,901	\$26,050	\$1,274,951	\$0	0.0%	\$19,860	1.6%

<sup>1</sup> Excludes effects of the Low Income Bill Payment Assistance Charge (Sch. 91), BPA Credit (Sch. 98), Public Purpose Charge (Sch. 290) and System Benefits Charge (Sch. 291).

<sup>2</sup> Percentages shown for Schedules 48 and 47 reflect the combined rate change for both schedules

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 4 + Cost-Based Supply Service**  
**Residential Service - Single Family**

kWh	Monthly Billing*			Percent Difference
	Present Price	Proposed Price	Difference	
100	\$19.75	\$19.96	\$0.21	1.06%
200	\$28.77	\$29.18	\$0.41	1.43%
300	\$37.78	\$38.40	\$0.62	1.64%
400	\$46.80	\$47.62	\$0.82	1.75%
500	\$55.82	\$56.85	\$1.03	1.85%
600	\$64.84	\$66.07	\$1.23	1.90%
700	\$73.86	\$75.30	\$1.44	1.95%
800	\$82.87	\$84.51	\$1.64	1.98%
<b>900</b>	<b>\$91.89</b>	<b>\$93.74</b>	<b>\$1.85</b>	<b>2.01%</b>
1,000	\$100.91	\$102.96	\$2.05	2.03%
1,100	\$112.06	\$114.31	\$2.25	2.01%
1,200	\$123.20	\$125.66	\$2.46	2.00%
1,300	\$134.36	\$137.02	\$2.66	1.98%
1,400	\$145.50	\$148.37	\$2.87	1.97%
1,500	\$156.65	\$159.72	\$3.07	1.96%
1,600	\$167.79	\$171.07	\$3.28	1.95%
2,000	\$212.38	\$216.48	\$4.10	1.93%
3,000	\$323.85	\$330.00	\$6.15	1.90%
4,000	\$435.31	\$443.52	\$8.21	1.89%
5,000	\$546.78	\$557.04	\$10.26	1.88%

\* Net rate including Schedules 91, 98, 290 and 291.  
Note: Annualized monthly bill for seasonal rates.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 4 + Cost-Based Supply Service**  
**Residential Service - Multi-Family**

kWh	Monthly Billing*			Percent Difference
	Present Price	Proposed Price	Difference	
100	\$18.22	\$18.43	\$0.21	1.15%
200	\$27.24	\$27.65	\$0.41	1.51%
300	\$36.25	\$36.87	\$0.62	1.71%
400	\$45.27	\$46.09	\$0.82	1.81%
500	\$54.29	\$55.32	\$1.03	1.90%
600	\$63.31	\$64.54	\$1.23	1.94%
700	\$72.33	\$73.77	\$1.44	1.99%
800	\$81.34	\$82.98	\$1.64	2.02%
900	\$90.36	\$92.21	\$1.85	2.05%
1,000	\$99.38	\$101.43	\$2.05	2.06%
1,100	\$110.53	\$112.78	\$2.25	2.04%
1,200	\$121.67	\$124.13	\$2.46	2.02%
1,300	\$132.83	\$135.49	\$2.66	2.00%
1,400	\$143.97	\$146.84	\$2.87	1.99%
1,500	\$155.11	\$158.19	\$3.08	1.99%
1,600	\$166.26	\$169.54	\$3.28	1.97%
2,000	\$210.85	\$214.95	\$4.10	1.94%
3,000	\$322.32	\$328.47	\$6.15	1.91%
4,000	\$433.78	\$441.99	\$8.21	1.89%
5,000	\$545.25	\$555.51	\$10.26	1.88%

\* Net rate including Schedules 91, 98, 290 and 291.  
Note: Annualized monthly bill for seasonal rates.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 23 + Cost-Based Supply Service**  
**General Service - Secondary Delivery Voltage**

k W Load Size	kWh	Monthly Billing*						Percent	
		Present Price		Proposed Price		Difference		Single Phase	Three Phase
		Single Phase	Three Phase	Single Phase	Three Phase	Single Phase	Three Phase		
5	500	\$68	\$77	\$69	\$78	1.75%	1.55%	1.75%	1.75%
	750	\$93	\$102	\$95	\$104	1.92%	1.75%		
	1,000	\$118	\$127	\$121	\$129	2.01%	1.87%		
	1,500	\$169	\$177	\$172	\$181	2.12%	2.01%		
	1,000	\$118	\$127	\$121	\$129	2.01%	1.87%		
10	2,000	\$219	\$228	\$224	\$232	2.17%	2.09%	2.17%	2.09%
	3,000	\$319	\$328	\$326	\$335	2.23%	2.18%		
	4,000	\$407	\$415	\$416	\$425	2.34%	2.29%		
	4,000	\$437	\$446	\$447	\$456	2.18%	2.13%		
	6,000	\$612	\$620	\$626	\$635	2.33%	2.30%		
20	8,000	\$786	\$795	\$805	\$814	2.42%	2.39%	2.42%	2.39%
	10,000	\$960	\$969	\$984	\$993	2.48%	2.45%		
	9,000	\$935	\$943	\$956	\$965	2.29%	2.27%		
	12,000	\$1,196	\$1,205	\$1,225	\$1,233	2.39%	2.37%		
	15,000	\$1,458	\$1,466	\$1,493	\$1,502	2.45%	2.43%		
30	18,000	\$1,719	\$1,728	\$1,762	\$1,771	2.49%	2.48%	2.49%	2.48%

\* Net rate including Schedules 91, 290 and 291.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 23 + Cost-Based Supply Service**  
**General Service - Primary Delivery Voltage**

k W Load Size	kWh	Monthly Billing*						Percent	
		Present Price		Proposed Price		Difference		Single Phase	Three Phase
		Single Phase	Three Phase	Single Phase	Three Phase	Single Phase	Three Phase		
5	500	\$67	\$76	\$68	\$77	1.77%	1.56%	1.90%	
	750	\$92	\$101	\$94	\$102	1.95%	1.77%		
	1,000	\$116	\$125	\$119	\$128	2.04%	1.90%		
	1,500	\$166	\$175	\$169	\$178	2.15%	2.04%		
10	1,000	\$116	\$125	\$119	\$128	2.04%	1.90%	2.33%	
	2,000	\$215	\$224	\$220	\$229	2.21%	2.12%		
	3,000	\$314	\$323	\$321	\$330	2.27%	2.21%		
	4,000	\$400	\$408	\$409	\$418	2.38%	2.33%		
20	4,000	\$430	\$439	\$440	\$448	2.21%	2.17%	2.49%	
	6,000	\$602	\$610	\$616	\$625	2.37%	2.34%		
	8,000	\$773	\$782	\$792	\$801	2.46%	2.43%		
	10,000	\$944	\$953	\$968	\$977	2.52%	2.49%		
30	9,000	\$920	\$928	\$941	\$950	2.33%	2.31%	2.47%	
	12,000	\$1,177	\$1,185	\$1,205	\$1,214	2.42%	2.41%		
	15,000	\$1,434	\$1,443	\$1,469	\$1,478	2.49%	2.47%		
	18,000	\$1,691	\$1,700	\$1,734	\$1,742	2.53%	2.52%		

\* Net rate including Schedules 91, 290 and 291.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 28 + Cost-Based Supply Service**  
**Large General Service - Secondary Delivery Voltage**

kW Load Size	kWh	Monthly Billing*		Percent Difference
		Present Price	Proposed Price	
15	3,000	\$328	\$332	1.01%
	4,500	\$426	\$431	1.17%
	7,500	\$621	\$629	1.33%
31	6,200	\$658	\$664	1.04%
	9,300	\$859	\$869	1.19%
	15,500	\$1,262	\$1,279	1.35%
40	8,000	\$843	\$852	1.05%
	12,000	\$1,103	\$1,116	1.20%
	20,000	\$1,623	\$1,645	1.36%
60	12,000	\$1,256	\$1,269	1.05%
	18,000	\$1,646	\$1,666	1.21%
	30,000	\$2,426	\$2,459	1.36%
80	16,000	\$1,662	\$1,680	1.06%
	24,000	\$2,183	\$2,209	1.21%
	40,000	\$3,223	\$3,267	1.37%
100	20,000	\$2,069	\$2,091	1.07%
	30,000	\$2,719	\$2,752	1.22%
	50,000	\$4,020	\$4,075	1.37%
200	40,000	\$4,071	\$4,115	1.08%
	60,000	\$5,371	\$5,437	1.23%
	100,000	\$7,972	\$8,083	1.38%

\* Net rate including Schedules 91, 290 and 291.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 28 + Cost-Based Supply Service**  
**Large General Service - Primary Delivery Voltage**

kW Load Size	kWh	Monthly Billing*		Percent Difference
		Present Price	Proposed Price	
15	4,500	\$429	\$434	1.16%
	6,000	\$521	\$527	1.27%
	7,500	\$612	\$620	1.35%
31	9,300	\$860	\$870	1.19%
	12,400	\$1,049	\$1,063	1.30%
	15,500	\$1,238	\$1,255	1.38%
40	12,000	\$1,102	\$1,115	1.20%
	16,000	\$1,346	\$1,364	1.31%
	20,000	\$1,590	\$1,612	1.39%
60	18,000	\$1,643	\$1,663	1.21%
	24,000	\$2,009	\$2,036	1.32%
	30,000	\$2,375	\$2,408	1.39%
80	24,000	\$2,176	\$2,203	1.22%
	32,000	\$2,664	\$2,700	1.32%
	40,000	\$3,152	\$3,197	1.40%
100	30,000	\$2,710	\$2,743	1.22%
	40,000	\$3,320	\$3,364	1.33%
	50,000	\$3,930	\$3,985	1.40%
200	60,000	\$5,342	\$5,408	1.24%
	80,000	\$6,562	\$6,650	1.34%
	100,000	\$7,782	\$7,892	1.42%

\* Net rate including Schedules 91, 290 and 291.



**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 30 + Cost-Based Supply Service**  
**Large General Service - Secondary Delivery Voltage**

kW Load Size	kWh	Monthly Billing*		Percent Difference
		Present Price	Proposed Price	
100	20,000	\$2,505	\$2,521	0.64%
	30,000	\$2,990	\$3,014	0.80%
	50,000	\$3,960	\$4,000	1.01%
200	40,000	\$4,505	\$4,537	0.71%
	60,000	\$5,475	\$5,523	0.87%
	100,000	\$7,415	\$7,495	1.07%
300	60,000	\$6,685	\$6,733	0.71%
	90,000	\$8,140	\$8,211	0.88%
	150,000	\$11,050	\$11,169	1.08%
400	80,000	\$8,737	\$8,801	0.73%
	120,000	\$10,677	\$10,773	0.89%
	200,000	\$14,557	\$14,717	1.09%
500	100,000	\$10,825	\$10,905	0.74%
	150,000	\$13,250	\$13,369	0.90%
	250,000	\$18,100	\$18,299	1.10%
600	120,000	\$12,912	\$13,008	0.74%
	180,000	\$15,822	\$15,966	0.91%
	300,000	\$21,642	\$21,881	1.10%
800	160,000	\$17,087	\$17,215	0.75%
	240,000	\$20,967	\$21,158	0.91%
	400,000	\$28,727	\$29,046	1.11%
1000	200,000	\$21,262	\$21,421	0.75%
	300,000	\$26,112	\$26,351	0.91%
	500,000	\$35,792	\$36,190	1.11%

\* Net rate including Schedules 91, 290 and 291.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 30 + Cost-Based Supply Service**  
**Large General Service - Primary Delivery Voltage**

kW Load Size	kWh	Monthly Billing*		Percent Difference
		Present Price	Proposed Price	
100	30,000	\$2,979	\$3,003	0.80%
	40,000	\$3,465	\$3,497	0.92%
	50,000	\$3,952	\$3,991	1.01%
200	60,000	\$5,467	\$5,514	0.87%
	80,000	\$6,440	\$6,503	0.99%
	100,000	\$7,412	\$7,492	1.07%
300	90,000	\$8,123	\$8,195	0.88%
	120,000	\$9,582	\$9,678	1.00%
	150,000	\$11,042	\$11,161	1.08%
400	120,000	\$10,679	\$10,775	0.89%
	160,000	\$12,625	\$12,752	1.01%
	200,000	\$14,571	\$14,730	1.09%
500	150,000	\$13,249	\$13,368	0.90%
	200,000	\$15,681	\$15,840	1.02%
	250,000	\$18,113	\$18,312	1.10%
600	180,000	\$15,818	\$15,962	0.91%
	240,000	\$18,737	\$18,928	1.02%
	300,000	\$21,656	\$21,894	1.10%
800	240,000	\$20,958	\$21,149	0.91%
	320,000	\$24,849	\$25,104	1.03%
	400,000	\$28,740	\$29,059	1.11%
1000	300,000	\$26,097	\$26,336	0.92%
	400,000	\$30,961	\$31,279	1.03%
	500,000	\$35,805	\$36,203	1.11%

\* Net rate including Schedules 91, 290 and 291.

**Pacific Power**  
**Billing Comparison**  
**Delivery Service Schedule 41 + Cost-Based Supply Service**  
**Agricultural Pumping - Secondary Delivery Voltage**

kW	Load Size	kWh	Present Price*		Proposed Price*		Percent Difference	
			Monthly Bill	Annual Load Size Charge	Monthly Bill	Annual Load Size Charge	April - November Monthly Bill	Annual Load Size Charge
<u>Single Phase</u>								
10		2,000	\$161	\$175	\$166	\$175	3.20%	0.00%
		3,000	\$241	\$175	\$249	\$175	3.20%	0.00%
		5,000	\$402	\$175	\$414	\$175	3.20%	0.00%
<u>Three Phase</u>								
20		4,000	\$321	\$349	\$332	\$349	3.20%	0.00%
		6,000	\$482	\$349	\$497	\$349	3.20%	0.00%
		10,000	\$803	\$349	\$829	\$349	3.20%	0.00%
100		20,000	\$1,607	\$1,561	\$1,658	\$1,561	3.20%	0.00%
		30,000	\$2,410	\$1,561	\$2,487	\$1,561	3.20%	0.00%
		50,000	\$4,016	\$1,561	\$4,145	\$1,561	3.20%	0.00%
300		60,000	\$4,820	\$3,929	\$4,974	\$3,929	3.20%	0.00%
		90,000	\$7,229	\$3,929	\$7,461	\$3,929	3.20%	0.00%
		150,000	\$12,049	\$3,929	\$12,435	\$3,929	3.20%	0.00%

\* Net rate including Schedules 91, 98, 290 and 291.

**Pacific Power  
Billing Comparison  
Delivery Service Schedule 41 + Cost-Based Supply Service  
Agricultural Pumping - Primary Delivery Voltage**

kW Load Size	kWh	Present Price*		Proposed Price*		Percent Difference	
		Monthly Bill	Annual Load Size Charge	Monthly Bill	Annual Load Size Charge	April - November Monthly Bill	Annual Load Size Charge
<u>Single Phase</u>							
10	3,000	\$236	\$172	\$244	\$172	3.27%	0.00%
	4,000	\$315	\$172	\$326	\$172	3.26%	0.00%
	5,000	\$394	\$172	\$407	\$172	3.26%	0.00%
<u>Three Phase</u>							
20	6,000	\$473	\$345	\$488	\$345	3.26%	0.00%
	8,000	\$630	\$345	\$651	\$345	3.26%	0.00%
	10,000	\$788	\$345	\$814	\$345	3.26%	0.00%
100	30,000	\$2,364	\$1,541	\$2,441	\$1,541	3.26%	0.00%
	40,000	\$3,152	\$1,541	\$3,255	\$1,541	3.26%	0.00%
	50,000	\$3,940	\$1,541	\$4,069	\$1,541	3.26%	0.00%
300	90,000	\$7,092	\$3,868	\$7,324	\$3,868	3.26%	0.00%
	120,000	\$9,457	\$3,868	\$9,765	\$3,868	3.26%	0.00%
	150,000	\$11,821	\$3,868	\$12,206	\$3,868	3.26%	0.00%

\* Net rate including Schedules 91, 98, 290 and 291.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 48 + Cost-Based Supply Service**  
**Large General Service - Secondary Delivery Voltage**  
**1,000 kW and Over**

kW Load Size	kWh	Monthly Billing		Percent Difference
		Present Price	Proposed Price	
1,000	300,000	\$25,940	\$26,090	0.58%
	500,000	\$35,159	\$35,409	0.71%
	700,000	\$44,190	\$44,540	0.79%
2,000	600,000	\$51,165	\$51,465	0.59%
	1,000,000	\$67,127	\$67,637	0.76%
	1,400,000	\$84,164	\$84,878	0.85%
6,000	1,800,000	\$137,264	\$138,181	0.67%
	3,000,000	\$188,374	\$189,903	0.81%
	4,200,000	\$239,484	\$241,626	0.89%
12,000	3,600,000	\$272,363	\$274,198	0.67%
	6,000,000	\$374,583	\$377,642	0.82%
	8,400,000	\$476,804	\$481,086	0.90%

Notes:	Present	Proposed
On-Peak kWh	38.11%	38.11%
Off-Peak kWh	61.89%	61.89%

\* Net rate including Schedules 91, 290 and 291. Restricted Sch 291 applied to levels over 730,000 kWh.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 48 + Cost-Based Supply Service**  
**Large General Service - Primary Delivery Voltage**  
**1,000 kW and Over**

kW Load Size	kWh	Monthly Billing		Percent Difference
		Present Price	Proposed Price	
1,000	300,000	\$24,192	\$24,342	0.62%
	500,000	\$32,897	\$33,147	0.76%
	700,000	\$41,415	\$41,765	0.85%
2,000	600,000	\$47,698	\$47,998	0.63%
	1,000,000	\$62,546	\$63,056	0.82%
	1,400,000	\$78,538	\$79,251	0.91%
6,000	1,800,000	\$135,690	\$136,608	0.68%
	3,000,000	\$183,663	\$185,193	0.83%
	4,200,000	\$231,637	\$233,778	0.92%
12,000	3,600,000	\$269,330	\$271,165	0.68%
	6,000,000	\$365,277	\$368,336	0.84%
	8,400,000	\$461,223	\$465,506	0.93%

Notes:	Present	Proposed
On-Peak kWh	37.88%	37.88%
Off-Peak kWh	62.12%	62.12%

\* Net rate including Schedules 91, 290 and 291. Restricted Sch 291 applied to levels over 730,000 kWh.

**Pacific Power**  
**Monthly Billing Comparison**  
**Delivery Service Schedule 48 + Cost-Based Supply Service**  
**Large General Service - Transmission Delivery Voltage**  
**1,000 kW and Over**

kW Load Size	kWh	Monthly Billing		Percent Difference
		Present Price	Proposed Price	
1,000	500,000	\$31,074	\$31,324	0.80%
	700,000	\$39,017	\$39,367	0.90%
2,000	1,000,000	\$58,661	\$59,171	0.87%
	1,400,000	\$73,480	\$74,194	0.97%
6,000	3,000,000	\$173,411	\$174,941	0.88%
	4,200,000	\$217,870	\$220,012	0.98%
12,000	6,000,000	\$344,428	\$347,488	0.89%
	8,400,000	\$433,347	\$437,630	0.99%

Notes:	Present	Proposed
On-Peak kWh	37.61%	37.61%
Off-Peak kWh	62.39%	62.39%

\* Net rate including Schedules 9 I, 290 and 291. Restricted Sch 291 applied to levels over 730,000 kWh.