

Confidential per WAC 480-07-160
Exh. TJH-1CT
Docket UE-23____
Witness: Timothy J. Hemstreet

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,

Complainant,

v.

PACIFICORP dba
PACIFIC POWER & LIGHT COMPANY

Respondent.

Docket UE-23____

PACIFICORP

REDACTED DIRECT TESTIMONY OF TIMOTHY J. HEMSTREET

March 2023

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- Exhibit No. TJH-2—Foote Creek II-IV Site Layout
- Exhibit No. TJH-3—Rock River I Site Layout
- Confidential Exhibit No. TJH-4C—Foote Creek II-IV Energy Production Analysis
- Confidential Exhibit No. TJH-5C—Rock River I Energy Production Analysis

1 **I. INTRODUCTION AND QUALIFICATIONS**

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

4 A. My name is Timothy J. Hemstreet. My business address is 825 NE Multnomah Street,
5 Suite 1800, Portland, Oregon 97232. My present position is Vice President of
6 Renewable Energy Development for PacifiCorp.

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

8 A. I hold a Bachelor of Science degree in Civil Engineering from the University of Notre
9 Dame in Indiana and a Master of Science degree in Civil Engineering from the
10 University of Texas at Austin. I am also a Registered Professional Engineer in the
11 State of Oregon. Prior to joining the Company in 2004, I held positions in engineering
12 consulting and environmental compliance. Since joining the Company, I have held
13 positions in environmental policy, engineering, project management, and
14 hydroelectric project licensing and program management. In 2016, I assumed a role in
15 renewable energy development, and in June 2019 I assumed the Managing Director
16 role focusing on PacifiCorp’s wind repowering effort, and assumed my current role in
17 September 2022, in which I oversee the development of renewable energy resources
18 that enhance and complement PacifiCorp’s existing renewable energy resource
19 portfolio.

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

21 A. Yes. I have previously sponsored testimony in California, Idaho, Oregon, Utah,
22 Washington, and Wyoming.

1 **II. PURPOSE OF TESTIMONY**

2 **Q. What is the purpose of your direct testimony?**

3 A. The purpose of my testimony is to demonstrate the prudence of the Company’s
4 efforts to acquire and repower the Foote Creek II, III and IV (Foote Creek II-IV) and
5 Rock River I wind energy facilities (the Repowered Facilities), similar to the effort
6 undertaken previously at the Company’s Foote Creek I wind facility, was approved
7 for inclusion in rates in the Company’s last general rate case, docket
8 UE-191024 (2020 Rate Case) and reviewed in the Company’s 2021 limited-issue rate
9 case.¹ My testimony provides detail on the Company’s commercial and other
10 arrangements related to the Repowered Facilities, and explains their customer
11 benefits. Specifically, my testimony addresses:

- 12 • the background of the Repowered Facilities;
- 13 • the scope of the repowering effort and the Project’s relationship to the
- 14 Company’s earlier repowering efforts;
- 15 • the contracting arrangements, implementation status, permitting status, and
- 16 schedule for the Repowered Facilities;
- 17 • the energy benefits of the Repowered Facilities;
- 18 • the financial benefits for customers of repowering resulting from production
- 19 tax credit (PTC) qualification of the Repowered Facilities; and
- 20 • the evaluation of the Repowered Facilities in the 2021 Integrated Resource
- 21 Plan (IRP).

22 Additionally, my testimony describes the Company’s investments in
23 hydroelectric resources to replace the Prospect No. 3 flowline, and construct a new
24 Fall Creek Hatchery, and describes how these projects are consistent with the
25 requirements of the Federal Energy Regulatory Commission (FERC) and, in the case

¹ *WUTC v. PacifiCorp, d/b/a Pac. Power & Light Co.*, Docket No. UE-191024, UE-190750, UE-190929, UE-190981, UE-180778 (cons.), Final Order 09/07/12, ¶7 (Dec. 14, 2020); *WUTC v. PacifiCorp, d/b/a Pac. Power & Light Co.*, Docket Nos. UE-210532, UE-210328 (cons). Order 06/03 (Jan. 18, 2022).

1 of the Fall Creek Hatchery, the Klamath Hydroelectric Settlement Agreement
2 (KHSA).

3 III. SUMMARY OF TESTIMONY

4 **Q. Please summarize your wind repowering testimony.**

5 A. PacifiCorp recently completed a significant repowering of its owned wind fleet in
6 March 2021, including the Foote Creek I facility, that will deliver enhanced value and
7 long-term customer benefits. The Company proposes to build from these efforts by
8 acquiring and repowering additional wind facilities adjacent to the Company's Foote
9 Creek I facility, including Foote Creek II-IV and Rock River I. These projects will
10 allow the Company to leverage existing long-term wind energy lease rights, facilities,
11 and infrastructure in the area (including staff and contractor resources) that will
12 provide customers with the enhanced benefits from these cost-effective,
13 high-capacity-factor wind energy resources.

14 Acquiring and repowering the Repowered Facilities is consistent with the
15 Company's 2021 IRP, that identified both Projects as beneficial to customers and
16 were included in the Company's least-cost, least risk preferred portfolio, and are also
17 consistent with recent Wyoming Public Service Commission decisions that approved
18 certificates of public convenience and necessities (CPCN) for both projects.²
19 Construction for Foote Creek II-IV began in the summer of 2022, and the project is
20 on track to reach commercial operation in late 2023, while construction of Rock River

² *In re Foote Creek II-IV CPCN*, Docket No. 20000-606-EN-21 (Record No. 16955) (a bench decision was rendered by the Commission on April 26, 2022; a written order has not been issued at the time of drafting this testimony); *In re Rock River I CPCN*, Docket No. 20000-613-EN-22 (Record No. 17017), Order 29130 (Feb. 3, 2023).

1 I will begin in the summer of 2023, and is expected to be commercially operational in
2 late 2024.

3 **Q. Please summarize your Prospect No. 3 flowline replacement testimony.**

4 A. The Company operates a series of hydroelectric projects on the Rogue River in
5 Southern Oregon, including Prospect No. 3, a 7.2 megawatt (MW) facility. The
6 FERC recently re-licensed the facility and directed to replace an existing deteriorating
7 wood stave flowline with a new, steel pipeline.³ This new pipeline will reduce
8 leakage, provide protection from ruptures related to rock falls, and avoid associated
9 erosion from those events. This pipeline will also address recent failures from the
10 existing flowline that eroded steep banks between the flowline alignment and the
11 South Fork Rogue River, that has interrupted hydroelectric power generation at the
12 facility until the flowline can be replaced. Replacing the wood stave flowline will also
13 allow erosion remediation to be completed, and return the facility to operation so
14 customers can continue to benefit from the resource.

15 **Q. Please summarize your Fall Creek Hatchery testimony.**

16 A. The Company is building a new fish hatchery adjacent to the Fall Creek
17 Hydroelectric Plant, which is the remaining operating Company-owned hydro
18 development within the Klamath Hydroelectric Project. The hatchery is necessary for
19 the Company to meet its obligations under the KHSA, and a July 13, 2022,
20 Memorandum of Agreement with the States of California and Oregon, to continue
21 fish production for an eight-year period following Klamath dam removal.⁴ The
22 facility has been designed in consultation with the California Department of Fish and

³ *In re Prospect No. 3 Re-Licensing*, 168 FERC ¶ 62,175 (Sept. 27, 2019)

⁴ See KHSA 7.6.6 and Interim Measures 18-19.

1 Wildlife (CDFW) and the National Marine Fisheries Service (NMFS) specifically to
2 meet fish production goals following the removal of Iron Gate Dam. Construction of
3 the facility is underway, and the new hatchery will be operational in December
4 2023 to ensure fish production can continue following planned removal of Iron Gate
5 dam in 2024. The hatchery will fulfill the Company's obligations under the KHSA,
6 and protects customers from uncertain costs and risks related to the Klamath hydro
7 assets.

8 **IV. WIND REPOWERING PROJECT BACKGROUND,**
9 **SCOPE AND RELATION TO PRIOR REPOWERING PROJECTS**

10 **Q. Please explain the background of the Foote Creek II-IV and Rock River I wind**
11 **energy projects.**

12 A. The Foote Creek Rim wind energy projects, consisting of Foote Creek I, II, III and
13 IV, were the first utility-scale, commercial wind energy projects in the State of
14 Wyoming. The Repowered Facilities were located at Foote Creek Rim due to the
15 extraordinary combination of geography and wind energy resource, that causes
16 already robust winds to accelerate as they move over the elevated plateau of the Foote
17 Creek Rim. Development of wind energy facilities to take advantage of these
18 favorable wind energy characteristics began in the early 1990s, and construction of
19 the Foote Creek Rim projects was completed between 1999 and 2000. The Rock
20 River I wind project is located approximately five miles northeast of the Foote Creek
21 Rim projects and four miles northwest of the High Plains and McFadden Ridge
22 projects. Rock River I was developed shortly after the Foote Creek Rim projects, and
23 reached commercial operation in October 2001.

24 PacifiCorp participated in wind energy development at the Foote Creek Rim

1 site in partnership with the Eugene Water & Electric Board (EWEB) and the
2 Bonneville Power Administration (BPA). PacifiCorp and EWEB were co-owners of
3 the Foote Creek I wind energy facility that reached commercial operation in 1999,
4 and BPA purchased a portion of the project's output. The Foote Creek II-IV wind
5 energy facilities, which were previously owned by Terra-Gen, LLC (Terra-Gen),
6 were independently developed and their generation output was sold to other utilities
7 under power purchase agreements. The Foote Creek II-IV projects were constructed
8 with 64 wind turbines (of which 33 turbines had a nameplate capacity of 0.6 MW
9 each and 31 turbines had a nameplate capacity of 0.75 MW) with a total nameplate
10 capacity of 43.35 MW.

11 Rock River I was constructed with 50 wind turbines (each turbine with a
12 nameplate capacity of one megawatt) with a total nameplate capacity of 50 MW.
13 Rock River I was previously co-owned by Terra-Gen and Shell Wind Energy Inc.
14 (Shell) and its output was sold to the Company under a 20-year power purchase
15 agreement that expired in December 2021. The Rock River I project interconnects to
16 the Company's transmission system at the Foote Creek Substation.

17 **Q. What does it mean to repower a wind energy facility?**

18 A. Repowering a wind energy facility means upgrading the wind turbine generator
19 (WTG) equipment at an existing wind energy project with more efficient equipment
20 to increase the power generation from the facility and extend the life of the facility.
21 Specifically, repowering Foote Creek II-IV and Rock River I involves installing new
22 turbines while reusing other pre-existing facility infrastructure.

1 **Q. Please briefly describe PacifiCorp’s effort to repower the Foote Creek II-IV and**
2 **Rock River I facilities.**

3 A. Similar to the Company’s effort to repower its neighboring Foote Creek I facility,
4 repowering of the Repowered Facilities involves installing modern WTGs.

5 At Foote Creek II-IV, the repowering effort will involve installing 11 new
6 WTGs of the same type recently installed at Foote Creek I to replace the older wind
7 turbines of much smaller capacity that were previously at the site. Similarly, the Rock
8 River I repowering effort will erect 19 new WTGs to replace the smaller capacity
9 turbines originally installed.

10 The new WTGs at the Repowered Facilities will be supported on new
11 foundations and connected to the Foote Creek Substation with new energy collector
12 circuits. The turbines will have updated switchgear and controls, and the new WTG
13 locations will be linked by new turbine access roads. The proposed site layout for the
14 Foote Creek II-IV repowering effort is shown in Exhibit TJH-2 and the Rock River I
15 site layout is shown in Exhibit TJH-3.

16 **Q. Will the Repowered Facilities benefit from PacifiCorp’s prior efforts to repower**
17 **the adjacent facilities?**

18 A. Yes. As part of the Foote Creek I repowering effort, the Company obtained the master
19 wind energy lease rights for the entire Foote Creek Rim site, encompassing the
20 original Foote Creek I, Foote Creek II, Foote Creek III, and Foote Creek IV wind
21 energy project boundaries. These rights were acquired in August 2019 and their
22 acquisition enhanced the customer benefits of the Foote Creek I repowering project
23 by reducing the ongoing land rights cost of the project. Similarly, repowering the

1 Foote Creek II-IV facilities will allow customers to fully benefit from these wind
2 energy lease rights, which provide the ability to cost-effectively generate power at
3 one of the most favorable wind energy locations in Wyoming. Acquiring the Foote
4 Creek II-IV facilities will allow the Company to nearly double the number of turbines
5 operated at the site, increasing operations and maintenance efficiencies at the site.

6 The Rock River I facility will benefit from the Company's recent repowering
7 effort at the nearby High Plans and McFadden Ridge projects, utilizing operations
8 and maintenance staff contracted for that project to also operate the Rock River I
9 facility. Thus, no additional operations facilities are needed to support project
10 operations. Some project controls will also be housed at the Company's Foote Creek
11 operations and maintenance building, which is nearby the Foote Creek substation,
12 where Rock River I will interconnect to the transmission system. This local
13 infrastructure results in efficiencies and cost savings for the project since it can draw
14 on existing infrastructure as well as Company staff and contractor resources.

15 **Q. Are there other ways in which Foote Creek II-IV will benefit from PacifiCorp's**
16 **prior repowering effort at Foote Creek I?**

17 A. Yes. As part of the Project, an existing 2.0 MW turbine previously constructed as part
18 of the Foote Creek I repowering project will be interconnected to the 1.8 MW Foote
19 Creek II interconnection. This will allow this small Foote Creek II interconnection to
20 be used by an existing, appropriately sized turbine while also allowing more
21 generation from the existing Foote Creek I turbines as a result of less curtailment at
22 higher wind speeds. Additionally, the Foote Creek I repowering project required
23 access road upgrades to the Foote Creek Rim plateau to allow larger, modern wind

1 turbine equipment to be delivered to the site. These improvements will continue to
2 provide benefits for the Foote Creek II-IV facilities, and the enclosed switchgear
3 building constructed adjacent to the Foote Creek Substation as part of the Foote
4 Creek I repowering project will be used for equipment that will support the Project,
5 reducing costs. Finally, the Foote Creek II-IV facilities will be operated from the
6 Company's existing operations and maintenance building for the Foote Creek I
7 project, so no additional facilities are needed for project operations.

8 **Q. Will the larger blades from the new turbines increase the potential for avian**
9 **impacts at the repowered facilities?**

10 A. Monthly monitoring conducted at the Repowered Facilities over the last several years
11 shows no significant avian impacts. Although the larger blades and greater
12 rotor-swept area will increase the overall risk zone of the repowered wind turbines,
13 this does not necessarily correlate with an increased risk of avian impacts. The
14 significant reduction in the number of turbines that will be deployed at the site also
15 means that less of the overall project site area will be covered by wind turbines. To
16 further mitigate any potential impacts, at both the Foote Creek II-IV and Rock River I
17 projects, new turbine locations have been sited to avoid areas of higher avian use such
18 as the edges of the plateaus.

19 The Company also performs monthly monitoring at all Company-owned
20 Wyoming wind facilities and reports to both the Wyoming Game and Fish
21 Department and the U.S. Fish and Wildlife Service. Once repowering concludes, the
22 Company will begin this monthly monitoring at the Repowered Facilities to
23 determine if the new turbines cause additional impacts to avian species and will

1 engage with the appropriate agency to discuss and, if prudent and practicable,
2 implement additional avoidance, minimization, or mitigation measures. This will also
3 include an Eagle Conservation Plan and Bird and Bat Conservation Strategy for the
4 new turbines that the Company is currently developing with both the Wyoming Game
5 and Fish Department and the U.S. Fish and Wildlife Service.

6 **V. WIND REPOWERING PROJECT CONTRACTING, PERMITTING STATUS,**
7 **SCHEDULE, AND COST**

8 **Q. What commercial arrangements has PacifiCorp made to acquire and repower**
9 **the Repowered Facilities?**

10 A. For Foote Creek II-IV, in addition to the earlier acquisition of the master wind energy
11 lease rights for the project site, PacifiCorp executed a Purchase and Sale Option
12 Agreement (PSOA) with Terra-Gen to acquire 100 percent of its interests in the Foote
13 Creek II, III and IV facilities. Under the PSOA, Terra-Gen has removed the original
14 64 turbines from the site and completed site restoration activities in preparation for
15 repowering of the facility by the Company. The Company closed on the acquisition of
16 the facilities under the PSOA in June 2022, following the approval of the Company's
17 CPCN application by the Wyoming Public Service Commission.

18 For Rock River I, the Company negotiated a PSOA with Terra-Gen and Shell
19 to acquire 100 percent of their interests in the Rock River I facility including the
20 project's wind energy lease rights, transmission and access easements, and
21 interconnection agreement. Under the PSOA, Terra-Gen and Shell removed the
22 original 50 turbines from the site and completed site restoration activities in
23 preparation for repowering of the site by the Company. The Company closed on the
24 acquisition of the facilities under the PSOA on February 10, 2023. The Company is

1 now preparing for repowering construction activities beginning in the second quarter
2 2023, in support of a late 2024 in-service date for the project.

3 **Q. What other commercial arrangements has PacifiCorp made with respect to the**
4 **Repowered Facilities?**

5 A. For Foote Creek II-IV, the Company executed a master supply agreement and a
6 turbine supply agreement for the repowering turbines with Vestas-American Wind
7 Energy, Inc. (Vestas) in which Vestas will supply and commission WTGs suitable for
8 the site of the same type used at the Foote Creek I facility. The Company has also
9 executed a contract for balance of plant (BOP) wind energy construction services
10 following a competitive procurement process in which proposals from qualified wind
11 energy construction companies were solicited. The Company has also executed a
12 turbine service and maintenance agreement with Vestas, which will provide service
13 for the repowered turbines consistent with negotiated pricing and terms.

14 For Rock River I, the Company executed a safe harbor purchase agreement
15 and a turbine supply agreement with General Electric International, Inc. (GE) in
16 which GE will supply and commission WTGs suitable for the site. The Company has
17 also executed a BOP wind energy construction services contract. The Company has
18 also executed a turbine full-service agreement with GE under which GE will maintain
19 the repowered turbines consistent with negotiated pricing and terms.

20 **Q. What is the status of necessary permitting to begin construction of the**
21 **repowering projects?**

22 A. For both Projects the Company has received the necessary Federal Aviation
23 Administration no-hazard determinations to install the larger new turbines at the site.

1 The Company has also received Conditional Use Permits for the repowering efforts
2 from Carbon County, Wyoming. The Company has received building permits from
3 Carbon County for the Foote Creek II-IV project and is in the process of obtaining
4 building permits for Rock River I.

5 **Q. What is the anticipated construction schedule for the Repowered Facilities?**

6 A. For Foote Creek II-IV, the Company began construction in the summer of 2022, and
7 turbines and commissioning activities will occur in 2023. Foote Creek II-IV is
8 anticipated to be fully online and serving customers in November 2023. Major Project
9 milestones for Foote Creek II-IV are shown below:

	<u>Milestone</u>	<u>Completion Date</u>
10	Wyoming CPCN Approval	May 2022
11	Project Acquisition	June 2022
12	Construction Mobilization	June 2022
13	Turbine Foundation Completion	November 2022
14		
15		<u>Anticipated Date</u>
16	Access Road Completion	May 2023
17	Complete Turbine Deliveries	June 2023
18	Mechanical and Electrical Completion	August 2023
19	Turbine Commissioning Completion	November 2023
20	Final Completion/Site Restoration	July 2024

21 For Rock River I, the Company anticipates construction to begin in the
22 summer of 2023, with turbines and commissioning activities occurring in 2024. The
23 Project is anticipated to be fully online and serving customers in November 2024.
24 Major Project milestones are indicated below:

	<u>Milestone</u>	<u>Completion Date</u>
25	Wyoming CPCN Approval	September 2022
26		
27		<u>Anticipated Date</u>
28	Project Acquisition	Feb 2023
29	Construction Mobilization	April 2023
30	Turbine Foundation Completion	November 2023

1	Access Road Completion	May 2024
2	Complete Turbine Deliveries	June 2024
3	Mechanical and Electrical Completion	August 2024
4	Turbine Commissioning Completion	November 2024
5	Final Completion/Site Restoration	July 2025

6 **Q. What is the construction status of Foote Creek II-IV?**

7 A. At Foote Creek II-IV, 96 percent of the access road improvements have been
 8 completed and all 11 foundations have been completed and backfilled and are ready
 9 to support the new turbines. More than 95 percent of the collection cable and fiber
 10 optic cable has been installed. Construction activities have been halted for the winter,
 11 and the contractor is expected to resume site work in April 2023 to receive and install
 12 the new turbines.

13 **Q. What is the construction status of Rock River I?**

14 A. Rock River I construction has not yet begun but will commence in the summer of
 15 2023 after receiving the Carbon County building permit.

16 **Q. What is the forecasted cost of the Repowered Facilities?**

17 A. The cost of acquiring and repowering the Foote Creek II-IV facilities is estimated at
 18 approximately \$82 million on a total-Company basis, which translates to
 19 approximately \$6.5 million on a Washington-allocated basis. The cost of acquiring
 20 and repowering the Rock River I facility is estimated at approximately [REDACTED]
 21 on a total-Company basis, which is equal to approximately [REDACTED] on a
 22 Washington-allocated basis.

23 **Q. Does the acquisition and repowering of the Repowered Facilities result in**
 24 **customer benefits?**

25 A. Yes. Acquisition and repowering of the Foote Creek II-IV and Rock River I projects

1 will benefit customers, as more fully detailed in the direct testimony of Company
2 witness Thomas R. Burns.

3 **VI. WIND REPOWERING BENEFITS INCLUDING REQUALIFICATION FOR**
4 **PRODUCTION TAX CREDITS**

5 **Q. What benefits will customers realize from the Repowered Facilities once**
6 **repowered?**

7 A. Given the extraordinary wind resource in the area, the Repowered Facilities will
8 provide significant energy benefits to customers: the Foote Creek II-IV facilities are
9 estimated to have a high net capacity factor of ■ percent, and the Rock River I
10 facility is estimated to provide a similarly high net capacity factor of ■ percent.
11 These generous net capacity factors will ensure that the facilities contribute to system
12 capacity needs.

13 **Q. Will the Repowered Facilities qualify for PTCs?**

14 A. Yes. Repowering will requalify the Foote Creek II-IV facilities and Rock River I
15 facility for PTCs, which will be passed on to the Company's customers.

16 **Q. What is the value of the PTC for the Repowered Facilities?**

17 A. For 2021, the value of the federal PTC was 2.5 cents per kilowatt-hour, or \$25 per
18 megawatt-hour. This PTC value is adjusted annually based upon an inflation index,
19 and the PTC is available for energy produced during the 10-year period after the wind
20 facility begins commercial operation. Under the Inflation Reduction Act of 2022, the
21 Repowered Facilities are expected to qualify for 110 percent of the value of the
22 federal PTC given the location of the Repowered Facilities in Carbon County, which
23 is expected to meet the definition of an "energy community" under the law.

1 **Q. Are there other requirements that the Repowered Facilities must satisfy to**
2 **qualify for the PTC?**

3 A. Yes, the repowered Foote Creek II-IV and Rock River I facilities must be in service
4 before the end of 2025 and 2026, respectively, to meet the IRS continuous efforts safe
5 harbor and qualify for the PTC by completing construction within four calendar
6 years. Because repowering at the Repowered Facilities will not incorporate retained
7 components from the existing wind turbines at the site there are no requirements
8 related to the Internal Revenue Service “80/20” test – a test that was applicable to the
9 repowering of the majority of PacifiCorp’s wind fleet in which the foundations and
10 towers were retained.

11 **Q. Will repowering increase the overall generating capacity of the Repowered**
12 **Facilities?**

13 A. No. The existing Foote Creek II, Foote Creek III, Foote Creek IV, and Rock River I
14 interconnections will be fully used but the generating capacity of the Repowered
15 Facilities will not be expanded as a result of repowering. The wind turbine equipment
16 that will be used at the Repowered Facilities has been optimized to make full use of
17 the existing interconnection capacities and the Company does not at this time
18 anticipate increasing the interconnection capacity for the facilities.

19 **Q. What is the anticipated generation that the Repowered Facilities will produce?**

20 A. The Company retained the engineering consulting firm Black & Veatch, Inc. (Black
21 & Veatch) to evaluate the energy production expected from the Repowered Facilities.
22 To complete this assessment, Black & Veatch used site wind data, wind turbine
23 location data, operational performance data, and other available site-specific

1 information to model the expected generation from the Repowered Facilities. The
2 wind model also evaluated generation losses resulting from the wake losses at each
3 turbine location. Wake losses are the reduction in generation at turbines downwind of
4 other turbines due to reduced wind speed and increased turbulence in the airflow—or
5 wake—behind a turbine. At Foote Creek II-IV, the estimated annual energy
6 production from the 11 new turbines is expected to be [REDACTED] gigawatt-hours (GWh),
7 resulting in a high net capacity factor of [REDACTED] percent. An additional [REDACTED] GWh per year
8 is expected to be produced as a result of interconnecting a previously constructed 2.0
9 MW turbine at Foote Creek I to the Foote Creek II interconnection as part of the
10 Project. At Rock River I, the estimated annual energy production of the facility is
11 expected to be [REDACTED] GWh after repowering, resulting in a high net capacity factor of
12 [REDACTED] percent. In total, the repowered Projects will produce an amount of energy used by
13 nearly 42,000 homes. The technical analysis documenting the expected generation
14 from the Repowered Facilities is provided in Confidential Exhibit TJH-4C and
15 Confidential Exhibit TJH-5C.

16 VII. REVIEW OF WIND REPOWERING PROJECTS IN THE 2021 IRP

17 **Q. Were the Repowered Facilities reviewed as part of the Company's 2021 IRP?**

18 A. Yes. The Repowered Facilities were made available as a potential resource that could
19 meet customer energy and capacity needs in the model used to develop the
20 Company's 2021 IRP.⁵ Because the resources were beneficial to customers, they were
21 included in the Company's least-cost, least-risk preferred portfolio.

⁵ *In re PacifiCorp 2021 Integrated Resource Plan*, at 295 (available [here](#)).

1 **Q. Was the acquisition and repowering of the Repowered Facilities included in the**
2 **2021 IRP Action Plan?**

3 A. Yes. Action Item 2b of the 2021 IRP notes the Company will pursue necessary
4 regulatory approvals to authorize the acquisition and repowering of the Foote Creek
5 II-IV and Rock River I facilities to support late 2023 and late 2024 in-service dates,
6 respectively.⁶

7 **VIII. PROSPECT NO. 3 FLOWLINE REPLACEMENT**

8 **Q. What is the Prospect No. 3 flowline replacement project?**

9 A. The FERC directed the Company to replace the Prospect No. 3 flowline when re-
10 licensing the Company's hydroelectric facility.⁷ The existing flowline is a 5,558-foot
11 long, 66-inch diameter, wood stave pipeline that conveys flows diverted from the
12 South Fork Rogue River by the South Fork Diversion Dam to the Prospect No. 3
13 canal, and then to the Prospect No. 3 powerhouse for generation of up to 7.2 MW of
14 hydroelectric power. The flowline begins 273-foot downstream of the diversion dam
15 near river elevation, and conveys up to 150 cubic feet per second of diverted waters
16 out of the steep river canyon and into the canal, which is located on the relatively flat
17 plateau between the South and Middle Forks of the Rogue River. The wood staves of
18 the flowline are original staves from the hydroelectric project, first constructed in
19 1932.

20 **Q. Where is the Prospect No. 3 flowline located?**

21 A. The Prospect No. 3 flowline is located on the north (right) bank of the South Fork
22 Rogue River, east of the community of Prospect in northeastern Jackson County,

⁶ *Id.* at 323.

⁷ 168 FERC ¶ 62,175.

1 Oregon. The flowline alignment includes property owned by PacifiCorp and the
2 federal government as administered by the United States Department of Agriculture,
3 Forest Service (Forest Service). Approximately 3,592-feet (65 percent) of the
4 flowline occurs within and to the east of the Rogue River-Siskiyou National Forest
5 boundary. The remaining segment of the flowline west of the National Forest
6 boundary is on PacifiCorp property.

7 **Q. Why does the Prospect No. 3 flowline have to be replaced?**

8 A. On September 27, 2019, FERC issued to PacifiCorp a new 40-year license to operate
9 and maintain the Prospect No. 3 Hydroelectric Project. Article 301 of this FERC
10 license requires PacifiCorp to complete construction of the flowline within five years
11 from the issuance date of the license (*i.e.*, by September 27, 2024). The license
12 explains that PacifiCorp is required to replace the deteriorating wood stave flowline
13 with a new, steel pipe to reduce leakage, prevent flowline ruptures from rock falls,
14 and avoid associated erosion from flowline leakage. In March 2022, after an
15 extended, dewatered, outage period, the flowline experienced multiple wood stave
16 failures upon rewatering the flowline. These flowline failures resulted in erosion of
17 the steep banks between the flowline alignment and the South Fork Rogue River.
18 Shortly thereafter PacifiCorp closed the Prospect No. 3 headgate, ceasing water
19 diversions and halting hydroelectric power generation until the flowline can be
20 replaced and the erosion remediated. Erosion remediation cannot be completed until
21 the existing flowline is demolished, thereby providing heavy equipment access to the
22 erosion sites along the narrow flowline bench perched along the steep river canyon
23 walls. The flowline is integral to operation of the overall hydroelectric project.

1 **Q. What is the status of the Prospect No. 3 flowline replacement project?**

2 A. PacifiCorp has developed final engineering designs for the flowline replacement and
3 submitted these designs to regulatory agencies for approval. Additional plans to
4 address the erosion will be developed as access is made possible by demolition of the
5 wood stave pipe. The engineering designs include construction access roads that
6 traverse the steep slopes between the plateau above and the narrow flowline
7 alignment below on both PacifiCorp and Forest Service property. These construction
8 access roads are necessary to safely demolish the existing flowline and construct the
9 new steel pipeline, including concrete supports and protective measures against
10 rockfall remediation. PacifiCorp is completing a competitive procurement process to
11 select a contractor for the flowline construction work. All agencies have provided
12 authorization or a notice to proceed for the construction of the access roads. However,
13 PacifiCorp is awaiting authorization and notice to proceed from FERC and Forest
14 Service before construction may begin on the demolition and construction of the
15 flowline.

16 **Q. What regulatory agencies are involved in the review, consultation, and approval**
17 **of the Prospect No. 3 Flowline Replacement Project?**

18 A. PacifiCorp has received or will receive review, consultation, exemptions, and/or
19 authorizations from the following federal, state, and local agencies with respect to the
20 Prospect No. 3 flowline replacement project: FERC, Forest Service, U.S. Army Corps
21 of Engineers, Oregon Department of Environmental Quality, Oregon Department of
22 Forestry, Oregon Department of State Lands, Oregon State Historic Preservation
23 Office (SHPO), and Jackson County Planning Department. The flowline replacement

1 project will be conducted under the Prospect No. 3 Hydroelectric Project FERC
2 license and the associated FERC-approved management plans, including the
3 following: Erosion and Sediment Control Plan, Fire and Fuels Management Plan,
4 Fish Salvage Plan, Historic Properties Management Plan (HPMP), Operations
5 Compliance Monitoring Plan, Road Plan, Vegetation Management Plan, and Wildlife
6 Crossing Plan. PacifiCorp has consulted with the following tribes regarding the
7 flowline replacement project under the HPMP and Programmatic Agreement between
8 FERC and the SHPO: the Confederated Tribes of the Grand Ronde Community of
9 Oregon, Confederated Tribes of Siletz Indians, the Cow Creek Band of Umpqua
10 Tribe of Indians, and the Klamath Tribes.

11 **Q. What is the value of the Prospect No. 3 flowline replacement project to**
12 **PacifiCorp's customers?**

13 A. The Prospect No. 3 flowline replacement will allow PacifiCorp to safely operate the
14 Prospect No. 3 Hydroelectric Project through 2059 in compliance with the FERC
15 license. The new flowline will reduce leakage of diverted waters, thereby increasing
16 generation efficiency and decreasing the risk of environmental damage resulting from
17 flowline leakage and subsequent erosion. The demolition of the existing flowline
18 will facilitate remediation of existing erosion from wood stave flowline leakage. The
19 Prospect No. 3 Hydroelectric Project provides PacifiCorp customers with low-cost
20 and renewable generation.

1 **IX. FALL CREEK HATCHERY BACKGROUND, SCOPE,**
2 **STATUS, COST AND BENEFITS**

3 **Q. Please explain the background of the Fall Creek Hatchery project.**

4 A. The Fall Creek Hatchery project fulfills an obligation of the Company arising out of
5 the KHSA. The KHSA was signed by numerous tribes, governmental agencies, the
6 states of California and Oregon, the Company, and other stakeholders on February
7 18, 2010, and amended on April 6, 2016, and November 30, 2016. The KHSA
8 resolved the issues surrounding the relicensing of the Klamath Hydroelectric Project
9 (FERC Project. No. P-2082) through the transfer of the Lower Klamath Project
10 developments (J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate) to the Klamath
11 River Renewal Corporation (KRRC) and the States of California and Oregon, which
12 will undertake their removal. FERC formally split the Klamath Hydroelectric Project
13 into two licenses in March 2018 and in doing so created the Lower Klamath Project
14 (P-14803). In July 2021, FERC issued a license transfer order that, when it became
15 effective, would transfer the license for the Lower Klamath Project from the
16 Company to the KRRC and the states of California and Oregon as co-licensees. On
17 November 17, 2022, FERC issued a license surrender order for the Lower Klamath
18 Project and on December 1, 2022, the KRRC, California, and Oregon formally
19 accepted that surrender order and the Company transferred the license to the Lower
20 Klamath Project and associated real property to the KRRC, California, and Oregon on
21 the same date. The Company retains ownership of the Fall Creek development
22 including the water rights, diversion works, canals, powerhouse, and the property on
23 which the new hatchery will be constructed. The Company is continuing to operate
24 the Lower Klamath Project as a contract operator until the facilities are removed, and

1 the Company's customers will continue to benefit from the generation from the
2 Lower Klamath Project facilities until they are decommissioned.

3 The original Fall Creek Hatchery facilities were constructed following the
4 completion of Copco No. 1 Dam in 1918. This hatchery was operated by the
5 California Department of Fish and Wildlife from approximately 1918 to 1948, and
6 then sporadically thereafter. Because of the age of the facility and the lack of routine
7 use, the existing Fall Creek Hatchery is not in suitable condition to meet current
8 fish-rearing or worker safety requirements and is not capable of rearing the number of
9 fish that need to be raised to meet established production goals.

10 **Q. Why is the Company required to build the Fall Creek Hatchery?**

11 A. Section 6.1.1 of the KHSA obligated the Company to implement a suite of interim
12 measures to address water quality and aquatic species impacts of the Lower Klamath
13 Project facilities until their removal. One of these, Interim Measure 19, requires the
14 Company to develop a plan in consultation with the California Department of Fish
15 and Wildlife (CDFW) and the National Marine Fisheries Service (NMFS) to continue
16 to meet established fish production goals for a period of eight years after the removal
17 of Iron Gate Dam. Implementation includes the development of designs,
18 specification, permits, and construction as necessary to meet mitigation production
19 goals. Interim Measure 20 requires the Company to fund hatchery operations and
20 maintenance costs for a period of eight years after removal of Iron Gate Dam.

21 The KHSA also requires that the Company have the hatchery production
22 continuity measures in place before Iron Gate Dam is removed and the existing water
23 supply to the Iron Gate Hatchery from Iron Gate Reservoir is no longer available.

1 Given the current schedule for removal of Iron Gate Dam in 2024, construction of
2 Fall Creek Hatchery has been scheduled to occur in 2023 so that the facility is
3 operational when needed to continue fish rearing.

4 **Q. Why is it necessary to build a new hatchery?**

5 A. Iron Gate Hatchery was completed in 1962, concurrent with the completion of Iron
6 Gate Dam, and has been in continuous operation since that time. The cold-water
7 supply to Iron Gate Hatchery is provided by Iron Gate Reservoir through intake
8 structures in the dam itself. With the removal of Iron Gate Dam, starting with
9 reservoir drawdown planned for January 2024, there will no longer be a cold-water
10 supply for Iron Gate Hatchery and it will not be possible to raise Chinook and Coho
11 salmon at that location.

12 **Q. Did the Company consider other means of meeting its hatchery obligations**
13 **under the KHSA?**

14 A. Yes. The Company, in coordination with the KRRC and CDFW and NMFS,
15 evaluated a suite of alternatives to the Fall Creek Hatchery. Alternatives considered
16 included ways to keep the Iron Gate Hatchery functioning using alternative water
17 supplies, building new facilities to rear fish at different locations, and using other
18 existing hatchery facilities in Oregon and California. The use of Iron Gate Hatchery,
19 with modifications to address the impacted water supply after dam removal, was not
20 feasible because Klamath River water temperatures are too warm in the summer to
21 rear salmon and there are no suitable local surface or groundwater sources that could
22 support the hatchery. Development of hatchery facilities at other locations was also
23 evaluated, but the lack of infrastructure and access at these remote sites made

1 operations, staffing, and security challenging. Other existing hatchery facilities in
2 Oregon and California were investigated but found to be operating at capacity and
3 therefore unavailable to assist in meeting hatchery production goals. Even if capacity
4 were available, using out-of-basin facilities to raise fish would have created biological
5 challenges related to increased straying in returning adults, inter-basin transfer, and
6 potential fish disease issues.

7 Ultimately, building a new facility at the existing Fall Creek Hatchery site was
8 determined to be the best option. The main reasons for this choice are that there is an
9 adequate volume of water available to support the fish to be raised at the new facility,
10 that water is high quality, and, because it comes from spring-fed sources, is near
11 optimal temperatures for rearing fish throughout the year. CDFW also had experience
12 with successfully raising fish at this location. Additionally, the Company continues to
13 own this property, facilitating construction in a timeline that meets the requirements
14 of the KHSA.

15 **Q. Does construction of the Fall Creek Hatchery facility allow the Company to meet**
16 **its obligations under the KHSA?**

17 A. Yes. Constructing the Fall Creek Hatchery facility will fulfill the Company's
18 obligation under the KHSA to provide funding for implementation of the mitigation
19 plan developed under Interim Measure 19. The fish raised at the Fall Creek Hatchery
20 will help mitigate for fisheries impacts associated with dam removal activities and
21 help provide ongoing fish harvest opportunities for Klamath Basin tribes as well as
22 commercial and sport fishing stakeholders. The agreed-upon fish production levels

1 will help bolster populations of Coho and Chinook as they recolonize areas upstream
2 of Iron Gate Dam.

3 **Q. Has the project been approved by relevant regulatory agencies?**

4 A. Yes. Plans for the construction of the Fall Creek Hatchery were submitted to FERC
5 for approval and FERC approved the plans and issued an authorization to the
6 Company to proceed with construction on December 21, 2022. Other approvals and
7 permits are in place from the U.S. Army Corps of Engineers, the California State
8 Water Board, CDFW, U.S. Fish and Wildlife, NMFS, and the California State
9 Historic Preservation Officer. At this time, the only outstanding approvals are related
10 to local building permits, heavy haul permits, and an air quality permit for the
11 emergency generator. These permits are being obtained.

12 **Q. What is the cost of the hatchery?**

13 A. Total cost for the new facility is approximately \$36.4 million on a total-Company
14 basis, or approximately \$2.9 million on a Washington-allocated basis. This includes
15 all planning, design, permitting, materials, construction, oversight, and project
16 management costs. This cost does not include operations costs following completion.

17 **Q. Where are operational costs captured?**

18 A. Operational costs for the Fall Creek Hatchery are to be paid by the Company per
19 Interim Measure 20 and have been in the Company's budget as a routine operational
20 and maintenance cost since the original KHSA was executed in 2010.

21 **Q. What is the construction status of the project?**

22 A. Following a competitive bid process in 2022, the Company selected a contractor to
23 build the new Fall Creek Hatchery. A construction contract has been executed and a

1 limited notice to proceed was issued on August 26, 2022, to allow for the contractor
2 to order long-lead time items (e.g., pre-fabricated buildings) and secure necessary
3 subcontracts. Following receipt of the approval from FERC on December 21, 2022,
4 the Company issued a full notice to proceed on December 28, 2022. The contractor
5 mobilized to the site on January 23, 2023, to begin construction. The hatchery will be
6 capable of receiving fish from Iron Gate Hatchery in December 2023 and final
7 completion is expected in April 2024.

8 **Q. How does construction of the facility benefit Washington customers?**

9 A. Implementation of the KHSA, of which this project is one element, benefits
10 Washington customers by achieving a fair and balanced outcome related to the
11 relicensing proceeding for the Klamath Hydroelectric Project, and addresses costs,
12 risks, and liabilities associated with ongoing operation of the four dams slated for
13 removal.

14 **Q. Is the Company transferring the hatchery to the Klamath River Renewal
15 Corporation as it did the Lower Klamath Project?**

16 A. No. The Company is not transferring the Fall Creek Hatchery or the property on
17 which the hatchery will be built to the KRRC. The Company will continue to own
18 both the new hatchery and the property for the foreseeable future.

19 **X. CONCLUSION**

20 **Q. Please summarize your testimony.**

21 A. Repowering Foote Creek II-IV and Rock River I wind projects leverages federal PTC
22 benefits to renew not only some of Wyoming's first utility-scale wind plants, but also

1 expands wind operations in one of the most favorable wind energy locations in the
2 Country, while increasing customer benefits and savings.

3 The Prospect No. 3 flowline replacement is required by FERC to support
4 continued generation from the Prospect No. 3 Hydroelectric Project, will reduce
5 leakage of diverted waters, increase efficiency, and decrease the risk of
6 environmental damage from subsequent erosion. These upgrades will allow the
7 Prospect No. 3 Hydroelectric Project to continue to provide dependable generation for
8 the Company's customers.

9 Construction of the Fall Creek Hatchery supports implementation of the
10 KHSA, and benefits Wyoming customers by achieving a fair and balanced outcome
11 related to the numerous costs, risks, and liabilities associated with ongoing operation
12 and removal of the four dams.

13 **Q. What is your recommendation?**

14 A. I recommend the Commission: (1) find that acquiring and repowering the Foote
15 Creek II-IV and Rock River I wind projects, replacing the Prospect No. 3 flowline,
16 and building the Fall Creek Hatchery are prudent and provide ample customer
17 benefits; and (2) allow the Company to recover the cost of these investments in retail
18 rates.

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

20 A. Yes.

Exh. TJH-2
Docket UE-23____
Witness: Timothy J. Hemstreet

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,

Complainant,

v.

PACIFICORP dba
PACIFIC POWER & LIGHT COMPANY

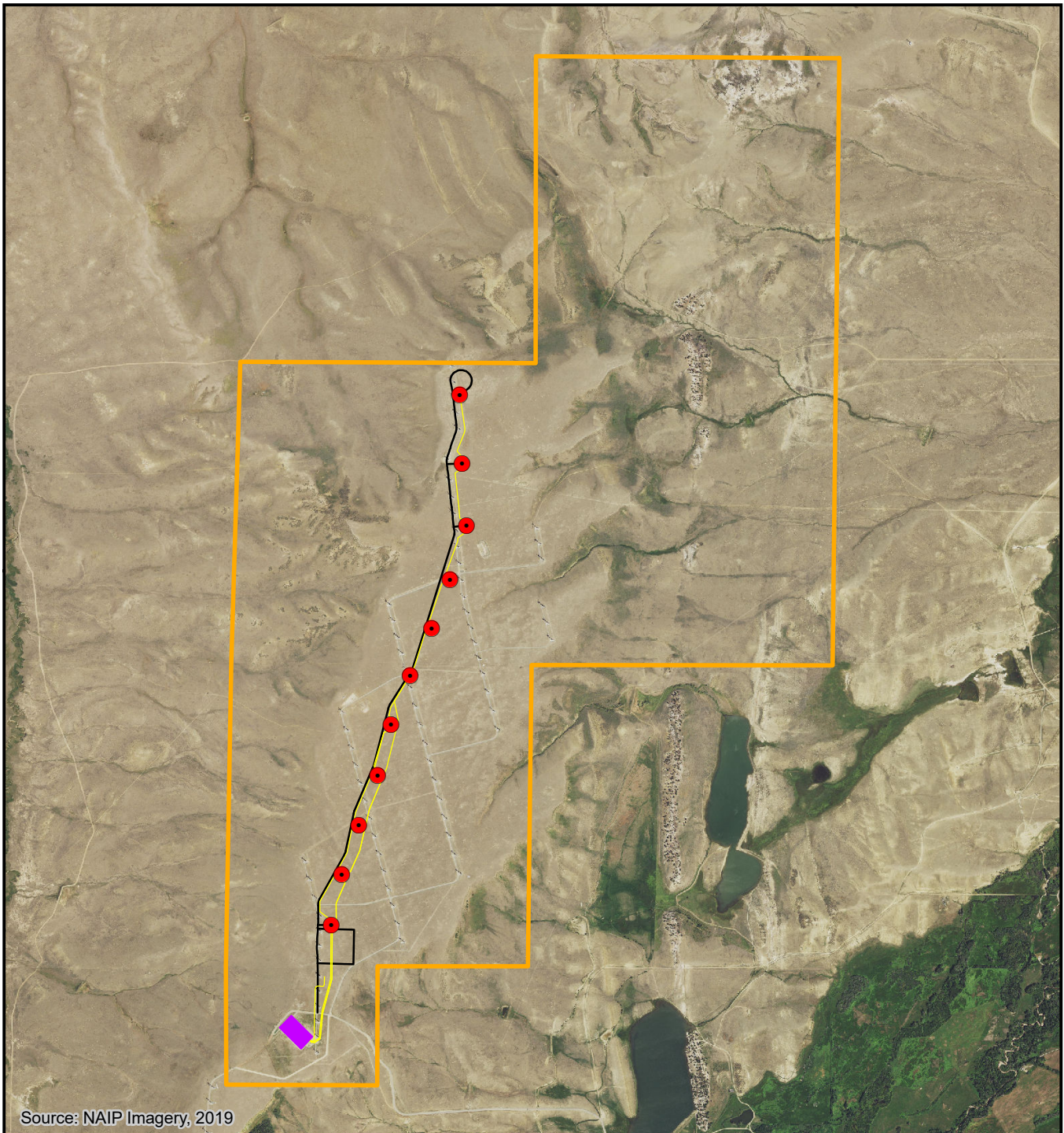
Respondent.

Docket UE-23____

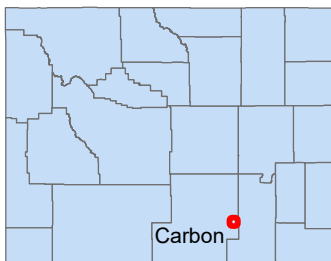
**PACIFICORP
EXHIBIT OF TIMOTHY J. HEMSTREET**

Foote Creek II-IV Site Layout

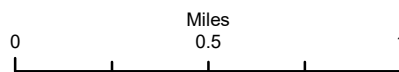
March 2023



Source: NAIP Imagery, 2019



-  Lease Boundary
-  Foote Creek II-IV Turbine
-  Electrical Collection Line
-  Access Road
-  Laydown Area
-  Substation



Foote Creek II-IV

Repowering

Project Location



MARTIN & NICHOLSON
ENVIRONMENTAL CONSULTANTS

Exh. TJH-3
Docket UE-23____
Witness: Timothy J. Hemstreet

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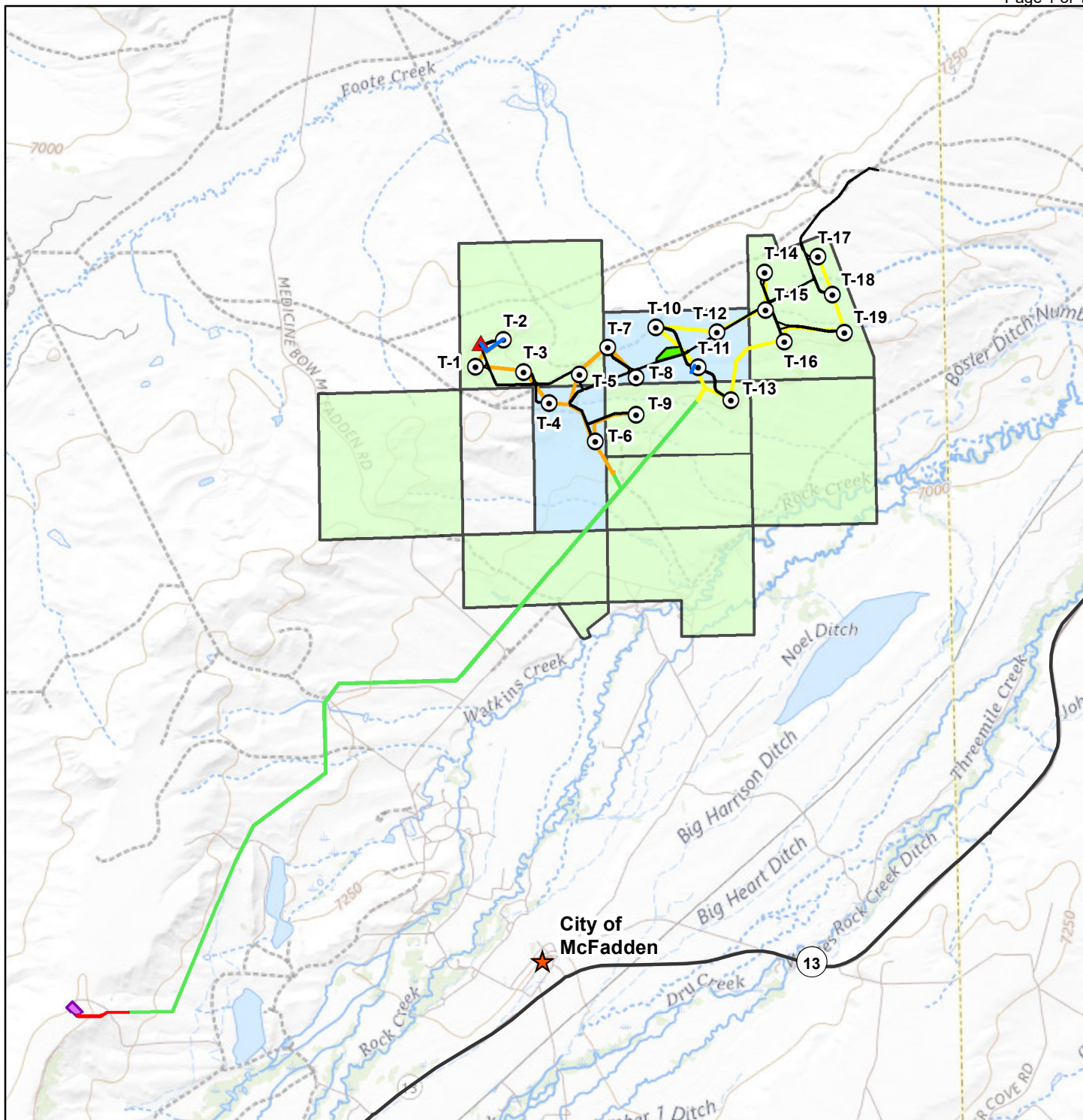
Respondent.

Docket UE-23____

**PACIFICORP
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Rock River I Site Layout

March 2023



- MET Tower
- Structure
- Roadway
- Existing Overhead Transmission Line
- Feeder 1
- Feeder 2
- LV AC Cable
- UG Feeders
- Laydown Area
- Substation
- Rocky River Ranches
- State of Wyoming

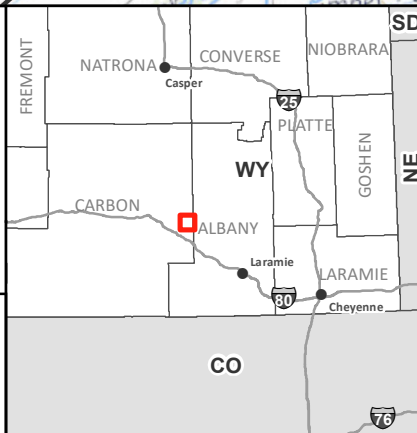
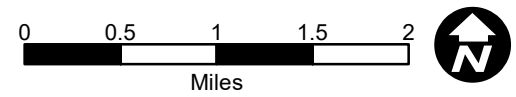


FIGURE 1: VICINITY MAP
ROCK RIVER REPOWER PROJECT
CARBON COUNTY, WYOMING
 Project No. 193579D.000



Sources:
USGS (2019)
ESRI (2021)



Exh. TJH-4C
Docket UE-23 _____
Witness: Timothy J. Hemstreet

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,

Complainant,

v.

PACIFICORP dba
PACIFIC POWER & LIGHT COMPANY

Respondent.

Docket UE-23 _____

**PACIFICORP
REDACTED EXHIBIT OF TIMOTHY J. HEMSTREET**

Foote Creek II-IV Energy Production Analysis

March 2023

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Exh. TJH-5C
Docket UE-23____
Witness: Timothy J. Hemstreet

**BEFORE THE WASHINGTON
UTILITIES AND TRANSPORTATION COMMISSION**

WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,

Complainant,

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Docket UE-23____

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Rock River I Energy Production Analysis

March 2023

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