

Application No. 22-05-____
Exhibit PAC/700
Witness: Timothy J. Hemstreet

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

PACIFICORP

REDACTED

Direct Testimony of Timothy J. Hemstreet

Acquisition and Repowering of Foote Creek II-IV

May 2022

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ATTACHED EXHIBITS

Exhibit PAC/701 – Foote Creek II-IV (Foote Creek North Project) Site Layout

Confidential Exhibit PAC/702 – Foote Creek II-IV 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 Pacific 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 Managing Director 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, focusing on PacifiCorp's wind repowering effort, and
16 assumed my current role in June 2019, in which I oversee the development of
17 renewable energy resources that enhance and complement PacifiCorp's existing
18 renewable energy resource portfolio.

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

20 A. Yes. I have previously sponsored testimony in California, Idaho, Oregon, Utah,
21 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 wind energy facilities,
5 similar to the effort undertaken previously at the Company's Foote Creek I wind
6 facility, which was approved in the Company's 2019 rate case, Application (A.) 18-
7 04-002.¹ The acquisition and repowering of the Foote Creek II-IV wind facilities is
8 also referred to as the Foote Creek North Project (Project). My testimony provides
9 detail on the Company's commercial and other arrangements related to the Project
10 and explains the benefits of the Project to customers. Specifically, my testimony
11 addresses:

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

21 **Q. What conclusion do you reach in your direct testimony?**

22 A. The Company's decision to acquire and repower the Foote Creek II-IV facilities is
23 reasonable and prudent and should be included in the Company's revenue
24 requirement in this case.

¹ *In the Matter of the Application of PACIFICORP (U 901 E), an Oregon Company, for an Order Authorizing a General Rate Increase Effective January 1, 2019*, Decision (D.) 20-02-025 (Feb. 6, 2020).

1 **III. SUMMARY OF TESTIMONY**

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

3 A. Through its previous wind repowering efforts, PacifiCorp leveraged past investments
4 in its wind fleet to enhance the future value of these resources for its customers.

5 PacifiCorp completed the repowering effort for its owned wind fleet in March 2021
6 with the repowering of the Foote Creek I facility. The Company is adding to these
7 repowering benefits by acquiring and repowering the other wind facilities at the Foote
8 Creek Rim in Wyoming that are adjacent to the Company's Foote Creek I facility.

9 Acquiring and repowering the Foote Creek II-IV facilities allows the Company to
10 leverage its existing long-term wind energy lease rights at the Foote Creek Rim so
11 that customers can continue to benefit from the cost-effective, high-capacity-factor
12 wind energy resources available at the site. Acquisition and repowering the Foote
13 Creek II-IV facilities was identified as beneficial to customers and included in the
14 least-cost, least risk preferred portfolio identified in the Company's 2021 IRP. The
15 Wyoming Public Service Commission (WPSC) has approved a Certificate of Public
16 Convenience and Necessity (CPCN)² for the Project and construction will begin in
17 the summer of 2022, with the repowered facilities anticipated to be in service in late
18 2023.

² See *In the Matter of the Application of Rocky Mountain Power for a Certificate of Public Convenience and Necessity to Construct New Wind Turbines and Update Collector Lines at the Existing Foote Creek II-IV Wind Energy Facility*, Docket No. 20000-606-EN-21, Record No. 16955, Bench Decision Rendered on April 26, 2022.

1 **IV. PROJECT BACKGROUND, WIND REPOWERING SCOPE AND**
2 **RELATION TO FOOTE CREEK I PROJECT**

3 **Q. Please explain the background of the Foote Creek Rim wind energy projects.**

4 A. The Foote Creek Rim wind energy projects, consisting of Foote Creek I, II, III and
5 IV, were the first utility-scale, commercial wind energy projects in the State of
6 Wyoming. The projects are located at the Foote Creek Rim site due to the
7 extraordinary wind energy resource available at the location as a result of its
8 geographic features, which cause already robust winds in the local area to accelerate
9 further as they move over the elevated plateau of the Foote Creek Rim. Development
10 of wind energy facilities at the site to take advantage of these favorable wind energy
11 characteristics began in the early 1990s, and construction of the Foote Creek Rim
12 projects was completed between 1999 and 2000.

13 PacifiCorp participated in wind energy development at the site in partnership
14 with the Eugene Water & Electric Board (EWEB) and the Bonneville Power
15 Administration (BPA). PacifiCorp and EWEB were co-owners of the Foote Creek I
16 wind energy facility that reached commercial operation in 1999, and BPA purchased
17 a portion of the project’s output. The Foote Creek II-IV wind energy facilities, which
18 are owned by Terra-Gen, LLC (Terra-Gen), were independently developed and their
19 generation output was sold to utilities under power purchase agreements that have
20 since expired. The Foote Creek II-IV projects were constructed with 64 wind turbines
21 (of which 33 turbines had a nameplate capacity of 0.6 megawatts (MW) each and 31
22 turbines had a nameplate capacity of 0.75 MW) with a total nameplate capacity of
23 43.35 MW.

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

2 A. Repowering a wind energy facility means upgrading the wind turbine generator
3 (WTG) equipment at an existing wind energy project with more efficient equipment
4 to increase the power generation from the facility and extend the life of the facility.
5 Specifically, repowering Foote Creek II-IV involves installing new turbines while
6 reusing other pre-existing facility infrastructure.

7 **Q. Please briefly describe PacifiCorp's effort to repower the Foote Creek II-IV**
8 **facilities.**

9 A. Similar to the Company's effort to repower its neighboring Foote Creek I facility, the
10 repowering of the Foote Creek II-IV facilities involves installing modern WTGs. The
11 11 new WTGs to be installed are of the same type recently installed at Foote Creek I
12 to replace the older wind turbines of much smaller capacity that were previously at
13 the site. The new WTGs will be supported on new foundations and connected with
14 new energy collector circuits, will have updated switchgear and controls, and the new
15 WTGs locations will be linked by a new turbine access road. The proposed site layout
16 for the Foote Creek II-IV repowering effort is shown in Exhibit PAC/701.

17 **Q. Will the Project benefit from PacifiCorp's prior efforts to repower the adjacent**
18 **Foote Creek I facility?**

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

1 by reducing the ongoing land rights cost of the project. Similarly, repowering of the
2 Foote Creek II-IV facilities will allow customers to fully benefit from these wind
3 energy lease rights, which provide the ability to cost-effectively generate power at
4 one of the most favorable wind energy locations in Wyoming.

5 **Q. Are there other ways in which the Project will benefit from PacifiCorp's prior**
6 **repowering effort at Foote Creek I?**

7 A. Yes. As part of the Project, an existing 2.0 MW turbine previously constructed as part
8 of the Foote Creek I repowering project will be interconnected to the 1.8 MW Foote
9 Creek II interconnection. This will allow this small Foote Creek II interconnection to
10 be used by an existing, appropriately sized turbine while also allowing more
11 generation from the existing Foote Creek I turbines as a result of less curtailment at
12 higher wind speeds. Additionally, the Foote Creek I repowering project required
13 access road upgrades to the Foote Creek Rim plateau to allow larger, modern wind
14 turbine equipment to be delivered to the site. These improvements will be re-used for
15 the Foote Creek II-IV facilities, and the enclosed switchgear building constructed
16 adjacent to the Foote Creek Substation as part of the Foote Creek I repowering project
17 will be used for equipment that will support the Project, reducing costs. Finally, the
18 Foote Creek II-IV facilities will be operated from the Company's existing operations
19 and maintenance building for the Foote Creek I project, so no additional facilities are
20 needed for project operations.

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

23 A. Monthly monitoring conducted at the Foote Creek II-IV project area over the last

1 several years shows no significant avian impacts. Although the larger blades and
2 greater rotor-swept area will increase the overall risk zone of the repowered wind
3 turbines, this does not necessarily correlate with an increased risk of avian impacts.
4 The significant reduction in the number of turbines that will be deployed at the site
5 also means that less of the overall project site area will be covered by wind turbines.
6 Similar to turbine location adjustments made at the Foote Creek I facility, the
7 reduction in turbines at the site allows the Company to locate the wind turbines to
8 avoid areas of higher avian use such as the edges of the Foote Creek Rim, as shown in
9 Exhibit PAC/701.

10 The Company performs monthly monitoring at all company-owned Wyoming
11 wind facilities and reports to both the Wyoming Game and Fish Department and the
12 U.S. Fish and Wildlife Service. Once repowering concludes, the Company will begin
13 this monthly monitoring to determine if the new turbines cause additional impacts to
14 avian species and will engage with the appropriate agency to discuss and, if prudent
15 and practicable, implement additional avoidance, minimization, or mitigation
16 measures. In addition, the Company is coordinating with both the Wyoming Game
17 and Fish Department and the U.S. Fish and Wildlife Service on the Project, including
18 the development of an Eagle Conservation Plan and Bird and Bat Conservation
19 Strategy for the new turbines.

1 **V. PROJECT CONTRACTING, PERMITTING STATUS, PROJECT**
2 **SCHEDULE, AND PROJECT COST**

3 **Q. What commercial arrangements has PacifiCorp made to acquire and repower**
4 **the Foote Creek II-IV facilities?**

5 A. In addition to the earlier acquisition of the master wind energy lease rights for the
6 project site, PacifiCorp has executed a Purchase and Sale Option Agreement (PSOA)
7 with Terra-Gen to acquire 100 percent of its interests in the Foote Creek II, III and IV
8 facilities. Pursuant to the PSOA, Terra-Gen has removed the original 64 turbines from
9 the site and completed site restoration activities in preparation for repowering of the
10 facility by the Company. The Company is now preparing to close on the acquisition
11 of the facilities pursuant to the PSOA given the recent approval of the Company's
12 CPCN application by the WPSC. This supports the Company's efforts to proceed
13 with repowering construction activities beginning in the summer of 2022, in support
14 of a late 2023 in-service date for the Project.

15 **Q. What other commercial arrangements has PacifiCorp made with respect to the**
16 **Project?**

17 A. PacifiCorp has also negotiated a master supply agreement for the repowering turbines
18 with Vestas-American Wind Energy, Inc. (Vestas) in which Vestas will supply and
19 commission WTGs suitable for the site of the same type used at the Foote Creek I
20 facility. In addition to the turbine supply agreement, the Company will also contract
21 with Vestas to maintain the WTGs under a service and maintenance agreement using
22 Vestas staff that are performing similar work at the Foote Creek I facility. The
23 Company has executed a contract for balance of plant (BOP) wind energy

1 construction services following a competitive procurement process in which
2 proposals from qualified wind energy construction companies were solicited. The
3 Company is in the process of finalizing a turbine supply agreement for the Project
4 consistent with negotiated pricing and terms and will soon issue a full notice to
5 proceed to the BOP contractor in order to initiate construction activities this summer.

6 **Q. What is the status of necessary permitting to begin construction?**

7 A. PacifiCorp has received the necessary Federal Aviation Administration no-hazard
8 determinations to install the larger new turbines at the site. The Company has also
9 received a Conditional Use Permit for the repowering effort from Carbon County,
10 Wyoming. The Company is now in the process of applying for building permits from
11 Carbon County, which are expected to be received within the next several months.

12 **Q. Are there other applicable permitting requirements?**

13 A. Yes. PacifiCorp may need to obtain standard construction permits such as storm-
14 water permits and fugitive dust permits. The Company will obtain these before
15 construction and will continue to work with the appropriate regulatory and permitting
16 authorities to obtain any other necessary permits or to process any amendments or
17 modifications to the existing facility permits.

18 **Q. What is the anticipated construction schedule for the Project?**

19 A. The Company anticipates commencing construction activities in the summer of 2022,
20 with turbine erection and commissioning activities occurring in 2023. The Project is
21 anticipated to be fully online and serving customers in December 2023. Major Project
22 milestones are indicated below:

	<u>Milestone</u>	<u>Anticipated Date</u>
1		
2	Wyoming CPCN Approval	May 2022
3	Construction Mobilization	June 2022
4	Turbine Foundation Completion	November 2022
5	Access Road Completion	May 2023
6	Complete Turbine Deliveries	June 2023
7	Mechanical and Electrical Completion	August 2023
8	Turbine Commissioning Completion	December 2023
9	Final Completion/Site Restoration	July 2024

10 **Q. What is the forecasted cost of the Project?**

11 A. The cost of acquiring and repowering the Foote Creek II-IV facilities is estimated at
12 \$82 million on a total-Company basis.³

13 **VI. BENEFITS OF REPOWERING INCLUDING REQUALIFICATION FOR**
14 **PRODUCTION TAX CREDITS**

15 **Q. What benefits will customers realize from the Foote Creek II-IV facilities once**
16 **repowered?**

17 A. As discussed earlier, the Foote Creek II-IV facilities will be able to make full use of
18 existing PacifiCorp wind energy lease rights at an existing developed wind energy
19 facility to continue energy production from an existing wind energy project using
20 larger, more efficient turbines. Given the favorable wind conditions at the site, and
21 the fact that the Company operates the adjacent Foote Creek I facility, the repowered
22 Foote Creek II-IV facilities will allow the Company to expand its Foote Creek Rim
23 operations from 13 to 24 WTGs and create efficiencies at the project site where the
24 Company already has existing operations and staff. Repowering will also requalify
25 the facility for PTCs, which will be passed on to the Company's customers.

26 Additionally, given the extraordinary wind resource of the Foote Creek Rim site, the

³California's allocated share represents less than two percent of total-Company costs.

1 Foote Creek II-IV facilities will have a high net capacity factor of [REDACTED] percent, and that
2 high net capacity factor allows the facilities to contribute to system capacity needs.

3 **Q. Will the repowered Foote Creek II-IV facilities qualify for PTCs?**

4 A. Yes. Consistent with Internal Revenue Service (IRS) guidance, a facility owner can
5 demonstrate that construction of a facility has begun in the year in which at least
6 five percent of the applicable project costs are incurred. If wind turbine equipment is
7 purchased and delivered in 2020, and the equipment comprises at least five percent of
8 the applicable project costs, a PTC safe harbor is created for the wind facilities
9 subsequently constructed. To meet this requirement, the Company will use safe-
10 harbor equipment purchased from Vestas in 2020.

11 **Q. What is the value of the PTC for wind facilities?**

12 A. For 2021, the value of the federal PTC was 2.5 cents per kilowatt-hour, or \$25 per
13 megawatt-hour. This PTC value is adjusted annually based upon an inflation index,
14 and the PTC is available for energy produced during the 10-year period after the wind
15 facility begins commercial operation. Under current law, the Foote Creek II-IV
16 facilities would qualify for 60 percent of the value of the federal PTC.

17 **Q. Are there other requirements that the repowered Foote Creek II-IV facilities
18 must satisfy to qualify for the PTC?**

19 A. Yes, the repowered facilities must be in service before the end of 2025 to meet the
20 IRS continuous efforts safe harbor and qualify for the PTC. However, similar to the
21 Company's Foote Creek I repowering effort, repowering at Foote Creek II-IV will not
22 incorporate retained components from the existing wind turbines at the site.

23 Therefore, the IRS "80/20" test that requires no more than 20 percent of the fair

1 market value of a repowered turbine to be composed of retained components is not
2 applicable to the Foote Creek II-IV facilities. If such a test were applied, 100 percent
3 of the wind turbine generator equipment would be new and there would be no value
4 from retained components.

5 **Q. Will repowering increase the overall generating capacity of the Foote Creek II-**
6 **IV facilities?**

7 A. No. The existing Foote Creek II, Foote Creek III and Foote Creek IV interconnections
8 will be used that allow for 43.35 MW of generation capacity to be connected to the
9 transmission system. The wind turbine equipment that will be used at the facilities has
10 been optimized to make full use of the existing interconnection limits and the
11 Company does not anticipate increasing the interconnection capacity for the facilities.

12 **Q. What is the anticipated generation that will result from the Project?**

13 A. The Company retained the engineering consulting firm Black & Veatch, Inc. (Black
14 & Veatch) to evaluate the energy production expected from the Project. To complete
15 this assessment, Black & Veatch used site wind data, wind turbine location data,
16 operational performance data, and other available site-specific information to model
17 the expected generation from the Project. The wind model also evaluated generation
18 losses resulting from the wake losses at each turbine location. Wake losses are the
19 reduction in generation at turbines downwind of other turbines due to reduced wind
20 speed and increased turbulence in the airflow—or wake—behind a turbine. The
21 estimated annual energy production from the 11 new turbines is expected to be
22 [REDACTED] gigawatt-hours (GWh), resulting in a high net capacity factor of [REDACTED] percent. An
23 additional [REDACTED] GWh per year is expected to be produced as a result of interconnecting

1 a previously constructed 2.0 MW turbine at Foote Creek I to the Foote Creek II
2 interconnection as part of the Project. The repowered facilities will produce enough
3 energy to power nearly 20,000 homes. The technical analysis documenting the
4 expected generation from the Project is provided in Confidential Exhibit PAC/702.

5 **Q. Will the Project help the Company meet the State of California's**
6 **decarbonization goals for the electricity sector?**

7 A. Yes. The Foote Creek II-IV acquisition and repowering project will allow customers
8 to benefit from low-cost emissions-free energy from one of the most productive wind
9 energy sites in the United States, and secure the ability to continue generating wind
10 energy from this favorable location for decades into the future under long-term wind
11 energy lease rights now owned by the Company. The repowering effort will increase
12 the amount of carbon-free energy able to be produced from the project site by more
13 than 50 percent as compared to the original turbine equipment installed. This
14 renewable generation will help the Company to achieve California's policy goals of
15 achieving a zero-carbon electricity supply by 2045 as required by Senate Bill 100
16 (2018) as well as the state's overall greenhouse gas reduction goals.

17 **VII. REVIEW OF THE PROJECT IN THE 2021 IRP**

18 **Q. Was repowering of the Foote Creek II-IV facilities reviewed as part of the**
19 **Company's 2021 IRP?**

20 A. Yes. The Project was made available as a potential resource that could meet customer
21 energy and capacity needs in the model used to develop the Company's 2021 IRP.⁴

⁴ PacifiCorp's 2021 IRP at 295. See, <https://www.pacificorp.com/energy/integrated-resource-plan.html>.

1 Because the resource was found to be beneficial to customers, it was identified as a
2 resource in the least-cost, least-risk preferred portfolio. Company witness Shayleah J.
3 LaBray discusses the evaluation of the Project in the Company's 2021 IRP and the
4 economic benefits of the Project in her direct testimony, Exhibit PAC/400.

5 **Q. Is the acquisition and repowering of the Foote Creek II-IV facilities included in**
6 **the 2021 IRP Action Plan?**

7 A. Yes. Action Item 2b of the 2021 IRP notes the Company will pursue necessary
8 regulatory approvals to authorize the acquisition and repowering of the Foote Creek
9 II-IV facilities in order to support a late 2023 in-service date.⁵

10 **VIII. CONCLUSION**

11 **Q. Please summarize your testimony.**

12 A. Acquiring and repowering the Foote Creek II-IV facilities presents the opportunity to
13 leverage expiring federal PTC benefits to renew one of the first wind plants built in
14 Wyoming in a cost-effective manner for the benefit of the Company's customers. In
15 addition, acquiring the Foote Creek II-IV facilities and repowering them provides a
16 unique opportunity to expand the Company's operations at the Foote Creek Rim
17 location—one of the most favorable wind energy sites in the country—while
18 significantly increasing the efficiency of this existing wind site. Repowering the
19 Foote Creek II-IV facilities will allow customers to fully benefit from the Company's
20 existing wind energy lease rights at the site and provide low-cost energy sufficient to
21 power nearly 20,000 homes. The Company has negotiated the commercial
22 arrangements necessary to acquire and repower the site, and repowering will be

⁵ *Id.* at 323.

1 underway this summer. Review of acquisition and repowering of the Foote Creek II-
2 IV facilities in the Company's 2021 IRP process indicates that the Project provides
3 customer benefits and is a component of the least-cost, least-risk resource portfolio
4 identified through that process.

5 **Q. What is your recommendation to the California Public Utilities Commission**
6 **(Commission)?**

7 A. I recommend the Commission find that acquiring and repowering the Foote Creek II-
8 IV facilities is in the public interest and allow the Company to recover the cost of the
9 repowering effort in rates since the Project will allow the Company's customers to
10 fully benefit from prior Company investments at the Foote Creek Rim site and make
11 more efficient use of an existing wind site, and given the substantial benefits that will
12 be provided to customers by the Project.

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

14 A. Yes.

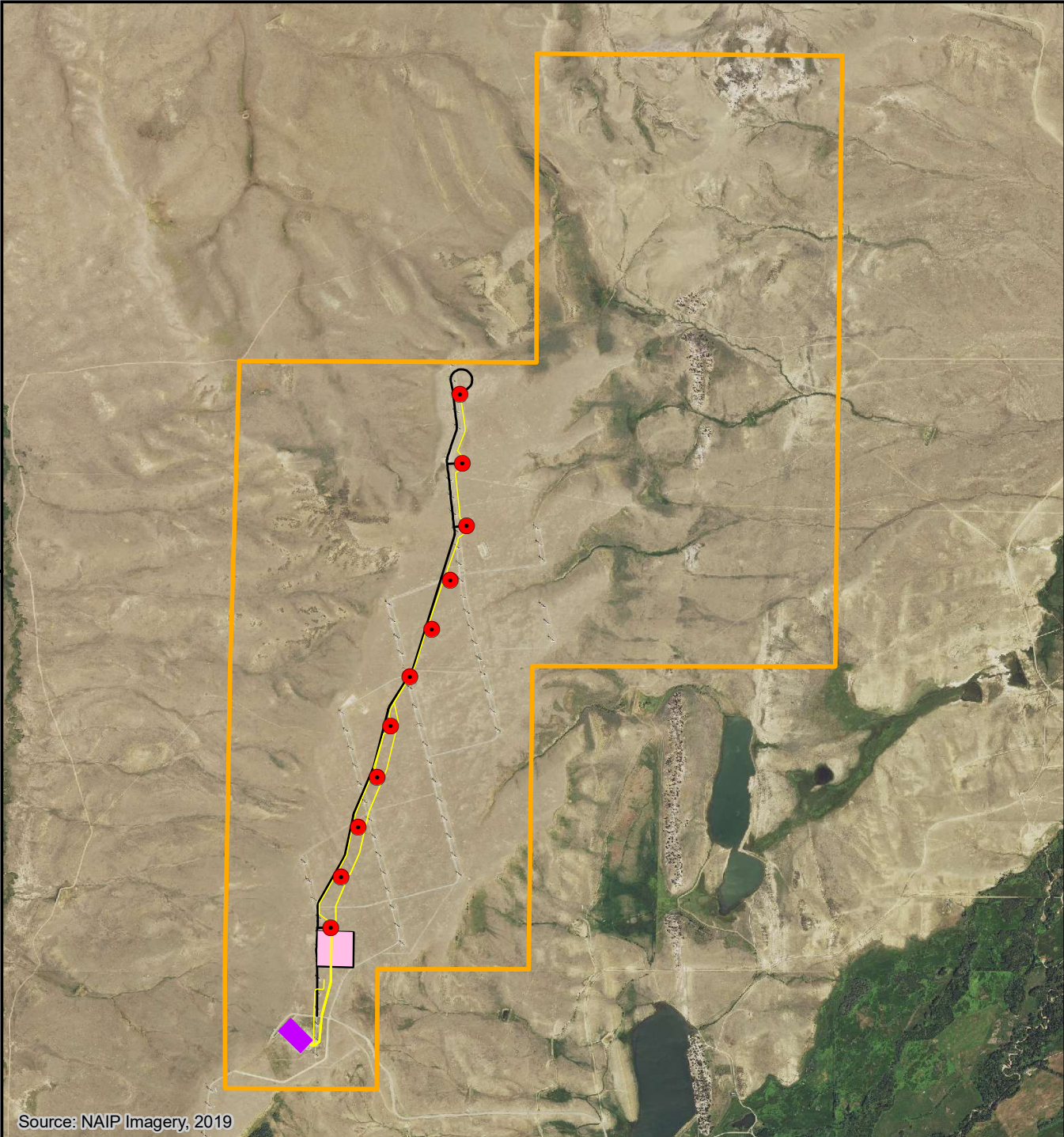
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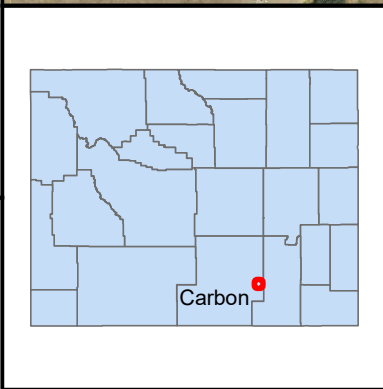
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Exhibit Accompanying Direct Testimony of
Timothy J. Hemstreet
Foote Creek II-IV (Foote Creek North Project) Site Layout

May 2022



Source: NAIP Imagery, 2019




-  Lease Boundary
-  Foot Creek North Turbine
-  Electrical Collection Line
-  Access Road
-  Laydown Area
-  Substation

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Foote Creek North

Project Location



MARTIN & NICHOLSON
ENVIRONMENTAL CONSULTANTS

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