BATES WHITE
ECONOMIC CONSULTING

THE INDEPENDENT EVALUATOR'S FINAL REPORT ON PACIFICORP'S 2017R REQUEST FOR PROPOSALS

Presented to:
OREGON PUBLIC UTILITY COMMISSION

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The Independent Evaluator's Final Report on PacifiCorp's 2017R Request for Proposals is Confidential and will be provided to those parties who have signed the protective order, except for Attachment 3 to the report, which is provided non-confidentially.

Large Generator Interconnection
System Impact Restudy Report

Completed for

("Interconnection Customer")
Q0713

Proposed Point of Interconnection

Yellowcake – Antelope Mine 230 kV transmission line
(POI at approx.43.113 N, 105.425 W)

January 29, 2018

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1.0 DESCRIPTION OF THE GENERATING FACILITY

("Interconnection Customer") proposed interconnecting 350 MW of new generation to PacifiCorp's ("Transmission Provider") Yellowcake – Antelope Mine 230 kV transmission line (Point of Interconnection at approx. 43.113 N, -105.425 W) located in Converse County, Wyoming. The project ("Project") will consist of one hundred forty (140) GE 127 2.5 MW wind turbines for a total output of 350 MW. The requested commercial operation date is December 31, 2020.

The restudy of this Project is performed due to the staging of the Energy Gateway West project. Specifically, while the entire Gateway West project has a longer development timeline, the Aeolus-Bridger/Anticline D.2 segment of the project (500 kV segment from the planned Aeolus substation to the planned Anticline substation) now has an expected 2020 in-service date. The earlier availability of the D.2 segment materially changes certain modeling assumptions that could impact the cost or timing of the interconnection of certain projects whose previous studies depended on Gateway West in its entirety.

Interconnection Customer will NOT operate this generator as a Qualified Facility as defined by the Public Utility Regulatory Policies Act of 1978 (PURPA).

The Transmission Provider has assigned the Project "Q0713."

2.0 SCOPE OF THE STUDY

The interconnection system impact restudy shall evaluate the impact of the proposed interconnection on the reliability of the transmission system. The interconnection system impact study will consider Base Case as well as all generating facilities (and with respect to (iii) below, any identified network upgrades associated with such higher queued interconnections) that, on the date the interconnection system impact study is commenced:

(i) are directly interconnected to the transmission system;
(ii) are interconnected to Affected Systems and may have an impact on the interconnection request;
(iii) have a pending higher queued interconnection request to interconnect to the transmission system; and
(iv) have no Queue Position but have executed an LGIA or requested that an unexecuted LGIA be filed with FERC.

This interconnection system impact restudy will consist of a short circuit analysis, a stability analysis, and a power flow analysis. The study will state the assumptions upon which it is based; state the results of the analyses; and provide the requirements or potential impediments to providing the requested interconnection service, including preliminary indication of the cost and length of time that would be necessary to correct any problems identified in those analyses and implement the interconnection. The study will also provide a list of facilities that are required as a result of the Interconnection Request and a non-binding good faith estimate of the cost responsibility and a non-binding good faith estimated time to construct.

Based on the engineering judgement, the stability results for this project are not expected to change and hence the restudy of stability analysis was not performed.

3.0 TYPE OF INTERCONNECTION SERVICE

The Interconnection Customer has selected *Energy Resource (ER)* interconnection service.

4.0 DESCRIPTION OF PROPOSED INTERCONNECTION

The Interconnection Customer's proposed Generating Facility is to be interconnected through a new Point of Interconnection ("POI") substation between Yellowcake and Antelope Mine 230 kV substations. Figure 1 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

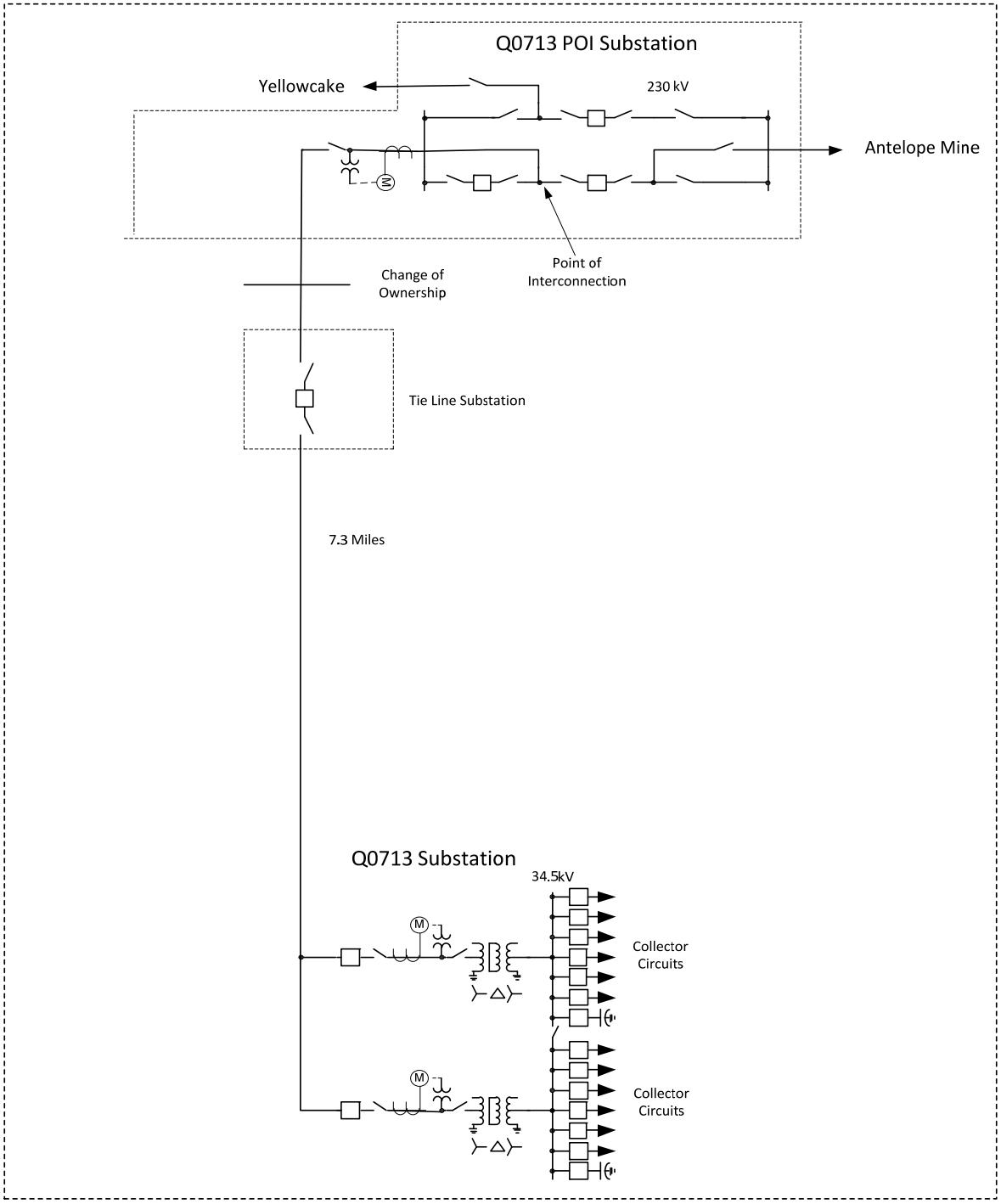

Figure 1: Simplified System One Line Diagram

5.0 OTHER OPTIONS CONSIDERED

The following alternative options were considered as potential points of interconnection for this Project: None

6.0 STUDY ASSUMPTIONS

- All active higher priority transmission service and/or generator interconnection requests with an in-service date of December 2020 or earlier will be considered in this study and are listed in Appendix 1. If any of these requests are materially modified or withdrawn, the Transmission Provider reserves the right to restudy this request, and the results and conclusions could significantly change.
- For study purposes there are two separate queues:
  - Transmission Service Queue: to the extent practical, all network upgrades that are required to accommodate active transmission service requests will be modeled in this study.
  - Generation Interconnection Queue: Interconnection Facilities associated with higher queued interconnection requests with an in-service date of December 2020 or earlier will be modeled in this study.
- The Interconnection Customer's request for energy or network resource interconnection service in and of itself does not convey transmission service. Only a Network Customer may make a request to designate a generating resource as a Network Resource. The provision of transmission service may require additional studies and the construction of additional upgrades.
- Under normal conditions, the Transmission Provider does not dispatch or otherwise directly control or regulate the output of generating facilities. Therefore, the need for transmission modifications, if any, which are required to provide Network Resource Interconnection Service will be evaluated on the basis of 100 percent deliverability (i.e., no displacement of other resources in the same area).
- This study assumes the Project will be integrated into the Transmission Provider's system at agreed upon and/or proposed POI.
- The Interconnection Customer will construct and own any facilities required between the Point of Change of Ownership and the Project unless specifically identified by the Transmission Provider.
- Generator tripping may be required for certain outages.
- All facilities will meet or exceed the minimum Western Electricity Coordinating Council ("WECC"), North American Electric Reliability Corporation ("NERC"), and the Transmission Provider's performance and design standards.
- The Energy Gateway West, Aeolus-Bridger/Anticline D.2 500 kV line from the proposed Aeolus substation to the proposed Anticline substation and ancillary projects are assumed in service in 2020.
- All system improvements associated with the prior queued projects are in service before Q0713. This includes a new Aeolus – Shirley Basin #2 230 kV line with 2x1557 ACSR (Q0707), rebuild of the Standpipe-Freezeout-Aeolus 230 kV line to 2x1272 (Q0712), and rebuild of the Aeolus – Shirley Basin #1 230 kV line with 2x1557 ACSR (Q0712).
- All existing and proposed Remedial Action Schemes ("RAS") associated with prior queue generation facilities are assumed to be in service for this study.

- A RAS that will arm approximately 640 MW of generation for the Energy Gateway D.2 outages was assumed to be in-service.
- This report is based on information available at the time of the study. It is the Interconnection Customer's responsibility to check the Transmission Provider's web site regularly for Transmission System updates at http://www.pacificorp.com/tran.html

7.0 ENERGY RESOURCE (ER) INTERCONNECTION SERVICE

Energy Resource Interconnection Service allows the Interconnection Customer to connect its Generating Facility to the Transmission Provider's Transmission System and to be eligible to deliver electric output using firm or non-firm transmission capacity on an as available basis.

7.1 Requirements

7.1.2 GENERATING FACILITY MODIFICATIONS

All interconnecting synchronous and non-synchronous generators are required to design their Generating Facilities with reactive power capabilities necessary to operate within the full power factor range of 0.95 leading to 0.95 lagging. This power factor range shall be dynamic and can be met using a combination of the inherent dynamic reactive power capability of the generator or inverter, dynamic reactive power devices and static reactive power devices to make up for losses.

For synchronous generators, the power factor requirement is to be measured at the Point of Interconnection. For asynchronous generators, the power factor requirement is to be measured at the high-side of the generator substation. The Generating Facility must provide dynamic reactive power to the system in support of both voltage scheduling and contingency events that require transient voltage support, and must be able to provide reactive capability over the full range of real power output.

If the Generating Facility is not capable of providing positive reactive support (i.e., supplying reactive power to the system) immediately following the removal of a fault or other transient low voltage perturbations, the Generating Facility must be required to add dynamic voltage support equipment. These additional dynamic reactive devices shall have correct protection settings such that the devices will remain on line and active during and immediately following a fault event.

Generators shall be equipped with automatic voltage-control equipment and normally operated with the voltage regulation control mode enabled unless written authorization from the Grid Operator is given to operate in other control mode (e.g. constant power factor control). The control mode of the generating units shall be accurately represented in operating studies. The generators shall be capable of operating continuously at their maximum power output at its rated field current within +/- 5% of its rated terminal voltage.

As required by NERC standard VAR-001-1a, the Transmission Provider will provide a voltage schedule for the Point of Interconnection. In general, Generating

Facilities should be operated so as to maintain the voltage at the Point of Interconnection, or other designated point as deemed appropriated by Transmission Provider, between 1.00 per unit to 1.04 per unit. The Transmission Provider may also specify a voltage and/or reactive power bandwidth as needed to coordinate with upstream voltage control devices such as on-load tap changers. At the Transmission Provider's discretion, these values might be adjusted depending on operating conditions. Generating Facilities capable of operating with a voltage droop are required to do so. Voltage droop control enables proportionate reactive power sharing among generation facilities. Studies will be required to coordinate voltage droop settings if there are other facilities in the area. It will be the Interconnection Customer's responsibility to ensure that a voltage coordination study is performed, in coordination with Transmission Provider, and implemented with appropriate coordination settings prior to unit testing.

For areas with multiple generating facilities additional studies may be required to determine whether or not critical interactions, including but not limited to control systems, exist. These studies, to be coordinated with Transmission Provider, will be the responsibility of the Interconnection Customer. If the need for a master controller is identified, the cost and all related installation requirements will be the responsibility of the Interconnection Customer. Participation by the Generating Facility in subsequent interaction/coordination studies will be required pre- and post-commercial operation in order ensure system reliability.

To facilitate collection and validation of accurate modeling data to meet NERC modeling standards, PacifiCorp, as the Planning Coordinator, requires Phasor Measurement Units (PMUs) at all new Generating Facilities with an individual or aggregate nameplate capacity of 75 MVA or greater. In addition to owning and maintaining the PMU, the Generating Facility will be responsible for collecting, storing and retrieving data as requested by the Planning Coordinator. Data must be collected and be able to stream to Planning Coordinator for each of the Generator Facility's step-up transformers measured on the low side of the GSU at a sample rate of at least 30 samples per second and synchronized within +/- 2 milliseconds of the Coordinated Universal Time (UTC). Initially, the following data must be collected:

- Three phase voltage and voltage angle (analog)
- Three phase current (analog)

Data requirements are subject to change as deemed necessary to comply with local and federal regulations.

All generators must meet the Federal Energy Regulatory Committee ("FERC") and WECC low voltage ride-through requirements as specified in the interconnection agreement. As the Transmission Provider cannot submit a user written model to WECC for inclusion in base cases, a standard model from the WECC Approved Dynamic Model Library is required 180 days prior to trial operation. The list of approved generator models is continually updated and is available on the http://www.WECC.biz website.

Based on the turbine specification data provided by the Interconnection Customer, the wind turbines do not have the capability to deliver 100% of the power to the Point of Interconnection within the range of +/- 0.95 power factor. The data provided indicates that the wind turbines have a power factor capability of 0.98 capacitive and 0.96 inductive at rated power.

The study showed that the collector system injects approximately 17.2 MVAr (see Figure 3 in Appendix 3) when it is connected to the transmission system without the wind turbines being online. The Interconnection Customer will be required to ensure that there is minimum reactive interchange under these conditions and that the collector system of the Project is not contributing excessive reactive power into the system increasing voltage under light load conditions. Failure of the Project to minimize the reactive interchange under these conditions may result in the opening of the POI breakers for the Project by the grid operator.

At low output level, the Project needs to ensure that it maintains the power factor within +/- 0.95 at the POI and minimize the reactive power flow towards the transmission system to prevent high voltages. PacifiCorp has experienced high voltages in the Wyoming area when the transmission system is lightly loaded with low wind conditions. With low wind conditions the wind farms tend to supply reactive power into the transmission system increasing the voltage.

The Interconnection Customer is responsible for the protection of the transmission line between the Generating Facility and the Point of Interconnection substation. In order to provide this protection the Interconnection Customer shall construct and own a tie line substation to be located at the change of ownership (separate fenced facility adjacent to the Transmission Provider's Point of Interconnection substation) and include an Interconnection Customer owned protective device and associated transmission line relaying/communications. The ground grids of the Transmission Provider's Point of Interconnection substation and the Interconnection Customer's tie line substation will be connected to support the use of a bus differential protection scheme which will protect the overhead bus connection between the two facilities

7.1.3 TRANSMISSION SYSTEM MODIFICATIONS

- Construct a new POI substation with 3-breaker ring bus configuration between Yellowcake and Antelope Mine substations (refer to Figure 1).
- Expansion of the Windstar 230 kV substation with a new 230 kV bus.
- Addition of two new 230 kV breakers at Windstar substation.
- A new line termination at Windstar substation.
- A new line termination at Shirley Basin substation and one 230 kV circuit breaker.
- Construction of a new, 60-mile Windstar – Shirley Basin 230 kV line with 2-1272 ACSR (Aluminum Conductor Steel Reinforced).

Additionally, the Q0713 project triggers the need for the Transmission Provider's planned Energy Gateway South project. This project consists of a new 400 mile 500 kV transmission line from the planned Aeolus substation in Wyoming to the Transmission Provider's existing Clover substation in central Utah, with ancillary improvements.

7.1.4 TRANSMISSION REQUIREMENTS

Construct approximately 1,200 feet of 230 kV transmission line to loop-in the existing Antelope-Yellowcake 230 kV line to the Q0713 POI substation. This will require two guyed wood pole main line structures near structure 1/33 and a new guyed wood pole structure at each end of the POI sub.

Construct approximately 60 miles of 230 kV transmission line from Windstar substation to Shirley Basin substation. Conductor shall be double bundle 1272 ACSR "Bittern" Conductor.

The Interconnection Customer shall construct the tie line from the collector substation to the tie-line substation.

The Interconnection Customer is required to build tie-line substation adjacent to the new POI substation which will house the tie-line circuit breaker. The Transmission Provider shall review the design of the tie-line span between the tie-line substation deadend tower and the new POI substation deadend tower. The Interconnection Customer shall coil conductor, OPGW, shield wire, and line hardware with sufficient quantities to span between the tie-line substation tower and the POI substation tower.

The Transmission Provider will construct the span between the tie-line substation tower and the new POI substation tower.

If any Transmission Provider lines are crossed by Interconnection Customer tie-line, the Interconnection Customer line will cross under Transmission Provider's line with at least NESC plus 3 foot clearance under all sag conditions of both lines.

7.1.5 EXISTING CIRCUIT BREAKER UPGRADES – SHORT CIRCUIT

The increase in the fault duty on the system as a result of the addition of the Generating Facility with 140 GE 127 2.5 MW wind turbine generators fed through 140 – 2600 kVA 34.5 kV – 690 V transformers with 9.0% impedance then fed through two 230 – 34.5kV 120/115/200 MVA step up transformers with 8.0% impedance will not push the fault duty above the interrupting rating of any of the existing fault interrupting equipment.

7.1.6 PROTECTION REQUIREMENTS

The installation of protective relays for line fault detection will be required at the Transmission Provider's new 230 kV POI substation for the protection of the line

to the Interconnection Customer's collector substation and the lines to Windstar and Teckla substations.

The ground mats of the tie-line substation and the Q0713 POI substation must be tied together so that metallic control cables can be used between the two facilities. Bus differential relays will be applied to detect faults on this connection. With this arrangement the Interconnection Customer must install line relays systems that will detect and clear all faults on the tie lines in 5 cycles or less. A set of non-pilot step distance line relays that will detect faults on the tie-line will also be applied at the Q0713 POI substation. Should the Interconnection Customer desire a potential alternative to the tie line substation in order to provide adequate protection to its tie-line, the Interconnection Customer may petition the Transmission Provider for an exemption to this arrangement. The Transmission Provider must review and approve the Interconnection Customer's proposed alternative. Without approval of the proposed alternative the tie-line substation configuration will be required. The Interconnection Customer will need to supply and maintain sets of line relays to be installed at Q0713 collector substation that will detect faults on the 230 kV line back to the Q0713 POI substation. These line relays can be time coordinated with the relays detecting faults on the transmission network and will not communicate with the line relays to be installed at the Q0713 POI substation for the tie-line.

Protective relay elements in the line relays at the Q0713 POI substation will monitor voltage and frequency. If the voltage, magnitude or frequency is outside of the normal operation range, this relay will trip the 230 kV breaker at the tie line substation.

The lines to Windstar and Teckla substations will continue to use permission over reaching logic line distance relays so the existing relays at Windstar and Teckla substations will require setting adjustments to accommodate addition of the POI substation.

The new 230 kV line between Windstar and Shirley Basin substations will be protected with a line current differential relay system.

7.1.7 DATA (RTU) REQUIREMENTS

Data for the operation of the power system will be needed from the Generating Facility and the new POI substation. The Interconnection Customer will install a Transmission Provider approved data concentrator at the collector substation and will install OPGW between the collector substation and tie line substation. The data will then be tied into a Transmission Provider owned RTU at the new POI substation.

In addition to the control and indication of the new 230 kV breakers at the POI substation, the following data will be acquired through the POI substation RTU. Also listed is the data that will be acquired from the collector substation.

From POI substation:
Analogs:

- Net Generation MW
- Net Generator MVAr
- Energy Register

From the Q0713 collector substation:
Analogs:

- Transformer 1 Real power
- Transformer 1 Reactive power
- Transformer 2 Real power
- Transformer 2 Reactive power
- 34.5 kV Real power 52 A1 & N
- 34.5 kV Reactive power 52 A1 & N
- 34.5 kV Real power 52 A2 & C
- 34.5 kV Reactive power 52 A2 & C
- 34.5 kV Real power 52 D
- 34.5 kV Reactive power 52 D
- 34.5 kV Real power 52 E
- 34.5 kV Reactive power 52 E
- 34.5 kV Real power 52 F
- 34.5 kV Reactive power 52 F
- 34.5 kV Real power 52 G
- 34.5 kV Reactive power 52 G
- 34.5 kV Real power 52 H
- 34.5 kV Reactive power 52 H
- 34.5 kV Real power 52 I
- 34.5 kV Reactive power 52 I
- 34.5 kV Real power 52 J
- 34.5 kV Reactive power 52 J
- 34.5 kV Real power 52 K
- 34.5 kV Reactive power 52 K
- 34.5 kV Real power 52 L & B1
- 34.5 kV Reactive power 52 L & B1
- 34.5 kV Real power 52 M &B2
- 34.5 kV Reactive power 52 M & B2
- 34.5 kV Reactive power 52 CAP 1
- 34.5 kV Reactive power 52 CAP 2
- A phase 230 kV transmission voltage
- B phase 230 kV transmission voltage
- C phase 230 kV transmission voltage
- Average Wind speed
- Average Plant Atmospheric Pressure (Bar)
- Average Plant Temperature (Celsius)

Status:

- 230 kV Transformer Breaker 1
- 230 kV Transformer Breaker 2
- 34.5 kV breaker 52 A1 & N
- 34.5 kV breaker 52 A2 & C
- 34.5 kV breaker 52 D
- 34.5 kV breaker 52 E
- 34.5 kV breaker 52 F
- 34.5 kV breaker 52 G
- 34.5 kV breaker 52 H
- 34.5 kV breaker 52 I
- 34.5 kV breaker 52 J
- 34.5 kV breaker 52 K
- 34.5 kV breaker 52 L & B1
- 34.5 kV breaker 52 M & B2
- 34.5 kV breaker 52 CAP 1
- 34.5 kV breaker 52 CAP 2
- 34.5 kV breaker Bus Tie
- Line Relay Alarm

From the Tie Line Substation
Status:

- 230 kV Breaker

7.1.8 SUBSTATION REQUIREMENTS

Q0713 POI Substation:

To support the requested interconnection, the Project will require a new 230kV, three breaker ring bus POI substation. The substation will be approximately 270' x 470' (fence dimensions) based on the Interconnection Customer provided facility requirements. The following is a list of the major equipment required for this Project:

- 3 – 230kV Power Circuit Breakers
- 6 – 230kV CCVTs
- 3 – 230kV CT/VT Metering units
- 13 – 230kV Switches
- 9 – 230kV Lightning Arresters
- 1 – 230kV SSVT
- 1 – Microwave Communication System

Q0713 Collector Station:

The Interconnection Customer will provide a separate graded, grounded and fenced area along the perimeter of the Interconnection Customer's Generating Facility for the Transmission Provider to install metering equipment. This area will share a fence and ground grid with the Generating Facility and have separate, unencumbered access for the Transmission Provider. AC station service for the

control house will be supplied by the Interconnection Customer. DC power for the control house will be supplied by the Transmission Provider.

Windstar Substation:

Install a new 230kV bay and line position to support a new 230kV line to Shirley Basin substation. The following major material will be required for this Project:

- 2 – 230kV Power Circuit Breakers
- 3 – 230kV CCVTs
- 5 – 230kV Switches
- 3 – 230kV Lightning Arresters

Shirley Basin Substation:

Install a new 230kV bay and line position to support a new 230kV line to Windstar substation. The following major material will be required for this Project:

- 1 – 230kV Power Circuit Breaker
- 3 – 230kV CCVTs
- 5 – 230kV Breaker Disconnect Switches
- 1 – Motor Operated Line Disconnect Switch
- 3 – 230kV Lightning Arresters
- 1 – Line Relay Panel
- 1 – Breaker Control Panel

7.1.9 COMMUNICATION REQUIREMENTS

The Interconnection Customer is required to install OPGW between the POI substation and the collector substation. ADSS fiber is required between the tie-line substation and the POI substation. The Interconnection Customer is to supply 2 - DNP3 circuits from the collector substation to the tie line substation and into the POI substation building with the SCADA points required.

Communications to the Transmission Provider's existing communications will be achieved through microwave. A new microwave communication system will be installed at the POI substation. The POI microwave will connect to the Transmission Provider's Flat Top communications site. The microwave tower at Flat Top will need to be replaced. The path will then connect to the Transmission Provider's Glenrock communications site and on through the existing system. The existing microwave between Glenrock and Flat Top will be upgraded to a 6 Ghz space diversity path.

Communication circuits are required between the POI, Windstar and Teckla substations over the new microwave. Multiplexes, routers and channel banks will be required at the POI, Teckla, and collector substations. At the POI substation a 48volt battery and charger is required for communication. At the collector substation the Interconnection Customer will supply AC voltage for the communication equipment.

7.1.10 METERING REQUIREMENTS

Interchange Metering

Point of Interconnection will be at the Transmission Provider Q0713 substation. Metering will be designed bidirectional and rated for the total net generation of the Project. The bidirectional metering will also include the retail load (per tariff) delivered to the Interconnection Customer. The Transmission Provider will specify and order all interconnection revenue metering, including the instrument transformers, metering panels, junction box and secondary metering wire. The primary metering transformers shall be combination 1000:5 CT/VT extended range for high accuracy metering.

The metering design package will include two revenue quality meters, test switch, with DNP real time digital data terminated at a metering interposition block. One meter will be designated a primary SCADA meter and a second meter will be used designated as backup with metering DNP data delivered to the alternate control center. The metering data will include bidirectional KWH KVARH, revenue quantities including instantaneous PF, MW, MVAR, MVA, including per phase voltage and amps data.

An Ethernet connection is required for retail sales and generation accounting via the MV-90 translation system.

Q0713 Transformer A metering:

Revenue metering is required on the high side of the step-up transformers. The primary metering transformers shall be combination 230kV, 500:5 CT/VT extended range for high accuracy metering.

The Transmission Provider will design and procure the collector revenue metering panels. The panels shall be located inside the collector control house. The collector substation metering panel shall include two revenue quality meters, test switches, and all SCADA metering data terminated at a metering interposition block. An Ethernet phone line is required for retail sales and generation accounting via the MV-90 translation system.

Q0713 Transformer B metering:

Revenue metering is required on the high side of the step-up transformer. The primary metering transformers shall be combination 230kV, 500:5 current ratio, CT/VT extended range for high accuracy metering.

The Transmission Provider will design and procure the collector revenue metering panels. The panels shall be located inside the collector control house. The collector substation metering panel shall include two revenue quality meters, test switches, and all SCADA metering data terminated at a metering interposition block. An Ethernet phone line is required for retail sales and generation accounting via the MV-90 translation system.

Station Service/Construction Power

The Project is within the Transmission Provider service territory. Please note, prior to back feed Interconnection Customer must arrange transmission retail meter service for electricity consumed by the Project and arrange back up station service for power that will be drawn from the transmission or distribution line when the Project is not generating. Interconnection Customer must call the PCCC Solution Center 1-800-625-6078 to arrange this service. Approval for back feed is contingent upon obtaining station service.

7.2 COST ESTIMATE (ER)

The following estimate represents only scopes of work that will be performed by the Transmission Provider. Costs for any work being performed by the Interconnection Customer are not included.

Direct Assigned

Q0713 Collector substation *Add metering and control house*	$1,218,000
Q0713 POI substation *Add POI terminal and metering*	$837,000
Total Direct Assigned	**$2,055,000**

Network Upgrade

Q0713 POI substation *Add 230kV ring bus substation*	$9,702,000
Yellowcake – Antelope Mine transmission line *Loop transmission line in/out of POI substation*	$399,000
Windstar to Shirley Basin 230kV line *Build 60 miles of new 230 kV line*	$28,726,000
Windstar substation *Add new line position, update relay settings*	$4,194,000
Shirley Basin substation *Add new line position*	$2,120,000
Flat Top substation *Upgrade communications equipment*	$904,000
Teckla substation *Upgrade communications equipment, update relay settings*	$48,000
Glenrock substation *Upgrade communications equipment*	$174,000
Total Network Upgrade	**$46,267,000**
Grand Total	**$48,322,000**

*Any distribution line modifications identified in this report will require a field visit analysis in order to obtain a more thorough understanding of the specific requirements. The estimate provided above for this work could change substantially based on the results of this analysis. Until this field analysis is performed the Transmission Provider must develop the Project schedule using conservative assumptions. The Interconnection Customer may request that the Transmission Provider perform this field analysis, at the Interconnection Customer's expense, prior to the execution of an Interconnection Agreement in order to obtain more cost and schedule certainty.

Note: Costs for any excavation, duct installation and easements shall be borne by the Interconnection Customer and are not included in this estimate. This estimate is as accurate as possibly given the level of detailed study that has been completed to date and approximates the costs incurred by Transmission Provider to interconnect this Generating Facility to Transmission Provider's electrical distribution or transmission system. A more detailed estimate will be calculated during the Facilities Study. The Interconnection Customer will be responsible for all actual costs, regardless of the estimated costs communicated to or approved by the Interconnection Customer.

7.3 SCHEDULE

The Transmission Provider estimates it will require approximately 60-78 months to permit, design, procure and construct the facilities described in the Energy Resource sections of this report following the execution of an Interconnection Agreement. The schedule will be further developed and optimized during the Facilities Study.

Please note, the time required to perform the scope of work identified in this report as well as the current anticipated in-service date of the Transmission Provider's Gateway South transmission line (2024) does not support the Interconnection Customer's requested Commercial Operation date of December 31,2020.

7.3.1 MAXIMUM AMOUNT OF POWER THAT CAN BE DELIVERED INTO NETWORK LOAD, WITH NO TRANSMISSION MODIFICATIONS (FOR INFORMATIONAL PURPOSES ONLY)

Zero (0) MW can be delivered on a firm basis to the Transmission Provider's network loads with additional transmission modifications.

7.3.2 ADDITIONAL TRANSMISSION MODIFICATIONS REQUIRED TO DELIVER 100% OF THE POWER INTO NETWORK LOAD (FOR INFORMATIONAL PURPOSES ONLY)

In order to deliver 100% of the power into Network Load, in addition to the mitigation identified in section 5.1.1.2, the completion of additional Transmission Provider Energy Gateway projects and other system improvements would also be required.

8.0 PARTICIPATION BY AFFECTED SYSTEMS

Transmission Provider has identified the following affected systems: WAPA, Black Hills, Tri-State, and Basin Electric

A copy of this report will be shared with each Affected System.

9.0 APPENDICES

Appendix 1: Higher Priority Requests
Appendix 2: Property Requirements
Appendix 3: Study Results

9.1.1 APPENDIX 1: HIGHER PRIORITY REQUESTS

All active higher priority transmission service and/or generator interconnection requests will be considered in this study and are identified below. If any of these requests are withdrawn, the Transmission Provider reserves the right to restudy this request, as the results and conclusions contained within this study could significantly change.

Transmission/Generation Interconnection Queue Requests considered:

Q0542 (240 MW) – QF/NR
Q0706 (250 MW) – ER
Q0707 (250 MW) – ER
Q0708 (250 MW) – ER
Q0712 (520 MW) – ER

9.1.2 APPENDIX 2: PROPERTY REQUIREMENTS

Property Requirements for Point of Interconnection Substation

Requirements for rights of way easements
Rights of way easements will be acquired by the Interconnection Customer in the Transmission Provider's name for the construction, reconstruction, operation, maintenance, repair, replacement and removal of Transmission Provider's Interconnection Facilities that will be owned and operated by PacifiCorp. Interconnection Customer will acquire all necessary permits for the Project and will obtain rights of way easements for the Project on Transmission Provider's easement form.

Real Property Requirements for Point of Interconnection Substation
Real property for a Point of Interconnection substation will be acquired by an Interconnection Customer to accommodate the Interconnection Customer's Project. The real property must be acceptable to Transmission Provider. Interconnection Customer will acquire fee ownership for interconnection substation unless Transmission Provider determines that other than fee ownership is acceptable; however, the form and instrument of such rights will be at Transmission Provider's sole discretion. Any land rights that Interconnection Customer is planning to retain as part of a fee property conveyance will be identified in advance to Transmission Provider and are subject to the Transmission Provider's approval.

The Interconnection Customer must obtain all permits required by all relevant jurisdictions for the planned use including but not limited to conditional use permits, Certificates of Public Convenience and Necessity, California Environmental Quality Act, as well as all construction permits for the Project.

Interconnection Customer will not be reimbursed through network upgrades for more than the market value of the property.

As a minimum, real property must be environmentally, physically, and operationally acceptable to Transmission Provider. The real property shall be a permitted or able to be permitted use in all zoning districts. The Interconnection Customer shall provide Transmission Provider with a title report and shall transfer property without any material defects of title or other encumbrances that are not acceptable to Transmission Provider. Property lines shall be surveyed and show all encumbrances, encroachments, and roads.

Examples of potentially unacceptable environmental, physical, or operational conditions could include but are not limited to:

1. Environmental: known contamination of site; evidence of environmental contamination by any dangerous, hazardous or toxic materials as defined by any governmental agency; violation of building, health, safety, environmental, fire, land use, zoning or other such regulation; violation of ordinances or statutes of any governmental entities having jurisdiction over the property; underground or above ground storage tanks in area; known remediation sites on property; ongoing mitigation activities or monitoring activities; asbestos; lead-based paint, etc. A

phase I environmental study is required for land being acquired in fee by the Transmission Provider unless waived by Transmission Provider.

2. Physical: inadequate site drainage; proximity to flood zone; erosion issues; wetland overlays; threatened and endangered species; archeological or culturally sensitive areas; inadequate sub-surface elements, etc. Transmission Provider may require Interconnection Customer to procure various studies and surveys as determined necessary by Transmission Provider.

Operational: inadequate access for Transmission Provider's equipment and vehicles; existing structures on land that require removal prior to building of substation; ongoing maintenance for landscaping or extensive landscape requirements; ongoing homeowner's or other requirements or restrictions (e.g., Covenants, Codes and Restrictions, deed restrictions, etc.) on property which are not acceptable to the Transmission Provider.

9.1.3 APPENDIX 3: STUDY RESULTS

Power Flow Study Results

A Western Electricity Coordinating Council (WECC) approved 2015 Heavy Summer case was used to perform the power flow studies using PSS/E version 33.7. The 2015 Heavy Summer case was modified for the study.

Power flow studies were performed on both peak and off-peak load cases. The study was performed assuming the Energy Gateway D.2 Projects are in-service. The local 500 kV, 345 kV, 230 kV and 115 kV transmission system outages were considered during the study.

N-0 Results:
Under N-0 conditions with the Q0713 project in service there is a 101% overload on the Difficulty – Amasa 230 kV line. A new approximately 60-mile 230 kV line from Windstar to Shirley Basin constructed with 2- 1272 ACSR will mitigate this issue as well as some N-1 issues discussed below.

The data provided by the Interconnection Customer indicated that the generator does not have adequate reactive capability to deliver 100% of its power output at +/- 0.95 power factor. Hence, external shunt compensation which is dynamic in nature will be required in order to control the voltage and provide adequate reactive capability to maintain the voltage at the POI with a +/- 0.95 power factor on the high side of the step-up transformer.

Figure 3 below, shows injection of approximately 17.2 MVAr into the transmission system was observed if the collector system was connected with no generation from the Project. The addition of 17.2 MVAr on the transmission system under light load conditions could cause high voltages. The Project must control the voltage at the POI within the required voltage range provided by the Transmission Operator.

N-1 Results: Assuming Energy Gateway D.2 segment and the system improvements associated with the prior queued projects are in service, the following issues were identified.

- Outage of the Amasa – Difficulty-Shirley Basin 230 kV line overloads the Dave Johnston South Tap – Refinery Tap to 101%. Low voltages in the Spence – Buffalo Head area also observed. The new Windstar – Shirley Basin 230 kV line identified as mitigation under the N-0 results will resolve these issues.

- Outage of the Aeolus – Anticline 500 kV line, the Aeolus 230/500 kV transformer or the Anticline 345/500 kV transformer, post generation dropping of 640 MW (Aeolus RAS), results in multiple 230 kV line overloads. Construction of the Transmission Provider's planned Energy Gateway South 500 kV line from Aeolus to Clover, approximately 400 miles, will mitigate these issues.

N-2 Results: No N-2 thermal or voltage issues were observed in the studies.

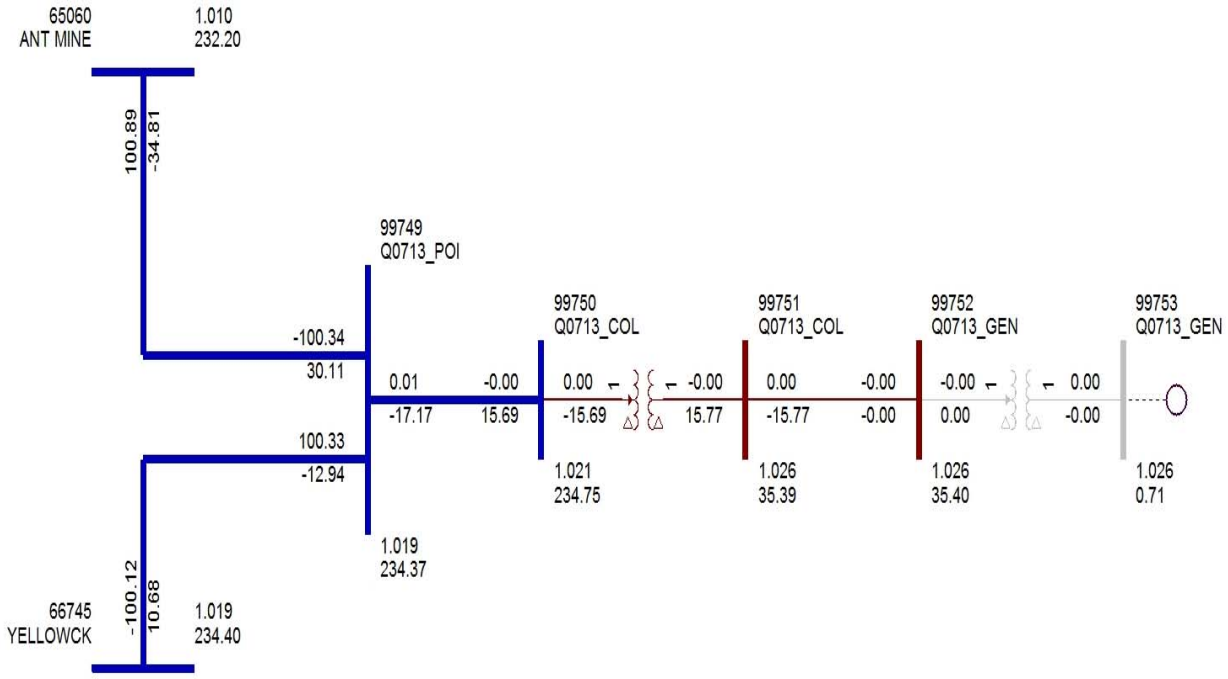

Figure 3: Charging from Q713 collector systems