PACIFICORP

Large Generator Interconnection
Facilities Study Report

FINAL

Completed for

(“Interconnection Customer”)
TCS-41

Proposed Point of Interconnection
South Milford 46 kV substation

February 21, 2023

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1.0 DESCRIPTION OF THE PROJECT

The Interconnection Customer has proposed to interconnect 31.1 MW of new generation to the Transmission Provider's South Milford 46 kV substation located in Beaver County, Utah. The Interconnection Request is proposed to consist of a 31,176 KVA Brush DG185ZL-04 geothermal steam turbine for a total output of 31.1 MW at the Point of Interconnection. The requested commercial operation date is December 31, 2026.

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 "TCS-41."

2.0 STUDY SCOPE AND OBJECTIVES

The objective of the facilities study is to:

- complete a facilities analysis, which shall specify and estimate the cost of equipment, engineering, procurement, and construction required to address issues as outlined in the system impact study, and
- provide a scope of work and an estimated cost and schedule for completing the scope of work.

The information contained in this study report is based on preliminary information and not to be used for construction.

3.0 STUDY ASSUMPTIONS

- All active higher priority transmission service and/or generator interconnection requests will be considered in this study and are listed in Appendix 1. If any of these requests are withdrawn, the Transmission Provider reserves the right to restudy this request, as the results and conclusions contained within this study could significantly change.
- 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 queue interconnection requests 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. Because the queue of higher priority transmission service requests may be different when a Network Customer requests network resource designation for this Generating Facility, the available capacity or transmission modifications, if any, necessary to provide network resource interconnection service may be significantly different. Therefore, the Interconnection Customer should regard the results of this study as informational rather than final.

- This study assumes the Project will be integrated into Transmission Provider's system at the agreed upon and/or proposed point of interconnection.
- The Interconnection Customer will construct and own any facilities required between the Point of Interconnection and the Project.
- Line reconductor or fiber underbuild required on existing poles will be assumed to follow the most direct path on the Transmission Provider's system. If during detailed design the path must be modified it may result in additional cost and timing delays for the Interconnection Customer's Project.
- 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 Transmission Provider performance and design standards.
- 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 (https://www.oasis.oati.com/ppw)

4.0 TYPE OF INTERCONNECTION SERVICE

The Interconnection Customer has selected Energy Resource Interconnection Service (ERIS).

5.0 PROPOSED POINT OF INTERCONNECTION

The Interconnection Customer's proposed Generating Facility is to be interconnected through a new 46 kV substation to be constructed adjacent to the Transmission Provider's existing South Milford substation. Figure 1 below, is a one-line diagram that illustrates the interconnection of the proposed Generating Facility to the Transmission Provider's system.

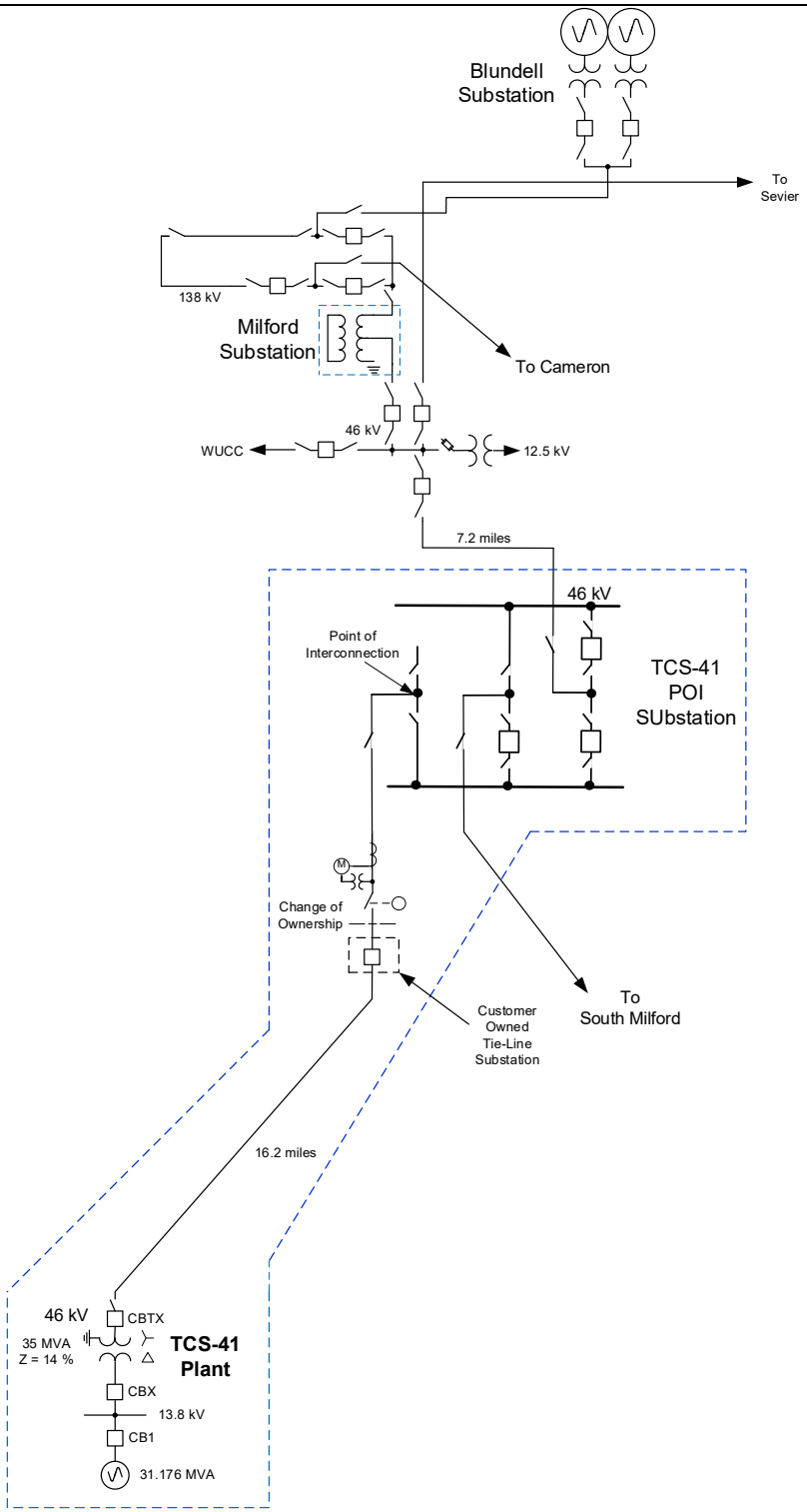

Figure 1: System One Line Diagram

6.0 SCOPE OF WORK

6.1 Generating Facility Requirements

The following outlines the design, procurement, construction, installation, and ownership of equipment at the Interconnection Customer's Generation Facility.

6.1.1 INTERCONNECTION CUSTOMER TO BE RESPONSIBLE FOR

- Procure all necessary permits, lands, rights of way and easements required for the construction and continued maintenance of the Interconnection Customer's Generating Facility and collector substation.
- Design, procure, construct, own and maintain the Interconnection Customer's Generating Facility and associated collector substation.
- Design the Generating Facility with reactive power capabilities necessary to operate within the full power factor range of 0.95 leading to 0.95 lagging as measured at the high side of the Interconnection Customer's GSU transformer. 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.
- Design the generating facility such that it can provide positive reactive support (i.e., supply reactive power to the system) immediately following the removal of a fault or other transient low voltage perturbations or install 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.
- Operate the Generating Facility to the voltage set point to be provided by the Transmission Provider.
- Equip the Generating Facility with automatic voltage-control equipment and operate with the voltage regulation control mode enabled unless explicitly authorized to operate another control mode by the Transmission Provider.
- Install, maintain and operate a functioning governor or equivalent controls to ensure primary frequency capability as required under FERC Order 842.
- Operate the Generating Facility continuously at the maximum power output at its rated field current within +/- 5% of its rated terminal voltage.
- Operate the Generating Facility so as to maintain the voltage at the Point of Interconnection, or other designated point as deemed appropriate by Transmission Provider, at a voltage schedule to be provided by the Transmission Provider following testing. Voltage will typically be required to operate between 1.00 and 1.04 per unit.
- Operate the Generating Facility with a voltage droop.

- Have any Transmission Provider required studies, such as a voltage coordination study, performed and provide results to Transmission Provider. Any additional requirements identified in these studies will be the responsibility of the Interconnection Customer.
- Meet the Federal Energy Regulatory Commission (FERC) and WECC low voltage ride-through requirements as specified in the interconnection agreement.
- Provide the Transmission Provider the manufacturer Electromagnetic Transient Modeling ("EMT") model a minimum of 180 days prior to Commercial Operation.
- Provide the Transmission Provider a standard model from the WECC Approved Dynamic Model Library.
- Design the Generating Facility control system such that it can receive an analog output from the Transmission Provider for setpoint control and provide an analog input back to the Transmission Provider on the status of the setpoint.
- Procure, install, own and maintain a set of line relays that will detect and clear all faults on the tie line between the Interconnection Customer's collector and tie line substations in seven (7) cycles or less.
- Design, procure, and install a Transmission Provider approved data concentrator to transfer data from the collector substation to the Transmission Provider's RTU located at the POI substation via an optical fiber communications circuit in DNP3 protocol. The Transmission Provider will input and hold the second level passwords for the data concentrator. Password control ensures the Transmission Provider is aware of and is accepting of the changes being requested by the Interconnection Customer.
- Design, procure and install conduit and control cabling and hard wire the Interconnection Customer's source devices to the data concentrator. Replicated values are not acceptable.
- Provide the following points which are based on the Interconnection Customer's most recent design information. Please note that this list of points could change if the Interconnection Customer's final design changes:

  <u>Analog Written to the RTU:</u>
  - Max Gen Limit MW Set Point

  <u>Analogs:</u>
  - Max Gen Limit MW Set Point Feed Back
  - Potential Power MW
  - 46 kV A phase voltage
  - 46 kV B phase voltage
  - 46 kV C phase voltage

  <u>Status:</u>
  - 46 kV transformer circuit switcher CBTX

  - 13.8 kV transformer breaker CBX
  - 13.8 kV generator breaker CB1
- Procure, install, own and maintain fiber optic cable from the Interconnection Customer's data concentrator to a splice point with the fiber optic cable installed on the Interconnection Customer's tie line.
- Arrange for and provide permanent retail service for power that will flow from the Transmission Provider's system when the Project is not generating with the retail service provider in this area.
- Provide any construction or backup retail service necessary for the Project.
- Provide a professional engineer ("PE") stamped maintenance plan package for all Interconnection Customer protective equipment prior to energization.

6.1.2 TRANSMISSION PROVIDER TO BE RESPONSIBLE FOR

- Provide the Interconnection Customer the designated point at which the voltage is to be maintained and the associated voltage schedule.
- Identify any necessary studies that the Interconnection Customer must have performed.

6.2 Tie Line Requirements

The following outlines the design, procurement, construction, installation, and ownership of equipment associated with the radial line connecting the Interconnection Customer's Generating Facility to the Transmission Provider's Point of Interconnection substation.

6.2.1 INTERCONNECTION CUSTOMER TO BE RESPONSIBLE FOR

- Procure all necessary permits, property rights and/or rights of way for the new transmission line between the Interconnection Customer's collector substation and the Interconnection Customer tie line substation. Interconnection Customer will be responsible for all required regulatory or compliance reporting associated with its transmission tie line facilities
- Design, construct, own and maintain the 46 kV transmission tie line between the Interconnection Customer's collector and tie line substations.
- Design, procure, install, own and maintain Transmission Provider standard fiber optic cable on the transmission tie line.
- Design around and coordinate with the Transmission Provider regarding any crossings the Interconnection Customer's tie line will have with existing Transmission Provider facilities.

6.2.2 TRANSMISSION PROVIDER TO BE RESPONSIBLE FOR

- Coordinate with the Interconnection Customer regarding any crossings the Interconnection Customer's tie line will have with existing Transmission Provider transmission lines.

- Procure and install any required transmission structures to maintain necessary clearance should the Interconnection Customer's tie line cross existing Transmission Provider facilities and are unable to meet clearance requirements.

6.3 Tie Line Substation Requirements

The following outlines the design, procurement, construction, installation, and ownership of equipment associated with the radial line connecting the Interconnection Customer's Generating Facility to the Transmission Provider's Point of Interconnection substation.

6.3.1 Interconnection Customer to be Responsible For

- Procure all necessary permits, property rights and/or the rights of way to allow for the construction of the Interconnection Customer's new tie line substation.
- Design, procure, construct, own and maintain the Interconnection Customer's tie line substation (consisting of a sole 46 kV circuit breaker and associated equipment) adjacent (less than 800' between deadend structures) to the POI substation. This includes all radial transmission line relaying to the collector station, breaker failure protection and associated communications. The short line/bus segment between the tie line substation and the POI substation will be considered a bus section and will be protected with redundant bus differential relay systems.
- Coordinate with the Transmission Provider on the location of the tie line substation in order minimize modifications to the POI substation.
- Provide and install a set of current transformers to be fed into the bus differential relays with a maximum current transformer ratio matching the maximum CT ratio of the breakers at the POI substation. Provide and install conduit and cabling to the POI substation marshalling cabinet with these outputs.
- Provide and install the tie line substation such that the ground grid can be connected to the POI substation ground grid to support the installation of a Transmission Provider owned and maintained bus differential scheme. The Interconnection Customer is responsible to ensure the ground grid design supports safe step and touch potentials.
- The following data points are required from the Interconnection Customer's tie line substation:
  Status:
  - 46 kV breaker
- Provide and install conduits (number and size TBD) and control cabling between the Interconnection Customer's tie line substation and marshalling cabinet just inside the fence of the POI substation to support copper circuits installed between the facilities. Hard wire all tie line substation status, control, and protection circuit interface to the

POI substation to a Transmission Provider owned and maintained marshalling cabinet.
- Provide and install conductor, shield wire, fiber optic cable and line hardware in sufficient quantities to allow the Transmission Provider to terminate the tie line into POI substation dead-end structure.

6.3.2 TRANSMISSION PROVIDER TO BE RESPONSIBLE FOR

- Coordinate with the Interconnection Customer on the location of its substation.
- Provide the Interconnection Customer the necessary specifications to allow the ground grids of the Interconnection Customer's tie line substation and the POI substation to be tied together.
- Provide the Interconnection Customer the necessary specifications for the last bus/line segment of the Interconnection Customer's tie line substation and the new POI substation to be connected.

6.4 Point of Interconnection

The following outlines the design, procurement, construction, installation, and ownership of equipment at the Point of Interconnection.

6.4.1 INTERCONNECTION CUSTOMER TO BE RESPONSIBLE FOR

- Test and confirm functionality of the communications system between the Interconnection Customer's collector substation the POI substation.

6.4.2 TRANSMISSION PROVIDER TO BE RESPONSIBLE FOR

- Procure all necessary permits, property rights and/or the rights of way to allow for the construction of the new POI substation adjacent to the South Milford substation.
- Design, procure and construct the new POI substation including the installation of the following major equipment:
  - (3) – 72.5 kV breaker
  - (13) – 69 kV group operated switch
  - (3) – 46 kV CT/VT metering combination units
  - (6) – 46 kV CCVT
  - (9) – 46 kV arrester
  - (1) – 46 kV SSVT
  - (1) – Control house
  - (1) – Marshalling cabinet
- Terminate the transmission lines running from Milford and South Milford substations.
- Terminate the last span/bus from the Interconnection Customer's tie line substation deadend structure into the POI substation deadend structure.

- Design, procure and install bus differential relays for the connection to the South Milford substation.
- Design, procure and install bus differential relays for the connection to the Interconnection Customer's tie line substation.
- Design, procure and install line current differential relays for the connection to the Milford substation.
- Procure and install a relay for under/over voltage and over/under frequency protection of the system.
- Procure a marshalling cabinet and install on the edge of the POI substation near the Interconnection Customer's tie line substation.
- Install communications equipment in the POI substation control house to tie the Interconnection Customer's data and associated communication circuit to the Transmission Provider's communications network.
- Observe the Interconnection Customer's test of the communications system running from the collector substation to the POI substation and provide acceptance of functionality.
- Include the following data points into the substation RTU:
  Analogs:
  - New Generation MW
  - Net Generator MVAr
  - Interchange metering kWH
- Design, procure and install 46 kV revenue metering equipment including two (2) revenue quality meters, test switch, instrument transformers, metering panels, junction box and secondary metering wire.
- Provide and install an Ethernet connection for retail sales and generation accounting via the MV-90 translation system.

6.5 Other

The following outlines the design, procurement, construction, installation, and ownership of equipment past the Point of Interconnection.

6.5.1 Transmission Provider to be Responsible For

- Tripping Scheme
  - Add the Interconnection Customer's Generating Facility to the existing tripping scheme for the following outages:
    - Cameron-Milford 138 kV transmission line
    - Milford substation 138-46 kV transformer

- Milford-South Milford Transmission Line
  - Loop the transmission line in/out of the new POI substation.
  - Loop the fiber optic cable installed on the transmission line in/out of the new POI substation.

- Mona Substation
  - Replace the line relays with versions compatible with relays to be installed in the new TCS-09 POI substation and install a new panel.

- Camp Williams Substation
  - Replace the line relays with versions compatible with relays to be installed in the new TSC-09 POI substation and install a new panel.

- Milford Substation
  - Replace the existing 75 MVA, 138-46 kV LTC transformer with a 150 MVA unit.
  - Replace conductor within the substation with higher rated conductor.
  - Install six (6) disconnect switches.
  - Modify relay settings to coordinate with the new TCS-41 POI substation relays.

- Huntington Substation
  - Replace the jumpers on the 345 kV line to Emery substation.

- System Operations Centers
  - Update databases to include the Interconnection Customer's Generating Facility along with Interconnection Facilities and Network Upgrades.

7.0 COST ESTIMATE (+/- 20%)

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
POI substation $540,000
Line termination and metering

Network Upgrades

Station Equipment

TCS-41 POI substation $7,000,000
Construct new 46 kV substation

Milford-South Milford transmission line $850,000
Loop line in/out of new substation

Total: $7,850,000

Shared Network Upgrades

The following estimated costs are the Interconnection Customer's proportional share of the overall estimated costs for these upgrades for the entire cluster area in which this Interconnection Request resides.

Emery-Hunter transmission line *Replace jumpers at Huntington substation*	$15,000
Camp Williams substation *Install new panels*	$61,000
Mona substation *Install new relay panels*	$61,000
Milford substation *Install new 150 MVA transformer*	$353,000
Network Upgrade Total:	**$487,000**
Total:	**$8,877,000**

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 Generator Facility to Transmission Provider's electrical distribution or transmission system. The Interconnection Customer will be responsible for all actual costs, regardless of the estimated costs communicated to or approved by the Interconnection Customer.

8.0 SCHEDULE

Execute Interconnection Agreement	May 1, 2023
Provision of Financial Security	May 15, 2023
Interconnection Customer Approval for Transmission Provider to Commence Engineering and Procurement Activities	May 15, 2023
*Interconnection Customer Initial Design Package Provided	July 15, 2023
Transmission Provider Engineering & Procurement Commences	July 15, 2023
Interconnection Customer Energy Imbalance Market Submittal	September 15, 2023
Interconnection Customer Property/Permits/ROW Procured	November 15, 2023
Transmission Provider Property/Permits/ROW Procured	March 1, 2024

*Interconnection Customer Final Design Package Provided	March 1, 2024
Transmission Provider Engineering Design Complete	August 15, 2024
Interconnection Customer Approval for Transmission Provider to Commence Construction Activities	August 15, 2024
Construction Begins	October 15, 2024
Interconnection Customer Commences Voltage Coordination Study	November 15, 2024
Interconnection Customer Submits Request for Voltage Schedule	November 15, 2024
Interconnection Customer Maintenance and Commissioning Plans Provided	December 15, 2025
Interconnection Customer and Transmission Provider Construction Complete	February 9, 2026
Transmission Provider Commissioning Activities Complete	March 23, 2026
Transmission Provider Commissioning Document Review Complete	March 29, 2026
Interconnection Customer's Facilities Receive Backfeed Power	March 30, 2026
Initial Synchronization/Generation Testing	April 2, 2026
Commercial Operation	May 15, 2026

*Interconnection Customer initial design package shall include final generating facility location, inverter/turbine selection, basic protection package, tie line route and collector system locations and data as applicable. Interconnection Customer final design package shall include PE stamped issued for construction ("IFC") drawings for generating facility, collector substation, tie line as well as an updated PSS/e model and updated WECC approved model, electromagnetic transient ("EMT") model and a detailed short circuit model of its generation system using the ASPEN OneLine short circuit simulation program as applicable. The WECC model parameters must be adjusted to reflect the plant's actual anticipated performance. The plant controller must be included in the model. If there is to be coordination between facilities or a master VAR controller, this must be included in the detailed WECC dynamic model, as well as in the PSS/e user-written model.

Please note, the time required to perform the scope of work identified in this report appears to result in a timeframe that does support the Interconnection Customer's requested Commercial Operation date of December 31, 2026.

9.0 PARTICIPATION BY AFFECTED SYSTEMS

Transmission Provider has identified the following affected systems: None

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

10.0 APPENDICES

Appendix 1: Higher Priority Requests
Appendix 2: Contingent Facilities
Appendix 3: Property Requirements

10.1 APPENDIX 1: HIGHER PRIORITY REQUESTS

All active higher priority Transmission Provider projects, and 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:

LGI Q#	MW	TSR Q#
634	99	
636	99	
642	58	
752	40	2867
763	200	2872/2873
777	100	
778	200	2879
787	200	
788	200	
792	80	
799	67	
805	95	
815	20	
823	178	
838	525	

10.2 Appendix 2: Contingent Facilities

The following Interconnection Facilities and/or upgrades to the Transmission Provider's system are Contingent Facilities for the Interconnection Customer's Interconnection Request and must be in service prior to the commencement of generation activities:

None

10.3 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.