



U.S. Department of the Interior
Bureau of Land Management

Environmental Assessment

Sweetwater Solar Energy Facility



Rock Springs Field Office

June 2018

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

WY-D040-2017-0008-EA

Environmental Assessment
for
Sweetwater Solar Energy Facility

Bureau of Land Management
Rock Springs Field Office
Wyoming

WY-D040-2017-0008-EA

June 2018

Acronym List

AADT	average annual daily traffic
AC	alternating current
amsl	above mean sea level
APE	area of potential effect
APLIC	Avian Power Line Interaction Committee
AUM	animal unit month
BO	Biological Opinion
bgs	below ground surface
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
CESA	cumulative effects study area
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMRP	Construction, Management, and Reclamation Plan
DC	direct current
DOI	Department of the Interior
EA	environmental assessment
ECL	electrical connection line
EO	Executive Order
EPA	United States Environmental Protection Agency
EPM	environmental protection measure
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
GHMA	General Habitat Management Area
GIS	geographic information system
GPS	Global Positioning System
HUC	Hydrologic Unit Code
KOP	Key Observation Point
KSLA	Known Sodium Leasing Area
kV	kilovolt
M&M	monitoring and maintenance
MBTA	Migratory Bird Treaty Act
met	meteorological

MMTA	Mechanically Mineable Trona Area
MOU	Memorandum of Understanding
mph	mile per hour
MW	megawatt
NEPA	National Environmental Policy Act
NHD	National Hydrography Data
NHPA	National Historic Preservation Act of 1966
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
OHV	off-highway vehicle
OHWM	ordinary high water mark
O&M	operations and maintenance
PFYC	Potential Fossil Yield Classification
PHMA	Priority Habitat Management Area
PILT	Payment in Lieu of Taxes
POD	Plan of Development
PV	photovoltaic
PVM	photovoltaic modules
RFFA	reasonably foreseeable future action
ROW	right-of-way
RMP	resource management plan
ROD	record of decision
RSFO	Rock Springs Field Office
RV	recreational vehicle
SCADA	Supervisory Control and Data Acquisition
SH	State Highway
SHPO	State Historic Preservation Office
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
Sweetwater Solar	Sweetwater Solar LLC
SWPPP	Storm Water Pollution Prevention Plan
U.S.	United States
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VRM	Visual Resource Management
WAS	Western Archaeological Services

WDAI	Wyoming Department of Administration and Information
WDEQ	Wyoming Department of Environmental Quality
WGFD	Wyoming Game and Fish Department
WYDOT	Wyoming Department of Transportation
WYNDD	Wyoming Natural Diversity Database
WYSHPO	Wyoming State Historic Preservation Office

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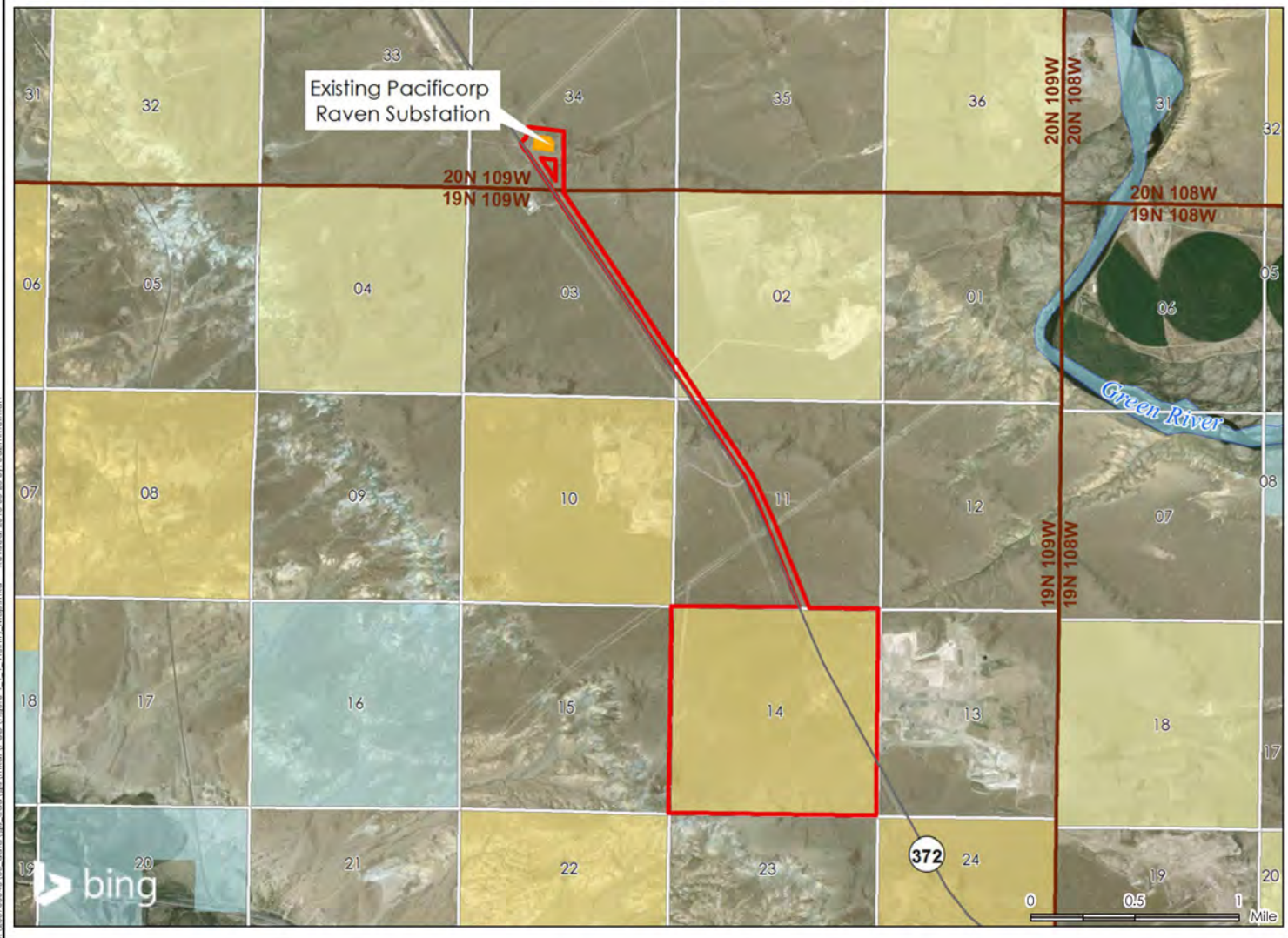
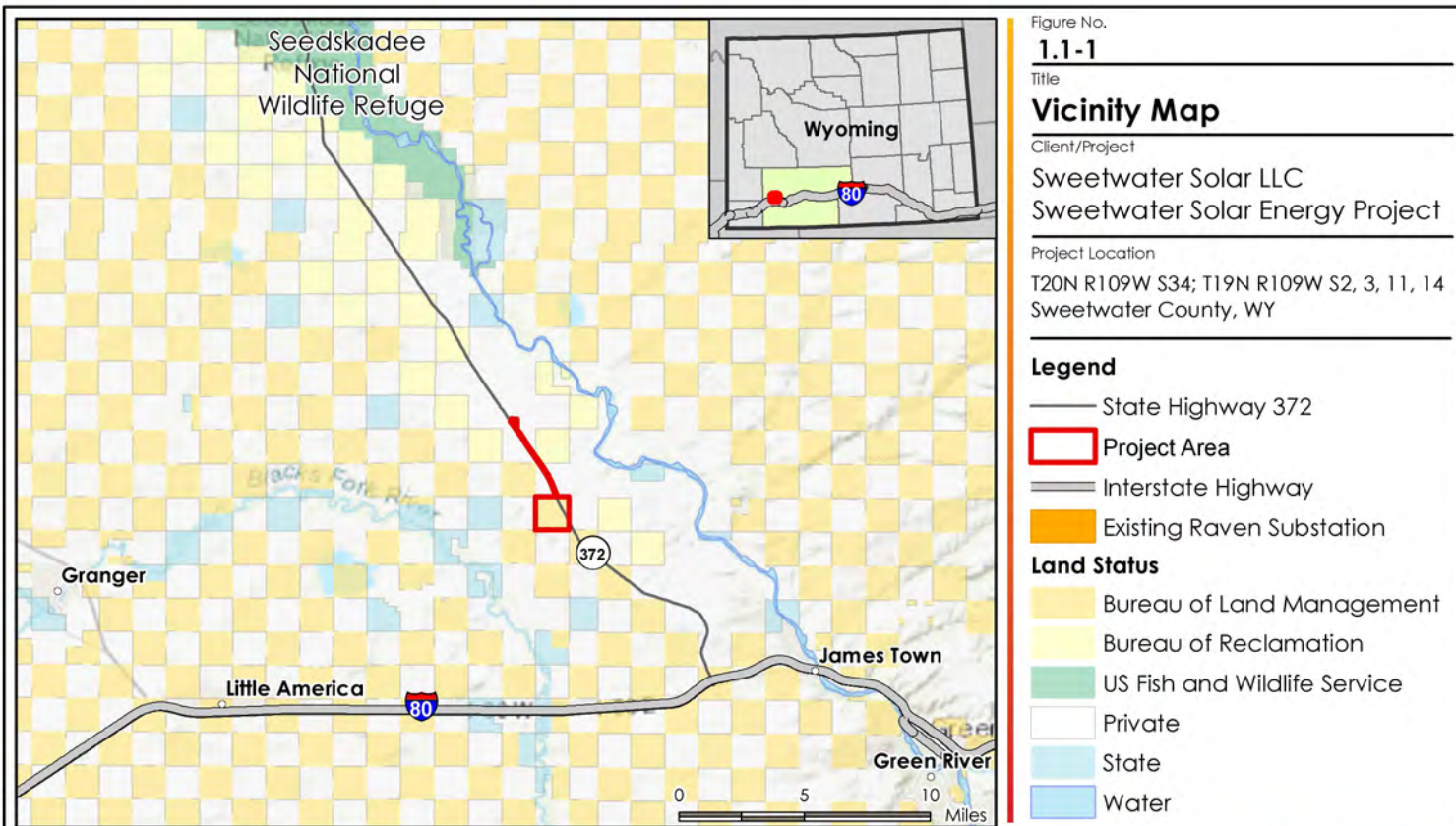
1.0 Introduction

The Bureau of Land Management (BLM), Rock Springs Field Office (RSFO), has received an application from Sweetwater Solar, LLC (Sweetwater Solar) requesting a right-of-way (ROW) grant across public lands in Sweetwater County, Wyoming (**Figure 1.1-1**) for an approximately 80 megawatt (MW) (alternating current [AC]) utility scale solar photovoltaic (PV) energy generating facility and electrical connection power line (herein referred to as *the Project*). Sweetwater Solar has proposed the Project on BLM, Bureau of Reclamation (BOR), and private lands in Section 34 of Township 20 North, Range 109 West and Sections 2, 3, 11, and 14 of Township 19 North, Range 109 West. This environmental assessment (EA) (No. DOI-BLM-WY-D040-2017-0008-EA) was prepared by the BLM in compliance with the National Environmental Policy Act (NEPA) to analyze and disclose the effects of granting the ROW to Sweetwater Solar to construct, operate, maintain, and decommission the Project. The Council on Environmental Quality (CEQ) gives the BLM discretion under 40 Code of Federal Regulations (CFR) 1501.3(b) to prepare an EA on any action to assist the agency in planning and decision making.

1.1 BACKGROUND AND PROJECT LOCATION

The Project location has a high resource potential for solar irradiation. The local area has monthly average direct normal irradiance values (the amount of solar radiation per unit surface area) of 5.5 to 6.0 (National Renewable Energy Laboratory 2007), but also has cool temperatures and relatively low snowfall, which makes this site favorable for utility scale PV development. It is estimated that the yield potential for the site exceeds 1,850 kilowatt hour/kilowatt peak based on a PV system (**Appendix A**). Wyoming has a high level of insolation, with an annual average of 64 percent of the possible maximum sunshine hours (ranking 9th in the U.S.). At 6,500 feet above mean sea level (amsl), the altitude provides a thinner atmosphere for the sun's rays to penetrate and, because of the relative lack of fog, haze, and smoke at this site, the intensity of insolation is of unusually high quality.

Sweetwater Solar submitted a Form SF-299 (*Application for Transportation and Utility Systems and Facilities on Federal Lands*) to the BLM RSFO on July 18, 2016, requesting a ROW grant to construct, operate, maintain, and decommission the Project. The Project would be in Sweetwater County, Wyoming, approximately 11 miles northwest of the city of Green River, along the southern and northern sides of State Highway (SH) 372 (**Figure 1.1-1**). The Project would encompass approximately 703 acres, including 638 acres on public lands and 65 acres on private land. The lands included in the Project are largely vacant with undeveloped surface, and consist of relatively flat terrain.



1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the action is to respond to Sweetwater Solar's ROW grant application to construct, operate, maintain, and decommission an 80 MW utility scale solar project, and ancillary facilities. The need for the action is provided under Title V of the Federal Land Policy and Management Act (FLPMA) (43 United States Code [U.S.C.] § 1761), Section 211 of the Energy Policy Act of 2005 (119 Stat. 594, 660), BLM ROW Regulations, and other applicable federal laws. The BLM will decide whether to approve, approve with modification, or deny issuance of a ROW grant to Sweetwater Solar, LLC for the Project.

1.3 LEAD AND COOPERATING AGENCIES

The BLM is the lead federal agency responsible for preparing this EA. The RSFO is the lead BLM field office, responsible for consultations required by Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended.

Cooperating agencies include those federal, state, or local agencies that have jurisdiction by law and/or special expertise (40 CFR Section 1508.5). The following agencies are cooperators on this Project:

- BOR
- U.S. Fish and Wildlife Service (USFWS)
- State of Wyoming
- Sweetwater County
- Sweetwater County Conservation District

1.4 RELATIONSHIP TO STATUTES, REGULATIONS, PLANS, OR OTHER ENVIRONMENTAL ANALYSES

1.4.1 Green River RMP and ROD

The Project has been reviewed for compliance with agency policies, plans, and programs. The use of federal land in the RSFO is guided by the Green River Resource Management Plan (RMP) and Record of Decision (ROD) (BLM 1997) as amended by the ROD and Approved RMP Amendments for the Rocky Mountain Region, including the Greater Sage-grouse Sub-Regions of Lewistown, North Dakota, Northwest Colorado, and Wyoming (signed September 21, 2015). The Project would meet the RMP's objective to make public lands available for ROWs, permits, and leases and would not be located within an avoidance or exclusion area for ROWs.

1.4.2 Applicable Laws and Authorities

FLPMA mandates that the BLM manage public lands on the basis of multiple use and sustained yield (43 U.S.C. § 1701[a] [7]). The BLM administers approximately 245 million surface acres of public land in the U.S. This administrative responsibility consists of stewardship, conservation, and resource use, including the development of energy resources, in an environmentally sound manner.

The Project would also be subject to the following key laws, as amended:

- Archaeological Resource Protection Act of 1979
- Native American Graves Protection and Repatriation Act of 1990
- Clean Air Act of 1970
- Clean Water Act of 1972
- Endangered Species Act of 1973 (ESA)
- Federal Noxious Weed Act of 1974
- Migratory Bird Treaty Act of 1918 (MBTA)
- National Environmental Policy Act of 1969 (NEPA)
- National Historic Preservation Act of 1966 (NHPA)
- Paleontological Resources Preservation Act of 2009
- Wild Horse and Burro Act

1.4.3 Sweetwater County

The Project would require a conditional use permit and other permits, as applicable, from Sweetwater County. The Project would conform with Sweetwater County's amendments to the Sweetwater County Zoning Resolution on Solar Energy Systems (Sweetwater County 2016).

1.5 SCOPING, PUBLIC INVOLVEMENT, AND ISSUES

A 30-day public scoping period was held from January 16 through February 14, 2017, to inform the public about the Project and solicit comments from the interested public, governmental agencies, community organizations, landowners, and other stakeholders. A scoping letter was prepared by the BLM that summarized the Project and the public involvement process, including announcing an open house. Information about the Project and the public involvement opportunity was included on the Project website (<http://bit.ly/SweetwaterSolar>) and in advertisements in the Green River Star and Rock Springs Rocket-Miner newspapers. The letter and a Project map were mailed to 190 interested parties on January 3, 2017. An open house was held in Rock Springs at the RSFO on January 23, 2017, from 4:30 to 6:30 pm.

By the close of the scoping period, 11 formal responses had been received. The scoping comments expressed concern in the following areas:

- Issue 1: Reasonable Range of Alternatives, including Alternative Project Sites
- Issue 2: Conflict with BLM's Multiple Use Mission
- Issue 3: Lack of Designated Solar Zones in Wyoming
- Issue 4: Concern with Current and Future Pipeline ROWs
- Issue 5: Concern with Project Tying into the Raven Substation and Power Reliability
- Issue 6: Potential Impacts to Pronghorn Crucial Winter Range and Migration Corridors
- Issue 7: Potential Impacts to Greater Sage-grouse Leks and Habitat
- Issue 8: Potential Impacts to Trona and Gravel Mining
- Issue 9: Potential Impacts to Soils and Hydrology
- Issue 10: Potential Impacts to Grazing
- Issue 11: Potential Impacts to Cultural Resources

2.0 Proposed Action and Alternatives

This section describes the alternatives evaluated in this EA including: 1) the No Action Alternative to the Proposed Action, 2) the Proposed Action, and 3) a site configuration alternative to the Proposed Action (the Alternative Site Configuration). Factors considered in evaluating whether alternatives were technically feasible and economically practical, and whether these would meet the purpose and need for the Project, included: legal requirements, environmental issues and concerns, technical design, and/or engineering feasibility.

2.1 NO ACTION ALTERNATIVE

The BLM would not authorize a ROW grant to Sweetwater Solar for the Project. The development of new facilities that comprise the Project would not occur under the No Action Alternative.

2.2 PROPOSED ACTION

Under the Proposed Action, the BLM would authorize a 30-year ROW grant for Sweetwater Solar to construct, operate, maintain, and decommission the Project per the Plan of Development (POD) (**Appendix A**) within a 703-acre Project area. The Project would have a generating capacity of up to 80 MW AC capacity, which would be fueled by approximately 102 MW of direct current (DC) PV power. The Project would include PV modules (PVMs), switchgear, a monitoring and maintenance (M&M) facility, collection and distribution power lines, access roads, and temporary construction laydown/staging areas located on BLM-administered public land.

A 34.5-kilovolt (kV) electrical connection line (ECL) (power line) would extend approximately 2.5 miles from the switchgear associated with the Project, northwest along the east side of SH372 on private land and public land administered by the BOR, to the existing PacifiCorp Raven Substation (**Figure 2.2-1**). The Project would connect to the PacifiCorp regional transmission grid via the Raven Substation. PacifiCorp has completed an interconnection Feasibility Study, a System Impact Study, an Optional Interconnection Study, and a revised System Impact Study to identify any potential adverse system impacts that would result from the interconnection of the Project to the network. The studies specifically:

- Confirm that no circuit breaker short-circuit capability limits would be exceeded because of the interconnection;
- Confirm that no thermal limits on the 34.5-kV system or Raven Substation transformers would be exceeded because of the interconnection; and
- Identify improvements at the Raven Substation that would need to be made to ensure system protection (Pacific Northwest Energy Consultants 2017).

PacifiCorp conducted a transient study analysis for the Project. The purpose of this study was to assess the various local area disturbances that may occur on the transmission network near the Raven Substation and the local 230-kV transmission network. The results of the study showed that the Project would be transiently stable and would ride through all simulated local area contingencies. An improved inverter configuration is likely to be utilized to provide for enhanced operating characteristics and response capabilities (Pacific Northwest Energy Consultants 2017).

\\030706043\03_40151\06_600\06\mxd\000\Figure 2.2-1 Project Area.mxd Revised: 2018-02-26 By: edwinmoran

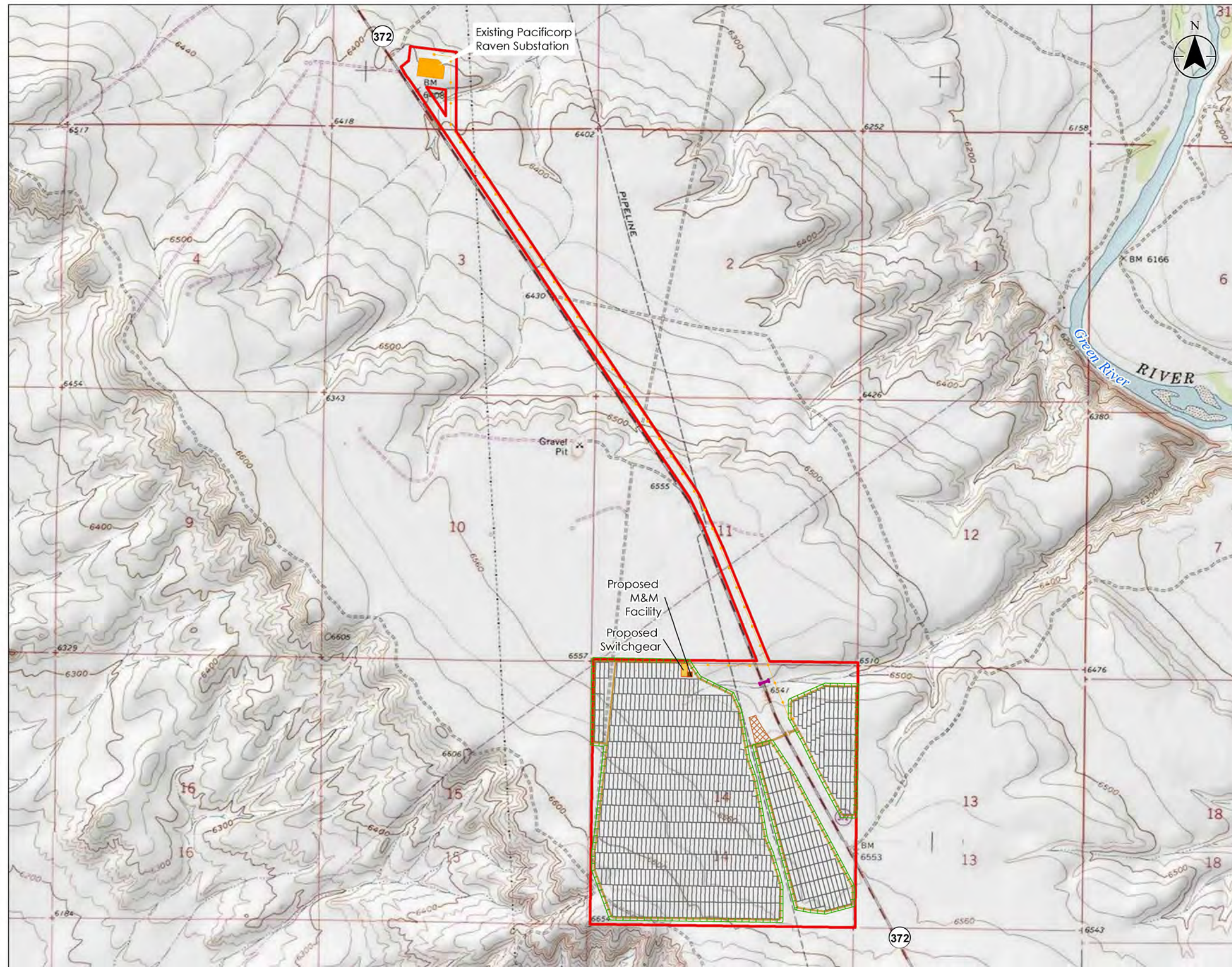


Figure No.

2.2-1

Title

Project Area

Client/Project

Sweetwater Solar LLC
Sweetwater Solar Energy Project

Project Location

T20N R109W S34; T19N R109W S2, 3, 11, 14
Sweetwater County, WY

203706043

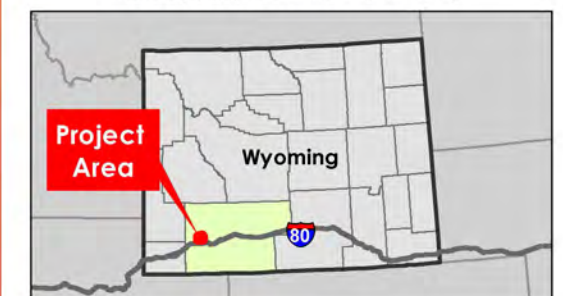
Prepared by EDZ on 2018-02-26

Technical Review by SL on 2018-02-26

Legend

- Existing Highway Culvert (Approximate)
- Existing Raven Substation
- Proposed Electrical Connection Line
- Proposed Fence
- Proposed Road
- Temporary Construction Laydown/Staging Area
- Proposed M&M Facility, Parking
- Proposed Project Switchgear
- Proposed Photovoltaic Array Area
- Project Area

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Notes

1. Coordinate System: NAD 1983 HARN StatePlane Wyoming West Central FIPS 4903 Feet
2. Service Layer Credits: Copyright:© 2013 National Geographic Society, I-cubed

The Project would not be expected to have any impact on either the Jim Bridger Power Plant or the 345-kV transmission system originating at the Jim Bridger Power Plant. PacifiCorp's 230-kV transmission system terminates at the 230-kV substation located at the Jim Bridger Power Plant. However, delivery of power from the Jim Bridger Power Plant is on three 345-kV transmission lines originating at the Jim Bridger Power Plant and terminating at the Populus and Goshen substations in Idaho. PacifiCorp's 230-kV transmission system is electrically isolated from the 345-kV system at Jim Bridger and the Project would not be expected to have any impact on either the Jim Bridger Power Plant or the 345-kV transmission system originating at the Jim Bridger Power Plant.

The following sections provide a summary of the Project; further details may be obtained in the POD (**Appendix A**).

The Project disturbance area would consist of approximately 121 acres, which includes both short-term disturbance (i.e., during construction) and long-term disturbance (i.e., during Project operations) on BLM, BOR, and private lands in Section 34 of Township 20 North, Range 109 West and Sections 2, 3, 11, and 14 of Township 19 North, Range 109 West (**Figure 2.2-2, Table 2.2-1**).

Table 2.2-1 Short-term and Long-term Disturbance, Proposed Action

Project Component	Short-term Disturbance*		Long-term Disturbance*	
	Federal	Private	Federal	Private
Racking (solar array) posts	0	0	<0.1	0
Inverter pads	0.8	0	0.2	0
M&M ¹ facility	0.1	0	0.2	0
Switchgear	<0.1	0	0.7	0
Fencing	0	0	<0.1	0
Perimeter and collector roads	0	0	22.9	0
ECL ² poles	0	0	<0.1	<0.1
ECL maintenance road	0	0	0.9	3.7
Temporary construction laydown/staging areas	2.9	0	0	0
Topography leveling/cut and fill	84.2	0	0	0
Buried collector cable	4.0	0	0	0
Subtotals	92.1	0	25.2	3.8
TOTAL (Short Term + Long Term)	121.1			

*Vegetation mowing and temporary crushing is not included in the disturbance table.

¹ monitoring and maintenance

² electrical connection line

2.2.1 Project Components

This section briefly summarizes the components of the Project, including the equipment, ECL, onsite switchgear, and electrical connections. Other elements of the Project, including environmental protection measures (EPMs); construction; and operation, monitoring, maintenance, and decommissioning are also briefly summarized. Further details regarding these Project components are provided in **Appendix A**.

2.2.1.1 PV Modules, Arrays, and Inverters

Solar energy is converted from photon energy to DC electrical energy via the semi-conductor material in PV cells. AC electricity is the standard used by all commercial appliances and utilities serviced by a utility grid.

\\020706043\03_40151\08_000\08\mxd\000\Figure 2.2-2_Proposed Action_Site Plan.mxd Revised: 2018-02-26 8:46:00 AM

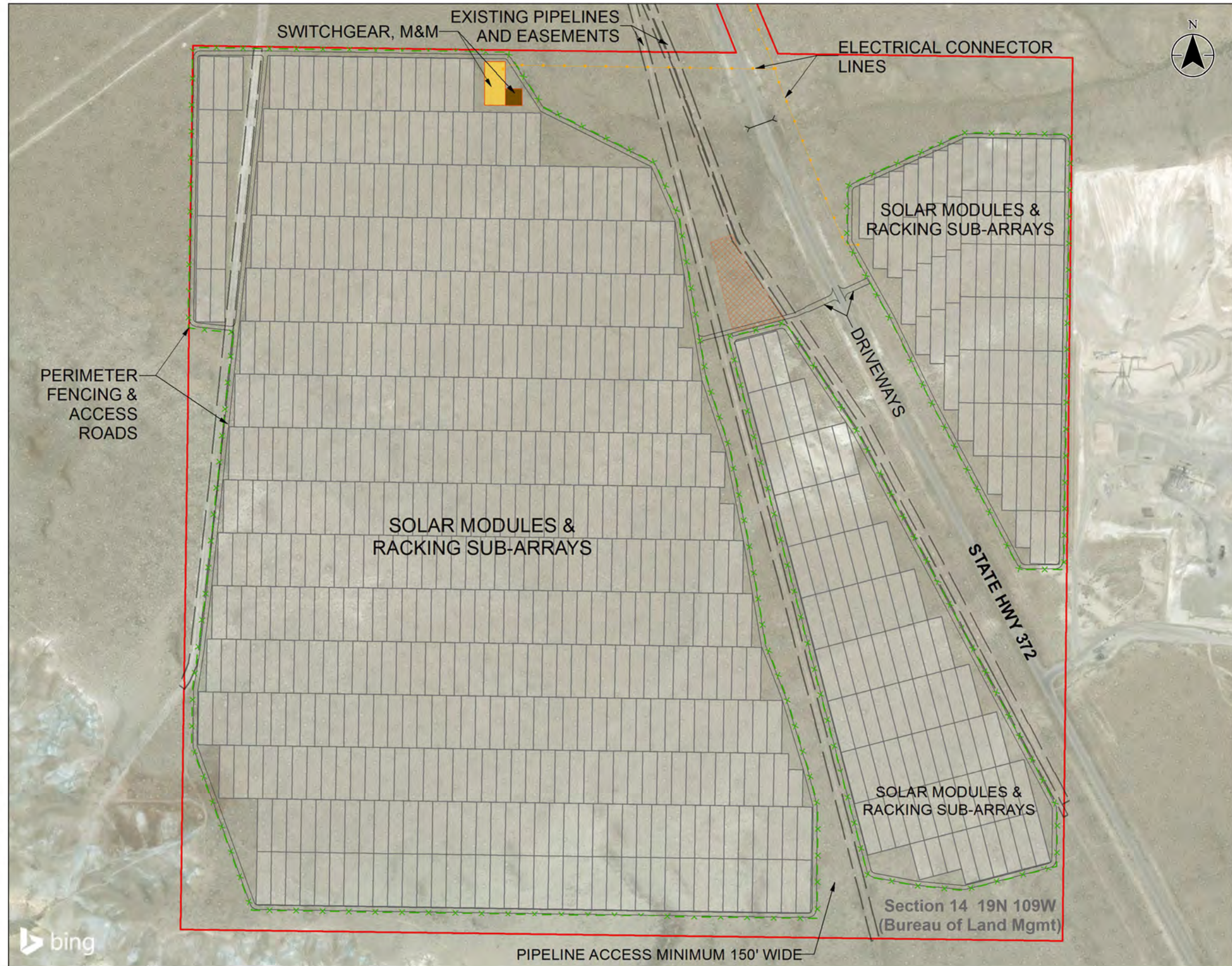


Figure No.

2.2-2

Title

Proposed Action: Site Plan

Client/Project

Sweetwater Solar LLC
Sweetwater Solar Energy Project

Project Location

T20N R109W S34; T19N R109W S2, 3, 11, 14
Sweetwater County, WY

203706043

Prepared by EDZ on 2018-02-26

Technical Review by SL on 2018-02-26

Legend

- Existing Highway Culvert (Approximate)
- - - Proposed Electrical Connection Line
- x x x Proposed Fence
- Temporary Construction Laydown/Staging Area
- Proposed Road
- Proposed M&M Facility, Parking
- Proposed Project Switchgear
- Proposed Photovoltaic Array Area
- Project Area

0 600 1,200 Feet
1:7,200 (At original document size of 11x17)



Notes

- Coordinate System: NAD 1983 HARN StatePlane Wyoming West Central FIPS 4903 Feet
- Service Layer Credits: © 2018 Microsoft Corporation © 2018 DigitalGlobe ©CNES (2018) Distribution Airbus DS

Groups of PVM rows, along with the associated electrical equipment, would comprise the Project arrays. The PVMs would be inserted into a pre-fabricated frame and anchored into the ground via steel posts or helical anchors. Posts would project from the ground up to three to six feet above the ground surface. The array rows would be spaced at intervals of 16 feet, center to center. There would be approximately 30 inverters that would be distributed throughout the PVM arrays. An inverter's basic function is to convert the DC output produced from solar photons into AC by "inverting" the polarity and voltage of the DC energy.

2.2.1.2 Solar Trackers

The solar tracker racking and actuators are devices that maintain the PVM's angle towards the sun. These devices would change the orientation of the arrays throughout the day to follow the sun's path to maximize energy production. The solar trackers would rotate on one axis moving from east to west each day and returning to the east each night. On average, the panels would move every five to ten minutes from sunup to sundown.

2.2.1.3 Electrical Distribution System and Switchgear

A transformer at each PVM inverter would transform the power generated by each inverter unit to 34.5 kV AC for delivery via the ECL to the Raven Substation (**Section 2.2.2**). Transformers would be non-polychlorinated biphenyl oil-filled types.

The transformers would be connected to buried collector cables that make up the electrical distribution system. The electrical distribution system would deliver the electricity to the onsite electrical switchgear (**Figure 2.2-2**). The collector cables would be buried approximately 36 inches underground in 36-inch wide trenches. The onsite switchgear site itself may be surrounded by a separate security fence typical of the fencing surrounding the rest of the facility (**Section 2.2.1.7**).

2.2.1.4 Access

Primary access to the Project would occur from Interstate 80 (I80) to SH372. Access to the facility would occur from driveways and gravel roads connecting to SH372 (**Figure 2.2-1**, **Figure 2.2-2**). New permanent roads would support Project construction and operation; temporary construction access routes are described in **Section 2.2.2.2**. The permanent roads would support emergency and maintenance vehicles and would include:

- Facility perimeter road;
- Roads within the arrays (interior roads); and
- Roads to access the switchgear and M&M facility.

The facility perimeter road would be 20-feet wide, gravel surfaced, and constructed within the facility perimeter fence (**Section 2.2.1.7**). This road would not be open to the public, but access would be available to emergency responders and existing ROW holders. The road would be constructed to the standards of the International Fire Code and approved by the Sweetwater County Fire Warden and Code Enforcement Specialist. Access roads within the PVM arrays would consist of 16-foot wide, permanent compacted native soil roads. Where permanent roads that would be used for construction would cross existing utility ROWs, the roads would be constructed to provide adequate protection to existing buried pipelines and other conveyances.

Two new vehicle access driveways would be established to enter Section 14 from SH372 (**Figure 2.2-2**). There would be lockable double swinging security gates constructed at these locations, but with access provided to emergency service providers and existing ROW holders within Section 14.

2.2.1.5 Monitoring and Maintenance Facility

The M&M facility would consist of pre-fabricated metal enclosures or sheds (conexes) that would be located adjacent to the onsite switchgear (**Figure 2.2-2**). The M&M facility would be used for parts storage, plant security systems, and Project monitoring equipment.

2.2.1.6 SCADA System, Fiber Optic Communications, and Meteorological Stations

The Project would include a Supervisory Control and Data Acquisition (SCADA) system to collect operating and performance data from the facility and to provide for remote operation of the facility. The PVMs would be linked to a central computer in an M&M building and to a remote operations center by a fiber optic network (onsite) and cellular, telephone, or satellite communications (off-site) via a 20-foot high, lattice structure microwave tower. The fiber optic cables used for SCADA communication would be buried with the electrical distribution system in a trench carrying the electrical connection from the switchgear to the M&M facility.

Four, less than 10-foot high meteorological ('met') stations would be installed at various locations within the facility. The met stations would be located within the fencing and connected to the SCADA system to collect data for analysis and system monitoring.

2.2.1.7 Perimeter Fence

A perimeter fence would be constructed around the entire facility (creating a 481-acre fenced area) to provide security, safety, and prevent livestock damage (**Figure 2.2-2**). This fence would consist of 6 feet of chain link topped with three-strand barbed wire for a total height of approximately 7 feet. The fence is required by National Electric and National Safety Codes to prevent unauthorized personnel from gaining access to energized components.

2.2.2 ECL and Raven Substation Interconnection

The ECL would extend approximately 2.5 miles from the onsite switchgear northwest to the existing Raven Substation within a temporary 80-foot construction ROW and a 50-foot permanent ROW along the east side of SH372 (**Figure 2.2-1**).

The power line would consist of two power conductors, communications (fiber optic) below the power conductors, and possibly a lightening protection wire above. Complete structures would not exceed a height of 75 feet.

Shutdown of the Raven Substation is not anticipated during any construction or tie-in activities of the Project to the Raven Substation. There would be limited line outages near the Raven Substation and these would be communicated by PacifiCorp to affected parties once a detailed construction and energization plan is completed by PacifiCorp (Pacific Northwest Energy Consultants 2017).

2.2.2.1 Permanent ECL Access Roads

A permanent compacted native soil road would be constructed within the permanent 50-foot ROW that would allow for maintenance. The ECL access road would not routinely be traveled more than once per year and only for inspection and possible cleaning or repair.

2.2.2.2 Temporary ECL Access Routes

Temporary construction routes would be developed using a bushwacker to remove tall brush, while leaving plant root structure intact. These ECL construction routes would be used throughout the ECL construction period and would then be decommissioned and reclaimed (**Section 2.2.6**).

2.2.3 Environmental Protection Measures as Design Features of the Project

Sweetwater Solar has committed to specific environmental protection measures (EPMs) as part of the Project design to minimize or avoid potential impacts to resources during construction and operation. These EPMs are summarized in **Table 2.2-2**.

Table 2.2-2 Environmental Protection Measures

Resource	EPMs As Design Features
Air Quality	Water or chemical soil binders would be used to control dust within the Project area during construction in accordance with federal, state, and local requirements.
	Posted speed limits (e.g., 10 miles per hour [mph]) would be required of contractors within the construction site to minimize airborne fugitive dust.
	Soil disturbance activities and travel on unpaved roads would be suspended during periods of high winds. Site-specific wind speed thresholds shall be determined on the basis of soil properties determined during site characterization.
Soils	Soil erosion would be minimized by implementing procedures described in the Construction Mitigation and Reclamation Plan (CMRP) and Storm Water Pollution Prevention Plan (SWPPP) (Appendix A).
	If construction is planned during a storm event, vehicle traffic, and equipment would be restricted to prevent excessive rutting.
	Project roads that are no longer needed would be recontoured and revegetated to increase infiltration and reduce soil compaction (Appendix A).
	Construction activity timeframes would be reduced so that ground-disturbing activities take place over as short a timeframe as possible.
Water Resources and Wetlands	The SWPPP would be implemented to minimize storm water transport of sediment from disturbed areas.
	Water used for dust control during construction, etc., would be obtained from a private well. Water for operations and maintenance would be from a municipal hydrant. The installation or abandonment of any wells is not anticipated. Groundwater appropriation is not anticipated.
	Culverts would be designed to comply with BLM, state, and local standards, or to accommodate the runoff of a 100-year storm, whichever is larger.
	Stormwater retention and/or infiltration and treatment systems would be designed for storm events up to and including the 100-year storm event.
	A large construction general permit would be obtained from the Wyoming Department of Environmental Quality (WDEQ) to cover storm water discharges during construction.
	A Drainage Plan would be prepared by a Wyoming-licensed engineer that will address both on and offsite drainage impacts, mitigation measures (as appropriate), and other related concerns.
Vegetation	The BLM RSFO has approved native seed mixtures (grasses, shrubs, and forbs) that must be used to revegetate disturbed areas. All seed must be certified weed-free. Each seed mixture would be selected based on the soil type and species present prior to disturbance (Appendix A). For this reason, the seed mixture to be used at any one site would be identified during the onsite evaluation.
	Areas disturbed during construction that are not needed for long-term operation and maintenance would be reclaimed once construction is complete per the CMRP and efforts would be continued until satisfactory revegetation cover is established and the site is stabilized (3 to 5 years for herbaceous species, 10 to 15 years for shrub species).

Resource	EPMs As Design Features
	<p>All reclamation would be completed within six months after decommissioning is complete (or the following fall season) and efforts would continue until satisfactory revegetation cover is established and the site is stabilized (3 to 5 years for herbaceous species, 10 to 15 years for shrub species). In order to determine reclamation success, BLM may require vegetation monitoring data to be collected by the operator.</p> <p>Interim restoration would be used during the operating life of the Project as soon as possible after land disturbances.</p>
Noxious Weeds	<p>The Project's Noxious and Invasive Weed Control Plan (Appendix A) would be implemented to minimize the spread of noxious weeds.</p> <p>Noxious weed monitoring and control would continue for any area over which Sweetwater Solar would retain control over the land surface use during operations.</p> <p>Herbicides and pesticides would be used within the framework of BLM and DOI policies and standard operating procedures, to include the use of only U.S. Environmental Protection Agency (EPA)-registered pesticides/herbicides that also comply with state and local regulations. Noxious weeds would be controlled and treated over the life of the Project as outlined in Appendix A.</p> <p>Project personnel would be educated on weed identification, the way weeds spread, and methods for treating infestations.</p> <p>Periodic monitoring, reporting, and immediate eradication of noxious weed or invasive species occurring within all managed areas would be implemented.</p>
Wildlife and Fisheries	<p>Construction would not be allowed from November 15 to April 30 within pronghorn crucial winter range, as defined by the Wyoming Game and Fish Dept. (WGFD), unless an exception to construct until December 31 is granted by the BLM in coordination with the WGFD. The exception would be granted in two-week increments and could be cancelled at any time at the discretion of the BLM in coordination with the WGFD.</p> <p>The ECL and all aboveground electrical facilities would be designed to provide raptor, migratory bird, and Greater Sage-grouse protection in compliance with the standards described in Avian Power Line Interaction Committee (APLIC) 2006 and APLIC (2015).</p> <p>If construction occurs during migratory bird breeding season (generally February 1 to July 31, or April 1 to September 10 for burrowing owl), pre-construction surveys would be performed for active nests, including raptor nests, to avoid disrupting migratory birds during the breeding season. A qualified biologist would survey the Project area for nesting migratory birds within five days prior to any ground disturbing activity. To minimize impacts to migratory birds (including raptors), active nest sites would be avoided during construction activities, in coordination with BLM and USFWS. If surveys or other available information indicate a potential for take of migratory birds, their eggs, or active nests, Sweetwater Solar would suspend activities in a 300-foot-radius buffer around passerine nests and up to a 1-mile-radius buffer around raptor nests and contact the BLM and USFWS for further coordination on the extent of the impact.</p> <p>Operators would be trained to monitor the Project area for the presence of larger wildlife such as pronghorn, deer, and sensitive species such as golden eagles and Greater Sage-grouse. The operator would only attempt to move wildlife off site under coordination with the BLM and the WGFD. Mortality information would be collected and reported on a weekly basis. Sweetwater Solar would establish wildlife protection policies that would prohibit hunting, feeding, or harassment of wildlife unless attempting to move wildlife off the site (only under coordination with the BLM).</p>

Resource	EPMs As Design Features
	Proper trash removal and storage procedures would be implemented, such as using secured containers and periodic emptying, on the Project site to reduce attractive opportunistic species, such as common ravens and coyotes.
	A post-construction wildlife monitoring plan would be prepared in coordination with the BLM and the WGFD.
Special Status Species	Within 2-miles of occupied Greater Sage-grouse lek locations outside core population areas, a 2-mile seasonal restriction (March 15 to June 30) for construction activities would be implemented to protect Greater Sage-grouse nesting habitat.
Land Use	A permanent perimeter fence would be installed around the entire solar facility for safety (Section 2.2.1.7). The facility would also be marked with warning and no trespassing signage on fences, gates, and electrical equipment, and all gates, access doors and ports would be locked at all times.
Recreation and Visual Resources	Existing rocks, vegetation, and drainage patterns would be preserved to the maximum extent possible.
	Retro-reflective or luminescent markers would be used in lieu of permanent lighting.
	Off-site visibility of all commercial symbols and signs and associated lighting would be minimized. Necessary signs would be made of non-glare materials and utilize unobtrusive colors. The reverse sides of signs and mounts would be painted or coated using a suitable color selected from the BLM Standard Environmental Color Chart to reduce contrasts with the existing landscape; however, placement and design of any signs required by safety regulations must conform to regulatory requirements.
Transportation	Placement of temporary access would be designed to avoid sensitive features. Areas used for temporary roads or working areas during construction would be restored to their original condition to the extent practicable.
Cultural and Paleontological Resources	To minimize indirect impacts to cultural and paleontological resources, Project-related personnel would be educated as to the sensitive nature of the resources; a strict policy of prohibiting collecting of these resources would be implemented.
	National Register of Historic Places (NRHP)-eligible sites that are not covered by the solar array would be fenced (using typical livestock fence) for the life of the Project.
	If cultural resources, including human remains, are discovered during Project construction, all work would stop in the area of the discovery and the procedures outlined in the Unanticipated Cultural Discoveries Plan (Appendix A) would be followed. If the cultural resource is determined to be a historic property, and cannot be avoided, then appropriate mitigation measures would be developed in consultation with the State Historic Preservation Office (SHPO) and BLM. Written permission stating that work in this area no longer presents a hazard to cultural resources would be required before work could resume in the area of the discovery. If human remains are discovered, the Environmental Inspector would immediately stop construction in a 300-foot radius and notify the BLM. If human remains are found on federal lands and determined to be Native American, BLM would follow the requirements under the NAGPRA. BLM would provide written notice to Sweetwater Solar indicating they can proceed with construction once the remains have been fully evaluated and appropriate treatment of the discovery has been completed.
	If unanticipated paleontological resources are discovered during construction, all work would stop in the area of the discovery and the procedures identified in the Unanticipated Paleontological Discoveries Plan (Appendix A) would be followed.
	Cultural field monitors would be employed to monitor ground-disturbing activities (e.g., in geomorphic settings, such as in shifting sands, where buried deposits may be present) in cases where there is a potential of encountering cultural resources during construction that could not be detected during prior Class III inventory.

Resource	EPMs As Design Features
Noise	The Project area would be at least 1-mile from occupied houses and structures. At this distance, noise created during construction should be below ambient background levels.
Hazardous Materials	<p>A “just-in-time” ordering procedures is designed to limit the amounts of hazardous materials present on the site to quantities minimally necessary to support continued operations would be implemented. Excess hazardous materials shall receive prompt disposition.</p> <p>Hazardous materials and waste storage areas and facilities would be designated, and access limited to authorized personnel only.</p> <p>The release of hazardous materials and petroleum products would be controlled by the Hazardous Materials Management Plan and the Spill Prevention, Control, and Countermeasures (SPCC) Plan (Appendix A).</p>
Health and Safety	<p>No dogs/pets would be allowed in the Project area.</p> <p>No firearms would be allowed in the Project area.</p> <p>All hazardous and potentially hazardous materials would be transported, stored, and handled in accordance with applicable regulations.</p> <p>If toxic or hazardous waste materials are encountered during construction, construction would stop immediately, and would not restart until clearance is granted by the BLM.</p> <p>Project developers would maintain emergency response capabilities throughout the reclamation and decommissioning period as long as hazardous materials and wastes remain on-site.</p> <p>Training and awareness measures would be implemented for workers and the general public to minimize and address standard practices (such as Occupational Safety and Health Administration) for the safe use of occupational electric and magnetic field exposures; fire safety and evacuation procedures; and safety performance standards (e.g., electrical system standards and lighting protection standards).</p> <p>General project injury prevention would be identified and accounted for within the Health and Safety Plan (Appendix A), such as establishing personal protective equipment requirements, respiratory protection, hearing conservation measures, electrical safety considerations, hazardous materials safety and communication, housekeeping and waste handling, confined space identification, and rescue response and emergency medical support, including on-site first aid capability.</p>

2.2.4 General Construction Information

Construction of the Project would be accomplished over six months by two or more construction crews specializing in various construction components. The construction period would be from July to November 15, 2018, unless an exception to construct until December 31 is granted by the BLM in coordination with the WGFD (**Table 2.2-2**).

Construction would require 10 to 125 employees, depending on the phase of construction. Following principal construction, the workforce would reduce to less than 20 employees that are specialized to the wiring and SCADA connections for the facility. Qualified local and non-local contractors would be used per the equipment and personnel needs of the Project. A large percentage of the work force would be from Wyoming, if qualified, although specialty workers from various parts of the country may be required.

Trucks transporting Project components and construction materials would access the Project from SH372, primarily by way of I80. Approximately 8,725 vehicle trips (4,965 passenger/service truck trips, 1,510 large diesel trucks and trailer trips, and 2,250 water truck trips) would be needed during the construction phase of the Project. These vehicle trips would occur primarily during the work week during the working hours of 5:00 AM to 4:00 PM; however, in order to meet the Project construction schedule those daily working hours may be extended. No oversized (wide or long load) trucks would be used to transport Project components to the Project site. It is not anticipated that any road improvements would be needed to accommodate delivery and construction traffic along public highways and interstates. Equipment and material hauling would be performed in a manner to prevent damage to areas outside the Project area and minimize interference with existing land use activities. Transportation and construction contractors would obtain all necessary permits for transportation-related elements of the Project from the Wyoming Department of Transportation (WYDOT). A Traffic and Transportation Plan to ensure safety and minimize impacts on traffic flow in the vicinity of the Project is provided in the POD (**Appendix A**).

Routine vehicle and equipment maintenance activities would be performed off site or within the temporary construction areas. Noxious and invasive weeds would be controlled during construction under the Noxious and Invasive Weed Control Plan (**Appendix A**).

2.2.4.1 General Construction Methods

Site Preparation

Site preparation of vegetated areas associated with the arrays would involve utilizing a bushwhacker to mow shrubs approximately 4 to 12 inches from their base and leave the root structure intact. Grading (cut and fill) would occur on approximately 84 acres within the Project area (**Table 2.2-1**) to prepare for Project roads and meet the requirements of the slope for the solar array racking system, M&M facility, and switchgear site. Clearing of these areas would be accomplished using a standard bulldozer, grader, or other similar earthmoving equipment. This grading would generally maintain existing contours but would cut and fill in the high and low spots.

Soil disturbance would require that affected areas (approximately 92 acres; **Table 2.2-1**) are reseeded after construction is complete, if not covered by gravel roads or equipment foundations. Regrading and revegetation techniques from short-term and permanent disturbance are provided in the CMRP (**Appendix A**).

Temporary access to the construction areas would occur by driving over existing vegetation and creating temporary access routes over crushed vegetation; no clearing and grading would be required. This construction method would minimize disturbance of soils and vegetation.

Topsoil Removal and Protection

For areas requiring topsoil removal, topsoil would be removed and either used as backfill, where appropriate, or utilized in final grading and reseeded. Erosion control measures would be employed in areas where surface disturbance and/or slope leave the soil susceptible to wind and water erosion. There would not be any long-term soil stockpiling on site.

Temporary Construction Facilities

Temporary construction facilities would include secured areas for receiving and storing Project materials (staging or laydown areas), one to two temporary construction trailers with temporary electrical service and sanitation facilities (portable toilets), and parking for work trucks and personal vehicles for the construction crews (**Figure 2.2-1**). Additionally, a temporary line pulling and tensioning site would be located adjacent to the Raven Substation. These temporary construction facilities would disturb vegetation by mowing or crushing vegetation at the sites;

gravel may also need to be applied in some areas (**Table 2.2-1**). These construction facilities would be used throughout the construction period and then reclaimed (**Section 2.2.4.2, Appendix A**).

Fueling stations would be located within a temporary secondary containment berm, would be equipped with a spill kit, and would be operated consistent with the Project Spill Prevention, Control, and Countermeasures Plan (SPCC Plan) (**Appendix A**).

Water Needs

Up to 71 acre-feet of water would be purchased from a private well drawing from the Green River (Township 23N, Range 111W, Section 7) during construction of the Project. The water would be used for compaction of electrical trenches and foundations, onsite dust control, and non-potable water for the construction trailer(s).

Electrical Connection Line

Light grading would occur to create the ECL access road to remove any localized impediments to passage by four-wheel drive utility service trucks. No altering of existing major grades, installation of road base or gravel, etc., would be required.

Temporary access to the ECL construction area would occur by driving over existing vegetation and creating temporary access routes over crushed vegetation; no clearing and grading would be required. This construction method would minimize disturbance of soils and vegetation.

2.2.4.2 Reclamation and Revegetation

The final phase of construction would be cleanup and reclamation and revegetation of areas disturbed by construction but not required for Project operation. Specific requirements and additional details are included in the CMRP (**Appendix A**).

Areas that have been temporarily disturbed by grading or other earthmoving activities would be restored to the original contours of the land to the extent possible and consistent with future operating needs. Reclamation work may consist of re-contouring areas, establishing vegetation, and applying mulch to provide additional erosion control. Ungraded areas disturbed only by overland travel would be assessed in coordination with BLM to determine if reclamation is needed for recovery of the affected area.

Temporary disturbance areas would be revegetated using seed mixtures and techniques developed in consultation with the BLM. The CMRP includes success criteria and monitoring protocols to assess the success of revegetation efforts and to determine whether additional reclamation efforts are needed.

Noxious and invasive weed control would continue onsite during the reclamation process per the specifications stipulated in the Project's Noxious and Invasive Weed Control Plan (**Appendix A**).

Upon completion of construction and reclamation, fences and other previously existing structures would be reestablished to fully functioning condition.

2.2.4.3 Health and Safety Program

Site Safety and Security

Warning signs would be posted along the Project access roads informing the public of construction activities and directing that the public not enter the site. For areas where public safety risks could exist and site personnel would not be available to control public access (such as excavated foundation holes and electrical distribution system trenches), warning signs and

temporary fences would be erected. Temporary fencing also may be installed around material storage, staging, and laydown areas. Other areas determined to be hazardous or where issues of security or theft are of concern also may be fenced in coordination with the BLM. Temporary fencing around unfinished excavations and other potential hazards typically would consist of a high-visibility plastic mesh. Security guards, cameras, and/or additional fencing may be utilized, if necessary, to protect public health and safety and Project facilities.

Lighting

A limited amount of night-time lighting would also be utilized to provide security. The switchgear and M&M buildings would have downward pointing/full cut-off nighttime lighting (designed to limit upward light pollution or across Project boundaries) to minimize effects on dark night skies.

2.2.5 Operation, Monitoring, and Maintenance

2.2.5.1 PVM Array Facility, Onsite Substation, and M&M Facility

Operation of the Project would require approximately four to six full-time employees. Routine maintenance of the PVM arrays would be necessary to optimize performance and to detect potential malfunctions. PVM surfaces also are required to be kept clean to maintain their optimized performance. This would typically be performed using water; detergents would not be used. Each PVM array would be cleaned once or twice a year which would require approximately 100,000 gallons of water per wash (up to 200,000 gallons per year [0.6 acre-feet] total). This frequency and optimum timing would be determined by monitoring Project performance versus weather throughout each year of operation. Wash water would be obtained from an existing, municipal source (hydrant H5-56 in the City of Green River [Township 18N, Range 107W, Section 15]) and trucked to the site.

Once temporary reclamation is complete and vegetation is stable following construction, noxious weed surveys would continue on an annual basis. Routine maintenance would include weed monitoring and treatment (**Appendix A**).

2.2.5.2 Electrical Connection Line

The ECL would be inspected approximately once per year for conductor soiling, corrosion or oxidation, operating temperatures, physical damage, etc.

2.2.5.3 Environmental Protection

EPMs are provided in **Section 2.2.3**.

2.2.6 Decommissioning

At the conclusion of the 30-year Project ROW grant, if Sweetwater Solar does not pursue an extension of the ROW grant from the BLM, Project decommissioning would be initiated according to the CMRP (**Appendix A**) and in compliance with all applicable federal, state, and local requirements.

2.2.6.1 Facility and ECL Decommissioning

Decommissioning is a systematic deconstruction process that would involve removing and disposing of the infrastructure and associated facilities with the Project. In general, decommissioning of the Project would involve disassembling the PVM arrays and associated infrastructure and salvaging the equipment, such as PVM array steel, electric transformers, switchgear components, and materials such as steel and copper.

Following the removal of Project facilities, the site would undergo final cleanup and reclamation as per the CMRP (**Appendix A**). Areas disturbed during removal of Project features would be restored and rehabilitated as near as possible to their original condition and would be available for the same uses that existed prior to construction of the Project.

2.3 ALTERNATIVE SITE CONFIGURATION

This alternative would be similar to the Proposed Action (**Section 2.2**) but would include a different site configuration utilizing smaller wattage PVMs that may have both fixed and/or tracking arrays and a different orientation than the Proposed Action. Additionally, several modifications are proposed as part of the Alternative Site Configuration to address concerns related to range and livestock, wildlife, and cultural resources.

Wildlife and livestock movement along SH372 has been incrementally impacted by development and fencing. The Alternative Site Configuration was designed to maintain wildlife and livestock movement through the Project area. The footprint of the Project on the west side of SH372 would be arranged to accommodate a 600-foot wildlife and livestock movement route on the southwest portion of Section 14 (**Figure 2.3-1**).

The alignment of the perimeter fence (**Section 2.2.1.7**) would follow the Section 14 boundary and would tie into the WYDOT fencing along the west side of SH372 (except for the 600-foot wildlife and livestock route where it would follow the facility footprint) (**Figure 2.3-1**). This configuration would address concerns of creating big game traps that would result by the irregular fencing configuration under the Proposed Action. This modified fencing configuration would result in a larger fenced-in area than that under the Proposed Action (514 acres instead of 481 acres).

To address concerns regarding NRHP-eligible cultural sites on Section 14, the proposed layout for the solar arrays and other facility components under the Alternative Site Configuration would avoid these sites. The perimeter fencing along the north section boundary would not be able to avoid non-contributing¹ portions of two NRHP-eligible sites. The cultural sites would be fenced (using typical livestock fence) for the lifetime of the Project as an EPM to prevent unauthorized/accidental access.

The Project disturbance area for the Alternative Site Configuration would be similar to the Proposed Action; approximately 129 acres versus 121 acres for the Proposed Action (**Table 2.3-1**). There would be more temporary construction storage/laydown areas, and three driveways rather than two. The other Project components; ECL; EPMs; construction; operation, monitoring, and maintenance; and decommissioning; would be the same as described in **Section 2.2**.

¹ elements of the sites that do not contribute to the eligibility of the sites for the NRHP

Table 2.3-1 Short-term and Long-term Disturbance, Alternative Site Configuration

Project Component	Short-term Disturbance*		Long-term Disturbance*	
	Federal	Private	Federal	Private
Racking (solar array) posts	0	0	<0.1	0
Inverter pads	1.5	0	0.4	0
M&M facility	0.1	0	0.2	0
Switchgear	<0.1	0	0.7	0
Fencing	0	0	<0.1	0
Perimeter and collector roads	0	0	21.4	0
ECL poles	0	0	<0.1	<0.1
ECL maintenance road	0	0	0.9	3.7
Temporary construction laydown/staging areas	28.5	0	0	0
Topography leveling/cut and fill	69.7	0	0	0
Buried collector cable	1.3	0	0	0
Subtotals	101.2	0	23.9	3.8
TOTAL (Short Term + Long Term)	128.9			

*Vegetation mowing and temporary crushing is not included in the disturbance table.

2.4 ALTERNATIVES CONSIDERED BUT DISMISSED FROM FURTHER ANALYSIS

2.4.1 Original SF-299 (BOR) Location

A SF-299 ROW application was initially submitted to the BOR on August 25, 2015, requesting a ROW grant for the Project on 1,280 acres of BOR, BLM, and private land located approximately two miles northwest of the current proposed location. The site location in the original SF-299 submitted to the BOR included three sections of BOR land along SH372: Township 19 North, Range 109 West, Section 2 (southeast and west of the Raven Substation); and Township 20 North, Range 109 West, Sections 18 and 20 (northwest of the Raven Substation). The arrays were proposed to be distributed on likely two of three of the sections, depending on the results of public scoping and further feasibility studies. This configuration would also have generated 80 MW of electricity, and would have been connected to the Raven Substation via ECLs that would have come in from both the northwest and southeast of the substation. The BOR would have been the federal agency lead for the Project, and the BLM would have been a cooperating agency.

Prior to initiating public scoping, further feasibility analysis indicated that previously unidentified encumbrances on Section 2 of the originally proposed Project area could preclude development of that Section, which due to topography and previous disturbance, was the preferred section for array development. Section 2 is encumbered by a suspended oil and gas lease. In addition, the WYDOT holds an active gravel lease on approximately 50 percent of Section 2 that WYDOT would not be able to terminate within a timeframe necessary for Project construction and operation. Lastly, Sections 18 and 20 were found to have substantial environmental constraints, including close proximity to the Green River, priority Greater Sage-grouse habitat, and potential conflicts with BLM visual resource management (VRM) classes.

Due to the potential preclusion of solar development on this site, and the identification of substantial environmental constraints, this site was dismissed from further analysis.

2.4.2 Additional Sweetwater County Sites

Sections 4, 10, and 32 in Township 19 North, Range 109 West were also considered for the Project. Due to constraints on topography that would preclude the development of enough solar arrays to meet the electricity generation objectives of the Project, these alternative sites were dismissed from further analysis.

2.4.3 Linear Solar Array Layout

Several cooperating agencies requested that an alternative site configuration including solar arrays in a linear layout along the west side SH372 on Section 14 and north onto adjoining Section 11 (privately owned) be considered to avoid potential impacts to wildlife habitat. This alternative was dismissed from further analysis because the BLM has no authority over private lands.

2.4.4 Alternative Site Configuration with 900-foot Movement Route

BLM considered a 900-foot wildlife and livestock movement route in the Alternative Site Configuration action alternative, rather than a 600-foot route (**Section 2.3**). After considering the 900-foot corridor, it was determined that the 900-foot corridor configuration would eliminate more buildable land than the proposed facility could accommodate and still allow the Project to be technologically feasible. The corridor would impinge on the Project to the degree that it would require building PVMs in NRHP-eligible cultural sites, additional ground disturbance (cut, fill, and blading) and a change from tracking to stationary solar panels to generate the same amount of electricity. This would substantially increase impacts to other resources such as other wildlife and archeological concerns. Therefore, it was dismissed from further analysis.

3.0 Affected Environment

This chapter identifies the existing resources and uses that could be affected by the No Action Alternative, Proposed Action, and Alternative Site Configuration (**Sections 2.1 through 2.3**). Resource analysis areas are based on the predicted extent of direct and indirect impacts associated with the Proposed Action and alternatives. Environmental conditions and human uses within the analysis areas have been identified and described using geographic information system (GIS) data, literature searches, electronic information and data searches, and personal interviews.

The Project area is in Sweetwater County, Wyoming, approximately 11 miles northwest of the town of Green River, along the southern and northern sides of SH372 (**Figure 1.1-1**). The Project area is generally vacant and consists of relatively flat terrain in the Wyoming Basin EPA level 3 ecoregion of south-central Wyoming. This ecoregion is characterized as a broad arid intermontane basin interrupted by hills and low mountains and dominated by grasslands and shrublands (EPA 2016).

3.1 GEOLOGY, MINERALS, AND PALEONTOLOGICAL RESOURCES

3.1.1 Geology and Minerals

The Project area is situated in the Bridger Formation of the Eocene (Love and Christiansen 1985). The Project area is located on Green River alluvial terrace deposits that overlie the Bridger Formation. These terraces are dissected and mixed with slopewash, aeolian deposits, and/or residuum (Wyoming State Geological Survey 1999). The thickness of these deposits above the underlying sedimentary rocks is variable, depending on their location relative to the Green River. The terrace near the Project area is approximately 410 feet above the present elevation of the Green River (Jones and Scott 2010).

The Project would occur within an area that is considered to have a high potential for conventional oil and gas occurrence and a low potential for coalbed natural gas with current technology (BLM 2013). Section 14 of the Project area is available for fluid mineral leasing (BLM 2012a). However, Sections 2 and 34 are administratively unavailable for new fluid mineral leasing until it can be satisfactorily demonstrated that the oil and gas resource can be recovered without compromising the safety of underground miners and mine workings (BLM 2012a). No interest in fluid mineral leasing has been expressed for Section 14 (Nara-Kloepper pers. comm. 2017). The Project area is outside the BLM's Coal Occurrence Development Potential area, Potential Sodium Brine Area, and Uranium District (BLM 2012a). Locatable mineral activity in the Project area is precluded by a withdrawal for oil shale.

Mineral occurrence potential for mineral materials such as sand and gravel in the RSFO planning area is considered high (BLM 2012a). Sand and gravel is an essential component of road base, asphalt, and concrete in Sweetwater County. The gravel deposits in the area are part of a larger quartzite cobble formation that occurs along the Green River. This formation provides the source material for the majority of construction grade gravel in Sweetwater County. Without the gravel resource of this formation, gravel for construction would have to be hauled over 100 miles. Several sand and gravel operations are located near and adjacent to the Project area. The sand and gravel resources present within Section 14 of the Project area, although not thoroughly defined, appear to be limited. Section 14 contains less than 1 percent (in spatial extent) of Unit 2416 (Root et al. 1973). Each Unit defines an area that contains at least 25,000 cubic yards of gravel. Within Section 2, sand and gravel resources are managed by the BOR and within Section 34 they are owned by the private landowner.

A significant mineral resource within and surrounding the Project area is trona. Trona is a sodium carbonate mineral that occurs as an evaporate mineral deposited primarily in saline lakes. In the Project area, trona deposition occurred during the Eocene age. Trona is processed into soda ash which has a variety of uses. The Known Sodium Leasing Area (KSLA) is defined as “an area in the Green River Basin where developable trona deposits are known to occur at a thickness of at least 4 feet.” The Mechanically Mineable Trona Area (MMTA) was delineated by the BLM in 1993 as an area within the KSLA; the MMTA is defined as “an area underlain by trona deposits of the proper depth, thickness and quality that will support ore extraction by mining techniques that require an underground workforce”. Approximately 25,900 acres within the MMTA are available for sodium leasing. In 1995, it was estimated that at least 127 billion tons of trona were contained in 22 of the 25 trona beds (BLM 2012a). Outside of the MMTA, but within the KSLA, other mining methods such as dissolution may be considered. Currently, four active trona mining companies are operating within the MMTA and are using mechanical methods as the primary extraction technique. All portions (Sections 2, 14, and 34) of the Project area are within the KSLA. Sections 2 and 34 are also within the MMTA (BLM 2012a). Section 34 is currently leased for sodium to Ciner.

3.1.2 Paleontological Resources

The Bridger Formation has been assigned Potential Fossil Yield Classification (PFYC) class 5. The BLM adopted the PFYC system to identify and classify fossil resources on federal lands (BLM 2016). Paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geological units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources. The PFYC system is a way of classifying geologic units based on the relative abundance of vertebrate fossils or scientifically significant fossils (plants and invertebrates) and their sensitivity to adverse impacts. A higher PFYC class number indicates higher potential for fossils. The PFYC is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of the scientifically important localities is intended to be the major determinant for the class assignment.

3.2 TOPOGRAPHY AND SOIL RESOURCES

The Project area is in the eastern Greater Green River Basin, which is part of the Wyoming Basin physiographic province. The Greater Green River Basin covers much of southwestern Wyoming and extends into northeastern Utah and northwestern Colorado. The Project area is in an area characterized as a broad arid intermontane basin interrupted by hills and low mountains.

The Project area consists of relatively flat terrain that slopes from west to east. Elevation within the Project area ranges from approximately 6,380 to 6,600 feet amsl. There are no unique natural topographic features (e.g., spires, canyons, buttes) in the Project area.

There are three soil map units within the Project area: the Cambarge-Pepal complex, Leckman fine sandy loam, and Gasson-Haterton-Pepal complex (Natural Resources Conservation Service [NRCS] 2017). All three of these mapping units are rated as having a “slight” hazard rating for soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface. The soils mapped as Cambarge-Pepal complex (0 to 6 percent slopes) and Leckman fine sandy loam (1 to 8 percent slopes) are rated as having a “slight” hazard rating for soil loss from unsurfaced roads and trails, while the steeper Glasson-Haterton-Pepal complex (6 to 50 percent slopes) soils have a “moderate” rating. None of the three Project area soil types are rated as Hydric (at the scale of the soil survey); Prime Farmland ratings are not available for any of the three mapping units found in the Project area (NRCS 2017).

Cambarge-Pepal complex, 0 to 6 percent slopes. These soils are found at elevations between 6,200 and 7,000 feet. Cambarge and similar soils make up 55 percent of the complex and Pepal and similar soils make up 35 percent. Minor components make up the remaining portion of the mapping unit. Cambarge soils and Pepal soils are found on stream terraces. They are both deep (more than 80 inches) and composed of varying thicknesses of gravelly sandy loam, very gravelly sandy loam, very gravelly coarse sandy loam, and very gravelly loamy coarse sand down through their profiles. Thus, both soil types are well drained and runoff class is low or very low.

Leckman fine sandy loam, 1 to 8 percent slopes. This soil is found at elevations between 6,200 and 7,200 feet. Among the 80 percent Leckman and similar soils in this unit are 20 percent minor components or inclusions. Leckman soils typically are found on alluvial fans. They are deep and well drained, with a very low runoff potential. Soil texture through the typical profile is fine sandy loam.

Gasson-Haterton-Pepal complex, 6 to 50 percent slopes. This mapping unit makes up the smallest percentage of the Project area. It is associated with a dry wash located in the northeast corner of Section 14, the steepest part of the slope crossed by the proposed ECL, and a dry wash near the north end of the proposed ECL as it approaches the Raven Substation. Gasson and similar soils and Pepal and similar soils each make up about 35 percent of the mapping unit; Haterton and similar soils make up about 20 percent. Gasson soils are found on alluvial fans and fan remnants, Pepal soils are found on structural benches, and Haterton soils are found on ridges and hills. Gasson soils are deep, composed of very gravelly sandy loam and gravelly sand, and are well drained. Pepal soils also are deep, but composed of fine sandy loam; they also are well drained. Haterton soils are shallow loams, with paralithic bedrock found at 10 to 14 inches, though they are still considered to be well drained.

3.3 WATER RESOURCES

3.3.1 Surface Water

The Project area is located approximately 1.5 miles from the Green River, within the Green River Basin (Hydrologic Unit Code [HUC] Upper Green-Slate 14040103) (BLM 2013). The Green River is classified as a Class 2AB waterbody, which means it is designated for the beneficial uses of drinking water, fish consumption, cold water game fisheries, nongame fish, aquatic life other than fish, primary contact recreation, wildlife, agriculture, and industry (WDEQ 2013). This reach of the Green River is not listed as impaired for beneficial uses in the 2014 Integrated Report (WDEQ 2016).

The identification of any waterbodies (i.e., ponds, creeks, streams, rivers) within the Project area would be determined by the presence of an ordinary high water mark (OHWM). Common identifiable indicators of an OHWM include open water or evidence of a clear, natural line visible on the bank; shelving; changes in soil characteristics; the destruction of terrestrial vegetation; the presence of litter and debris; and watermarks on structures that are inundated during normal high water conditions. The OHWM typically represents the potential limits of the U.S. Army Corps of Engineers (USACE) jurisdiction.

A review of National Hydrography Data (NHD) indicated three intermittent stream channels occur within the Project area (**Figure 3.3-1**). Field verification confirmed that indicators of an OHWM or a continuous stream channel were not present. A vegetated swale was observed on the southernmost NHD-identified intermittent channel, which flattens out prior to reaching a culvert that crosses under SH372. The swale continues on the eastern side of the highway. Within the swale, there were small discontinuous patches of minimal scour. There were no other observed signs of continuous OHWM or channelization within the remainder of the swale. No other waterbodies were observed within the Project area (Stantec 2017a).

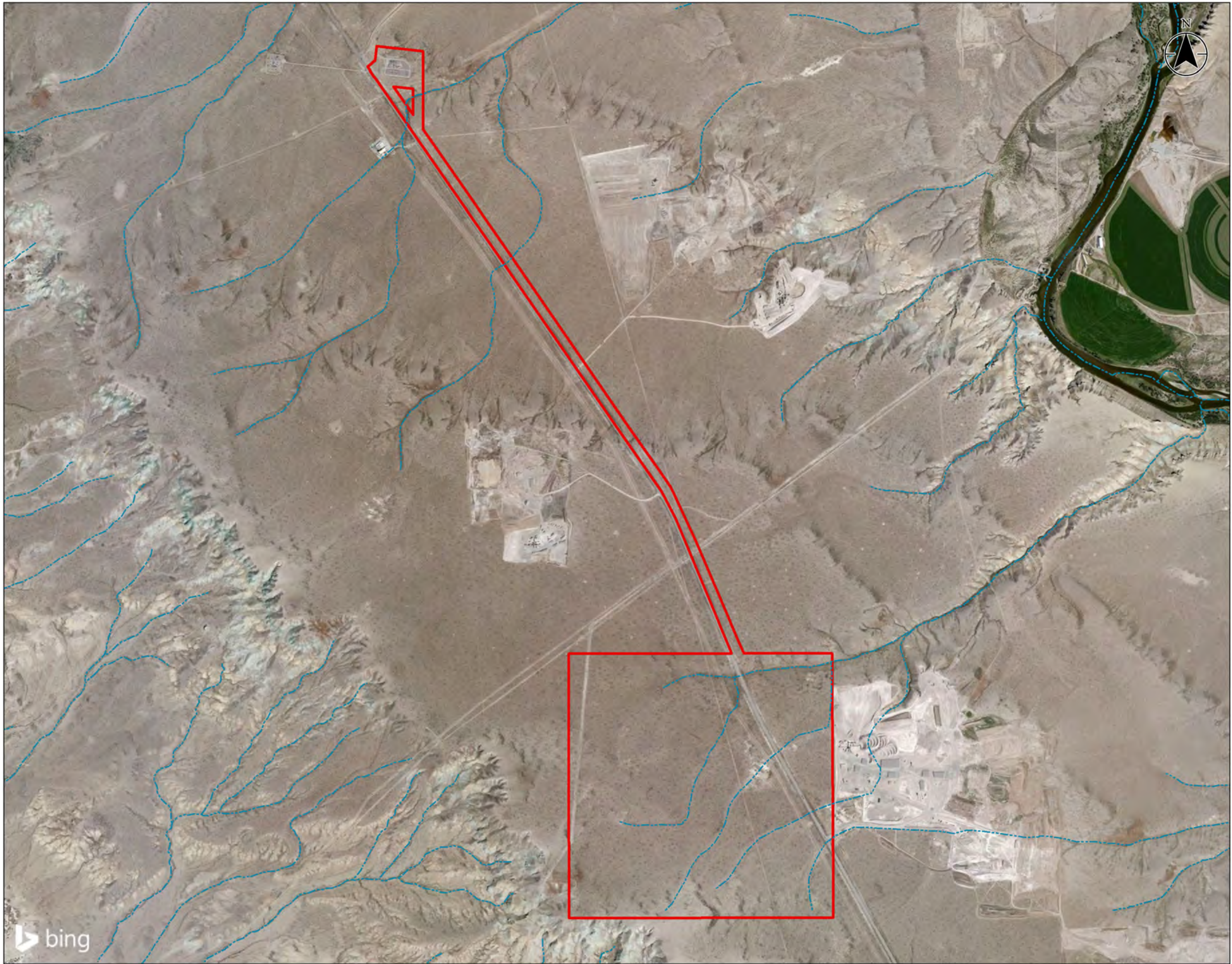


Figure No.

3.3-1

Title

Surface Water Map

Client/Project



Sweetwater Solar LLC
Sweetwater Solar Energy Project

Project Location

T20N R109W S34; T19N R109W S2, 3, 11, 14
Sweetwater County, WY
203706043

Prepared by EDZ on 2017-06-29
Technical Review by SL on 2017-06-29

Legend

-  Project Area
-  NHD Polyline - Intermittent

0 2,000 4,000 Feet
1:24,000 (At original document size of 11x17)



Notes

- Coordinate System: NAD 1983 StatePlane Wyoming West FIPS 4904 Feet
- Service Layer Credits: Image courtesy of USGS Earthstar Geographics
SIO © 2017 Microsoft Corporation

The term “wetlands” has a regulatory definition defined in 33 CFR 328.7(b) as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.” Under the USACE 1987 Wetland Delineation Manual, a “three-parameter” approach is required for delineating wetlands (USACE 1987). Based on this approach, areas are identified as wetlands if they exhibit hydrophytic plants, hydric soils, and at least periodically saturated conditions at some time during the growing season of the prevalent vegetation (USACE 1987).

Field surveys conducted in September 2016 confirmed that there were no wetlands within the Project area. The USACE concurred that only upland (non-wetland) features were present and a non-jurisdictional determination was made by the USACE on October 19, 2017 (USACE 2017). It is anticipated that given the flat terrain of the area and soil types (**Section 3.2**), stormwater quickly percolates into the ground in undeveloped areas.

3.3.2 Groundwater

Groundwater quality in Sweetwater County is highly variable, even within a single hydrogeologic unit. Water quality in any given hydrogeologic unit tends to be better near outcrop areas where recharge occurs and deteriorates as the distance from these areas increases. The water quality of a given hydrogeologic unit also usually deteriorates with depth. Groundwater quality in the area tends to be poor due to the high concentrations of total dissolved solids that can make it moderately saline to briny with increasing depth (Mason and Miller 2005). The depth to groundwater on the Project area is unknown but is expected to be greater than 100 feet below the ground surface (bgs); the depth to groundwater in four wells in the vicinity of the Project area ranged between 110 feet and 2,140 feet bgs (Wyoming State Engineer’s Office 2017).

3.4 VEGETATION AND RANGE RESOURCES

The Project area is located along the transition zone between two level 4 ecoregions: Rolling Sagebrush Steppe and Salt Desert Shrub Basins. Vegetation types that occur in the Project area include sagebrush shrubland and desert shrub (Stantec 2017a). The vegetation is consistent with the Project area falling in the transition zone, with a combination of species from both ecoregions present.

3.4.1 Sagebrush Shrubland

Sagebrush shrubland is the dominant vegetation community that occurs within the Project area (96 percent of the Project area). Within this vegetation type, Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*) is the dominant species present. Other associated shrub species present include prairie sagewort (*Artemisia frigida*), sand sagebrush (*Artemisia filifolia*), Gardner’s saltbush (*Atriplex gardneri*), spiny hopsage (*Grayia spinosa*), gray horsebrush (*Tetradymia canescens*), Atriplex (*Atriplex* spp.), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), and prickly pear (*Opuntia* spp.). The dominant herbaceous vegetation is predominantly grasses and includes Indian ricegrass (*Achnatherum hymenoides*), prairie junegrass (*Koeleria macrantha*), squirreltail (*Elymus elymoides*), and sand sedge (*Carex* spp.). Forbs are uncommon with a few scattered phlox (*Phlox* spp.) present.

Within the sagebrush shrubland community on the Project area are pipeline ROWs that are in the process of being reclaimed to pre-construction conditions. The dominant vegetation on the ROWs is crested wheatgrass (*Agropyron cristatum*) with some yellow rabbitbrush and Wyoming sagebrush (Stantec 2017a).

3.4.2 Desert Shrub

The desert shrubland community is interspersed throughout the sagebrush shrubland but is predominantly on the slopes on the western edge of the Project area (4 percent of the Project area). Dominant species include Gardner's saltbush, spiny hopsage, gray horsebrush, and atriplex. Dominant herbaceous vegetation and other associated shrubs is similar to sagebrush shrubland (Stantec 2017a).

3.4.3 Noxious Weeds

State- and county-designated noxious weeds are not present within the Project area. Cheatgrass (*Bromus tectorum*) and halogeton (*Halogeton glomeratus*) have been observed in the Project area; these are invasive species that are listed as noxious weeds in other states, and can impede successful reclamation and impact management of livestock, wildlife, and human activities. Cheatgrass has been observed in small patches east of SH372 near the Raven Substation and in Section 14 in the southwestern corner near a two-track road. Several patches of halogeton have been observed along the reclaimed pipeline ROWs and along the two-track roads on the western portion of Section 14 (Stantec 2017a).

3.4.4 Special Status Plant Species

Special status species are those species for which tribal, federal, or state agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the ESA and species designated as sensitive by the BLM. In accordance with the ESA, the BLM, in coordination with the USFWS, must ensure that any action they authorize, fund, or carry out would not adversely affect a federally listed threatened or endangered species. As stated in Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125), it also is BLM policy "to conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA provisions are no longer needed for these species, and to initiate proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA."

Information regarding the presence of special status species that may occur within the Project area was obtained via field surveys, coordination with BLM staff, and database information provided by the USFWS, Wyoming Game and Fish Department (WGFD), and Wyoming Natural Diversity Database (WYNDD) (USFWS 2016a; WGFD 2016a; WYNDD 2016). No special status plant species were identified on the Project area.

3.4.5 Range

The Project area is located in the northwest portion of the 2,061,062-acre Rock Springs Allotment (WY13018). Animal unit months (AUMs) represent the amount of forage required to support one cow and her calf, five sheep, or one horse for one month. The associated AUMs for the entire Rock Springs Allotment are 30,926 AUMs for cattle, 76,973 AUMs for sheep, and 70 AUMs for horses. There are 28 AUMs associated with the Project area (Allred 2017). There are no natural or artificial water sources used by livestock in the Project area.

While there are 21 livestock operators that utilize the Rock Springs Allotment, only three have the potential to utilize the Project area. Two of those operators are permitted to graze a total of approximately 250 cattle during the summer months (May through November). The other operator is permitted to graze over 19,000 cattle and approximately 285,000 sheep, primarily during the winter (December through May); however, only a small portion of that number (typically 2,000 to 4,000 sheep) utilize the Project area during any given year. Due to the scarcity of water in the area, and the relatively low forage production at the site, livestock use is not

typically concentrated in the Project area. However, these livestock operators typically trail through the area as part of their annual operation on the allotment.

Small grass-dominated sites are present in localized areas in Section 14; otherwise, the dominant species include Wyoming big sagebrush, rabbitbrush, spiny hopsage, and gray horsebrush. On the east side of SH372, the dominant species is Wyoming big sagebrush. The dominant grasses within the Project area are squirreltail and Indian ricegrass (Stantec 2017a). Indian ricegrass is highly palatable to livestock and wildlife and preferred forage regardless of the season. Sagebrush are preferred forage in the winter for many wildlife species when there is limited herbaceous species available and can be used as forage by livestock. Average annual production of forage for livestock within the Project area is approximately 136 pounds per acre (Allred 2017).

3.5 WILDLIFE RESOURCES

3.5.1 Recreationally and Economically Important Species and Nongame Wildlife

The Project area includes two habitat types: desert shrub and sagebrush shrubland (**Section 3.4**). Habitat in the Project area is characterized by flat to low rolling terrain with intermittent drainages. Baseline descriptions of both resident and migratory wildlife include species that have either been documented within the Project area or those that may occur in the region based on habitat associations. Wildlife species that may occur within the Project area are typical of the sagebrush shrubland/desert shrub communities of southwest Wyoming.

3.5.1.1 Big Game Species

Big game species that may occur in the Project area include pronghorn antelope, mule deer, elk, and moose (WGFD 2017a, b). The Project area is completely contained within pronghorn Hunt Unit 96. Hunt Units 135 and 131 for mule deer, Hunt Units 102 and 100 for elk, and moose Hunt Units 40 and 33 are not present in the Project area and will not be further addressed.

Seasonal ranges considered to be crucial for these species during the winter months (generally November 15 to April 30) include habitats that provide adequate forage and thermal cover for over-winter survival, particularly during severe winters.

Pronghorn

Pronghorn occur throughout the region and are found year-round within the Project area, with periods of increased use during the winter months (Stantec 2017a; WGFD 2017c). Pronghorn inhabit grasslands and semi-desert shrublands on flat to rolling topography and browse on shrubby plants, especially sagebrush, throughout the year (Armstrong et al. 2011). During the winter, pronghorn generally utilize areas of relatively high sagebrush densities and overall low snow accumulations, on south- and east-facing slopes.

The Project area occurs within the 6,842,167-acre Sublette Herd Unit (PR401) in southwestern Wyoming, which includes Hunt Areas 85 through 93, 96, 101, and 107. This Herd Unit is managed with a population objective of 48,000 animals, but has been below WGFD's population objective since 2011 with an average annual population of 36,210 animals (WGFD 2016c). Pronghorn in the Sublette Herd Unit typically occur at higher densities in the northern portions of the Herd Unit (Hunt Areas 89 and 93) and at lower densities in the southern and southeastern portions of the Herd Unit (Hunt Area 96). The Project area is located within Hunt Area 96, which encompasses 402,344 acres of the Sublette Herd Unit. In addition, the Project area is within crucial winter/yearlong range for the species (WGFD 2017a, b). According to the WGFD the pronghorn utilizing the Project area are from Hunt Area 96 of the Sublette Herd.

The winter of 2016 to 2017 was the most severe winter on record in southwest Wyoming, including in the Project area (Keith pers. comm. 2017a). This led to a large number of pronghorn utilizing the Project area, especially in late-December 2016 through mid-February 2017 during very cold and heavy snow events (Stantec 2017a). Pronghorn utilizing the Project area were a combination of resident and migratory animals that were traveling to lower elevations along the Green River and I80 corridor. In addition to anecdotal evidence of pronghorn use of the Project area, the following studies also describe pronghorn use and movement through the Project area over the past 20 years.

2002 GPS Pronghorn Study

Between January 2002 and December 2003, approximately 33,000 locations were collected from 72 Global Positioning System (GPS)-collared pronghorn in southwest Wyoming (Sheldon 2005). Locations were collected on schedules that ranged from two locations per day to one location every three days, depending on the time of year.

Of the 72 GPS-marked pronghorn, 10 animals occurred within a one-mile buffer of the Project area. Of the 10 animals that overlapped with the Project area, enough data were collected on eight animals to determine migratory status, which indicated four resident and four migratory animals. Migratory animals crossed through the Project area during the winter (January to February), while resident animals were in the Project vicinity year-round. These data suggest the Project area provides both year-round and migration habitat to pronghorn. Movement data showed animals crossing SH372 both north and south of the Project area; however, this study occurred before gravel pit development north and east of Project area.

Migratory animals that used the Project area migrated to summer ranges 40 to 70 miles away, including west along the Ham's Fork, northwest towards the Wyoming Range, and north to SH 351. When migrating through or around the Project area, three of the four migratory animals moved around the west side closer to the ridge that runs north-south, rather than the east side closer to SH372.

2017 GPS Pronghorn Study

In March 2017, the University of Wyoming, in collaboration with WEST, Inc., captured and equipped 40 pronghorn individuals with GPS collars along the I80 corridor (WEST 2017). The primary goal of this study was to examine pronghorn movements relative to I80. The secondary goal was to collect GPS data from a sample of pronghorn that utilize the Project area. The GPS collars were programmed to collect locations every two hours for three years. Of the 40 collars, approximately 12 were allocated to the SH372 corridor, where pronghorn are believed to move back and forth through the Project area. As of May 15, 2017, data from this study showed that 8 of the 12 collared pronghorn that wintered south of the Project area have moved adjacent to the Project area, primarily along the western edge of the Project area but also directly east of the Project area on the east side of SH372 during their northerly migration. The remaining four pronghorn were captured two to three miles north of the Project area in March 2017 and never migrated past the Project area. This study has shown that during the spring of 2017 some pronghorn had already migrated up to 60 miles during their northerly migration. Most pronghorn moved in a northwesterly direction, towards the town of Kemmerer, Wyoming, and the south end of the Wyoming Range.

Based on the information presented above, both resident and migratory pronghorn utilize the Project area during various times of the year but especially throughout the winter months (December to February) during severe winters.

3.5.1.2 Migratory Birds

Migratory birds encompass a variety of raptor, waterfowl (or water-associated birds), and passerine species including species that are protected under the MBTA (16 U.S.C. 703-711) and Executive Order (EO) 13186 (66 FR 3853). Pursuant to EO 13186, a MOU between the BLM and USFWS outlines a collaborative approach to promote the conservation of migratory bird populations.

Raptor species expected in the Project area include eagles (bald and golden eagles); buteos (e.g., red-tailed hawk, Swainson's hawk, ferruginous hawk); falcons (e.g., prairie falcon, American kestrel); owls (e.g., burrowing owl, short-eared owl); northern harrier; and turkey vulture (Stokes and Stokes 1996; WGFD 2017d). Short-eared owls have been documented within the Project area (Stantec 2017a). The bald eagle, ferruginous hawk, and burrowing owl are BLM sensitive species and are discussed further in **Section 3.5.2** and **Appendix B**.

The occurrence of different species and species groups of birds are of interest at PV solar sites. Waterfowl of interest include American coot, loons, grebes, and geese. All other bird species, including diverse groups such as raptors, hummingbirds, and songbirds, are referred to as non-water-associated birds. The occurrence of water-associated birds in the Project area is expected to be very low due to the lack of suitable habitat and would occur only during migration (Martinson pers. comm. 2018).

A variety of passerines occur within the Project area throughout the year; however, they are most abundant during the spring/fall migration as well as during the breeding season (May 15 to June 30 [Nicholoff 2003]). Representative bird species that occur in the Project area include mountain bluebird, barn swallow, vesper sparrow, chipping sparrow, horned lark, field sparrow, and common raven (Stantec 2017a; Stokes and Stokes 1996).

3.5.1.3 Amphibians and Reptiles

Due to the lack of perennial water sources, amphibian use of the Project area is limited to Great Basin spadefoot. This species is a BLM sensitive species and is discussed in detail in **Section 3.5.2.4**. Reptiles occupying the Project area typically are limited by their specific habitat requirements. Species that could potentially occur within the Project area include the greater short-horned lizard, northern sagebrush lizard, and Great Basin gophersnake (Baxter and Stone 1980; Orabona et al. 2016).

3.5.2 Special Status Wildlife Species

There is potential for 16 Special Status species in the Project area, or species that may be impacted by activities associated with the Project: the four Colorado River endangered fishes and their critical habitats, western yellow-billed cuckoo and its proposed critical habitat, pygmy rabbit, four sensitive bat species, Greater Sage-grouse, four sagebrush obligate birds, and the Great Basin spadefoot.

3.5.2.1 Mammals

Pygmy Rabbit

The pygmy rabbit is classified as a BLM sensitive species. Pygmy rabbits inhabit sagebrush shrublands and require dense sagebrush canopies with deep soils with high clay content for burrowing. This species is often found in drainages with tall sagebrush present (Keinath and McGee 2004; Orabona et al. 2016). Suitable habitat (678 acres) is available within the Project area and four possible pygmy rabbit burrows as well as tracks and droppings were observed on the Project area (Stantec 2017a). Therefore, the potential for this species to occur within the Project area is high.

Sensitive Bat Species

The Townsend's big-eared bat, spotted bat, long-eared myotis, and fringed myotis are classified as BLM sensitive species. These species occur in a wide variety of habitats including semi-desert scrub, sagebrush shrubland of the Project area. Based on the presence of suitable foraging habitat and the proximity to the Green River (approximately 1.5 miles east), the potential for these species to occur within the Project area is moderate.

3.5.2.2 Birds

Greater Sage-grouse

The Project area is not located within core population areas or BLM Priority Habitat Management Areas (PHMA) as defined by EO 2015-4 (State of Wyoming 2015) and BLM Casper, Kemmerer, Newcastle, Pinedale, Rawlins, and RSFOs' Approved RMP Amendment for Greater Sage-grouse (BLM 2015b). Therefore, Greater Sage-grouse populations and habitat within the Project area is currently managed according to provisions under non-core population areas and General Habitat Management Areas (GHMA) and within the 2-mile nesting area associated with two leks.

Lekking/Nesting Habitat

A total of two lek sites have been identified within two miles of the Project area. Both leks are determined to be "occupied" by the WGFD and their associated two-mile buffers for nesting habitat completely encompasses the Project area with suitable nesting habitat.

Brooding Habitat

Due to the lack of perennial water sources and therefore absence of lush habitats or wet areas within sagebrush habitat, only early brooding habitat occurs within the Project area. However, suitable late brooding habitat is located near the Green River, approximately 1.5 miles east of the Project area.

Wintering Habitat

Based on the presence of occupied leks and suitable brooding habitat within two miles of the Project area, as well as Greater Sage-grouse sign and suitable nesting and wintering habitat within the Project area, the potential for this species to occur within the Project area is high.

Brewer's Sparrow, Loggerhead Shrike, Sage Sparrow, Sage Thrasher

The Brewer's sparrow, loggerhead shrike, sage sparrow, and sage thrasher are classified as BLM sensitive species. These species are typically found in open habitats including grassland, sagebrush shrubland, semi-desert scrub, and agricultural areas (Stokes and Stokes 1996; WGFD 2017d). However, in this part of Wyoming they are considered sagebrush obligate species. These species have been documented within the Project area and are abundant in areas of suitable habitat (Stantec 2017a). Based on the presence of suitable habitat and the documented occurrence of each species during breeding bird surveys (Stantec 2017a), the potential for these species to occur within the Project area is high.

Western Yellow-billed Cuckoo

The western yellow-billed cuckoo is classified as a federally threatened species. The western yellow-billed cuckoo is found from southern Canada to South America, breeding across most of the U.S. and wintering in South America. This species nests primarily in large stands of cottonwood-riparian habitat below 7,000 feet amsl. The western yellow-billed cuckoo is a riparian obligate species that prefers extensive areas of dense thickets and mature deciduous forests near water, and requires low, dense, shrubby vegetation for nest sites (Stoke and Stokes 1996; USFWS 2017a). This species is known to occur along the Green River. The USFWS has

proposed critical habitat along a 28-mile-long stretch of the Green River in the vicinity of Seedskadee National Wildlife Refuge (NWR) (USFWS 2014). The southern end of the 28-mile-long stretch is nearly seven miles northwest of the Project area. Based on the presence of suitable habitat along the Green River but the lack of suitable habitat within the Project area, the potential for this species to occur within the Project area is very low.

3.5.2.3 Fish

Colorado River Endangered Fish

The bonytail, Colorado pikeminnow, humpback chub, and razorback sucker are classified as federally endangered species. These species occur within the Colorado River Basin and are adapted to large river environments that experience high spring flows and warm temperatures during the summer months (USFWS 2017b). While these species do not have the potential to occur within the Project area, water use as a result of the Project that results in depletions to the Green River, and therefore the Colorado River system, may result in impacts to these species and their downstream critical habitat; therefore, they are considered in this EA.

3.5.2.4 Amphibians

Great Basin Spadefoot

The Great Basin spadefoot is classified as a BLM sensitive species. This species ranges from southern British Columbia south through the Great Basin to northern Arizona and New Mexico. Great Basin spadefoots prefer sagebrush communities below 6,000 feet amsl, although they have been found at elevations of 9,200 feet amsl. This species requires loose soil for burrowing. In Wyoming, this species is most abundant west of the Continental Divide in the Wyoming Basin and the Green River Valley, but in the center of the state, it crosses the Divide into Fremont and Natrona counties (WGFD 2017d). Although this species has not been documented in the Project area, suitable habitat for this species occurs within the northeast corner of Section 14 because of the potential for ephemeral water in the drainage area. Therefore, the potential for this species to occur within the Project area is high.

3.6 CULTURAL RESOURCES AND NATIVE AMERICAN TRUST ASSETS

3.6.1 Cultural Resources

File searches (FS#32748) through the SHPO, Cultural Records Division, and other sources were conducted prior to fieldwork in order to evaluate the prehistory and history of the area; this literature search and documentation analysis was used to help identify previously-recorded sites and form expectations about site density in the area. General Land Office plats and other historical maps, historical indices, and land patents were also consulted prior to the fieldwork to identify potential historic features.

A Class III cultural resources inventory was conducted on a total of approximately 790 acres covering the entire proposed Project disturbance area in 2016 (Western Archaeological Services [WAS] 2016); an additional Class III inventory was conducted on an approximately 45-acre area comprised of a revised power line corridor location and a block around the Raven Substation (WAS 2017). The direct area of potential effect (APE) is the inventoried areas.

The Class III inventories resulted in six previously recorded sites, 24 new sites, and seven isolated resources being documented. All sites recorded are prehistoric open camps except one, which is a multi-component site with prehistoric and historic elements. Of the 30 sites total, six are recommended eligible for nomination to the NRHP. The remaining 24 sites do not meet any of the NRHP eligibility criteria, are recommended not eligible, and therefore require no further management consideration. The seven isolated finds are not eligible for the NRHP; therefore, these isolated finds require no further management consideration.

3.6.2 Native American Trust Assets

The U.S. has a special legal relationship with Indian tribal governments, as set forth in the U.S. Constitution, treaties, statutes, regulations, EOs, and court decisions. In recognition of this unique relationship, the BLM consults with tribes on a government-to-government basis regarding NHPA, NEPA, treaty rights, sacred sites, and broader responsibilities. This responsibility also requires federal agencies to take actions necessary to protect Native American trust assets. Examples of trust assets are lands, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and instream flows associated with trust land. The trust responsibilities of the U.S. shall include, but are not limited to, appropriately managing the natural resources located within the boundaries of Indian reservations and trust lands (25 U.S.C. 162a(d)).

In January 2017, the BLM mailed tribal consultation letters to potentially affected tribes, formally initiating government-to-government consultation regarding the Project. The tribal consultation letters provided an overview of the Project; requested consultation and invited input on the Project; provided contact information to submit any questions, concerns, or comments on the Project; and offered the opportunity for visit to the Project area. Subsequent to mailing the tribal consultation letters, BLM cultural resource specialists followed up with the tribes through telephone calls and emails to establish contact and offer meetings with the BLM to discuss the Project. The BLM contacted the following tribes through the mailing of consultation letters and subsequent phone calls and emails:

- Eastern Shoshone Tribe;
- Northern Arapaho Tribe;
- Shoshone-Bannock Tribes of Fort Hall; and
- Ute Tribe of the Uinta and Ouray Reservation.

The Shoshone-Bannock Tribe of the Fort Hall Reservation has deferred to the Eastern Shoshone Tribe regarding effects of the Project. Field visits were undertaken with the Eastern Shoshone Tribe in June 2017, and with the Northern Arapaho in July 2017. The NRHP-eligible sites in the Project area were identified as important and/or culturally sensitive by the Eastern Shoshone Tribe, the Northern Arapaho Tribe, and the Shoshone-Bannock Tribe of the Fort Hall Reservation.

During the development of this EA, the BLM provided continuing Project updates and maps, and invited tribes to participate in the alternatives development workshops, the cumulative effects workshop, and the preferred alternative workshop. Consultations with tribes that have an interest in the Project will be ongoing throughout the EA process, consistent with applicable regulation and guidance, including the NHPA. Consultations with the Wyoming SHPO pursuant to compliance with the NHPA were also coordinated with tribal consultation, as appropriate.

3.7 LAND USE AND RECREATION

3.7.1 Previous and Current Land Use

Grazing is the primary land use on the Project area (**Section 3.4.5**). The existing uses of BLM-managed land in Section 14 and a small portion of Section 2 are classified as multiple-use as defined by the BLM. Limited historic industrial activity has occurred on the BLM land; marked soil borings associated with historic trona exploration are present on Section 14.

The Raven Substation occupies the southwestern portion of Section 34. The Raven Substation is part of the larger PacifiCorp 230-kV transmission system that spans from the Monument Substation and phase shifter to the west, to the Flaming Gorge Substation to the south, to the Dave Johnson Power Plant to the northeast, and to the Yellowtail Substation to the north. Several

oil and natural gas pipeline ROWs and the ROW associated with SH372 crosses the Project area (**Figure 2.2-2**).

Land use on lands adjoining the Project area also is primarily grazing with the exception of various ROWs, buried pipelines, gravel access roads, sand/gravel mineral quarries, a compressed air facility, and overhead electric transmission lines.

3.7.2 Special Designations

There are no special designations associated with the Project area or adjoining lands (e.g., areas of critical environmental concern, wilderness study areas, lands with wilderness characteristics, etc.). The closest special designation is the Seedskaadee NWR, which is located approximately seven miles northwest of the Project area.

3.7.3 Recreation

Dispersed recreation occurs in the area and generally is associated with hunting. There are no notable natural features that would attract recreationists and visitation to the Project area. There are no designated off-highway vehicle (OHV) routes on the Project area or adjoining lands (BLM 2013). Field surveys conducted in September 2016 did not identify any recent OHV activity in the Project area (Stantec 2017a).

There was no data available related to hunting on the Project area, but hunting use on the Project area is estimated to be light to moderate, depending on the species (Keith pers. comm. 2017b). Hunting generally occurs in the fall and winter months and occurs in Greater Sage-grouse Hunt Area 1 and pronghorn Hunt Area 96.

3.8 VISUAL RESOURCES

The Project area is located in an area designated by BLM as VRM Class III. The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape can be moderate. Management activities may attract attention, but should not dominate the view of the casual observer.

The Project area is located within an elevated basin characterized visually by widespread shrublands – consisting of predominantly sagebrush, but with some desert shrublands – interspersed with low grasslands. The relatively flat Project area is surrounded by slight to moderate variation in elevation: low hills to the south separate the Project area from the I80 corridor approximately six miles away; the entrenched, meandering Green River passes within 1.5 miles to the east of the Project area; and more distant mountains are visible to the west and north. In addition, a sand and gravel mining operation adjacent to the Project area includes mesa-shaped mounds that rise 20 to 30 feet above grade and appear as land forms in more distant views from within the Project vicinity. These features serve to somewhat topographically frame the Project area. **Figure 3.8-1** shows the locations from which the Project area would be visible.

There are few structures visible in the general area outside of the Project area, though numerous uses are supported in the area surrounding it. The sand and gravel mining operation is the most visible development, and other nearby mineral mining activities are apparent throughout the landscape. The Ciner soda ash processing facility, approximately four miles from the Project area, is prominently visible along the horizon in views to the north. Other uses in the vicinity include the Pioneer Trails Picnic Grounds, a Sweetwater County park approximately 3.5 miles northeast of the Project area, and Seedskaadee NWR, the southern extent of which is nearly seven miles from the Project area. These open space areas are oriented along the Green River.

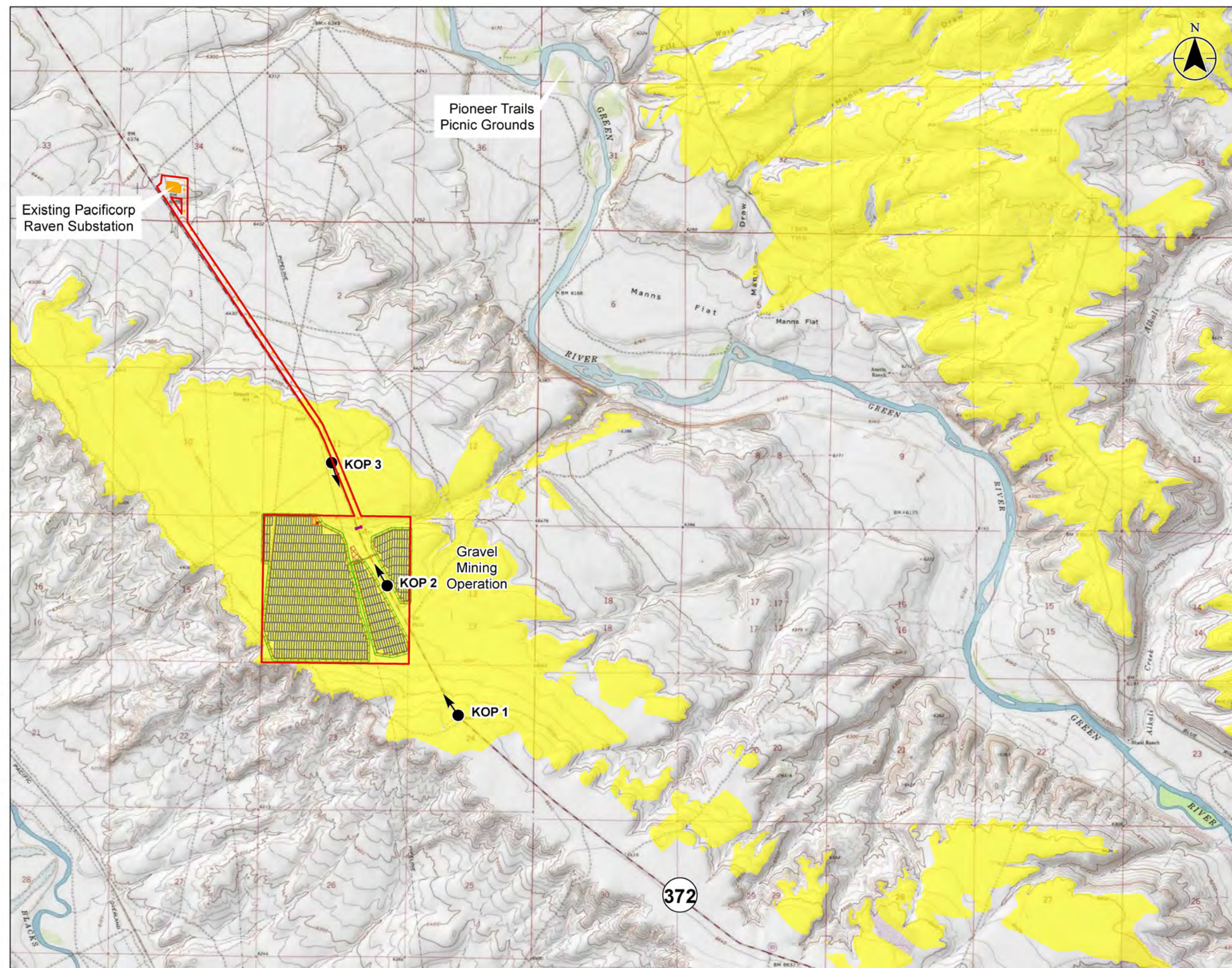


Figure No.
Figure 3.8-1





Title

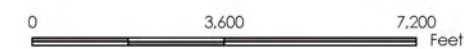
Project Viewshed and Key Observation Points (KOPs)

Client/Project
Sweetwater Solar LLC
Sweetwater Solar Energy Project

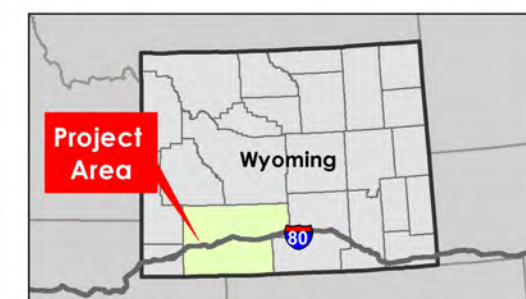
Project Location: T20N R109W S34; T19N R109W S2, 3, 11, 14 Sweetwater County, WY
 Prepared by CLG on 2017-03-06
 Technical Review by NF on 2017-03-06

Legend

-  KeyObservationPoints
-  Project Area
-  Area of Potential Visibility
-  Existing Raven Substation



1:43,200 (At original document size of 11x17)



Notes

1. Coordinate System: NAD 1983 HARN StatePlane Wyoming West Central FIPS 4903 Feet
2. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
3. Terrain Input Source: USGS 10m DEM; Assumes observer height of 4.5 feet. Proposed solar array height: 8 feet

The SH372 corridor is the dominant linear feature on the Project area. Property fences on either side of the roadway reinforce this element. Greens, browns, grays, and tans associated with shrublands and their underlying desert soils are the dominant colors in views of the Project area and its vicinity. The paved SH372 appears gray and evidence of land alterations (mining activities, access roads) appear tan, reflecting soils in the area. Singular or distant structures add white elements to some views in the area. Non-vegetated areas result in some gradation of texture; however, scrub brush and limited development result in a generally medium-grained, mostly consistent texture throughout the landscape. Three key observation points (KOPs) were selected as representative viewpoints for use in describing the affected environment at the Project area and for use in assessing potential visual effects (**Figure 3.8-1**). Each of these views shows what are primarily foreground-middleground views (views showing areas within three to five miles of the viewpoint), with some background features visible. All are located along SH372, since the roadway is the main location from which views of the Project would be available.

KOP 1, approximately 0.4 mile south of the Project area, represents an initial view by northbound travelers on SH372 emerging from low hills and descending toward the Project area. The slight elevation of this view shows the Project area in its broadest context: nearby mining operations and the more distant processing facility are clearly visible, as is the mountain backdrop along the horizon. Most variations in land form from this vantage point are man-made, and they appear in contrast with the portions of this view that are undeveloped.

KOP 2 is at a location where solar PV arrays would appear on either side of the highway, oriented to the south and, therefore, toward the northbound viewer. This KOP was selected to assess views from within the Project area. In the existing view from this KOP, the SH372 corridor is the dominant feature, and the mounds of gravel to the east of the road are prominent landforms, extending linearly across a portion of the right half of the view.

KOP 3 is along the ECL. The low hills south of the Project area, approximately two miles from the KOP, frame the far end of this view, and the mounds of gravel east of the Project area are prominent in the left half of the view. This KOP represents views of southbound travelers, some of whom could be approaching the Project area from the nearby county park or NWR.

3.9 TRANSPORTATION

The Project area is accessed by SH372 (**Figure 1.1-1**). SH372 is classified by WYDOT as a major collector; in the vicinity of the Project area the speed limit is 70 mph. Generally, SH372 is accessed via I80 at Exit 83, located seven miles south of the Project area. The interchange and SH372 are used by passenger trucks and cars, and semi-trailers and other heavy vehicles associated with the gravel operation and trona mines. From I80, Exit 83 north on SH372 the pavement is rated good to excellent (WYDOT 2016a).

There are no developed or maintained roads within the Project area but there are unimproved native surface and two-track roads that have been used infrequently to manage grazing activity and for existing ROW access. The Project area is not near any federally obligated or private aviation facility.

Traffic volume on SH372 is provided in WYDOT (2016b) for milepost 3.19. The average annual daily traffic (AADT) at this location ranged from 1,078 to 1,442 vehicles per day from 2007 to 2016. Monthly average week day traffic data indicates that higher traffic volume occurs during the months of July through October. The AADT on I80 generally at Exit 83 was 6,000 to 12,000 vehicles per day in 2015 (WYDOT 2015).

3.10 HAZARDOUS MATERIALS

The Project area has no current areas of hazardous material usage or disposal, or petroleum product usage, storage, or disposal. There are no authorized or unauthorized landfills or dump sites on the Project area (Stantec 2017b).

3.11 SOCIOECONOMICS

Socioeconomic resources include the local population base, workforce, housing availability, locations for purchase of materials and other supplies. Due to the rural location of the proposed Project, Project activities would have impacts on amenities, business, local governments, and public services outside of the immediate Project area.

3.11.1 Population and Demographic Characteristics

Sweetwater County is the largest county in Wyoming, by area, covering about 10,500 square miles in southwestern Wyoming. The County is largely rural and as of 2016, it contained about 44,200 residents. Together, the cities of Rock Springs and Green River are home to about 82 percent of the County's population, with additional residents located in the towns of Bairoil, Granger, Superior, Wamsutter, and other smaller locales. The County's population has remained relatively stable in recent years, with only small annual fluctuation. Sweetwater County is expected to grow by about 18 percent by 2040, an increase of about 7,700 people (Census 2017; Wyoming Department of Administration and Information [WDAI] 2015).

3.11.2 Housing Resources

In 2016, Sweetwater County had about 19,270 housing units, including about 5,350 rental units (apartments, houses, mobile homes). Of those rental units, about 450 were vacant and available to rent; additional vacant housing units included those for sale, for seasonal or recreational use, and units used for other purposes.² Between 2010 and 2016, the number of housing units in the County grew by an average of about 90 units per year (Census 2017).

In addition to the traditional types of housing described above, both Rock Springs and Green River have numerous hotel and motel accommodations available and there are also several recreation vehicle (RV) parks and campgrounds located throughout Sweetwater County. Altogether, there are about 2,300 hotel and motel rooms spread across Rock Springs and Green River; outside of those cities, temporary accommodations are limited (Volsey pers. comm. 2017). As much as 80 percent of the County's temporary accommodations are in Rock Springs (Wyoming Department of Revenue 2016).

3.11.3 Employment, Unemployment, and Income

There were 29,300 full and part-time jobs in Sweetwater County in 2015, including both wage and salary employees and business owners (a small percentage of workers held multiple positions)³. The mining and oil and gas extraction industries employed the largest number of people (about 18.5 percent), with government (federal, state, and local) jobs following closely behind, at about 16 percent of total jobs (BEA 2016).

² No definition was available from the Census Bureau for vacant housing units identified as "other".

³ Including both Sweetwater County residents and those commuting in from other areas.

The Sweetwater County economy is largely dependent on activity in the mining industry. Trona mining, oil and gas development, and coal production generate jobs, as well as revenues to the County and local jurisdictions.

Earnings vary widely across industries in Sweetwater County. Jobs in mining and similar industries pay more than the countywide average salary. The median household income in Sweetwater County is higher than the statewide average, while the percent of the County population below the poverty line is similar to that of the state (Census 2017).

The unemployment rate in Sweetwater County has fluctuated in recent years, ranging from a low of 3.6 percent in December 2014 to a high of 6.7 percent in June 2016. As of May 2017, Sweetwater County's unemployment rate was 4.3 percent (as compared to an average of 4.1 percent for all of Wyoming (Bureau of Labor Statistics 2017). Throughout 2017, the County has experienced a continuous decline in the unemployment rate. Fluctuations in the local unemployment rate are attributable, in part, to the major industries and types of employers in the area, including oil and gas development and mining; those industries are affected by changes in national and even international market conditions.

3.11.4 Minerals Valuation

A number of different minerals are produced in Sweetwater County, led by trona and natural gas (**Section 3.1.1**). Trona production makes up over 35 percent of the County's total taxable valuation from minerals, with natural gas adding about another 29 percent. Sand and gravel contributes 0.1 percent of the 2017 total assessed valuation of Sweetwater County (Divis pers. comm. 2018). Although not a significant taxable valuation contributor, sand and gravel is an essential component of road base, asphalt and concrete and a vital resource for almost all construction in the county.

3.11.5 Fiscal Conditions

3.11.5.1 Property Tax Revenues for Sweetwater County Jurisdictions

In 2016, Sweetwater County had 26 different taxing districts, with total mill levies for each district ranging from 64.1160 mills to 81.5840 mills (Harvey Economics 2018). Property tax revenues in Sweetwater County are largely supported by the mining and oil and gas industries. For example, in 2016, over 30 percent of total property taxes were paid by four of those companies (Tronox, BP America, Bridger Coal, and Solvay Minerals/ Chemicals) and almost all the top 30 taxpayers (making up about 78 percent of total property taxes) were minerals related.

3.11.5.2 Payments in Lieu of Taxes

Payments in Lieu of Taxes (PILT) are federal payments to local governments that help offset losses in property taxes due to non-taxable federal lands within their boundaries. The DOI has authority over the PILT program; payments are made annually for tax-exempt federal lands administered by the BLM and other federal agencies. PILT distributions generally are based on population, receipt sharing payments, and the number of acres of federal land within a specific county. In FY 2016, Sweetwater County received \$3,329,647 in PILT money from the DOI; that payment was the second largest made to a county in Wyoming and amounted to about 12 percent of total state PILT money.

3.11.5.3 Sweetwater County Government Financials

The majority of Sweetwater County's General Fund revenues come from taxes (including severance taxes, property taxes, and sales and lodging taxes). Total General Fund revenues have generally increased in recent years, but decreased by about 1 percent between 2015 and 2016. In 2016, total General Fund revenues amounted to about \$50.8 million (Sweetwater County Financial and Compliance Reports, 2014 – 2016).

3.11.6 Social Culture

Sweetwater County is a largely rural area, with heavy emphasis on various mining activities and agricultural production. Those activities influence the social and cultural experiences and expectations of County residents and visitors, as well as local economic well-being. For example, areas dependent to any degree on oil and gas activity experience the effects of boom and bust cycles on local employment and government revenues; Sweetwater County residents have seen that in the past and are experiencing that now as well. Activity in Sweetwater County's trona industry has generally been more stable than oil and gas, possibly muting the effects of historical swings in oil and gas production to a small degree. Additionally, a large portion of the County is made up of public lands and therefore, the management of federal and state lands also adds important context to life in Sweetwater County, in terms of mining, recreation, and the existence of undeveloped wildlife habitat.

Sweetwater County has a documented interest in public involvement and community cooperation in decision making, as evidenced by the stated goals and objectives of the Sweetwater County Comprehensive Plan (Sweetwater County 2002). That Plan emphasizes partnerships and coordination among federal, state, county, and local agencies in terms of land use planning and other development.

3.12 HEALTH AND SAFETY

The Project area is in a rural area adjacent to a well-traveled state highway and within the vicinity of two trona mines, several gravel quarries, and a county park. The open space within the area may receive some dispersed recreational use (**Section 3.7.3**). There are no schools, residential housing units, or business/commercial operations in the vicinity of the Project area.

4.0 Environmental Effects

This chapter discusses the potential physical, biological, cultural, and socioeconomic direct, indirect, and cumulative effects of the No Action Alternative, Proposed Action, and Alternative Site Configuration as described in **Chapter 2**. Impacts may be short term (impacts that occur through construction), long term (impacts that occur from operation until decommissioning and reclamation), or permanent (impacts that would occur beyond reclamation). Impacts also are described by their level of significance (i.e., major, moderate, minor, negligible, or no impact). An impact is considered to be major if it would result in a substantial change to the environment. An impact is considered moderate or minor if it would not result in a substantial environmental change but could still have some measurable effect. The determination of whether an impact is moderate or minor varies for each resource and the context of the specific action alternative. In contrast to no impact, a negligible impact is one that would occur but at the lowest limits of detection of an effect. The analysis applies quantitative thresholds when available, to determine the level of significance. Other issues have been analyzed qualitatively where necessary. The total disturbance is analyzed unless specifically broken out into short-term or long-term disturbances (**Table 2.2-1**).

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Because there would be no solar project approved, the site would continue to remain in its existing condition with no new structures or facilities constructed or operated on the site.

Under the Proposed Action, the BLM would grant Sweetwater Solar a ROW to construct the Project as described in the POD (**Appendix A**) and summarized in **Section 2.2**. Under the Alternative Site Configuration, BLM would grant Sweetwater Solar a ROW to construct the Project with the alternative design elements described in **Section 2.3**. Sweetwater Solar would amend the POD to reflect the Alternative Site Configuration if it were selected.

4.1 DIRECT AND INDIRECT EFFECTS

Direct impacts are defined as those impacts that are caused by the action and occur at the same time and place. Indirect impacts are those that are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable.

4.1.1 Geology, Minerals, and Paleontological Resources

4.1.1.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because the site would continue to remain in its existing condition there would not be any effect on geology, minerals, or paleontological resources.

4.1.1.2 Proposed Action

Geology and Minerals

The Project would have no impact on geology, as there would be little or no disturbance to bedrock. Grading would generally be limited to topsoil and would result in, at most, some potential rearrangement of sorted alluvial terrace materials. This would be a negligible effect on geologic features.

The effects to minerals would vary by mineral resource but would occur for the 30-year Project lifetime. Fluid mineral resources would be available for development in Section 14 but would require extraction methods that exclude occupying the Project area surface; acreage outside of the Project area is available for fluid mineral leasing. There would be no impact to locatable minerals as such mineral activity is precluded by a withdrawal for oil shale.

The gravel resources within Section 14, although not thoroughly defined, appear to be limited. If the sand and gravel resources were unavailable for the duration of the Project, they would be available along the Green River in the immediate vicinity of the Project area (BLM 2013).

Sodium leasing is a discretionary action. The BLM has not received a formal expression of interest to lease sodium in Sections 2 or 14. If an expression of interest to lease was submitted, the BLM would consider the compatibility of the uses (existing and proposed) prior to proceeding. Section 2 is within the MMTA and could be a mechanical or solution mining target. Because Section 14 of the Project area falls outside of the MMTA, sodium (trona) leasing likelihood for the near future is low. Current primary mining methods use mechanical means and are within the MMTA. Solution mining technology is still in a developmental phase as a primary mining method. Secondary solution mining has been successful and is utilized currently. Many of the trona mine operators have been and are researching solution mining as a means of primary extraction. Although the research indicates it may be viable, none of that research has produced a successful commercial project. Since Section 14 lies within the KSLA but outside of the MMTA, it may have potential as a solution mining target. Section 34 is currently leased for sodium to Ciner. The Big Island Mine is designed and managed for little to no subsidence. Such management would be expected to continue since the Raven Substation and SH372 are both located in Section 34.

Paleontological Resources

While the likelihood of vertebrate fossils being present in the Project area is substantial, there would be a negligible chance of encountering fossils due to the lack of bedrock outcrops on the Project area and little to no disturbance to bedrock during grading. Further, an Unanticipated Discoveries Plan for Paleontological Resources (**Appendix A**) would be adhered to during construction; BLM policies require that any noticed occurrences during construction activities be reported if discovered, so that they could be properly assessed or recovered. Therefore, there would be negligible effects on paleontological resources.

4.1.1.3 Alternative Site Configuration

The Alternative Site Configuration would have generally the same disturbance and future site limitations as the Proposed Action; therefore, the effects to geology, minerals, and paleontological resources under the Alternative Site Configuration would be similar in nature to those described under the Proposed Action.

4.1.2 Topography and Soil Resources

4.1.2.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because the site would continue to remain in its existing condition there would not be any effect on topography or soil resources.

4.1.2.2 Proposed Action

Steep topography associated with steep slopes, deep ravines, and washes are unsuitable for a PV solar facility and therefore are avoided. Grading on approximately 84 acres would be necessary to level certain portions of the ground surface for the Project facilities and to prepare

for access roads. This grading would occur on 12 percent of the Project area and original contours would be re-established after decommissioning to the extent practicable under the CMRP (**Appendix A**). Therefore, effects on topography would be long-term but minor.

Disturbance to topsoil and subsoil from the Project would have the potential to accelerate erosion and/or reduce soil productivity. Vehicle and equipment travel on disturbed areas could also increase the potential for erosion and/or contribute to soil compaction, thus reducing restoration potential. At locations within the Project area where soil disturbance occurs, temporary stockpiling procedures, EPMs (**Section 2.2.3**) and revegetation per the CMRP (**Appendix A**) would reduce the potential for both water and wind erosion to a minor, short-term effect. With these practices, it is assumed that there would be no measurable loss of soil.

A SWPPP would be developed and a Stormwater Permit would be obtained prior to initiating construction activities. In addition to requiring erosion control, the permit would require additional best management practices such as runoff control and site inspections. EPMs related to hazardous materials and a SPCC Plan (**Appendix A**) would reduce the potential for a release of hazardous materials or petroleum products to Project area soils to a negligible effect.

The Project area is generally flat and its soils are generally deep and well-drained, with a low runoff potential, and most of the site has a slight erosion hazard rating; this would further reduce the potential for erosion. Some soil salvage would occur in certain areas (i.e., power pole locations, switchgear, facility foundations, and roads). In areas where soil would be left in place, ungraded, and with root systems intact, its profile structure would remain, and important organic materials (i.e., roots) would be left to both reduce erosion potential and support reclamation (e.g., retain microorganisms). However, some soil compaction may still occur. In areas where grading occurs, there would be at least some alteration of the soil profile and potential mixing with underlying alluvium, as well as compaction. Last, in areas where soil would be salvaged and immediately spread in the surrounding areas, it also would lose its profile makeup. These would be minor long-term effects on soil resources.

In any degree of soil disturbance (left in place and ungraded, left in place but graded, or salvaged/spread), the soils' ability to support vegetation after reclamation would not be lost. Compaction would be relieved mechanically during restoration efforts and supplements (organic matter and/or fertilizer amendments) would be added as needed to enhance fertility (**Appendix A**). Thus, the potential effects on soil resources would be minor and long-term.

4.1.2.3 Alternative Site Configuration

The potential effects to topography and soil resources under the Alternative Site Configuration would be similar in nature to those described under the Proposed Action. Grading would occur on 10 percent of the Project area and original contours would be re-established after decommissioning to the extent practicable under the CMRP (**Appendix A**).

4.1.3 Water Resources

4.1.3.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because the site would continue to remain in its existing condition and no water would be needed for construction or maintenance of a solar facility, there would not be any effect on water resources.

4.1.3.2 Proposed Action

Construction activities could result in increased local stormwater runoff, erosion, and/or sedimentation. However, the relatively flat gradient, low precipitation, and permeable soil types associated with the Project area would reduce this potential, although stormwater may not be as likely to percolate into the ground as it would in the undeveloped pre-Project area. The CMRP (**Appendix A**), SWPPP, construction storm water permit, and EPMs related to soil and water resources (**Section 2.2.3**) would further reduce the potential sediment-related impacts to surface water. Sediment and inadvertent releases of pollutants such as diesel could occur, although they would not be expected to reach the nearest perennial surface water source – the Green River - which occurs approximately 1.5 miles east of the Project area. EPMs related to hazardous materials, a Hazardous Materials Management Plan, and a SPCC Plan (**Appendix A**) would reduce the potential for a release of hazardous materials or petroleum products to surface water or groundwater to a negligible effect. Due to the depth to groundwater, it is unlikely to be affected by the Project. Overall, the impact to water quality would be negligible.

Up to 71 acre-feet of water would be needed during Project construction and would be obtained from a private well drawing from the Green River (Township 23N, Range 111W, Section 7). An additional 200,000 gallons (0.6 acre feet per year, or 18 acre-feet over the life of the Project) of water would be needed annually during Project operation, primarily for once- or twice-annual panel washing. The source of this water would be an existing, municipal source (City of Green River hydrant).

4.1.3.3 Alternative Site Configuration

The potential effects to water resources under the Alternative Site Configuration would be similar in nature to those described for the Proposed Action.

4.1.4 Vegetation and Range Resources

4.1.4.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because the site would continue to remain in its existing condition and none of the site would be fenced, there would not be any effect on vegetation and range resources.

4.1.4.2 Proposed Action

Under the Proposed Action, vegetation in areas developed for the solar arrays would be mowed or crushed as part of construction, as well as sites used for temporary construction laydown and storage. Approximately 121 acres of vegetation would be removed as part of grading and trenching activities for the facility; this would be a minor, long-term (three to five years for herbaceous species, 10 to 15 years for shrub species) impact until successful revegetation under the CMRP (**Appendix A**) occurred. Minor, long-term direct impacts would result due to the loss of vegetation associated with racking (solar array) post footprints, M&M buildings, switchgear, ECL poles, and roads. As most of the desert shrubland is found on the south and west edges of the Project area, it is assumed that the disturbance would occur primarily within the sagebrush shrubland community (**Section 3.4**).

Vegetation clearing would be conducted by cutting shrubs 4 to 12 inches from their base while leaving the root structure intact to minimize soil disturbance, vegetative loss, and spread of noxious weeds. Temporary access roads would be created by driving over existing vegetation. Erosion control under the CMRP (**Appendix A**) and the SWPPP would be employed to prevent wind and water erosion until revegetation was successful. EPMs related to vegetation

(**Section 2.2.3**) and as part of the CMRP (**Appendix A**) would improve site stabilization and ensure revegetation of the Project area following construction and after decommissioning.

Potential indirect impacts to vegetation would include potential changes to the vegetation community as a result of shading by the solar arrays. Plants that are more shade-tolerant may increase, while plants that require more sun may decrease. However, this indirect impact is expected to be minor due to the spacing of the PVMs and the daytime movement (tracking) of the PVMs. Other indirect impacts could result from accidental spills of oil and lubricants and accumulation of fugitive dust on plants. Fugitive dust accumulation on plants has been shown to adversely affect a variety of plant functions (Farmer 1993). Accidental spills would be prevented or controlled by the EPMs (**Section 2.2.3**) and under the SPCC Plan. Dust control measures would be implemented as described in **Section 2.2.3** and **Appendix A** to minimize adverse impacts to vegetation. Areas not required for Project operation would be reclaimed as the final phase of construction.

Vegetation cover types would recover at varying rates, depending on the type of species, and the level of disturbance. It is anticipated that ungraded areas would recover to pre-disturbance conditions sooner than areas that would be graded, because the plant root structures would not be affected. In ungraded areas where only the top portion of the plant was removed during construction, herbaceous-dominated plant communities (i.e., grasslands) would begin to grow back immediately following construction, but crown-sprouting shrubs such as rabbitbrush would re-sprout within one to two years following construction.

Grasslands that were removed as part of grading would require a minimum of three to five years to establish adequate ground cover to minimize erosion. Typically, shrub-dominated communities would require approximately 10 to 15 years for successful re-establishment, and 20 to 40 or more years for shrubs of pre-construction stature to re-establish in the area. Graded areas would be reseeded and monitored per the CMRP (**Appendix A**) to ensure revegetation success within the life of the Project.

Noxious Weeds

The prevention of the spread of noxious weeds and invasive plant species is a high priority throughout Wyoming. Following surface-disturbing activities, noxious weeds and invasive species may readily colonize areas that typically lack or have minimal vegetation cover. It is anticipated that populations of weedy annual species (e.g., halogeton, cheatgrass) may become established in localized areas for extended periods of time. Noxious weed species can degrade and modify native communities, reduce resources for native species, and adversely affect native pollinators. Noxious weeds and invasive species generally are fast-growing and could displace native species and inhibit the reestablishment of native grass, forb, and shrub species within the disturbed areas.

To control the spread of noxious weeds and invasive species within the Project area, noxious and invasive weed control would continue through the reclamation and decommissioning process per the specifications stipulated in the Project's Noxious and Invasive Weed Control Plan (**Appendix A**). Substantial increases in weed prevalence are not anticipated, especially with the low number of weed species currently present and efforts to limit disturbance areas. However, despite efforts to prevent the proliferation of noxious weeds, it is possible that Project construction, operation, and decommissioning activities could result in the spread or introduction of noxious weeds and invasive species within the Project area or that weed species would be transported into areas that were relatively weed-free. Due to the EPMs related to noxious weeds (**Section 2.2.3**) and the Project's Noxious and Weed Control Plan, the effects to vegetation related to noxious weeds would be minor and long term.

Range

Under the Proposed Action, 481 acres in the Rock Springs Allotment would be fenced off and unavailable for grazing for the life of the Project. The facility would be fenced for the duration of the Project and no livestock grazing would be allowed. However, adequate area for grazing would continue to be available outside of the fenced area and along the ECL in the Rock Springs Allotment.

Two plots for forage estimation were established in the Project area during field surveys conducted in September 2016 (Stantec 2017a). Based on the data collected, there would be a long-term loss of approximately 28 AUMs each year in the Rock Springs Allotment. This annual loss of forage would continue for the life of the Project. This represents 0.03 percent of the total active AUMs available within this allotment. As a result of this Project a total of 28 AUMs may be removed from the associated grazing permits in this area. Due to the large size of the Rock Springs Allotment, there would be sufficient area for potential livestock relocation. Once the Project has been decommissioned and reclamation has been determined to be successful, the BLM would reinstate grazing on the Project area.

Because the Project area would be fenced, and would be bounded by SH372 to the east and some terrain that is impassable by livestock to the west, the Project would become an obstacle that livestock operators would have to navigate around. However, the corridor provided for the pipeline ROW would also allow livestock to trail through the area, minimizing the potential impact.

Indirect effects to livestock include the introduction and spread of noxious weeds. Due to the EPMs related to noxious weeds (**Section 2.2.3**) and the Project's Noxious and Weed Control Plan, the effects to range forage related to noxious weeds would be minor.

There are no range improvements within the Project area. Therefore, there would be no impacts to range improvements in the Project area. Functional use of existing fences and range improvements would be maintained. Any damage to existing fences or range improvements would be repaired immediately. Upon completion of construction and reclamation, fences and other previously existing structures would be reestablished to fully functioning condition.

4.1.4.3 Alternative Site Configuration

The potential effects to vegetation and range resources under the Alternative Site Configuration would be generally similar in nature to those described for the Proposed Action, and site vegetation would be restored under the CMRP (**Appendix A**). However, a 600-foot route through the southwest corner of Section 14 would be left undeveloped and unfenced to allow livestock to utilize and pass through the Project, and the facility perimeter fence would follow the section line rather than the facility footprint (514 total acres fenced) (**Figure 2.3-1**). Therefore, although the existing pipeline ROW would be fenced off, livestock would be able to move through the 600-foot route.

The Alternative Site Configuration also would result in approximately 28 AUMs that would be affected, which also would be a negligible impact on the Rock Springs Allotment.

4.1.5 Wildlife Resources

The effects to wildlife habitat would be similar to those summarized for vegetation and range resources (**Section 4.1.4**). Long-term effects consist of changes to habitats and the wildlife populations that depend on those habitats, regardless of interim reclamation success. Activities associated with operation would be long term, and would cease upon Project completion and successful restoration.

4.1.5.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because the site would continue to remain in its existing condition and none of the site would be fenced, there would not be any effect on wildlife resources.

4.1.5.2 Proposed Action

Impacts to wildlife resources under the Proposed Action would include surface disturbance or alteration of native and reclaimed habitats, increased habitat fragmentation, animal displacement, changes in plant species composition, and direct loss of wildlife. The severity of these impacts on terrestrial wildlife species would depend on factors such as the sensitivity of the species, species ability to access the area, current population trends, seasonal use patterns, type and timing of Project activity, and physical parameters (e.g., topography, cover, forage, and climate).

Two vegetation cover types occur in the Project area: sagebrush shrubland and desert shrub (**Section 3.4**). However, effects would generally only occur to the sagebrush shrubland community (Wyoming big sagebrush cover type). Effects from the Proposed Action would include disturbance for temporary construction laydown/storage areas during construction and the long-term elimination of 481 acres of potential wildlife habitat (Wyoming big sagebrush) as a result of the fencing of Project facilities that would preclude big game access.

Big Game Species

Under the Proposed Action, the majority of effects to big game would result from the long-term elimination of 481 acres of habitat that would be fenced off to provide safety and site security. The greatest effect to big game would be the loss of 481 acres of pronghorn winter/yearlong range (0.1 percent of the crucial winter range in Hunt Area 96) and an increase in potential animal/vehicle collisions. This is due to the fencing alignment under the Proposed Action which would follow the facility footprint and potentially funnel big game onto SH372. However, the Wyoming Wildlife and Roadways Initiative Big Game – Vehicle Collisions Kernel Density Maps for SH372 show only minor to no impacts to big game from vehicle collisions (0 - < 2 animals per mile, per year average from 2011 – 2015 for pronghorn [Smith and Riginos 2017] and less for mule deer, elk and moose) in the vicinity of the Project.

Short-term effects to big game may include increased potential for mortality (i.e., vehicle collisions) as a result of increased traffic to and from the Project area during construction. Due to the inherently slow nature of vehicle traffic within the Project area, there would be little potential for big game/vehicle collisions within the Project area during construction.

Indirect effects to big game would consist of displacement of animals in close proximity to the Project due to increased noise and human presence in the Project area. In addition, vehicle and equipment emissions and fugitive dust during construction may further disperse wildlife away from the Project area. Indirect impacts may result in a short-term, localized reduction in relative abundance of pronghorn but likely would not reduce species populations or abundance on a landscape level. The displacement of individuals may result in additional stress placed on these individuals; however, it likely would not cause a significant increase in mortality or lowering of species viability.

Pronghorn

Construction would not occur during the seasonal pronghorn restriction of November 15 through April 30 unless the BLM, in coordination with the WGFD, determines that weather and other

factors could allow for a temporary, short-term exception to this restriction without unduly stressing the animals on this crucial winter range. The Proposed Action would result in the long-term loss of 481 acres of pronghorn habitat by fencing, specifically crucial winter/yearlong range. Pronghorn can generally be found in the Project area year-round as flat semi-desert shrubland and Wyoming big sagebrush are their preferred habitats in this portion of Wyoming. However, semi-desert shrubland and Wyoming big sagebrush communities can be found in abundance in the Project region.

The Project area occurs within the WGFD Sublette Herd Unit and Hunt Area 96. The Sublette Herd Unit occupies 6,842,167 acres in southwestern Wyoming. Habitat loss associated with the Proposed Action would include approximately 0.17 percent of the Sublette Herd Unit. The pronghorn in this portion of the herd primarily occupy Hunt Area 96 accounting for 402,334 acres (6 percent) of the Sublette Herd Unit. Habitat loss associated with the Proposed Action would include approximately 481 acres, or 0.2 percent of Hunt Area 96. Although not all habitats are equally valuable, this reduction of 0.007 percent of the Sublette Herd Unit and 0.2 percent of Hunt Area 96 represents a negligible portion of the Sublette herd.

Crucial winter/yearlong range is considered the limiting factor for pronghorn in this portion of Wyoming. The entire Project area is located within WGFD pronghorn crucial winter/yearlong range within Hunt Area 96. There are 119,978 additional acres of crucial winter/yearlong habitat in Hunt Area 96 outside the Project area. The loss of these resources represents a negligible percentage of the resources available to pronghorn in the Project region. The loss of this range on pronghorn crucial winter/yearlong habitat would have negligible effects on pronghorn populations in the region. However, the perimeter fence around the southwest corner of Section 14 is expected to have minor to moderate (depending on the severity of the winter), long-term, negative impacts on maintaining pronghorn migration in the Project region by blocking the route to additional crucial winter/yearlong range and back to springs/summer ranges. This blockage could be critical during years with severe winters.

Recent studies by Sheldon (2005) and WEST (2017) have suggested pronghorn populations in this area of Wyoming are both resident and migratory at various times throughout the year. WGFD has identified an established migration route approximately 1.5 miles west of the Project area (WGFD 2017) but other migration routes are likely present in the vicinity. WEST (2017) and Sheldon (2005) data suggest pronghorn may travel through the Project area and in close proximity to the Project during the winter and spring months. The construction of a perimeter fence around the Project's solar facilities would make this area impassable for resident and migrating pronghorn.

Two potential scenarios regarding pronghorn movement in the region may result from the construction of the perimeter fence. First, pronghorn may cross SH372 north of Section 14. Crossing the highway ROW fence and the actual highway at this location would put individual pronghorn at risk of collision with vehicles. Second, pronghorn would be required to move around the western boundary of Section 14 along a hillslope. In most migration years, this is not likely to impact the pronghorn; however, during years with extreme winter conditions, this area may be more difficult to pass through due to potential heavy snow drifts. However, telemetry data from early- to mid-2017 demonstrated that pronghorn use the area west of Section 14 as part of their normal migration pattern, even during the extreme winter conditions of early-2017 (WEST 2017). While this is a small dataset, it does suggest pronghorn have the ability to migrate immediately adjacent to Section 14 even when heavy snow cover occurs in the vicinity. However, the WGFD has expressed concern that pronghorn populations in the region are limited by the number of available continuous, unblocked migration routes as well as the availability of quality crucial winter yearlong/range. Therefore, the BLM has determined that Project-related impacts to pronghorn migration routes in the Project region should be minimized to the extent possible. The presence of the perimeter fence around the southwest corner of Section 14 does not meet this

goal and would be a long-term, negative impact on maintaining pronghorn migration in the Project region.

Migratory Birds

A number of raptor species (e.g., golden eagle, ferruginous hawk, prairie falcon, red-tailed hawk, short-eared owl) occupy the habitats in the Project vicinity year-round and seasonally. Impacts to raptor species can result from the loss or alteration in habitat, reduction in prey base, and increased human disturbance. The loss of native habitat to human development has resulted in declines of hawks and eagles throughout the West (Boeker and Ray 1971; Schmutz 1984). In some cases, habitat changes have not reduced numbers of raptors but have resulted in shifts in species composition (Harlow and Bloom 1987). Impacts to small mammal populations due to habitat loss and fragmentation can result in a reduced prey base for raptors, resulting in lower raptor densities. Thompson et al. (1982) and Woffinden and Murphy (1989) found that golden eagles and ferruginous hawks had lowered nesting success where native vegetation had been lost and was unable to support jackrabbit (prey) populations. Furthermore, raptors have a high potential of being disturbed from nests and roosts, thereby leading to displacement and reduced nesting success (Holmes et al. 1993; Postovit and Postovit 1987; Stalmaster and Newman 1978).

Noise levels and human activity also can preclude otherwise acceptable raptor habitat from use. The ECL and Project fencing may provide additional perching opportunities for raptors but the barbed wire on the top of the perimeter fence also presents a collision risk for birds hunting in the area. However, raptors already forage in the Project area and perch from existing overhead utility structures; therefore, the Project may allow for increased foraging opportunities for raptors near the Project but impacts to raptor populations are not expected to be substantially impacted as a result of the Project.

Based on the results of the 2016 and 2017 field survey efforts (Stantec 2017a) and review of BLM raptor nest data, no known nests are within one mile of the Project area. BLM and WGFD personnel have observed numerous golden eagles, ferruginous hawks and other raptors utilizing the Project area and surrounding lands (L. Keith pers. comm. 2017c). Also, numerous short-eared owls were documented within the Project area during field surveys in 2016 and 2017 (Stantec 2017a). This species nests on the ground in grassland and shrubland habitats and their nests can only be located by pedestrian surveys. Therefore, if construction were to extend into the breeding season (February 1 to July 31), nesting raptor surveys would be conducted, focusing on short-eared owls, through areas of suitable habitat to identify active nest sites within the Project area prior to construction (**Table 2.2-2**). Since a number of variables (e.g., nest location, phenology, topographical shielding) would determine the level of impact to a breeding pair, appropriate protection measures, such as seasonal constraints and establishment of buffer areas, would be implemented at active nest sites on a site-specific basis, in coordination with the jurisdictional agencies (e.g., BLM, WGFD, or USFWS). As a result of these committed EPMS, construction-related impacts to raptor species would be anticipated to be negligible but collisions with the barbed wire on the perimeter fence could cause mortalities to hunting raptors and slow flying birds. This type of injury usually results in the death of the bird due to the trauma of trying to break free of the barbs on the wire. However, these effects are anticipated to be minimal to the local populations.

Other migratory bird species that may be impacted by construction and operation activities include water-associated waterfowl, nesting passerines or songbirds that use the various habitats within the Project area. Direct and indirect impacts to other avian species include mortalities or displacement related to Project construction and operation; habitat loss, alteration, and fragmentation; and increased levels of noise, activity, and human presence. The occurrence of water-associated bird species led to the development of the lake-effect hypotheses related to PV solar projects. Mortality of water-associated birds could occur during migration as a result of

birds mistaking the panels as a body of water (“lake effect”) and attempting to land on the site. This has occurred in other areas such as parking lots and other flat surfaces when weather events such as heavy fog or snow has obscured the birds’ vision. These are rare stochastic events that would not be expected to impact water-associated bird populations (Martinson pers. comm. 2018).

Across the three PV projects with publicly available monitoring data, non-water-associated birds made up the largest percentage of detections among solar arrays (303 of 358 detections, or 85 percent of detections). The majority of non-water-associated bird detections among solar arrays has been passerines, doves, and pigeons (83 percent), and comprised 34 identifiable species. Only four raptors (two species) have been detected among the arrays at the three facilities (Martinson pers. comm. 2018).

The Wildlife Protection Measures, Mitigation, and Monitoring Plan and the Adaptive Management Plan will address and mitigate impacts to birds over the life of the Project (**Appendix A**).

Project construction and operation would result in disturbance to 121 acres of nesting and foraging habitat. However, there is ample similar habitat in the surrounding area, so these effects would be negligible to minor. Effects to nesting bird species would be minimized by avoiding construction from May 15 to June 30. According to the Wyoming PIF Bird Conservation Plan (Nicholoff 2003), the primary dates for most breeding bird species in Wyoming are May 15 to June 30, depending on the spring weather conditions. Therefore, should removal of habitat within the Project area be required from May 15 to June 30, Sweetwater Solar would coordinate with the BLM and USFWS to conduct breeding bird surveys and implement appropriate EPMs, such as buffer zones around occupied nests, as needed. As a result, construction related impacts to breeding migratory birds resulting primarily from alterations of habitat within the Project area, are anticipated to be negligible.

Special Status Wildlife Species

Pygmy Rabbit (BLM Sensitive)

Impacts to the pygmy rabbit on approximately 481 acres could include direct mortalities of individuals as a result of burrow crushing from construction activities, vehicles, and equipment. Additional impacts could result from increased habitat fragmentation, human presence, and noise. Pygmy rabbits favor tall, undisturbed sagebrush habitat. While sagebrush plants would be mowed to prepare for the solar arrays, it is unlikely the remaining mowed sagebrush habitat would provide suitable habitat for pygmy rabbits. Project construction and operation would result in the loss of 66 percent of the suitable sagebrush habitat for this species within the Project area until reclamation has been completed and the mature sagebrush communities have been reestablished. Given the extent of suitable sagebrush habitat in the surrounding region, the geographic location of the Project area (i.e., within Predicted Present – Medium Probability of Occurrence and Predicted Present – High Probability of Occurrence based on the WYNDD pygmy rabbit distribution model), and the documented occurrences (e.g., burrows, scat) within the Project area (Stantec 2017a), activities associated with the Project may impact individual pygmy rabbits. However, given the extent of suitable habitat in the vicinity, the Project likely would not cause a trend towards federal listing or loss of viability of the local population of pygmy rabbits. The impacts to the pygmy rabbit would be long-term but minor.

Sensitive Bat Species (BLM Sensitive)

Four BLM sensitive bat species, the Townsend’s big-eared bat, spotted bat, long-eared myotis, and fringed myotis, could be impacted by Project construction. No impacts to communal roosts (e.g., hibernacula, nursery colonies, bachelor roosts) would be anticipated from Project construction, based on review of bat literature for Wyoming and the lack of suitable roosting

habitat within the Project area. Project construction and operation would result in the loss of 66 percent of the suitable foraging habitat for these bat species until reclamation has been completed and the plant communities have been re-established.

The nearest known roosting activity is 1.5 miles away along the Green River. There are ample foraging areas throughout the vicinity, however new studies suggest that bats can collide with vertical smooth surfaces such as glass (Greif et al. 2017). The extent of this potential impact is currently unknown but expected to be minor. Grief et al. (2017) states that bats may mistake upright smooth glass surfaces for open areas. Most of the time the panels would not be in an upright position. Once the last sunlight fades the panels would be programmed to return to an east-facing position to capture the morning sun. This area is not known to support bats; however, migrating bats passing through the area could be impacted.

The impact analyses from other proposed PV projects and the scientific literature have not shown any impacts to bats from PV projects. Therefore, in combination with the above information there is a very low likelihood of impacts to bats as a result of the Proposed Action.

Regardless, post-construction mortality monitoring would be conducted for both birds and bats for two years to determine if adaptive management needs to be employed for the Project and what those changes would be (**Appendix A**). A Bird and Bat Conservation Strategy is also in development for the Project in coordination with the BLM, USFWS, and the WGFD.

Greater Sage-grouse (BLM Sensitive)

The Project area is located in general habitat for Greater Sage-grouse. The Proposed Action would result in the loss of usable Greater Sage-grouse habitat in the GHMA, effectively 703 acres including the fenced area and a behavioral avoidance of the power line. Greater Sage-grouse are likely to be found in the Project area at different times of the year. Suitable nesting habitat and wintering habitat have been documented within the Project area as well as sign indicating the presence of Sage-grouse (scat and tracks) and an observed flock of birds immediately adjacent to the northern boundary of Section 14 (Stantec 2017a). In the 15,623-acre cumulative effect study area (CESA) (**Section 4.2.6**) a loss of 703 acres of potential habitat is approximately 5 percent of available Greater Sage-grouse habitat in the CESA which would be a minor, long-term loss.

Greater Sage-grouse Lekking/Nesting Habitat

Two leks have been documented within two miles of the Project area. Lewis Gravel Lek to the east and Big Island 2 Lek to the west/northwest are over one mile from the Project area. Construction of the Project would follow the Green River RMP guidance of:

No surface disturbance will be allowed within 0.25 mile of the perimeter of an occupied lek and human activity should be avoided between 8 p.m. and 8 a.m. from March 1 through May 15.

Avoid activity in nesting and brood habitat within 2 miles of a lek or in designated nesting and brood habitat beyond the 2-mile buffer from March 15 through July 15.

The BLM also has identified a similar restriction within the Approved RMP Amendments (BLM 2015b). MD-SSS-9 of the Approved RMP Amendments specifies:

Surface disturbing and/or disruptive activities will be prohibited from March 15 through June 30 to protect sage-grouse nesting and early brood rearing habitats within 2 miles of the lek perimeter of an occupied lek located outside PHMAs.

Construction of the Project would not occur during the Greater Sage-grouse seasonal restriction of March 15 through June 30. Therefore, there would be negligible effects on lekking activities near the Project area as a result of Project construction.

Greater Sage-grouse Brooding Habitat

The Project area does not include perennial water features or the wet, lush plant communities sought by brooding hens. Riparian areas, irrigated farmlands, and overall wetter, more diverse plant community conditions can be found east of the Project area near the Green River; however, the Proposed Action is not likely to influence these areas. As the Project area does not contain suitable brooding habitat for Greater Sage-grouse, and the nearest suitable brooding habitat areas are approximately 1.5 miles east of the Project area, it is unlikely that the Project would impact brooding Greater Sage-grouse, or their brooding habitat, assuming similar construction activity restrictions as described above under Lekking/Nesting Habitat are followed.

Greater Sage-grouse Wintering Habitat

Surveys conducted within the Project area in early-February 2017 (Stantec 2017a) documented Greater Sage-grouse use the Project area during winter months. Winter use sign (scat and tracks) were documented within the Project area and a flock of nine Greater Sage-grouse were observed near the northern boundary of Section 14. Approximately 481 acres of winter habitat would be impacted as a result of the Project. However, ample winter habitat would be left undisturbed in the region and available for local Greater Sage-grouse populations, the loss of Greater Sage-grouse winter habitat as result of the Project would have a negligible impact on local Greater Sage-grouse populations.

In addition to increased habitat disturbance and fragmentation impacts, the new ECL constructed within the Project area would increase the potential for collisions and would also provide additional perches for avian predators (i.e., raptors and corvids) that prey on eggs, young, and adult Greater Sage-grouse. Existing overhead utilities already occur north and west of the Project area. The addition of the ECL may provide additional perching opportunities for avian predators of Greater Sage-grouse. However, avian predators already likely forage in the Project area and perch from existing overhead utility structures. Nonetheless, APLIC-recommended protection measures (APLIC 2006 and 2015) would be utilized for Greater Sage-grouse protection (**Table 2.2-2**) to reduce potential impacts to Greater Sage-grouse.

Therefore, the primary impacts to Greater Sage-grouse as a result of Project construction and operation activities would be habitat loss and fragmentation. The loss of Greater Sage-grouse habitats within the Project area may result in the alteration of seasonal movements. However, given the extent of suitable habitat in the vicinity, the Project would not likely cause a trend towards federal listing or loss of viability of the local population of Greater Sage-grouse.

Brewer's Sparrow, Loggerhead Shrike, Sage Sparrow, Sage Thrasher (BLM Sensitive)

Impacts to Brewer's sparrow, loggerhead shrike, sage sparrow, and sage thrasher generally would be the same as described above for **Migratory Birds**. Impacts specific to Brewer's sparrow, loggerhead shrike, sage sparrow, and sage thrasher, if present, would occur as a result of the loss of potentially suitable upland habitats within the Project area. Additional impacts such as displacement and avoidance also would result from increased noise and human presence associated with construction and operation activities. However, due to the amount of suitable habitat in the Project vicinity, the Project would not likely cause a trend towards federal listing or loss of viability of the local population of these species.

Western Yellow-billed Cuckoo (Federally Threatened)

Impacts to western yellow-billed cuckoos generally would be the same as described above for **Raptors and Other Migratory Birds**. However, based on the distance to suitable habitat as well as proposed critical habitat along the Green River north and east of the Project area (approximately 1.5 miles), occurrence of this species within the Project area is unlikely and would be limited to migrating or dispersing individuals. Therefore, impacts to western yellow-billed cuckoos as a result of Project construction and operation are anticipated to be negligible and there would be no effects from this Project.

Colorado River Endangered Fish (Federally Endangered)

Water use during the six months of construction would require up to 71 acre-feet of water (**Section 2.2.4.1**), primarily for dust control activities. This water would be sourced from a private well adjacent to the Green River and north of the Project area. This source is not known to have previously been consulted on under the ESA. During operation of the Project, washing the solar arrays up to twice per year would require 0.6 acre-feet per year for the life of the Project (30 years; 18 acre-feet total). This water would be obtained from a municipal source (hydrant in the City of Green River) and is also considered a new depletion. Any use of water from the Colorado River over 0.1 acre-feet that has not been previously consulted on is considered a new depletion and would require consultation under the ESA.

Therefore, the Project would use up to 89 acre-feet of Colorado River system water over the life of the Project. The BLM initiated consultation with the USFWS in a letter dated March 16, 2018, for use of up to 89 acre-feet of Colorado River water for the Project (**Appendix C**). The BLM stated that the Project may affect, and is likely to adversely affect, the Colorado River fishes and their critical habitat. The USFWS issued a Biological Opinion (BO) on March 30, 2018, that stated Colorado River depletions less than 100 acre-feet would not jeopardize the Colorado River fishes and would not destroy or have an adverse modification to their habitat (**Appendix C**).

Great Basin Spadefoot (BLM Sensitive)

Potential impacts to the Great Basin spadefoot could include direct mortalities of individuals from construction activities, ground compaction, and vehicle traffic within suitable habitat. Impacts also could result from the loss of suitable habitat until reclamation has been completed and vegetation has been re-established. In addition, grading would occur on 84 acres during construction, which would destroy burrows and potentially cause mortality of individuals. However, given the extent of suitable habitat in the Project vicinity, the Project likely would not cause a trend towards federal listing or loss of viability of the local population of Great Basin spadefoots. These impacts would be long-term but minor.

4.1.5.3 Alternative Site Configuration

The disturbance impacts to wildlife under the Alternative Site Configuration would be similar to those under the Proposed Action. Several modifications are proposed under the Alternative Site Configuration to address impacts to wildlife that would occur under the Proposed Action (**Figure 2.3-1, Section 4.1.5.2**). First, the Project would accommodate a 600-foot-wide (approximately 55 acre) wildlife and livestock movement route on the southwest portion of Section 14. This would assist in maintaining wildlife movement, pronghorn in particular, through this area. Second, the perimeter security fence configuration would follow the section boundary rather than the facility footprint, eliminating the irregular alignment that could create big game traps under the Proposed Action.

However, the fenced area under the Alternative Site Configuration – which would preclude big game access – would be 7 percent larger than under the Proposed Action (514 acres rather than 481 acres). Considering the substantial amount of similar wildlife habitat in the region, this would be a negligible difference on general wildlife habitat between the two alternatives.

Big Game

The fence configuration under the Alternative Site Configuration would cross SR372 at roughly right angles. This would eliminate the “funnel effect” that could occur under the Proposed Action.

Pronghorn

The Alternative Site Configuration would fence off 514 acres of pronghorn crucial winter range which would be a long-term loss of this habitat. However, this represents a negligible reduction of 0.007 percent of the Sublette Herd Unit and a 0.12 percent reduction of habitat in Hunt Area 96. The Alternative Site Configuration would not substantially impact populations of pronghorn associated with these management units.

The Alternative Site Configuration also would incorporate a 600-foot wide wildlife and livestock movement route on the southwest side of the Project area. It is anticipated that pronghorn would be able to maintain migration patterns near the Project due to the movement route. Therefore, the Alternative Site Configuration likely would have less impact on migrating pronghorn in the Project vicinity, as compared to the Proposed Action.

Migratory Birds

Impacts to migratory birds as a result of the Alternative Site Configuration would be similar to those impacts described for the Proposed Action.

Special Status Wildlife Species

Pygmy Rabbit

Impacts to pygmy rabbits as a result of the Alternative Site Configuration would be similar to those impacts described for the Proposed Action.

Sensitive Bat Species (BLM Sensitive)

Impacts to sensitive bat species as a result of the Alternative Site Configuration would be similar to those impacts described for the Proposed Action.

Greater Sage-grouse (BLM Sensitive)

Impacts to Greater Sage-grouse habitat, specifically nesting and wintering habitat, as a result of the Alternative Site Configuration would be similar to those impacts described for the Proposed Action.

Brewer's Sparrow, Loggerhead Shrike, Sage Sparrow, and Sage Thrasher (BLM Sensitive)

Impacts to these species as a result of the Alternative Site Configuration would be similar to those impacts described for the Proposed Action.

Western Yellow-billed Cuckoo (Federally Threatened)

Impacts to western yellow-billed cuckoos as a result of the Alternative Site Configuration would be similar to those impacts described for the Proposed Action.

Colorado River Fish Species (Federally Endangered)

Impacts to the Colorado River fishes as a result of the Alternative Site Configuration would be similar to those impacts described for the Proposed Action.

Great Basin Spadefoot (BLM Sensitive)

Impacts to the Great Basin spadefoot as a result of the Alternative Site Configuration would be similar to those impacts described for the Proposed Action.

4.1.6 Cultural Resources and Native American Trust Assets

4.1.6.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because the site would continue to remain in its existing condition there would not be any effect on cultural resources or Native American trust assets.

4.1.6.2 Proposed Action

Six NRHP-eligible cultural resources were recorded in the APE. A portion of the solar arrays associated with the Proposed Action would be constructed over the entirety of one NRHP-eligible site. Although cultural resources would not be removed, these would constitute an Adverse Effect to Historic Properties. If the Proposed Action is selected, a mitigation plan would be developed by the BLM in conjunction with tribal consultation (**Section 4.3**). Also, non-contributing portions of three NRHP-eligible sites would be affected by the construction of the facility fence; the impact would involve the advancement of fence posts approximately six to ten feet into the ground, through the cultural sites. This would constitute No Adverse Effect to these Historic Properties.

As part of the design features of the Proposed Action, the proponent has committed to educating Project-related personnel as to the sensitive nature of the resources and prohibiting disturbance of the sites, flagging the sites during construction, adhering to an Unanticipated Discoveries Plan for Cultural Resources (**Appendix A**), and conducting construction monitoring in the vicinity of these sites (**Section 2.2.3**). Additionally, the NRHP-eligible sites that would not be overlain by facility components would be fenced for the life of the Project.

No localities of historic or Native American cultural significance were identified in the indirect APE of the Project. Following completion of construction, no auditory or atmospheric impacts would be anticipated.

There would be negligible or no effect on land use, minerals, hunting and fishing rights, or water under the Proposed Action; therefore, there would be negligible or no effect on these tribal trust assets.

The Shoshone-Bannock Tribe of the Fort Hall Reservation has deferred to the Eastern Shoshone Tribe regarding effects of the Project. The Northern Arapaho Tribe has stated that if any contributing portions of NRHP-eligible sites would be impacted then data recovery is acceptable to mitigate the adverse effect of construction activities. After appropriate consultation and site-specific permitting, the impacts to the NRHP-eligible sites in the Project area that have been previously identified as culturally sensitive by the Eastern Shoshone Tribe, the Northern Arapaho Tribe, or the Shoshone-Bannock Tribe of the Fort Hall Reservation would be mitigated as appropriate under a mitigation plan developed by the BLM, Tribes, and SHPO (**Section 4.3**).

4.1.6.3 Alternative Site Configuration

Under the Alternative Site Configuration, all identified NRHP-eligible sites would be avoided by the facility components, but non-contributing portions of three NRHP-eligible sites would be affected by the construction of the facility fence; this would constitute No Adverse Effect to Historic Properties. Under the Alternative Site Configuration, all NRHP-eligible sites would be

fenced for the life of the Project. The monitoring and treatment of unanticipated discoveries would be the same as under the Proposed Action.

The effects to tribal trust assets would be the similar to those under the Proposed Action. The response of the participating tribes regarding the Proposed Action also applies to the Alternative Site Configuration, but the Eastern Shoshone Tribe agrees with the attempts to minimize disturbance to the NRHP-eligible sites under the Alternative Site Configuration and the requirements for construction monitors for activities within the Project area that are covered by sand deposits. They wish to be informed of any future important cultural discoveries.

4.1.7 Land Use and Recreation

4.1.7.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because the site would continue to remain in its existing condition there would not be any effect on land use or recreation.

4.1.7.2 Proposed Action

The Proposed Action would change the current land use from primarily grazing (agricultural) to an industrial use (solar energy generation) for the duration of the Project. The effects related to this change in land use are discussed in **Section 4.1.4.2**. Existing ROWs would not be affected as the Project would be constructed around current buried and surface ROWs in the Project area and access to ROW holders would be maintained. Hunting would not be allowed on Section 14 for the duration of the Project to ensure human safety (**Section 4.1.11**) and for the security of the Project equipment. The Proposed Action would remove approximately 0.2 percent of Hunt Area 96 from recreational opportunities. Because there is ample land in the applicable hunting units outside of the Project area, this would be a negligible effect on recreation. Once the Project has been decommissioned and reclamation has been determined to be successful, the BLM would reinstate grazing and allow hunting on the Project area.

4.1.7.3 Alternative Site Configuration

The potential effects to land use and recreation under the Alternative Site Configuration would be generally similar in nature to those described for the Proposed Action. The exception is that a 600-foot route through the southwest corner of Section 14 would be left undeveloped and unfenced to allow wildlife and livestock to utilize and pass through the Project. Therefore, the agricultural land use would be maintained in this 55-acre area. Hunting would be prohibited in the 600-foot route to ensure human safety and security to Project equipment.

4.1.8 Visual Resources

Visual contrast reflects the degree to which a proposed project's components differ from the existing landscape character and visual quality. Contrast is measured by separating the landscape into major features (land, water, vegetation, structures) then assessing the contrast introduced by the project in terms of the basic design elements of form, line, color, and texture. The degree of contrast introduced by a proposed project to landscape elements is then rated as follows (BLM 1986):

- None – The element contrast is not visible or perceived.
- Weak –The element contrast can be seen but does not attract attention.
- Moderate – The element contrast begins to attract attention and begins to dominate the characteristic landscape.

- Strong – The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

This method reveals the project's elements and features that could cause the greatest degree of visual change, and to guide efforts to reduce the visual impact of a proposed activity.

This section relies on information detailed in Visual Contrast Rating Worksheets completed for each of the representative viewpoints (**Appendix D**).

4.1.8.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because the site would continue to remain in its existing condition there would not be any effect on visual resources.

4.1.8.2 Proposed Action

There would be short-term impacts to visual quality from KOPs 1, 2, and 3 during construction grading and trenching activities due to the generation of fugitive dust. Although water would be sprayed on these areas to reduce dust according to the CMRP (**Appendix A**) (control efficiency of 70 percent), intermittent airborne dust could be visible above construction activities in views from outside of the Project area and potentially diminish visibility in views adjacent to the Project area. These would be minor, short-term impacts on visual resources.

Development of the Project would result in moderate contrast with the existing conditions, which would meet VRM Class III objectives for the Project area. The existing landscape character would be retained and development would not dominate the view of the casual observer. The effects to visual resources under the Proposed Action would be long term and minor.

The visual contrast rating analyses for the three KOPs selected for the Project concluded that, while visible in views toward the Project area from the south (KOP 1), from within the solar arrays (KOP 2), and from the north (KOP 3), the Project would result in a moderate degree of contrast with existing conditions. The Project would, in more distant, expansive views, introduce relatively dark, geometric forms to an area that, while generally undeveloped at present, sits within a broader context of land modification, with mining and industrial activities typically included in local views. In closer-in views, particularly those from points adjacent to the Project, solar arrays would be prominent but, due to their 150-foot setback from the perimeter road to SH372 and relatively low profile, would not dominate views as much as they would appear to reinforce the existing characteristic landscape, within which existing activities and land uses would remain visible.

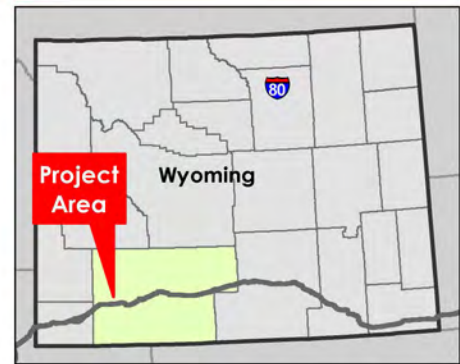
As shown in the simulations for each viewpoint (**Figures 4.1-1 through 4.1-3**), in which the single-axis solar trackers are angled to the west toward afternoon sunlight, the Project would not appear as a substantial alteration to land form. The smooth texture of the panels would appear in place of the desert shrublands and grasslands, which also have a smooth texture in longer views, and which appear somewhat rough and clumped in closer proximity. The dark color of the Project when facing the modules – as well as the somewhat less dark underside of the modules, visible when the arrays have rotated away from the viewer – would appear as shadows across a portion of the landscape in most views from outside of the Project area, which would present a noticeable change in color. However, under cloudy conditions, such effects likely would be absorbed visually by shadows caused by atmospheric conditions.



A - Existing view from northbound WYO 372, approximately 0.4 mile south of proposed Sweetwater Solar Facility.



B - View from KOP 1 with project simulated.



Project Location
T20N R109W S34; T19N R109W S2, 3, 11, 14
Sweetwater County, WY

203706043
Prepared by EDZ on 2017-06-29
Technical Review by JH on 2017-06-29

Client/Project
Sweetwater Solar LLC
Sweetwater Solar Energy Project

Figure No.
4.1-1

Title

Key Observation Point 1

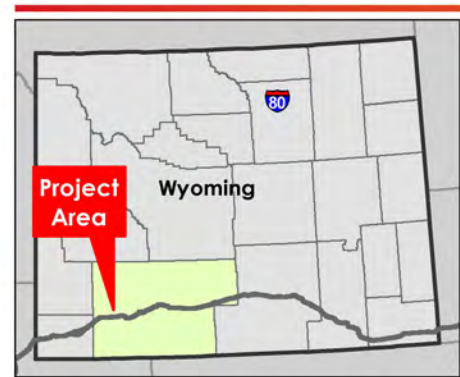
U:\203706043\03_data\gl_coad\gl\mxd\Visibilty_Analysis\Figure_4.1-2_Key_Observation_Point_2.mxd Revisd: 2017-06-29 By: edzmmemman



A - Existing view from northbound WYO 372, within the proposed Sweetwater Solar Facility.



B - View from KOP 2 with project simulated.



Project Location
T20N R109W S34; T19N R109W S2, 3, 11, 14
Sweetwater County, WY

203706043
Prepared by EDZ on 2017-06-29
Technical Review by JH on 2017-06-29

Client/Project
Sweetwater Solar LLC
Sweetwater Solar Energy Project

Figure No.
4.1-2

Title

Key Observation Point 2

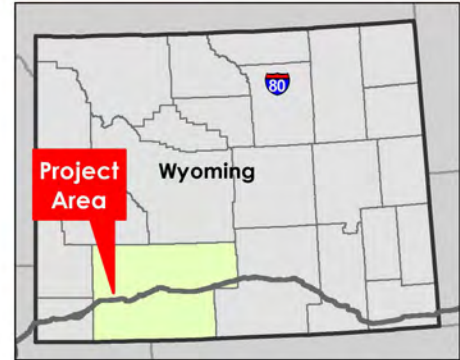
U:\203706043\03_data\gl_cad\gl\mxd\Visually_Analyst\Figure_4_1_3_Key_Observation_Point_3.mxd Revisit: 2017-06-29 By: edzmmmm



A - Existing view from southbound WYO 372, approximately 0.4 mile north of the proposed Sweetwater Solar Facility and adjacent to proposed Electric Connection Line.



B - View from KOP 3 with project simulated.



Project Location		203706043
T20N R109W S34; T19N R109W S2, 3, 11, 14		Prepared by EDZ on 2017-06-29
Sweetwater County, WY		Technical Review by JH on 2017-06-29
Client/Project		
Sweetwater Solar LLC		
Sweetwater Solar Energy Project		
Figure No.		
4.1-3		
Title		
Key Observation Point 3		

The M&M facility, switchgear, ECL poles, and lattice microwave tower would be relatively small features, visible at a distance from primary viewing locations along SH372. They would not be dominant elements in any view from the roadway. The poles associated with the ECL would be new vertical features in their immediate proximity along the roadway, but would relate to other similar structures nearby, particularly near the Raven Substation. As such, they would not constitute a strong contrast with the existing character of the view.

Finally, duration of views from SH372 are assumed to be relatively short, based on the high rate of vehicular speed through the Project area (70 mph speed limit). This would limit exposure to broader views in which the Project would appear as a collection of large, dark polygons (KOP 1 and KOP 3), and to views within the Project (KOP 2), an area that extends for less than 1 mile, within which the visibility of the Project is reduced by the site boundary setbacks from the road corridor.

A glare analysis conducted for the Proposed Action (Stantec 2017c) determined that any glare produced by the solar panels would have “low potential for temporary after-image,” which refers to the lingering effects a viewer might experience after direct exposure to a flash or bright light. The model accounts for the Project’s single-axis tracking and produces an estimated duration of time, given the season and the sun’s relative position in the sky, during which there would be potential for glare effects. No glare would be experienced from KOP 1. From KOP 2, potential for glare would range from approximately 50 minutes per day in the winter to nearly 300 minutes a day in summer. From KOP 3, glare could be experienced for as many as 100 minutes during winter and fewer than 15 minutes in summer. In general, potential for glare is concentrated in the midday to early afternoon hours. The vast majority of people who might view the Project from KOP 2 and KOP 3 would be in vehicles, traveling at a relatively high rate of speed. Duration of viewer exposure to any potential glare is therefore anticipated to be brief, reinforcing the conclusion that the potential for after-image is low (Stantec 2017c). This would be a long-term, minor impact.

4.1.8.3 Alternative Site Configuration

In order to accommodate the wildlife and livestock movement route, the Project components would be rearranged slightly, with development removed from the southwestern and northwestern portions of Section 14, and developed areas increasing in the southeastern and central portions of Section 14. The M&M facility would be closer to SH372 than under the Proposed Action, and the perimeter security fence would tie into the SH372 fence.

The potential effects to visual resources under the Alternative Site Configuration generally would be similar in nature to those described for the Proposed Action. While proposed locations of certain facilities and portions of solar arrays would shift, the Project under the Alternative Site Configuration would appear generally as it would under the Proposed Action, though in slightly different geometric figures. In views from within the Project area (e.g., KOP 2), effects from the Alternative Site Configuration likely would be no different than those under the Proposed Action.

A glare analysis conducted for the Alternative Site Configuration (Stantec 2017d) determined that there would be no glare produced by the solar panels under this alternative at any of the KOPs since the arrays would be oriented differently than under the Proposed Action. Therefore, there would be no glare impact to motorists.

4.1.9 Transportation

4.1.9.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because there would be no

construction on the site, or maintenance of a solar facility, there would be no effects on transportation.

4.1.9.2 Proposed Action

Construction

Construction of the Project would utilize between 10 to 125 employees, depending on the phase of construction. Daily traffic to and from the Project area would include passenger cars and trucks, semi-trailers, and heavy-duty trucks with trailers. Construction traffic would be heaviest during the summer, during principal construction. Following principal construction, the workforce would reduce to less than 20 people with a corresponding decrease in passenger and heavy vehicle traffic.

Trucks transporting Project components and construction materials would access the Project from SH372 (**Section 2.2.4**). Assuming that the majority of this traffic would occur during the active facility construction period of July through November, there would be a maximum of 97 daily vehicle trips during construction if all vehicle trips were assumed to occur during these months. This represents a 7 to 9 percent increase in traffic on SH372 during these months, which would be a minor, short-term effect on transportation. Construction traffic would adhere to a Traffic and Transportation Plan (**Appendix A**) to ensure safety and minimize impacts on local traffic in the vicinity of the Project. It is not anticipated that any road improvements would be needed to accommodate delivery and construction traffic along the public roads and highways.

Operations and Maintenance

During operations and maintenance, trips to the site would be for routine maintenance and unscheduled repairs. These trips would consist of a limited number of vehicles and staff (e.g., less than 400 trips per year) and as such impacts to transportation would be negligible.

4.1.9.3 Alternative Site Configuration

Because the vehicle access to the site under construction and maintenance would be similar to that under the Proposed Action, the potential effects to transportation under the Alternative Site Configuration would be similar in nature to those described for the Proposed Action.

4.1.10 Socioeconomics

4.1.10.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because there would not be any development on the site there would not be any effect on socioeconomics.

4.1.10.2 Proposed Action

Construction Phase

The effects on socioeconomics during the construction phase are expected to be negligible to minor and short term. Project construction is anticipated to occur over a period of about five to six months in 2018 (July through December). Construction activities would support local employment and generate labor income for workers. Prior to and during construction, various materials and supplies would be purchased from local sources, benefitting local businesses, and generating sales taxes.

Construction Costs, Local Purchases, and Sales Taxes

Total construction costs are estimated at about \$84.6 million (excluding sales taxes), to be expended over the course of a one-year period (**Appendix A**, Harvey Economics 2018).

The majority of materials and supply costs are related to the solar components, most of which would be purchased outside of Wyoming; items purchased in Sweetwater County or other areas of Wyoming would include items such as fencing, concrete, gravel, and wire.

Based on the applicable tax rates, the assumed distribution of Project purchases, and the distribution of state sales tax revenues, the Project's construction activities would generate sales/use and lodging tax revenues for Sweetwater County of \$421,200 and \$616,500 for the State of Wyoming (Harvey Economics 2018). The majority of local purchases would be made in Rock Springs and Green River; those cities would receive the bulk of Sweetwater County's sales and lodging tax revenues.

Altogether, almost \$400,000 in sales tax revenues for Sweetwater County jurisdictions would be supported by construction activities. That amounts to about 1 percent of total 2016 sales tax revenues in the County. However, Project generated lodging taxes would amount to about 2.5 percent increase in those countywide revenues. These would be minor, short-term effects.

Project Supported Employment and Income

Based on recent unemployment rates in Sweetwater County and the distribution of the existing workforce across industries, an estimated 60 percent of the Project's general (non-solar specialized) workforce (**Table 4.1-1**) could be hired from within the County. The remaining 40 percent likely would be hired from other areas within the state. The Project's construction employment would serve to reduce the local unemployment rate; however, that effect would be minor and short-term.

Table 4.1-1 Project Construction Workforce, by Month

	Number of Workers (Total)	Number of Workers (Local Hires)	Total Work Hours
Month 1	150	90	24,000
Month 2	300	180	48,000
Month 3	300	180	48,000
Month 4	250	150	40,000
Month 5	30	18	4,800
Total			164,800

Sources: Harvey Economics 2018.

About 65 percent of the workforce would be made up of general laborers, 10 percent would be civil engineers and 25 percent would be electricians. Hourly wages likely would range widely for different types of workers, but overall, wages are expected to average about \$64 per hour, exclusive of any benefits. That wage rate is about double the average hourly rate for all industries in Sweetwater County and is on par with wages in the County's mining industry. Including anticipated contingency for potential overtime work due to the compressed construction schedule and the estimated per diem costs for non-local workers, total labor costs are estimated at approximately \$15.9 million over the entire construction period.

In addition to direct employment of project construction workers, company spending for local materials and supplies and household spending on the part of the construction workers would stimulate the need for additional employment in other sectors, likely focusing on retail, restaurants, and other commercial establishments. In total, an additional 98 jobs would be

generated by Project activities, albeit on a short-term basis⁴. Those jobs generally would be lower paying than the construction positions, but would generate an additional \$2.4 million in local income.

In total, the construction of the Project would support about 350 jobs and generate about \$17.1 million in income.

Housing Impacts

About 60 percent of the required general workforce likely would be available in the local area (Green River, Rock Springs); those workers would commute to and from the worksite from their existing housing. The remaining 40 percent of the general workforce would require short-term housing facilities for short periods of time. Those workers would find accommodations in the numerous hotels and motels in the area, at local RV parks or campgrounds, or in the vacant apartments available for rent locally. The hotels and motels in Green River and Rock Springs should be able to absorb the Project's non-local construction workers without noticeably limiting the availability of short-term housing units for other purposes (i.e., tourism, other business needs).

Social and Cultural Effects

The Project's construction activities would not affect the general social or cultural atmosphere of Sweetwater County or local residents. Construction activity and other industrial activity is an integral part of the Sweetwater County lifestyle; therefore, the Project's construction activities should integrate relatively seamlessly into other current economic activities in the area. Overall, the relatively short duration of construction activity would limit any social impacts related to construction to a negligible effect.

Operational Phase Impacts

Once construction is complete, the Project is expected to operate continuously for a period of 30 years, prior to decommissioning. During that 30-year operational period, the Project would generate employment and local income, as well as revenues to various entities, including local businesses, Sweetwater County, the BLM, and private property owners. These socioeconomic effects are expected to be negligible to minor and long term.

Employment and Income

Operations and maintenance (O&M) activities would require the equivalent of about nine full-time employees, ranging from skilled electricians to general laborers. Hourly wages for those employees would range from about \$25 per hour up to about \$100 per hour, based on position and skill level.⁵ Total employee income over the 30-year operational period would amount to over \$19.6 million (Harvey Economics 2018).

In addition to those people directly employed by Sweetwater Solar, Project spending on materials and supplies and household spending by Project employees would generate additional employment opportunities in Sweetwater County. Employment of about 16 indirect and induced

⁴ Indirect and induced employment was estimated using a 2014 IMPLAN employment multiplier for the "construction of new power and communications structures" sector for Sweetwater County.

⁵ Hourly rates include benefits.

workers and about \$710,000 in annual income would be supported by the Project's on-going O&M activities (Harvey Economics 2018)⁶.

Population, Demographics, and Housing

Due to the small number of total employees required, and the fact that a large portion of the employees would come from the existing workforce, the Project would not result in any noticeable impact on the County's population base or demographic characteristics.

Fiscal Impacts

Sales Tax Revenues

Project O&M activities would require the purchase of a variety of materials and other supplies, including wire, splices, oils and lubricants, cleaning materials, herbicides and landscaping materials, and replacement parts for the electronic components.

Altogether, about \$12,000 in annual sales tax revenues for Sweetwater County and municipalities would be supported by Project activities. That amounts to about one-third of 1 percent of total 2016 county sales tax revenues. Over the 30-year operational period, that would amount to a total of about \$387,000 distributed among Sweetwater County and municipalities and about \$329,000 for the State (Harvey Economics 2018).

Property Tax Revenues and Federal Payments in Lieu of Taxes

Total property taxes paid by Sweetwater Solar over the 30-year period of operations would amount to over \$17.1 million (Harvey Economics 2018).

Annual property tax revenues received by County recipient entities would amount to only a small portion of their total property tax revenues. For example, Year 1 Project property tax revenues to Sweetwater County would amount to an increase of about 0.5 percent, based on total 2016 property tax revenues to that jurisdiction (Harvey Economics 2018).

Because county PILT receipts are largely based on program funding, the amount of federal acreage in a county, and changes in population size, and not tied to the use of that land, the Project is not anticipated to have an impact on Sweetwater County's PILT funding.

BLM Site Lease Fee Payments

Sweetwater Solar would pay an annual site lease fee to the BLM for use of the public lands each year for 30 years. The Project would generate total site lease revenues ranging from about \$62,600 in the first year of operation to about \$712,900 in the last year for total lease revenues of just over \$13.1 million over the 30-year life of the Project. However, none of that money would remain in Sweetwater County or even in Wyoming; those revenues would be deposited directly into the General Fund of the U.S. Treasury, for distribution according to specific Congressional directives (Harvey Economics 2018).

ROW Costs

ROW payments related to the power line to the Raven Substation would be made to landowners for use of their property. Those landowners include both public and private entities. Total ROW

⁶ Indirect and induced employment and income were estimated using 2014 IMPLAN multipliers for the "electric power transmission and distribution" sector for Sweetwater County.

costs are assumed to be \$15,000 in Year 1 and, increasing at a rate of 2 percent per year for the life of the Project, those costs would amount to a total of about \$636,000 over the 30-year period (Harvey Economics 2018).

Public Facilities and Services/Fiscal Impacts to Affected Jurisdictions

Fiscal impacts to public facilities and services during the Project's operational phase would be negligible.

Potential Impacts to Other Industries

Agriculture

There would be a negligible effect on available AUMs in the Rock Springs Grazing Allotment (**Section 4.1.4.2**); therefore, there would be a negligible economic effect related to the AUM reduction.

Trona Mining

Project components on Section 14 would be located within the KSLA, but outside of the MMTA. In-situ or solution trona mining could occur beneath the Project on Section 14, if site-specific studies and research deemed those uses to be compatible at that location. Additionally, there is a large amount of unleased BLM acreage within the KSLA (outside the MMTA); the location of future trona mining operations is unknown, but mining opportunities may exist outside the Project area (**Section 3.1**). Therefore, the Proposed Action would have a negligible economic effect on the trona industry.

Sand and Gravel Mining

The demand for sand and gravel is largely dependent on construction activity, including construction of residential and commercial facilities, as well as highways and other roadways. The extent to which road and other construction occurs in the future will impact the level of sand and gravel production throughout the State, including in Sweetwater County.

The operation of a sand and gravel facility would be incompatible with the existence of the Project. Therefore, under the Proposed Action, no sand and gravel mining could occur on Section 14 for at least 30 years until the Project was decommissioned. The potential impacts to the sand and gravel industry under the Proposed Action were not quantified. Sand and gravel are essential components of road base, asphalt, and concrete and vital resources for almost all construction in the county. However, sand and gravel production comprises only a small percentage of total mineral taxable valuation for Sweetwater County; therefore, economic effects to the sand and gravel industry would be negligible.

Social and Cultural Effects

As the first major power generating solar facility in the State of Wyoming, the Sweetwater Solar Project likely would increase awareness of solar power generation in the state. On a larger scale, the Project also may spur or add input into discussions of economic diversification, renewable energy production, compatible land uses, and similar topics at the County and state level. However, the long-term operation of the Project would not provide a major economic engine for the County, in terms of employment or tax revenues. Mining activity and agriculture would continue to provide major influences on economic activity and demographic characteristics in the County, which in turn shape social norms and expectations.

Decommissioning

Employment and Income

The workforce and effort required to complete decommissioning activities (i.e., number of workers, duration of activity, wages) likely would be somewhat less than those required for Project construction. Fewer workers may be able to complete facility removal activities in a shorter period of time, as compared to construction activities. Additionally, decommissioning work may not require the same level of experience or skill sets as for project construction, resulting in the employment of relatively more general laborers at lower wages.

4.1.10.3 Alternative Site Configuration

Because the construction, operation, and maintenance of the Project under the Alternative Site Configuration would generally be the same as under the Proposed Action, the potential effects to socioeconomics under the Alternative Site Configuration would be similar in nature to those described for the Proposed Action.

4.1.11 Health and Safety

The Project represents a potential risk to health and safety, both to the public and Project workers. Potential safety issues include site safety and security, emergency response procedures, fire control, safe work practices, heavy equipment transportation, and traffic management.

4.1.11.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant Sweetwater Solar a ROW for the Project, there would be no construction or operational activities associated with the Project, and the ROW application area would not be disturbed. Therefore, because there would not be any development on the site there would not be any effect on health and safety.

4.1.11.2 Proposed Action

Due to the site safety and security, emergency response procedures, fire prevention and response procedures, and traffic controls outlined in **Appendix A**, the effects to health and safety would be negligible.

4.1.11.3 Alternative Site Configuration

Because the construction, operation, and maintenance of the Project under the Alternative Site Configuration would generally be the same as under the Proposed Action, the potential effects to health and safety under the Alternative Site Configuration would be similar in nature to those described under the Proposed Action.

4.2 CUMULATIVE EFFECTS

The CEQ regulations defines cumulative effects as the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). If there would be no or negligible direct or indirect effects as a result of an action, there would not be cumulative effects from the action.

For the purposes of this EA, the cumulative effects are the sum of all past, present (including proposed actions), and reasonably foreseeable future actions (RFFAs) resulting primarily from

mining, oil and gas leasing and pipelines, commercial activities, and public uses⁷. The purpose of the cumulative analysis in this EA is to evaluate the significance of the Proposed Action's contributions to the cumulative environment.

As required under NEPA and the regulations implementing NEPA, this chapter addresses those cumulative effects on the resources in the CESA for each affected resource that could result from the implementation of the Proposed Action, past actions, present actions, and RFFAs. If the Alternative Site Configuration would result in specific or different cumulative effects than the Proposed Action, these cumulative effects are discussed separately. Otherwise, the cumulative effects can be assumed to apply to both.

The period considered to be most appropriate for evaluating the incremental effects of RFFAs on most resources is 35 years, which is the projected lifetime of the Project plus the time of decommissioning and reclamation; if the cumulative effects period differs for a resource, it is described under that resource. The reasonable scope of the cumulative analysis would be restricted to connected, cumulative, and similar actions to the Proposed Action within the CESA.

4.2.1 Past, Present, and Reasonably Foreseeable Future Actions

Past actions considered are those whose effects to one or more of the affected resources have persisted to present day. Present actions are those occurring at the time of this evaluation and during implementation of the Proposed Action. RFFAs constitute those actions that are known or could reasonably be anticipated to occur within the analysis area for each resource, within a period appropriate to the expected impacts from the Proposed Action (**Table 4.2-1**).

Table 4.2-1 Past, Present, and RFFAs Applicable to CESA

Project Description	Status (X)		
	Past	Present	Future
Locatable mineral exploration/development precluded due to oil shale withdrawal (1968)	X	X	X
Trona mining	X	X	X
Gravel operation/mineral sites	X	X	X
Oil and gas pipelines	X	X	X
Oil and gas leasing	X	X	X
Highways and access roads	X	X	X
Water lines	X	X	X
Power lines	X	X	X
Fiber optics	X	X	X
ROW authorizations	X	X	X

4.2.2 Geology, Minerals, and Paleontological Resources

There would be only negligible direct or indirect effects to geology, minerals, and paleontological resources from the Project; therefore, there would be negligible cumulative effects. For sodium (trona) leasing, as of 2010 the public land that is available is approximately 186,282 acres within the KSLA and 25,904 acres within the MMTA. If Section 14 could not be leased, the impact would be 0.34 percent and 2.4 percent, respectively. The sand and gravel resources present

⁷ Quantitative data regarding these past, present, and RFFAs was calculated by digitizing disturbance and reclaimed areas from aerial imagery provided by Bing Imagery Services; data was digitized using most recent available imagery on Bing which may not be current to digitization date (October 26, 2017).

within Section 14 are not considered substantial within the context of neighboring gravel resources.

4.2.3 Topography and Soil Resources

The CESA for topography is HUC 10 (Eight Mile Wash-Green River) from I80 north to where the HUC meets SH372 (200,959 acres) (**Figure 4.2-1**). Gravel mining, other mining operations, and linear facilities have contributed to changes to topography in the CESA. Within the CESA, 3,664 acres of surface topography have been affected by industrial activities that have flattened or excavated previous topographic contours (gas plants, mining, electrical substation) and an additional 1,015 acres of topography have been affected by linear features such as roads and pipelines. With the addition of incidental acreage changes related to unknown developments, recreational facilities, and homes, previous disturbance has affected approximately 2 percent of the topography of the CESA. The addition of 84 acres of changes to topography related to grading under the Proposed Action would be a negligible cumulative effect on topography in the CESA.

Ground-disturbing activities associated with the construction, operation, maintenance, and decommissioning of the Project, along with other past, present, or RFFAs, could result in a cumulative effect on soil resources. Under the Proposed Action, ground-disturbing activities would increase the potential for down gradient soil loss through wind- and water-driven erosion. While soil erosion best management practices would be in place for the Project, some amount of localized soil erosion can be expected, given the acreage graded and the acreage of vegetation disturbed (but not graded), typically dry soil conditions, and occurrence of high winds in the development area.

The CESA for soil resources is HUC 10 (Eight Mile Wash-Green River) from I80 north to where the HUC meets SH372 (200,959 acres) (**Figure 4.2-1**). The period considered for cumulative effects to soil resources is up to 50 years to take into account the time it would take for herbaceous vegetation to completely establish on disturbed areas. Previous disturbance has affected approximately 2 percent of the soil in the CESA. It is presumed that a certain portion of this previous soil disturbance has been reclaimed or is in the process of being reclaimed, which would reduce the effects (**Section 4.1.2**) of such disturbance. The additional soil disturbance under the Proposed Action would be a negligible cumulative effect on soil resources in the CESA. It is assumed that all reasonably foreseeable development on BLM lands near the Project area and surrounding public lands would be subject to similar design considerations and site-specific environmental analysis to reduce the potential future cumulative impacts to soil resources.

4.2.4 Water Resources

There would be only negligible direct or indirect effects to water resources from the Project; therefore, there would not be any cumulative effects.

4.2.5 Vegetation Resources

Like much of the public lands BLM administers, the area has been affected by utility corridors, mining claims, oil and gas leasing, settlements and livestock grazing since the mid-19th century. These disturbances have altered the ecological processes that maintained the biological integrity of the vegetation communities and rangelands and has provided for the introduction and expansion of exotic invasive species.

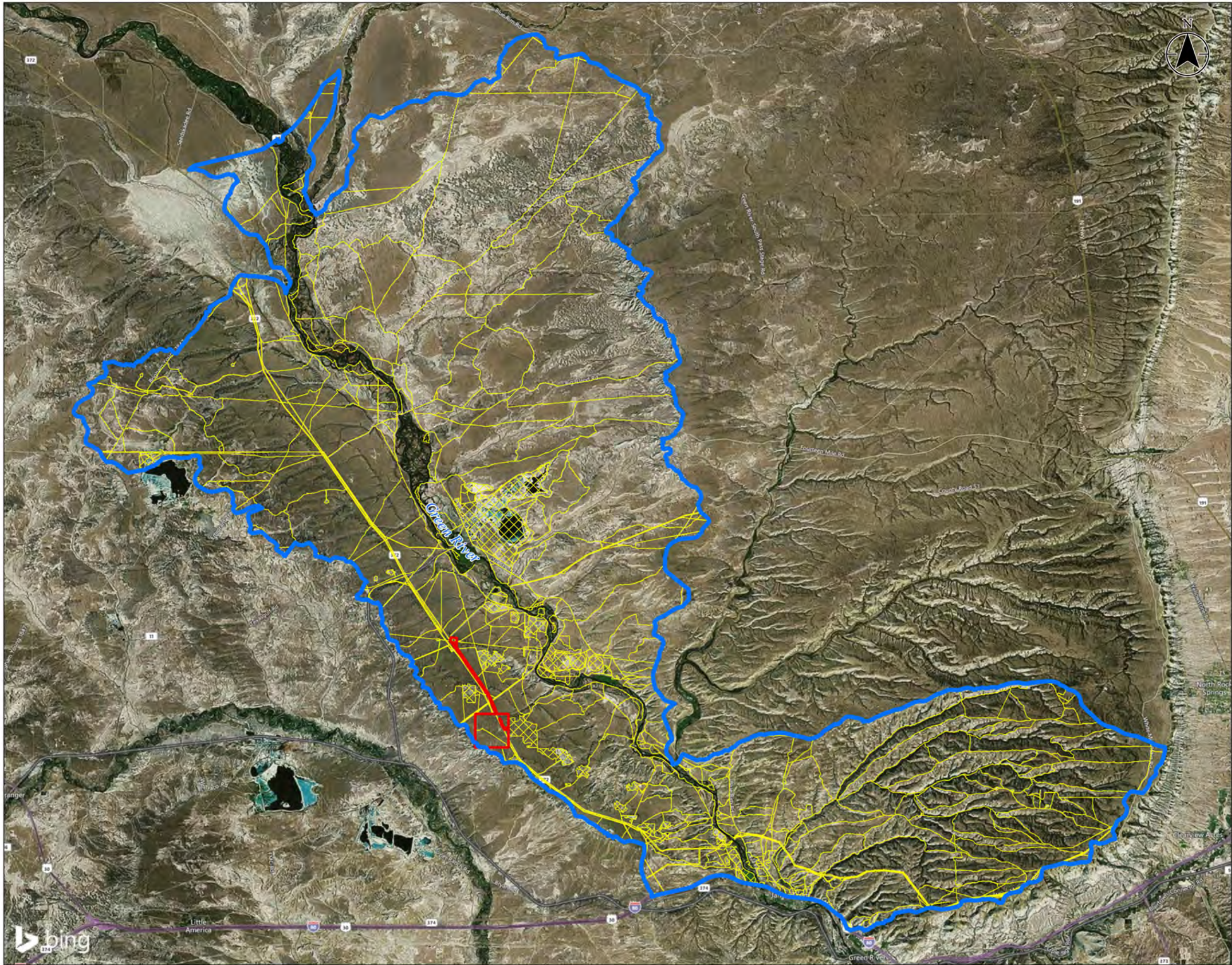


Figure No.

4.2-1

Title

Cumulative Effects Study Area for Topography, Soils, Vegetation, and Visual Resources

Client/Project

Sweetwater Solar LLC
Sweetwater Solar Energy Project

Project Location

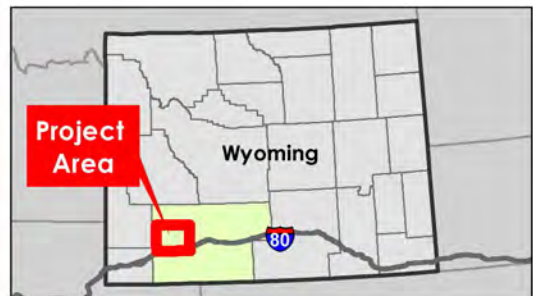
T20N R109W S34; T19N R109W S2, 3, 11, 14
Sweetwater County, WY
203706043

Prepared by EDZ on 2017-10-26
Technical Review by SL on 2017-10-26

Legend

- Cumulative Effects Study Area
- Project Area
- Ground Disturbance Areas

0 3 6 Miles
1:190,080 (At original document size of 11x17)



Notes

- Coordinate System: NAD 1983 StatePlane Wyoming West FIPS 4904 Feet
- Service Layer Credits: Earthstar Geographics SIO © 2017 HERE © 2017 Microsoft Corporation

The CESA for vegetation resources is HUC 10 (Eight Mile Wash-Green River) from I80 north to where the HUC meets SH372 (200,959 acres) (**Figure 4.2-1**). The period considered for cumulative effects to vegetation resources is up to 50 years to take into account the time it would take for herbaceous vegetation to completely establish on disturbed areas. Previous disturbance has affected approximately 2 percent of the vegetation communities and rangeland in the CESA. When combined with the effects from past, present, and RFFAs, there could be a minor cumulative effect on vegetation until revegetation on the Project area was successful. In addition to the 3,664 acres of vegetation communities and rangelands that been affected by industrial activities and the 1,015 acres that have been affected by linear features such as roads and pipelines, an additional 657 acres of native vegetation has been replaced by agricultural fields in the CESA.

It is presumed that a certain portion of this previous vegetation removal associated with industrial facilities and linear features has been reclaimed or is in the process of being reclaimed, which would reduce the effects (**Section 4.1.4**) of such disturbance. The vegetation removal, mowing, and potential community changes on the Project area would be a negligible cumulative effect on vegetation resources in the CESA. It is assumed that all reasonably foreseeable development on BLM lands near the Project area and surrounding public lands would be subject to similar design considerations and site-specific environmental analysis to reduce the potential future cumulative impacts to vegetation resources.

4.2.6 Wildlife Resources

The CESA for wildlife resources is the Project area plus a one-mile buffer unless stated otherwise. The CESA is represented primarily by shrubland vegetation types, intermittent drainages, and surrounding rolling plains. More specifically sagebrush shrubland and desert shrub habitat.

The Project would fence off 481 acres of sagebrush shrubland and desert shrub habitat types, used by wildlife (including big game, migratory birds, and special status species) for breeding, foraging, and movement.

Past, present, and RFFAs within the CESA that may impact wildlife and their habitat, including special status species, include ROWs (e.g., transmission lines, water lines, fiber optics, roads, etc.), livestock grazing, mineral material pits, dispersed recreation, locatable mineral exploration and mining, and invasive weed treatments.

There are existing mining claims and leasable solid and fluid mineral sites primarily within the Wyoming big sagebrush habitat. The existing level of disturbance within the sites ranges from almost entirely disturbed complete with new access roads, overhead transmission lines, and fences to containing only a few small sample pits or drill/bore holes and temporary access roads.

Past, present, and RFFAs such as constructing range improvements and conducting invasive weed treatments in many cases can increase the quantity and quality of habitat available to wildlife. Conversely, actions such as recreation, mining, oil and gas development, creating mineral material pits, agricultural activities, and livestock grazing can either directly and/or indirectly (e.g., noise) have negative impacts on the quantity and/or quality of habitat available to wildlife. When analyzing the potential impacts of the Project in combination with past, present, and RFFAs, the incremental change in the quantity and quality of habitat available for wildlife (including migratory birds and special status species) in the CESA would be minimal. Many of the local wildlife populations that occur in the Project region likely would continue to occupy their respective ranges (minus the Project area) and breed successfully, although population numbers may show a small decrease relative to the movement restrictions and impacts to behavior such as avoidance to tall structures and obstructed views.

Big Game

For pronghorn, the WGFD considers Hunt Areas 85 through 93, 96, 101, and 107 as the extent of the 6,842,167-acre pronghorn Sublette Herd Unit (PR401). The CESA covers Hunt Area 96 (402,334 acres). In recent years, the population for this herd has remained relatively stable, although an updated population estimate is not yet available following the severe winter of 2016-2017. Approximately 282,366 acres of pronghorn crucial winter/yearlong range occurs within the CESA. The entire Project area is located within pronghorn crucial winter/yearlong range and implementation of the Project would remove 481 acres of crucial winter/yearlong range for 30 years, which is approximately 0.17 percent of the total crucial winter/yearlong range found within the CESA. In addition to the loss of crucial winter/yearlong range from development of the Project, pronghorn seasonal movement within the CESA may be impacted as a result of the Project. This is particularly true for pronghorn that move around the eastern and western boundaries of the Project area as they travel to and from wintering ranges south and east of the Project area. Mitigation efforts have been made and are currently being conducted in other portions of the Sublette Herd Unit to aid migrating pronghorn (e.g., fence removal, fence marking, and additional research on movement patterns, installing signage along highways near known crossings). These efforts have a cumulative positive effect on pronghorn and aim to maintain or increase the herd population size. Therefore, in combination with past, present, and RFFAs, implementation of the Project would have negligible impacts on the Sublette pronghorn herd population. However, locally severe impacts could occur as a result of restricting pronghorn movements during winters of deep snow and extreme cold.

Migratory Birds

The CESA for migratory birds is the Project Area and an additional one-mile buffer. Existing overhead transmission lines exist within CESA, all of which may provide perching opportunities for avian species and still present a collision risk to birds and bats, even though many already have perch deterrents installed. These transmission lines may still also present an electrocution and collision hazard to larger bird species (e.g., raptors). The ECL would contribute additional overhead transmission line to the overall quantity of transmission lines currently within the CESA. Constructing the ECL would result in a very minor increase in the amount of artificial perching/nesting opportunities for avian species and would not considerably increase the collision or electrocution potential for birds from transmission lines within the CESA, especially since existing overhead transmission lines already occur within and immediately adjacent to the Project area and have perch deterrents installed. However, even a small increase in the number of artificial perching opportunities may cause additional predation on local wildlife species, such as migratory birds and small mammals.

Pygmy Rabbit (BLM Sensitive)

No additional environmental effects are expected beyond those discussed in **Section 4.1.5**.

Sensitive Bat Species (BLM Sensitive)

No additional environmental effects are expected to sensitive bats species beyond those discussed in **Section 4.1.5**.

Greater Sage-grouse

Regarding specific impacts to Greater Sage-grouse, the entire Project is within a GHMA. There are approximately 15,623 acres in the two-mile radius CESA. Similar to other wildlife species discussed above, the local Greater Sage-grouse population that occurs in the Project region likely would continue to occupy their respective ranges and breed successfully, although local population numbers may decrease relative to the amount of cumulative habitat loss and disturbance from incremental development. At this time there are approximately 3,383 acres of

disturbance in the CESA. The Project would remove another 703 acres from Greater Sage-grouse availability (total 4,089 acres), leaving 74 percent of the CESA available for use by Greater Sage-grouse. In addition, a timing stipulation (March 15 to June 30) would be implemented for projects in the CESA (similar to that for this Project) if construction activities were proposed to take place during that time.

Yellow-billed Cuckoo (Threatened)

No additional environmental effects are expected beyond those discussed in **Section 4.1.5**.

Colorado River Fish (Endangered)

No additional environmental effects are expected beyond those discussed in **Section 4.1.5**.

4.2.7 Cultural Resources and Native American Trust Assets

The CESA for cultural resources is Sweetwater County. Indirect and direct effects to cultural resources similar to those that would occur under the Project are likely to have occurred and most likely would continue to occur in Sweetwater County through increased access, development, and increased human presence, as a result of past, present, and RFFAs. The effects on cultural resources under the Project would be mitigated as described in **Section 4.3**. Therefore, cumulative effects would not occur.

There would not be any direct or indirect effects on Native American trust assets; therefore, there would not be any cumulative effects.

4.2.8 Land Use and Recreation

There would be only negligible direct or indirect effects on land use and recreation from the Project; therefore, there would not be any cumulative effects.

4.2.9 Visual Resources

The CESA for visual resources is HUC 10 (Eight Mile Wash-Green River) from I80 north to where the HUC meets SH372 (200,959 acres) (**Figure 4.2-1**). Previous industrial activity and linear features have changed the visual landscape on approximately 2 percent of the of the CESA. The Project is proposed for an area characterized visually as an elevated shrubland that includes limited views of widely dispersed structures that indicate land alterations associated with extractive industries. Given the adjacent gravel pit, the degree of development in the immediate vicinity of the Project would appear to be substantially expanded with the Project. However, both the pit and Project would be visible only for a relatively short duration of time, mainly by viewers traveling along SH372 at typically high rates of speed. With the Project developed, these viewers would experience views of an intensively developed site from within the development, itself. Views of the Project from areas north and south along the highway, however, would be limited by topography, and the Project's lack of substantial vertical forms would prevent the Project from being prominently visible in longer duration, long-distance views. Further, the generally sparse degree of development in the region allows for a sense of visual recovery; large structures may be visible on the horizon, but there is substantial physical separation between areas where development would be highly visible to viewers. Views of the Project would be discrete from most other developments in the area, and the degree to which Project-based contrast with regard to form, line, color, and texture would be visible would be limited and not likely to be viewed cumulatively with other projects. Due to the relatively short duration of the relatively limited views within which the Project would be prominently visible, and the physical distance between the Project and other developments of similar scale in the vicinity, present or future, the Project would not result in any cumulative effects to visual resources.

4.2.10 Transportation

The CESA for transportation is I80 from Rock Springs to the interchange with SH372 and SH372 from I80 to the Raven Substation, since that would be the portions of SH372 and I80 affected by the Project. The RFFAs identified in **Table 4.2-1** would only cumulatively affect transportation if RFFAs not already accounted for in direct effects (**Section 4.1.9**) occurred during the active facility construction period of the Project (July through December). For example, if a new gravel operation became operational or an existing gravel operation expanded their current operations or output during the same period. Otherwise, there would not be cumulative effects beyond the direct effects identified in **Section 4.1.9**.

4.2.11 Socioeconomics

The CESA for socioeconomics is Sweetwater County. The RFFAs identified in **Table 4.2-1** are those that have historically occurred in Sweetwater County for many years. Those projects focus mainly on various types of construction, oil and gas development and mining activity, which are all activities that have been present in the County's economy and demographic make-up over the long-run. Current and future construction, energy development and mining projects will all require a number of hired workers; therefore, depending on the specific timing, duration, and required workforce of those activities in relation to the Project's construction schedule, there may be some increased competition for labor and perhaps increased demand for short-term housing. Additional demands also may be placed on certain public facilities or services if Project construction overlaps with one or more other activities. However, local County businesses would benefit from increased sales due to Project construction and other activities and County jurisdictions would receive property, sales/use, and lodging tax revenue from each of those activities, as applicable. The Project's workforce requirements and anticipated local expenditures during its operational phase would be minimal and would therefore not likely add to any long-term cumulative economic impacts. Overall, in combination with other anticipated activity, the Project would result in a short-term beneficial cumulative economic stimulus to Sweetwater County.

4.3 MITIGATION MEASURES

With the implementation of EPMs (**Section 2.2.3**), the CMRP and Wildlife Monitoring Plan (**Appendix A**), and wildlife timing restrictions (**Section 4.1.5.2**), there would not be any additional mitigation measures necessary for the Project (with the exception of cultural resources).

One NRHP-eligible site would be impacted by the Proposed Action. The Northern Arapaho Tribe have stated that data recovery is acceptable to mitigate adverse effects to contributing portions of NRHP-eligible sites. Once planned impacts from the Project are known, a data recovery plan will be developed. Once the data recovery plan(s) have been reviewed by the BLM, it will also be sent to Wyoming SHPO, the Eastern Shoshone Tribe, Northern Arapaho Tribe, and the Shoshone-Bannock Tribe of the Fort Hall Reservation. If approved, the data recovery plan will serve as the framework for mitigation of adverse effects for the affected site. If multiple eligible properties are to be affected, then an overall historic properties treatment plan will be developed that will include data recovery plans for each affected site. The historic properties treatment plan will undergo the same process of approval as the data recovery plan for a single site.

4.4 RESIDUAL EFFECTS

With the exception of cultural resources, there would not be any mitigation measures for the Project. Therefore, there would not be any residual effects.

With the implementation of the approved data recovery and treatment plan (**Section 4.3**), there would not be any residual effects on cultural resources.

5.0 Tribes, Individuals, Organizations, or Agencies Consulted

Tribes, individuals, organizations, and agencies were included in the scoping process.

Further information regarding tribal consultation is provided in **Section 3.6**. The BLM formally requested consultation with the following tribes via letters sent January 12, 2017:

- Eastern Shoshone Tribe;
- Northern Arapaho Tribe;
- Shoshone-Bannock Tribes of Fort Hall; and
- Ute Tribe of the Uinta and Ouray Reservation.

The Eastern Shoshone Tribe responded to the invitation to consult on the Project and provided input in a letter received by the BLM on August 23, 2017. The letter stated that the Eastern Shoshone Tribal Historic Preservation Office found that there may be a low potential for an adverse effect due to the proposed undertaking on cultural resources significant to the Eastern Shoshone Tribe (based on the commitment to avoid NRHP-eligible sites). They further determined that the Project would directly affect documented cultural resources and that the vicinity of the Project is significant to the Eastern Shoshone Tribe who have camped, hunted, practiced their ceremonies, and gathered food in the area around the Project for millennia. They stressed that it is important to remain in the areas designated in the original site plans (**Figures 2.2-1** and **2.3-1**). The Eastern Shoshone Tribe attended a meeting at the RSFO and a field visit on June 23, 2017. No further cultural resource work is required on their behalf outside of the designated areas. However, if potential (important) cultural resources were located during construction they would be immediately notified.

The Shoshone-Bannock Tribe of the Fort Hall Reservation responded that they wish to defer to the Eastern Shoshone Tribe regarding effects of the Project. Although the Northern Arapaho have not submitted written comments, they did state during the July 2017 site visit that data recovery is an acceptable form of mitigation for adverse effects to important cultural resources. (**Section 4.3**). The Northern Ute Tribe did not respond to the request and consultation with this tribe is not being pursued at this time.

Under the Programmatic Agreement between the BLM and the Wyoming SHPO, the Wyoming SHPO was consulted regarding the National Register status of cultural sites as well as the overall effect that the Project may have on historic properties within the direct and indirect APE for this undertaking.

The USFWS was consulted on threatened and endangered species (**Appendix C**), migratory birds, and bald and golden eagles. The WGFD was consulted on all other wildlife matters.

6.0 List of Preparers and Reviewers

6.1 LIST OF PREPARERS

The individuals in **Tables 6.1-1** and **6.1-2** assisted in the preparation of this EA.

Table 6.1-1 BLM Preparers

Name	Title
Kimberlee Foster	RSFO Manager
Crystal Hoyt	Realty Specialist
Joanna Nara-Kloepper	Assistant Field Manager, Minerals
Lorraine Keith	Wildlife Biologist
Gavin Lovell	Assistant Field Manager, Resources
Gene Smith	Archaeologist/Paleontology Coordinator
Scott Stadler	Supervising Archaeologist
Georgia Foster	Outdoor Recreation Planner
Steve Madden	Outdoor Recreation Planner
Spencer Allred	Range Specialist
Dennis Doncaster	Hydrologist
Jim Glennon	Botanist
Brandon Teppo	Natural Resource Specialist

Table 6.1-2 Contractor Preparers

Name	Firm	Title/Resource
Stephanie Lauer	Stantec	Project Manager
Matt Brekke	Stantec	Assistant Project Manager Wildlife Biologist
Erin Bergquist	Stantec	Vegetation and Range
Karla Knoop	Stantec	Geologic, Mineral, and Paleontological Resources Soil Resources Water Resources
Josh Hohn	Stantec	Visual Resources
Brian Bass	Stantec	Land Use and Recreation Hazardous Materials
Jenni Prince-Mahoney	Stantec	Cultural Resources
Eric Clark	Stantec	Air and Climate Resources
Nicole Lynass	Stantec	Transportation
Susan Walker	Harvey Economics	Socioeconomics

Name	Firm	Title/Resource
Mark Klein	Pacific Northwest Energy Consultants	Transmission Reliability
Stacy Goodrick	Western Archaeological Services	Cultural Resources

6.2 LIST OF REVIEWERS

The individuals identified in **Table 6.1-1** and cooperating entities identified below provided review of this EA:

- Office of the Governor of Wyoming;
- Wyoming Department of Agriculture;
- Wyoming Department of Environmental Quality;
- WGFD;
- Sweetwater County; and
- Coalition of Local Governments.

The comments provided by the cooperating entities, and the BLM's responses to their comments, are provided as **Appendix E**.

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