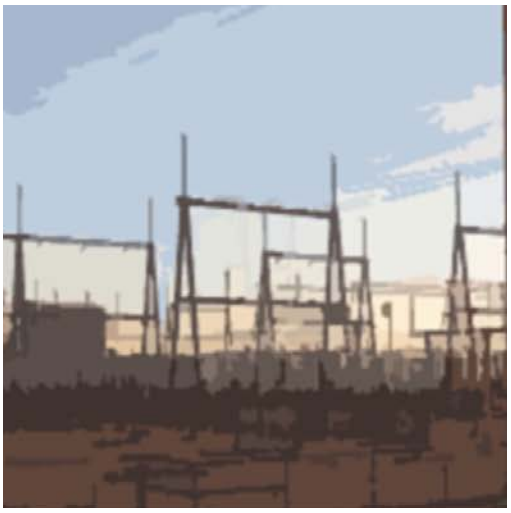
# Draft Environmental Assessment for the Cliffrose Solar Interconnection Project DOE/EA-1989



PREPARED BY
DEPARTMENT OF ENERGY
WESTERN AREA POWER ADMINISTRATION
DESERT SOUTHWEST REGION

Western
AREA POWER
ADMINISTRATION

May 2015

**Department of Energy**
Western Area Power Administration
Desert Southwest Customer Service Region
P.O. Box 6457
Phoenix, AZ 85005-6457

MAY 01 2015

**SUBJECT: Notice of Availability of an Environmental Assessment for Public Comment for Western's Cliffrose Solar Interconnection Project, Mohave County, Arizona (DOE/EA-1989)**

Dear Interested Party:

Western Area Power Administration (Western) invites you to review and comment on the Environmental Assessment (EA) for the Cliffrose Solar Interconnection Project located near Kingman, Mohave County, Arizona. The document tracking number is DOE/EA-1989. Western is the lead Federal agency for this action and prepared this public document in compliance with the National Environmental Policy Act. Western seeks comments from Federal and State agencies, local governments, Indian tribes and individuals or organizations interested or affected by the proposal.

The EA can be accessed online at Western's Desert Southwest Region website or the U.S. Department of Energy's website:

http://www.wapa.gov/dsw/environment/CliffroseSolarEnergyProject.html

http://energy.gov/nepa/nepa-documents/environmental-assessments-ea

Review copies are available at the Mohave County Library - Kingman: 3269 North Burbank Street, Kingman, AZ 86401. Printed copies can be obtained upon request from Western.

Western would like to know of any comments you have on the EA. Please make your comments as specific as possible. Comments that are solution-oriented and provide specific examples are effective. For more advice, see Page 27 in *A Citizen's Guide to the NEPA: Having Your Voice Heard,* which is available at http://energy.gov/nepa/downloads/citizens-guide-nepa-having-your-voice-heard. Comments can be provided in writing, by phone, by fax, or via email. All comments received or post-marked before or on Monday, June 8, 2015 will be considered.

Mail: Western Area Power Administration
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Comments received, including names and addresses, could be subject to release under the Freedom of Information Act. Individuals may request that we withhold their name or home address, which we will honor to the extent allowable by law. If you wish us to withhold your name or home address, you must state this prominently at the beginning of your comments.

**Supplementary Information**

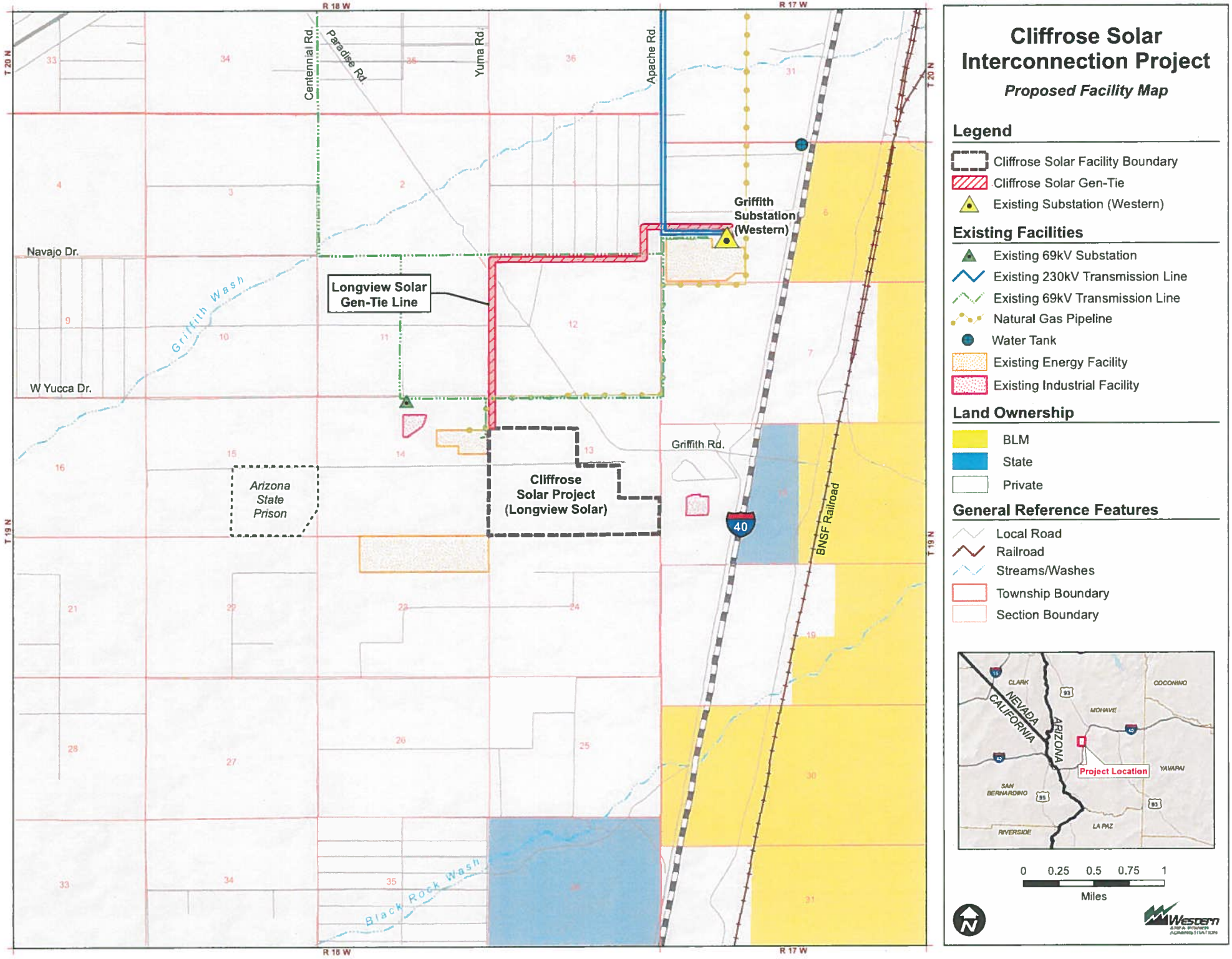
Western proposes to execute an interconnection agreement to connect Longview Solar's proposed Cliffrose Solar Facility to Western's Griffith Substation. Western would construct, own, operate, and maintain transmission equipment at the substation to support the physical interconnection. Longview Solar's would construct, own, operate, and maintain the proposed Cliffrose Solar Facility that consists of a 350-acre, 45 megawatt photovoltaic installation, containing approximately 200,000 photovoltaic panels, and a three mile long single-circuit 230kV generation intertie transmission line.

We look forward to receiving your comments on this action.

Sincerely,

Linda Marianito
Environmental Manager

Enclosure (map)




# Cliffrose Solar Interconnection Project

***Proposed Facility Map***

## Legend

- Cliffrose Solar Facility Boundary
- Cliffrose Solar Gen-Tie
- Existing Substation (Western)

## Existing Facilities

- Existing 69kV Substation
- Existing 230kV Transmission Line
- Existing 69kV Transmission Line
- Natural Gas Pipeline
- Water Tank
- Existing Energy Facility
- Existing Industrial Facility

## Land Ownership

- BLM
- State
- Private

## General Reference Features

- Local Road
- Railroad
- Streams/Washes
- Township Boundary
- Section Boundary

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Western Area Power Administration

# DRAFT ENVIRONMENTAL ASSESSMENT

for the

**CLIFFROSE SOLAR INTERCONNECTION PROJECT**
**DOE/EA-1989**

Prepared by

**Department of Energy**
**Western Area Power Administration**
**Desert Southwest Region**

**May 2015**

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# LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AC | Alternating Current |
| ACS | American Community Survey |
| ADA | Arizona Department of Agriculture |
| ADEQ | Arizona Department of Environmental Quality |
| ADOT | Arizona Department of Transportation |
| ADWR | Arizona Department of Water Resources |
| APE | Area of Potential Effect |
| APLIC | Avian Power Line Interaction Committee |
| ASLD | Arizona State Land Department |
| AZGFD | Arizona Game and Fish Department |
| BCC | Birds of Conservation Concern |
| BLM | Bureau of Land Management |
| BMGS | Black Mountain Generating Station |
| BNSF | Burlington Northern Santa Fe Railroad |
| CAA | Clean Air Act |
| CWA | Clean Water Act |
| DC | Direct Current |
| DOE | Department of Energy |
| EA | Environmental Assessment |
| EMF | Electric and Magnetic fields |
| EPA | Environmental Protection Agency |
| ESA | Endangered Species Act |
| GPM | gallons per minute |
| Hz | hertz |
| I-40 | Interstate 40 |
| ICNIRP | International Commission on Non-Ionizing Radiation Protection |
| IPaC | Information, Planning, and Conservation |
| IVM | Integrated Vegetation Management |
| kA | kiloamperes |
| KFO | Kingman Field Office |
| Kf | K-factor |
| KOP | Key Observation Points |
| kV | kilovolt |
| kV/m | kilovolt per meter |
| LGIP | Large Generator Interconnection Procedures |
| MBTA | Migratory Bird Treaty Act of 1918 |
| MCCWPP | Mohave County Community Wildfire Protection Plan |
| MCDPH | Mohave County Department of Public Health |
| mG | milliGauss |
| MOU | Memorandum of Understanding |
| MW | megawatt |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |

| | |
|---|---|
| NRHP | National Register of Historic Places |
| O&M | Operation and Maintenance |
| OHV | Off Highway Vehicle |
| PV | Photovoltaic |
| ROW | Right-of-way |
| SDWA | Safe Drinking Water Act |
| SGCN | Species of Greatest Conservation Need |
| SNA | Significant Nexus Analysis |
| tpy | tons per year |
| USACE | United States Army Corps of Engineers |
| USDA | United States Department of Agriculture |
| USFWS | United States Fish and Wildlife Service |
| VRI | Visual Resource Inventory |
| VRM | Visual Resource Management |
| WSC | Wildlife of Special Concern |
| WUS | Waters of the United States |

# EXECUTIVE SUMMARY

## Project Location

The Cliffrose Solar Interconnection Project (Project) is located in Mohave County, Arizona, on Western Area Power Administration (Western)-owned and private land.

## Project Participants

Western, a federal marketing administration under the US Department of Energy, is the lead federal agency for this Project pursuant to the National Environmental Policy Act (NEPA). Longview Solar LLC (Longview), a private solar development company, is the Project proponent.

## Purpose and Need

### Western's Purpose and Need

Western's purpose and need is to consider and respond to Longview's interconnection request in accordance with its Large Generator Interconnection Procedures as part of its Open Access Transmission Service Tariff and the Federal Power Act.

### Longview's Purpose and Need

The purpose and need of Longview's Proposed Action is to construct and operate a solar facility to generate and distribute photovoltaic (PV) solar power.

## Proposed Action and Alternatives

### Western's Proposed Action

Western's Proposed Action is to execute an interconnection agreement to connect Longview's proposed solar facility to Western's Griffith Substation, and to construct, own, operate, and maintain facilities supporting the physical interconnection. Western would build a new 230kV line bay at Griffith Substation, install protection and communications equipment in the existing control house, add cables between the new bay and the control house, add metering equipment near the new bay and in the control house, and erect the gen-tie transmission line entry structure situated outside the substation fence. Western would also likely modify the Griffith Peacock and Griffith McConnico 230 kilovolt (kV) Transmission Lines within existing rights-of-way to accommodate crossings by Longview's gen-tie line. The federal action is limited to the execution of the interconnection agreement and Western's construction, operation, and maintenance of its facilities.

Longview's Proposed Action

Longview's Proposed Action is to build and operate a 350-acre, 45 megawatt (MW) PV solar facility and a three mile long single-circuit 230kV gen-tie to deliver the electricity generated at the solar facility to Western's Griffith Substation.

The proposed solar array field would comprise approximately 200,000 PV panels on fixed-tilt mounting systems or single-axis, horizontal tracker structures supported by driven steel posts and/or other embedded foundation design. The PV modules would convert sunlight into Direct Current (DC) electricity by conveying power from each of the multiple rows of PV modules through one or more combiner boxes to an inverter. The inverter would convert the DC power to Alternating Current (AC) power, which would then either be delivered directly to an on-site switchyard or routed to a medium-voltage transformer that would step up the voltage of the power prior to delivery to the on-site switchyard. At the on-site switchyard, the power would be stepped up to 230kV for delivery to Western's transmission system via the gen-tie.

The proposed gen-tie would consist of an approximately three mile long single-circuit line, within an approximately 200 to 400-foot wide right of way (ROW), resulting in between 36-73 acres of disturbance. Longview would obtain, own, and maintain this ROW. The gen-tie structures would be approximately 85-foot tall steel monopoles with vertical framing. Longview would install a dual fiber optic communication path on top of the structures. The proposed gen-tie would extend north from the northwestern corner of the solar facility and terminate at a new Western 230kV double-dead-end monopole entry structure that would direct the line into the new bay to be constructed within the Griffith Substation.

**Summary of Environmental Consequences**

Western considered the following resource areas, but did not evaluate them further because Western expects no impacts: environmental justice, farmlands, floodplains, fuels/fire management, minerals, noise and sensitive receptors, rangelands, recreation, threatened or endangered species, wetlands/riparian zones, wild and scenic rivers, and wild horses/burros.

A summary of the environmental consequences resulting from the Proposed Actions and No Action alternatives for each resource analyzed follows.

Air Quality/Climate Change

Western's and Longview's Proposed Actions would generate minimal, localized, short-term, pollutant emissions from construction equipment during construction of the interconnection facilities, and solar and gen-tie facilities respectively. Over the long term, minimal vehicular emissions associated with maintenance and repair of Griffith Substation are expected to occur. The generation of localized dust pollution from ground-disturbing activities associated with the solar site and gen-tie construction operation and maintenance activities are also expected. Under the No Action Alternative, no new impacts to air quality are expected. The extent of cumulative impacts on air quality depends on emission source characteristics, pollutant types, emission rates, and meteorological and topographical conditions. Western expects that the implementation of the

Proposed Actions, along with other past, present, and reasonably foreseeable future projects, would have minimal cumulative impacts to air quality, climate, and climate change.

Cultural and Paleontological Resources and Native American Religious Concerns

Both Western's and Longview's Proposed Actions would result in no impacts to historic properties within the study area, based on the cultural resource inventory completed for both actions. Under the No Action Alternative, there would be no new impacts to cultural resources. The majority of the identified past, present, and reasonably foreseeable future projects and actions are federal, thus subject to required cultural resource studies prior to use of the area. Western expects that the implementation of the Proposed Actions, along with other past, present, and reasonably foreseeable future projects, would result in minimal cumulative impacts to cultural resources.

Intentional Destructive Acts

Intentional destructive acts may be directed at Western's transmissions system and facilities within and near Griffith Substation. The extent and duration of this impact would depend upon the specific role and relationship of damaged or destroyed equipment to and within the overall infrastructure network as well as upon the degree of damage. Implementation of Longview's Proposed Action could also increase the potential for intentional destructive acts, as it would introduce new utility infrastructure, which could be viewed as a potential target. The incidence of an intentional destructive act is speculative, but could occur at Griffith Substation or Longview's proposed solar and gen-tie facilities. Based on past occurrences, if an act were to take place, it would likely result in minor or negligible environmental impacts.

No impacts from intentional destructive acts would occur under the No Action Alternative. Implementation of the Proposed Actions combined with other past, present, and reasonably foreseeable future projects would introduce new infrastructure into the region, which could be viewed as a target for destructive acts. Consequently, cumulative impacts resulting from intentional destructive acts could result.

Land Use

Western's Proposed Action would preclude the ability for the interconnection of other power generation facilities into the currently open transmission line bay position in the Western-owned Griffith Substation. The Proposed Action would establish ROW for the installation of the gen-tie substation entry structure on approximately 1.1 acres of currently vacant land, resulting in the removal of this land from potential future use. No additional land use impacts to federal, state, or privately owned land are expected through implementation of Western's Proposed Action.

Longview's Proposed Action would result in approximately 350 acres of disturbance associated with the solar facility, and approximately 73 acres of new ROW associated with the gen-tie, resulting in the removal of this currently vacant land from potential future use. Western expects no land use impacts associated with Longview's Proposed Action on federal, state, or private land not owned or leased by Longview.

No impacts to land uses within the study area would result through implementation of the No Action Alternative. The land would remain available for development. The Proposed Actions combined with other past, present, and reasonably foreseeable future projects would result in the removal of lands available for other uses. Longview expects minimal incremental cumulative impacts to land use.

Public Health and Safety

Public health is not expected to be affected by the short-term construction activities and subsequent operation and maintenance associated with Western's and Longview's Proposed Actions. Western expects the Proposed Actions to generate localized pollution, mainly from construction activities, and from continued operation and intermittent maintenance. Western expects minimal impacts relating to dust generation as construction activities would be temporary and localized.

The No Action Alternative would not result in negative impacts to public health and safety. Due to the rural nature of the Project and solar facility region and distance to population centers in the county, Western expects minimal impacts from the Project and solar facility, i.e., increased travel, vehicle emissions, and dust generation, combined with past, present, and future development.

Socioeconomics

Western does not expect their Proposed Action to noticeably affect the socioeconomics of Mohave County. The expected number of construction and operation jobs associated with Western's Proposed Action would have a negligible effect on overall employment in Mohave County.

Western expects Longview's Proposed Action to result in minimal beneficial impacts to socioeconomics. During construction, the number of onsite workers would average approximately 100 per day, with a peak of 200 workers per day. Permanent maintenance and operation jobs associated with the solar facility would have a small effect on overall employment in Mohave County. Additionally, improvements made to vacant land would subject that land to a potentially higher tax assessment ratio, which would affect the long-term property tax revenue paid to Mohave County.

No impact would occur under the No Action Alternative to socioeconomic conditions in the county. Due to the rapid growth expected in Mohave County, the existing and future tourism industry, and proximity to large urban centers such as Phoenix, Arizona and Las Vegas, Nevada, the Proposed Actions, along with reasonably foreseeable future actions, could benefit new development and subsequent populations that result by contributing to the renewable energy industry within the region.

Soils

Both Western's and Longview's Proposed Actions could adversely affect soil resources by increasing the exposure of soil that is susceptible to water or wind erosion at the land surface.

This could result in a slight degradation of the land surface, reduced long-term soil productivity through loss of topsoil material, and increased nonpoint pollution as eroded soil material could be washed into nearby ephemeral streams.

Implementation of the No Action Alternative would not impact existing soil conditions. Past, present, and reasonably foreseeable future projects within the region could add to cumulative effects to soil resources, though impacts to soil resources are generally localized and do not result in regional cumulative effects. Western expects that the implementation of Western's and Longview's Proposed Actions along with other past, present, and reasonably foreseeable future projects would have minimal cumulative impacts to soil resources.

Travel Management/Transportation

Western's and Longview's Proposed Actions would result in minimal impacts to traffic in the study area, primarily during construction. A negligible temporary increase in traffic volume on existing transportation facilities would occur during construction and maintenance of facilities at Griffith Substation and solar facility components.

Under the No Action Alternative, no impact to existing travel management and traffic conditions would occur. Western expects impacts of the Proposed Actions, along with identified past, present, and reasonably foreseeable future development, to result in negligible cumulative effects to traffic and transportation.

Vegetation

Western's Proposed Action would take place in an area already fully developed and devoid of vegetation. The new Western gen-tie entry structure is located in native vegetation adjacent to the substation, and construction of this structure would cause the permanent loss of approximately 1.1 acres of vegetation.

Longview's Proposed Action would result in the direct loss of up to approximately 423 acres of vegetation. Ground and soil disturbance within the solar facility may increase susceptibility to the colonization of noxious weeds and other invasive plants. Although Longview's contractor observed no noxious weeds during a survey of the site, development and ground disturbance in the surrounding vicinity may facilitate the introduction of invasive plants.

Western expects no impacts to existing vegetation through implementation of the No Action Alternative. The Proposed Actions would contribute incrementally to the effects of past, present, and reasonably foreseeable future projects resulting in ground disturbance and vegetation loss. This could contribute to increased susceptibility of noxious and invasive weed colonization, which may induce resource competition, and therefore, native plant loss.

Visual Resources

Western anticipates low impacts to scenic quality, as the Project would be located within the vicinity of existing modifications for Class C landscapes. The facilities associated with both Western's and Longview's Proposed Actions as viewed from key observation points and other

sensitive viewers would be seen in the context of the existing transmission lines, and solar and other power generating facilities.

No impacts to visual resources would occur under the No Action Alternative. The Proposed Actions would incrementally add to the industrial nature of the Sacramento Valley. Western anticipates identified reasonably foreseeable future projects to be similar in nature to the existing development or to have the potential to create new visual impacts within the same viewshed as the Proposed Actions from public travel routes, recreation areas, and residential areas.

Water Resources

Due to the limited nature of the disturbance, the lack of surface water resources present in proximity to Western's proposed facilities, and small amount of water required for construction and operations, Western expects implementation of their Proposed Action to result in negligible impacts to water resources.

Longview expects that the proposed solar facility would need approximately 150 acre-feet of water during construction of the project, and approximately five acre-feet of water per year for operations, including PV panel washing and other non-potable and potable uses. Due to the short duration of construction activities and intermittent maintenance, and the limited amount of water required during operations, Western expects minimal impacts to water resources. No impacts to water resources would occur under the No Action Alternative.

The possibility of erosion exists with the development of this site as well as cumulatively with other past, present, or foreseeable future projects. Additionally, removal of vegetation and other construction activities associated with the Proposed Actions and other reasonably foreseeable future projects could alter the current drainage patterns thus affecting the erosion rates.

Wildlife

Western's Proposed Action would generate noise that may adversely affect wildlife within the area. Although electrical components can create an electrocution hazard to birds, the required clearance between energized and grounded components on 230kV systems is greater than the wingspan of bird species present in the Project area, and the potential that the Action would electrocute any birds is extremely low (Avian Power Line Interaction Committee [APLIC] 2006).

Impacts on wildlife from Longview's Proposed Action include loss of habitat, human disturbance, direct mortality, noise pollution, light pollution, and habitat fragmentation. The removal of up to 423 acres of vegetation would result in the nearly complete loss of wildlife and their habitat in the solar facility, although birds and some mammals would capably avoid construction vehicles and disperse out of the construction area. Potential impacts related to noise would be similar to those described above for Western's Proposed Action, although these impacts would take place over a greater area and time span associated with construction of the solar facility. Additionally, light pollution stemming from construction, although temporary, may disorient wildlife and impact foraging, reproduction, and communication.

Implementing the No action Alternative would not impact existing wildlife conditions. Wildlife present on the site would remain and continue to inhabit and disperse through the wildlife study area. The Proposed Actions would contribute incrementally to the effects of past, present, and foreseeable future projects resulting in ground disturbance and vegetation loss.

# Chapter 1. Introduction

## 1.1. Introduction

Western Area Power Administration (Western), an agency of the Department of Energy (DOE), has prepared this Environmental Assessment (EA) to analyze environmental impacts related to the Cliffrose Solar Interconnection Project (Project) proposed by Longview Solar LLC (Longview).

Longview applied to connect the proposed Cliffrose Solar Facility (solar facility) to Western's existing Griffith Substation located approximately 1.5 miles north-northeast of the proposed solar facility. Longview would make the connection via an approximately three mile, 230-kilovolt (kV) generation intertie line (gen-tie). Longview seeks to locate the proposed 45 megawatt (MW) photovoltaic (PV) solar facility on a site south of Kingman, Arizona in Mohave County. The proposed solar facility site (approximately 350 acres) is located between the Hualapai Mountains (approximately six miles to the east) and the Black Mountains (approximately five miles to the west), in Golden Valley, Arizona, and 0.4 miles west of Interstate 40 (I-40) (Figure 1).

The EA will address Western's action of allowing the interconnection for the proposed solar facility to the existing transmission system, which, if allowed, would include the construction of new facilities and modifications to existing Western facilities necessary to accommodate the interconnection. The EA will also include a review of the potential environmental impacts of constructing, operating, maintaining, and decommissioning the solar facility.

## 1.2. Purpose and Need

### 1.2.1. Western's Purpose and Need

Western's purpose and need is to consider and respond to Longview's interconnection request in accordance with its Large Generator Interconnection Procedures (LGIP) as part of its Open Access Transmission Service Tariff (Tariff) and the Federal Power Act. Western's Tariff is filed with the Federal Energy Regulatory Commission for approval.

Under the Tariff, Western offers capacity on its transmission system to deliver electricity when available. The LGIP contains terms for processing requests for the interconnection of generation facilities to Western's transmission system. In reviewing interconnection requests, Western must ensure that existing reliability and service is not degraded. Western's LGIP provides for transmission and system studies to ensure that system reliability and service to existing customers are not adversely affected by new interconnections. These studies also identify system upgrades or additions necessary to accommodate the proposed request and address whether the upgrades or additions are within the proposed Project scope.

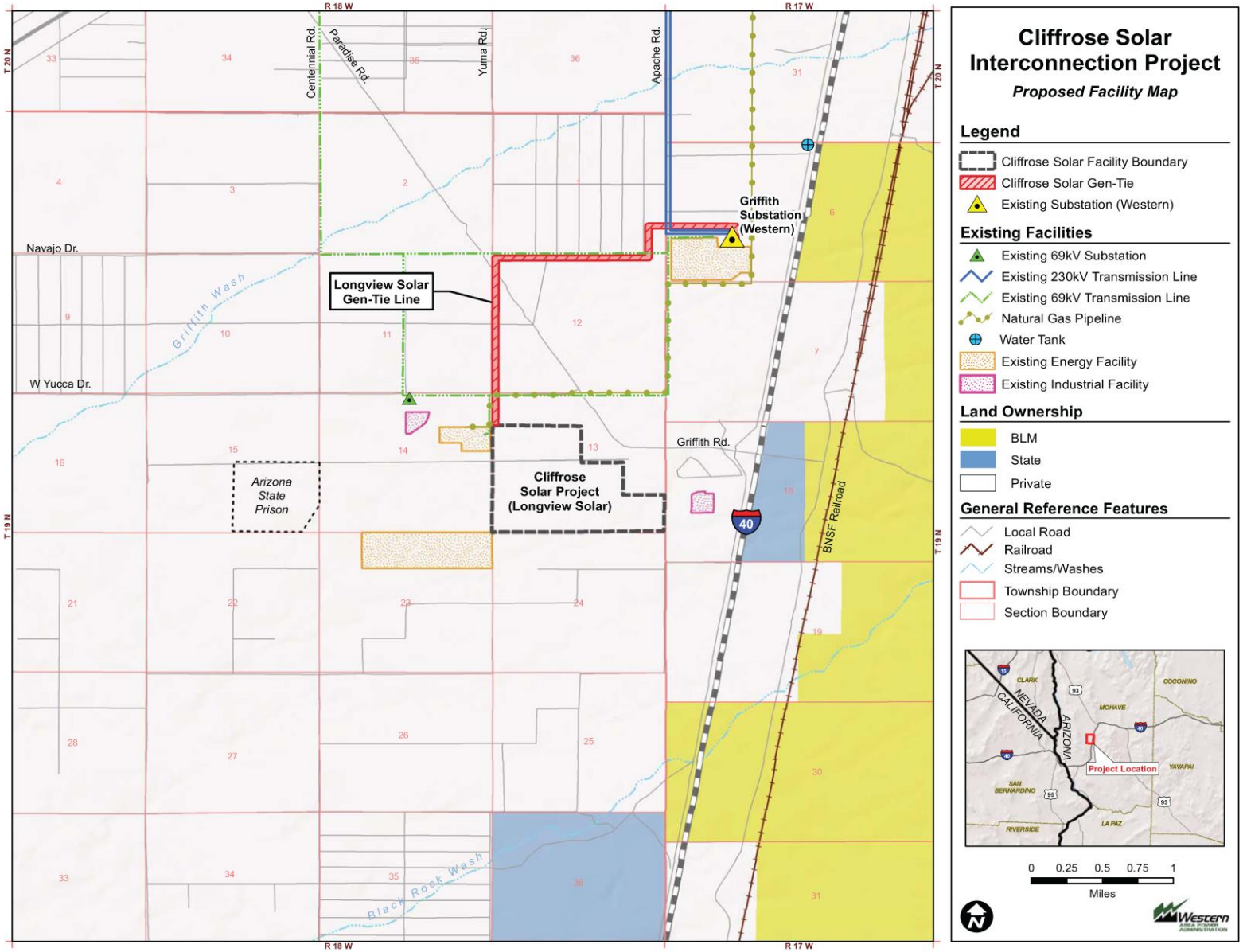



**Figure 1 Proposed Facility Map**

### 1.2.2. Longview's Underlying Purpose and Need

The purpose and need of Longview's Proposed Action is to construct and operate a solar facility to generate and distribute PV solar power.

## 1.3. Public Scoping and Tribal Consultation

### 1.3.1. Public Scoping

The scoping period for the proposed Project began September 12, 2014, and ended on October 17, 2014. Western sent a public scoping notification letter to all identified stakeholders on September 4, 2014, informing them of the proposed Project and scoping period, requesting input, providing opportunities for comment, and inviting them to a public open house meeting. A legal advertisement, providing the same information as the scoping notification letter, was placed in *The Kingman Daily Miner* newspaper, a daily electronic and print news publication based in Kingman, Arizona, with readership in Kingman and the surrounding areas. The advertisement was published on September 12, September 14, September 16, September 21, September 23, September 28, September 30, October 5, and October 17, 2014.

Western held an open-house style public meeting on September 30, 2014, at the Holiday Inn Express Hotel and Suites in Kingman, Arizona. At this public open-house meeting, Western and Longview provided general information on the proposed Project's technology and facilities, requirements of the NEPA process, and anticipated timelines for the proposed Project. Thirteen people attended the public meeting. The public was invited to comment on the proposed Project using comment forms provided at the meeting, via email, or written correspondence. Scoping meeting materials can be found in Appendix A.

The issues and questions raised during the public scoping meeting included the following:

- alternatives
- noise
- socioeconomics
- visual resources
- water resources

### 1.3.2. Tribal Consultation

Western initiated consultation with federally recognized Native American tribes with a notice of proposed Project letter sent on September 4, 2014. Tribes contacted included the:

- Chemehuevi Indian Tribe of the Chemehuevi Indian Reservation
- Colorado River Indian Tribes
- Fort McDowell Yavapai Nation
- Fort Mohave Indian Tribe
- Havasupai Tribe of the Havasupai Reservation

- Hualapai Tribe of the Hualapai Reservation
- Hopi Tribe of Arizona
- Kaibab Band of Paiute Indians
- Las Vegas Tribe of Paiute Indians
- Moapa Band of the Paiute Indians
- Paiute Indian Tribe of Utah
- Yavapai-Apache Nation of the Camp Verde Indian Reservation

One representative from the Colorado River Indian Tribe and one from the Hualapai Tribe of the Hualapai reservation participated as attendees at the September 30, 2014, public meeting.

## 1.4. Decisions Needed

### 1.4.1. Western's Decision

In reviewing this interconnection request, Western must ensure that existing reliability and service is not degraded. Western's decision is limited to deciding whether the solar facility proposed by Longview can be interconnected with the transmission system. Western's approval of this interconnection would enable the proposed Project to proceed. Based on the analysis presented in this EA, Western will determine whether to issue a Notice of Intent to prepare an Environmental Impact Statement or a Finding of No Significant Impact.

### 1.4.2. Other Decisions Needed

In addition to Western's decision described above, approvals from other governing bodies, outlined below, would be required in order for the solar facility and/or gen-tie to be constructed.

A Certificate of Environmental Compatibility would be required from the Arizona Corporation Commission – Power Plant and Transmission Line Siting Committee (Siting Committee). The Siting Committee evaluates applications to build power plants of 100 MW or more (though PV generation is excluded) or transmission projects of 115kV or more within Arizona. As the gen-tie is proposed as a 230kV transmission line, it would be subject to review and approval by the Siting Committee prior to construction.

Longview would also need to apply for and obtain a building permit from Mohave County Development Services. Design and construction of the solar facility would be required to follow the Mohave County Building Code, which regulates the use, occupancy, location, and quality of material used in construction.

# Chapter 2. PROPOSED ACTION AND ALTERNATIVES

## 2.1. Western's Proposed Action

### 2.1.1. Overview

Western's Proposed Action is to execute an interconnection agreement to connect Longview's proposed solar facility to Western's Griffith Substation, and to construct, own, operate, and maintain facilities supporting the physical interconnection. Western would build a new 230kV line bay at Griffith Substation, install protection and communications equipment in the existing control house, add cables between the new bay and the control house, add metering equipment near the new bay and in the control house, and erect the gen-tie transmission line entry structure situated outside the substation fence (Figure 2). Western would also likely modify the Griffith Peacock and Griffith McConnico 230kV Transmission Lines within existing ROWs to accommodate crossings by Longview's gen-tie line. The federal action is limited to the execution of the interconnection agreement and Western's construction, operation, and maintenance of its facilities.

If, and when, Longview requests transmission service from Western, Western would conduct appropriate studies to evaluate the request based upon the system conditions existing at the time. These studies would identify upgrades needed at other existing Western facilities to accommodate the request. Upgrades could include replacing conductors and other electrical equipment or installing new electrical equipment and controls. In the event that transmission system upgrades are required in order to meet a request from Longview, Western would conduct a separate NEPA process.

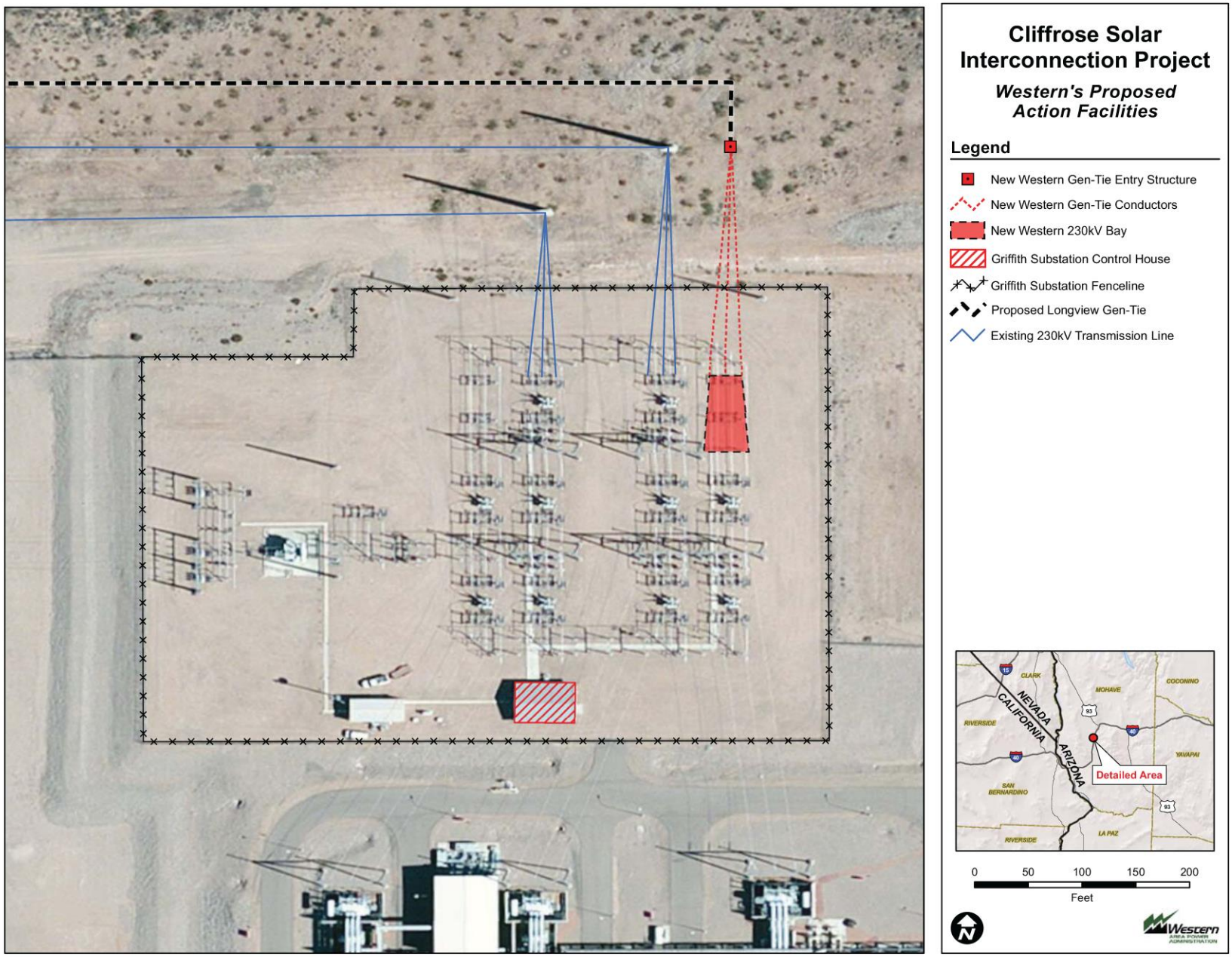



**Figure 2 Western's Proposed Action Facilities**

### 2.1.2. Proposed Facilities

230kV Substation Bay

In order to accommodate the interconnection, Western would construct a new 230kV transmission line bay in an open position in the northeastern most end of the Griffith Substation. The new bay would consist of one 230kV 90 kiloampere (kA) circuit breaker, two 230kV disconnect switches (one with grounding blades), instrument transformers, support steel and foundations, rigid bus-work, a steel takeoff structure (Figure 3), and relay protection equipment. Western would route control and communications equipment and power cables between the new bay position and the control building using the existing cable tray system. Western would install metering equipment, including pedestal-mounted instrument transformers near the new bay and meters in the control building.

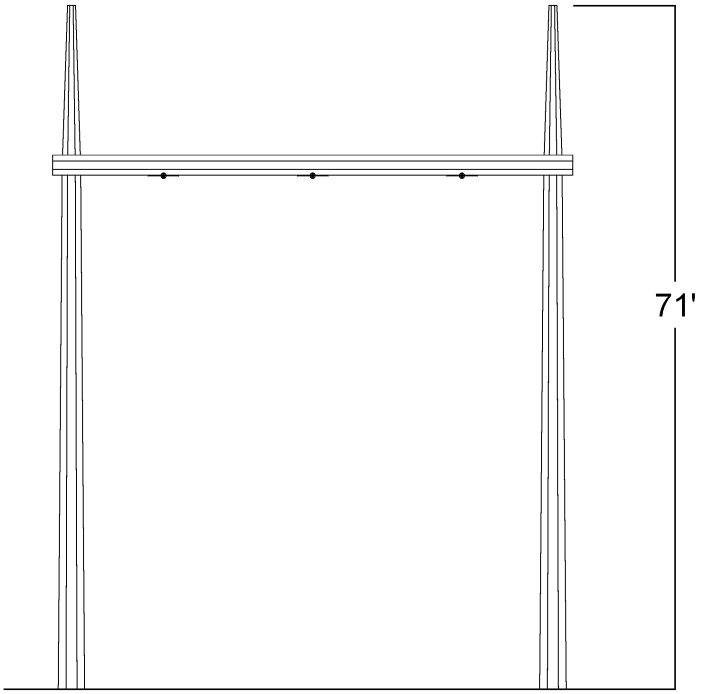



**Figure 3 Example Substation Bay Takeoff Structure**

Gen-tie Substation Entry Structure

In order to direct the gen-tie into the new bay, Western would install a 230kV monopole transmission structure approximately 150 feet outside the northeast fenceline at the Griffith Substation, in-line with the new bay. Western would design this transmission structure as a double-dead-end structure (Figure 4), with Western's conductors connecting to the new bay takeoff structure on one side and Longview's gen-tie approach span on the other side of the structure. Approximately 0.5 acres of disturbance would be attributed to this structure and it's ROW.

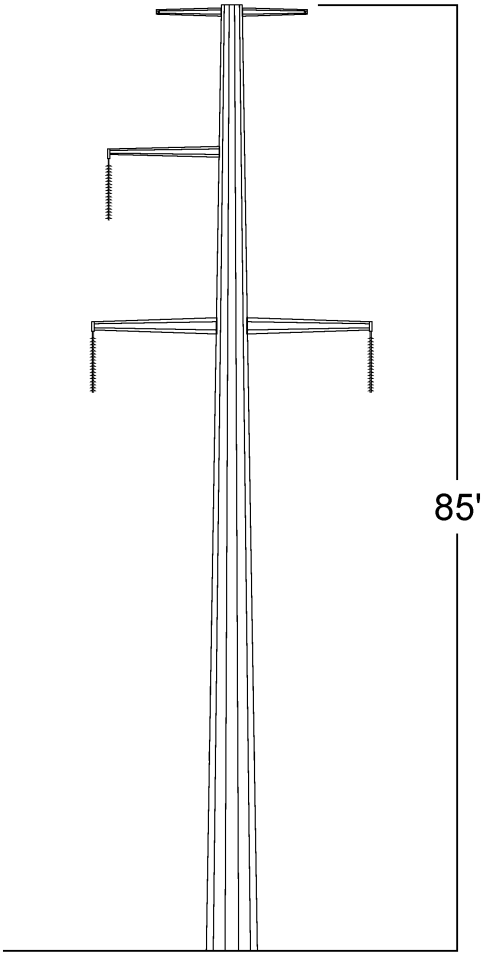



**Figure 4 Example Dead-End Structure**

Existing Transmission Line Modifications

Western would modify the Griffith Peacock and Griffith McConnico 230kV Transmission Lines as needed within existing ROWs to accommodate crossings by Longview's gen-tie line.

### 2.1.3. Construction

Western's proposed construction activities would last for an expected seven months, with approximately 32 construction workers required to complete construction of the facilities.

Approximately 1.1 acres of disturbance outside of Griffith Substation, including the disturbance and ROW associated with the gen-tie substation entry structure, is expected due to construction, including access, grading, and placement of facilities. Approximately 0.6 acres of disturbance would occur within the previously disturbed Griffith Substation for storage, parking, and transport, and no grading or digging would be required within the substation.

Western plans to use the following type and quantity of construction equipment during construction:

- Backhoe (1)
- Boom line truck (1)
- Cable reel stringing truck (1)
- Cement mixing truck (2)
- Construction trailer (2)
- Crane: 25-50 ton capacity (1)
- Dump truck (1)
- Flatbed truck (2)
- Forklift (1)
- Front-end loader (1)
- Manlift (1)
- Motor grader or dozer (1)
- Puller (2)
- Tensioner (2)
- Tractor trailer (2)
- Tractor with Auger (1)
- 2-wheeled motorcycle (1)
- 4-wheeled pickup trucks (5)
- 4-wheeled sedans (3)
- 6-wheeled "dually" pickup truck (1)

Western's Proposed Action would require approximately 0.07 acre-feet (22,500 gallons) of water during construction.

Gen-tie Substation Entry Structure

Western would construct the gen-tie substation entry structure by first producing a foundation. Western would stake the foundation location with wooden lathe, and would augur an approximately six-foot diameter, 30-foot deep hole, then place a pre-manufactured, five-foot diameter, 30-foot long bolt cage and concrete into the hole. Construction personnel would then create a finished surface on the concrete for placement of the gen-tie substation entry structure pole.

Following the foundation construction, Western construction personnel would then construct the gen-tie substation entry structure pole in sections and anchor the lower section of the pole to the foundation. Construction personnel would either construct the top sections (using insulators, hardware, attachments) on the ground, crane them into position, and then attach them to the bottom section, or they would crane the top sections into position, attach the top sections to the bottom section, and then construct the top (using insulators, hardware, attachments) in the air.

Bay Takeoff Structure

Western would construct a new takeoff structure within the new bay position similar to the gen-tie substation entry structure pole. Western would stake the foundation location with wooden lathe, and then augur an approximately six-foot diameter, 30-foot deep hole; Western would then place a pre-manufactured, five-foot diameter, 30-foot long bolt cage and concrete into the hole. Construction personnel would then create a finished surface on the concrete for placement of the takeoff structure. Personnel would crane the takeoff structure into position; bolt it together; and construct insulators, hardware, and attachments in the air.

Cables between Gen-tie Substation Entry Structure and Takeoff Structure

Western would string conductors between the gen-tie substation entry structure and the takeoff structure. A combination of cable reel stringing trucks, pullers and tensioners, and manlifts would pull the ground and phase conductors into the insulator attachment points and then clip and tension the cables.

### 2.1.4. Operation and Maintenance

Western's Operation and Maintenance (O&M) requirements associated with Griffith Substation would generally include such activities as checking or replacing circuit breakers, disconnect switches, transformers, or insulators; tightening, replacing, or repairing towers/poles or hardware; and replacing existing conductors. Generally, Western would perform these activities wherever or whenever damage, deterioration, or insufficiency of transmission lines or facilities poses a threat to safety or reliability.

Western would conduct circuit breaker maintenance activities in five-year intervals, and at each interval would take the breaker out of service. The first circuit breaker maintenance interval would include a visual inspection, including the cleaning and checking of trips and blocks, and the performance of micro-ohm measurements across the contacts. All subsequent circuit breaker maintenance intervals would include a check of timing and double testing. Western would inspect disconnect switches and instrument transformers monthly and adjust them at that time if necessary. Once a year, Western would perform an infrared inspection of the disconnect switches and instrument transformers.

The type of equipment needed for these activities could include a helicopter, pickup truck, sedan, manlift, forklift, boom line truck, crane (25-50 ton capacity), bulldozer, backhoe, and hand tools, depending on the repair or maintenance required. Western's *Parker-Davis Transmission System Routine O&M Project and Proposed IVM Program Draft Programmatic EA* (Western 2014a) provides further detail on operation and maintenance activities.

### 2.1.5. Decommissioning

Should the solar facility no longer need to interconnect to Western's facilities, Western personnel would decommission the Western facilities no longer required. All equipment added as a part of Western's Proposed Action, except a single set of jumpers, would remain in place and in service. The circuit breaker and disconnect switches would remain in service, in closed positions. Protective relays would remain in operation, after being reprogrammed to remove the elements needed to coordinate with the customer interconnection that was removed. Western personnel would remove the jumpers installed between the takeoff structure and the buswork and keep them at the site.

### 2.1.6. Western's Resource Protection Measures

Standard 13, Environmental Quality Protection, of Western's 2013 Construction Standards (Appendix B), details Western's resource protection measures.

## 2.2. Longview's Proposed Action

### 2.2.1. Overview

The two main components of Longview's Proposed Action are (1) Longview's gen-tie interconnection to Western's existing Griffith Substation, and (2) Longview's proposed Cliffrose solar facility (Figure 5).

### 2.2.2. Proposed Facilities

Generation Intertie Line

Longview would construct a 230kV gen-tie from the solar facility to the first transmission line structure located outside Western's Griffith Substation. The gen-tie would consist of an approximately 3-mile long single-circuit line, within an approximately 200 to 400-foot wide ROW, resulting in between 36-73 acres of disturbance (Figure 1). Longview would obtain, own, and maintain this ROW. The gen-tie structures would be approximately 85-foot tall steel monopoles with vertical framing (Figure 6). Longview would install a dual fiber optic communication path on top of the structures.

The proposed gen-tie would extend north from the northwestern corner of the solar facility, travel north on the east side of Yuma Road, head east on the south side of Navajo Drive, then north on the west side of Apache Road until reaching the northern alignment of Griffith Substation. From there, it would then turn east and cross Apache Road and pass below the existing Western Griffith Peacock and Griffith McConnico 230kV transmission lines before connecting to a new 230kV double-dead-end monopole entry structure that would direct the line into the new bay to be constructed within the Griffith Substation.

Cliffrose Solar Facilities

Longview would build the 350-acre proposed solar facility consisting of a field of PV module arrays that would produce cumulative power of 45 MW Alternating Current (AC). Descriptions of the required components and facilities associated with the proposed solar facility follow below. In addition to these major components, the solar site facilities would include junction boxes, low voltage Direct Current (DC) wiring, combiner boxes, DC fuses/disconnects, medium voltage AC cabling and collection system, and associated AC fuses/disconnects.

**Generating Facility Components**

The proposed solar array field would comprise approximately 200,000 PV panels on fixed-tilt mounting systems or single-axis, horizontal tracker structures supported by driven steel posts and/or other embedded foundation design (Figure 7). The PV modules would convert sunlight into DC electricity by conveying power from each of the multiple rows of PV modules through one or more combiner boxes to an inverter. The inverter would convert the DC power to AC power, then deliver power directly to an on-site switchyard or route it to a medium-voltage transformer that would step up the voltage of the power prior to delivery to the on-site

switchyard. At the on-site switchyard, the power would step up to 230kV for delivery to Western's transmission system via the gen-tie.

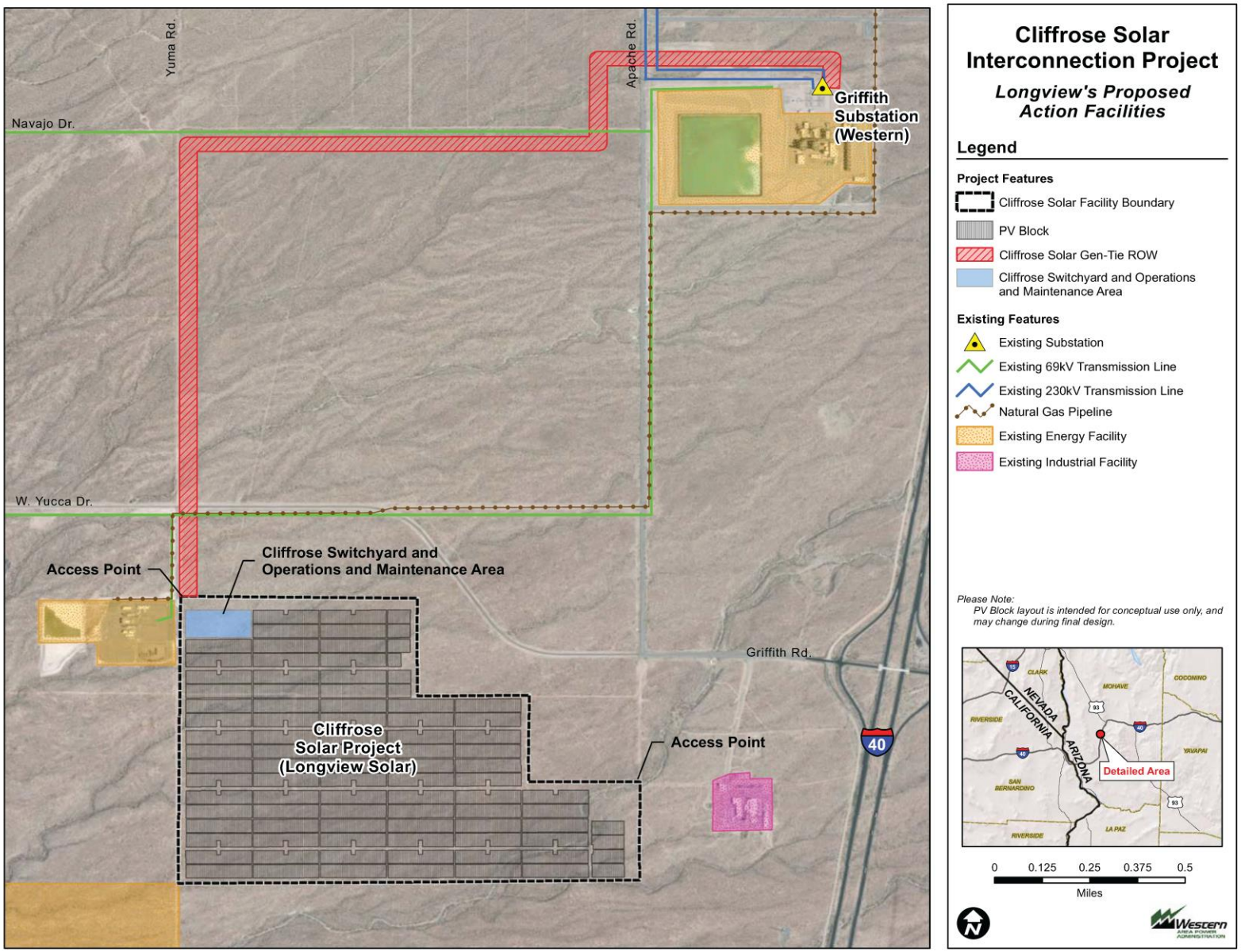



**Figure 5 Longview Proposed Action Facilities**

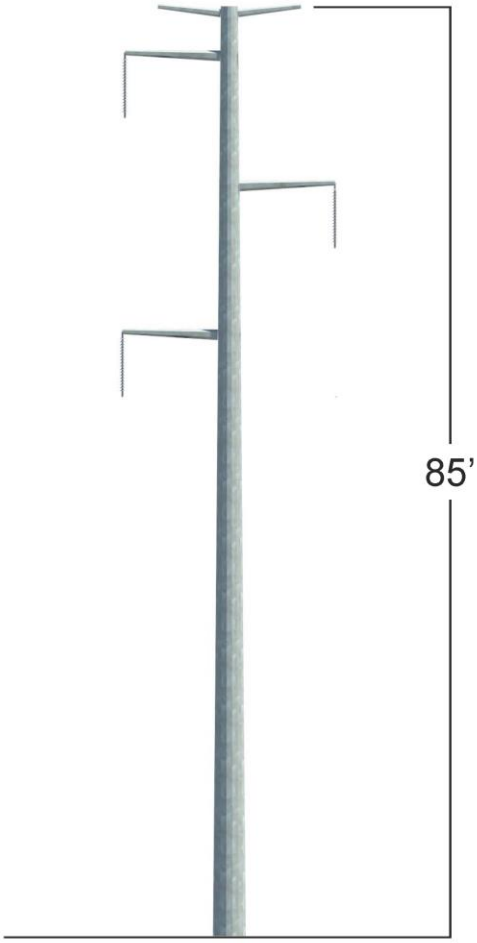



**Figure 6 Example Gen-Tie Structure**

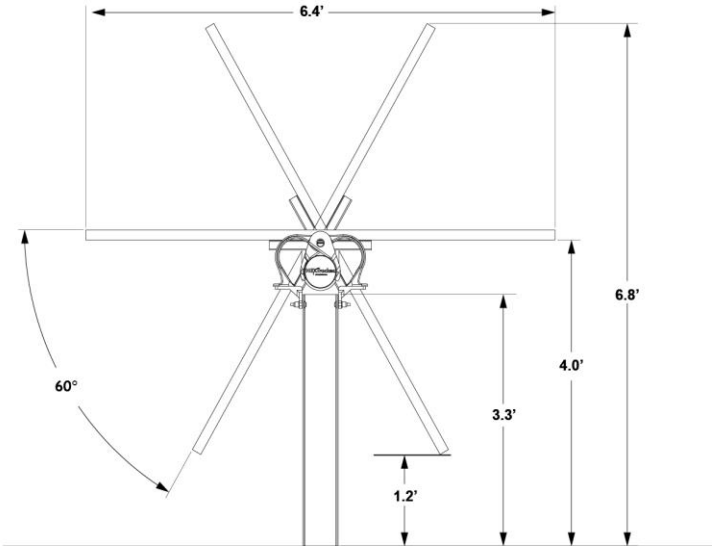



**Figure 7 Example Single-Axis, Horizontal Tracker PV Structure**

### Buildings

Longview would construct an approximately 500 foot by 500 foot on-site switchyard, located within the northwest corner of the solar facility, where power steps up to 230kV prior to reaching the 230kV gen-tie.

Longview also proposes to construct a two- to five-acre O&M area within the solar facility footprint that would accommodate an O&M building (up to 10,000 square feet), parking area, and other associated facilities. Associated facilities in the O&M area would include aboveground water storage tanks, septic system (including an onsite septic tank and leach field), security gate, signage, and flagpoles. Motion-activated exterior lighting would provide the minimum illumination needed to achieve safety and security objectives and would shield and orient focus illumination on the desired area. Longview would design and construct the O&M building and related facilities consistent with applicable Mohave County building standards.

### Roads, Fencing, and Security

The solar facility would require the construction of two access roads, one from Yuma Road and one from Apache Drive. The access roads may be compacted earth or improved to an aggregate or paved surface if determined appropriate by Longview, or if necessary to comply with Mohave County requirements.

Longview would construct approximately 10 miles of new perimeter and access roads immediately within the solar facility's perimeter fence and within the solar field area around specific blocks of equipment. The perimeter/access roads would be compacted earth and constructed to allow access by maintenance and security personnel.

Site security facilities would include perimeter security fencing, controlled access gates, and signage. The perimeter fence would be approximately six to 10 feet high, and would consist of chain-link, security, or storm fencing with barbed-wire security strands at the top. Longview will locate the switchyard outside of the solar facility and fence it separately. Controlled access gates would allow maintenance and security access to all portions of the solar facility.

### 2.2.3. Construction

Longview proposes to begin construction of the solar facility in the first quarter of 2016 and complete construction in the fourth quarter of 2016. During the estimated six to 12 month construction period, the number of onsite workers would average approximately 100 per day, with a peak of 200 workers per day. The solar facility would need approximately 150 acre-feet of water during construction.

Longview will complete construction activities with traditional earthmoving equipment, including, but not limited to, bulldozers, scrapers, motor graders, excavators, water trucks, water wagons, loaders, compactors, cement trucks, drill rigs, and pneumatic hammer or chisel apparatus.

Cliffrose Solar Facility

**Generating Facility**

Site preparation and construction of the solar facility would include the grading and recontouring, as needed, of the approximately 350-acre solar site. Only areas of excavation for foundations would require complete removal of all vegetation. The root system of existing vegetation would remain intact to the extent possible to limit fugitive dust and soil erosion, and to allow native vegetation to regrow. Longview will use herbicides in areas where trimming is not feasible. Longview would impact native plants, including salvage, consistent with Arizona's Native Plant Law. Longview would remove subsequent plant material with heavy equipment and may include the use of a bulldozer equipped with a brush rake, and would stockpile topsoil from the solar facility area for use in revegetation areas.

As the terrain on the solar facility site is generally flat, minimal grading, primarily limited to access roads and parking areas (to provide access) and laydown areas within the solar facility footprint (to provide an early location for storage) would occur, but would also include the solar facility switchyard and inverter pads. Longview will minimize disturbance to existing ephemeral washes within the solar facility to the extent practicable, but may need to divert and channel washes around or through the solar facility. Longview will develop detailed information regarding the location of the laydown and parking areas within the solar field, as well as any modifications to ephemeral washes, once finalizing the solar facility engineering.

Ongoing minor grading, in the form of excavation and backfill for foundations, pipelines, conduits, and other miscellaneous facilities for the duration of construction, would occur. Longview would re-grade access roads as part of maintenance due to soil erosion and regular use.

Longview would install a temporary fence around the construction laydown and parking area, and install a permanent fence as soon as doing so would not disrupt construction of the solar facility.

Longview would mount the PV panels on fixed-tilt or single-axis tracking systems on steel support structures and install the footings for the steel support structures on the existing grade. Typically, Longview would pile drive footings eight to 10 feet into the ground, although, based on the geology of the site, they may first use other drilling or pneumatic hammer or chisel to break up the rock material underlying the topsoil at the locations of the support structures. Alternatively, Longview may install the footings via poured foundations. Varying the mounting height of the PV panels would account for any undulations in the terrain.

**Buildings**

Longview would construct the on-site switchyard, located within the northwest corner of the solar facility, where power would be stepped up to 230kV prior to reaching the 230kV gen-tie. The control building, transformers, and other features within the switchyard would be installed on concrete foundations. Longview would place a metal grounding grid or net under the footprint of the switchyard.

Longview would install a prefabricated O&M building, or construct a wood or steel framed O&M building, on a concrete foundation. Longview would also construct and install pre-manufactured aboveground water storage tanks on concrete foundations, and a below ground septic system adjacent to the O&M building. Detailed design and construction methods of the O&M building, water storage tanks, and septic system would be developed as part of the final solar facility engineering.

Generation Intertie Line

Longview would construct the approximately three-mile long 230kV gen-tie between the solar facility and Griffith Substation as a single-circuit overhead line on steel monopoles. Longview contractors would excavate foundation holes for the structures, construct forms, install reinforcing bars, and pour concrete foundations. Assembly of the gen-tie structures would occur in sections at a staging area large enough to accommodate their construction (either within the solar facility or transmission ROW) and then Longview would transport structures to each tower location by truck, place them by crane, and bolt them to the foundations. Longview would identify the size and location of the staging area during final design. The design of the transmission line would be in accordance with industry codes and standards.

Prior to conductor installation, Longview would install temporary guard structures at road crossings and other locations where the new conductors may inadvertently come into contact with electric or communications facilities and/or vehicular traffic during installation. These guard structures consist of one or two poles on either side of the feature crossed with a "V"-shaped cargo net tensioned between the guard structures.

Longview's contractors would begin conductor stringing by attaching rollers to the cross arm of the gen-tie structures. The rollers would allow the individual conductors to be pulled through each structure until the conductor is ready to be pulled up to the final tension position. Ground equipment would pull a sock line (a small cable used to pull in the conductor) from tower to tower after placing the pull and tension equipment. After the sock line installation, a tension-

stringing method would pull in the conductor attached to the sock line. This method would involve pulling the conductor through each tower under a controlled tension to keep the conductor elevated above crossing structures, roads, and other facilities. Contractors adjust tension to a pre-calculated level after pulling the conductor into place. Contractors would then clamp the conductor to the end of each insulator while removing rollers. Finally, contractors would install vibration dampers and other accessories to the conductors.

Longview's contractors would install a dual fiber optic communication path on top of the gen-tie structures. Installation of the fiber optic communication path would include the use of a manlift truck, a truck-mounted tensioner, and a reel truck and trailer, and occurs in a manner similar to the conductors.

The existing 69kV UNS line located along Yuma Road and/or backfed through the proposed 230kV gen-tie will bring electricity for construction and operation (to serve station, light, and power needs when not producing electricity) to the site.

### 2.2.4. Operation and Maintenance

Operation of the solar facility would include periodic maintenance and overhaul of all solar facility equipment in accordance with manufacturer-recommended schedules. Necessary routine cleaning of the PV panels with water would maintain the desired efficiency. General landscape labor would include vegetation maintenance at some interval to maintain ground cover and remove unwanted vegetation that could block or shadow the panels. Longview would regularly trim or manage vegetation with the application of herbicide within the solar facility boundaries.

Certified site personnel would conduct regular inspections of the switchyard and gen-tie line as required by federal, state, and local codes or as needed under emergency conditions. All non-destructive testing and in-process compliance inspections and certifications would occur in accordance with the applicable federal, state, and local codes for each given activity. Longview would conduct various inspection processes, including ground inspection and climbing. Longview would inspect all of the onsite switchyard structures from the ground on an annual basis for corrosion, misalignment, and foundation condition. Frequency of inspection may vary depending on factors such as the age of the system, structure type, and vegetation conditions.

Access roads would likely require intermittent grading and drainage maintenance due to soil erosion and regular use. Re-application of dust palliatives would limit fugitive dust.

The existing 69kV UNS line located along Yuma Road and/or backfed through the proposed 230kV gen-tie would bring electricity for operation (to serve station, light, and power needs when not producing electricity) to the site.

<u>Water</u>

The solar facility would require approximately five acre-feet of water per year for operations, including PV panel washing (using a water truck with a spray nozzle attachment) and other non-potable and potable uses. If intended for potable use, the facility would treat the water for human

use. Longview would supply water either by transporting to the site or by drilling one to five onsite wells for groundwater.

### 2.2.5. Decommissioning

Longview expects a 30 to 40 year lifespan for the facility, after which time they would repower or decommission it. Due to the excellent solar resource at the solar facility area, repowering is a viable option. This may involve retrofitting existing components with updated, more efficient components, thereby extending the useful lifespan of the solar facility.

Longview designed the procedures described for decommissioning to ensure public health and safety, environmental protection, and compliance with applicable regulations. Decommissioning would begin an assumed 30 to 40 years after the commercial operation date of the solar facility.

Longview has the following goals for solar facility decommissioning:

- Remove aboveground structures, unless converted to other uses
- Restore the lines and grades in the disturbed area of the solar facility to match the natural gradients of the site
- Re-establish native vegetation in the disturbed areas

Decommissioning and demolition would proceed according to the following general staging process. The first stage consists of the dismantling and demolition of aboveground structures. The second stage consists of concrete removal, as needed, to ensure that no concrete structure remains within three feet of final grade (i.e., floor slabs, belowground walls, and footings), as appropriate. The third stage consists of removal/dismantling of underground utilities within three feet of final grade. The fourth stage consists of the excavation and removal of soils and final site contouring to return the originally disturbed solar facility area to near-original conditions while disturbing as little of the adjacent and nearby areas as is practical.

Longview would transport residual materials from aboveground structures and facility removal via heavy haul dump truck to a central recycling/staging area that would process the debris for transport to an offsite recycler.

The belowground facilities to be removed would include PV panel support structures and concrete slabs and footings that would remain within three feet of final grade at the end of the solar facility lifespan. Longview anticipates removing any and all solar facility-related piping and utilities—including water lines, belowground electric, control, and communication lines—regardless of the depth below final grade. Longview would excavate and transport these materials to the recycling area(s) for processing and ultimate recycling, and would backfill the resulting trenches with suitable certified clean fill material of similar consistency and permeability as the surrounding native materials and compacted.

Longview does not anticipate removal of contaminated soil. However, if required, Longview would conduct removal to meet regulatory cleanup criteria for the protection of groundwater and the environment, and would backfill the resulting excavations with certified clean fill native soil of similar permeability and consistency as the surrounding materials and compacted.

Longview would conduct recontouring of the solar facility using standard grading equipment to return the land to match, within reason, the previously existing surface and surrounding grade and function. Longview would limit grading activities to previously disturbed areas that require recontouring. Longview would compact fills by wheel or track rolling to avoid over-compaction of the soils. To the extent feasible, Longview would make efforts to place a layer of coarser materials at the ground surface to add stability.

After recontouring, the solar facility would use native plants and seeds to revegetate, where appropriate.

### 2.2.6. Longview's Resource Protection Measures

Longview proposes to implement Western's Construction Standard (Appendix B), where applicable, to avoid and minimize impacts to the environment.

Longview would implement dust control measures throughout the construction phase and during operations. These measures would include frequent application of a Mohave County-approved dust suppressant, restriction of construction vehicle speed on unpaved roadways to less than 15 miles per hour, restriction or cessation of construction activities during high wind events, and covering or otherwise shielding stockpiles of soil or similar construction materials.

Cleaning of vehicles before entering and leaving construction areas, and through the use of approved weed-free seed mixes, as required by the Arizona Department of Agriculture (ADA), would minimize the risk of introduction of invasive plants.

## 2.3. No Action Alternative

Under the No Action Alternative, Western would not approve an interconnection agreement with Longview and would not construct, operate, or maintain the physical interconnection. In order for Longview's Proposed Action to proceed, Longview would have to connect with another transmission provider. The No Action Alternative would presumably result in Longview not constructing, operating, and maintaining their Proposed Action and the associated environmental impacts not occurring.

## 2.4. Alternatives Considered but Eliminated

### 2.4.1. Interconnection Alternatives

Western only identified the connection into the Griffith Substation approximately 1.5 miles north-northwest of the proposed solar facility and the No Action Alternative. As Western's Interconnection Facilities Study identified no adverse transmission system impacts associated with connection to the Griffith Substation, and Longview applied only for an interconnection at the Griffith Substation, no other alternatives were considered.

## 2.5. Solar Facility Siting

As part of the initial conceptual development and siting of the solar facility, Longview applied solar facility siting criteria to identify potential sites in Arizona. These criteria included the following:

- High solar insolation
- Available land of sufficient size for the solar facility
- Proximity to Western transmission lines and substations
- Proximity to existing roads
- Cost effective land value and permitting requirements

Longview identified the proposed solar facility and gen-tie based on these criteria. Private owners currently own the site, which the National Renewable Energy Laboratory rates as possessing approximately 6.5 and 6.6 kilowatt-hours per square meter per day. It is within close proximity to both an existing transmission line and substation, and can be accessed from I-40. Longview did not consider other solar facility sites in detail.

# Chapter 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## 3.1. Introduction

This chapter describes the affected environment and the effects on that environment that would occur from the construction, operation, and maintenance of the Project and solar facility. A description of the affected environment, based on primary and secondary sources and field observations is included for each environmental resource analyzed below, and is immediately followed by a description of the anticipated environmental consequences, including cumulative impacts.

The affected environment is the physical area that bounds the environmental, sociological, economic, or cultural features of interest that could be impacted by the Proposed Actions. Information contained within serves as a baseline from which to identify and evaluate environmental changes resulting from construction, operation, and maintenance of the Project and solar facility. The baseline conditions, for the purposes of analysis, are the conditions that currently exist.

This chapter describes the environmental consequences in terms of impacts, defined as modifications to the existing environment brought about by implementing a Project alternative. Impacts can be beneficial or adverse, result from the action directly or indirectly, and can be long-term, short-term, permanent, or cumulative in nature. The impact analysis in this chapter is either quantitative or qualitative (dependent on available data and nature of the impact) and establishes the severity of impacts in the context of the affected environment.

Evaluation of the Proposed Actions and No Action Alternative in the EA considers the following resources:

- 3.4 Air Quality/Climate Change
- 3.5 Cultural and Paleontological Resources
- 3.6 Intentional Destructive Acts
- 3.7 Land Use
- 3.8 Public Health and Safety (including Electric and Magnetic Fields [EMF], Fuels/Fire Management, Wastes-Hazardous or Solid)
- 3.9 Socio-economics
- 3.10 Soils
- 3.11 Travel Management/Transportation
- 3.12 Vegetation (including Weeds-Invasive and Non-native)
- 3.13 Visual Resources (including Wilderness)
- 3.14 Water Resources
- 3.15 Wildlife (including Migratory Birds)

## 3.2. Resources Not Evaluated

Western determined the environmental resources requiring analysis within the EA. Western based the need or requirement for the analysis of a resource in the EA on the comments received during Project scoping, or on preliminary research completed on the Project site, or both. Environmental resources not analyzed, or not analyzed in detail are listed below in Table 3-1 below, along with the rationale for the exclusion of analysis.

**Table 3-1. Resources Not Evaluated**

| Resource | Reason for Exclusion from Evaluation |
|---|---|
| Environmental Justice | Little residential development exists in proximity to the Project or solar facility areas. Based on preliminary analysis Western does not expect the Proposed Action to disproportionately affect minority or low income populations. |
| Farm Lands Prime or Unique | Western did not identify prime or unique farm lands within the Project or solar facility areas. |
| Floodplains | Western will not locate project and solar facility features within or impact designated floodplains. |
| Fuels/Fire Management | Western expects negligible impact to fuels/fire management. |
| Minerals | Western expects negligible impacts to mineral resources. |
| Noise and Sensitive Receptors | Western did not identify sensitive noise receptors within or near Project or solar facility areas. |
| Rangelands | Western identified no active grazing within the Project or solar facility areas. |
| Recreation | Western identified no design recreation opportunities within the Project or solar facility areas and do not expect impacts to regional dispersed recreation. |
| Threatened or Endangered Species | Western identified no threatened or endangered species within or near the Project or solar facility areas. |
| Wetlands/Riparian Zones | Western identified no wetlands/riparian zones within or near the Project or solar facility areas. |
| Wild and Scenic Rivers | Western identified no wild and scenic rivers within or near the Project or solar facility areas. |
| Wild Horses/Burros | Although surrounding mountains contain populations of wild burros, Western anticipates no impacts to wild horse/burro populations. |

## 3.3. Cumulative Impact Methodology

The CEQ (40 CFR § 1508.7) defines "cumulative impact" as "...the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions."

Cumulative impacts result when the effects of an action are added to, or interact with, other effects in a given place at a given time. The cumulative impact analysis included in this EA

focuses on the combination of these effects and any resulting environmental degradation. The Environmental Impacts section of each environmental resource analyzed below includes an analysis of cumulative impacts.

### 3.3.1. Past, Present, and Reasonably Foreseeable Future Actions

For the cumulative impact analysis, Western evaluated the impacts of the Project and solar facility, when added to other past, present, and reasonably foreseeable future actions, in context with inventoried resources within the vicinity. Implementation of the No Action Alternative, along with past, present, and reasonably foreseeable future actions, would have no environmental consequences or cumulative impacts on the resources analyzed. Table 3-2 displays a list of past, present, and reasonably foreseeable future activities within approximately one mile of the Project and solar facility.

**Table 3-2. List of Past, Present, and Reasonably Foreseeable Future Projects and Actions**

| Name or Owner | Description | Type | Status |
|---|---|---|---|
| Grazing | Ongoing permitting and management of livestock grazing on Bureau of Land Management (BLM) and Arizona State Land Department (ASLD) land | General Activity | Past, Present, and Future |
| Dispersed recreation | Dispersed recreation | General Activity | Past, Present, and Future |
| Off-highway vehicle (OHV) use | General OHV activity | General Activity | Past, Present, and Future |
| Atchison Topeka Railroad | Railroad | Transportation | Past, Present, and Future |
| Santa Fe Pacific Railroad | Railroad | Transportation | Past, Present, and Future |
| Arizona Department of Transportation | Highway (I-40 and Route 66) | Transportation | Past, Present, and Future |
| Citizens Utilities Company | Buried telephone lines | Communication | Past, Present, and Future |
| Mohave County | Roadway east and west of Griffith Road/I-40 Interchange | Transportation | Past, Present, and Future |
| BLM Kingman Field Office | Land exchange | Land Use | Past, Present, and Future |
| UniSource Energy Corp. | Natural gas pipeline | Utility | Past, Present, and Future |
| Vanterra Energy, Inc. | Oil and Gas lease | Utility | Past, Present, and Future |
| Unknown | Proposal to the BLM for seismic exploration | Mining | Future |
| Arizona Department of Transportation (ADOT)/BLM | Study to identify a preferred alternative to provide a free flow traffic interchange along I-40/US 93 in west Kingman | Transportation | Future |
| Western | Routine commercial cell antenna maintenance at Western Desert Southwest Region facilities | Utility | Past, Present, and Future |
| Western | Routine substation maintenance at Western Desert Southwest Region substations | Utility | Past, Present, and Future |

| Table 3-2. List of Past, Present, and Reasonably Foreseeable Future Projects and Actions | | | |
|---|---|---|---|
| **Name or Owner** | **Description** | **Type** | **Status** |
| Western | Routine herbicide application at Western Desert Southwest Region substations | Utility | Past, Present, and Future |
| Western | Protection and communication facilities maintenance at Western Desert Southwest Region facilities and substations | Utility | Past, Present, and Future |
| Western/UNS | Installation of new 80 megavolt amperes transformer at Griffith Substation and connecting to Western's 230kV transmission line. | Utility | Present, Future |
| Source: BLM 2015; Western 2014b; Western 2015 | | | |

## 3.4. Air Quality/Climate Change

### 3.4.1. Affected Environment

Air Quality

The Clean Air Act (CAA) requires the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ground level ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. These standards regulate the amount of contaminants in the air due to all sources. EPA designates areas that do not meet the NAAQS as nonattainment areas, and provides a specified amount of time to achieve compliance (EPA 2012). EPA gives special protection to certain areas from air quality degradation through the use of more stringent requirements. The EPA designates these areas as Class I and include some (but not necessarily all) national parks, monuments, wilderness areas, and certain tribal land (EPA 2012).

EPA designated most areas within the United States as Class II, wherein standard pollution control requirements apply. The Project and solar facility are in an area designated Class II, pursuant to the provisions of the federal Prevention of Significant Deterioration program, codified at 40 CFR 51.166 and 40 CFR 52.21, and regulated by Title 49 of the Arizona Revised Statutes (Arizona Department of Environmental Quality [ADEQ] 2015).

Based on the Project and solar facility's location within a designated attainment area, with zero days exceeding emissions standards (Mohave County 2013), relatively low population density, and a lack of pollution sources in the immediate vicinity, air quality is generally good to excellent. Vehicles traveling along I-40 and the many miles of unpaved roads in the county, the airborne particulate matter (i.e., dust) generated by construction activities, and gas-fired power plants (Mohave County 2005) result in typical air pollution in the local area. The size of the airborne particles generated by such activities categorizes the particulate matter. Those that are less than 10 micrometers in size ($PM_{10}$) are of concern because they are small enough to enter the lungs through the nose and throat, and have the potential to cause major health problems,

especially among the elderly, children, and people with chronic lung disease, influenza, or asthma (EPA 2012). Prolonged and/or frequent exposure can have effects on breathing and respiratory systems, damage to lung tissue, cancer, and premature death (EPA 2012).

Additionally, airborne particulates are a source of diminished visibility in some areas of Mohave County; however, the county is in compliance with acceptable levels of the six criteria pollutants mentioned above, according to the NAAQS (Mohave County 2005; EPA 2015). Since the proposed Project and solar facility area is generally rural in nature with few major point or area sources of air pollutants, air pollutant concentrations will likely remain in attainment with the levels established by the EPA.

Two gas-fired power plants are in close proximity to the Project. The first is the Black Mountain Generating Station (BMGS), a 96MW gas-fired peaking power plant located immediately adjacent to the northwestern corner of the solar facility. A.A.C. R18-2-101.64 classifies BMGS as a Class I Major Source. Potential emissions of nitrogen oxides and carbon monoxide each exceed 100 tons per year (tpy), less than the 250 tpy self-imposed restriction. This does not constitute a major source as defined under A.A.C. R18-2-401 for the purposes of Prevention of Significant Deterioration (PSD), Title I, Part C of the CAA, and A.A.C. R18-2-406 (ADEQ 2007).

The second is the Griffith Energy Power Plant, a 600MW natural gas-fired combined cycle power plant located adjacent to the south and west sides of the Griffith Substation. The facility burns natural gas in its two combustion turbine generators (CTGs), operated with two heat recovery steam generating units (HRSGs) and one steam turbine. The facility includes an auxiliary boiler, cooling towers, evaporative condenser and an emergency diesel fire pump. A.A.C. R18-2-101.64 classifies Griffith Energy Power Plant as a Class I Major source. (ADEQ 2012). Potential emissions of nitrogen oxides and carbon monoxide are approximately 268 tpy and 872 tpy respectively. Subject to the PSD program requirements, the facility received an initial Title V permit in 1999, with a renewal permit in 2006 (ADEQ 2012).

Climate

Arizona has an arid or semiarid continental climate characterized by light precipitation totals, abundant sunshine, low relative humidity, and a relatively large annual and diurnal temperature range. Climate varies due to the state's diverse topographic features, including high plateaus, mountain ranges, canyons, valleys, and normally dry arroyos.

Season and elevation governs precipitation in Arizona. From November to March, the principal sources of moisture for the state are storm systems from the Pacific Ocean, with heavy snows falling in central and northern portions of the state. Gradual melting of this snowfall during the spring helps to maintain a supply of water in the state's principal rivers. Arizona is at the northern fringe of the area affected by the Southwest Monsoon. The monsoon season typically begins in June and ends around mid-September with the state receiving 30 to 50 percent of its yearly precipitation in these months (Western Regional Climate Center [WRCC] 2015).

During the summer, daytime temperatures often exceed 100 degrees Fahrenheit at elevations below 5,000 feet. Extremes occur between day and night temperatures; at times with a 50 to 60

degree Fahrenheit difference between minimum and maximum daily temperatures during drier months. The warmest days often occur in June, before the monsoon season sets in. During July and August, afternoon convective storms tend to decrease solar insolation, lowering temperatures before they reach their potential daily high. A preponderance of clear skies and low relative humidity permits rapid cooling after sundown (WRCC 2015).

In the central and northern mountains, temperatures can reach far below freezing while the lower desert valleys can have several years in succession without freezes (WRCC 2015). Average annual precipitation for Mohave County is generally less than 10 inches of rainfall per year (WRCC 2015).

Climate Change

The EPA agrees with scientific research that human activity is indeed changing the composition of the Earth's atmosphere as greenhouse gases including carbon dioxide ($CO_{2)}$, methane (CH4), nitrous oxide (N2O), and hydrofluorocarbons are on the rise (EPA 2013). The "Southwestern Region Climate Change-Trends and Forest Planning" states that the Southwestern regional climate over the next several decades would experience:

- A decrease in overall moisture
- An overall rise in air temperature
- Increased wildfire occurrence
- An increase in the intensity of storms, resulting in more severe flooding, especially in the Southwest

As the Southwest is the hottest and driest region in the U.S., water availability would continue to remain a vital concern in relation to climate change and its subsequent effects on the natural as well as human environment (EPA 2013). No global warming emissions are associated with the generation of electricity from solar energy. However, emissions are associated with the manufacturing, transportation of materials, and decommissioning of facilities (Union of Concerned Scientists of the United States of America [UCSUSA] 2013).

### 3.4.2. Environmental Impacts

Impacts of Western's Proposed Action

Western's Proposed Action would generate minimal, localized, short-term, pollutant emissions from construction equipment during construction of the interconnection facilities. Over the long-term, Western expects minimal vehicular emissions associated with maintenance and repair of Griffith Substation to occur.

Construction emissions can vary from day-to-day depending on the level of activity, the specific operations, and the prevailing meteorological conditions. These emissions are primarily fugitive dust emissions from earthmoving and construction vehicle exhaust emission.

Impacts of Longview's Proposed Action

Western expects the Proposed Action to generate minimal, localized, short-term, pollutant emissions from construction equipment during construction of the solar and gen-tie facilities. Over the long-term, Longview expects minimal vehicular emissions associated with operations and maintenance to occur. In addition, implementation of Longview's Proposed Action is expected to generate localized dust pollution from ground-disturbing activities associated with the solar site and gen-tie construction activities, but is not expected to affect current ambient air quality attainment status designated by the EPA. Operation and maintenance activities could generate dust pollution through travel on unpaved roads.

Western expects beneficial long-term impacts to air quality and climate change through implementation of Longview's Proposed Action, as continued solar development may lead to a reduction in the reliance on pollution-generating fossil fuels for the production of electricity.

Impacts of the No Action Alternative

Western expects no new impacts to air quality under the No Action Alternative.

Cumulative Impacts

In general, the extent of cumulative impacts on air quality depends on emission source characteristics, pollutant types, emission rates, and meteorological and topographical conditions. For the Proposed Actions, the air pollutant emissions would primarily occur during the construction timeframe. The potential for air quality effects are, therefore, not long-term in nature. The impacts from these operations would be temporary, and limited to the local area surrounding the Project and solar facility. Western expects that the implementation of the Proposed Actions, along with other past, present, and reasonably foreseeable future projects, would have minimal cumulative impacts to air quality, climate, and climate change.

## 3.5. Cultural and Paleontological Resources

This section of the EA describes the area of potential effects (APE) for cultural and paleontological resources and examines the potential effects including damage, loss, degradation, or other disturbance to cultural and paleontological resources under the Proposed Actions and No Action alternative.

The term "cultural resource" refers to a broad category of resources that includes prehistoric and historic archaeological sites, buildings, districts, structures, locations, or objects considered important to a culture or community for scientific, traditional, religious, or other reasons. The National Historic Preservation Act (NHPA) affords certain protections and makes eligible for listing on the National Register of Historic Places (NRHP) as a *historic property* any cultural resources deemed significant for their contribution to broad patterns of history, prehistory, architecture, engineering, and cultural information value. Because the interconnection Project is a federal undertaking, the Project and associated solar facility are subject to compliance with Section 106 of the NHPA of 1966, as amended (54 U.S.C. § 300101 et seq.). Section 106 (36 CFR Part 800, as amended August 5, 2004) requires federal agencies to consider the effects of their

undertakings on historic properties, and provide the Advisory Council on Historic Preservation the opportunity to comment. In addition, Section 106 and the American Indian Religious Freedom Act of 1978 also specify that agencies take Native American concerns into consideration.

For NRHP listing, a property must be significant under one or more of four evaluation Criteria (36 CFR § 60.4):

- Criterion A: Associated with events that have made a significant contribution to the broad patterns of our history
- Criterion B: Associated with the lives of persons significant in our past
- Criterion C: Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction
- Criterion D: Yielded, or may be likely to yield, information important in prehistory or history

In addition, a property must convey its significance through the retention of specific aspects of integrity, such as location, design, materials, setting, workmanship, feeling, and association. In general, properties less than 50 years of age, unless of exceptional importance, are not eligible for listing in the NRHP.

### 3.5.1. Affected Environment

EPG performed an intensive Class III cultural resource survey for areas of proposed disturbance in January 2015. The survey resulted in the identification of 4 newly recorded sites (1 historic roadside camp and 3 historic roads), all of which EPG recommends not eligible for listing in the NRHP.

The cultural and paleontological APE considered in this analysis consists of the proposed solar facility, gen-tie, and Griffith Substation. The visual APE is defined as a 5.0-mile buffer around these features.

Paleontology

According to the state geologic map of Arizona (Arizona Geological Survey 2000), the APE overlies a geologic unit mapped as early Pleistocene to latest Pliocene surficial deposits (Qo) The Geological Survey describes this unit as coarse relict alluvial fan deposits that form rounded ridges or flat, isolated surfaces that are moderately to deeply incised by streams. These topographic highs have undergone substantial erosion, and are moderately to strongly consolidated. The primary and secondary sediments are gravel and sand with minor amounts of mud and silt. These coarse sediments, within a highly eroded environment, have a low sensitivity for paleontological resources, and no fossil localities are reported within one mile of the APE (Carrasco et al. 2005, Graham and Lundelius 2010).

### 3.5.2. Environmental Impacts

Impacts of Western's Proposed Action

The cultural resource inventory completed for the direct APE for this Project, which included the proposed facilities and disturbance areas identified under Western's Proposed Action, revealed that there are no NRHP-listed or NRHP-eligible cultural resources within these areas (Vorsanger 2015).

Western's Proposed Action would result in no impacts to historic properties (i.e., cultural resources eligible for listing in the NRHP), and no impacts to identified cultural resources not eligible for listing on the NRHP, within the direct APE. Two NRHP-eligible sites, AZ I:15:156(ASM), the historic alignment of Route 66, and AZ F:16:72(ASM), the Kingman-Goldman Road, lie within the visual APE for the proposed Project. In addition, one rock art site, AZ F:16:71(ASM), lies within the visual APE. Although NRHP eligibility for this site is unevaluated, it is likely eligible for listing in the NRHP. Western's Proposed Action would result in a low impact to the sites within the visual APE as the proposed Project would be in the background distance zone and seen in the context of the existing transmission lines and power generating facilities as well as dispersed residences and the prison.

Based on the low sensitivity for paleontological sediments, Western expects no impacts to paleontological resources.

Impacts of Longview's Proposed Action

The cultural resource inventory completed for the solar facility and proposed Project, which included the proposed facilities and disturbance areas identified under Longview's Proposed Action, determined that no NRHP-listed or NRHP-eligible cultural resources exist within these areas (Vorsanger 2015).

Longview's Proposed Action would result in no impacts to historic properties (i.e., cultural resources eligible for listing on the NRHP), and no impacts to identified cultural resources not eligible for listing on the NRHP, within the APE. Two NRHP-eligible sites, AZ I:15:156(ASM), the historic alignment of Route 66, and AZ F:16:72(ASM), the Kingman-Goldman Road, lie within the visual APE for the proposed Project. In addition, one rock art site, AZ F:16:71(ASM), lies within the visual APE. Although NRHP eligibility for this site is unevaluated, it is likely eligible for listing in the NRHP. Longview's Proposed Action would result in a low impact to the sites within the visual APE as the proposed Project would be in the background distance zone and seen in the context of the existing transmission lines and adjacent PV facility and other power generating facilities as well as dispersed residences, the prison, and other industrial facilities.

Based on the low sensitivity for paleontological sediments, Western expects no impacts to paleontological resources.

Impacts of the No Action Alternative

The No Action Alternative results in no new impacts to cultural resources.

Cumulative Impacts

The Proposed Action could potentially impact cultural resources during all ground disturbing activities. However, actions undertaken by, or on lands managed by, federal agencies require cultural resource studies prior to use of the area. The majority of the identified past, present and reasonably foreseeable future projects and actions are federal, and thus the development of projects in the area has provided or could provide occasions to conduct studies that would likely not occur otherwise. Implementation of the Proposed Actions, along with other past, present, and reasonably foreseeable future projects, would result in minimal cumulative impacts to cultural resources.

## 3.6. Intentional Destructive Acts

### 3.6.1. Affected Environment

The DOE Office of NEPA Policy and Compliance issued guidance on the need to consider intentional acts of destruction (e.g., terrorism, vandalism) in NEPA documents (DOE 2006). Power transmission facilities are part of America's critical infrastructure and are considered to be possible targets of intentional acts of destruction. Potential aggressors include terrorists hoping to cause disruption or activists targeting facilities for other reasons. A more likely occurrence is an act of opportunity, such as individuals shooting at or vandalizing insulators or structures.

### 3.6.2. Environmental Impacts

Impacts of Western's Proposed Action

Intentional destructive acts may be directed at Western's transmissions system and facilities within and near Griffith Substation. Destroying a tower or equipment could disrupt the supply of electricity, in turn affecting utility customers and end users. The extent and duration of this impact would depend upon the specific role and relationship of damaged or destroyed equipment to and within the overall infrastructure network (i.e., the potential for cascading effects), as well as upon the degree of damage. However, as opposed to acts of terrorism, vandalism and theft are more likely forms of destruction. Although potentially costly, such acts do not usually disrupt the provision of electricity or have significant environmental effects.

Western speculates that the incidence of an intentional destructive act could occur at the proposed facilities at Griffith Substation. Based on past occurrences, if an act were to take place, it would likely result in minor or negligible environmental impacts. Western does not expect implementation of the Proposed Action to measurably affect the risk of an intentional destructive act.

Impacts of Longview's Proposed Action

Similar to the potential environmental impacts described above for Western's Proposed Action, intentional destructive acts may be directed at Longview's solar facility and gen-tie. Destroying a tower or equipment could disrupt the supply of electricity, in turn affecting utility customers and end users. The extent and duration of this impact would depend upon the specific role and relationship of damaged or destroyed equipment to and within the overall infrastructure network (i.e., the potential for cascading effects), as well as upon the degree of damage. However, as opposed to acts of terrorism, vandalism and theft are more likely forms of destruction. Although potentially costly, such acts do not usually disrupt the provision of electricity or have significant environmental effects.

Western speculates that the incidence of an intentional destructive act could occur at Longview's solar facility and gen-tie. Based on past occurrences, if an act were to take place, it would likely result in minor or negligible environmental impacts. The implementation of Longview's Proposed Action could increase the potential for intentional destructive acts, as it would introduce new utility infrastructure which could be viewed as a target for destructive acts.

Impacts of the No Action Alternative

No impacts from intentional destructive acts would occur under the No Action Alternative.

Cumulative Impacts

Implementation of the Proposed Actions and other past, present, and reasonably foreseeable future projects would introduce new infrastructure into the region that could be viewed as a target for destructive acts. As such, cumulative impacts resulting from intentional destructive acts could result.. However, protection and security measures would reduce the potential for these intentional destructive acts to occur.

## 3.7. Land Use

This section of the EA examines the existing and future land uses within the land use study area, which includes lands within approximately one mile of Project and solar facility features.

### 3.7.1. Affected Environment

Federal

Federal land within the study area includes land owned or managed by Western and the Bureau of Land Management (BLM).

The primary existing land use on Western-owned land within the land use study area is electrical transmission associated with the Griffith Substation, which is a 230/69kV electrical substation, to which Western proposes to connect the solar facility. Western expects existing land use on this Western-owned parcel to persist into the future.

BLM-managed land within the land use study area is located approximately .4 miles east of the proposed interconnection location and approximately .8 miles east of the proposed solar facility. These lands are within the BLM Kingman Field Office (KFO) planning area, which includes more than 2.4 million acres managed under the KFO Resource Management Plan. Livestock grazing, transportation (I-40 and Burlington Northern Santa Fe Railroad [BNSF]), dispersed recreation, and undeveloped land characterize land uses on these BLM lands. A portion of the Walnut Creek Grazing Allotment, administered by the BLM, is within this area of BLM land. Table 3-3 below lists the identified, authorized, and pending lands and minerals actions on BLM land within the land use study area.

**Table 3-3. Identified Authorized and Pending Lands Actions**

| Name/Owner | Serial Number | Description | Right-of-Way Type | Status |
|---|---|---|---|---|
| Atchison Topeka RR | AZPHX 0086795 | Railroad | ROW - Railroad | Authorized |
| Santa Fe Pacific RR Co. | Patent 824305 | Conveying all interests of U.S. as to secs. 17 and 19 to the Santa Fe Pacific RR Co., issued 9/22/1921 | ROW - Railroad | Authorized |
| Arizona Department of Transportation | AZPHX 0085418; AZPHX 0085419; AZAR 0034610 | Approximately 2,000 ft. west of and parallel with RR ROW; originally for U.S. Route 66, then I-40; instruments dated 8/29/1949, 4/7/1965, dimensions variable per survey maps | ROW - Highway Easement Deeds | Authorized |
| Citizens Utilities Rural Co. | AZAR 0034565 | ROW for a buried telephone line parallel with and east of Griffith Interchange, 1,830 ft. X 50 ft.; granted 10/25/1965 to Citizens Utilities Rural Co. | ROW-Telephone | Authorized |
| Citizens Utilities Rural Co. | AZA 007475 | ROW for a buried telephone line west and parallel to I-40, granted 3/2/1973 to Citizens Utilities Rural Co., the width is noted as variable, either 12 or 20 ft | ROW-Telephone | Authorized |
| Mohave County Board of Supervisors | AZA 017930 | ROW for access road east of Griffith Interchange north to sec. 7, 2,310 ft. X 84 ft., granted 11/15/1982 to the Mohave County Board of Supervisors | ROW-Roadway | Authorized |
| BLM Kingman Field Office | AZA 019263 PT | Reconveyance of lands via land exchange, title accepted by the U.S. 8/20/1986 | EX-BLM SEC 206, FLPMA | Authorized |
| UniSource Energy Corp. | AZA 30831 | ROW for gas line from gas transmission line, granted 12/14/1999 to UniSource Energy Corp. | ROW-Oil and Gas Pipeline | Authorized |
| Mohave County Board of Supervisors | AZA 030847 | ROW for access road from Griffith Interchange west to private lands, 60 ft. X 43 ft., granted 4/19/1999 to the Mohave County Bd. of Supervisors | ROW-Roadway | Authorized |

| Table 3-3. Identified Authorized and Pending Lands Actions | | | | |
|---|---|---|---|---|
| **Name/Owner** | **Serial Number** | **Description** | **Right-of-Way Type** | **Status** |
| Vanterra Energy, Inc. | AZA 034158 | Authorized 9/1/2007 | Lease-Oil and Gas | Authorized |
| Mohave County Development Services | AZA 035376 | Pending application for access road west of and parallel to railroad, submitted 3/29/2010 by Mohave County Development Services, proposed width 84ft. | ROW-Roadway | Pending |
| Unknown | N/A | Seismologic exploration proposal | N/A | Proposal |
| Source: BLM 2015 | | | | |

State

The ASLD manages a small parcel of land located approximately 0.5 miles east of the proposed solar facility. Existing land uses within this ASLD parcel include transportation (I-40/Griffith Road interchange and a dirt road fronting the BNSF) and undeveloped land. A portion of the Walnut Creek Grazing Allotment, administered by the BLM, also extends across this tract of ASLD land. No planned future land uses have been identified.

Private

Existing land uses on private lands within the land use study area include largely undeveloped land, with dispersed industrial, utilities, and transportation uses.

Paved and dirt roadways traverse the land use study area, and provide access to the nearby industrial and utilities facilities and prison. The BNSF and I-40 cross private land, approximately 0.8 and 0.4 miles, respectively, east-southeast of the solar facility.

Two 69kV transmission lines are located north of the solar facility, both connecting to the Black Mountain Power Plant, a 96MW gas-fired peaking power plant, located immediately adjacent to the northwestern corner of the solar facility, as well as the Griffith Energy Project Power Plant, a 600MW gas-fired combined cycle power plant, located adjacent to the south and west sides of Griffith Substation. Two 230kV transmission lines, the Griffith Peacock and Griffith McConnico transmission lines connect to the Griffith Substation. The Black Mountain Solar facility, a 10MW PV solar plant, is located adjacent to the southwest corner of the proposed solar facility. A UNS 69kV substation is located approximately 0.5 miles west-northwest of the northwest corner of the proposed solar facility. A natural gas line is located adjacent to the east of Griffith Substation, and adjacent to the west of the proposed solar facility, and presumably serves both the Griffith Energy Project Power Plant and the Black Mountain Power Plant. A natural gas pump station is located approximately 0.15 miles northeast of the Griffith Substation.

The Arizona State Prison-Kingman is located approximately one mile west of the solar facility. Mohave Block Company, a concrete block manufacturing facility, is located approximately 0.4

miles west of the northwest corner of the proposed solar facility. Praxair, Inc., an industrial welding gas and equipment supply company is located approximately 0.2 miles east of the solar facility. An approximately 90-foot diameter water storage tank, of unknown ownership, is located approximately 0.75 miles northeast of Griffith Substation.

Privately owned land within the land use study area is unincorporated, and thus under the jurisdiction of Mohave County. The *Mohave County, Arizona General Plan* (General Plan), which details the county's policies addressing the desired location and character of development within the unincorporated parts of the county, and outlines an objective to "promote beneficial economic growth, development, and renewal," generally describes the planned use patterns on private land. According to the General Plan, the entirety of the proposed Project and solar facility and majority of land use study area is within a Heavy Industrial land use designation. The General Plan describes the policy intent of the Heavy Industrial designation as including uses such as construction yards, heavy manufacturing, factories, and operation involving significant outside production or transfer of goods. The Heavy Industrial designation allows for power generation facilities.

The General Plan designates portions of the land use study area west of the solar facility as a Light Industrial land use, which includes such uses as warehousing, wholesale sales and distribution, and light manufacturing. The General Plan does not specifically prescribe portions of the land use study area south of the solar facility a land use, and as such the portions fall under the designation of a Rural Development Planning Area.

The land use study area identifies no planned developments on county managed land (Mohave County 2015).

### 3.7.2. Environmental Impacts

Impacts of Western's Proposed Action

#### Federal

Western's Proposed Action would preclude the ability for the interconnection of other power generation facilities into the currently open transmission line bay position in the Western-owned Griffith Substation. Western anticipates no impacts to BLM lands. Western expects no additional land use impacts to federal land through implementation of Western's Proposed Action.

#### State

Western expects no impacts to ASLD lands to result from implementation of Western's Proposed Action.

**Private**

Western's Proposed Action would establish ROW for the installation of the gen-tie substation entry structure on approximately 1.1 acres of currently vacant land, resulting in the removal of this land from potential future use. Western's Proposed Action is compatible with the *Mohave County, Arizona General Plan*. Western expects no land use impacts associated with Western's Proposed Action for private land not owned or leased by Western.

Impacts of Longview's Proposed Action

**Federal**

Western does not expect impacts to federally owned or managed land as a result of Longview's Proposed Action.

**State**

Western expects no impacts to ASLD lands to result from implementation of Longview's Proposed Action.

**Private**

Longview's Proposed Action would result in approximately 350 acres of disturbance associated with the solar facility, and approximately 73 acres of new ROW associated with the gen-tie, resulting in the removal of this currently vacant land from potential future use. Longview's Proposed Action is compatible with the *Mohave County, Arizona General Plan*. Western expects no land use impacts associated with Longview's Proposed Action for private land not owned or leased by Longview.

Impacts of the No Action Alternative

No impacts to land uses within the land use study area would result through implementation of the No Action Alternative. The land would remain available for development.

Cumulative Impacts

The Proposed Actions and other past, present, and reasonably foreseeable future projects would result in the removal of lands available for other uses. Western expects minimal incremental cumulative impacts.

## 3.8. Public Health and Safety

### 3.8.1. Affected Environment

The Mohave County Community Health Improvement Initiative is an ongoing process for improving health and quality of life in Mohave County. The process involves performing a community health assessment and developing a community health improvement plan every three years (MCDPH 2014). Public health and safety is of major concern when evaluating impacts to the environment from development projects large and small. According to the Mohave County Department of Public Health (MCDPH) Community Health Improvement Plan 2014, the fastest growing sector of the population is the 65 years and older age group. This is expected to cause a drastic impact on the amount and type of healthcare services required by the community in the future (MCDPH 2014). The nearest healthcare facilities to the Project and solar facility are in Kingman and Golden Valley, approximately 12 miles to the north and east, respectively.

The proposed Project and solar facility are located in a rural area with few population centers nearby. The closest population centers are given below, with approximate distances to the Project and solar facility and most recent population estimates (U.S. Census 2013). They include three incorporated cities:

- Lake Havasu City - 40 miles; population: 52,935
- Bullhead City - 22 miles; population: 39,383
- Kingman - 12 miles; population: 28,393

and several unincorporated towns, including:

- Fort Mohave - 24 miles; population: 14,364
- Mohave Valley - 25 miles; population: 13,694
- Golden Valley - 14 miles; population: 4,515
- Yucca - 7 miles; population: 282

The Mohave County Division of Emergency Management provides coordination of emergency planning, and training among all county jurisdictions and emergency services (Arizona Department of Emergency Management [AZDEM] 2013). Two fire departments and 14 fire districts provide fire and emergency services within the county. Additionally, there are three fire department hazmat teams with numerous trained hazmat technicians in other departments (AZDEM 2013). Either the Golden Valley Fire District or the Yucca Fire Department would provide fire and emergency services on the Project and solar facility.

The Mohave County Sheriff's Office would provide law enforcement for the Project and solar facility, as they patrol the unincorporated areas of the county, and coordinate with the police departments from the surrounding communities of Kingman, Bullhead City, Lake Havasu City, and three tribal police agencies (AZDEM 2013).

Health officials are concerned regarding the occurrence of valley fever, particularly in desert areas of the southwest (Mayo Clinic 2015). Valley fever is a fungal infection caused by coccidioides organisms present in the soil, which pose a threat when they become airborne to those that breathe the fungi into their lungs (Mayo Clinic 2015). Any disturbance of the topsoil

can release the organisms, and if inhaled can cause symptoms from mild respiratory irritation to a severe flu-like response that could become chronic, causing pneumonia and possibly death in the most extreme cases. Most cases, however, are mild and usually resolve on their own (Mayo Clinic 2015).

Electric and Magnetic Fields (EMF)

The current and voltage required to transmit electrical energy through a transmission line creates a magnetic field measured in amperes (amps). Both electric and magnetic fields (EMF) occur together with the flow of electricity and are thus considered together in terms of exposure. All electrical devices and equipment, including common household appliances, produce EMF that decrease rapidly with distance from the source. The nearest potential receptors of EMF within the Project and solar facility region are more than one mile away, and include a small number of private residences and inmates and staff at the Arizona State Prison.

National and international guidelines restrict exposures to high levels of EMF that may cause measureable effects to human health (World Health Organization [WHO] 2015). Short term low frequency exposure of EMF is not known to cause any harmful effects to human health, however debates continue and further research is being conducted in consideration of long term exposures (WHO 2015).

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has established a continuous magnetic field exposure limit of 833mG (milliGauss) and a continuous electric field exposure limit of 4.2 kilovolts per meter (kV/m) for members of the general public (ICNIRP 2009). No federal laws or policies regulate exposure levels of EMF in the U.S.; however, in addition to the general public EMF limits stated above, the ICNIRP recommends the limit for occupational exposure to 60 Hertz (Hz) magnetic fields to be 10 Gauss (10,000mG) and 25 kV/m for electric fields (ICNIRP 2010).

Fuels and Fire Management

The Mohave County Community Wildfire Protection Plan 2008 describes the proposed Project and solar facility region as within the wildland-urban interface (MCCWPP). MCCWPP categorizes the area as a "low-flammability" area due to the sparse vegetation. The MCCWPP indicates a desire for all private landowners to comply with Firewise Standards as recommended by the plan. Firewise is a national program that helps communities reduce the risk of wildfires by providing information, education, and suggested measures to mitigate losses from fires (MCCWPP 2008).

Hazardous Materials

The Arizona Department of Environmental Quality (ADEQ) is the state agency in Arizona that manages hazardous wastes. The Arizona Administrative Code Title 18, Chapter 8 describes hazardous waste management for the State of Arizona. Construction, operation, and decommissioning of the Project and solar facility would utilize the latest industrial technology

and design standards and would adhere to these and all other regulatory hazardous materials codes and guidelines.

Hazardous materials potentially housed and/or used within the solar facility include small quantities (less than 55 gallons, 500 pounds, or 200 cubic feet) of janitorial supplies, office supplies, laboratory supplies, paint, degreasers, herbicides, air conditioning fluids (chlorofluorocarbons), gasoline, and hydraulic fluid. Longview would store these materials in the O&M facility. Longview would store flammable materials (e.g., paints, solvents) in flammable material storage cabinet(s) with built-in containment sumps. While intact solar panels emit no hazardous waste, cracked or broken panels could potentially leech carcinogenic chemicals (Hales 2014).

### 3.8.2. Environmental Impacts

Relative to the Project and solar facility, the primary conceivable threat to public health comes from particulate matter, more specifically $PM_{10}$, discussed in Section 3.4. Further, toxic air pollutants that become airborne may be deposited onto soil or into lakes and streams, thereby affecting ecological systems (EPA 2012). Training and adherence to procedures would minimize the risk and severity of potential accidents involving chemicals.

The rural desert environment location of the proposed Project does offer favorable conditions for the presence of the fungi that cause Valley Fever, thus it is important for the implementation of Best Management Practices for the mitigation of the release of fugitive dust. Workers in the immediate area would primarily receive fugitive dust, but due to the sparse population in the area, dust poses an unlikely threat to the general public overall.

Construction emissions can vary from day-to-day depending on the level of activity, the specific operations, and the prevailing meteorological conditions. These emissions are primarily fugitive dust emissions from earthmoving and construction vehicle exhaust emission.

The Project and solar facility would produce EMF. Transmission lines operate at a power frequency of 60 Hz; at this frequency, for a 230kV transmission line there would be an average EMF level of approximately 58mG directly under the line, and an average level of approximately 7.1mG at a distance of 100 feet (minimum distance of proposed right-of-way) (XcelEnergy 2007). Household electrical appliances also operate at 60 Hz. Examples of measured average magnetic field levels for household appliances include: 8mG for an electric oven, 60mG for a vacuum cleaner, and 150mG for a can opener. This demonstrates that EMF levels within the home can be much higher than those of transmissions lines depending on the size of the line and proximity to the source, though home appliances are often operated less frequently than a transmission line (Halpin n.d.).

Impacts of Western's Proposed Action

Western expects its Proposed Action to result in negligible public health and safety impacts associated with EMF, fuels and fire, or hazardous materials due to the temporary timeframe of construction activities. Over the long term, minimal vehicular emissions associated with maintenance and repair of the gen-tie substation entry structure would also occur. Western does

not expect short-term construction activities and subsequent operation and maintenance associated with Western's Proposed Action to affect public health.

Impacts of Longview's Proposed Action

Western expects Longview's Proposed Action to result in negligible public health and safety impacts associated with EMF, fuels and fire, or hazardous materials. Ongoing maintenance and inspection of solar panels would minimize any potential damage (natural or otherwise) to the panels, and would thus minimize the potential for carcinogenic chemical to leak from panels.

Upon decommissioning of the solar facility, Longview will make efforts to recycle solar panels and other materials to the greatest extent possible in order to minimize waste and potential hazardous material releases. Western expects Longview's Proposed Action to generate localized pollution, mainly from construction activities, as well as from continued operation and intermittent maintenance. Dust generated from grading and vehicular travel, as well as vehicle emissions, is detrimental to public health depending on length of exposure and proximity to the source. Western expects minimal impacts from Longview's Proposed Action relating to dust generation as construction activities would be temporary and localized, and maintenance activities would be intermittent, temporary, and localized.

Impacts of the No Action Alternative

The No Action Alternative would not result in negative impacts to public health and safety.

Cumulative Impacts

Construction activities combined with an increase in traffic in the county would exacerbate the public health impacts resulting from new development

Due to the rural nature of the Project and solar facility region and distance to population centers in the county, Western expects minimal impacts from the Project and solar facility, i.e., increased travel, vehicle emissions, and dust generation, combined with past, present, and future development.

Collectively, Western does not expect the impacts associated with the construction, operation, and maintenance of the proposed Project and solar facility to cause or contribute to cumulative effects relating to hazardous materials management because of the nature of the materials used, compliance with applicable laws and regulations, and the engineering and administrative controls that Longview would implement to prevent and control accidental releases of hazardous materials.

Proper facility design and the development and implementation of safe material handling programs for the Project and solar facility would reduce the potential for cumulative impacts from release of hazardous materials on the environment. Each reasonably foreseeable future project would be required to comply independently with hazardous materials regulations, depending on the circumstances of each project.

Cumulative impacts to public health and safety would occur only if impacts of the Proposed Actions combined with impacts of the foreseeable future projects occurred at the same time and in close proximity. Due to the negligible and temporary nature of the impacts of the Proposed Actions, such events are unlikely. Therefore, Western does not expect the Proposed Actions to result in cumulative impacts to public health and safety.

## 3.9. Socioeconomics

### 3.9.1. Affected Environment

Located in southern Mohave County, Arizona, the proposed Project and solar facility are situated 0.5 miles west of I-40 in an area where the mainly east-west route runs north-south between Kingman and Yucca, Arizona. This section describes the existing social and economic conditions of Mohave County, which includes three incorporated cities: Lake Havasu City, Bullhead City, and Kingman, and several unincorporated towns.

The American Community Survey (ACS), a component of the U.S. Census Bureau, issues one year estimates that report the 2013 population of Mohave County as 203,030, approximately 48,000 higher than the 2000 census figure of 155,062; an approximate 23 percent increase over the 13 year period. The main population centers of Mohave County are Lake Havasu City, Bullhead City, and Kingman, with 52,935, 39,383, and 28,393 residents, respectively. The remainder of the county is rural with sporadic population clusters (U.S. Census 2015).

The Project and solar facility region contains a not disproportionate representation of minority populations. ACS one year estimates indicate that, in the United States, residents identifying as "Hispanic or Latino of any race" make up the largest minority in the country. In Mohave County, 15.5 percent of the population identify as "Hispanic or Latino of any race", while those that identify as "Not Hispanic or Latino" make up approximately 84.5 percent. Those identifying as "white alone" make up the largest majority in Mohave County overall, at close to 90 percent. For further analysis, an evaluation of race by census tract performed found that over 75 percent of individuals identified as "white alone" in the tract where the Project and solar facility are proposed, with the largest minority, "Hispanic or Latino", at 27.5 percent (U.S. Census 2015). However, there are no residents within one mile of the Project area to evaluate for minority status.

The median age for Mohave County was 49.2, according to the ACS 2013 one year estimates. The county continues its popularity among retirees and tourists to the Colorado River towns of Lake Havasu City, and Bullhead City.

The largest sectors of employment in the county are retail trade, healthcare and social assistance, and accommodation and food service (which includes tourism). The annual unemployment (not seasonally adjusted) rate in the county has recently experienced a downward trend, demonstrated by an estimated annual rate of 9.6 percent in 2013, and a preliminary report of 7.9 percent for the month of December 2014 (Bureau of Labor Statistics [BLS] 2015).

Median household income between 2009 and 2013 was $39,200, lower than the state median at 49,774. Poverty levels were also higher in Mohave County than they were in the state overall, at 19.4 percent and 17.9 percent, respectively.

Housing is stable within the county, but with the increase in population and a trend towards smaller and single parent households, as well as seasonal housing, the county will need more housing units, including more affordable housing types (Mohave County 2005). Of the 81,257 occupied units in the county, 66.8 percent are owner occupied while 33.2 percent are rental units (U.S. Census 2015).

Area land owners, during the Project public scoping period, expressed an interest in the potential effects of the Project and solar facility to property values. A decline in property values could occur in areas near solar facilities or other industrial or utility infrastructure, if a "deterioration in aesthetic quality, increases in noise, real or perceived health effects, congestion, or social disruption" results (Argonne National Laboratory 2013).

The nearest residences to Project or solar facility features are 1.07 miles and 2.49 miles, respectively, however, lands subdivided for residential use are located adjacent and near the proposed Project and solar facility. Originally subdivided in the early 1960s, these subdivisions lack utility service or amenities other than unimproved roads graded at the time of subdivision, and are largely vacant (Vorsanger 2015). Predominantly zoned as Agricultural-Residential, these properties' primary permitted uses consist of agriculture and home occupations (Mohave County 2014). However, as noted in Section 3.7, industrial development currently dominates the proposed Project and solar facility area.

### 3.9.2. Environmental Impacts

Impacts of Western's Proposed Action

Western does not expect its Proposed Action to noticeably affect the socioeconomics of Mohave County. The expected number of construction and operation jobs associated with Western's Proposed Action would have a negligible effect on overall employment in Mohave County. No underserved or otherwise at-risk populations live in close proximity to the proposed Project. Western does not expect impacts to area property values.

Impacts of Longview's Proposed Action

Western expects implementation of Longview's Proposed Action to result in minimal beneficial impacts to socioeconomics. During the estimated six to 12 month construction period, the number of onsite workers would average approximately 100 per day, with a peak of 200 workers per day. Permanent maintenance and operation jobs associated with the solar facility would have a small effect on overall employment in Mohave County.

Improvements made to vacant land would subject that land to a potentially higher tax assessment ratio, which would affect the long-term property tax revenue paid to Mohave County. Western expects higher tax revenues as land values increase; however, the county legislature changes

property classification and assessment ratios often, which can have a dramatic impact on taxes due (Mohave County 2015b).

Western expects Longview's Proposed Action to result in minimal deterioration in aesthetic quality; short-term increases in noise; negligible health effects; and little to no congestion or social disruption; based on the existing industrial landscape, Western expects minimal impacts to property value.

Impacts of the No Action Alternative

The No Action Alternative would not impact socioeconomic conditions in the county. The current tax revenue generated by the vacant land, which was $15,283.58 for 2014, would remain subject only to the increase or decrease in the tax rates based on future assessments (Mohave County 2015b).

Cumulative Impacts

Due to the rapid growth expected in Mohave County, the existing and future tourism industry, and proximity to large urban centers such as Phoenix, Arizona and Las Vegas, Nevada, the Proposed Actions along with reasonably foreseeable future actions could benefit new development and subsequent populations that result by contributing to the renewable energy industry within the region.

## 3.10. Soils

### 3.10.1. Affected Environment

The proposed Project and solar facility are located within the Basin and Range Physiographic province, and specifically within the Sacramento Valley, which is bounded by the Black Mountains to the west and the Hualapai Mountains to the east. The surficial deposits mapped within the region of the proposed Project and solar facility are early Pleistocene to late Pliocene relict alluvial fan deposits. The dominant soil within this area is the Castaneda extremely gravelly loam soil unit, which forms on fan terraces with an elevation of 1,600 to 4,000 feet, and on slopes of one to seven percent. This soil unit encompasses approximately 71,182 acres, or approximately 2.8 percent of the total soils for this approximately 2,492,300-acre US Department of Agriculture (USDA) Soil Survey Study Area, which includes the southern portion of Mohave County. This soil unit is well drained and has moderate permeability. The Castaneda soil has a wind erodibility group classification of eight, which is low for wind erodibility. The K-factor (Kf) is 0.37, which is moderate to high for water erosion from sheet and rill erosion from rainfall (USDA 2005). Existing soil disturbances within the region are primarily a result of road grading and other industrial development.

### 3.10.2. Environmental Impacts

Impacts of Western's Proposed Action

Because the area of the ground disturbance is minimal relative to the regional soil unit, Western expects implementation of Western's Proposed Action to result in minimal impacts to soils. Western maintains a bare earth standard within, and a five-foot bare earth buffer around, its substations, so Western does not anticipate new impacts to soils within Griffith Substation. Up to approximately 1.1 acres of ground disturbance associated with the installation of Western's gen-tie substation entry structure could adversely affect soil resources by slightly increasing the exposure of soil that is susceptible to water or wind erosion at the land surface. This could result in a degradation of the land surface, reduced long-term soil productivity through loss of topsoil material, and increased nonpoint pollution as eroded soil material washes into nearby ephemeral streams.

Impacts of Longview's Proposed Action

Up to approximately 423 acres of ground disturbance, or approximately 0.6 percent of the soil unit within the USDA Soil Survey Study Area, associated with the site preparation and construction of the solar facility, the creation or improvement of access roads, and installation of the gen-tie could adversely affect soil resources by increasing the exposure of soil that is susceptible to water or wind erosion at the land surface. This could result in a slight degradation of the land surface, reduced long-term soil productivity through loss of topsoil material, and increased nonpoint pollution as eroded soil material could wash into nearby ephemeral streams. However, because the root system of existing vegetation within the solar facility would remain intact to the extent possible to limit soil erosion, because access roads would be intermittently maintained to minimize soil erosion, and because the area of the ground disturbance is minimal relative to the regional soil unit, Western expects implementation of Longview's Proposed Action to result in low impacts to soils.

Impacts of the No Action Alternative

Western expects the existing soil conditions to persist under the No Action Alternative.

Cumulative Impacts

The area of cumulative analysis for soil resources includes the soil map units associated with Western and Longview's Proposed Actions. Past, present, and reasonably foreseeable future projects within the region could add to cumulative effects to soil resources, though impacts to soil resources are generally localized and do not result in regional cumulative effects. Soil conditions vary significantly over short distances, effectively limiting the geographic range of impacts on soil resources. Western expects that the implementation of Western and Longview's Proposed Actions along with other past, present, and reasonably foreseeable future projects would have minimal cumulative impacts to soil resources.

## 3.11. Travel Management/Transportation

### 3.11.1. Affected Environment

Primary access to the Project and solar facility is via I-40, located approximately 0.5 miles east-southeast of the solar facility. Griffith Interchange, an access point to reach the Project and solar facility areas from I-40, is also located approximately 0.5 miles east of the solar facility. Oatman Highway (formerly Route 66), a minor collector road, is approximately five miles to the north and west of the solar facility. The remaining access routes in the Project and solar facility vicinity are a combination of paved and unpaved roads.

The BNSF Railway runs parallel to I-40, approximately .8 miles east-southeast of the solar facility, on which freight and Amtrak Southwest Chief Line run (Amtrak 2015). The closest airports to the Project and solar facility site are Kingman Airport, 15 miles northeast, Laughlin/Bullhead International Airport, 25 miles northwest, Sun Valley Airport in Fort Mohave approximately 23 miles to the west, and Lake Havasu City Airport, 32 miles south.

### 3.11.2. Environmental Impacts

Impacts of Western's Proposed Action

Western expects minimal impacts to traffic through implementation of Western's Proposed Action. A negligible temporary increase in traffic volume, of up to 32 round trips per day, on existing transportation facilities would occur during construction and maintenance of facilities at Griffith Substation, and would require no upgrades or improvements to transportation facilities. Western does not expect any required road closures.

Impacts of Longview's Proposed Action

Western expects minimal impacts to traffic through implementation of Longview's Proposed Action, and would primarily occur during construction. A temporary increase in traffic volume, of up to 200 round trips per day, on existing transportation facilities would occur during construction and of the solar facility components. An increase in traffic volume, up to 10 round trips per day on existing transportation facilities, would occur during operations. The solar facility would require the construction and or improvement and regular maintenance of two access roads to the solar facility site, one from Yuma Road and one from Apache Drive. Additionally, Longview would construct and maintain maintenance roads within the solar facility property to allow access to various areas of the site. Western does not expect any required road closures.

Impacts of the No Action Alternative

Western expects no impacts to travel management and traffic under the No Action Alternative.

Cumulative Impacts

Rapid growth in Mohave County has increased traffic congestion along I-40. Mohave County commits to maintaining a level of service on all county roads that will enhance its residents' quality of life as well as travelers' safety. Identified past, present, and reasonably foreseeable future projects include a joint ADOT and BLM study to identify a preferred alternative to provide a free flow traffic interchange along I-40/US 93 in west Kingman (ADOT 2015). Western expects impacts of the Proposed Actions along with identified past, present, and reasonably foreseeable future development to result in negligible cumulative effects to traffic and transportation.

## 3.12. Vegetation

EPG biologists reviewed the existing environment related to vegetation in a two mile buffer around the Project area and solar facility, referred to in this section as the vegetation study area.

The Project and solar facility are located in the Sacramento Valley between the Hualapai and Black Mountains within the physiographic Basin and Range province (Schwartz and Uhlman 2009). The Basin and Range province contains "sky islands" (mountain ranges mostly or completely isolated by lower-elevation valleys); deep sand and gravel alluvial fill and aquifers are distributed throughout the basins (*ibid*). Elevation ranges from approximately 2,300 to 2,500 feet. The Project and solar facility are located within one biome, Mohave Desertscrub, as described by Brown and Lowe (1981). This biome receives rainfall predominantly in the winter months (Brown 1982). Dominant plants include Creosote Bush (*Larrea tridentata)*, Cattle Saltbush (*Atriplex polycarpa*), Brittlebush (*Encelia farinosa*), Desertholly (*Atriplex hymenelytra*), Burrobrush (*Hymenoclea salsola*), and the Mohave endemic Joshua Tree (*Yucca brevefolia*) (Brown 1982). Riparian habitat within the vegetation study area is limited to xeric desert washes with ephemeral streams. Wildlife and plant species present within the vegetation study area are consistent with those found in Mohave Desertscrub.

Two EPG biologists conducted a reconnaissance survey of the vegetation study area on December 23, 2014, on behalf of Longview Solar. EPG intended the reconnaissance-level survey to provide an overview of existing conditions, including a list of plant species and an assessment of the potential for the site to provide habitat to any special-status species.

The Arizona Native Plant Law (Arizona Revised Statutes Title 3-Chapter 7), administered by the Arizona Department of Agriculture, addresses native plant resources in Arizona. Four categories of protected plants exist under the law: highly safeguarded, salvage restricted, salvage assessed, and harvest restricted. Highly safeguarded are plants threatened or in danger of extinction; salvage restricted plants may be subject to vandalism or unauthorized harvest; salvage assessed are plants that have enough value if salvaged to cover the cost of salvaging, and harvest restricted plants have intrinsic value based on products produced from their wood or fiber. Plants may by listed under more than one category. Arizona does not have an endangered or threatened species law.

Arizona Department of Agriculture maintains three categories of noxious weeds under the Arizona Revised Statutes (Title 3, Chapter 2): prohibited, regulated, and restricted. Prohibited

weeds are those prohibited from entering the state. If found within the state, regulated noxious weeds may be quarantined to prevent further infestation or contamination. Restricted noxious weeds shall be quarantined to prevent further infestation. Table C-2 in Appendix C contains a complete list of noxious weeds that could colonize the vegetation study area.

### 3.12.1. Affected Environment

#### Native Vegetation

Vegetation present within the study area is representative of the Mohave Desertscrub biome, specifically the Creosote Bush series as described by Brown (1982). The Project area is cleared and developed within the boundaries of the existing substation, and is largely devoid of vegetation. EPG survey results reported Creosote Bush and Burrobush (*Ambrosia dumosa*) as the most abundant plants present in the proposed solar facility area. Other, less common, species include Longleaf Jointfur (*Ephedra trifurca*), Sandmat (*Chamaesyce* sp.), Catclaw Acacia (*Acacia greggii*), Littleleaf Ratany (*Krameria erecta*), and Bastardsage (*Eriogonum wrightii*). Table C-1 in Appendix C contains the complete list species of plant species observed.

#### Noxious Weeds and Invasive Plants

EPG observed no noxious weed species study area (Table C-1), although any ground disturbance may encourage colonization. One uncommon, non-native species observed within the solar facility is the Redstem Stork's Bill (*Erodium cicutarium*).

### 3.12.2. Environmental Impacts

Impacts of Western's Proposed Action

Many of the activities associated with Western's Proposed Action would take place in an area already fully developed and devoid of vegetation. The new Western gen-tie entry structure is located in native vegetation adjacent to the substation, and construction of this structure would cause the permanent loss of approximately 1.1 acres of vegetation.

Impacts of Longview's Proposed Action

Longview's Proposed Action potentially causes direct loss of up to approximately 423 acres of vegetation. As stated in section 2.2.3, Longview would preserve topsoil and the root systems of native vegetation to the extent possible to encourage regrowth following construction.

Longview may need to divert water running through ephemeral desert washes within the solar facility and channel it around or through the solar facility. This may alter vegetation growth within the solar facility ephemeral washes and areas downslope or downstream, and may alter the type of flora that recover in areas of temporary disturbance. Longview would take measures to avoid diversion of water to the extent practicable, as stated in section 2.2.3.

Dust deposition resulting from construction may negatively impact plants adjacent to the solar facility. Dust particles landing on leaves or photosynthetic stems and bark reduce photosynthetic activity, and therefore reduce plant growth and survival (Sharifi *et al.* 1997). This effect would be temporary; following construction termination, Longview would apply a Mohave County-approved dust suppressant, as stated in section 2.2.6, minimizing deposition effects on vegetation adjacent to the solar facility.

Ground and soil disturbance within the solar facility may increase susceptibility to the colonization of noxious weeds and other invasive plants. Although EPG observed no noxious weeds during a survey of the site, development and ground disturbance in the surrounding vicinity may facilitate the introduction of invasive plants. In addition, inadvertent seed transfer from construction equipment could introduce these species during construction of the solar facility. Non-native plant species may out-compete native plants for resources such as water and soil nutrients, and in some cases can increase fire frequency in vegetation communities not adapted to fire, such as Mojave Desertscrub. Longview would minimize the risk of introduction of invasive plants through cleaning of vehicles before entering and leaving construction areas, and through the use of approved weed-free seed mixes, as required by the ADA.

Impacts of the No Action Alternative

Western expects existing vegetation conditions to persist through implementation of the No Action Alternative; the Mojave Desertscrub-dominated landscape would continue to exist in its current state.

Cumulative Impacts

The Proposed Actions would contribute incrementally to the effects of past, present, and reasonably foreseeable future projects resulting in ground disturbance and vegetation loss. Ground disturbance generates dust deposition and increased susceptibility of noxious and invasive weed colonization. Dust deposition would decrease plants' ability to photosynthesize, critically impacting their ability to grow and survive. Invasive and noxious weed colonization may induce resource competition, and therefore, native plant loss.

## 3.13. Visual Resources

This section of the EA addresses the affected environment associated with visual resources, including visual resource management objectives, scenic quality, key observation points (KOP); and visibility related to the construction, operation, and maintenance of the proposed Project and solar facility. Although not located on BLM lands, EPG used the Visual Resource Management (VRM) methodology for this study due to the widespread use of the system and VRM information available from the BLM. The visual resource study is consistent with the BLM VRM System (BLM 1986) and addresses the potential visual effects of the proposed Project and solar facility on landscape scenic quality, KOPs, and compliance with VRM classifications.

The visual assessment described below includes an inventory of visual resources within five miles of the nearest Project or solar facility features. EPG collected inventory data for visual

resources from BLM data, a field review, and previous transmission line studies in similar settings.

### 3.13.1. Affected Environment

Project Setting

The proposed Project and solar facility are within the Mojave Desert section of the Basin and Range province (Fenneman 1931), characterized by linear desert mountains, separated by large desert plains, and typical Mojave Desert vegetation such as creosote, Burro Bush, Catclaw Acacia, and Banana Yucca. The project site is located within the Sacramento Valley with the Black Mountains to the west and Hualapai Mountains to the east. The valley is flat with little to no topography and drains to the southwest towards the Colorado River approximately 40 miles away.

Cultural modifications that affect the natural landscape setting include existing 230kV transmission lines, substations, power generation facilities, an existing 60 acre solar facility, an Arizona State Prison facility, dispersed residences, I-40, and various improved and unimproved roads. These facilities create a semi-industrial setting within the Project area.

Inventory

**Methodology**

Although not located on BLM lands, EPG used the VRM methodology for this study. To inventory, characterize, and assess visual resources for the Project, EPG considered the following visual components: (1) scenery, (2) viewing locations and KOPs, and (3) BLM visual management classifications.

Scenery is an expression of landscape character, which, for this study, is expressed as Scenic Quality. The BLM defines Scenic Quality as the measure of the visual appeal of a tract of land with rankings based on characteristics of landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modifications. These rankings range from Class A (high ranking of characteristics) to Class C (low ranking of characteristics).

Sensitivity levels are a measure of public concern for the maintenance of Scenic Quality. Public lands are assigned high, medium, or low sensitivity by analyzing the various indicators of public concern, including type of user, amount of use, public interest, adjacent land uses, special areas, and other factors.

Visual Resource Inventory (VRI), used to establish VRM classes, comprises these two components combined, along with Distance Zones (foreground/middleground, background and seldom seen VRI and VRM classifications range from Class I (preserve existing character of land) to Class IV (major modifications are allowable). The BLM KFO supplied the VRI and VRM data.

VRM classifies all lands within the visual study area as Class C scenic quality, with the exception of a Class A landscape (Warm Springs Wilderness) located approximately 3.5 miles to the west. The proposed Project and solar facility are located on VRI Class IV lands with Moderate sensitivity levels within the foreground/middleground (zero to three miles) to background distance zone (three to five miles).

### Sensitive Viewers

KOPs, typically organized into three characterizations: (1) residential views, (2) recreation views, and (3) travel route views, represent the inventory of sensitive viewers. These KOPs, as inventoried in the field, described below, include three components: (1) the identification of sensitive-viewer locations and visual sensitivity (low concern; i.e. little concern over changes to the landscape, moderate; i.e. moderately concerned over changes to the landscape, or high; i.e. very concerned over changes to the landscape); (2) distance zones (foreground-middleground i.e. zero to three miles, background i.e. three to five miles, and seldom seen i.e. over five miles); and (3) viewing conditions (level, superior – i.e. high vantage point looking down on Project, inferior – i.e. low vantage point looking up to Project, screened, unobstructed). Appendix D includes KOP worksheets.

Concern levels relate to the importance of maintaining existing scenic quality and/or viewsheds associated with a specific viewing location, and are considered when assessing viewer impacts. For example, a Wilderness Area is a viewing location that is associated with viewers who have a high degree of concern for maintaining scenic quality and/or viewshed, because the landscape setting is typically a key component to the Wilderness designation. In contrast, a viewing location associated with an interstate route would have low concern, because viewers are traveling at a high rate of speed, and arrival at their destination takes priority over a recreational viewing experience. EPG assessed concern levels for each identified viewing location and associated KOPs based on the following five criteria: (1) volume of use, (2) viewing duration, (3) concern for aesthetics, (4) scenic or historic status, and (5) special status or designations.

### Residential Views

Approximately 24 residential viewers are dispersed throughout the visual study area, all located to the west and north of the project site. EPG considers residential viewers High Concern sensitivity due to long viewing durations of the proposed Project. Typical residences would have level, unobstructed to partially screened views of the proposed Project and solar facility due to low vegetation and flat topography associated with the area (as represented in KOP 2). EPG considers these views the foreground to middleground.

### Recreation Views

The Warm Springs Wilderness is an area of approximately 112,400 acres with primitive recreation opportunities and is located approximately 3.5 miles to the west of the solar facility. The primary recreation is hiking on informal trails throughout the wilderness area with horseback riding and camping opportunities also available. An access road leading to the

wilderness boundary is located within the visual study area with level, unobstructed views of the project area (as represented by KOP 2), however viewers would likely focus attention on the scenery entering the Wilderness Area, and viewers leaving the Wilderness Area would see the semi-industrial landscape.

Travel Route Views

Travelers heading north and south along I-40, at a moderate to high rate of speed (I-40 has a 75 mph speed limit), would have low to moderate concern with changes in the landscape. Travelers would have an unobstructed view of the proposed Project and solar facility and a level view as they move from the background to foreground (as represented by KOP 3).

Travelers heading northeast or southwest along historic Route 66 (Oatman Road) would have moderate to high concern with changes in the landscape, due to travelers along Oatman Road having a higher concern for scenery than arriving quickly at a destination and traveling at a moderate rate of speed at the current speed limit of 45 mph on US 66. Travelers have level, unobstructed views of the proposed Project and solar facility in the background distance zone and see the Project and solar facility in the context of the existing transmission lines and power generating facilities.

**Site Photos**

*Refer to KOP Worksheets for photos associated with Key Observation Point viewing locations*

View of proposed project facilities, from residence approx. 2.5 miles northwest of Project location (arrow).

View of proposed project facilities, from Wilderness Area approx. five miles southwest of Project location (arrow).

View of proposed project facilities, from I-40 approx. .65 miles northeast of Project location (arrow).

View of proposed project facilities, from Historic Route 66 approx. four miles north of Project location (arrow).

### 3.13.2. Environmental Impacts

The primary purpose of the impact assessment is to evaluate and characterize the level of visual modification, or visual contrast, to the landscape that would result from implementation of the Proposed Actions. EPG defines visual contrast as the degree of perceived change that occurs in the landscape due to modifications necessary for the Proposed Actions. EPG performs the assessment for visual contrast by comparing visual elements (form, line, color, and texture) of the existing landscape with the visual elements associated with the implementation of the Proposed Actions. Visual contrast from the proposed Project and solar facility would occur from (1) the landform modifications that are necessary to construct new access roads and the structure pads; (2) the removal of vegetation to construct roads and maintain right-of-way and clearance zones associated with the structure pads; and (3) the introduction of new transmission line structures into the landscape.

Impacts of Western's Proposed Action

#### Project Contrast and Scenic Quality

Western anticipates low impacts to scenic quality, as Western would locate the Project within the vicinity of existing modifications for Class C landscapes. KOPs and other sensitive viewers would see the facilities and approximate 1.1 acres of disturbance, associated with Western's Proposed Action in the context of the existing transmission lines, substation, and power generating facilities.

Residential Views

Western's Proposed Action would result in weak contrast for high concern residential viewers located over one mile away from Project or solar facility features (as represented by KOP 1). The low vegetation and flat landform for dispersed residences with views in the foreground to

middleground would make views of the proposed gen-tie entry structure unobstructed. The proposed gen-tie entry structure and new bay introduced into the landscape would be similar in size, shape, and color to the existing structures and would be seen in the context of the existing transmission lines and substation facilities, thus lowering impacts. Western anticipates low overall impacts to residential viewers.

Recreation Views

Western's Proposed Action would result in weak contrast for moderate concern level views from the Warm Springs Wilderness. Views of the proposed gen-tie entry structure and new bay would be within the context of the existing substation; additionally, due to the flat terrain, contrast would be weak as viewers would not be able to see the extent of modifications. Structures introduced in the landscape would be similar to the existing structures in line, form, and color so as to introduce weak contrast for structures in the landscape, thus lowering overall impacts. Western anticipates low impacts to dispersed recreation viewers and views from an access road leading to the Wilderness area (KOP 2).

Travel Route Views

Western's Proposed Action would result in weak contrast for moderate sensitivity travel route viewers (as represented by KOP 3). Impacts to viewers traveling southbound on I-40 are low due to the proposed Project being seen in the context of the existing transmission lines in the foreground and existing substation and power generation facilities in the background. Western anticipates low impacts for travelers traveling north on I-40, as viewers would see the proposed Project in the context of the existing substation and power generation facilities in the foreground and existing transmission lines in the background, also, views of the modifications on the flat terrain would not be as noticeable as travelers pass from the middleground distance zone to the foreground distance zone. Likewise, Western anticipates low impacts from Route 66 (KOP 4) as the proposed Project would be in the background distance zone and seen in the context of the existing substation, transmission lines, and power generating facilities, as well as dispersed residences.

Impacts of Longview's Proposed Action

**Project Contrast and Scenic Quality**

Western anticipates low impacts to scenic quality, as Longview would locate the solar facility within the vicinity of existing modifications for Class C landscapes. KOPs and other sensitive viewers would see the facilities associated with Longview's Proposed Action in the context of the existing transmission lines and solar and other power generating facilities.

Residential Views

Longview's Proposed Action would result in weak contrast for high concern residential viewers (as represented by KOP 1). Low vegetation and flat landform for dispersed residences would make views of the vegetation clearing and landform modification unobstructed. The proposed gen-tie and solar facility introduced into the landscape would be similar in shape and color to the existing structures and would be seen in the context of the existing transmission lines and solar and other power generating facilities, thus lowering impacts. Western anticipates low overall impacts to residential viewers.

Recreation Views

Western anticipates moderate contrast for moderate concern level views from the Warm Springs Wilderness. Views of vegetation removal and landform modification would be unobstructed; however, due to the flat terrain, contrast would be weak as viewers would not be able to see the extent of modifications. Structures introduced in the landscape would be similar to the existing structures in line, form, and color so as to introduce weak contrast for structures in the landscape, and the proposed solar facility would be seen in the context of the existing transmission lines, power generating station, and prison, thus lowering overall impacts. Western anticipates low impacts to dispersed recreation viewers and views from an access road leading to the Wilderness area (KOP 2).

Travel Route Views

Western anticipates weak contrast for moderate sensitivity travel route viewers (as represented by KOP 3). Impacts to viewers traveling southbound on I-40 are low due to the proposed solar facility being seen in the context of the existing power station and associated transmission lines in the foreground and existing power generation facilities in the background. Western anticipates low impacts for travelers traveling north on I-40, as views of vegetation clearing, landform modification, and solar panels would be unobstructed; however, views of the modifications on the flat terrain would not be as noticeable as travelers pass from the middleground distance zone to the foreground distance zone. As travelers enter into the foreground distance zone, they view the proposed gen-tie structures and solar panels in the context of the existing substation, power generation facilities, prison facility and transmission line structures, thus reducing overall impacts. Likewise, Western anticipates low impacts from Route 66 (KOP 4), as the proposed solar facility would be in the background distance zone and seen in the context of the existing transmission lines and power generating facilities as well as dispersed residences and the prison.

## Glint and Glare

*Glint* is defined as a bright, momentary flash of light; *glare* is defined as a more continuous and sustained presence of light that may appear to sparkle from public viewing locations. Although EPG has not conducted a visible light study for this project, EPG based the following conclusions on a literature review of glint and glare studies for solar power facilities and the *Final Programmatic Environmental Impact Statement (FPEIS) for Solar Development in Six Southwestern States* (BLM and DOE 2010).

Western anticipates that a PV plant with single-axis tracking technology would face east (and thus I-40) for a limited time the morning, which would be the time of highest impact to sensitive viewers in regard to glint and glare. The range of motion for these trackers is confined to the angles at which they would track the sun, generally 45 degrees above horizontal in either direction. This limited range would likely reduce the time in which sensitive viewers would observe glint and glare. Single-axis tracking panels not in use are in the 'stow' position, typically between 0 and 20 degrees above horizontal when not in operation, thus reducing the potential for glint and glare for sensitive viewers. Western expects that during installation, panels would be in the neutral or stow position and would not be a hazard for workers during construction on-site.

A typical fixed panel PV plant has panels installed at approximately 20–35 degrees above horizontal and are permanently fixed in a southern facing skyward direction; therefore, the panels cannot move. For fixed panel systems used on the Cliffrose Project, potential for glint and glare would exist in the late afternoon for east-bound travelers on I-40; however, any glint or glare from the facilities would be intermittent as travelers are typically traveling at high rates of speed. Additionally, PV panel surfaces are designed specifically not to reflect light, thus reducing the potential for glint and glare (U.S. Air Force 2011). Similar to vehicular traffic, impacts to aircraft pilots would be intermittent or limited to certain times of the day.

Impacts of the No Action Alternative

No impact to visual resources would occur under the No Action Alternative.

Cumulative Impacts

The Proposed Actions would incrementally add to the industrial nature of the Sacramento Valley. Western anticipates identified reasonably foreseeable future projects to be similar in nature to the existing development or to have the potential to create new visual impacts within the same viewshed as the Proposed Actions from public travel routes, recreation areas, and residential areas.

When considered with the existing visual setting and future developments potentially modifying the visual character of the Sacramento Valley, the Proposed Actions would moderately alter existing scenic quality or viewsheds but would not substantially add to overall cumulative effects to visual resources.

## 3.14. Water Resources

Federal and state laws and policies establish standards for clean water, controlling development in flood plains, and protecting the environment. A summary of the regulatory agencies that have set forth the policies and regulations that must be considered in reference to the proposed Project and solar facility follows.

The Clean Water Act 1977 (CWA) sets water quality standards for all bodies of water. The objective of the CWA, as amended, is to restore and maintain the chemical, physical, and

biological integrity of the nation's waters. The Safe Drinking Water Act as amended 1996 (SDWA) protects drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells.

Section 404 of the CWA regulates the dredging or filling of any material into Waters of the United States (WUS) under the regulatory jurisdiction of the United States Army Corps of Engineers (USACE). If the Project and solar facility requires the dredge or fill in a WUS as defined in the CWA, it may be necessary to obtain a federal permit to conduct the work. The USACE defines Waters of the United States as waters that are "currently used or were used in the past or may be susceptible to use in interstate or foreign commerce, including all waters subject to the ebb and flow of the tide and all interstate waters including interstate wetlands" (33 CFR Part 328.3).

The ADEQ implements protection of water resources in Arizona for federal and state regulations at the state level. The responsibilities of the ADEQ include the CWA and the SDWA.

### 3.14.1. Affected Environment

The proposed Project and solar facility are located in the Sacramento River Valley Basin within the Upper Colorado River Planning Area as described by the Arizona Department of Water Resources (ADWR). The area is characterized by semi-arid to arid alluvial basins, the Colorado River, on the western edge of the planning area, is the largest perennial stream (ADWR 2009). Groundwater quality is generally good in the basin except along the base of the mountains where waters have been found to contain high mineral content (ADWR 2009;2014).

Surface Water

No perennial surface waters, springs, or wetlands are on the Project or solar facility site. Three ephemeral washes: Griffith Wash, Shingle Canyon, and Black Rock Wash, cross the region. All washes on the site flow northeast to southwest into the Sacramento Wash, a tributary of the Colorado River. Longview would develop a drainage plan for the Project. The plan will address how Longview will manage precipitation falling on the site, and will include engineering details demonstrating how Longview will divert stormwater flowing in washes currently crossing the site through the site and return it to the unmodified wash on the downstream edge of the site.

Longview commissioned a Significant Nexus Analysis (SNA) for the proposed Project and solar facility, which determined that there is no significant nexus to WUS. The USACE exercises jurisdiction over WUS under Section 404 of the CWA. Longview has submitted the SNA to the USACE for review. If the USACE determines that jurisdictional washes are present, the USACE may require that Longview develop on-site drainage and erosion control measures for the project.

Groundwater

The Sacramento Valley Basin aquifer is within the vast Basin and Range system of aquifers that extend through 200,000 square miles of the southwestern United States. This system of aquifers

is the principal source of groundwater in most of Nevada, western Utah, southeastern California, and southern and eastern Arizona (United States Geological Survey [USGS] 2009).

The Sacramento Valley Basin aquifer is considered a basin-fill aquifer that receives recharge from stream inflow and mountain front snow melt. Natural recharge estimates range from 1,000 to 4,000 acre feet per year. The deepest recorded water level in the basin was 1,062 feet, west of Kingman, and the shallowest was 38 feet, east of Topock. Well yields in this aquifer range between less than 100 gallons per minute (GPM) to 2,000 GPM. As of 2005, 1,010 registered wells were registered with pumping capacity of less than 35 GPM, and 151 with pumping capacity greater than 35 GPM (ADWR 2009).

Groundwater Demand

Increased population and development placed a greater demand on groundwater in and around the proposed Project and solar facility. Most municipal water demand from the Sacramento Valley Basin is in the vicinity of Kingman, which is categorized as high intensity Municipal and Industrial (M&I). The only other area within the basin categorized as high intensity M&I is in the area of the proposed Project and solar facility at the Griffith Energy Project Power Plant south of Kingman. West of Kingman along Highway 68 including Golden Valley is categorized as low intensity M&I (ADWR 2009).

### 3.14.2. Environmental Impacts

Impacts of Western's Proposed Action

Due to the limited nature of the disturbance, the lack of surface water resources present in proximity to Western's proposed facilities, and small amount of water required for construction and operations, Western expects implementation of Western's Proposed Action to result in negligible impacts to water resources.

Impacts of Longview's Proposed Action

Longview expects that the solar facility would need approximately 150 acre-feet of water during construction of the project, and approximately five acre-feet of water per year for operations, including PV panel washing and other non-potable and potable uses. Longview would treat this water for potable use, and would supply it by groundwater or transport it to the site. If Longview uses groundwater, one to five onsite wells would be drilled.

Due to the short duration of construction activities and intermittent maintenance, the limited amount of water required during operations, and the implementation of best management practices, Western expects minimal impacts to water resources. Longview will divert stormwater that currently flows across the site in small, ephemeral washes through channels and return it to the original wash on the downstream edge of the site.

Impacts of the No Action Alternative

No impacts to water resources would occur under the No Action Alternative.

Cumulative Impacts

The possibility of erosion exists with the development of this site as well as cumulatively with other past, present, or future projects. As Longview grades the solar facility area, increasing run-off and erosion could affect the ephemeral washes depending on the direction of the drainage. As stated in section 3.10, the soil's Kf is 0.37, which is moderate to high for water erosion from sheet and rill erosion from rainfall (USDA 2011). Additionally, removal of vegetation and other construction activities associated with the Proposed Actions and other reasonably foreseeable future projects could alter the current drainage patterns thus affecting the erosion rates.

Three of the four designated water providers in the Sacramento Valley Basin have a total projected annual estimated demand of 7,434.86 acre feet, more than double the average 3,700 AFA reported during the years 2001-2005. One provider, the City of Kingman, does not have a projected annual or estimated demand. Increased development and population will place a greater strain on the Sacramento Valley Basin aquifer. Longview expects minimal water usage during construction and ongoing operation and maintenance when considering the annual estimated recharge of the aquifer. However, through best management practices including adherence to the codes set forth by the Arizona Groundwater Management Code, Longview would lessen the impacts.

## 3.15. Wildlife

EPG reviewed the existing environment related to wildlife in a two mile buffer around the Project area and solar facility, referred to in this section as the wildlife study area.

The Project and solar facility are located in the Sacramento Valley between the Hualapai and Black Mountains within the physiographic Basin and Range province (Schwartz and Uhlman 2009). The Basin and Range province contains "sky islands" (mountain ranges mostly or completely isolated by lower-elevation valleys); deep sand and gravel alluvial fill and aquifers are distributed throughout the basins (*ibid*). Elevation ranges from approximately 2,300 to 2,500 feet. The Project and solar facility are located within one biome, Mohave Desertscrub, as described by Brown and Lowe (1981). This biome receives rainfall predominantly in the winter months (Brown 1982). Dominant plants include Creosote Bush (*Larrea tridentata),* Cattle Saltbush (*Atriplex polycarpa*), Brittlebush (*Encelia farinosa*), Desertholly (*Atriplex hymenelytra*), Burrobrush (*Hymenoclea salsola*), and the Mohave endemic Joshua Tree (*Yucca brevefolia*) (Brown 1982). Riparian habitat within the wildlife study area is limited to xeric desert washes with ephemeral streams. Wildlife and plant species present within the wildlife study area are consistent with those found in Mohave Desertscrub.

Two EPG biologists conducted a survey of the wildlife study area on behalf of Longview Solar. EPG intended the reconnaissance-level survey to provide an overview of existing conditions, including a list of plant species and an assessment of the potential for the site to provide habitat to any special-status species.

Both federal and state laws protect wildlife resources. The Endangered Species Act of 1973 (16 U.S.C. 1531-1544) as amended, provides protection for fish, wildlife, and plant species listed as threatened or endangered by the United States Fish and Wildlife Service (USFWS). All federal agencies in consultation with the USFWS must ensure any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of an endangered, threatened, or proposed listed species, or result in destruction or adverse modification of the critical habitat of a species.

Arizona does not have a law listing wildlife as endangered or threatened. In 1996, The Arizona Game and Fish Department (AZGFD) created the "Wildlife of Special Concern in Arizona" (WSC) list indicating species, or associated habitats, that may be in jeopardy. AZGFD no longer maintains this list, but a permanent closed season implemented in Arizona's hunting regulations provides protection for the species on the list. This prevents intentional take (capture or killing) of these species but does not provide protections related to accidental take or habitat loss. In 2005, AZGFD developed a list of Species of Greatest Conservation Need (SGCN), described in Arizona's State Wildlife Action Plan, which was updated in 2012. The three tiers of SGCN are 1A, 1B, and 1C. 1A species are those that are federally listed, a candidate for listing, are the topic of a signed conservation agreement, or may require monitoring following delisting. 1B species are those that are petitioned for federal listing or are a sensitive species for any federal agency. 1C species are vulnerable, but do not fit into a category listed for 1A or 1B species.

The federal Migratory Bird Treaty Act of 1918 (MBTA), which is administered by the USFWS, protects nearly all bird species native to North America. The MBTA protects birds against intentional and unintentional killing, including taking active nests (nests which contain eggs or young). Because the MBTA does not provide protections for bird habitat, loss of which is a major cause of modern bird population declines, Executive Order 13186 directed each federal agency with substantial land management responsibilities to develop a Memorandum of Understanding (MOU) with the USFWS to address migratory bird habitat conservation. The DOE and USFWS signed an MOU for the conservation of migratory birds in 2013.

### 3.15.1. Affected Environment

This section provides information on the environmental setting of the wildlife study area, placing an emphasis on special-status species. The wildlife study area included the Sacramento Valley, and the review additionally considered the potential for any downstream effects of the Project that could reach the Colorado River.

#### Special-status Species

Evaluated special-status species include Endangered Species Act (ESA)-listed, proposed, and candidate species reported by the USFWS Information, Planning, and Conservation (IPaC) database (IPaC 2014). EPG reviewed WSC, SGCN, and USFWS Birds of Conservation Concern (BCC) for potential special-status presence within the wildlife study area. A total of 65 special-status species were evaluated, and 28 of them may occur within the wildlife study area (Table C-3) as determined by a review of the habitat and distribution of each species. Table C-3

presents a brief description of the rationale used to determine whether a species may be present. EPG does not anticipate any species listed under the ESA to be present in the study area.

### Mammals

Eight special-status mammals are known to occur within the wildlife study area (Table C-3).

Five bat species (Pale Townsend's Big-eared Bat, Spotted Bat, Greater Western Mastiff Bat, Pocketed Free-tailed Bat, and Mexican Free-tailed Bat) may occur within the wildlife study area and all are SGCN. The five species inhabit desertscrub areas and roost in crevices, caves, mines, and abandoned buildings (AZGFD 2003a, AZGFD 2003b, AZGFD 2002a, AZGFD 2011a, AZGFD 2004a). The five bat species forage for insects either in flight or from the surfaces of vegetation (*ibid*).

The Kit Fox, also SGCN, may occur within the wildlife study area. A nocturnal mammal, the Kit Fox spends the day in underground dens and exits at night to prey on small mammals such as Kangaroo Rats (*Dipodomys* spp.) and rabbits (*Sylvilagus* spp.) (Reid 2006).

The Arizona Pocket Mouse and Harris' Antelope Squirrel, two SGCN, small mammal species, may occur within the wildlife study area. Both species inhabit desertscrub landscapes and build burrows under shrubs, especially Creosote Bush (AZGFD 2011c, Reid 2006).

### Birds

Eighteen special-status birds may occur within the wildlife study area (Table C-3). Eleven birds are BCC, one bird is an SGCN, and six birds are both BCC and SGCN. The majority of these birds may migrate through the wildlife study area, although some may nest and/or winter in the area.

### Reptiles

Two special-status reptiles occur within the wildlife study area: the Gila Monster and Sonoran Desert Tortoise. The diurnal Gila Monster inhabits rocky bajadas, preys upon small mammals, birds (primarily eggs and nestlings), and reptiles, and retreats into burrows at night (Stebbins 2003).

The Sonoran Desert Tortoise remains a candidate species under the ESA, as well as an SGCN in Arizona. The species shows an apparent preference for steep terrain on rocky hillsides and mountain foothills, and is rarely recorded in valley bottoms except during infrequent long-distance dispersal (Averill-Murray 2005). In extreme temperatures, both cold and hot, the Sonoran Desert Tortoise seeks shelter in burrows or underneath low-lying vegetation; therefore, presence of adequate shelter is a key determinate of their habitat (AZGFD 2010). Burrows consist of self-excavated spaces below rocks, boulders, and shrubs in loose soil (AZGFD 2010). In addition, the Sonoran Desert Tortoise may use previously formed burrows in rock crevices and caliche caves along desert washes (AZGFD 2010). As herbivores, Sonoran Desert Tortoises

consume annual and perennial grasses, forbs, and succulents (AZGFD 2010). The AZGFD (2010) reported mallows (Malvaceae) to be the primary dietary component. EPG biologists observed caliche caves in the banks of a large wash near the southeastern corner of the solar facility. EPG biologists observed no Gila Monsters, Sonoran Desert Tortoises, or their sign, although either species may be present.

### 3.15.2. Environmental Impacts

Impacts of Western's Proposed Action

Western's Proposed Action would generate noise that may adversely affect wildlife within the area. Increased noise in an environment can alter predator-prey interactions, and can require increased territorial song volume in birds, thereby increasing physiological stress and/or mortality (Francis and Barber 2013). Although electrical components can create an electrocution hazard to birds, the required clearance between energized and grounded components on 230kV systems is greater than the wingspan of bird species present in the Project area, and the potential that any birds would be electrocuted is extremely low (Avian Power Line Interaction Committee [APLIC] 2006). Bird collision with transmission lines does occur, although the risk is highest in poor visibility and near areas where high numbers of birds are taking off and landing, such as roost sites, ponds, or concentrated food sources (APLIC 2012). Siting multiple transmission lines near each other can reduce collision risk, as this creates a greater visual cue for birds to avoid.

Impacts of Longview's Proposed Action

Impacts on wildlife from Longview's Proposed Action include loss of habitat, human disturbance, direct mortality, noise pollution, light pollution, and habitat fragmentation. The removal of up to 423 acres of vegetation would result in the nearly complete loss of wildlife and their habitat in the solar facility; however, birds and some mammals would be capable of avoiding construction vehicles and dispersing out of the construction area. Also, human activity throughout the duration of the construction, and to a lesser extent following construction, may cause avoidance of the solar facility and its immediate vicinity by wildlife species that are sensitive to human presence, such as nesting birds.

Although habitat for special-status species such as the Gila Monster and Sonoran Desert Tortoise is potentially present within the solar facility, the steep, rocky terrain with abundant shelters preferred by both species is not present. Construction may affect caliche caves in major washes near the southeastern boundary of the solar.

Potential impacts related to noise would be similar to those described above for Western's Proposed Action, although these impacts would take place over a greater area and time span associated with construction of the solar facility.

Light pollution stemming from construction, although temporary, may disorient wildlife and impact foraging, reproduction, and communication (Longcore and Rich 2004). Longview would reduce lighting to a low level around the solar facility following construction, as stated in section 2.2.2, minimizing the impact on wildlife species.

Longview's Proposed Action would not likely impact habitat fragmentation, or the breaking apart of habitat independent of habitat loss (Fahrig 2003). The relatively small size and non-linear design of the solar facility would not impede present wildlife from successfully dispersing through the Sacramento Valley.

Impacts of the No Action Alternative

Western expects existing wildlife conditions to persist through implementation of the No Action Alternative. Wildlife present on the site would remain and continue to inhabit and disperse through the wildlife study area.

Cumulative Impacts

The Proposed Actions would contribute incrementally to the effects of past, present, and foreseeable future projects resulting in ground disturbance and vegetation loss. Ground disturbance and vegetation loss would precipitate the impacts of human activity, habitat loss, noise pollution, and light pollution; all of which would prompt an avoidance of the Project and solar facility areas by wildlife through the duration of construction, and in some cases, permanently.

# Chapter 4. LIST OF PREPARERS

**Table 4-1. List of Western Reviewers and Non-Western Preparers of This EA**

| Name | Agency or Company | Title | Responsibilities |
|---|---|---|---|
| Matthew Billsbarrow | Western | Environmental Protection Specialist | NEPA Document Manager, Project Management, Review |
| Sean Heath | Western | Environmental Protection Specialist | Review |
| Linda Marianito | Western | Environmental Manager | Review |
| Lisa Meyer | Western | Historic Preservation Specialist/Archeologist | Section 106, Review |
| Newton DeBardeleben | EPG | Senior Environmental Planner | Senior Review |
| Tony DeLuca | EPG | Environmental Planner | Air Quality, Public Health and Safety, Socioeconomics, Travel Management and Transportation, Water Resources |
| David Kahrs | EPG | Biologist | Vegetation, Wildlife |
| Conrad Langley RLA, ASLA | EPG | Visual Resource Specialist | Visual Resources |
| Tyffany Nidey | EPG | Biologist | Vegetation, Wildlife |
| Mike Pasenko | EPG | Paleontologist | Paleontological Resources, Soils |
| Devin Petry | EPG | Environmental Planner | Project Manager, Land Use, Intentional Destructive Acts |
| Steve Swanson PhD, RPA | EPG | Cultural Resources Director | Cultural and Paleontological Resources |

## Chapter 5. REFERENCES


ADEQ. *See* Arizona Department of Environmental Quality.

ADOT. 2015. Arizona Department of Transportation. Accessed 09 February 2015 from, http://azdot.gov/projects/far-west/i-40-us-93-system-traffic-interchange-design-concept-and-environmental-studies/overview

ADWR. 2009. Arizona Water Atlas Volume 4: Upper Colorado River Planning Area. Accessed 11 February 2015 from, http://www.azwater.gov/AzDWR/StatewidePlanning/WaterAtlas/UpperColoradoRiver/documents/Volume_4_final_web.pdf

_____. 2014. Hydrology of the Sacramento Valley Basin. Accessed 11 February 2015 from, http://www.azwater.gov/AzDWR/StatewidePlanning/WaterAtlas/UpperColoradoRiver/Hydrology/SacramentoValley.htm

Ammon, E. M. 1995. Lincoln's Sparrow (*Melospiza lincolnii*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/191

Amtrak. 2015. Amtrak. West Train Routes. Accessed 09 February 2015 from, http://www.amtrak.com/west-train-routes

Argonne National Laboratory. 2013. An Overview of Potential Environmental, Cultural, and Socioeconomic Impacts and Mitigation Measures for Utility-Scale Solar Energy Development. Accessed 02 April 2015 from, http://www.evs.anl.gov/downloads/Solar_Environmental_Impact_Summary.pdf.

Arizona Department of Emergency Management (AZDEM). 2013. State of Arizona Hazard Mitigation Plan, State and County Descriptions. Accessed 18 February 2015 from, http://www.dem.azdema.gov/preparedness/docs/coop/mitplan/12_Mohave_County.pdf

Arizona Department of Environmental Quality (ADEQ). 2007. Technical Support Document for Unisource Development Company Black Mountain Generating Station, Air Quality Permit Number 42864. Accessed 11 February 2015 from, http://www.azdeq.gov/environ/air/permits/title_v/EGP/UEDCO/42864/deqsupport.pdf

_____. 2012. Arizona Department of Environmental Quality. Technical Support Document for Griffith Energy, LLC. Air Quality Permit Number 53024. Accessed 11 February 2015 from, http://www.azdeq.gov/environ/air/permits/title_v/EGP/53024/deqsupport.pdf

_____. 2015. Arizona Department of Environmental Quality. Title 49-The Environment. Accessed 11 February 2015 from, http://www.azleg.gov/ArizonaRevisedStatutes.asp?Title=49

Arizona Geological Survey. 2000. The Geological Map of Arizona. Arizona Geological Survey Digital Geologic Map: DGM-17. Accessed from, www.azgs.state.az.us/services_azgeo map.shtml.

Averill-Murray, R. C. and A. Averill-Murray. 2005. Regional-Scale Estimation of Density and Habitat Use of the Desert Tortoise (Gopherus agassizii) in Arizona. Society for the Study of Amphibians and Reptiles. Journal of Herpetology 39 (1): 65-72.

AZGFD. 2000. *Plagopterus argentissimus*: Woundfin. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2001a. *Idionycteris phyllotis*: Allen's Big-eared Bat. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 4 pp.

_____. 2001b. *Athene cunicularia*: Western Burrowing Owl. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 7 pp.

_____. 2001c. *Gila elegans*: Bonytail Chub. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2001d. *Gila cypha*: Humpback Chub. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2001e. *Gila seminuda*: Virgin River Chub. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 4 pp.

_____. 2002a. *Eumops perotis californicus*: Greater Western Mastiff Bat. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2002b. *Aquila chrysaetos*: Golden Eagle. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 4 pp.

_____. 2002c. *Heloderma suspectum cinctum*: Banded Gila Monster. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2002d. *Xyrauchen texanus*: Razorback Sucker. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 7 pp.

_____. 2002e. *Gila robusta*: Roundtail Chub. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2003a. *Corynorhinus townsendii pallescens*: Pale Townsend's Big-eared Bat. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2003b. *Euderma maculatum*: Spotted Bat. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 9 pp.

_____. 2004a. *Tadarida brasilliensis*: Mexican Free-tailed Bat. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2004b. *Falco peregrinus anatum*: American Peregrine Falcon. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2010. *Gopherus morafkai*: Sonoran Desert Tortoise. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 11 pp.

_____. 2011a. *Nyctinomops femorosaccus*: Pocketed Free-tailed Bat. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2011b. *Myotis occultus*: Arizona Myotis. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2011c. *Perognathus amplus cineris*: Arizona Pocket Mouse. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 5 pp.

_____. 2011d. *Haliaeetus leucocephalus*: Bald Eagle. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 9 pp.

_____. 2013a. *Buteo regalis*: Ferruginous Hawk. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2013b. *Buteo swainsoni*: Swainson's Hawk. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ. 6 pp.

_____. 2014. Heritage Data Management System (HDMS). Query retrieved December 2014.

Baltosser, W. H. and P. E. Scott. 1996. Costa's Hummingbird (*Calypte costae*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/251

BLM. 1986. U.S. Department of the Interior Bureau of Land Management. BLM Manual H-8410-1: Visual Resource Inventory.

_____. 2015. Personal Communication between Andy Whitefield, BLM EnvironmentalProtection Specialist, and Devin Petry. February 9, 2015.

BLM and DOE. 2012. *Final Programmatic Environmental Impact Statement (FPEIS) for Solar Development in Six Southwestern States.* BLM, Department of the Interior. Washington, D.C. December 2012. Accessed 07 April 2015 from, http://solareis.anl.gov/documents /fpeis/index.cfm

Brown, D. E. 1982. Biotic Communities of the American Southwest-United States and Mexico. University of Arizona. Desert Plants 4 (1-4): 342 pp.

Brown, D. E. 1994. Desertlands. *Biotic Communities: Southwestern United States and Northwestern Mexico*. University of Utah Press, Salt Lake City.

Brown, D. E., and C. H. Lowe. 1981. Biotic Communities of the Southwest Map.

Bureau of Labor Statistics (BLS). 2015. Bureau of Labor Statistics. Local Area Unemployment Statistics (LAUS); Unemployment. Accessed 12 February 2015, http://www.bls.gov/lau/data.htm

Calder, W. A. and L. L. Calder. 1994. Calliope Hummingbird (Selasphorus calliope), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/135

Carrasco, M.A., B.P. Kraatz, E.B. Davis, and A.D. Barnosky. 2005. Miocene Mammal Mapping Project (MIOMAP). University of California Museum of Paleontology http://www.ucmp.berkeley.edu/miomap/.

DOE. 2006. Memorandum on the Need to Consider Intentional Destructive Acts in NEPA Documents. Accessed 12 February 2015 from, http://energy.gov/sites/prod /files/nepapub/nepa_documents/RedDont/G-DOE-intentdestructacts.pdf

England, A. S. and W. F. Laudenslayer, Jr. 1993. Bendire's Thrasher (*Toxostoma bendirei*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/071

EPA. 2012. U.S. Environmental Protection Agency. Toxic Air Pollutants. Accessed 09 February 2015 from, http://www.epa.gov/airtrends/aqtrnd95/tap.html

_____. 2013. U.S. Environmental Protection Agency. Climate Change: Climate Impacts in the Southwest. Accessed 09 February 2015 from, http://www.epa.gov/climatechange/impacts-adaptation/southwest.html

_____. 2015. U.S. Environmental Protection Agency. Green Book. Current non-attainment counties for all criteria pollutants. Accessed 09 February 2015 from, http://www.epa.gov/oaqps001/greenbk/ancl.html

Fahrigh, L. 2003. Effects of Habitat Fragmentation on Biodiversity. Annual Review of Ecology, Evolution, and Systematics 34: 487-515.

Francis, C. D. and J. R. Barber. 2013. A Framework for Understanding Noise Impacts on Wildlife: An Urgent Conservation Priority. Ecological Society of America. Frontiers in Ecology and the Environment 11 (6): 305-313.

Graham, R.W. and E.L. Lundelius, Jr. 2010. FAUNMAP II: New data for North America with a temporal extension for the Blancan, Irvingtonian and early Rancholabrean. FAUNMAP II Database, version 1.0.

Hales, R.L. 2014. Clean Technica. *Solar panels & their toxic emissions*. Accessed 24 March 2015 from, http://cleantechnica.com/2014/05/01/solar-panels-toxic-emissions/

Halpin, P.E., M.P. (n.d.) Transmission Lines-Electric and Magnetic Fields (EMF). Accessed 13 February 2015, http://www.dep.state.fl.us/siting/files/application/ppsa/turkey_pt/emf_presentation.pdf

Healy, S. and W. A. Calder. 2006. Rufous Hummingbird (*Selasphorus rufus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/053

ICNIRP. 2009. ICNIRP Guidelines on Limits of Exposure to Static Magnetic Fields. Accessed 13 February 2015, http://www.icnirp.org/cms/upload/publications/ICNIRPstatgdl.pdf

_____. 2010. International Commission on Non-Ionizing Radiation Protection. The 2010 ICNIRP Guidelines. Accessed 13 February 2015, http://www.emfs.info/limits/limits-organisations/icnirp-2010/

Kennedy, E. D. and D. W. White. 2013. Bewick's Wren (*Thryomanes bewickii*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/315

Knopf, F. L. and M. B. Wunder. 2006. Mountain Plover (*Charadrius montanus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/211

Longcore, T. and C. Rich. 2004. Ecological Light Pollution. Ecological Society of America. Frontiers in Ecology and the Environment 2 (4): 191-198.

Mayo Clinic. 2015. Diseases and Conditions: Valley Fever. Accessed 23 March 2015 from, http://www.mayoclinic.org/diseases-conditions/valley-fever/basics/definition/con-20027390

MCCWPP. 2008. Accessed 23 March 2015 from, http://resources.mohavecounty.us/file/DevelopmentServices/EmergencyManagment/Mohave%20County%20Community%20Wildfire%20Protection%20Plan.pdf

MCDPH. 2014. Mohave County Department of Public Health. Community Health Improvement Plan 2014. Accessed 23 March 2015 from, http://resources.mohavecounty.us /file/PublicHealth/EnvironmentalHealth/2014%20EH%20Changes/CHIP%202014.pdf

Mohave County. 2005. Mohave County General Plan 1995; revised 2005. Accessed 09 February 2015 from, http://legacy.co.mohave.az.us/depts/pnz/general_plan.asp.

_____. 2014. Mohave County Zoning Regulations; adopted 1965; revised 2014. Accessed 01 April 2015 from, http://resources.mohavecounty.us/file/PlanningAndZoning /Zoning_Code%20Enforcement/Mohave%20County%20Zoning%20Ordinance%20Master%20081414.pdf.

_____. 2015. Personal Communication between Mimi Meyers, Mohave County Development Services Staff, and Devin Petry. January 21, 2015.

_____. 2015b. Mohave County Official Website: Property Tax Data. Accessed 25 March 2015 from, http://www.mohavecounty.us/ContentPage.aspx?id=132&cid=716

Reid, F. A. 2006. Mammals of North America-Fourth Edition. Peterson Field Guides. Houghton Mifflin Company, New York, New York. 579 pp.

Schwartz, K. and K. Uhlman. 2009. Physiographic Provinces. Arizona Cooperative Extension, University of Arizona College of Agriculture and Life Sciences. Tucson, Arizona. 2 pp.

Sharifi, M. R., A. C. Gibson, and P. W. Rundel. 1997. Surface Dust Impacts on Gas Exchange in Mojave Desert Shrubs. British Ecological Society. Journal of Applied Ecology 34 (4): 837-346.

Sheppard, J. M. 1996. Le Conte's Thrasher (*Toxostoma lecontei*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/230

Sibley, D. A. 2014. The Sibley Guide to Birds-Second Edition. Alfred A. Knopf, New York. 599 pp.

Stebbins, R. C. 2003. Western Reptiles and Amphibians-Third Edition. Peterson Field Guides. Houghton Mifflin Company, New York, New York. 533 pp.

Steenhof, K. 2013. Prairie Falcon (*Falco mexicanus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell .edu/bna/species/346

Union of Concerned Scientists of the United States of America (UCSUSA). 2013. Union of Concerned Scientists. Environmental Impacts of Solar Power. Accessed 10 February 2015 from, http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/environmental-impacts-solar-power.html#bf-toc-3

United States Geological Survey (USGS). 2009. Ground Water Atlas of the United States: Arizona, Colorado, New Mexico, Utah, HA 730-C. Accessed 13 February 2015 from, http://pubs.usgs.gov/ha/ha730/ch_c/C-text3.html

US Air Force. 2011. *Outgrant for Construction and Operation of a Solar Photovoltaic System in Area I, Nellis Air Force Base, Clark County, Nevada*.

US Census. 2015. United States Census Bureau. State & County QuickFacts. Accessed 12 February 2015 from, http://quickfacts.census.gov/qfd/states/04/04015.html

USDA. 2005. Soil Survey of Mohave County, Arizona, Southern Part, 685 pages.

_____. 2011. U.S. Department of Agriculture. Natural Resources Conservation Service: Updated T and K Factors Q&A. Accessed 11 February 2015 from, http://www.nrcs.usda.gov /Internet/FSE_DOCUMENTS/nrcs142p2_019867.pdf USFWS. 2008. Birds of Conservation Concern. Division of Migratory Bird Management, Arlington, Virginia.

_____. 2014. Information, Planning, and Conservation System (IPaC). Retrieved online December 2014.

Vorsanger, Andrew. 2015. *A Cultural Resources Survey of 350 Acres Near Kingman for the Cliffrose Solar Interconnection Project, Mohave County, Arizona*. EPG Cultural Resource Services Technical Paper No. 2015-0002. Environmental Planning Group, LLC, Phoenix.

Walker, Henry P. and Don Bufkin. 1986. *Historical Atlas of Arizona*. University of Oklahoma Press, Norman.

Western. 2014a. *Parker-Davis Transmission System Routine O&M Project and Proposed IVM Program Draft Programmatic EA*. U.S. Department of Energy, Western Area Power Administration, Desert Southwest Region. Phoenix, Arizona. November 2014.

Western. 2014b. Desert Southwest Region FY15 Ten-Year Appropriated Capital Program. Accessed from, http://www.wapa.gov/dsw/Ten_Year_Capital_Program/Files/ TYPFY15.pdf.

Western. 2015. Desert Southwest Region Environmental Review – NEPA list. Accessed from, http://www.wapa.gov/dsw/environment/.

Western Regional Climate Center (WRCC). 2015. Western Regional Climate Center. Climate Narrative of the States: Climate of Arizona. Accessed 09 February 2015 from, http://www.wrcc.dri.edu/narratives/arizona/

World Health Organization (WHO). 2015. World Health Organization. Electromagnetic Fields (EMF). Accessed 18 February 2015 from, http://www.who.int/peh-emf/about/WhatisEMF/en/index1.html

XcelEnergy. 2007. Electric and Magnetic Fields (EMF): The Basics. Accessed 13 February 2015 from, https://www.xcelenergy.com/staticfiles/xe/Corporate/Corporate%20PDFs/HiawathaElectricManageneticFields.pdf

Yosef, R. 1996. Loggerhead Shrike (*Lanius ludovicianus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology. Accessed from, http://bna.birds.cornell.edu/bna/species/231

# Appendix A Scoping Meeting Materials

# Welcome

## Cliffrose Solar Energy Interconnection Project

**DOE/EA-1989**

## Scoping Meeting

### Please Sign In

**September 30, 2014**

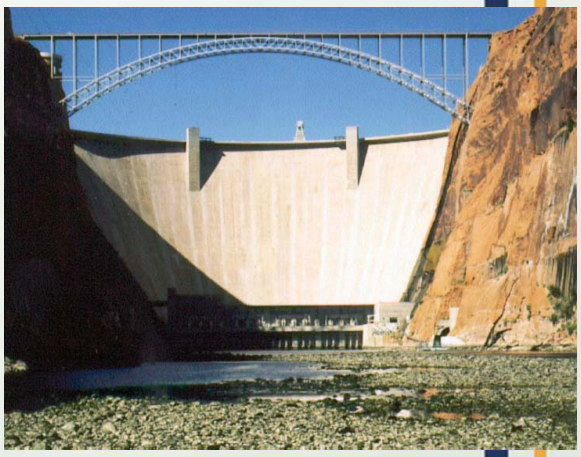
Western AREA POWER ADMINISTRATION

LONGVIEW SOLAR

# Western Area Power Administration

LONGVIEW SOLAR

Western Area Power Administration (Western) markets and delivers reliable, cost-based, hydroelectric power and related services within a 15-state region that includes Arizona, California, Colorado, Iowa, Kansas, Minnesota, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota, Texas, Utah, and Wyoming.



Western is one of four power marketing administrations within the U.S. Department of Energy whose role is to market and transmit electricity.

Some of Western's nearby power customers include the Arizona Power Authority, Fort Mohave Indian Tribe, Town of Fredonia, Hualapai Tribe, Luke Air Force Base, City of Williams, and the Town of Wickenburg.

Western operates and maintains the following transmission lines located in the Kingman area:

- Davis – McConnico 230-kilovolt (kV)
- Griffith – McConnico 230kV
- Griffith – Peacock 230kV
- Davis – MEC Kingman Tap 69kV

Western AREA POWER ADMINISTRATION

# What is NEPA?

The National Environmental Policy Act (NEPA) of 1969:

- Requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions
- Ensures federal agencies act in good faith during federal undertakings
- Provides the interested public and agencies the opportunity to provide input, identify issues, and offer solutions early in the planning process

As the lead federal agency, Western is responsible for analyzing the potential environmental impacts associated with the interconnection prior to responding to Longview's request for interconnection.

Western has determined that an Environmental Assessment (EA) will be prepared to analyze the potential environmental effects of the interconnection. Environmental resources to be considered in the EA include:

Air Quality/Climate Change,
Cultural and Paleontological Resources,
Environmental Justice,
Farm Lands – Prime or Unique,
Floodplains,
Fuels/Fire Management,
Intentional Destructive Acts,
Land Use,
Migratory Birds,
Minerals,
Native American Religious Concerns,
Noise and Sensitive Receptors,
Recreation,
Public Health and Safety,
Rangelands,
Recreation,
Socioeconomics,
Soils,
Threatened or Endangered Species,
Travel Management,
Vegetation,
Visual Resources,
Wastes – Hazardous or Solid,
Water Quality – Drinking or Ground,
Weeds – Invasive and Non-native,
Wetlands/Riparian Zones,
Wild and Scenic Rivers,
Wild Horses/Burros,
Wilderness,
Wildlife

LONGVIEW SOLAR

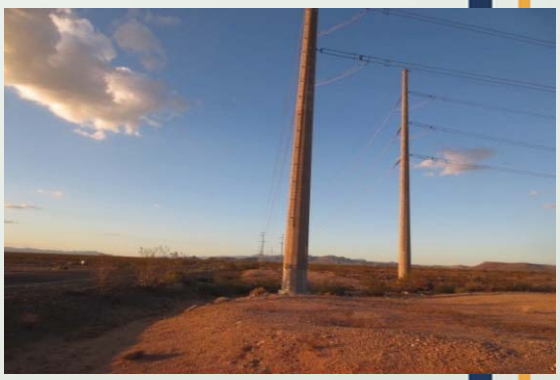
Western AREA POWER ADMINISTRATION

# Purpose and Need

Western is responding to a request from Longview Solar to interconnect their proposed Cliffrose Solar Energy Project to Western's electrical system.

Western will determine whether or not to approve the interconnection request based on available transmission capacity and the safety and reliability of the bulk electrical system.

Western's decision pertains only to the interconnection, as they lack authority over Longview's electrical generation methods, equipment, or location.

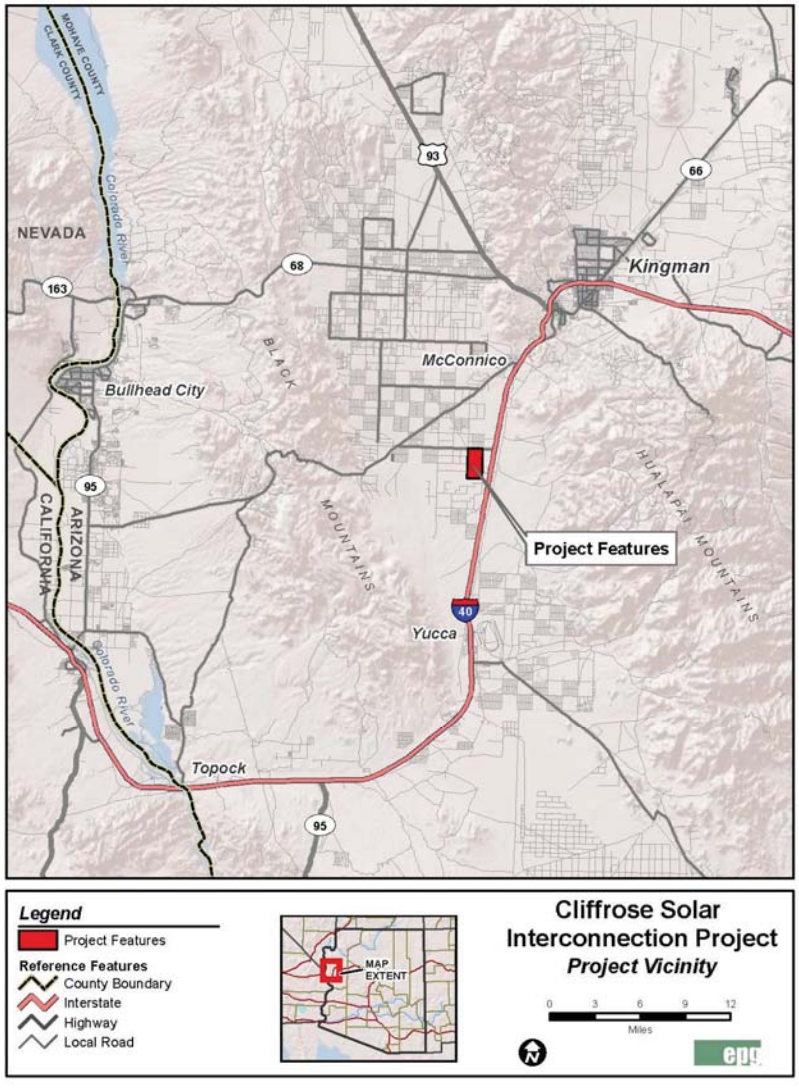


# Longview Solar




- Longview Solar is a joint venture between Tuusso Energy and Elemental Energy, formed to develop solar projects in the United States, exclusively focused on utility-scale photovoltaic solar.
- Currently, Longview Solar is developing projects with a combined total of 200 megawatts of solar energy.
- In addition to the Cliffrose project, Longview Solar is in the process of developing the Ridgenose Solar Project, near Aguila, Arizona.

# Cliffrose Solar Project

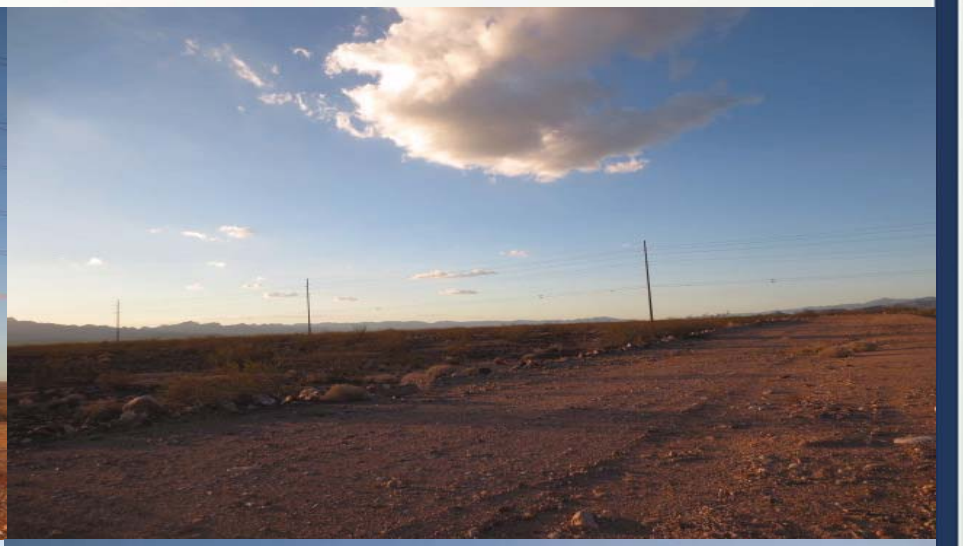



The solar project includes a 45-megawatt photovoltaic solar power facility, located on a 350-acre parcel of privately owned land in Golden Valley, Arizona.

The solar project improvements include:

- installation of a field of photovoltaic arrays consisting of three major components: photovoltaic modules (approximately 200,000 panels), mounting structures (either tracking or fixed tilt), and inverters (45 to 90 in all).
- installation of an approximately two-mile 230kV transmission line, to connect into the existing Western Griffith Substation, located approximately 1.5 miles northeast.
- installation of junction boxes, low-voltage DC wiring, combiner boxes, DC fuses/disconnects, medium-voltage AC cabling and collection system, and associated AC fuses/disconnects.

# Project Area



# Cliffrose Solar Interconnection

**If Western approves the interconnection, they may need to add new equipment, add an additional bay, and reconfigure existing equipment at Griffith Substation to receive Longview Solar's gen-tie line. Western may also need to add, move, or modify structures associated with the Griffith – Peacock and Griffith – McConnico 230kV Transmission Lines.**

# What is Scoping?

The public comment period allows the public and governments (local, state, federal, tribal) an opportunity to advise Western on the scope and content of the issues to be addressed in the environmental document. Your comments can help Western:

- Identify the people and organizations interested in the project
- Identify the issues to be analyzed in the environmental document
- Identify gaps in data and information needs

Scoping is required to satisfy the NEPA for federal actions and is intended to ensure that relevant issues and concerns are identified early and properly studied as part of the NEPA process.

The NEPA scoping process triggers the start of the environmental review process and provides the public an opportunity to become involved early in the process.

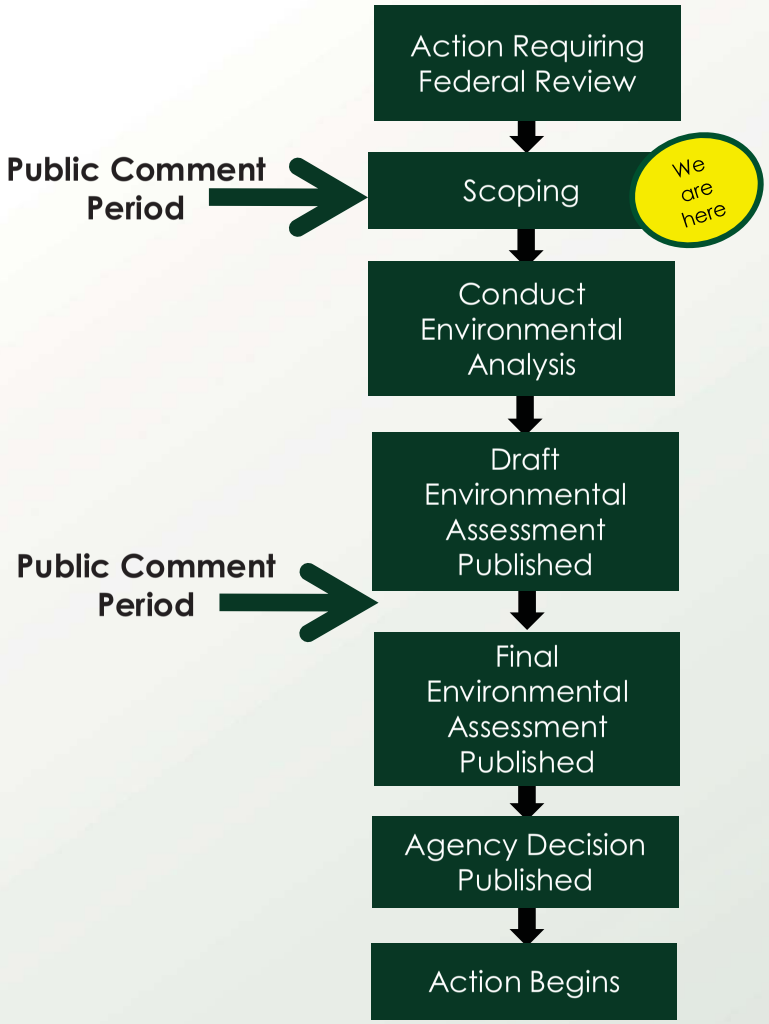
The scoping period for the Cliffrose Solar Interconnection Project is open until October 17, 2014.

# Other Permitting Requirements

- Arizona Corporation Commission – Power Plant and Transmission Line Siting Committee
  - Certificate of Environmental Compatibility (transmission line)

- U.S. Army Corps of Engineers
  - Clean Water Act (Section 404) surveying and permitting (solar site)

# NEPA Process for an Environmental Assessment (EA)



# Opportunity for Comment

**The scoping period for the Cliffrose Solar Interconnection Project is open until October 17, 2014.**

**Comments can be provided to Western in writing or by phone, fax, or email at the contact below. Or, fill out a comment form and submit it in person at the public scoping meeting tonight.**


**Mail:** Western Area Power Administration,
Desert Southwest Region
**ATTN.:** Matthew Bilsbarrow, NEPA Document Manager
PO Box 6457
Phoenix, AZ 85005

**Email:** DSW-EA1989PublicComment@wapa.gov
**Phone:** (602) 605-2536
**Fax:** (602) 605-2630


http://www.wapa.gov/dsw/environment/CliffroseSolarEnergyProject.html

LONGVIEW SOLAR

Western AREA POWER ADMINISTRATION

# CLIFFROSE SOLAR INTERCONNECTION PROJECT (DOE/EA-1989) COMMENT FORM

LONGVIEW SOLAR

**We would like to know of any issues, concerns, and suggestions you may have regarding the Cliffrose Solar Interconnection Project.**

**Please provide comment by October 17, 2014.**

| | | |
|---|---|---|
| NAME | | |
| ADDRESS | | |
| CITY | STATE | ZIP |
| PHONE (OPTIONAL) | | EMAIL (OPTIONAL) |

COMMENT:

**You may provide your comment via:**

**Mail:**

**Western Area Power Administration**
**Matthew Bilsbarrow, NEPA Document Manager**
**PO Box 6457, Phoenix, AZ 85005**

**Email:**

**DSW-EA1989PublicComment@wapa.gov**

**Phone/Fax:**

**Phone: (602) 605-2536**
**Fax: (602) 605-2630**

Western AREA POWER ADMINISTRATION

**http://www.wapa.gov/dsw/environment/CliffroseSolarEnergyProject.html**

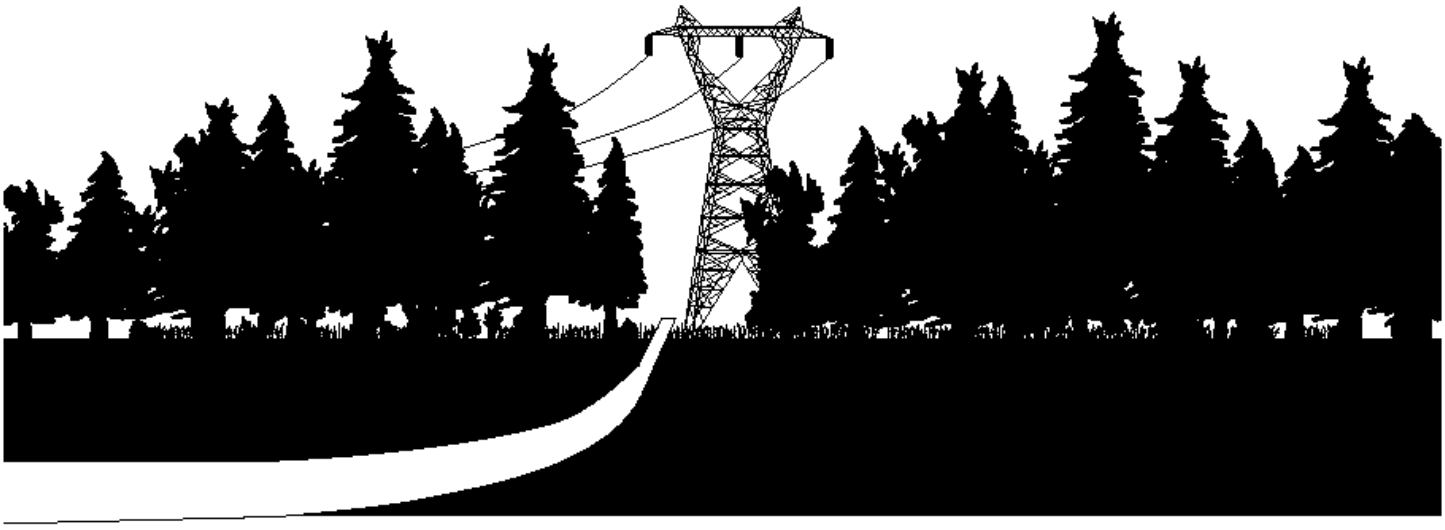
# Appendix B Western's Construction Standard 13 – Environmental Quality Protection

Western
AREA POWER
ADMINISTRATION

# CONSTRUCTION STANDARDS

## STANDARD 13

## ENVIRONMENTAL QUALITY PROTECTION



**September 2013**

SAFETY
A HABIT TO LIVE BY

**STANDARD 13 - ENVIRONMENTAL QUALITY PROTECTION**

**TABLE OF CONTENTS**

## STANDARD 13 - ENVIRONMENTAL QUALITY PROTECTION

### SECTION 13.1—REQUIRED SUBMITTALS, REPORTS, AND PLANS

1. FINAL PAYMENT: For each section below, final payment may be withheld until the referenced submittal, report, or plan is received.

### SECTION 13.2--CONTRACTOR FURNISHED DATA

1. RECYCLED MATERIALS QUANTITY REPORT: Submit quantities of recycled materials listed in Section 13.7, "Recycled Materials Quantities", to the COR prior to submittal of final invoice.

2. RECOVERED AND BIOBASED MATERIAL PRODUCTS REPORT: Provide the COR the following information for purchases of items listed in Section 13.8, "Use of Recovered and Biobased Material Products".

   (1) Quantity and cost of listed items with recovered or biobased material content and quantity and cost of listed items without recovered or biobased material content prior to submittal of final invoice.

   (2) Written justification of listed items if recovered material or biobased material products are not available: 1) competitively within a reasonable time frame; 2) meeting reasonable performance standards as defined in the Standards or Project Specifications; or 3) at a reasonable price.

3. RECLAIMED REFRIGERANT RECEIPT: A receipt from the reclaimer stating that the refrigerant was reclaimed, the amount and type of refrigerant, and the date shall be submitted to the COR prior to submittal of final invoice in accordance with Section 13.9.5, “Refrigerants and Receipts”.

4. WASTE MATERIAL QUANTITY REPORT: Submit quantities of total project waste material disposal as listed below to the COR prior to submittal of final invoice in accordance with Section 13.9.8, “Waste Material Quantity Report”.

   (1) Unregulated Wastes (i.e., trash): Volume in cubic yards or weight in pounds.

   (2) Hazardous or Universal Wastes: Weight in pounds.

   (3) PCB Wastes: Weight in pounds.

   (4) Other regulated wastes (e.g., lead-based paint or asbestos): Weight in pounds (specify type of waste in report).

5. SPILL PREVENTION NOTIFICATION AND CLEANUP PLAN (Plan): Submit the Plan as described in Section 13.11.2, "Spill Prevention Notification and Cleanup Plan”, to the COR for review and comment 14 days prior to start of work. Review of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

6. TANKER OIL SPILL PREVENTION AND RESPONSE PLAN: Submit the Plan as described in Section 13.11.3, "Tanker Oil Spill Prevention and Response Plan”, to the COR for review and comment 14 days prior to start of work. Review of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

7. PESTICIDE USE PLAN: Submit a plan as described in Section 13.12.3, “Pesticide Use Plan”, to the COR for review and comment 14 days prior to the date of intended pesticide application. Review of

the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Within seven days after application, submit a written report in accordance with Standard 2 – Sitework, Section 2.1.1_5, “Soil-Applied Herbicide”.

8. TREATED WOOD UTILITY POLES AND CROSSARMS RECYCLING - CONSUMER INFORMATION SHEET RECEIPT: Submit treated wood utility poles and crossarms - consumer information sheet receipts to the COR prior to submittal of final invoice (see 13.13, “Treated Wood Utility Poles and Crossarms Recycling or Disposal”).

9. PREVENTION OF AIR POLLUTION: Submit a copy of permits, if required, as described in 13.14, “Prevention of Air Pollution” to the COR 14 days prior to the start of work.

10. ASBESTOS LICENSES OR CERTIFICATIONS: Submit a copy of licenses, certifications, Demolition and Renovation Notifications and Permits for asbestos work as described in 13.15, ”Handling and Management of Asbestos Containing Material” to the COR 14 days prior to starting work. Submit copies of certificates of disposal and/or receipts for waste to the COR prior to submittal of final invoice.

11. LEAD PAINT NOTICES: Submit a copy of lead paint notices with contractor and recipient signatures as described in 13.16, “Material with Lead-based Paint” to the COR prior to submittal of final invoice. Submit copies of certificates of disposal and/or receipts for waste to the COR prior to submittal of final invoice.

12. WATER POLLUTION PERMITS: Submit copies of any water pollution permits as described in 13.17, “Prevention of Water Pollution” to the COR 14 days prior to start of work.

13. PCB TEST REPORT: Submit a PCB test report as described in 13.18, “Testing, Draining, Removal, and Disposal of Oil-filled Electrical Equipment”, prior to draining, removal, or disposal of oil or oil-filled equipment that is designated for disposal.

14. OIL AND OIL-FILLED ELECTRICAL EQUIPMENT RECEIPT: Obtain and submit a receipt for oil and oil-filled equipment transported and disposed, recycled, or reprocessed as described in 13.19, “Testing, Draining, Removal, and Disposal of Oil-filled Electrical Equipment”, to the COR prior to submittal of final invoice.

15. OSHA PCB TRAINING RECORDS: Submit employee training documentation records to the COR 14 days prior to the start of work as described in 13.19.1.

16. CLEANUP WORK MANAGEMENT PLAN: Submit a Cleanup Work Management Plan as described in 13.19, “Removal of Oil-contaminated Material” to the COR for review and comment 14 days prior to the start of work. Review of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

17. POST CLEANUP REPORT: Submit a Post-Cleanup Report as described in 13.19, “Removal of Oil-contaminated Material” to the COR prior to submittal of final invoice.

## SECTION 13.3--ENVIRONMENTAL REQUIREMENTS

Comply with Federal, State, and local environmental laws and regulations. The sections in this Standard further specify the requirements.

## SECTION 13.4--LANDSCAPE PRESERVATION

1. GENERAL: Preserve landscape features in accordance with the contract clause titled “Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements.”

2. CONSTRUCTION ROADS: Location, alignment, and grade of construction roads shall be subject to the COR's approval. When no longer required, surfaces of construction roads shall be scarified to facilitate natural revegetation, provide for proper drainage, and prevent erosion. If re-vegetation is required, use seed mixtures as recommended by Natural Resources Conservation Service or other land managing agency as appropriate.

3. CONSTRUCTION FACILITIES: Shop, office, and yard areas shall be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent and prevent impact on sensitive riparian areas and flood plains. Storage and construction buildings, including concrete footings and slabs, shall be removed from the site prior to contract completion. The area shall be re-graded as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion or transport of sediment and pollutants. If re-vegetation is required, use seed mixtures as recommended by Natural Resources Conservation Service or other land managing agency as appropriate.

## SECTION 13.5--PRESERVATION OF CULTURAL AND PALEONTOLOGICAL RESOURCES

1. GENERAL: Do not, at any time, remove, disturb, or otherwise alter cultural artifacts or paleontological resources (fossils). Cultural artifacts may be of scientific or cultural importance and includes, but are not limited to bones, pottery, projectile points (arrowheads), other stone or metal tools, surface features (stone circles, rock piles, etc.), glass, metal, ceramic, or other historic objects, structures and buildings (including ruins). Paleontological resources can be of scientific importance and include mineralized animals and plants or trace fossils such as footprints. Both cultural and paleontological resources are protected by Federal Regulations during Federal construction projects. Contractor shall restrict all ground disturbing activities to areas that have been investigated by Western for cultural or paleontological resources, or have been cleared in writing by the Regional Preservation Officer (RPO) and as specified in accordance with Standard 1 – General Requirements, Sections 1.3.1 Rights-of-way and 1.3.2 Access to the Work and Haul Routes.

2. KNOWN CULTURAL OR PALEONTOLOGICAL SITES: Following issuance of notice to proceed, Western will provide drawings or maps showing sensitive areas located on or immediately adjacent to the transmission line right-of-way and/or facility. These areas shall be considered avoidance areas. Prior to any construction activity, the avoidance areas shall be marked on the ground in a manner approved by the COR in conjunction with the RPO. Instruct employees and subcontractors that vehicular or equipment access to these areas is prohibited. If access is absolutely necessary, first obtain approval from the COR in conjunction with the RPO. Western will remove the markings during or following final cleanup. For some project work, Western will require an archaeological, paleontological or tribal monitor at or near cultural or paleontological site locations. The contractor, contractor’s employees, and subcontractors shall work with the monitor to insure that sensitive areas are avoided. Where monitors are required, the monitor shall meet with the crew each morning to go over the day’s work. The monitor will also conduct awareness training for all contractors prior to any work in the field. Untrained personnel shall not be allowed in the construction area. For sensitive areas requiring a monitor, the contractor may not access those areas without a monitor being present.

3. UNKNOWN CULTURAL OR PALEONTOLOGICAL SITES: On rare occasions cultural or paleontological sites may be discovered during excavation or other earth-moving or other construction activities.

   (1) Reporting: If evidence of a cultural or paleontological site is discovered, cease work in the area immediately and notify the COR of the location and nature of the findings. If a monitor is present, the monitor should also be notified. Stop all activities within a 200-foot radius of the discovery and do not proceed with work within that radius until directed to do so by the COR.

   (2) Care of Evidence: Protect the area. Do not remove, handle, alter, or damage artifacts or fossils uncovered during construction activities.

**SECTION 13.6--NOXIOUS WEED CONTROL**

Comply with Federal, State, and local noxious weed control regulations. Provide a "clean vehicle policy" while entering and leaving construction areas to prevent transport of noxious weed plants and/or seed. Transport only construction vehicles that are free of mud and vegetation debris to staging areas and the project right-of-way.

**SECTION 13.7--RECYCLED MATERIALS QUANTITIES**

1. GENERAL: All materials generated from the project that can be recycled, shall be recycled. Record quantities of material by category that is salvaged, recycled, reused, or reprocessed, including:

   (1) Transformers, Breakers: Weight without oil.

   (2) Aluminum Conductor – Steel Reinforced (ACSR): Weight in pounds or tons.

   (3) Steel: Weight in pounds or tons.

   (4) Aluminum: Weight in pounds or tons.

   (5) Copper: Weight in pounds or tons.

   (6) Other Metals: Weight in pounds or tons.

   (7) Oil: Gallons (separate by type - less than 2 ppm PCB, 2 to 50 ppm PCB, and 50 or greater ppm PCB).

   (8) Gravel, Asphalt, Or Concrete: Weight in pounds or tons.

   (9) Batteries: Weight in pounds.

   (10) Treated Wood Utility Poles and Crossarms: Weight in pounds.

   (11) Wood construction material: Weight in pounds.

   (12) Cardboard: Weight in pounds.

   (13) Porcelain Insulators: Weight in pounds.

2. RECYCLED MATERIAL QUANTITY REPORT: Submit quantities (pounds or metric tons) of all recycled material by category to the COR within 30 days of recycling and prior to submittal of final invoice.

## SECTION 13.8--USE OF RECOVERED MATERIAL AND BIOBASED MATERIAL PRODUCTS

1. RECOVERED MATERIAL PRODUCTS: If the products listed below or other products listed at http://www.epa.gov/epawaste/conserve/tools/cpg/products/index.htm are obtained as part of this project, purchase the items with the highest recovered material content possible unless recovered material products are not available: 1) competitively within a reasonable time frame; 2) meeting reasonable performance standards as defined in the Standards or Project Specifications; or 3) at a reasonable price.

   Construction Products:

   - Building Insulation Products
   - Carpet
   - Carpet cushion
   - Cement and concrete containing coal fly ash, ground granulated blast furnace slag, cenospheres, or silica fume
   - Consolidated and reprocessed latex paint
   - Floor Tiles
   - Flowable fill
   - Laminated Paperboard
   - Modular threshold ramps
   - Nonpressure pipe
   - Patio Blocks
   - Railroad grade crossing surfaces
   - Roofing materials
   - Shower and restroom dividers/partitions
   - Signage
   - Structural Fiberboard

2. BIOBASED MATERIAL PRODUCTS: If the products listed at http://www.biobased.oce.usda.gov are obtained as part of this project, purchase the items with the highest biobased content possible and no less than the percent indicated for each product unless biobased material products are not available: 1) competitively within a reasonable time frame, 2) meeting reasonable performance standards as defined in the Standards or Project Specifications, or 3) at a reasonable price.
   NOTE: All station service and pole mounted transformers will be bio-based oil. Western exempts purchase of bio-based large transformers rated above 5 MVA until May 13, 2015. Large transformers will be evaluated on a best value basis using life cycle cost analysis.

3. RECOVERED MATERIAL AND BIOBASED MATERIAL PRODUCTS REPORT: Provide the COR the following information for purchases of those items listed above:

   Quantity and cost of listed items with recovered or biobased material content and quantity and cost of listed items without recovered or biobased material content prior to submittal of final invoice.

   Written justification of listed items if recovered material or biobased material products are not available: 1) competitively within a reasonable time frame; 2) meeting reasonable performance standards as defined in the Standards or Project Specifications; or 3) at a reasonable price.

## SECTION 13.8--DISPOSAL OF WASTE MATERIAL

1. GENERAL: Dispose or recycle waste material in accordance with applicable Federal, State and local regulations and ordinances. In addition to the requirements of the Contract Clause “Cleaning

Up", remove all waste material from the construction site. No waste shall be left on Western property, right-of-way, or easement. Burning or burying of waste material is not permitted.

2. HAZARDOUS, UNIVERSAL, AND NON-HAZARDOUS WASTES: Manage hazardous, universal, and non-hazardous wastes in accordance with State and Federal regulations.

3. USED OIL: Used oil generated from the Contractor activities shall be managed in accordance with used oil regulations.

4. RECYCLABLE MATERIAL: Reduce wastes, including excess Western material, by recycling, reusing, or reprocessing. Examples of recycling, reusing, or reprocessing includes, but is not limited to, reprocessing of solvents; recycling cardboard; and salvaging scrap metals.

5. REFRIGERANTS AND RECEIPTS: Refrigerants from air conditioners, water coolers, refrigerators, ice machines and vehicles shall be reclaimed with certified equipment operated by certified technicians if the item is to be disposed. Refrigerants shall be reclaimed and not vented to the atmosphere. A receipt from the reclaimer stating that the refrigerant was reclaimed, the amount and type of refrigerant, and the date shall be submitted to the COR prior to submittal of final invoice.

6. HALONS: Equipment containing halons that must be tested, maintained, serviced, repaired, or disposed must be handled according to EPA requirements and by technicians trained according to those requirements.

7. SULFUR HEXAFLUORIDE (SF6): SF6 shall be reclaimed and shall not be vented to the atmosphere.

8. WASTE MATERIAL QUANTITY REPORT: Submit quantities of total project waste material disposal as listed below to the COR prior to submittal of final invoice.

   (1) Unregulated Wastes (i.e., trash): Volume in cubic yards or weight in pounds.

   (2) Hazardous or Universal Wastes: Weight in pounds.

   (3) PCB Wastes: Weight in pounds.

   (4) Other regulated wastes (e.g., lead-based paint or asbestos): Weight in pounds (specify type of waste in report).

**SECTION 13.10--CONTRACTOR'S LIABILITY FOR REGULATED MATERIAL INCIDENTS**

1. GENERAL: The Contractor is solely liable for all expenses related to spills, mishandling, or incidents of regulated material attributable to his actions or the actions of his subcontractors. This includes all response, investigation, cleanup, disposal, permitting, reporting, and requirements from applicable environmental regulation agencies.

2. SUPERVISION: The actions of the Contractor employees and subcontractors shall be properly managed at all times on Western property or while transporting Western's (or previously owned by Western) regulated material and equipment.

**SECTION 13.11--POLLUTANT SPILL PREVENTION, NOTIFICATION, AND CLEANUP**

1. GENERAL: Provide measures to prevent spills of pollutants and respond appropriately if a spill occurs. A pollutant includes any hazardous or non-hazardous substance that when spilled, will

contaminate soil, surface water, or ground water. This includes any solvent, fuel, oil, paint, pesticide, engine coolants, and similar substances.

2. SPILL PREVENTION NOTIFICATION AND CLEANUP PLAN (Plan): Provide the Plan to the COR for review and comment 14 days prior to start of work. Review of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Include the following in the Plan:

   (1) Spill Prevention measures. Describe the work practices or precautions that will be used at the job site to prevent spills. These may include engineered or manufactured techniques such as installation of berms around fuel and oil tanks; Storage of fuels, paints, and other substances in spill proof containers; and management techniques such as requiring workers to handle material in certain ways.

   (2) Notification. Most States and the Environmental Protection Agency require by regulation, that anyone who spills certain types of pollutants in certain quantities notify them of the spill within a specific time period. Some of these agencies require written follow up reports and cleanup reports. Include in the Plan, the types of spills for which notification would be made, the agencies notified, the information the agency requires during the notification, and the telephone numbers for notification.

   (3) Employee Awareness Training. Describe employee awareness training procedures that will be implemented to ensure personnel are knowledgeable about the contents of the Plan and the need for notification.

   (4) Commitment of Manpower, Equipment and Material. Identify the arrangements made to respond to spills, including the commitment of manpower, equipment and material.

   (5) If applicable, address all requirements of 40CFR112 pertaining to Spill Prevention, Control and Countermeasures Plans.

3. TANKER OIL SPILL PREVENTION AND RESPONSE PLAN: Provide a Tanker Oil Spill Prevention and Response Plan as required by the Department of Transportation if oil tankers with volume of 3,500 gallons or more are used as part of the project. Submit the Tanker Oil Spill Prevention and Response Plan to the COR for review and comment 14 days prior to start of work. Review of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

**SECTION 13.12--PESTICIDES**

1. GENERAL: The term “pesticide” includes herbicides, insecticides, rodenticides and fungicides. Pesticides shall only be used in accordance with their labeling and applied by appropriately certified applicators.

2. ENVIRONMENTAL PROTECTION AGENCY REGISTRATION: Use EPA registered pesticides that are approved for the intended use.

3. PESTICIDE USE PLAN: Provide a pesticide use plan that contains: 1) a description of the pesticide to be used, 2) where it is to be applied, 3) the application rate, 4) a copy of the label, and 5) a copy of required applicator certifications. Submit the pesticide use plan to the COR for review and comment 14 days prior to the date of intended application. Review of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Within seven days after

application, submit a written final report to the COR, including the pesticide applicators report, in accordance with Standard 2 – Sitework, Section 2.1.1_5. “Soil-Applied Herbicide, (4) Final Report”.

## SECTION 13.13--TREATED WOOD UTILITY POLES AND CROSSARMS RECYCLING OR DISPOSAL

Whenever practicable, treated wood utility poles and crossarms removed during the project shall be recycled or transferred to the public for some uses. Treated wood utility poles and crossarms transferred to a recycler, landfill, or the public shall be accompanied by a written consumer information sheet for treated wood as provided by Western. Obtain a receipt, part of the consumer information sheet, from the recipient indicating that they have received, read, and understand the consumer information sheet. Treated wood products transferred to right-of-way landowners shall be moved off the right-of-way. Treated wood product scrap, poles, and crossarms that cannot be donated or reused shall be properly disposed in a landfill that accepts treated wood and has signed Western’s consumer information sheet receipt. Submit treated wood utility poles and crossarms consumer information receipts to the COR prior to submittal of final invoice.

## SECTION 13.14--PREVENTION OF AIR POLLUTION

1. GENERAL: Ensure that construction activities and the operation of equipment are undertaken to reduce the emission of air pollutants. Submit a copy of permits for construction activities, if required (e.g., “non-attainment” areas, state implementation plans, or Class I air-sheds), from Federal, State, or local agencies to the COR 14 days prior to the start of work.

2. MACHINERY AIR EMISSIONS: The Contractor and subcontractor machinery shall have, and shall use the air emissions control devices required by Federal, State or Local Regulation or ordinance.

3. DUST ABATEMENT: Dust shall be controlled. Oil shall not be used as a dust suppressant. Dust suppressants shall be approved by the COR prior to use.

4. SULFUR HEXAFLUORIDE EMISSIONS:

    1) General: The Contractor shall record quantities of SF6, including:

        Nameplate capacity in pounds of $SF_6$ containing equipment.

        Record pounds of $SF_6$ stored in containers, before transferring into energized equipment.

        Record pounds of $SF_6$ left in containers, after transferring into energized equipment.

        Pounds of $SF_6$ purchased from equipment manufacturers or distributors.

        Pounds of $SF_6$ returned to suppliers.

        Scales used to weigh cylinders must be accurate to within +/- 2 pounds and must have current calibration sticker.

    2) CONTRACTOR FIELD QUALITY TESTING AND $SF_6$ HANDLING:

        The Contractor shall test all functions to verify correct operation and conduct a leak test. No SF6 gas leakage shall be allowed from any equipment or storage containers.

        Atmospheric venting of $SF_6$ gas is not allowed.

        The Contractor shall remove all empty SF6 gas cylinders and return to supplier.

(3) CERTIFICATES OF DISPOSAL AND RECEIPTS:

1) The Contractor can use Western's Reporting Form for reporting quantities listed above.

2) The Contractor shall provide receipts of SF6 gas returned to supplier.

3) The Contractor shall submit SF6 gas Reporting Forms and copies of receipts to the COR prior to submittal of final invoice.

## SECTION 13.15--HANDLING AND MANAGEMENT OF ASBESTOS CONTAINING MATERIAL

1. GENERAL: Obtain the appropriate Federal, State, Tribal or local licenses or certifications prior to disturbing any regulated asbestos-containing material. If a building or portion of a building will be demolished or renovated, obtain an Asbestos Notice of and Permit for Demolition and Renovation from the State or Tribal Department of Environmental Quality, Division of Air Quality (or equivalent). The building(s) shall be inspected by a State-Certified or Tribal accepted Asbestos Building Inspector. The inspector shall certify the presence and condition of asbestos, or non-presence of asbestos, on site as directed on the State or Tribal Demolition and Renovation Notice/Permit. The inspections shall be performed and notifications shall be submitted whether asbestos is present or not. Submit a copy of licenses, certifications, Demolition and Renovation Notifications and Permits for asbestos work to the COR 14 days prior to work. Ensure: 1) worker and public safety requirements are fully implemented and 2) proper handling, transportation, and disposal of asbestos containing material.

2. TRANSPORTATION OF ASBESTOS WASTE: Comply with Department of Transportation, Environmental Protection Agency, and State and Local requirements when transporting asbestos wastes.

3. CERTIFICATES OF DISPOSAL AND RECEIPTS: Obtain certificates of disposal for waste if the waste is a hazardous waste or receipts if the waste is a non-hazardous waste. Submit copies to the COR prior to submittal of final invoice.

## SECTION 13.16--MATERIAL WITH LEAD-BASED PAINT

1. GENERAL: Comply with all applicable Federal, State and local regulations concerning work with lead-based paint, disposal of material painted with lead-based paint, and management of these materials. OSHA and General Industry Standards apply to worker safety and right-to-know issues. Federal EPA and State agencies regulate waste disposal and air quality issues.

2. TRANSFER OF PROPERTY: If lead-based paint containing equipment or material is to be given away or sold for reuse, scrap, or reclaiming, the contractor shall provide a written notice to the recipient of the material stating that the material contains lead-based paint and the Hazardous Waste regulations may apply to the waste or the paint in some circumstances. The new owner must also be notified that they may be responsible for compliance with OSHA requirements if the material is to be cut, sanded, abraded, or stripped of paint. Submit a copy of lead paint notices with contractor and recipient signatures to the COR prior to submittal of final invoice.

3. CERTIFICATES OF DISPOSAL AND RECEIPTS: Obtain certificates of disposal for waste if the waste is a hazardous waste or receipts if the waste is a non-hazardous waste. Submit copies to the COR prior to submittal of final invoice.

## SECTION 13.17--PREVENTION OF WATER POLLUTION

1. GENERAL: Ensure that surface and ground water is protected from pollution caused by construction activities and comply with applicable regulations and requirements. Ensure that streams, waterways and other courses are not obstructed or impaired unless the appropriate Federal, State or local permits have been obtained.

2. PERMITS: Ensure that:

   (1) A National Pollutant Discharge Elimination System (NPDES) permit is obtained from the US Environmental Protection Agency or State as appropriate if the disturbed construction area equals 1 acre or more. Contractor is responsible for preparation and implementation of the associated Storm Water Pollution Prevention Plan (SWPPP). Disturbed areas include staging, parking, fueling, stockpiling, and any other construction related activities. Refer to www.epa.gov/npdes/stormwater for directions and forms.

   (2) A dewatering permit is obtained from the appropriate agency if required for construction dewatering activities.

   (3) Copies of permits and plans, approved by the appropriate regulating agencies, are submitted to the COR 14 days prior to start of work.

3. EXCAVATED MATERIAL AND OTHER CONTAMINANT SOURCES: Control runoff from excavated areas and piles of excavated material, construction material or wastes (to include truck washing and concrete wastes), and chemical products such as oil, grease, solvents, fuels, pesticides, and pole treatment compounds. Excavated material or other construction material shall not be stockpiled or deposited near or on streambanks, lake shorelines, ditches, irrigation canals, or other areas where run-off could impact the environment.

4. MANAGEMENT OF WASTE CONCRETE OR WASHING OF CONCRETE TRUCKS: Do not permit the washing of concrete trucks or disposal of excess concrete in any ditch, canal, stream, or other surface water. Concrete wastes shall be disposed in accordance with all Federal, State, and local regulations. Concrete wastes shall not be disposed of on any Western property, right-of-way, or easement; or on any streets, roads, or property without the owner's consent.

5. STREAM CROSSINGS: Crossing of any stream or other waterway shall be done in compliance with Federal, State, and local regulations. Crossing of some waterways may be prohibited by landowners, Federal or State agencies or require permits.

## SECTION 13.18--TESTING, DRAINING, REMOVAL, AND DISPOSAL OF OIL-FILLED ELECTRICAL EQUIPMENT

1. SAMPLING AND TESTING OF INSULATING OIL FOR PCB CONTENT: Sample and analyze the oil of electrical equipment (which includes storage tanks) for PCB's. Use analytical methods approved by EPA and applicable State regulations. Decontaminate sampling equipment according to documented good laboratory practices (these can be contractor developed or EPA standards). Use only laboratories approved by Western. The COR will furnish a list of approved laboratories.

2. PCB TEST REPORT: Provide PCB test reports that contain the information below for disposing of oil-filled electrical equipment. Submit the PCB test report for COR approval prior to draining, removal, or disposal of oil or oil-filled equipment that is designated for disposal.

   - Name and address of the laboratory
   - Description of the electrical equipment (e.g. transformer, breaker)

- Serial number for the electrical equipment.
- Date sampled
- Date tested
- PCB contents in parts per million (ppm)
- Unique identification number of container into which the oil was drained (i.e., number of drum, tank, tanker, etc.)

3. OIL CONTAINING PCB: Comply with the Federal regulations pertaining to PCBs found at Title 40, Part 761 of the U.S. Code of Federal Regulations (40 CFR 761).

4. REMOVAL AND DISPOSAL OF INSULATING OIL AND OIL-FILLED ELECTRICAL EQUIPMENT: Once the PCB content of the oil has been identified from laboratory results, the oil shall be transported and disposed, recycled, or reprocessed according to 40 CFR 761 (if applicable), Resource Conservation and Recovery Act (RCRA) "used oil", and other applicable regulations. Used oil may be transported only by EPA-registered used oil transporters. The oil must be stored in containers that are labeled "Used Oil." Use only transporters and disposal sites approved by Western.

5. OIL AND OIL-FILLED ELECTRICAL EQUIPMENT RECEIPT: Obtain and submit a receipt for oil and oil-filled equipment transported and disposed, recycled, or reprocessed to the COR prior to submittal of final invoice.

**SECTION 13.19--REMOVAL OF OIL-CONTAMINATED MATERIAL**

1. GENERAL: Removing oil-contaminated material includes excavating, stockpiling, testing, transporting, cleaning, and disposing of these material. Personnel working with PCBs shall be trained in accordance with OSHA requirements. Submit employee training documentation records to the COR 14 days prior to the start of work.

2. CLEANUP WORK MANAGEMENT PLAN: Provide a Cleanup Work Management Plan that has been approved by applicable Federal, State, or Local environmental regulation agencies. Submit the plan to the COR for review and comment 14 days prior to the start of work. Review of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. The plan shall address on-site excavation of contaminated soil and debris and include the following:

   - Identification of contaminants and areas to be excavated
   - Method of excavation
   - Level of personnel/subcontractor training
   - Safety and health provisions
   - Sampling requirements including quality control, laboratory to be used
   - Management of excavated soils and debris
   - Disposal methods, including transportation to disposal

3. EXCAVATION AND CLEANUP: Comply with the requirements of Title 40, Part 761 of the U.S. Code of Federal Regulations (40 CFR 761).

4. TEMPORARY STOCKPILING: Excavated material, stockpiled on site during construction, shall be stored on heavy plastic and covered to prevent wind and rain erosion at a location designated by the COR.

5. SAMPLING AND TESTING: Sample contaminated debris and areas of excavation to ensure that contamination is removed. Use personnel with experience in sampling and, in particular, with

experience in PCB cleanup if PCBs are involved. Use analytical methods approved by EPA and applicable State regulations.

6. TRANSPORTATION AND DISPOSAL OF CONTAMINATED MATERIAL: The Contractor shall be responsible and liable for the proper loading, transportation, and disposal of contaminated material according to Federal, State, and local requirements. Use only transporters and disposal sites approved by Western.

7. POST CLEANUP REPORT: Provide a Post-Cleanup Report that describes the cleanup of contaminated soils and debris. Submit the report to the COR prior to submittal of final invoice. The report shall contain the following information:

   - Site map showing the areas cleaned
   - Description of the operations involved in excavating, storing, sampling, and testing, and disposal
   - Sampling and analysis results including 1) Name and address of the laboratory, 2) sample locations, 3) sample dates, 4) analysis dates, 5) contents of contaminant (e.g. PCB or total petroleum hydrocarbons) in parts per million (ppm)
   - Certification by the Contractor that the cleanup requirements were met
   - Copies of any manifests, bills of lading, and disposal certificates
   - Copies of correspondence with regulatory agencies that support completion of the cleanup

**SECTION 13.20—CONSERVATION OF BIOLOGICAL RESOURCES**

1. GENERAL: Federal law prohibits the “take” of endangered, threatened, proposed or candidate wildlife and plants, and destruction or adverse modification of designated Critical Habitat. Federal law also prohibits the “take” of birds protected by the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. “Take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or attempt to engage in any such conduct with a protected animal or plant or any part thereof, or attempt to do any of those things without a permit from U.S. Fish and Wildlife Service. The Contractor will take precautions to avoid harming other wildlife species. Contractor shall restrict all ground disturbing activities to areas that have been surveyed by Western for natural resources and as specified in accordance with Standard 1 – General Requirements, Sections 1.3.1 Rights-of-way and 1.3.2 Access to the Work and Haul Routes.

2. KNOWN OCCURRENCE OF PROTECTED SPECIES OR HABITAT: Following issuance of the notice to proceed, and prior to the start of construction, Western will provide training to all contractor and subcontractor personnel and others involved in the construction activity if there is a known occurrence of protected species or habitat in the construction area. Untrained personnel shall not be allowed in the construction area. Western will provide drawings or maps showing sensitive areas located on or immediately adjacent to the transmission line right-of-way and/or facility. These sensitive areas shall be considered avoidance areas. Prior to any construction activity, the avoidance areas shall be marked on the ground by Western. If access is absolutely necessary, the contractor shall first obtain written permission from the COR, noting that a Western and/or other Federal or state government or tribal agency biologist may be required to accompany personnel and equipment. Ground markings shall be maintained through the duration of the contract. Western will remove the markings during or following final inspection of the project.

3. UNKNOWN OCCURRENCE OF PROTECTED SPECIES OR HABITAT: If evidence of a protected species is found in the project area, the contractor shall immediately notify the COR and provide the location and nature of the findings. The contractor shall stop all activity within 200 feet of the protected species or habitat and not proceed until directed to do so by the COR.

# Appendix C Vegetation and Wildlife Species Tables

## Introduction

Appendix C provides supplementary information on biological resources to support the discussion in Sections 3.12 and 3.15 of the EA. Table C-1 provides a list of all plant species, native and non-native, observed during a survey of the site conducted in 2014. Table C-2 lists noxious weed species listed as prohibited, restricted, or regulated by the Arizona Department of Agriculture, which are able to colonize Mojave Desertscrub or otherwise occur in vegetation similar to that in the study area. Table C-3 lists all special-status species reviewed for potential presence in the study area.

**Table C-1. Plant Species Observed During Survey**

| Common Name<br>*Scientific Name* | Family | Relative Abundance |
|---|---|---|
| Banana Yucca<br>*Yucca baccata* | Agavaceae | Common |
| Burro Bush<br>*Ambrosia dumosa* | Asteraceae | Abundant |
| Desertbroom<br>*Baccharis sarothroides* | Asteraceae | Uncommon |
| Brittlebush<br>*Encelia farinosa* | Asteraceae | Rare |
| Rocky Mountain Zinnia<br>*Zinnia grandiflora* | Asteraceae | Uncommon |
| Christmas Cactus<br>*Cylindropuntia leptocaulis* | Cactaceae | Uncommon |
| Hedgehog Cactus<br>*Echinocereus coccineus* | Cactaceae | Rare |
| Barrel Cactus<br>*Ferocactus cylindraceus* | Cactaceae | Uncommon |
| Beavertail Pricklypear<br>*Opuntia basilaris* | Cactaceae | Uncommon |
| Fourwing Saltbush<br>*Atriplex canescens* | Chenopodiaceae | Uncommon |
| Longleaf Jointfir<br>*Ephedra trifurca* | Ephedraceae | Common |
| Sandmat<br>*Chamaesyce* sp. 1 | Euphorbiaceae | Common |
| Catclaw Acacia<br>*Acacia greggii* | Fabaceae | Common |
| Catclaw Mimosa<br>*Mimosa aculeaticarpa* var. *biuncifera* | Fabaceae | Uncommon |
| Coues' Cassia<br>*Senna covesii* | Fabaceae | Uncommon |
| Ocotillo<br>*Fouquieria splendens* | Fouquieriaceae | Uncommon |
| Redstem Stork's Bill<br>*Erodium cicutarium* | Geraniaceae | Uncommon |
| Littleleaf Ratany<br>*Krameria erecta* | Krameriaceae | Common |

| Table C-1. Plant Species Observed During Survey | | |
|---|---|---|
| **Common Name** ***Scientific Name*** | **Family** | **Relative Abundance** |
| Globemallow *Sphaeralcea* sp. 1 | Malvaceae | Uncommon |
| Low Woollygrass *Dasyochloa pulchella* | Poaceae | Uncommon |
| Tobosagrass *Pleuraphis mutica* | Poaceae | Uncommon |
| Desert Trumpet *Eriogonum inflatum* | Polygonaceae | Uncommon |
| Bastardsage *Eriogonum wrightii* | Polygonaceae | Common |
| Lotebush *Ziziphus obtusifolia* | Rhamnaceae | Uncommon |
| Mistletoe *Phoradendron coryae* | Viscaceae | Uncommon |
| Creosote Bush *Larrea tridentata* | Zygophyllaceae | Abundant |

| Table C-2 Noxious Weed List | | |
|---|---|---|
| **PNW:** Prohibited Noxious Weed<br>**RNW**: Restricted Noxious Weed<br>**RGNW**: Regulated Noxious Weed | | |
| **Common Name**<br>***Scientific Name*** | **Family** | **Status** |
| Punagrass<br>*Achnatherum brachychaetum* | Poaceae | PNW |
| Russian Knapweed<br>*Acroptilon repens* | Asteraceae | PNW; RNW |
| Jointed Goatgrass<br>*Aegilops cylindrical* | Poaceae | PNW; RNW |
| Camelthorn<br>*Alhagi maurorum* | Fabaceae | PNW; RNW |
| Plumeless Thistle<br>*Carduus acanthoides* | Asteraceae | PNW |
| Southern Sandbur<br>*Cenchrus echinatus* | Poaceae | PNW; RGNW |
| Field Sandbur<br>*Cenchrus spinifex* [*C. incertus*] | Poaceae | PNW; RGNW |
| Red Starthistle<br>*Centaurea calcitrapa* | Asteraceae | PNW |
| Diffuse Knapweed<br>*Centaurea diffusa* | Asteraceae | PNW; RNW |
| Yellow Starthistle<br>*Centaurea solstitialis* | Asteraceae | PNW; RNW |
| Spotted Knapweed<br>*Centaurea maculosa* | Asteraceae | RNW |
| Sicilian Starthistle<br>*Centaurea sulphurea* | Asteraceae | PNW |
| Rush Skeletonweed<br>*Chondrilla juncea* | Asteraceae | PNW |
| Field Bindweed<br>*Convolvulus arvensis* | Convolvulaceae | PNW; RGNW |
| Dodder<br>*Cuscuta* spp. | Cuscutaceae | PNW; RNW |
| Alfombrilla<br>*Drymaria arenarioides* | Caryophyllaceae | PNW |
| Halogeton<br>*Halogeton glomeratus* | Chenopodiaceae | PNW; RNW |
| Morning Glory<br>*Ipomoea* spp. | Convolvulaceae | PNW |
| Three-cornered Morning Glory<br>*Ipomoea triloba* | Convolvulaceae | PNW; RNW |
| Burclover<br>*Medicago polymorpha* | Fabaceae | PNW; RGNW |
| Serrated Tussock<br>*Nassella trichotoma* | Poaceae | PNW |
| Scotch Thistle<br>*Onopordum acanthium* | Asteraceae | PNW; RNW |
| African Rue<br>*Peganum harmala* | Poaceae | PNW |
| Common Purslane<br>*Portulaca oleracea* | Portulaceae | PNW; RGNW |

| Table C-2 Noxious Weed List | | |
|---|---|---|
| **PNW:** Prohibited Noxious Weed<br>**RNW**: Restricted Noxious Weed<br>**RGNW**: Regulated Noxious Weed | | |
| **Common Name**<br>***Scientific Name*** | **Family** | **Status** |
| Carolina horsenettle<br>*Solanum carolinense* | Solanaceae | PNW |
| Silverleaf Nightshade<br>*Solanum elaeagnifolium* | Solanaceae | PNW |
| Tropical Soda Apple<br>*Solanum viarum* | Solanaceae | PNW |
| Puncturevine<br>*Tribulus terrestris* | Zygophyllaceae | PNW; RGNW |

| Table C-3. Special-status Species That Were Evaluated for Potential Occurrence within the Study Area | |
|---|---|
| **BCC:** Bird Species of Conservation Concern<br>**BGEPA:** Bald and Golden Eagle Protection Act<br>**C:** Candidate for ESA listing<br>**E:** ESA Endangered Species<br>**NEP:** Nonessential Experimental Population | **PT:** Proposed for Listing as ESA Threatened Species<br>**SGCN:** Species of Greatest Conservation Needs (Tier)<br>**T:** ESA Threatened Species<br>**WSC:** Wildlife of Special Concern in Arizona. |

| Common Name<br>*Latin Name* | Status | Designated Critical Habitat | Habitat and Notes | Occurrence in or Near the Study Area |
|---|---|---|---|---|
| **Mammals** | | | | |
| Pale Townsend's Big-eared Bat<br>*Corynorhinus townsendii pallescens* | SGCN (1C) | NA | Desertscrub to coniferous forests. Day roosts in caves, night roosts in abandoned buildings. Hibernates in cold caves, lava tubes, and mines during the winter. Gleans insects from leaves while in flight. | Yes |
| Spotted Bat<br>*Euderma maculatum* | SGCN (1B) | NA | Various biotic communities including arid desertscrub, riparian, piñon-juniper woodlands, and montane coniferous forests. Roosts in crevices and cracks of cliff faces. Forages for insects over open ground. | Yes |
| Greater Western Mastiff Bat<br>*Eumops perotis californicus* | SGCN (1B) | NA | Sonoran desertscrub, near cliffs in rugged, rocky canyons. Roosts in crevices. Requires a cliff above a vertical drop to launch into flight. Forages for insects at substantial heights over open areas. | Yes |
| Allen's Big-eared Bat<br>*Idionycteris phyllotis* | SGCN (1B) | NA | Ponderosa pine, piñon-juniper woodlands, and riparian habitats dominated by sycamore, cottonwood, and willows. Roosts in caves and abandoned mineshafts. Forages over water for insects. | No suitable habitat within the Study Area. |
| Arizona Myotis<br>*Myotis occultus* | SGCN (1B) | NA | Ponderosa pine and pine-oak woodlands adjacent to water. Roosts in snags, tree cavities, and crevices in close proximity to water it forages over. | No suitable habitat within the Study Area. |

## Table C-3. Special-status Species That Were Evaluated for Potential Occurrence within the Study Area

**BCC:** Bird Species of Conservation Concern
**BGEPA:** Bald and Golden Eagle Protection Act
**C:** Candidate for ESA listing
**E:** ESA Endangered Species
**NEP:** Nonessential Experimental Population
**PT:** Proposed for Listing as ESA Threatened Species
**SGCN:** Species of Greatest Conservation Needs (Tier)
**T:** ESA Threatened Species
**WSC:** Wildlife of Special Concern in Arizona.

| Common Name<br>*Latin Name* | Status | Designated Critical Habitat | Habitat and Notes | Occurrence in or Near the Study Area |
|---|---|---|---|---|
| Pocketed Free-tailed Bat<br>*Nyctinomops femorosaccus* | SGCN (1C) | NA | Desertscrub to pine-oak woodlands. Roosts in high crevices on cliff faces and in rugged canyons. Forages for insects in flight. | Yes |
| Mexican Free-tailed Bat<br>*Tadarida brasiliensis* | SGCN (1B) | NA | Primarily Sonoran Desert lowlands. Roosts in caves, mine tunnels, and crevices in bridges, parking garages, and buildings. Feeds predominately on moths, but will consume other insects. | Yes |
| Kit Fox<br>*Vulpes macrotis* | SGCN (1C) | NA | Desertscrub and desert grasslands, preferring sparsely vegetated open areas. Often associated with creosote bush communities. | Yes |
| Arizona Pocket Mouse<br>*Perognathus amplus* | SGCN (1B) | NA | Desertscrub habitats. Sleeps and rears young in burrows built under shrubs. | Yes |
| Harris's Antelope Squirrel<br>*Ammospermophilus harrisii* | SGCN (1B) | NA | Desert habitats in canyons, dry plains, and river valleys. Sleeps and rears young in burrows built under shrubs. | Yes |
| **Birds** | | | | |
| Least Bittern<br>*Ixobrychus exilis* | BCC | NA | Nests and forages in marshes with dense reedy vegetation. | Occurrence would be incidental. |
| Yellow-billed Cuckoo, Western DPS<br>*Coccyzus americanus* | T; BCC; SGCN (1A) | Proposed, outside of Study Area | Nests in large blocks of mature riparian woodland. | No suitable habitat within the Study Area. Proposed critical habitat outside of the Study Area. |
| Long-billed Curlew<br>*Numenius americanus* | BCC | NA | Short-grass or mixed prairie with flat topography. Migrates through Arizona. | Occurrence would be incidental. |
| Wood Duck<br>*Aix sponsa* | SGCN (1B) | NA | Wooded, freshwater habitats with an abundance of cover. This includes permanent ponds, marshes, and lakes. | No suitable habitat within the Study Area. |

## Table C-3. Special-status Species That Were Evaluated for Potential Occurrence within the Study Area

**BCC:** Bird Species of Conservation Concern
**BGEPA:** Bald and Golden Eagle Protection Act
**C:** Candidate for ESA listing
**E:** ESA Endangered Species
**NEP:** Nonessential Experimental Population
**PT:** Proposed for Listing as ESA Threatened Species
**SGCN:** Species of Greatest Conservation Needs (Tier)
**T:** ESA Threatened Species
**WSC:** Wildlife of Special Concern in Arizona.

| Common Name<br>*Latin Name* | Status | Designated Critical Habitat | Habitat and Notes | Occurrence in or Near the Study Area |
|---|---|---|---|---|
| Bald Eagle<br>*Haliaeetus leucocephalus* | BCC; BGEPA; SGCN (1A) | NA | Common in winter along water courses and reservoirs. Traditional roost sites are often clumps of mature, deciduous trees in riparian areas protected from human disturbance. | Yes |
| Golden Eagle<br>*Aquila chrysaetos* | BCC; BGEPA; SGCN (1A) | NA | Open and semi-open habitats within mountainous canyons and grasslands. | Yes |
| American Peregrine Falcon<br>*Falco peregrinus anatum* | BCC; SGCN (1A) | NA | Various biomes, but most commonly occupied habitats contain cliffs for nesting and open landscapes for foraging. | Yes |
| Prairie Falcon<br>*Falco mexicanus* | BCC | NA | Open expanses in deserts, grasslands, and agricultural land. Nests are built on cliff ledges. | Yes |
| Southwestern Willow Flycatcher<br>*Empidonax traillii extimus* | E; BCC SGCN (1A) | Yes, outside of Study Area | Dense riparian habitat of willow, salt cedar, and box elder. | No suitable habitat present; critical habitat outside of the Study Area. |
| Olive-sided Flycatcher<br>*Contopus cooperi* | BCC | NA | Montane coniferous forests and natural edges. | No suitable habitat within the Study Area. |
| Gilded Flicker<br>*Colaptes chrysoides* | BCC; SGCN (1B) | NA | Strongly associates with giant cactus forests of Southwest deserts, but also inhabits riparian woodlands dominated by cottonwoods and willows. | No suitable habitat present within the Study Area. |
| Lawrence's Goldfinch<br>*Spinus lawrencei* | BCC | NA | Arid woodlands near chaparral and a permanent water source. | Study Area is outside of known distribution. |
| Ferruginous Hawk<br>*Buteo regalis* | BCC; SGCN (1B) | NA | Arid grasslands and adjacent farmlands. Wintering habitat may include desertscrub. | Yes |
| Swainson's Hawk<br>*Buteo swainsoni* | BCC | NA | Grasslands, chaparral, or agricultural landscapes. Forages in opens stands of grass-dominated vegetation. | Yes |

## Table C-3. Special-status Species That Were Evaluated for Potential Occurrence within the Study Area

**BCC:** Bird Species of Conservation Concern
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**E:** ESA Endangered Species
**NEP:** Nonessential Experimental Population
**PT:** Proposed for Listing as ESA Threatened Species
**SGCN:** Species of Greatest Conservation Needs (Tier)
**T:** ESA Threatened Species
**WSC:** Wildlife of Special Concern in Arizona.

| Common Name<br>*Latin Name* | Status | Designated Critical Habitat | Habitat and Notes | Occurrence in or Near the Study Area |
|---|---|---|---|---|
| Calliope Hummingbid<br>*Selasphorus calliope* | BCC | NA | Migration stopovers are located along desert washes in the spring. Fall habitats consist of high-elevation mountain meadows. | Yes |
| Costa's Hummingbird<br>*Calypte costae* | BCC | NA | Low-desert chaparral, Sonoran desertscrub, and high montane meadows depending on the season. | Yes |
| Rufous Hummingbird<br>*Selasphorus rufus* | BCC | NA | Montane meadows and disturbed areas. Migrates through Arizona. | Yes |
| Pinyon Jay<br>*Gymnorhinus cyanocepahlus* | BCC | NA | Pinyon pine forests and open pinyon juniper habitats. | No suitable habitat present within the Study Area. |
| Dunlin<br>*Calidris alpine articola* | BCC | NA | Inland mudflats and lakeshores. | No suitable habitat present in the Study Area. |
| Western Burrowing Owl<br>*Athene cunicularia hypugaea* | BCC; SGCN (1B) | NA | Prairie grasslands with few scattered shrubs and other open, nearly flat habitats. | Yes |
| Elf Owl<br>*Micrathene whitneyi* | BCC | NA | Riparian woodlands and desert-wash woodlands. Nests in tree cavities. | No suitable habitat within the Study Area. |
| Flammulated Owl<br>*Psiloscops flammeneolus* | BCC | NA | Mixed-conifer woodlands. Prefers dense foliage for roosting. | No suitable habitat within the Study Area. |
| Mexican Spotted Owl<br>*Strix occidentalis lucida* | BCC | NA | Mixed-conifer woodlands in shaded canyons. | No suitable habitat within the Study Area. |
| Mountain Plover<br>*Charadrius montanus* | BCC | NA | Wintering habitats are primarily agricultural lands such as sod farms, recently cut alfalfa fields, and fallow fields. | No suitable habitat within the Study Area. |
| Snowy Plover<br>*Charadrius nivosus* | BCC | NA | Migrates along inland lakes throughout Arizona. | No suitable habitat within the Study Area. |
| California Least Tern<br>*Sterna antillarum browni* | E; SGCN (1A) | No | Nests on sandy beaches near estuaries, or manmade islands. | No suitable habitat present within Study Area. |
| Loggerhead Shrike<br>*Lanius ludovicianus* | BCC | NA | Prairies with scattered bushes and trees. | Yes |

**Table C-3. Special-status Species That Were Evaluated for Potential Occurrence within the Study Area**

**BCC:** Bird Species of Conservation Concern
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**C:** Candidate for ESA listing
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**NEP:** Nonessential Experimental Population
**PT:** Proposed for Listing as ESA Threatened Species
**SGCN:** Species of Greatest Conservation Needs (Tier)
**T:** ESA Threatened Species
**WSC:** Wildlife of Special Concern in Arizona.

| Common Name *Latin Name* | Status | Designated Critical Habitat | Habitat and Notes | Occurrence in or Near the Study Area |
|---|---|---|---|---|
| Black-chinned Sparrow *Spizella atrogularis* | BCC | NA | Slopes in chaparral sagebrush, juniper woodlands, and desertscrub. | Yes |
| Brewer's Sparrow *Spizella breweri* | BCC | NA | Sagebrush chaparral and desertscrub habitats. | Yes |
| Lincoln's Sparrow *Melospiza lincolnii* | SGCN (1B) | NA | Shrub-dominated habitats with dense cover, especially riparian areas. | Yes |
| Savannah Sparrow *Passerculus sandwichensis* | SGCN (1B) | NA | Open grasslands with short vegetation height. | No suitable habitat within the Study Area. |
| Bendire's Thrasher *Toxostoma bendirei* | BCC | NA | Open desertscrub. | Yes |
| Le Conte's Thrasher *Toxostoma lecontei* | BCC; SGCN (1B) | NA | Arid and sparsely vegetated plains dominated by saltbush and creosote bush on sandy ground. | Yes |
| Arizona Bell's Vireo *Vireo bellii arizonae* | BCC; SGCN (1C) | NA | Willow and mesquite thickets in riparian areas. | No suitable habitat within the Study Area. |
| Gray Vireo *Vireo vicinior* | BCC | NA | Rocky, arid hillsides with widely scattered juniper, oaks, and/or mesquites. | No suitable habitat within the Study Area. |
| Grace's Warbler *Setophaga graciae* | BCC | NA | Pine forests. | No suitable habitat within the Study Area. |
| Lucy's Warbler *Vermivora luciae* | BCC | NA | Dense, lowland riparian mesquite bosques. | No suitable habitat within the Study Area. |
| Virginia's Warbler *Oreothlypis virginiae* | BCC | NA | Piñon-juniper and oak woodlands. Breeds in dense, bushy understory. | No suitable habitat present within the Study Area. |
| Sonoran Yellow Warbler *Dendroica petechial sonorana* | BCC | NA | Mesic, deciduous thickets dominated by willows. | No suitable habitat present within the Study Area. |
| Red-faced Warbler *Cardellina rubrifrons* | BCC | NA | Shaded canyons along streams within montane, pine-oak forests. | No suitable habitat present within the Study Area. |

## Table C-3. Special-status Species That Were Evaluated for Potential Occurrence within the Study Area

**BCC:** Bird Species of Conservation Concern
**BGEPA:** Bald and Golden Eagle Protection Act
**C:** Candidate for ESA listing
**E:** ESA Endangered Species
**NEP:** Nonessential Experimental Population
**PT:** Proposed for Listing as ESA Threatened Species
**SGCN:** Species of Greatest Conservation Needs (Tier)
**T:** ESA Threatened Species
**WSC:** Wildlife of Special Concern in Arizona.

| Common Name<br>*Latin Name* | Status | Designated Critical Habitat | Habitat and Notes | Occurrence in or Near the Study Area |
|---|---|---|---|---|
| Gila Woodpecker<br>*Melanerpes uropygialis* | BCC; SGCN (1B) | NA | Low-elevation deserts with woody plants large enough to provide nest sites. | No suitable habitat present within the Study Area. |
| Lewis's Woodpecker<br>*Melanerpes lewis* | BCC | NA | Open ponderosa pine forests, riparian woodlands, and logged or burned pine forests. | No suitable habitat present within the Study Area. |
| Bewicks's Wren<br>*Thryomanes bewickii bewickii* | BCC | NA | Brushy areas including scrub and thickets in open riparian woodland and chaparral. | Yes |
| Lesser Yellowlegs<br>*Tringa flavipes* | BCC | NA | Wetlands surrounding ephemeral and permanent bodies of water. Migrates through Arizona. | Yes |
| **Reptiles** | | | | |
| Sonoran Desert Tortoise<br>*Gopherus morafkai* | C; WSC; SGCN (1A) | NA | Rocky, steep slopes and bajadas in palo verde-mixed cacti associations. May use desert washes and valley bottoms. | Yes |
| Gila Monster<br>*Heloderma suspectum* | SGCN (1B) | NA | Rocky foothills, bajadas, and canyons in desert landscapes. | Yes |
| Northern Mexican Gartersnake<br>*Thamnophis eques megalops* | T; SGCN (1A) | Proposed, outside of Study Area | Ponds, cienegas, lowland river riparian woodlands, and upland stream gallery forests. | Study Area is outside of known distribution. |
| **Amphibians** | | | | |
| Relict Leopard Frog<br>*Lithobates onca* | C; WSC; SGCN (1A) | NA | Permanent streams, springs, and spring-fed wetlands below approximately 2,000 feet in elevation. Experimental populations have been released in Union Pass, approximately 10 miles north of the Project area and/or Solar Facility. All other known populations occur in drainages around Lake Mead. | Study Area is outside of known distribution. |
| **Fish** | | | | |
| Bonytail Chub<br>*Gila elegans* | E; SGCN (1A) | Yes, outside of Study Area | Main stream, mid to large-sized rivers over rocks and mud. Also inhabits reservoirs. | Study Area is outside of known distribution |

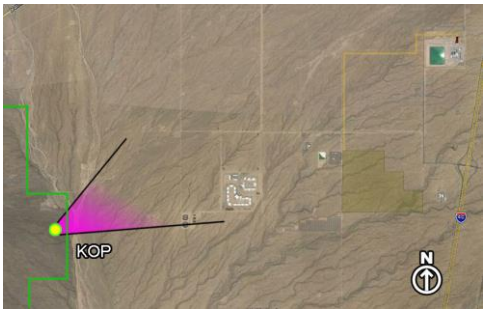
| Table C-3. Special-status Species That Were Evaluated for Potential Occurrence within the Study Area | |
|---|---|
| **BCC:** Bird Species of Conservation Concern<br>**BGEPA:** Bald and Golden Eagle Protection Act<br>**C:** Candidate for ESA listing<br>**E:** ESA Endangered Species<br>**NEP:** Nonessential Experimental Population | **PT:** Proposed for Listing as ESA Threatened Species<br>**SGCN:** Species of Greatest Conservation Needs (Tier)<br>**T:** ESA Threatened Species<br>**WSC:** Wildlife of Special Concern in Arizona. |

| Common Name<br>*Latin Name* | Status | Designated Critical Habitat | Habitat and Notes | Occurrence in or Near the Study Area |
|---|---|---|---|---|
| Humpback Chub<br>*Gila cypha* | E;<br>SGCN (1A) | Yes, outside of Study Area | Turbulent, high gradient, canyon-bound reaches of large rivers in the Colorado River Basin. | Study Area is outside of known distribution |
| Razorback Sucker<br>*Xyrauchen texanus* | E;<br>SGCN (1A) | Yes, outside of Study Area | Various habitat types from slow backwaters of large streams to mainstream rivers and reservoirs. | Study Area is outside of known distribution |
| Virgin River Chub<br>*Gila seminuda* | E;<br>SGCN (1A) | Yes, outside of Study Area | Mainstream, Virgin River in swift, deep pools near cover. | Study Area is outside of known distribution |
| Woundfin<br>*Plagopterus argentissimus* | E;<br>SGCN (1A) | Yes, outside of Study Area | Swift, silty streams avoiding clear waters and pools. | Study Area is outside of known distribution |
| Roundtail Chub, Lower Colorado River Basin DPS<br>*Gila robusta* | C;<br>SGCN (1A) | NA | Cool to warm water in mid-elevation streams and rivers. | Study Area is outside of known distribution. |

# Appendix D Visual Resource KOP Worksheets

# VISUAL CONTRAST RATING WORKSHEET

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

| | | |
|---|---|---|
| **Project Name: Longview – Cliffrose Solar**<br>**Key Observation Point: KOP 1 – from Warm Springs Wilderness**<br>**VRM Class: IV** | **Location**<br>Township: 19N<br>Range: 18W<br>Section: 20 | Location Sketch<br>  |

## Characteristic Landscape Description

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | FG: Flat, horizontal<br>BG: Rugged, jagged | Dense, clumping, low | Dense, geometric |
| **Line** | FG: Horizontal<br>BG: Bold, complex, angular | Undulating, digitate | Horizontal, thin |
| **Color** | FG: Grays, tans, browns<br>BG: Dark Browns, tan | Dark green, olive greens, greys, tans, browns | Grey, white |
| **Texture** | FG: Fine grain<br>BG: Dense, rough | Medium to fine grain | fine grain |

## Proposed Activity Description (Substation and Intertie Transmission Line)

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | Not Seen | Not Seen | Dense, geometric |
| **Line** | Not Seen | Not Seen | Horizontal, thin |
| **Color** | Not Seen | Not Seen | Grey, white |
| **Texture** | Not Seen | Not Seen | fine grain |

## Proposed Connected Action (Solar Facility)

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | Not Seen | Dense, geometric veg removal | Geometric, horizontal |
| **Line** | Not Seen | Defined, linear | Horizontal, angular |
| **Color** | Not Seen | Not Seen | Blue, grey |
| **Texture** | Not Seen | Not Seen | Medium to fine grain |

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

## Degree of Contrast for Proposed Activity (Substation and Intertie Transmission Line)

| | Degree of Contrast | Features | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Landform/ Water Body | | | | Vegetation | | | | Structures | | | |
| | | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Elements | Form | | | | X | | | | X | | | X | |
| | Line | | | | X | | | X | | | | X | |
| | Color | | | | X | | | | X | | | X | |
| | Texture | | | | X | | | | X | | | X | |

**Does project design meet visual resource management objectives?**
**Yes** No (Explain on reverse side)

**Additional mitigating measures recommended?**
Yes **No**

**Evaluators Names:** Conrad Langley, Marc Schwartz

## Degree of Contrast for Connected Action (Solar Facility)

| | Degree of Contrast | Features | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Landform/ Water Body | | | | Vegetation | | | | Structures | | | |
| | | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Elements | Form | | | | X | | | X | | | | X | |
| | Line | | | | X | | | X | | | | X | |
| | Color | | | | X | | | | X | | X | | |
| | Texture | | | | X | | | | X | | | X | |

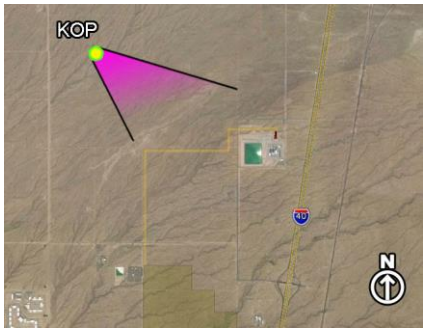
| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

*Viewing east towards Project area from Warm Springs Wilderness*

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated by the BLM as VRM Class IV as seen from dispersed recreation in the Warm Springs Wilderness approximately 5 miles west of the proposed project. The proposed transmission line structure and substation structures would be similar in form, line, color and texture as compared to existing structures located within the project area. The construction of the project would result in minimal vegetation clearing and landform modification of lay down areas and the use of existing access and sparse vegetation. Views from this vantage point would be level and the project would be seen in the context of the existing power plant and existing utility lines. It is unlikely that the contrast as a result of the project would be visible from the lower elevations of the Wilderness Area due to the distance of the project (approximately 5 miles) in addition to the project elements being seen in the context of the existing facilities. Overall impacts are anticipated to be Low.

# VISUAL CONTRAST RATING WORKSHEET

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

| | | |
|---|---|---|
| **Project Name: Longview – Cliffrose Solar**<br>**Key Observation Point: KOP 2 – from Residence**<br>**VRM Class: IV** | **Location**<br>Township: 19N<br>Range: 18W<br>Section: 3 | Location Sketch<br>  |

## Characteristic Landscape Description

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | FG: Flat, horizontal<br>BG: Rugged, jagged | Dense, low, simple | Low, geometric |
| **Line** | FG: Horizontal<br>BG: Bold, complex, angular | horizontal | Thin, horizontal angular |
| **Color** | FG: Grays, tans, browns<br>BG: Dark Browns, tan | Olive green, greys, tans, browns | Grey, brown |
| **Texture** | FG: Fine grain<br>BG: Dense, rough | Medium to fine grain | fine grain |

## Proposed Activity Description (Substation and Intertie Transmission Line)

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | N/A | N/A | Vertical, tall |
| **Line** | N/A | N/A | Thin, vertical |
| **Color** | N/A | N/A | Brown, grey |
| **Texture** | N/A | N/A | fine grain |

## Proposed Connected Action (Solar Facility)

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | N/A | N/A | Geometric, horizontal |
| **Line** | N/A | N/A | Horizontal, angular |
| **Color** | N/A | N/A | Blue, grey |
| **Texture** | N/A | N/A | Medium to fine grain |

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

## Degree of Contrast for Proposed Activity (Substation and Intertie Transmission Line)

| | Degree of Contrast | Features | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Landform/ Water Body | | | | Vegetation | | | | Structures | | | |
| | | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Elements | Form | | | | X | | | | X | | | X | |
| | Line | | | | X | | | | X | | | X | |
| | Color | | | | X | | | | X | | | X | |
| | Texture | | | | X | | | | X | | | X | |

**Does project design meet visual resource management objectives?**
**Yes** No (Explain on reverse side)

**Additional mitigating measures recommended?**
Yes **No**

**Evaluators Names:** Conrad Langley, Marc Schwartz

## Degree of Contrast for Connected Action (Solar Facility)

| | Degree of Contrast | Features | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Landform/ Water Body | | | | Vegetation | | | | Structures | | | |
| | | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Elements | Form | | | | X | | | | X | | | X | |
| | Line | | | | X | | | | X | | | X | |
| | Color | | | | X | | | | X | | | X | |
| | Texture | | | | X | | | | X | | | X | |

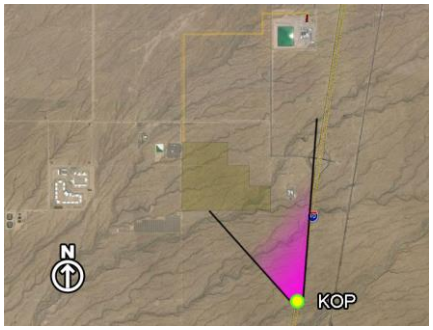
| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

*Viewing southeast towards Project from residence*

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated by the BLM as VRM Class IV as seen from dispersed residences north and west of the proposed project. The proposed transmission line structure and substation structures would be similar in form, line, color, and texture as compared to existing structures located within the utility corridor. The construction of the project would result in minimal vegetation clearing and landform modification of lay down areas and based on the use of existing access and sparse vegetation. Views from this vantage point would be level and the project would be seen in the context of the existing power plant and existing utility lines. It is unlikely that the contrast as a result of project contrast would be visible due to the distance of the project (approximately 2.5 miles) in addition to the project elements being seen in the context of the existing facilities. Overall impacts are anticipated to be Low.

# VISUAL CONTRAST RATING WORKSHEET

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

| | | |
|---|---|---|
| **Project Name: Longview – Cliffrose Solar**<br>**Key Observation Point: KOP 3 – from I-40**<br>**VRM Class: IV** | **Location**<br>Township: 19N<br>Range: 17W<br>Section: 18 | Location Sketch<br>  |

## Characteristic Landscape Description

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | FG: Flat, horizontal<br>BG: Flat to undulating | Dense, clumping | Tall, vertical, geometric |
| **Line** | FG: Horizontal<br>BG: Curvilinear, angular | Undulating, digitate | Thin, vertical, angular |
| **Color** | FG: Grays, tans, browns<br>BG: Dark Browns | Dark green, olive greens, tans, browns | Grey, brown, white |
| **Texture** | Fine grain | Medium to fine grain | Medium to fine grain |

## Proposed Activity Description (Substation and Intertie Transmission Line)

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | Not Visible | Not Visible | Tall, vertical, diagonals |
| **Line** | Not Visible | Not Visible | Thin, vertical, angular |
| **Color** | Not Visible | Not Visible | Grey |
| **Texture** | Not Visible | Not Visible | Fine grain |

## Proposed Connected Action (Solar Facility)

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | FG: Flat, horizontal<br>BG: Rolling hills, undulating | Dense, geometric veg removal | Geometric, horizontal |
| **Line** | FG: Horizontal, defined<br>BG: Curvilinear, rounded | Defined | Horizontal, angular |
| **Color** | FG: Grays, tans, browns<br>BG: Dark Browns | Dark green, olive greens, tans, browns | Blue, grey |
| **Texture** | Fine grain | Medium to fine grain | Medium to fine grain |

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

## Degree of Contrast for Proposed Activity (Substation and Intertie Transmission Line)

| | Degree of Contrast | Features | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Landform/ Water Body | | | | Vegetation | | | | Structures | | | |
| | | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Elements | Form | | | | X | | | | X | | | X | |
| | Line | | | | X | | | | X | | | X | |
| | Color | | | | X | | | | X | | | X | |
| | Texture | | | | X | | | | X | | | X | |

**Does project design meet visual resource management objectives?**
**Yes** No (Explain on reverse side)

**Additional mitigating measures recommended?**
Yes **No**

**Evaluators Names:** Conrad Langley, Marc Schwartz

## Degree of Contrast for Connected Action (Solar Facility)

| | Degree of Contrast | Features | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Landform/ Water Body | | | | Vegetation | | | | Structures | | | |
| | | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Elements | Form | | | X | | | | X | | | | X | |
| | Line | | | X | | | | X | | | | X | |
| | Color | | | X | | | | X | | | X | | |
| | Texture | | | X | | | | X | | | | X | |

| |
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| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

*Viewing northwest towards Project from I-40*

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated by the BLM as VRM Class IV. The proposed transmission line structure and substation structures would be similar in form, line, color, and texture as compared to existing structures located within the project area. The construction of the project would result in minimal vegetation clearing and landform modification of lay down areas and use of existing access and sparse vegetation. Views from this vantage point would be level the project would be seen in the context of the existing power plant and existing utility lines. The proposed project would be seen by travelers from a distance of approximately 2.5 miles to .5 miles as the traveler approaches and passes the project site. Overall impacts are anticipated to be Low.

# VISUAL CONTRAST RATING WORKSHEET

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

| | | |
|---|---|---|
| **Project Name: Longview – Cliffrose Solar**<br>**Key Observation Point: KOP 4 – from US66**<br>**VRM Class: IV** | **Location**<br>Township: 20N<br>Range: 18W<br>Section: 13 | Location Sketch<br>  |

## Characteristic Landscape Description

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | FG: Flat, horizontal<br>BG: Flat to undulating | Dense, clumping | Tall, vertical, diagonals |
| **Line** | FG: Horizontal<br>BG: Curvilinear, angular | Undulating, digitate | Thin, vertical, angular |
| **Color** | FG: Grays, tans, browns<br>BG: Dark Browns | Dark green, olive greens, tans, browns | grey |
| **Texture** | Fine grain | Medium to fine grain | fine grain |

## Proposed Activity Description (Substation and Intertie Transmission Line)

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | Not visible | Not visible | Tall, vertical, geometric |
| **Line** | Not visible | Not visible | Thin, vertical |
| **Color** | Not visible | Not visible | Grey, browns |
| **Texture** | Not visible | Not visible | Fine grain |

## Proposed Connected Action (Solar Facility and Transmission Line)

| | Landform/Water | Vegetation | Structures |
|---|---|---|---|
| **Form** | Not visible | Not visible | Geometric, horizontal |
| **Line** | Not visible | Not visible | Horizontal, angular |
| **Color** | Not visible | Not visible | Blue, grey |
| **Texture** | Not visible | Not visible | Medium to fine grain |

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

## Degree of Contrast for Proposed Activity (Substation and Intertie Transmission Line)

| Degree of Contrast | | Features | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Landform/ Water Body | | | | Vegetation | | | | Structures | | | |
| | | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Elements | Form | | | | X | | | | X | | | X | |
| | Line | | | | X | | | | X | | | X | |
| | Color | | | | X | | | | X | | | X | |
| | Texture | | | | X | | | | X | | | X | |

**Does project design meet visual resource management objectives?**
**Yes** No (Explain on reverse side)

**Additional mitigating measures recommended?**
Yes **No**

**Evaluators Names:** Conrad Langley, Marc Schwartz

## Degree of Contrast for Connected Action (Solar Facility)

| Degree of Contrast | | Features | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Landform/ Water Body | | | | Vegetation | | | | Structures | | | |
| | | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None | Strong | Moderate | Weak | None |
| Elements | Form | | | | X | | | | X | | | X | |
| | Line | | | | X | | | | X | | | X | |
| | Color | | | | X | | | | X | | | X | |
| | Texture | | | | X | | | | X | | | X | |

| |
|---|
| **Date: December 2014** |
| **District/Field Office: Kingman** |
| **Resource Area:** |
| **Activity (program):Transmission Line** |

*Viewing south towards Project (arrow) from Historic Route 66*

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated by the BLM as VRM Class IV as seen from Historic Route 66 approximately 4 miles north of the proposed project. The proposed transmission line structure and substation structures would be similar in form, line, color, and texture as compared to existing structures located within the project area. The construction of the project would result in minimal vegetation clearing and landform modification of lay down areas based on the use of existing access and sparse vegetation. Views from this vantage point would be level and the project would be seen in the context of the existing power plant and existing utility lines. It is unlikely that the contrast as a result of the project would be visible from Route 66 due to the distance of the project (approximately 4 miles) in addition to the project elements being seen in the context of the existing facilities. Overall impacts are anticipated to be Low.