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

Final Environmental Assessment
DOI-BLM-NV-S010-2010-0091-EA
November 2014

Southern Nevada Intertie Project

APPLICANT

Great Basin Transmission, LLC

GENERAL LOCATION

Clark County, Nevada

BLM CASE FILE SERIAL NUMBER

N-086359

PREPARING OFFICE

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CHAPTER 1. INTRODUCTION

Great Basin Transmission, LLC (Great Basin), a Delaware limited liability company, has filed joint right-of-way (ROW) applications with the Bureau of Land Management (BLM) – Southern Nevada District Office and U.S. Bureau of Reclamation (Reclamation) for the construction, operation, and maintenance of a new 500-kilovolt (kV) overhead transmission line (Proposed Action). The transmission line would stretch between a northern terminus at NV Energy's 500 kV Harry Allen Substation (approximately 20 miles northeast of Las Vegas) and a southern terminus at the existing 500 kV Eldorado Substation in Eldorado Valley; both in Clark County, Nevada. The proposed project, known as the Southern Nevada Intertie Project (SNIP), would interconnect existing and planned transmission facilities in southern Nevada in order to provide:

- New access in Southern Nevada to the regional electricity market for existing and proposed power generation facilities
- Economical transmission service to foster the development of new renewable energy resources
- A new energy pathway to reduce congestion on the existing transmission grid and increase regional transmission system reliability
- Increased import and export capacity for regional transmission systems in Nevada to help place downward pressure on electricity prices

The SNIP would cross federal lands managed by the BLM, requiring a ROW grant, and federal lands withdrawn for Reclamation project purposes and managed by Reclamation, requiring a right-of-use (ROU) authorization. The BLM has identified the Southern Nevada District Office as the lead office for processing Great Basin's BLM ROW application and for compliance with the National Environmental Policy Act of 1969 (NEPA); Reclamation will be a NEPA cooperating agency. The BLM and Reclamation have determined that an environmental assessment (EA) will be prepared to assist with identification of any potentially significant impacts that could result from implementation of the Proposed Action, and in making the final determination for any federal action.

The EA provides a site-specific analysis of environmental impacts that could result from the implementation of the Proposed Action, and from any reasonable alternatives to the Proposed Action. The EA also considers the No Action alternative.

If the BLM and Reclamation determine that "no significant impact" would result from the Proposed Action (and taking into account any committed mitigation measures), each agency would issue its own Finding of No Significant Impact (FONSI). If the BLM issues a FONSI, it would also issue a decision record (DR), either approving or denying the requested authorization. Reclamation does not issue DRs. Reclamation's approval of the project would be granted by signing the FONSI and by the execution of an ROU authorization. If significant impacts are identified, an environmental impact statement (EIS) would be prepared.

1.1. Identifying Information

1.1.1. Title, EA Number, and Type of Project

Southern Nevada Intertie Project, DOI-BLM-NV-S010-2010-0091-EA, Transmission Line Right-of-Way Project.

1.1.2. Location of Proposed Action

The proposed project is a 500 kV transmission line stretching between a northern terminus at the Harry Allen Substation located in Dry Lake, Nevada (approximately 20 miles northeast of Las Vegas) and a southern terminus located at the existing Eldorado Substation located in Eldorado Valley, Nevada (a total project distance of approximately 60 miles). The northern terminus will be located within BLM's Section 368 West-wide Energy Corridor ([WEC] 37-232) and the Dry Lake Solar Energy Zone (SEZ) in the northeast part of Section 35, Township 17S, Range 63E, and the southern terminus will be located in Section 2, Township 25S, Range 62E, M.D.B. &M.

The project alignment will generally follow existing transmission facilities and designated utility corridors, including the West-wide Energy Corridors (multimodal corridors that pass through most of the project area) and the Sunrise Corridor (an area where the West-wide Energy Corridor labeled as 39-231 narrows from 3,500 feet to approximately 500 feet, as it passes through the former Sunrise Mountain Instant Study Area [ISA] just east of Las Vegas). The Proposed Action will be located within Clark County, Nevada, primarily on public lands managed by the BLM and Reclamation. Approximately 7.6 miles of the line would pass just inside the eastern boundary of the city limits of Henderson, while approximately 4.0 miles would pass just inside the western boundary of the city limits of Boulder City.

1.1.3. Name and Location of Preparing Office

Southern Nevada District – Las Vegas Field Office
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130

1.1.4. Identify the Case File Number

Case file number N-086359

1.1.5. Applicant Name

Great Basin Transmission, LLC

1.2. Purpose and Need for Action

1.2.1. Background

Great Basin submitted an amended ROW application to the BLM – Southern Nevada District Office on March 10, 2010, and to the Reclamation – Lower Colorado Region on April 21, 2010.

The applications requested authorization to use federal lands (BLM and Reclamation) for the construction, operation, and maintenance of a 500 kV transmission line that would provide a new energy pathway to support current and future electrical demands by establishing a high-voltage electrical interconnection between the Harry Allen and Eldorado substations. According to Great Basin, the Proposed Action would create (1) new access in Southern Nevada to the regional electricity market for existing and proposed power generation facilities; (2) economical transmission service to foster the development of new renewable energy resources; (3) a new energy pathway to reduce congestion on the existing transmission grid, increasing regional transmission system reliability; and (4) increased import and export capacity for regional transmission systems to help place downward pressure on electricity prices.

1.2.2. BLM Purpose and Need

The BLM's proposed action is approval of Great Basin's ROW application, which would authorize construction, operation, and maintenance of a 500 kV transmission line as described above. The purpose and need for the BLM's proposed action arises under Title V of the Federal Land Policy and Management Act of 1976 (FLPMA), which gives the Secretary of the Interior authorization to grant, issue, or renew ROWs for systems for generation, transmission, and distribution of electric energy (43 United States Code [USC] § 1761). The BLM is required by FLPMA and other legislation to consider and respond to Great Basin's application for a ROW across public land. In considering the application, the BLM must apply a *multiple-use* management approach, generally defined as "management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people." The BLM's purpose and need, and its consideration of Great Basin's ROW application, is further guided by the Energy Policy Act of 2005 (EPAct), which recognized the need to improve domestic energy production, develop renewable resources, and enhance the infrastructure (e.g., transmission lines) for collection and distribution of energy resources across the nation.

1.2.3. Reclamation Purpose and Need

Reclamation's proposed action is approval of an ROU authorization to Great Basin to construct, operate, and maintain a 500 kV transmission line as described above. Similar to the BLM, the purpose and need for Reclamation's proposed action arises under the need to respond to Great Basin's application for an ROU authorization on Reclamation managed lands. It is Reclamation's responsibility under the Act of Congress of June 17, 1902 (32 Stat.388), the Act of Congress approved August 4, 1939 (53 Stat. 1187), Section 10, and 43 Code of Federal Regulations (CFR) Part 429 to respond to a request for ROU authorization on Reclamation-administered federal lands.

1.3. Decisions to be Made

This EA provides the information and environmental analysis necessary to inform the BLM, Reclamation, and the public about the potential environmental consequences of the Proposed Action and alternatives. If the EA results in a FONSI, the BLM's decision will be to:

- Issue DRs that approve all or a portion of the Proposed Action or alternative, and issue a ROW grant to the applicant
- Issue DRs that approve all or a portion of the Proposed Action or alternative, and issue a ROW grant with additional mitigation measures, or
- Issue a DR that denies the ROW application

Reclamation's decision will be to:

- Issue an ROU to the applicant that includes all or a portion of the Proposed Action, with any applicable mitigation, or
- Deny the ROU application

If the BLM or Reclamation determines that impacts of the Proposed Action or alternative would be significant, despite the application of reasonable mitigation, an EIS would be prepared.

1.4. BLM and Reclamation Policies, Plans, Authorizing Actions, and Permit Requirements

1.4.1. BLM

Applications for commercial electric power transmission lines on BLM-administered lands are processed as a ROW authorization under Title V of FLPMA. Title V states that in "…designating right-of-way corridors and in determining whether to require that the right-of-way be confined to them, [BLM] shall take into consideration national and state land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices." The FLPMA further directs that each ROW grant contain terms and conditions to protect federal property and economic interests, protect lives and property, and otherwise protect the public interest in the lands traversed by the ROW or adjacent to them (43 USC § 1765). These FLPMA Title V ROW provisions are implemented by the BLM through regulations codified at 43 CFR Part 2800.

BLM may only approve actions that are in conformance with the applicable land use plan. If a proposed action is not in conformance, BLM must either deny the proposal or amend the plan. Here, the applicable plan is the BLM Las Vegas Resource Management Plan (RMP)/EIS, which was approved by Record of Decision (ROD) on October 5, 1998 (BLM 1998), as amended January 2009, and the July 2012 court-approved settlement agreement.

On August 8, 2005, the President signed into law the EPAct. In Section 368 of the EPAct, Congress set forth provisions that would change the way certain federal agencies coordinated to authorize the use of public land for a variety of energy-related purposes. The EPAct Section 368 requires, among other things, the designation of energy corridors (also referred to as utility corridors) on federal lands. Consistent with the EPAct, BLM's 1998 Las Vegas RMP was amended by designating Section 368 corridors under the January 2009 ROD for the West-wide Energy Corridor. Conservation groups challenged the BLM's corridor designation decisions. A settlement agreement was approved in July 2012, which identified several Section 368 corridors designated by the agencies as corridors of concern (COC) and specified concerns with each

COC. Siting projects within COCs may lead to heightened public interest and concern, and could result in additional litigation, increased mitigation, and significant environmental impacts or involve consideration of alternative siting options. The 1998 Las Vegas RMP, as amended, has been reviewed, and it has been determined that the Proposed Action conforms with land use plan decision RW-1, RW-1-e, RW-1-h, under the authority of the FLPMA, as amended (43 USC 1761 et seq.)[1].

1.4.2. Reclamation

Applications for the placement, construction, and use of infrastructure, including utility facilities on Reclamation-managed lands, are processed through an ROU authorization per 43 CFR 429. In reviewing applications for a use authorization, Reclamation will consider the factors in 43 CFR 429.14, including compatibility with authorized project purposes and other public interests, public health and safety, environmental compliance, alternatives, and best interests of the United States. A Reclamation ROU authorization includes terms and conditions intended to protect the interests of the United States and reserve the rights of Reclamation to construct, operate, and maintain public works as authorized by Congress.

The Proposed Action will be located within a designated West-wide Energy Corridor across Reclamation-managed lands. West-wide Energy Corridors were established on certain federal lands pursuant to Section 368 of the EPAct (Public Law 109-58). The EPAct directs that applications to construct certain utility facilities, including electrical transmission and distribution facilities, within these corridors be expedited.

1.4.3. NEPA Regulations and Guidance

This EA was prepared in compliance with: Council for Environmental Quality (CEQ) regulations for implementing the NEPA (40 CFR § 1500-1508); Department of the Interior regulations for implementing NEPA (43 CFR Part 46); BLM NEPA Handbook, H-1790-1; BLM Land Use Planning regulations (43 CFR § 1600); BLM Land Use Planning Handbook (BLM Handbook H-1601-1); and Reclamation's 2012 NEPA Handbook.

In addition to conformance with the NEPA, FLPMA, and Las Vegas RMP, the Proposed Action would comply with other applicable federal, state, and local statutes, regulations, and plans. Table 1-1 identifies the federal and state agencies with potential jurisdiction over the Proposed Action, and the potential permits that may be needed based on final design.

[1] In January 2014, the Consolidated Appropriations Act, 2014, P.L. 113-76 was enacted. Section 115 of that Act, titled "Sunrise Instant Study Area Release," released the Sunrise ISA from further wilderness study under FLPMA Section 603 (c), and returned the subject land to non-WSA management by BLM under applicable land use plans pursuant to FLPMA Section 202.

Table 1-1. Permits Potentially Required for the Proposed Action			
Action Requiring Permit, Approval, or Review	**Permit/Approval**	**Accepting Authority/ Approving/ Consulting Agency**	**Statutory/Regulatory Reference**
FEDERAL			
ROW over land under federal management	ROW Grant	BLM	FLPMA 43 USC 1761-1771 and 43 CFR Part 2800
	ROU	Reclamation	Acts of June 17, 1902 and August 4, 1939, as amended and 43 CFR Part 429
NEPA compliance to grant ROW	EA/FONSI/DR	BLM and Reclamation	NEPA, 42 USC 4321-4327; CEQ 40 CFR Part 1500
BLM grant of ROW, Reclamation ROU	NHPA Compliance	Nevada SHPO	NHPA, 16 USC 47 (Section 106), 36 CFR Part 800
BLM grant of ROW, Reclamation ROU	Endangered Species Act Compliance by BLM (lead) and Reclamation; consultation with USFWS, Biological Opinion	USFWS	ESA, 16 USC 1539, 50 CFR Part 17
Tower location and height relative to air traffic	"No Hazard Declaration" required if structure is more than 200 feet in designated airport areas	Federal Aviation Administration	49 USC 1501 14 CFR Part 77
Dredge or fill activities in waters of the United States	Clean Water Act Section 404 Permit	USACE	Clean Water Act, 33 USC 1344 (Section 404)
STATE OF NEVADA			
Construction of Utility Facilities	Utility Environmental Protection Act – Permit to Construct	Public Utilities Commission of Nevada	NRS 704.870 NAC 703.423
Handling of protected Wildlife	Desert Tortoise and Gila Monster Handling Permit/Authorization	Nevada Division of Wildlife	NAC 503.093
Disturbance or destruction of critically endangered plants	Conditional Permit	Nevada Division of Forestry	NAC 527.17
Impacts to water quality associated with discharges of dredged or fill materials in waters of the United States	401 Water Quality Certification, Clean Water Act	NDEP	33 USC 1344
Construction activities that result in the discharge of stormwater to waters of the state	Compliance with Stormwater General Permit	NDEP Bureau of Water Pollution Control	40 CFR Section 122.26(b)(14)
Crossing state or US highways	Encroachment Permit	NDOT	NRS 408.423(1); NAC 408.403, 408.427

Table 1-1. Permits Potentially Required for the Proposed Action			
Action Requiring Permit, Approval, or Review	**Permit/Approval**	**Accepting Authority/ Approving/ Consulting Agency**	**Statutory/Regulatory Reference**
LOCAL			
Construction and Operation	Special Use Permit	Clark County Board of Commissioners	Clark County Code
	Special Use Permit	City of Henderson Board of Commissioners	City of Henderson, Development Code
	Excavation Permit	City of Boulder City	City Code, Title 9
	Compliance with Clark County Multiple Species Habitat Conservation Plan	Clark County Desert Conservation Program	Clark County Code
Construction/Fugitive Dust (PM_{10})	Dust Control Permit	Clark County Department of Air Quality and Environmental Management	Clean Air Act of 1977 and Amendments NRS 321.001, 40 CFR Subpart C, 42 USC 7408, 42 USC 7409

ESA – Endangered Species Act
NAC – Nevada Administrative Code
NDEP – Nevada Division of Environmental Protection
NDOT – Nevada Department of Transportation
NHPA – National Historic Preservation Act of 1966
NRS – Nevada Revised Statutes
SHPO – State Historic Preservation Office
USACE – U.S. Army Corps of Engineers
USFWS – U.S. Fish and Wildlife Service

1.4.4. Indian Trust Assets

Indian Trust Assets (ITA) are legal interests in property held in trust by the United States for Indian tribes or individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust. Examples of objects that may be trust assets are lands (including tribal trust, fee title, and allotted lands); minerals; hunting and fishing rights; and water rights. While most ITAs are on reservations, they may also be found off reservations. The United States has a trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and executive orders. These are sometimes further interpreted through court decisions and regulations. No ITAs have been identified in the proposed ROW area.

1.4.5. Indian Sacred Sites

Executive Order 13007 and 512 DM 3 require federal executive branch agencies with statutory or administrative responsibility for the management of federal lands to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of such sacred sites. A "sacred site" is a "specific, discrete, narrowly delineated location on federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site" (512 DM 3: Section 3.3C). If a sacred

site is identified (e.g., during tribal consultation), the federal agency must identify and analyze the potential effects its proposed actions, decisions, or activities may have with regard to the physical integrity of sacred sites or that may affect use of and/or access to known sites. No Indian Sacred sites have been identified in the proposed ROW area.

CHAPTER 2. PROPOSED ACTION AND ALTERNATIVES

2.1. Introduction

This chapter includes a detailed description of the Proposed Action and alternatives carried forward or eliminated from detailed consideration. Considerations for siting the alignment of the proposed project included use of existing BLM-designated utility corridors, most direct pathways, existing access roads and trails, and avoiding sensitive environmental resources. Because it is possible to locate the project within existing BLM utility corridors adjacent to other high-voltage transmission lines and existing access roads, for the majority of its length, no alternatives were evaluated outside of these corridors. Field investigations have been conducted by Great Basin to determine potential resource impacts as a result of the proposed project. The Proposed Action, Alternative 1, and the alternative routing areas are illustrated on Figure 2-1 and Figure 2-2.

2.2. No Action Alternative

Evaluation of the No Action alternative is addressed in 40 CFR 1500-1508. Under the No Action alternative, the new 500 kV electrical transmission line and associated infrastructure would not be constructed, and a new high-voltage electrical transmission line between the Harry Allen and Eldorado substations would not be constructed as part of this project. Without construction and operation of the proposed project, the conditions of the project area would remain the same and the potential environmental impacts associated with construction, operation, and maintenance of the proposed project would not occur. The new pathway to access the regional electricity market would not be available to foster development of new renewable energy resources and provide the other benefits of the project.

2.3. Proposed Action

The proponent's Proposed Action is the construction and operation of a 500 kV single- or double-circuit alternating current (AC) transmission line stretching between a northern terminus at the Harry Allen Substation located within the Dry Lake SEZ, in Dry Lake, Nevada (approximately 20 miles northeast of Las Vegas), and a southern terminus located at the Eldorado Substation located approximately 14 miles southwest of the city center of Boulder City, Nevada (a total project distance of approximately 60 miles) (Figure 2-1 and Figure 2-2).

With minor exceptions, the proposed project alignment will traverse several designated utility corridors ranging in widths from 2,000 feet to 3,000 feet, including Section 368 corridors (WEC 37-232, COC 39-113, and COC 39-231). These corridors include existing utility facilities, such as portions of the COC 39-231 that contain two 500 kV AC transmission lines, one 69 kV transmission line, one 500 kV direct current (DC) transmission line, and a number of underground water and natural gas pipelines. The proposed project alignment would parallel these existing facilities to the extent viable for the length of the proposed project. The route from Harry Allen Substation to these corridors follows an alignment parallel to the existing Harry Allen to Crystal 500 kV transmission line. This alignment was preferred over other potential routes that would either utilize more of the WEC 37-232 corridor or the Dry Lake corridor. Following the Harry Allen to Crystal transmission line will allow the project to utilize existing

access roads over a shorter distance compared to a route up the WEC-37-232 corridor, and will involve less new disturbance compared to being the first utility facility to be located in the Dry Lake corridor. Other alternatives near the northern terminus of the project were also considered and are described in Section 2.7 below.

Due to the configurations of the existing transmission lines within the WEC 39-231 corridor, Great Basin has identified two routing areas in which site-specific routing would be necessary to accommodate the existing utility facilities within the corridor. These areas are described in sections 2.5 through 2.6, below.

The Proposed Action consists of approximately 60 miles of new single- or double-circuit 500 kV transmission structures from the Harry Allen Substation to the Eldorado Substation. The transmission line would be located inside a 200-foot-wide (100 feet on either side of center) ROW that consists primarily of federal lands with some private easements. The new structures would parallel, to the extent practicable, the existing electric transmission facilities within the utility corridor, and the majority of the transmission line is proposed to be constructed approximately 200 feet from the closest parallel transmission line. Engineering constraints may require deviations from this 200-foot separation in certain areas along the transmission line; these specific areas would be determined as part of final engineering. A 400-foot separation from approximately mile 13.5 to 26 is intended to allow for a future transmission line to be constructed between the Harry Allen to Mead and SNIP 500 kV lines, and utilize the open position on the 18 miles of existing double-circuit Harry Allen to Mead structures through the Rainbow Gardens Area of Critical Environmental Concern (ACEC), and portions of Henderson, Nevada.

2.4. Alternative 1 – Using 18 Miles of Open Position on the Existing Harry Allen to Mead Double-circuit Structures

Great Basin has executed an agreement with NV Energy that would allow Great Basin to utilize the open position of the double-circuit transmission towers associated with NV Energy's previously approved and constructed Harry Allen to Mead 500 kV transmission line project (N-76327). This alternative includes the construction of approximately 42 miles of new single- or double-circuit structures. Approximately 26.5 miles of new transmission alignment would be constructed from the Harry Allen Substation to a point in the Rainbow Gardens ACEC (approximately mile marker 26.5), where the existing Harry Allen to Mead 500 kV transmission line double-circuit structures begin. At this location, the SNIP 500 kV conductors would be placed on the existing double-circuit structures for approximately 18 miles. Upon exiting the Harry Allen to Mead double-circuit structures, approximately 14.5 miles of new transmission alignment would be constructed for the remainder of the route south to the Eldorado Substation. The new structures would parallel, to the extent practicable, the existing electric transmission facilities within the utility corridor, and the line is proposed to be constructed approximately 200 feet from the closest parallel transmission line. Engineering constraints may require deviations from this 200-foot separation in certain areas along the transmission line; these specific areas would be determined as part of final engineering.

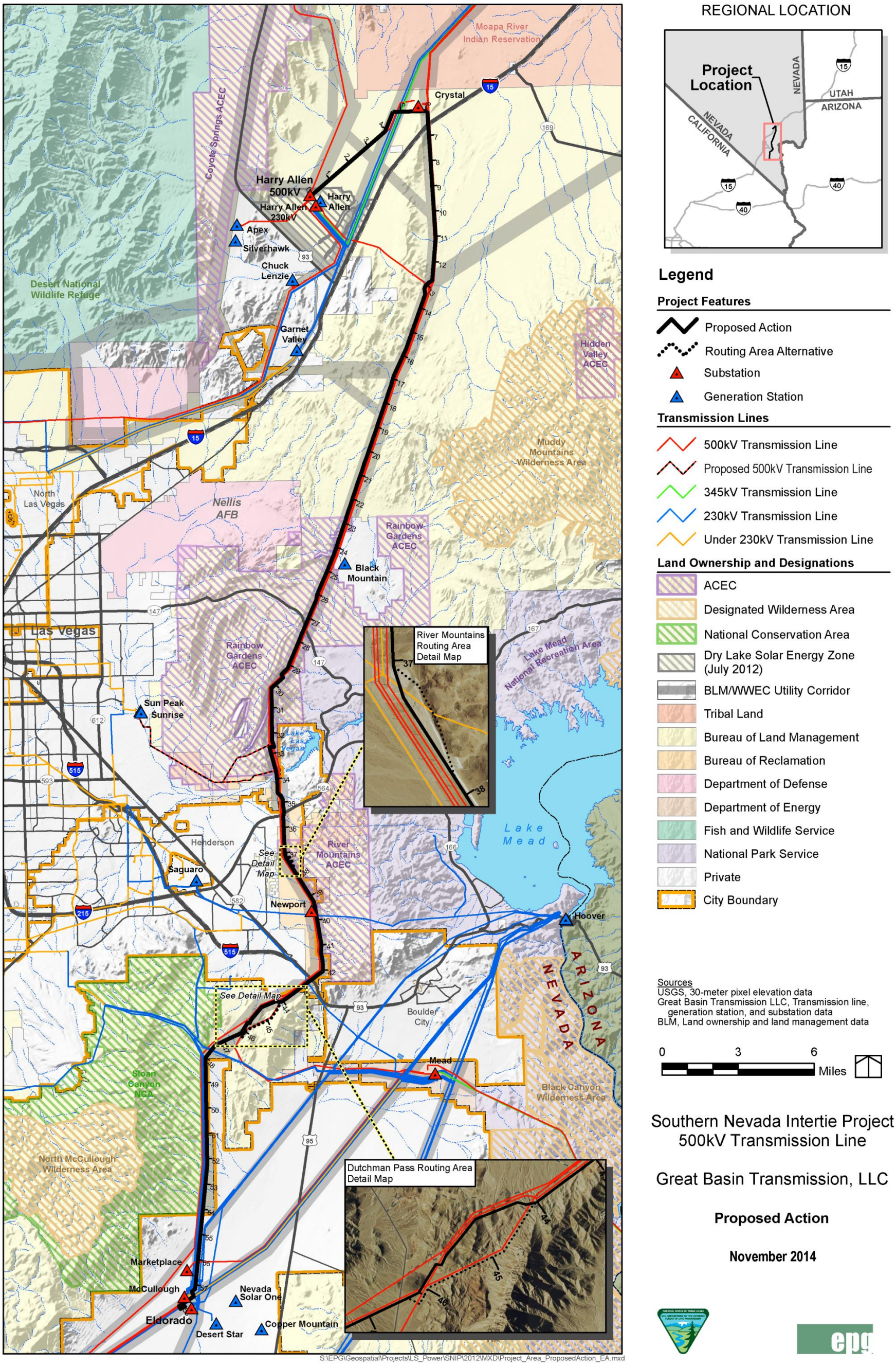

Figure 2-1. Project Area – Proposed Action

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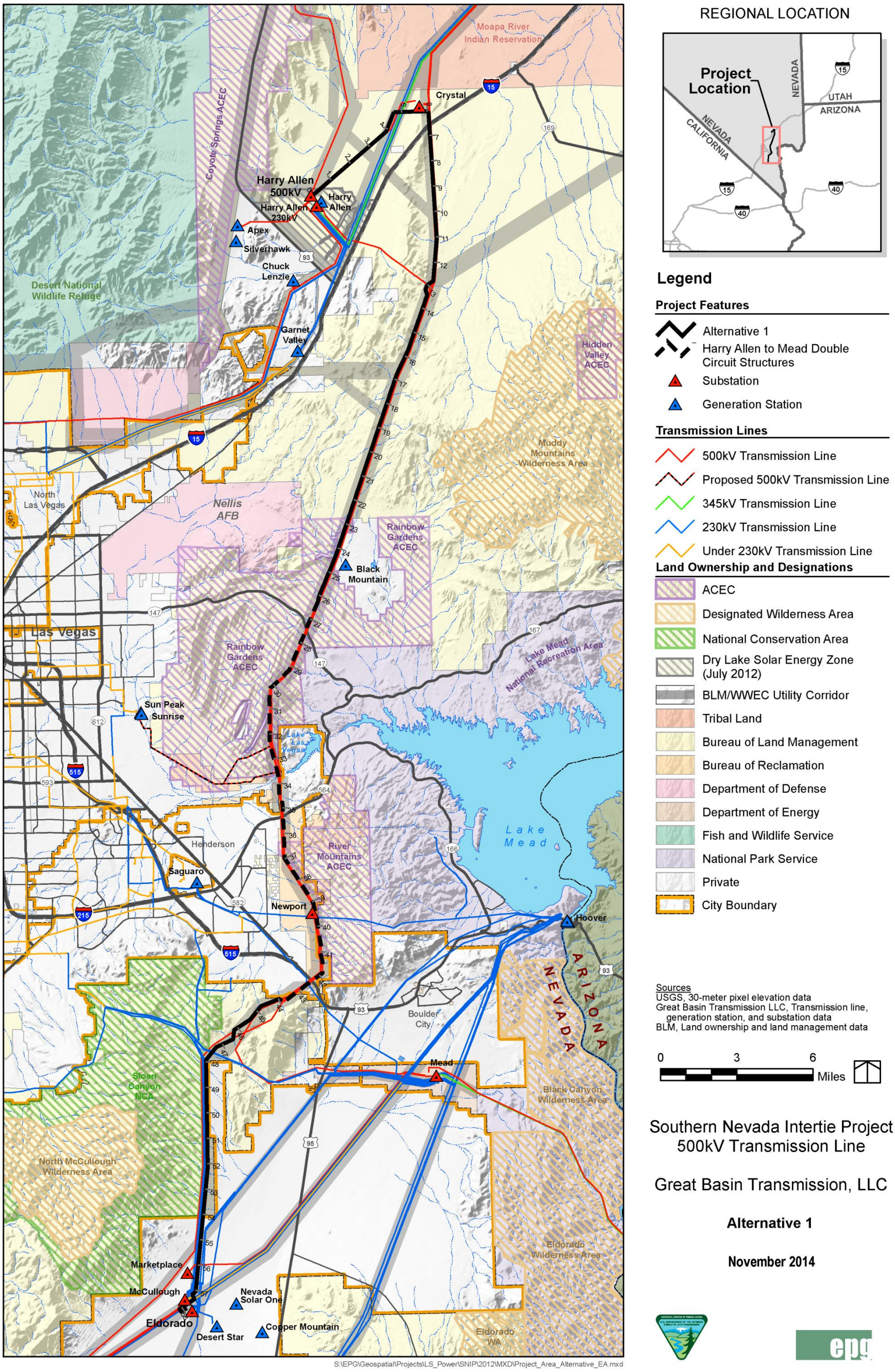

Figure 2-2. Project Area – Alternative 1

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2.5. River Mountains Alternative Routing Area

The River Mountains Alternative Routing Area is located on land managed by Reclamation at approximately mile marker 37 (Figure 2-1). A stormwater channel and detention basin has been constructed within the utility corridor immediately east of the existing transmission facilities. The infrastructure of the stormwater channel and detention basin and its associated spoil pile may hinder the placement of the SNIP line 200 feet from the adjacent Harry Allen to Mead line; final engineering will determine whether the SNIP line will be placed on the east or west side of this detention basin. The River Mountains routing alternatives would only be considered as a part of the Proposed Action, as they are located along the Harry Allen to Mead existing double-circuit structures, and Alternative 1 would utilize these structures.

2.6. Dutchman Pass Alternative Routing Area

The Dutchman Pass Alternative Routing Area is located on BLM land at approximately mile marker 44 (Figure 2-1). The routes of the existing transmission lines within this area diverge for approximately 2 miles: the Crystal to McCullough 500 kV line follows a route higher in elevation through Dutchman Pass; the Intermountain Power Project (IPP) 500 kV line and the Harry Allen to Mead 500 kV line follow a route lower in elevation through Dutchman Pass. The proposed alignment of the SNIP line is parallel to the Harry Allen to Mead 500 kV line (lower in elevation), as this alignment will remain within the designated utility corridor. If it is determined that the SNIP line may follow the IPP Crystal to McCullough 500 kV line (higher in elevation) outside of the utility corridor within the Routing Area, two major transmission line crossings would be avoided, each of which could lead to additional outages of the existing transmission lines during the construction period and future maintenance activities, and increased project costs. The Dutchman Pass routing alternatives would only be considered as a part of the Proposed Action, as Alternative 1 would be limited in its physical location based on the Harry Allen to Mead double-circuit structures.

2.7. Alternatives Considered but Eliminated

The following alternatives were considered but eliminated from further analysis.

2.7.1. Crystal Substation Alternative Routing Area

The Crystal Substation Alternative Routing Area was considered in the Draft EA. This routing alternative was located on BLM land approximately 5 miles from the northern terminus. The proposed transmission line leaves Harry Allen Substation and goes northeast towards the Crystal Substation, paralleling existing transmission lines (Figure 2-1 and Figure 2-2). While no interconnection at Crystal Substation is planned, the project must pass near the Crystal Substation in order to remain adjacent to existing transmission facilities and enter the Black Mountain – Crystal corridor. Due to multiple existing parallel transmission lines in this area, the ability to pass south of Crystal Substation required further engineering analysis. Great Basin has performed that additional engineering analysis and determined that the route south of Crystal

Substation is feasible, negating the need for consideration of the longer northern routing alternative.

2.7.2. Alternative Paralleling the Northern 5 Miles of the Harry Allen to Mead 500 kV Line

An alternative paralleling the Harry Allen to Mead 500 kV line from the Harry Allen Substation southeast was initially considered. This alternative would be approximately 7 miles shorter than the proposed route and would parallel the Harry Allen to Mead 500 kV transmission line southeast from the Harry Allen Substation through the Dry Lake Range to the designated utility corridor. Upon further examination of this alternative, it was determined that the planned connection point with Harry Allen Substation and the existing transmission structures located along this alternative route make this option not feasible. This alternative was eliminated from further consideration.

2.7.3. Southwest Intertie Project Interconnection Alternative

Great Basin originally considered an alternative that connected the proposed SNIP line to the southern terminus of the Southwest Intertie Project (SWIP), effectively shifting the electrical interconnection of SWIP with NV Energy's transmission system from Harry Allen Substation to Eldorado Substation. The alternative would begin at the southern terminus of the SWIP transmission line and continue south past the Crystal Substation to the designated utility corridor, where it would continue to the Eldorado Substation. This alternative was considered prior to the final results of electrical studies and commercial analyses for the SWIP. However, the electrical studies and commercial arrangement have now been finalized and established for the Southern Portion of the SWIP (now known as "ON Line"), and this alternative for the SNIP line is no longer being considered.

2.7.4. Mead Substation Alternative

Great Basin originally considered an alternative that targeted the Mead Substation as the southern terminus of the SNIP line. The Mead Substation is located approximately 3.5 miles south of Boulder City, Nevada. This alternative would begin at the point where the Harry Allen to Mead 500 kV line diverts from the utility corridor south of Dutchman Pass, and would parallel the Harry Allen to Mead 500 kV line from that point east to the Mead Substation. Based upon the results of electrical and commercial analyses, the existing market conditions for an interconnection to Mead Substation did not make the project feasible and Great Basin filed an updated Plan of Development (POD) in March 2010 that removed this alternative from further consideration.

2.8. Project Elements Common to the Proposed Action and All Action Alternatives

2.8.1. Facilities Associated with the Proposed Project and Action Alternatives

Typical design characteristics for the project are listed in Table 2-1 and Table 2-2.

Table 2-1. Proposed Action – Transmission Line Design Specification Summary	
Feature	**Description**
Line Length	Approximately 60 miles of new structures
Type of Structure	Single- or double-circuit
ROW Width	200 feet
Structure Height	90 to 175 feet (single-circuit); 150 to 190 feet (double-circuit)
Average Span Length	Approximately 1,400 feet (single-circuit); 1,000 feet (double-circuit)
Number of Structures	approximately 235 (single-circuit); 305 (double-circuit)
Land Temporarily Disturbed (Estimate)	
Structure Work Area	200 x 200 feet per structure
Wire Pulling/Tensioning Sites (tangent and angle structures, and at certain mid-span locations)	200 x 500 feet per site
Guard Structures	Minimum area needed to construct guard structures adjacent to roads/electrical lines
Access Roads (Estimate)	
New and Upgraded Roads Required	Up to 24 feet wide (may require additional cut and fill in steeper terrain)
Electrical Properties	
Nominal Voltage	500 kV
Circuit Configuration	Single- or double-circuit
Conductor	Aluminum Conductor Steel Reinforced
Ground Clearance of Conductors	Minimum of 31 feet per National Electrical Safety Code requirements

Table 2-2. Alternative 1 – Transmission Line Design Specification Summary	
Feature	**Description**
Line Length	Approximately 42 miles of new structures and 18 miles of existing structures
Type of Structure	Single- or double-circuit
ROW Width	200 feet
Structure Height	90 to 175 feet (single-circuit); 150 to 190 feet (double-circuit)
Average Span Length	Approximately 1,400 feet (single-circuit); 1,000 feet (double-circuit)
Number of Structures	approximately 155 (single-circuit); 215 (double-circuit)
Structure Work Area	200 x 200 feet per structure
Wire Pulling/Tensioning Sites (tangent and angle structures, and at certain mid-span locations)	200 x 500 feet per site
Guard Structures	Minimum area needed to construct guard structures adjacent to roads/electrical lines

Table 2-2. Alternative 1 – Transmission Line Design Specification Summary	
Feature	**Description**
Access Roads (Estimate)	
New and Upgraded Roads Required	Up to 24 feet wide (may require additional cut and fill in steeper terrain)
Electrical Properties	
Nominal Voltage	500 kV
Circuit Configuration	Single- or double-circuit
Conductor	Aluminum Conductor Steel Reinforced
Ground Clearance of Conductors	Minimum of 31 feet per National Electrical Safety Code requirements

Design, Construction, Operation, Maintenance, and Reclamation

Each of the descriptions below provides an overview of the proposed project elements. The final detailed specifications of each will be included in the Final POD, as approved by BLM as part of the ROW grant process.

Transmission Line Design

Structures

Transmission structures proposed for this project are self-supporting or guyed "V" lattice structures fabricated from unpainted galvanized or Corten steel, and self-supporting or guyed "V" tubular steel structures. Figure 2-3 through Figure 2-7 depict the types of towers under consideration for the project. Structure heights are expected to range between 90 and 190 feet.

Foundations

Self-supporting, steel-lattice towers require four footings, while the steel-lattice or tubular guyed towers require one footing for the tower base and four anchor rods for guy cables. Some foundation and guy anchors would consist of pre-cast concrete footings approximately 4 feet in diameter and 6 feet deep. Due to site-specific characteristics, some foundation and guy anchors would require cast-in-place footings. Self-supporting lattice towers would have cast-in-place concrete footings 3 to 4 feet in diameter and 12 to 24 feet deep. Final footing/foundation configurations will be developed as part of the final design.

Conductors

The conductor for a circuit would consist of three phases, with a two or three conductor bundle for each phase. The configuration of the conductor bundle would be determined during the engineering design of the project. Spacing between subconductors in a bundle would be approximately 18 inches. Aluminum-trapezoidal or aluminum-stranded nonspecular conductors with a steel-stranded reinforced core would be used. The aluminum carries the majority of the electrical current, and the steel provides tensile strength to support the aluminum strands. Minimum conductor height above the ground for the 500 kV lines would be 31 feet at

212 degrees Fahrenheit in accordance with the National Electrical Safety Code (NESC). The exact height of each tower would be governed by topography and safety requirements for conductor clearance. Alternate materials or designs may be selected to optimize efficiency, reliability, and/or economics, as determined during the final design.

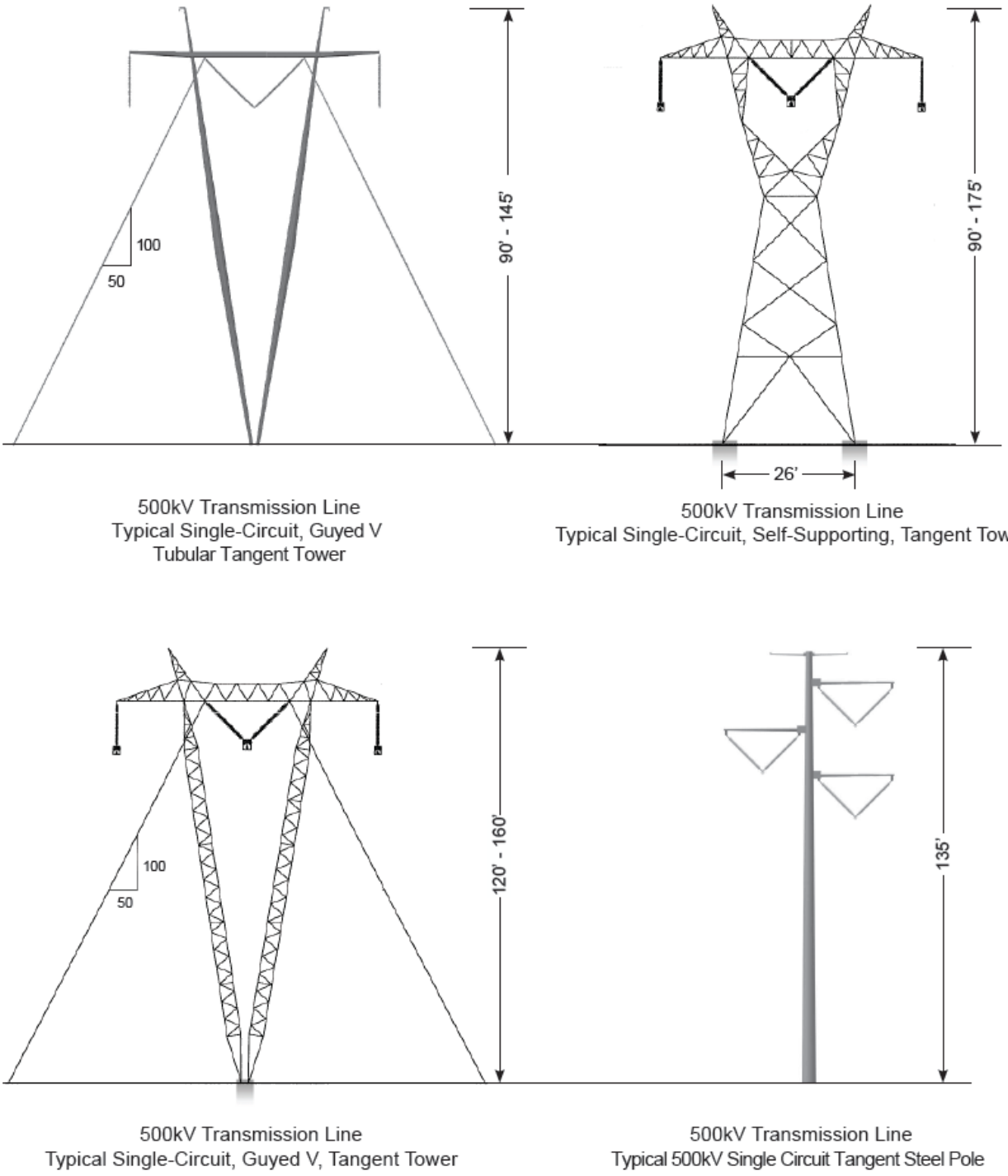

Figure 2-3. Typical Single-circuit Tangent Structure

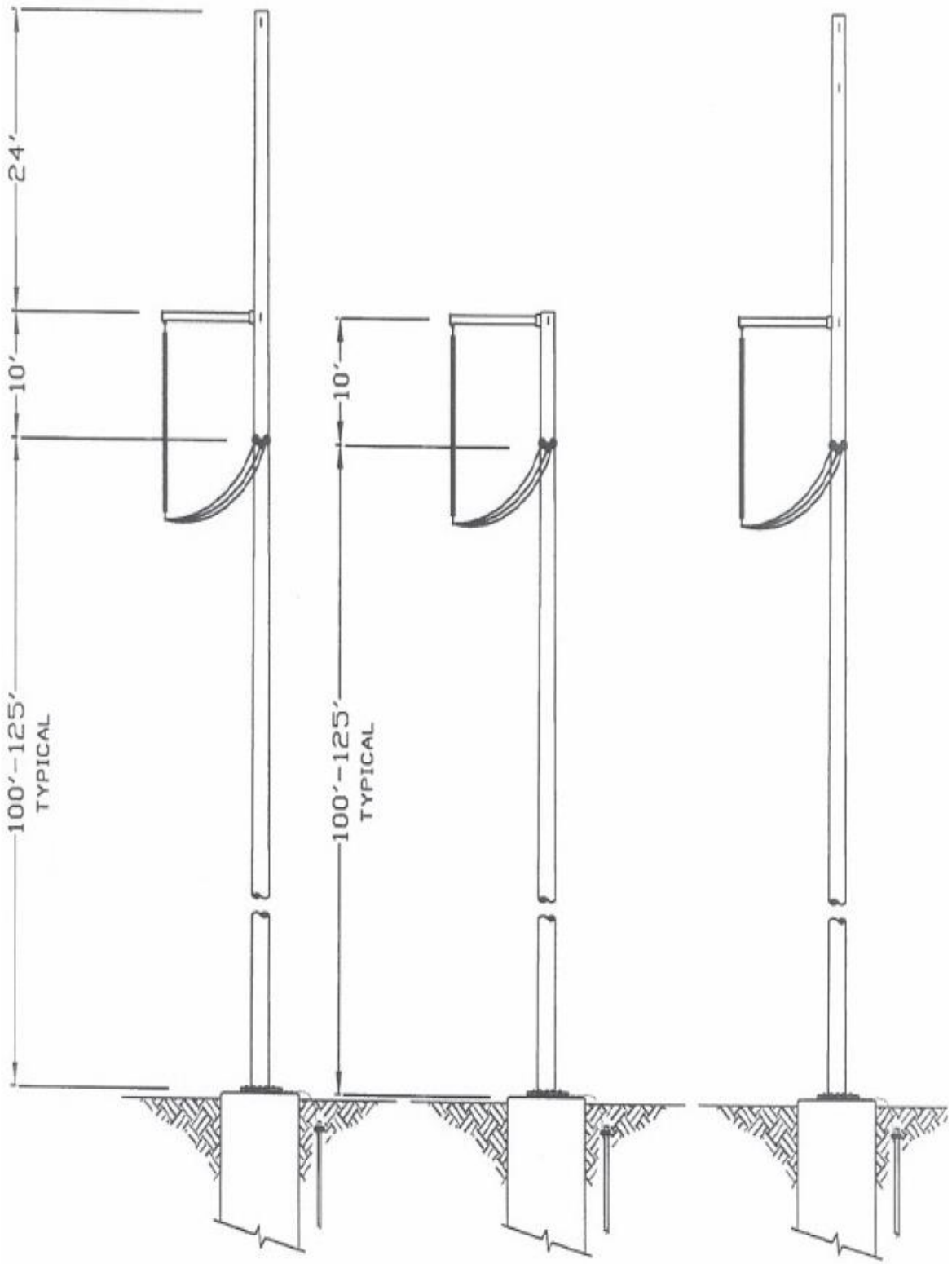

Figure 2-4. Typical 500 kV Monopole Crossing Structures

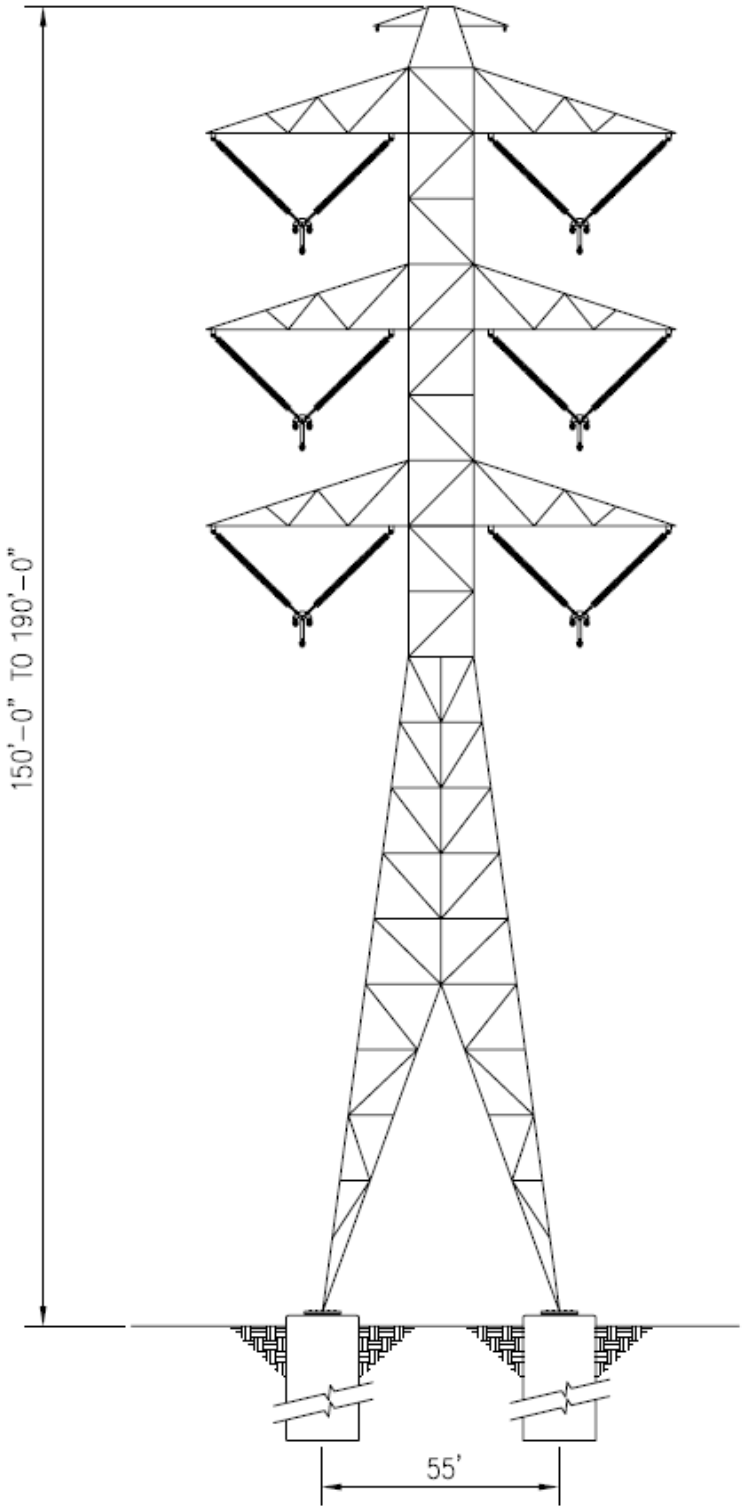

Figure 2-5. Typical 500 kV Double-circuit Lattice Tower

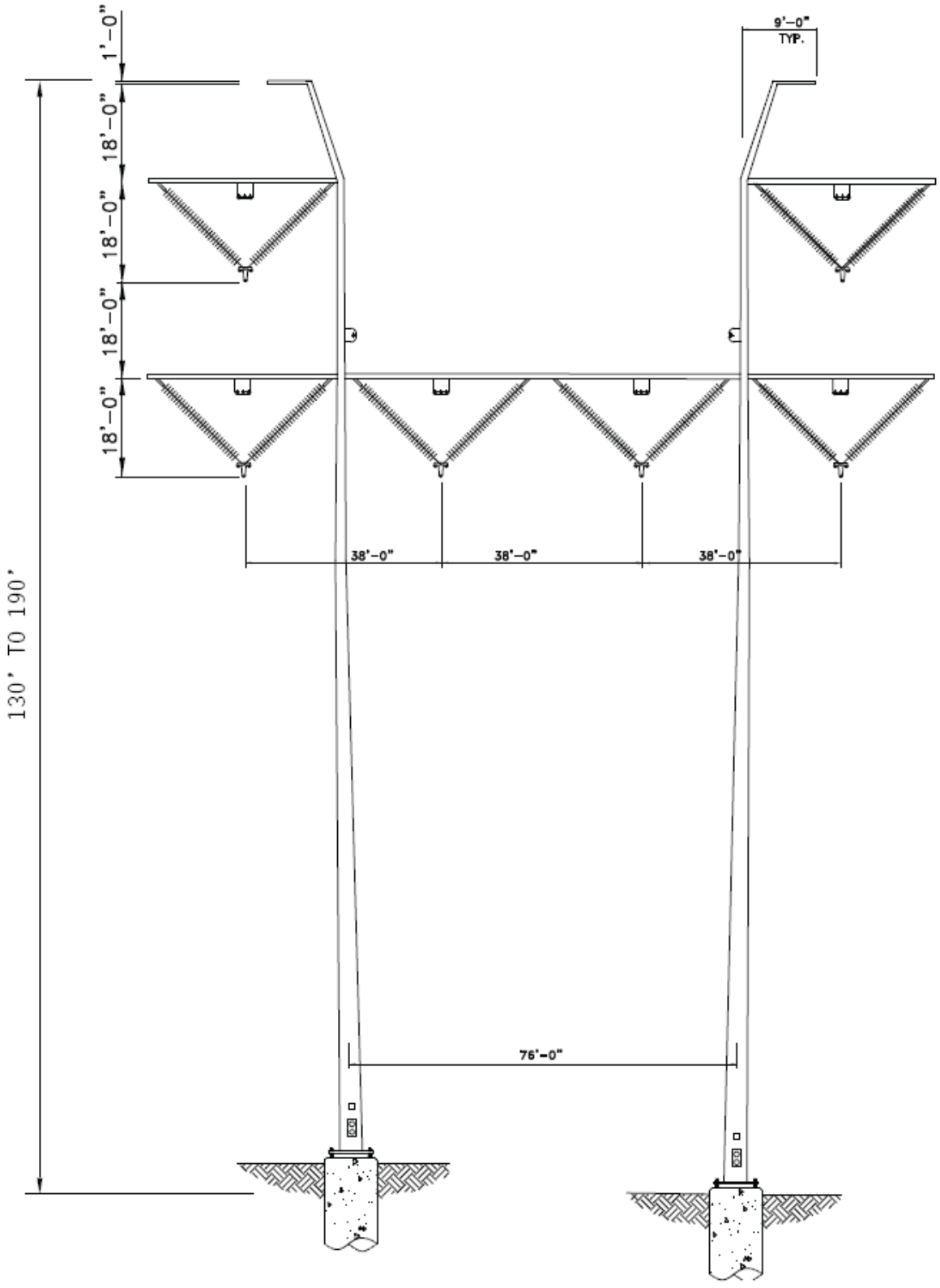

Figure 2-6. Typical 500 kV H-Frame Double-circuit Crossing Structure

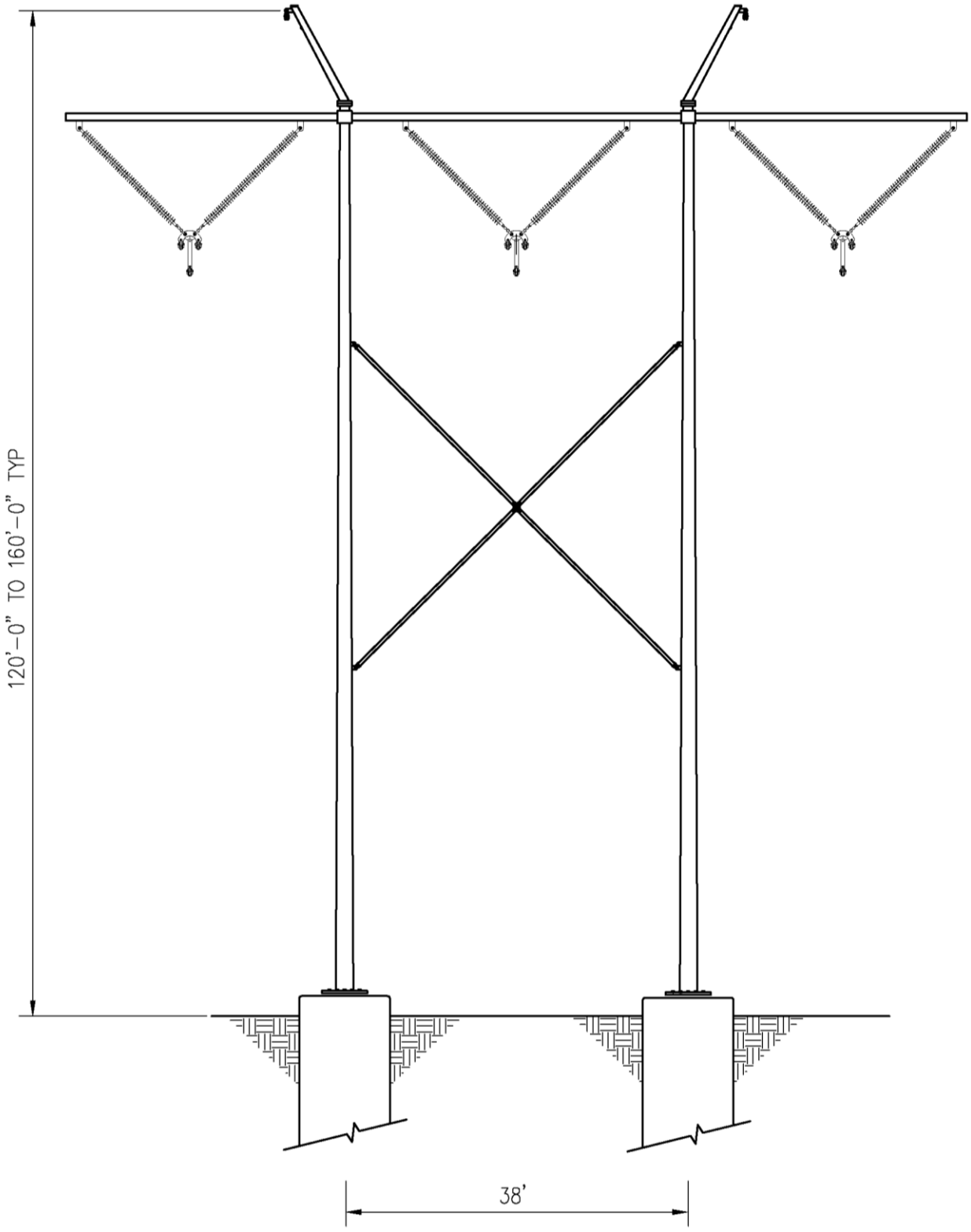

Figure 2-7. Typical 500 kV Single-circuit H-Frame Structure

Insulators and Associated Hardware

Three assemblies of insulators in the form of a "V" or "I" would be used to position and support each of the conductor bundles, while maintaining electrical design clearances between the conductors and the tower. Typically, "V" form insulators will be used for typical 500 kV tangent tower structures, while "I" form insulators will be used for 500 kV dead-end tower structures and double-circuit tangent towers. Some towers may use a combination of both insulator forms.

Fiber Optic Communications

A fiber optic component will be incorporated into the transmission system that could be used for voice and data communication, protective relay telemetering, and for supervisory control and data acquisition. While the project proponent is not seeking to conduct or lease commercial telecommunication services at this time, the system will be designed to accommodate such requests. Given the length of the proposed project, it is not anticipated that regeneration stations will be required. A redundant communications method may also be employed using fiber optic or microwave systems. It is likely that the fiber optic component will be integrated with the Overhead Groundwire discussed below.

Overhead Groundwires

To protect the 500 kV transmission lines from direct lightning strikes, two overhead groundwires, ½-inch in diameter, would be installed on the top of the structures. Current from lightning strikes would be transferred through the groundwires and structures into the ground.

Substations

The proposed project is planned for interconnection at the existing Harry Allen 500 kV Substation at the northern terminus and the existing Eldorado 500 kV Substation at the southern terminus. The interconnection of the project to the existing substations will require the addition of facilities at the substation. While it is currently not anticipated that either substation will require expansions to accommodate the interconnection facilities, final design details may require expansion of the Harry Allen Substation to incorporate series compensation equipment. If, during final design, it is determined that the location of the series compensation equipment should not be placed within the existing Harry Allen Substation, the equipment could be placed with the proposed 200-foot ROW near the northern terminus.

Temporary Construction Yards

Temporary construction yards would be located near the transmission line ROW as necessary to support construction activities. These would be up to approximately 40 acres in size and located in previously disturbed sites or in areas of minimal vegetative cover, where possible. All sites would be determined through discussions with land owners or the land management agencies.

The construction yards would serve as field offices, reporting locations for workers, parking space for vehicles and equipment, sites for material storage, and stations for equipment

maintenance. Facilities would be fenced and their gates locked. Security guards would be stationed where needed.

Conductor Tensioning and Pulling Sites

Typically, conductor tensioning and pulling sites are located at angle locations and at substation locations for stringing the conductor. However, distances between each site would vary depending on the geography and topography and environmental sensitivity of the specific area, the length of the conductor pull, and the accessibility by equipment. Pulling sites would be located along the transmission line centerline. At each pulling site, stringing equipment would be set up approximately 400 feet from the initial structure for leveraging the conductor pull safely. When construction occurs in steep and rough terrain, these sites may require larger, less symmetrical pulling and tensioning sites. The actual location of these pulling sites would be determined following final engineering design.

2.8.2. Construction

This section briefly describes the construction activities associated with the Proposed Action or action alternatives. Construction of a transmission line follows the sequence of surveying the centerline, access road identification and construction, tower sites and ROW clearing, as necessary (including construction yards), installing foundations, assembling and erecting the towers, installing groundwires and conductors, installing counterpoise/ground rods, and cleanup and site reclamation. Various phases of construction would occur at different locations throughout the construction process. Typical transmission line construction activities are depicted on Figure 2-8 and Figure 2-9.

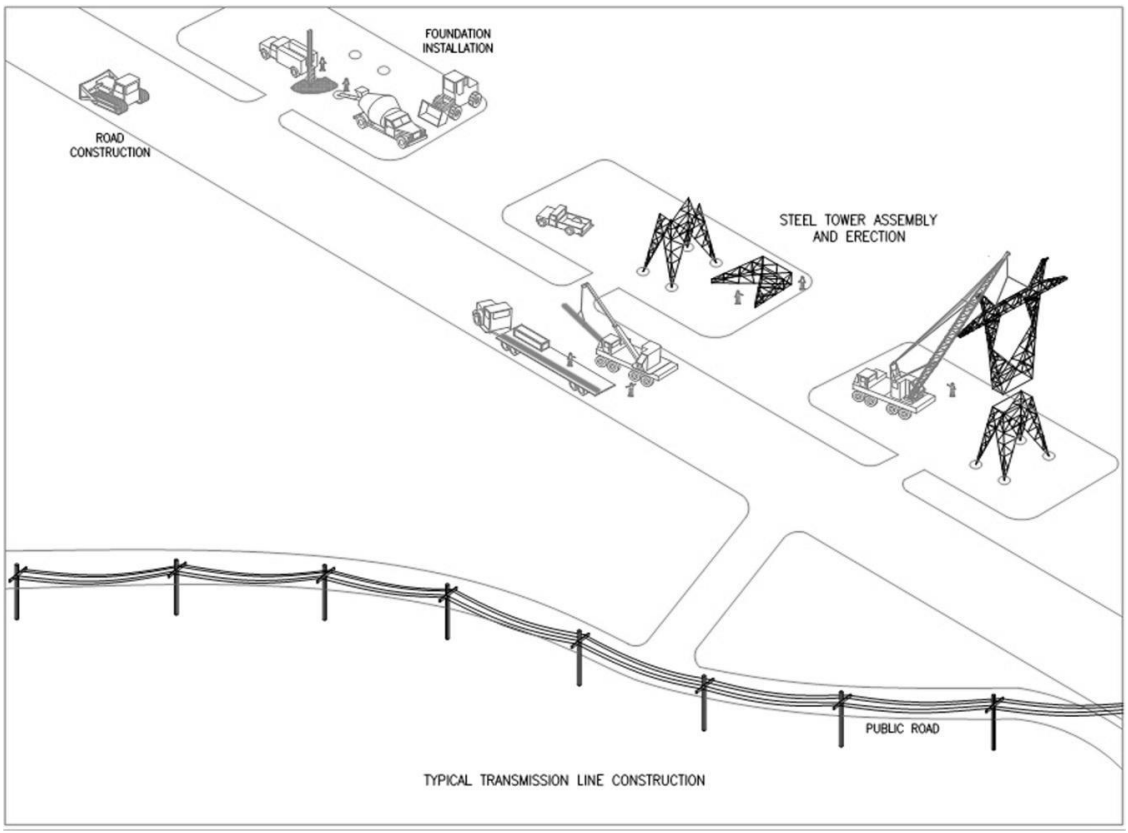

Figure 2-8. Foundation Installation, Tower Assembly and Tower Erection

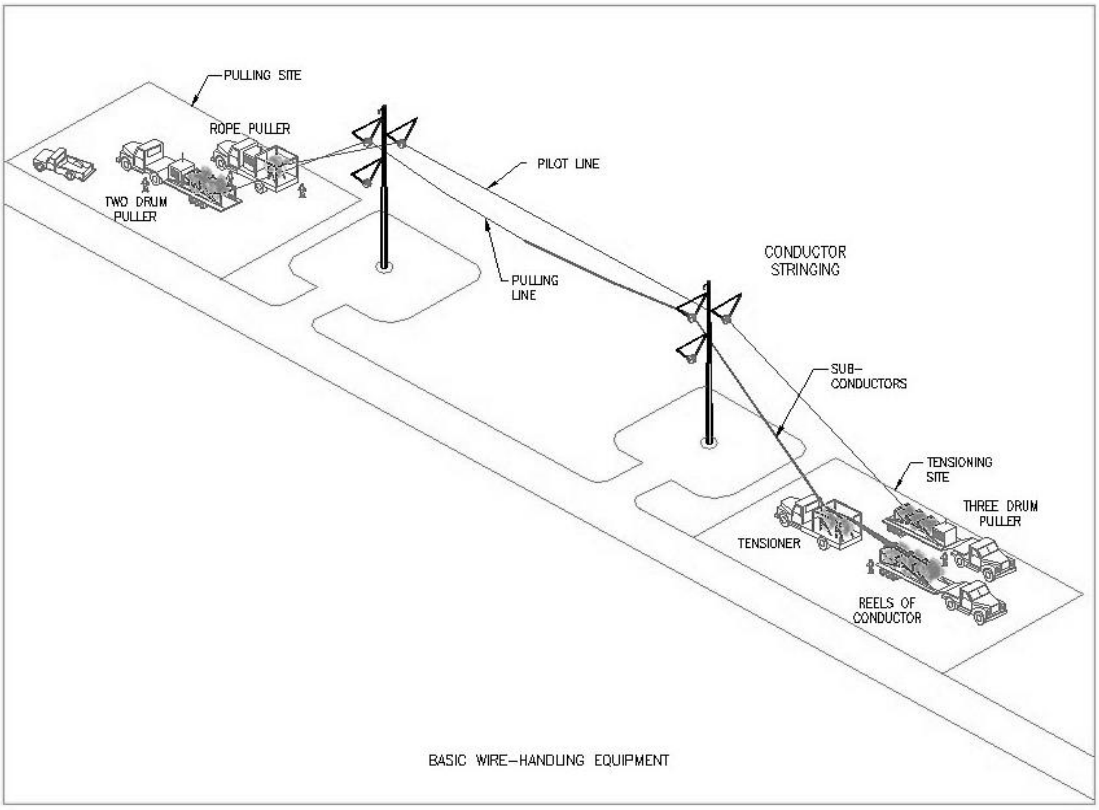

Figure 2-9. Typical Transmission Line Conductor Stringing Activities

Construction Work Force and Schedule

The estimated number of personnel and equipment required to construct the proposed project are presented in Table 2-3. Great Basin estimates that the majority of the total workforce would be hired locally. The project is expected to take up to approximately 2 years to construct. Some transmission facilities owned by other utilities may need to be temporarily taken out of service to allow for safe construction, especially in areas of line crossings. A detailed outage and construction schedule would be developed by Great Basin, in consultation with the utility owners, during final project design.

Table 2-3. Estimated Personnel and Equipment

Activity	People	Quantity of Equipment
Survey	4	2 pickup trucks
Geotechnical Investigations	6	3 pickup trucks 3 truck- or track-mounted drill rigs
Access Road and Structure Work Area Construction	4–8	4 bulldozers (D-8 Cat) 3 motor graders 2 pickup trucks 2 rollers 1 excavator 6 water trucks (for construction and maintenance)

Table 2-3. Estimated Personnel and Equipment		
Activity	**People**	**Quantity of Equipment**
Footing/Foundation Installation	28	6 hole diggers 2 bulldozers 1 truck 6 concrete trucks 2 dump trucks 4 pickup trucks 1 carry all 1 hydro crane 1 wagon drill 2 water trucks
Structure Steel Haul	8–10	4 steel haul trucks 2 pickup trucks 2 yard and field cranes 1 fork lift 1 water truck
Structure Assembly (per crew)	10–12	1 pickup truck 2 carry alls 1 crane (rubber tired) 1 truck (2 ton) 1 water truck 1 fork lift 2 bucket trucks
Structure Erection (per crew)	8–10	1 crane (120 ton) 1 truck (2 ton) 2 pickup trucks 1 carry all 1 water truck 1 fork lift 2 bucket trucks
Conductor Installation and Counterpoise	36	6 wire reel trailers 6 diesel tractors 4 cranes (2 19-ton, 2 30-ton) 2 trucks (5 ton) 4 pickup trucks 4–6 large bucket trucks 2 splicing trucks 4 3-drum pullers (2 medium, 2 heavy) 1 single drum puller (large) 1 double bull-wheel tensioner (heavy) 2 sagging equipment (D-8 Cat) 4 carry all 2 static wire reel trailer 2 water trucks 1 helicopter
Site Cleanup	8–10	3 trucks 1 pickup truck 1 D-6 Cat 1 water truck 2 motor grader

Table 2-3. Estimated Personnel and Equipment		
Activity	**People**	**Quantity of Equipment**
ROW Restoration	4	1 bulldozer 2 motor grader 2 pickup trucks 2 water truck 1 excavator

Surveying Activities

Before construction surveying begins, any required permits for surveying on federal lands, or rights-of-entry for private lands, would be obtained. Construction survey work would consist of locating the centerline, tower center hubs, ROW boundaries, work area boundaries, and tower access roads. All of these activities would begin prior to the start of construction.

Geotechnical Investigations

The proposed project includes performing a geotechnical investigation of the ROW prior to construction. Geotechnical investigations would consist of drilling at pre-identified sample locations to obtain core samples. Drilling would be performed by a truck- or track-mounted drill. Geotechnical investigations would begin prior to the start of construction.

Access Road Construction

The construction, operation, and maintenance of the proposed transmission lines would require that heavy equipment and vehicles are able to access tower sites along the ROW. Existing paved and unpaved roads along existing utility corridors would be used, where possible, to minimize new access road construction. Where existing roads can be used, only spur roads to the tower sites may be required. The majority of access roads utilized for the project will be existing roads.

Where structure sites are not immediately accessible from existing roads, short routes of nongraded overland access where feasible will be located in order to access the site. The construction of new spur roads will occur as necessary, to access structure sites that lack direct access from existing roads or where topographic conditions (e.g., steep terrain, rock outcrops, and drainages) prohibit safe overland access to the site. New spur roads will be located within the ROW whenever practical and will be located to minimize visual and biological impacts. The number of new spur roads will be held to a minimum, consistent with their intended use (e.g., structure construction or conductor stringing and tensioning).

Typical access roads will be constructed to a 24-foot travel way (20-foot road surface with 2 feet of berm or ditch on either side). New access and spur roads that are constructed in rough or steep terrain will likely exceed 24 feet in width to allow for safe use. Portions of the existing road network will require upgrading and maintenance, including improvements such as clearing overgrown vegetation, regrading, and/or installation of drainage structures.

Specific actions will be implemented to reduce construction impacts. Standard design techniques, such as installing water bars and dips to control erosion, will be included. In addition, measures will be taken to minimize impacts in specific locations and during certain periods of the year. For example, construction activities will not occur when weather or other conditions increase potential environmental impacts to unacceptable levels, as determined by the agencies. Such conditions could arise during heavy rains or high winds. To prevent impacts during such periods, construction activities will be restricted or curtailed.

The number of new roads would be consistent with their intended use and would be part of the permanent ROW for maintenance.

ROW Clearing

While the majority of the alignment passes through low-lying scrub vegetation, the clearing of some natural vegetation along the proposed ROW may be required. Selective clearing would be performed only when necessary to provide for surveying, electrical safety clearances, line reliability, and maintenance. Topping or removal of mature vegetation, under or near the conductors, would be done to provide adequate electrical clearance as required by NESC standards. After line construction, all work areas not needed for normal transmission line maintenance would be graded to blend, as near as possible, with the natural contours, and revegetated and restored where required.

Foundations, Structure Assembly, and Erection

Excavations for foundations would be made with power drilling and/or excavating equipment. Where the soil permits, a vehicle-mounted power auger or backhoe would be used. In rocky areas, the foundation holes may be excavated by drilling and blasting, or special rock anchors may be installed. Safeguards (e.g., blasting mats) would be employed when adjacent areas need to be protected. In extremely sandy areas, soil stabilization by water or a gelling agent may be used prior to excavation. After excavations are completed, precast or cast-in-place footings would be installed.

The precast footing would be lowered into the excavated foundation hole, positioned, and backfilled. The cast-in-place footing would be installed by placing reinforcing steel and a tower stub into the foundation hole, positioning the stub, and encasing it in concrete. Spoil material would be used for fill, where suitable. The foundation excavation and installation would require access to the site by a power auger or drill, a crane, material trucks, and ready-mix trucks.

Conductor Installation

After the towers are erected, insulators, hardware, and stringing sheaves may be delivered to each tower site. The towers would be rigged with insulator strings and stringing sheaves at each groundwire and conductor position.

For public protection during wire installation, guard structures would be erected over highways, railroads, power lines, structures, and other obstacles. Guard structures would consist of H-frame poles placed on one or both sides of an obstacle. These structures would prevent groundwire,

conductor, or equipment from falling on an obstacle. Equipment for erecting guard structures would include augers, line trucks, pole trailers, and cranes. Guard structures may not be required for small roads. In such cases other safety measures such as barriers, flagmen, or other traffic control would be used.

Pilot lines would be pulled (strung) from tower to tower by a helicopter and threaded through the stringing sheaves at each tower. Following pilot lines, a larger diameter steel cable line would be attached to conductors to pull them onto towers. This process, called the pulling line, would be repeated until the groundwire or conductor is pulled through all sheaves.

Groundwire and conductors would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment. Sites for tensioning equipment and pulling equipment would be approximately 2 to 5 miles apart. If a fiber optic groundwire is installed, rather than conventional groundwire, the construction methods would be the same. The appearance of a fiber optic groundwire is the same as conventional groundwire.

The tensioning and pulling sites would encompass an area approximately 200 feet by 500 feet. Tensioners, line trucks, wire trailers, and tractors needed for stringing and anchoring the groundwire or conductor would be located at this site. The tensioner in concert with the puller would maintain tension on the groundwire or conductor while they are fastened to the towers. A puller, line trucks, and tractors needed for pulling and temporarily anchoring the counterpoise/groundwire and conductor would be located at this site.

Ground Rod Installation

Part of standard construction practices prior to wire installation would involve measuring the resistance of tower footings. If the resistance to remote earth for each transmission tower is greater than 10 ohms, counterpoise (grounds) would be installed to lower the resistance to 10 ohms or less. Counterpoise would consist of a bare copper clad or galvanized steel cable buried a minimum of 12 inches deep, extending from one or more tower legs for approximately 200 feet in line with the linear transmission line ROW.

Cleanup

Construction sites, material storage yards, and access roads would be kept in an orderly condition throughout the construction period. Refuse and trash would be removed from the sites and disposed of in an approved manner. Oils and fuels would not be dumped along the line. Oils or chemicals would be hauled to a disposal facility authorized to accept such materials. No open burning of construction trash would occur without agency approval.

Hazardous Materials within Corridor

Petroleum products such as gasoline, diesel fuel, crankcase oil, lubricants, and cleaning solvents would be present within the transmission line corridor during construction. These products would be used to fuel, lubricate, and clean vehicles and equipment, and would be contained in fuel trucks or in approved containers. When not in use, hazardous materials would be properly

stored to prevent drainage or accidents. Hazardous materials would not be drained onto the ground or into streams or drainage areas. Totally enclosed containment would be provided for all trash. All construction waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials would be removed to a disposal facility authorized to accept such materials. All construction, operation, and maintenance activities would comply with applicable federal, state, and local laws and regulations regarding the use of hazardous substances. The construction or maintenance crew foreman would ensure that all applicable laws are obeyed. In addition, an on-site inspector would be present during construction to make sure that all hazardous materials are used and stored properly. A health and safety plan would be developed as part of the Final POD during the final engineering and preconstruction phase of the project.

Site Reclamation

The ROW would be restored, as required by the property owner or land management agency. All reasonable means would be made to restore the land to its original contour and to restore natural drainage patterns along the ROW. Because revegetation would be difficult in many areas of the project where precipitation is minimal, it would be important to minimize disturbance during construction. All reasonable means would be made to increase the chances of vegetation reestablishment in disturbed areas. The total construction period is anticipated to be approximately 2 years.

Fire Protection

All applicable fire laws and regulations would be observed during the construction period. All personnel would be advised of their responsibilities under the applicable fire laws and regulations, including taking practical measures to report and suppress fires.

2.8.3. Operation and Maintenance

Operational Characteristics

The nominal voltage for the transmission line would be 500 kV AC. There may be minor variations in voltage of up to 5 percent, depending upon load flow.

Permitted Uses

After the transmission line has been energized, land uses that are compatible with safety regulations would be permitted adjacent to the ROW; existing land uses such as grazing and recreation trail use are generally permitted within the ROW. Incompatible land uses within the ROW include construction and maintenance of inhabited dwellings, and any use requiring changes in surface elevation that would affect electrical clearances of existing or planned facilities.

Land uses that comply with local regulations would be permitted adjacent to the ROW. Compatible uses of the ROW on public lands would have to be approved by the appropriate

agency; certain types of uses of the ROW on private lands would require permission from Great Basin.

Safety

Safety is a primary concern in the design of this 500 kV transmission line. An AC transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead groundwires along the line. Electrical equipment and fencing at the substation would be grounded. All fences, metal gates, pipelines, etc., that cross or are within the transmission line ROW would be grounded to prevent electrical shock. If applicable, grounding outside of the ROW may also occur.

Maintenance

The 500kV transmission line would be inspected on a regular basis by both ground and air patrols. Maintenance would be performed as needed. When access is required for nonemergency maintenance and repairs, Great Basin would adhere to the same precautions that were taken during the original construction.

Emergency maintenance would involve prompt movement of repair crews to repair or replace any damaged equipment. Crews would be instructed to protect crops, plants, wildlife, and other resources of significance. Restoration procedures following completion of repair work would be similar to those prescribed for normal construction. The comfort and safety of local residents would be provided for by limiting noise, dust, and the danger caused by maintenance vehicle traffic. Details would be provided in the Final POD prior to line construction.

Long-term Access to and along the ROW

Authorized access roads will only be used for maintenance purposes upon completion of construction.

2.8.4. Termination and Restoration

Should the ROW and facilities no longer be needed, a termination and Restoration Plan would be developed by the ROW grant holder for agency approval. One year prior to termination of the ROW, the holder shall contact the appointed BLM and Reclamation authorized officer to arrange a joint inspection of the ROW. This inspection would be held in order to agree to an acceptable termination and rehabilitation plan. The BLM-authorized officer must approve the plan in writing prior to commencement of any termination activities. Restoration and termination procedures would attempt to restore and reclaim the landscape as near to original conditions as reasonably possible. The termination and restoration plan would be reviewed and approved by the appointed authorized officer and would include the following information:

- Which facilities and access routes are to be removed, restored, and/or rehabilitated
- How facilities and access routes would be removed, and the disturbed areas restored

- The time of year the facilities and access routes would be removed
- Stabilization and reclamation techniques to be used during restoration

CHAPTER 3. AFFECTED RESOURCES

This chapter describes the current resource conditions and environmental trends in the project area for the Proposed Action and alternatives. The affected environment discussed in this chapter will be the same for the Proposed Action and alternatives.

In considering the Affected Resources Form (ARF) (See Appendix A), and other NEPA documents and environmental reports completed for the project area, the following resources were determined to be present and potentially affected by the proposed project:

- Air Quality
- Geology/Mineral Resources
- Soils
- Water Resources
- Vegetation, Excluding Federally Listed Species
- Invasive Species and Noxious Weeds
- Threatened, Endangered, or Candidate Plant Species
- Wildlife, Excluding Federally Listed Species
- Threatened, Endangered, or Candidate Wildlife Species
- Cultural Resources
- Paleontological Resources
- Land Use, Recreation, and Access
- Visual Resources
- Socioeconomics
- Environmental Justice

The resources above will be considered in the evaluation of the Proposed Action and alternatives.

Existing published and unpublished environmental data, maps, reports, and statements prepared for previous transmission line-related actions in the area were reviewed and evaluated to determine their applicability and adequacy for use in the environmental studies. The most relevant information was incorporated from the following reports:

- Southwest Intertie Project Environmental Impact Statement, 1993
- Southwest Intertie Project Environmental Assessment, 2008
- Interstate Intertie, Centennial Plan, Environmental Assessment; Harry Allen – Mead 500 kV Transmission Line Project, DOE/EA-1470, 2004
- Harry Allen – Crystal 500 kV Transmission Line Project Environmental Assessment, 2001
- Sunrise Tap Transmission Line Project Environmental Assessment, 2008
- Copper Mountain Solar III Project Environmental Assessment, 2011

In the following sections, the term "project area" refers to the area that encompasses the proposed ROWs and associated project components, including access roads and any other areas of disturbance. The study area varies depending on the resource being analyzed and the predicted locations of direct and indirect impacts from the Proposed Action or alternatives. Each resource

section identifies the resource-specific study area. The area of potential effect (APE), as used in the Cultural and Historic Resources section, is synonymous with the project area.

3.1. Air Quality

3.1.1. Environmental Setting

The project is located within Clark County, Nevada, and crosses five hydrographic basins or air quality regions: Garnet Valley, Black Mountains Area, California Wash, Eldorado Valley, and Las Vegas Valley (Nevada Division of Water Resources [NDWR] 2014). These basins and regions make up the air quality study area. The state of Nevada and Clark County Department of Air Quality and Environmental Management (DAQEM) use hydrographic basins to delineate air quality management areas for planning purposes. Hydrographic areas represent natural and man-made stream drainage areas or basins (DAQEM 2004).

3.1.2. Regulatory Framework

Pursuant to the federal Clean Air Act of 1970, 42 USC 7401 et seq. as amended in 1990, the U.S. Environmental Protection Agency (EPA) has established primary and secondary National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: ozone (O_3), nitrogen dioxide (NO_2), lead (Pb), carbon monoxide (CO), particulate matter less than 10 microns (PM_{10}), and particulate matter less than 2.5 microns ($PM_{2.5}$).

The Nevada Division of Environmental Protection (NDEP), Bureau of Air Quality is charged with maintaining and improving the air quality for citizens of the state of Nevada. The state of Nevada's air pollution statutes and regulations (Chapter 445B of the Nevada Revised Statues and the Nevada Administrative Code) seek to achieve and maintain levels of air quality that will protect human health and safety, prevent injury to plant and animal life, prevent damage to property, and preserve visibility and scenic, aesthetic, and historic values. The statutes require the use of reasonably available methods to prevent, reduce, or control air pollution throughout Nevada.

The Clark County DAQEM is responsible for monitoring air quality, developing proper control measures, enforcing those measures, and educating the citizens of Clark County on how they can choose clean air. DAQEM regulates all stationary and nonvehicular sources, including construction sources, of fugitive dust. According to Section 17 of Clark County's Air Quality Regulations, a plan-specific permit is required for construction activities involving surface disturbances greater than 0.25 acre, such as grading and trenching. This permit would include conditions requiring control of fugitive dust emissions, as defined in Section 41 of the regulations.

3.1.3. Ambient Air Quality Standards and Pollutants of Concern

Ambient air quality is primarily a result of the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the regional meteorological conditions. The EPA has developed primary and secondary NAAQS areas that are in attainment or in nonattainment with each NAAQS.

In the project study area, the Clark County DAQEM operates and maintains an ambient air monitoring network throughout the county that measures the ambient concentrations of EPA criteria pollutants.

Under the applicable NAAQS, Clark County is in attainment for $PM_{2.5}$, NO_2, and O_3 (2008 8-hr. standard), and is unclassifiable for SO_2 and Pb. The Las Vegas Valley hydrographic basin within Clark County is designated as maintenance for PM_{10}, CO and O_3 (1997 8-hr. standard). While this area had previously held a designation of serious non-attainment for PM_{10}, it attained the PM_{10} standard as of December 31, 2006. NDEP submitted a Request for Redesignation and Maintenance Plan for PM_{10} to EPA in 2012. In July 2014, EPA gave notice of its proposal to approve NDEP's request to redesignate Las Vegas Valley as an attainment area for the PM_{10} standard, and to approve the proposed plan to maintain compliance with the standard through 2023. See 79 Fed. Reg. 42258 (July 21, 2014). On October 6, 2014, EPA gave notice of its final approval of the redesignation and maintenance plan approval, effective November 5, 2014. See 79 Fed. Reg. 60078.

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Particulate matter pollution consists of very small liquid and solid particles floating in the air, including dust, metals, smoke, soot, and acids. Coarse particles (larger than 2.5 micrometers) often come from a variety of sources, including windblown dust.

3.2. Geology and Minerals

This section presents an overview of the geologic landscape and conditions that occur within the proposed ROW corridor. The main purpose of this overview is to identify mineral resources that could be affected by project construction or operation.

3.2.1. Environmental Setting

The project area is located in the southern portion of the Basin and Range Province, a large geographic and geologic region that covers most of Nevada and parts of adjacent states. Basin and Range geomorphology is characterized by north to northeast trending mountain ranges separated by valleys filled with alluvial deposits from the mountain ranges.

The majority of lands crossed by the proposed ROW corridor are either open desert or the alluvial areas and foothills associated with the Arrow Canyon Range, Dry Lake Range, Sunrise Mountain, Frenchman Mountain, River Mountains, McCullough Range, and the Eldorado Mountains. The surrounding mountains are composed predominantly of Paleozoic carbonates, Mesozoic sedimentary rocks, and Tertiary volcanic and sedimentary rocks, including limestone, siltstone, sandstone, and basalt.

The route is underlain by unconsolidated Quaternary alluvium, Quaternary playa deposits, the Muddy Creek Formation, the Horse Spring Formation, and Tertiary volcanic rocks. These geological units, and those within 1 mile of the centerline, are described further in the Paleontological Resources, Section 3.11

3.2.2. Mineral Resources

Mineral resources on federal land can be categorized as follows: locatable minerals, leasable minerals (includes fluid minerals and solid minerals), and salable minerals. Locatable minerals include all "valuable mineral deposits" such as metallic minerals (gold, silver, lead, etc.) and nonmetallic minerals (fluorspar, asbestos, mica, etc.); and uncommon varieties of sand, gravel, stone, pumice, pumicite, cinders, and exceptional clay (BLM 1998).

Mineral materials within the project area are public property and administered by the BLM under the regulations at 43 CFR 3600 (Mineral Materials Disposal) and the Federal Aid to Highway Act. Mineral materials are authorized for disposal by the Las Vegas RMP and Final EIS (October, 1998). The regulations at 43 CFR 3600 establish procedures for the exploration, development, and disposal of mineral material resources on public lands, and for the protection of the resources and the environment. The regulations apply to free use permits and contracts for sale of mineral materials. The sale, free use or issuance of a material site ROW for mineral materials must be in conformance with the RMP, Minerals Management Section (Code MN), the Federal Aid to Highway Act and the regulations found at 43 CFR 3600. Any mineral materials extracted, severed or removed from public lands without a contract, free use permit or material site ROW constitutes unauthorized use. Unauthorized users are liable for damages to the United States, and are subject to prosecution for such unlawful acts.

The largest, currently active, locatable, mineral activities near the ROW corridor are the PABCO and Pioneer gypsum mines, which are located approximately 1 mile east of mile marker 24. Additional mining claims are located along the proposed corridor, and are detailed below in Table 3-1. Mining claims in the project area are mostly related to gypsum, limestone, or borate deposits (Longwell et al. 1965; Quade and Tingley 1985).

Table 3-1. Mining Claims in Project Area

Claim #	Name	Mile Marker	Acreage	Location Date	Location
NMC674013	Red Earth #3	25–26	160	12/23/1992	NE ¼ Sec. 14, T. 20S, 63E
NMC664130	Red Earth #2	25–26	160	10/7/1992	SE ¼ Sec. 14, T. 20S, 63E
NMC827208	3 Brothers #26	28–29	60	10/19/2001	NE ¼ Sec. 34, T. 20S, 63E
NMC827209	3 Brothers #27	28–29	60	10/19/2001	NE ¼ Sec. 34, T. 20S, 63E
NMC827205	3 Brothers #23	28–29	60	10/19/2001	NWSW ¼ Sec. 34, T. 20S, 63E
NMC827202	3 Brothers #20	28–29	60	10/19/2001	SW ¼ Sec. 34, T. 20S, 63E
NMC827203	3 Brothers #21	28–29	60	10/19/2001	SW ¼ Sec. 34, T. 20S, 63E
NMC767444	Crystal Colt #2	39–40	160	1/18/1997	SE ¼ Sec. 23, T. 22S, 63E
NMC789405	Jay Colt #1	40–41	160	2/21/1998	NE ¼ Sec. 26, T. 22S, 63E
NMC789403	Caireen Colt #1	40–41	160	2/21/1998	SE ¼ Sec. 26, T. 22S, 63E

Source: BLM 2012

3.3. Soils

This section describes soil conditions within the proposed ROW corridor. Soil data were obtained from the United States Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database, and from the following surveys: NV605 (Virgin River Area, Nevada and Arizona; NV788 (Las Vegas Valley Area, part of Clark County); and NV755 (Clark County Area) (USDA–NRCS 2012).

The proposed ROW corridor crosses 31 soil map units (NRCS 2012) (Table 3-2). These soils generally include poorly sorted, unconsolidated-to-cemented gravel and sandy gravel; deep, well-drained alluvial soils; and shallow soils on hills and mountains interspersed with rock outcrops and badland. Most of the soils in the project area can be generally described as having a permeability ranging from moderately slow to moderately rapid, low to moderate shrink-swell potential, and low to moderately high potential for wind and water erosion.

The soil map units along the proposed ROW corridor are listed below, with a brief description of their characteristics. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity. Values of K range from 0.02 to 0.069. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

A wind erodibility group (WEG) consists of soils that have similar properties affecting their susceptibility to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

The University of Nevada-Las Vegas published a report in the May 2013 Soil Science Society of America Journal documenting the results of soil samples taken in the vicinity of the Dutchman Pass Routing Area. The samples taken were found to contain naturally occurring fibrous actinolite, an asbestos mineral in rock, soil, and dust. South of mile marker 42, approximately seven sample locations were located within approximately one to two miles of the proposed project (Buck 2013).

3.4. Water Resources

This section describes the affected environment for water resources, including groundwater, surface water, floodplains, and water quality.

3.4.1. Surface Water

The proposed ROW corridor crosses four separate hydrographic basins from north to south. These include the Garnet Valley (Basin No. 216), Las Vegas Valley (Basin No. 212), Black Mountain Area (Basin No. 215), and the Eldorado Valley (Basin No. 167). These hydrographic areas are also part of the Colorado River Basin Hydrographic Region (Region 13).

The only major wash crossed by the proposed ROW corridor is the Las Vegas Wash, which is a 12-mile-long channel that feeds most of Las Vegas Valley's excess water into Lake Mead. The

watershed encompasses approximately 1,550 square miles, and is generally bounded on the north by the Sheep Mountains, on the west by the Spring Mountains, on the south by the McCullough Mountains, and on the east by the River and Frenchman mountains (Clark County Regional Flood Control District 2002). The terrain in the watershed includes steep mountain slopes that transition to alluvial fans, which in turn drain to braided washes, sheet flow areas, and incised washes. There are many small ephemeral washes in the area that drain into the Las Vegas Wash.

The Las Vegas Wash is fed by urban runoff, groundwater, treated wastewater discharge, urban and agricultural irrigation, and stormwater. Due to constant inflow of treated wastewater, the Las Vegas Wash has become a perennial waterway with an average flow of 153 million gallons per day or 220 cubic feet per second (Las Vegas Wash Coordination Committee 2010).

3.4.2. Groundwater

The proposed ROW crosses portions of four hydrographic basins, in which extensive groundwater resources are located. The basins are a complex sequence of interfingered and intermixed deposits of boulders, gravels, sands, silts, and clays with depths up to 3,000 feet in some portions of the valleys. Groundwater occurs in four general aquifer systems: (1) shallow aquifers defined as waters from 0 to 50 feet below ground surface (bgs), with the water table less than 20 feet bgs; (2) near surface aquifers defined as 0 to 200 feet bgs, with the water table greater than 20 feet bgs; (3) principal aquifers, generally greater than 200 feet bgs; and (4) regional carbonate aquifers, normally occurring at depths of several thousand feet bgs (BLM 1998, 1990).

3.5. Vegetation

3.5.1. Environmental Setting

The project area is located within the Mojave Desertscrub biome, the smallest of the four desert biomes in North America, and is intermediate in elevation and latitude between Sonoran Desertscrub and Great Basin Desertscrub. Plants and animals occupying Mojave Desertscrub are similar to those observed in the Lower Colorado River Subdivision of Sonoran Desertscrub, within the creosotebush series, *Larrea tridentata-Ambrosia dumosa* association. These sparsely vegetated communities occupy areas characterized by gravelly bajadas and low plains. Other plants associated with this biome include box-thorn (*Lycium andersonii*), Mormon tea (*Ephedra* spp.), and ratany (*Krameria* spp.). The Joshua tree (*Yucca brevifolia*), one of the few Mojave endemics, is arguably the most representative symbol of the Mojave Desert (Turner and Brown 1994). Table 3-2 represents the soil map units crossed by the project ROW centerline.

Table 3-2. Soil Map Units Crossed by Project ROW Centerline						
Soil Map Unit	Slope (%)	Geomorphic Feature	Erosion Potential		K Factor	WEG
			Water	Wind		
Akela-Rock outcrop complex	15–50	Low ridges and ridges and cliffs	Moderate	Moderate	0.43	6
Arizo, Caretal association	2–8	Inset fans and fan remnants	Low	Low	0.28	8
Arizo: very gravelly fine sandy loam	0–4	Fan pediments	Low	Low	0.10	3
Arizo: very gravelly fine sandy loam, gypsiferous substratum	2–8	Inset fans	Very low	Very Low	0.15	6
Badland soils	Steep	Badlands topography	Moderate-High	Moderate-High	Not rated	Not rated
Bard: gravelly fine sandy loam	2–8	Fan remnants	Low-Moderate	Low-Moderate	0.37	5
Baseline-Callville-Badland association	2–30	Fan remnants and pediments	Very low-Moderately low	Low	0.32	8
Baseline-Guardian association	2–8	Fan remnants	Moderate	Low	0.32	8
Caliza-Pittman-Arizo complex	2–8	Fan remnants	Moderate	Low	0.37	8
Caliza: extremely cobbly fine sandy loam	Not rated	Inset fans	Low	Moderate-High	0.24	3
Caliza: very gravelly sandy loam	2–8	Fan remnants	Moderate	Moderate	0.37	6
Carrizo-Carrizo-Riverbend association	2–8	Inset fans	Low	High	0.10	2
Colorock-Tonopah association	2–8	Fan remnants	Moderate	Low-Moderate	0.43	6
Guardian-Baseline-Guardian association	2–8	Pediments	Low-Moderate	Moderate-High	0.32	3
Gypwash-Callville-Carrizo association	0–30	Fan remnants	Low	Low	0.32	8
Haleburu-Crossgrain-Rock outcrop association	30–50	Mountainous areas, cliffs, and fan remnants	Low	Low	0.28	8
Hypoint: gravelly sandy loam	0–4	Fan aprons, fan skirts, and alluvial fans	Moderate	Moderate	0.32	5
Land: very fine sandy loam, wet soils	0–2	Alluvial flats	Moderate-High	Moderate-High	0.43	6
Nickel: very gravelly fine sandy loam	2–8	Fan remnants	Low-Moderate	Low-Moderate	0.32	6

Table 3-2. Soil Map Units Crossed by Project ROW Centerline						
Soil Map Unit	Slope (%)	Geomorphic Feature	Erosion Potential		K Factor	WEG
			Water	Wind		
Nipton-Haleburu-Rock outcrop	15–50	Mountainous areas	Low-Moderate	Low	0.32	8
Playas:, hydric soils	0–1	Lakebeds	Moderate	High	Not rated	Not rated
Rock land-St. Thomas association	15–50	Mountainous areas	Moderate	Moderate	0.43	6
Rock outcrop-Redneedle-Helweiser association	15–50	Cliffs and hills	Low-Moderate	Low-Moderate	0.32	6
St. Thomas-Iceberg-Rock outcrop association	15–50	Mountainous areas	Low	Low	0.32	8
St. Thomas association	8–30	Mountainous areas	Low	Low	0.37	8
Sunrock-Callville-Badland association	2–30	Fan remnants and pediments	Low-Moderate	Low-Moderate	0.37	6
Sunrock-Haleburu-Rock outcrop association	30–75	Mountains and cliffs	Low	Low	0.28	8
Tonopah-Arizo	2–8	Fan remnants and fan pediments	Low-Moderate	Low	0.32	8
Upperline: very gravelly sandy loam	8–30	Rock pediments	Low-Moderate	Low-Moderate	0.28	6
Wechech: very gravelly soils	8–30	Fan remnants	Moderate	Low	0.43	8
Weiser-Arizo association	2–8	Fan remnants	Moderate	Low	0.32	8

In addition to the upland Mojave Desertscrub biome, riparian areas occur along narrow communities along streams and marshes. The only riparian corridor in the project area is the Las Vegas Wash, a 12-mile-long channel, which drains northeasterly into the western arm of Lake Mead, which in turn drains into the Colorado River. The project would cross the Las Vegas Wash approximately 3 miles northeast of Henderson on the east side of Las Vegas. Typical vegetation found within this wetland biome generally includes cottonwoods (*Populus* sp.), willows (*Salix* sp.), and southern cattail (*Typha domingensis*) as dominant riparian woodland or marsh species; but at the project crossing, the vegetation is dominated by saltcedar (*Tamarix* spp.), an exotic species that has replaced many native plants as the dominant vegetation type along extensive reaches of riparian habitat.

Much of the surface flow in Las Vegas Wash is now within the Clark County Wetlands Park. Intensive management is ongoing in this area to reduce heavy erosion that has occurred since the 1950s, to improve wetland habitat quality, and to manage these wetlands to improve water quality where Las Vegas Wash flows into Lake Mead. Several temporary and permanent weirs have been constructed across Las Vegas Wash, and marsh vegetation has developed upstream from a number of these structures.

3.5.2. Botanical Inventory Methods

Botanical field surveys conducted in the spring and summer of 2009 were used for this analysis. In 2009, the BLM provided a list of sensitive species with the potential of occurring in the proposed project corridor. This list included species listed or proposed for listing under the ESA, ESA listing candidates, species listed by the BLM as sensitive Nevada state-protected species, and covered species under Clark County's Multi-Species Habitat Conservation Plan (MSHCP). Other technical information on rare plants was requested from the Nevada Natural Heritage Program (NNHP) database (2009), and the results were used to develop information on the botanical resources in the proposed corridor. Surveys were conducted along the entirety of the project corridor in accordance with the BLM Las Vegas Field Office Rare Plant Survey Protocols. The BLM provided modeled habitat for rare plants, including four species present in or near the project area, in 2012.

3.5.3. Botanical Inventory Results

Special Status Species is a term that refers to species that are not listed as threatened or endangered under the ESA, but which the U.S. Fish and Wildlife Service (USFWS) believes might be in need of concentrated conservation actions, or are considered sensitive or protected by the BLM and/or the Nevada Department of Forestry (NDF). Nevada state protected species are categorized by NDF as (1) critically endangered, (2) critically imperiled, (3) recommended for listing, or (4) protected as a cactus, yucca, or Christmas tree. The BLM also considers plants given special status by Clark County's Multi-Species Habitat Conservation Plan (MSHCP) as sensitive. The MSHCP was developed through Section 10 consultation with the USFWS to allow for the incidental take of species on nonfederal lands within Clark County, Nevada. Table 3-3 below lists the special status plant species that have the potential of occurring in the proposed project corridor. A description of those species found within the project corridor during the 2009

surveys follows. Figure 3-1 depicts the locations of the sensitive plants identified during these surveys.

Table 3-3. Plant Species of Concern that May Occur within the Proposed Project Corridor

Common Name *Scientific Name*	BLM Status	NDF State Status	USFWS Status	MSHCP Status	Detected in 2009 Surveys
Southwestern (=sticky) ringstem *Anulocaulis leiosolenus* var. *leiosolenus*	Sensitive	None	None	Covered	Yes
Las Vegas bearpoppy *Arctomecon californica*	Sensitive	Critically Endangered	Species of Concern	Covered	Yes
Meadow Valley sandwort *Arenaria stenomeres*	None	None	None	Medium Priority Evaluation Species	No
Threecorner milkvetch *Astragalus geyeri* var. *triquetrus*	Sensitive	Critically Endangered	Species of Concern	Covered	No
Littlefield milkvetch *Astragalus preussii* var. *laxiflorus*	None	Critically Imperiled	None	None	Yes
Nye milkvetch *Astragalus nyensis*	Sensitive	None	Species of Concern	None	No
Silverleaf sunray *Enceliopsis argophylla*	Sensitive	None	Sensitive	None	Yes
Las Vegas buckwheat *Eriogonum corymbosum* var. *nilesii*	Sensitive	Nominated as Critically Endangered	Candidate	High Priority Evaluation Species	No
Sticky buckwheat *Eriogonum viscidulum*	Sensitive	Critically Endangered	Species of Concern	Covered	No
Beaver Dam breadroot *Pediomelum castoreum*	Sensitive	None	Species of Concern	Watch List	Yes
Yellow two-toned beardtongue *Penstemon bicolor* ssp. *bicolor*	Sensitive	None	Species of Concern	High Priority Evaluation Species	No
Rosy two-toned beardtongue *Penstemon bicolor* ssp. *roseus*	Sensitive	None	Species of Concern	Watch List	No
Parish phacelia *Phacelia parishii*	Sensitive	None	Species of Concern	Covered	No
Sweet moustache moss *Trichostomum sweetii*	None	None	None	Medium Priority Evaluation Species	No

Southwestern (=sticky) ringstem (*Anulocaulis leiosolenus* var. *leiosolenus*). Southwestern ringstem has no federal or state protection, but is listed as sensitive by the BLM and is an MSHCP covered species. Sticky ringstem is a perennial herb that grows up to 1.5 meters in height. Flowers are greenish-bronze on the tube and white or pale pink on the limb. In Nevada, this species has been found on the eastern edge of Mojave desertscrub on gypsiferous soils on rolling hills and terrace, and is often associated with Las Vegas bearpoppy. The project includes

large areas of gypsum habitat (particularly in the vicinity of the PABCO Mine and Lava Butte area) and small scattered gypsum outcroppings. During field surveys, two rare species—Las Vegas bearpoppy and sticky ringstem—were abundant in this habitat; with a total of 1,101 and 288 plants recorded, respectively. The Rainbow Gardens ACEC is managed, in part, for the protection of this species, and suitable habitat modeled by the BLM includes a portion of the project area within and outside the ACEC. All detections of this species during field surveys in 2009 were within the ACEC.

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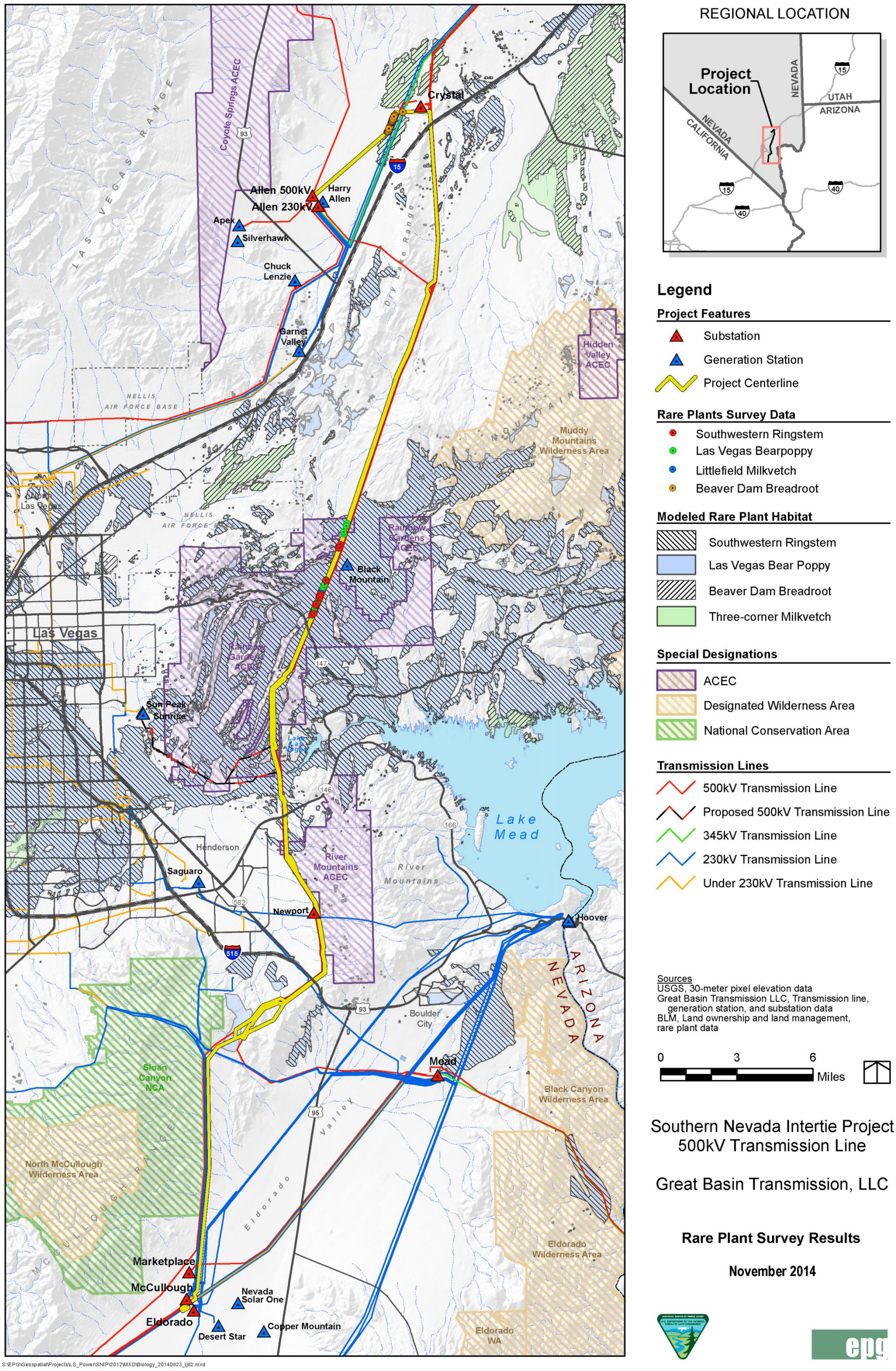

Figure 3-1. Rare Plant Survey Results

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Las Vegas bearpoppy (*Arctomecon californica*). The Las Vegas bearpoppy is listed as a species of concern by the USFWS, sensitive by the BLM, and is included as a critically endangered species in Nevada. This species is a perennial herb with short stems and stout taproot found on gypsiferous outcrops similar to that of sticky ringstem. During field surveys in 2009, this species was found growing abundantly in gypsum habitat with two other rare species—sticky ringstem and Las Vegas buckwheat. The Rainbow Gardens ACEC is managed in part for the protection of this species, and suitable habitat modeled by the BLM includes a portion of the project area within and outside the ACEC. All detections of this species during field surveys in 2009 were within the ACEC.

Littlefield milkvetch (*Astragalus preussii* var. *laxiflorus*). Littlefield milkvetch is critically imperiled in Nevada, with no other federal or state status. Little information is available regarding the habitat requirements for Littlefield milkvetch, but the NNHP considers this species to be dependent upon dune or deep sand habitats (NNHP 2004). During rare plant surveys, Littlefield milkvetch was found with 63 plants recorded. The dominant associated species were indigo bush, white bursage, desert alyssum (*Lepidium fremontii),* creosote bush, and Torrey's ephedra.

Threecorner milkvetch (*Astragalus geyeri* var. *triquetrus*). Threecorner milkvetch is listed as a species of concern by the USFWS, sensitive by the BLM, and is listed as fully protected in Nevada. Threecorner milkvetch is an annual plant associated with deep, sandy soils, and typically only sprouts and flowers following winters with above-average rainfall (NNHP 2001a). During rare plant surveys conducted in 2009, no threecorner milkvetch were found. However, the species is known to be present near the project area, and suitable habitat modeled by the BLM includes a portion of the project area.

Silverleaf sunray (*Enceliopsis argophylla*). Silverleaf sunray is listed as sensitive by the BLM and is on the watch list by the Northern Nevada Native Plant Society (NNNPS). A member of the sunflower family, this sunray is a long-lived perennial that flowers continually throughout the year. It is found in Arizona and Utah, and in Nevada is restricted to the Lake Mead area in Clark County at elevations 1,165 to 2,380 feet in dry, open, relatively barren areas on gypsum badlands, volcanic gravels, and loose sands in the creosote-bursage zone (NNHP 2001b). During rare plant surveys conducted in 2009, silverleaf sunray was found in areas of gypsum habitat and scattered gypsum outcroppings.

Beaver Dam breadroot (*Pediomelum castoreum*). Beaver Dam breadroot is listed as sensitive by the BLM, a species of concern by the U.S. Forest Service (USFS), and is on the watch list by the NNNPS. A member of the legume family, this species is a low-growing perennial herb that blooms from early April to mid-May and sets fruit by June. It grows on dry sandy soils or sandy-clay soils in a creosote bush-dominated community at elevations ranging from 1,280 to 5,000 feet. The range of Beaver Dam breadroot includes northwest Arizona, eastern California, and Clark County, Nevada. It occurs in similar habitats as threecorner milkvetch. During rare plant surveys conducted for the project, botanists found 397 individuals in the northern portion of the project area (Dry Lake, Crystal substation area).

3.6. Invasive Species and Noxious Weeds

The BLM defines noxious weeds as "a plant that interferes with management objectives for a given area of land at a given point in time." The State of Nevada defines noxious weeds as "any species of plant which is, or liable to be, detrimental or destructive and difficult to control or eradicate" but further notes that any weed species, at the time it is listed as noxious, should not be "already introduced and established in the State to such an extent as to make its control or eradication impracticable" (NRS 555). The State of Nevada Department of Agriculture administers laws relating to the designation and control of noxious weeds. Table 3-4 lists noxious weeds that may be present near the project area.

Table 3-4. Noxious Weeds

Common Name ***Scientific Name***	**Nevada Noxious Weed Category**	**Records in or Near Project Area**
Giant Reed *Arundo donax*	Category A	BLM Weed Inventory Database
Johnsongrass *Sorghum halepense*	Category C	BLM Weed Inventory Database
Maltese Star-thistle *Centaurea melitensis*	Category A	BLM Weed Inventory Database
Hardheads [Russian Knapweed] *Acroptilon repens*	Category B	BLM Weed Inventory Database
Asian [African] Mustard *Brassica tournefortii*	Category B	Observed in project area
Tamarisk *Tamarix* spp.	Category C	BLM Weed Inventory Database

In addition to listed noxious weeds, other invasive plant species may be present in the project area. The most common non-native species known to occur within the proposed project corridor are red brome (*Bromus madritensis* ssp. *rubens*), Mediterranean grass (*Schismus* sp.), redstem stork's bill (*Erodium cicutarium*), and tumbleweed (*Salsola* sp.). Cheatgrass (*Bromus tectorum*) occurs in small patches. Saltlover (*Halogeton* sp.) was detected at several locations. African mustard (*Malcolmia africana*) was common in each of the areas in which it was recorded, including the sand habitats in the north and the gypsum/clay areas in the central portions of the project area.

3.7. ESA-listed and Candidate Plant Species

In order to determine the presence or absence of sensitive plant species, in 2009 the BLM provided a list of sensitive species with the potential of occurring in the proposed project corridor. Other technical information on rare and listed plants was requested from the NNHP database (2009), and the results were used to develop information on the potential botanical resources in the proposed corridor. The Las Vegas buckwheat (*Eriogonum corymbosum* var. *nilesii*) is designated as a Candidate species by the USFWS, and was identified as a species with the potential to occur in the project area.

Botanical field surveys were conducted in the spring and summer of 2009, based on this information, and were conducted in accordance with the BLM Las Vegas Field Office Rare Plant Survey Protocols. No ESA-listed plants and no Las Vegas buckwheat plants were found during surveys in 2009. An updated 2014 query of the USFWS online Information, Planning, and Conservation (IPaC) database identified no other ESA-listed, proposed, or candidate plant species with the potential of occurring in the proposed project corridor.

3.8. Wildlife

This section discusses wildlife in a regional context around the project area, and summarizes the results of general wildlife surveys and surveys for special-status species conducted for the project or by other organizations. Special-status species addressed in this EA include BLM sensitive species, and species that are listed as sensitive or protected by the Nevada Division of Wildlife (NDOW). ESA-listed species are addressed in Section 3.9. The USFWS provided a list of sensitive species with the potential of occurring within the proposed project area. Other technical information on rare species was requested from the NNHP database (2009) and the results were used to develop information on rare wildlife resources potentially found within the proposed project area. Wildlife surveys conducted in the spring and summer of 2009 included surveys for desert tortoise (addressed in Section 3.9), aerial raptor surveys, and pedestrian surveys for rare plants where incidental wildlife sightings were also recorded.

Table 3-5 lists the special-status wildlife species that have the potential of occurring in the proposed project area.

Table 3-5. Special-Status Species that May Occur within the Proposed Project Area
(based on NNHP Database, agency input, and literature review)

Common Name *Scientific Name*	Habitat	ESA Status	BLM Status State Status	MSHCP
MAMMALS				
Pallid Bat *Antrozous pallidus*	Roosts singly or in small groups in caves, forages widely.	None	BLM: Sensitive	None
Big Brown Bat *Eptesicus fuscus*	Uses a variety of roost sites, forages widely.	None	BLM: Sensitive	None
Spotted Bat *Euderma maculatum*	Roosts in rock crevices on cliffs, forages widely	None	BLM: Sensitive State: Protected	Watch List
Greater Western Mastiff Bat *Eumops perotis*	Roosts in crevices on high cliffs, forages in open areas.	None	BLM: Sensitive	Watch List
Allen's Big-eared Bat *Idionycteris phyllotis*	Uses a variety of roost sites, forages widely.	None	BLM: Sensitive	Watch List
Silver-haired Bat *Lasionycteris noctivagans*	Prefers montane forests, but may migrate through lower elevations.	None	BLM: Sensitive	Covered
Western Red Bat *Lasiurus blossevillii*	Roosts in riparian trees, forages near water.	None	BLM: Sensitive	None
Hoary Bat *Lasiurus cinereus*	Roosts in riparian trees, forages near water.	None	BLM: Sensitive	None
California Leaf-nosed Bat *Macrotis californicus*	Roosts in caves and mines, forages in desertscrub.	None	BLM: Sensitive	Watch List

Table 3-5. Special-Status Species that May Occur within the Proposed Project Area
(based on NNHP Database, agency input, and literature review)

Common Name *Scientific Name*	Habitat	ESA Status	BLM Status State Status	MSHCP
California Myotis *Myotis californicus*	Uses a variety of roost sites, forages widely.	None	BLM: Sensitive	None
Long-eared Myotis *Myotis evotis*	Uses a variety of roost sites, often forages near water.	None	BLM: Sensitive	Covered
Western Small-footed Myotis *Myotis ciliolabrum*	Uses a variety of roost sites, forages widely.	None	BLM: Sensitive	Evaluation, Medium Priority
Big Free-tailed Bat *Nyctinomops macrotis*	Roosts in crevices on high cliffs, forages in open areas.	None	BLM: Sensitive	Watch List
Fringed Myotis *Myotis thysanodes*	Uses a variety of roost sites, forages in vegetated areas.	None	BLM: Sensitive State: Protected	Evaluation, Medium Priority
Cave Myotis *Myotis velifer*	Roosts in caves and mines, forages in desertscrub.	None	BLM: Sensitive	Watch List
Long-legged Myotis *Myotis volans*	Prefers montane forests, but may occur in desertscrub near water.	None	BLM: Sensitive	Covered
Yuma Myotis *Myotis yumanensis*	Uses a variety of roost sites, forages near water.	None	BLM: Sensitive	Watch List
Western Pipistrelle *Parastrellus hesperus*	Uses a variety of roost sites, forages in open areas.	None	BLM: Sensitive	None
Townsend's Big-eared Bat *Corynorhinus townsendii*	Uses a variety of roost sites, forages widely.	None	BLM: Sensitive State: Protected	Evaluation, High Priority
Brazilian Free-tailed Bat *Tadarida brasiliensis*	Uses a variety of roost sites, forages widely.	None	BLM: Sensitive	None
Kit Fox *Vulpes macrotus*	Mojave desertscrub, blackbrush, and saltbrush with soft soils	None	None	Evaluation, High Priority
Desert Bighorn Sheep *Ovis canadensis nelsoni*	Mojave desertscrub, with steep, rugged escape terrain.	None	BLM: Sensitive State: Big Game	Watch List
BIRDS				
Golden Eagle *Aquila chrysaetos*	Nests on large cliffs and ledges, forages widely.	None	BLM: Sensitive	Watch List
Western Burrowing Owl *Athene cunicularia hypugaea*	Prefers nearly level ground with low vegetation and soft soils.	None	BLM: Sensitive	Evaluation, High Priority
Ferruginous Hawk *Buteo regalis*	Grasslands, desertscrub, agriculture, sagebrush	None	BLM: Sensitive State: Protected	Watch List
American Peregrine Falcon *Falco peregrinus anatum*	Nests on cliffs or tall buildings, often forages near water	Delisted	BLM: Sensitive State: Protected	Covered
Loggerhead Shrike *Lanius ludovicianus*	Mojave desertscrub, sagebrush	None	BLM: Sensitive	Evaluation, Low Priority
Phainopepla *Phainopepla nitens*	Mojave desertscrub	None	State: Protected	Covered
Vermilion Flycatcher *Pyrocephalus rubinus*	Riparian woodlands, often with permanent water	None	State: Protected	Covered
Crissal Thrasher *Toxostoma crissale*	Mojave desertscrub, riparian	None	None	Evaluation, Low Priority

Table 3-5. Special-Status Species that May Occur within the Proposed Project Area (based on NNHP Database, agency input, and literature review)				
Common Name ***Scientific Name***	**Habitat**	**ESA Status**	**BLM Status State Status**	**MSHCP**
Le Conte's Thrasher *Toxostoma lecontei*	Open, sparsely vegetated desertscrub.	None	BLM: Sensitive	None
Arizona Bell's Vireo *Vireo bellii arizonae*	Brushy riparian corridors and desert washes	None	None	Covered
REPTILES AND AMPHIBIANS				
Arizona Toad *Anaxyrus microscaphus microscaphus*	Riparian areas with temporary or permanent surface water	None	None	Evaluation, High Priority
Desert Glossy Snake *Arizona elegans eburnata*	Mojave desertscrub	None	BLM: Sensitive	Covered
Mojave Shovel-nosed Snake *Chionactis occipitalis occipitalis*	Mojave desertscrub, in sparsely vegetated, sandy areas.	None	BLM: Sensitive	None
Mojave Desert Sidewinder *Crotalus cerastes cerastes*	Mojave desertscrub, in sparsely vegetated, sandy areas.	None	BLM: Sensitive	Covered
Banded Gila Monster *Heloderma suspectum cinctum*	Mojave desertscrub	None	BLM: Sensitive State: Protected	Evaluation, High Priority
Chuckwalla *Sauromalus ater*	Mojave desertscrub, associated with rocky hillsides and boulders	None	BLM: Sensitive	Covered
INVERTEBRATES				
Mojave Gypsum Bee *Andrena balsamorhizae*	Gypsum soils in Mojave desertscrub.	None	BLM: Sensitive	Evaluation, High Priority
Mojave Poppy Bee *Perdita meconis*	Associated with poppies, often on gypsum soils in Mojave desertscrub.	None	BLM: Sensitive	Evaluation, High Priority

3.8.1. Mammals

Big Game

The desert bighorn sheep is state protected and managed as big game by NDOW. This species is present in the precipitous desert mountain ranges of northwestern and southern Arizona, southeastern California, southern Nevada, and southwestern Utah (Bighorn Institute, no date). These mountain ranges, particularly in the southern part of the state of Nevada, typically feature broken rock, with numerous gullies and relatively sparse vegetation.

The four primary requirements for the bighorn sheep are food, water, escape terrain, and open space (Valdez and Krausman 1999). Because forage is more limited in rocky, montane areas, bighorn sheep prefer large blocks of continuous habitat that allow for regular movement as they forage. They spend little time on the flat land between ranges and will not readily range far from the safety of the steep, rocky terrain (Chapman and Feldhamer 1982). Threats to the species include the creation of dispersal barriers through development in intermountain valleys, noise and disturbance associated with recreational traffic and other human activities, and diseases that may be spread by livestock.

Bighorn sheep are known to occur in most of the ranges in the vicinity of the proposed project corridor. Within the project area, bighorn sheep are known to occur in the River and McCullough mountains in the southern portion of the proposed route, and also disperse through and seasonally use the Sunrise and Frenchman mountains. They are unlikely to occur in other portions of the project area due to development and/or lack of water in these areas. Bighorn sheep were not observed during the 2009 surveys.

Bats

Twenty special-status species of bats are known to occur along the proposed project corridor. All twenty bat species forage for insects in a variety of habitats during the night hours and roost in caves, mines, buildings, crevices in cliffs or rocky outcrops, and in some cases, hollow trees during the daylight hours. As 2009 surveys were diurnal, bats were not observed.

Other Mammals

Mojave desertscrub, including desert washes, supports a diverse assemblage of mammals in southern Nevada, although little site-specific information is available for much of the project area. Surveys along Las Vegas Wash identified 8 species of medium and large mammals, primarily predators and rabbit species (Eckberg and Foster 2011), 9 species of small terrestrial mammals (Las Vegas Wash Coordination Committee 2014a), and 17 species of bats (O'Farrell and Shanahan 2005), although other species are likely to occur away from Las Vegas Wash in the project area.

3.8.2. Birds

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703) makes it unlawful to pursue, hunt, take, capture, kill, or possess any migratory bird, or part, nest, or egg of such bird listed in wildlife protection treaties among the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former USSR. This act also contains a clause that prohibits baiting or poisoning of these bird species. All nesting birds listed in Table 3-5, as well as most birds occurring in the vicinity of the project area, are protected under the MBTA. Twenty-three species of migratory birds were observed during the 2009 surveys.

Executive Order (EO) No. 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (Clinton 2001), directs agencies to coordinate with the USFWS to support the conservation intent of the migratory bird conventions by integrating bird conservation principles, measures, and practices into agency activities' actions and by avoiding or minimizing, to the extent practicable, adverse impacts on resources used by migratory birds when conducting agency actions. The BLM and USFWS entered into a Memorandum of Understanding (MOU) in 2010 as directed by EO 13186, to specify the responsibilities of each agency in conserving migratory birds on BLM lands or through BLM actions.

Raptors

Four special-status species of raptors may inhabit areas along the project corridor.

Suitable nesting habitat for the golden eagle may be present in mountain ranges adjoining the proposed project corridor, typically in rocky areas at moderate-to-higher elevations. The project area is located primarily in an open landscape, providing suitable habitat for foraging golden eagles. Surveys were conducted for golden eagle nests within a 4-mile corridor (2 miles on either side of the alignment) of the proposed project alignments in April and May 2012. No confirmed golden eagle nests were found during the surveys, although two deteriorated, inactive nests were observed that may have previously been used by golden eagles. Four active raptor nests and one active raven nest were also detected during the surveys.

Burrowing owls could be present anywhere along the proposed project corridor in suitable habitat. Within the Mojave Desert, burrowing owls typically use burrows created by desert tortoise or mid-sized mammals. Surveys conducted in 2009 detected three burrowing owls. Two individuals were located between the Harry Allen and Crystal substations, and one was observed at its burrow immediately south of State Route (SR) 564 (Lake Mead Parkway).

Ferruginous hawks may be present anywhere along the proposed project corridor, primarily during migration and winter. The valley floors crossed by the project provide suitable foraging habitat, and existing transmission structures may provide suitable perching sites. No ferruginous hawks were observed during the 2009 wildlife surveys.

The peregrine falcon is typically found in open habitats in grasslands, rangeland, and agricultural areas where prey is abundant. This falcon is known to nest almost exclusively on sheltered cliffs, although they have been known to attempt nesting on buildings in the Las Vegas Valley. Nesting peregrine falcons are documented historically near the proposed project corridor along the Colorado River in the area of Black Canyon from Lake Mead downstream to Lake Mojave (Glinski and Garrison 1992), but may nest anywhere that suitable high cliffs are present. Foraging area for peregrine falcons may include nearly 60 square miles surrounding the nest site during the post-breeding season, shortly after young have fledged (*ibid*). No peregrine falcons were observed during the 2009 wildlife surveys.

Other Bird Species

Three special-status species included in Table 3-5 are riparian-dependent: vermilion flycatcher, crissal thrasher, and Arizona Bell's vireo. The only riparian corridor in the proposed project corridor is the Las Vegas Wash. Vegetation in the wash at the project crossing comprises patches of tamarisk, which is considered low-quality riparian nesting vegetation for the birds mentioned above; however, they may pass through during early spring and fall migration. Ongoing surveys in this area have recorded crissal thrashers, but no vermilion flycatchers or Bell's vireos (Las Vegas Wash Coordination Committee 2014b). American coots, double-crested cormorants, mallards, eared grebes, great blue herons, and red-winged blackbirds were observed at Las Vegas Wash during the 2009 surveys. Loggerhead shrikes and phainopeplas may also occur in or near riparian areas with permanent water, but regularly occur along desert washes in Mojave

desertscrub. Le Conte's Thrashers nest in sparse, open desertscrub, and are known to occur in the project area.

Many other bird species may occur in the project area, although these are not listed individually. For example, bird censuses conducted along and near Las Vegas Wash have recorded approximately 162 species to date (Las Vegas Wash Coordination Committee 2014). Additional high-elevation species may occur at lower elevations, such as the project area during winter, and migrating birds or individuals that wander far outside their known range ('accidentals') may result in a substantially higher total number of birds that could be detected in the project area.

3.8.3. Reptiles and Amphibians

The Arizona toad is a historic inhabitant of the Las Vegas Valley. Recent surveys have failed to detect the species within the Las Vegas Valley, including the Las Vegas Wash, although two other amphibian species were detected (Bradford et al. 2005). Arizona toads were not observed during the 2009 surveys.

Banded Gila monsters and chuckwallas are found throughout the Mojave and Sonoran deserts in shrubby, grassy, and succulent-dominated areas. They are often found along rocky crags and rock piles. No Gila monsters were observed during the 2009 surveys. Gila monsters may also share burrows with desert tortoises. One chuckwalla was observed between mile marker 40 and mile marker 41. Desert glossy snakes, Mojave Desert sidewinders, and Mojave shovel-nosed snakes typically occur in desert valleys, often in areas with loose, sandy soil. None of these species were observed during surveys.

Reptile surveys conducted along Las Vegas Wash detected 15 total species (Las Vegas Wash Coordination Committee 2014c), although several other species are expected to be present in the project area away from Las Vegas Wash.

3.9. Threatened, Endangered, Proposed, or Candidate Wildlife Species

3.9.1. Inventory Methods for Threatened, Endangered, Proposed, or Candidate Wildlife Species

Wildlife field surveys conducted in spring/summer 2009 and spring 2012 were used for this analysis. Surveys conducted in spring/summer 2009 were conducted along the entire length of the Proposed Action corridor. Surveys in spring 2012 were conducted along new build portions of Alternative 1 that were not covered by the 2009 surveys; this included approximately 360 feet immediately north of the Sunrise Mountain ISA (the ISA has since been terminated), and where Alternative 1 crosses Dutchman Pass through the McCullough Mountains.

The USFWS provided a list of sensitive species with the potential of occurring within the proposed project corridor. Other technical information on rare species was requested from the NNHP database (2009), and the results were used to develop information on the rare wildlife resources in the proposed project corridor. Surveys were conducted in accordance with the January 2009 USFWS's Pre-project Field Survey Protocol for Potential Desert Tortoise Habitats.

The protocol was a draft version still under review at that time, but was approved for use on this project by the BLM.

3.9.2. Inventory Results for Threatened, Endangered, Proposed, or Candidate Wildlife Species

The USFWS identified several threatened, endangered, and candidate wildlife species with the potential of occurring in the proposed project corridor. Table 3-6 lists these species and identifies corresponding protection status for BLM, NDOW, and Clark County MSHCP. A discussion of each species, including survey results, follows.

Table 3-6. ESA-Listed Wildlife Species that May Occur within the Proposed Project Corridor

Common Name *Scientific Name*	Habitat	ESA Status	Critical Habitat	State Status	MSHCP
Mojave Desert Tortoise *Gopherus agassizii*	Mojave desertscrub	Threatened	Designated, outside project area	Threatened	Covered
Southwestern Willow Flycatcher *Empidonax traillii extimus*	Lowland riparian	Endangered	Designated, outside project area	Protected	Covered
Yuma Clapper Rail *Rallus longirostris yumanensis*	Freshwater and brackish marshes	Endangered	None	Endangered	Watch List
Yellow-billed Cuckoo *Coccyzus americanus*	Riparian	Threatened	Proposed, outside project area	Protected	Covered

Mojave Desert Tortoise

The Mojave population of desert tortoises (*Gopherus agassizii*) was listed as Threatened under the ESA on April 2, 1990 (55 FR 12178-12191). The species is now recognized as distinct from the Sonoran desert tortoise (*G. morafkai*), a candidate for ESA listing. In 1994, a recovery plan was published in addition to the designation of 6.4 million acres of critical habitat (59 FR 5820-5866). Since that time, a revised recovery plan designated five recovery units. These recovery units are similar to the six recovery units originally designated in the 1994 recovery plan, except that the Northern Colorado and Eastern Colorado recovery units were merged into a single Colorado Desert Recovery Unit (USFWS 2011a). The project area is located within the Northeastern Recovery Unit and does not cross any designated critical habitat.

Mojave desert tortoises are found primarily in Mojave desertscrub, but also in vegetation characteristic of the Lower Colorado River Subdivision of Sonoran desertscrub (Turner and Brown 1994). They are generally associated with communities dominated by creosote bush and other sclerophyll shrubs and small cacti (Germano et al. 1994). Some parts of their range may contain Joshua trees in abundance. In the Mojave Desert, the terrain is generally gently rolling alluvial fans with sandy or gravelly soils (Ernst et al. 1994).

Adequate burrowing substrate and thermal cover species are a crucial habitat component for desert tortoises. In the Mojave region, desert tortoises will construct their own burrows to avoid

extreme hot or cold temperatures. Mojave desert tortoises often excavate burrows under vegetation that can be up to 10 meters (33 feet) deep (Arizona Game and Fish Department 2001). Elevations at which tortoises occur in the Mojave range from below sea level in Death Valley, California, up to approximately 5,000 feet at Yucca Mountain, Nevada (*ibid*).

Desert tortoise surveys were conducted between April 23 and June 3 2009, and April 4 2012, including 27 days and a total of 645 transect miles. Within that time, 15 live tortoises and 187 signs were documented. Of the total signs, 105 burrows, 42 scat, 35 carcasses, 2 egg shells, 1 bone, and 2 sets of tracks were recorded. Figure 3-2 depicts the location of tortoises and sign observed during surveys conducted in 2009 and 2012.

Southwestern Willow Flycatcher

The southwestern willow flycatcher was listed as endangered, without designated critical habitat, on February 27, 1995; primarily because of loss and modification of riparian habitats (60 FR 10695-10715). Critical habitat was later designated on July 22, 1997. A court decision in 2001 resulted in a subsequent final rule on critical habitat on October 19, 2005 (70 FR 60885). In addition to its protected status under the Endangered Species Act of 1973 (ESA), the flycatcher subspecies is classified as protected wildlife under Nevada Revised Statutes, Chapter 501. The Final Recovery Plan for the southwestern willow flycatcher was made available on March 5, 2003 (68 FR 10485). In Nevada, management units are identified for the Virgin River and Pahranagat Valley, and there is designated critical habitat for the southwestern willow flycatcher on the Virgin River, all of which are outside the boundaries of the project area. Critical habitat units had previously been designated by the 1997 rule at Upper and Lower Pahranagat Lake and at the Key Pittman Wildlife Management Area. However, the final rule designating critical habitat for this species excluded the habitat along the Pahranagat Wash and added habitat units on the Virgin River in Nevada and Utah (66 FR 51683-51684).

In the western United States, the southwestern willow flycatcher is often found on willow-covered islands, brush along watercourses, beaver meadows, and mountain parks, always in close association with riparian waters and lentic waters (USFWS 2002). It may be found as high as 2,400 meters (7,875 feet) elevation, and they also follow willow- or cottonwood-lined streams out into desert regions (Terres 1980). Southwestern willow flycatcher territories and nest sites are usually located near open water, cienegas, marshy seeps, or saturated soils (Sogge et al. 1997). In the semiarid and arid parts of the Southwest, hydrologic conditions can vary radically within a season and between years. Many sites have surface water or saturated soil only during the early part of the breeding season. Breeding habitat on the edge of a reservoir may have standing water during a wet year, or it may be farther from surface water during dry conditions.

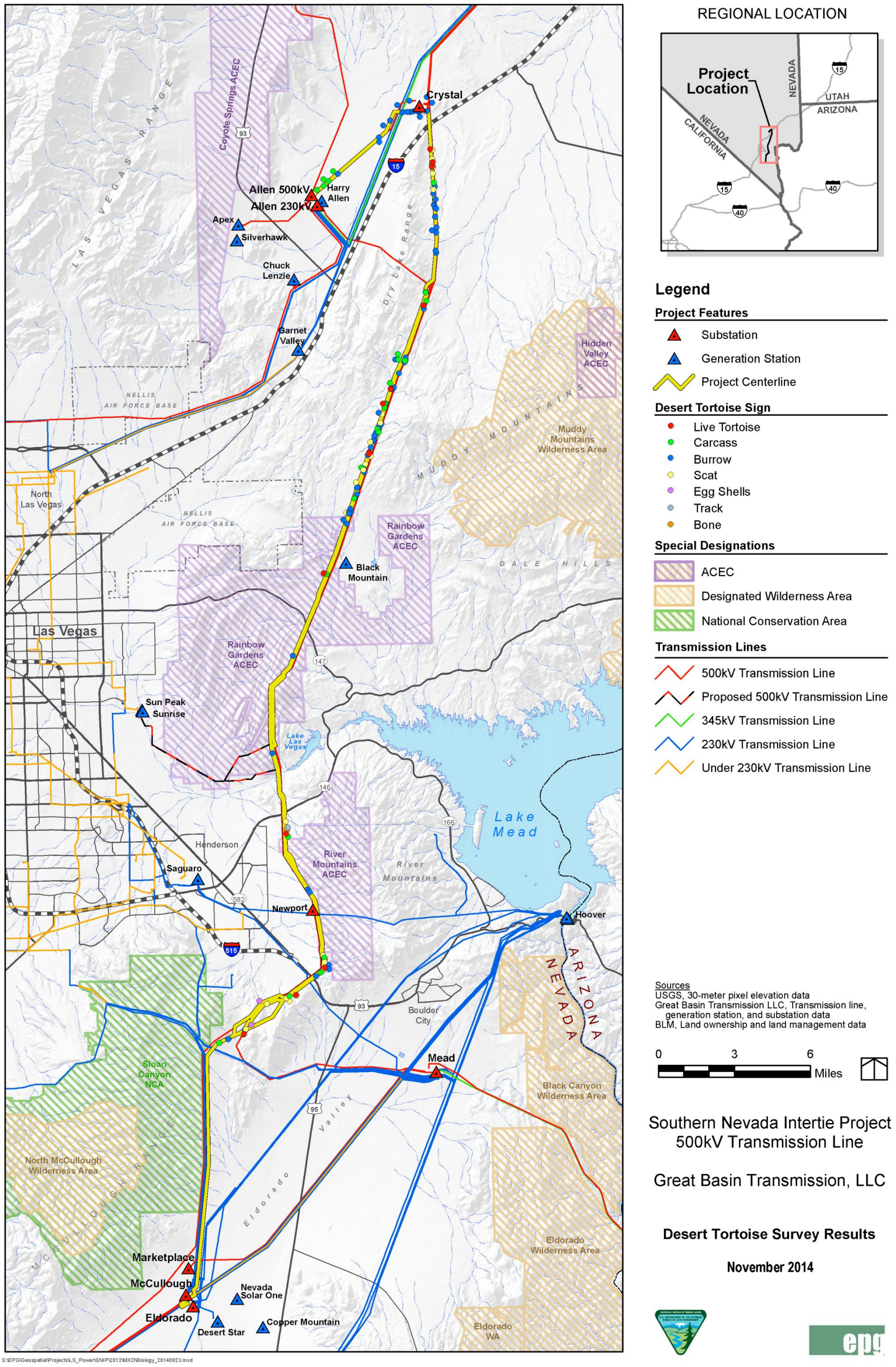

Figure 3-2. Desert Tortoise Survey Results

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The historical distribution of the southwestern willow flycatcher is unclear, but it apparently occurs only sporadically throughout the Mojave region of Nevada, in lowland riparian areas and wetlands (Finch and Stoleson 2000; USFWS 2002). Outside the project area, a dozen territories were observed along the Virgin River in 1997, and potential habitat included the Meadow Valley Wash, the Muddy River, and the Colorado River System (Hiatt and Boone 2003).

Within the proposed project area, the only potentially suitable habitat for southwestern willow flycatchers is along the Las Vegas Wash. During surveys conducted by SWCA in 2007, the first resident southwestern willow flycatcher was detected within the Las Vegas Wash. This individual was detected approximately 1.50 miles (2.40 kilometers) upstream from the proposed transmission line crossing (SWCA 2008). Surveys conducted in 2008 detected a resident west of the Pabco Road Weir, approximately 3 miles upstream of the proposed alignment (SWCA 2009). No residents were detected in 2009 or 2010, but an individual was confirmed in 2011 approximately 1.5 miles upstream from the proposed project alignment (Van Dooremolen 2014a).

In some years, willow flycatchers are only recorded outside the nesting season and may be migrating individuals from one of the other subspecies not listed under the ESA. In 2013, non-resident willow flycatchers were detected near the project area above the Rainbow Gardens Weir and at the Lake Las Vegas Mitigation Wetlands (Van Dooremolen 2014a). Habitat conditions near the project area were noted as largely unsuitable, but with some areas showing improved conditions in some years.

Yuma Clapper Rail

The Yuma clapper rail (*Rallus longirostris yumanensis*) was originally described by Dickey (1923) as a new species of clapper rail (*Rallus yumanensis*), but Oberholser (1937) revised the taxonomy to include it as a subspecies.

The Yuma clapper rail was listed as endangered, without designated critical habitat, on March 11, 1967; primarily because of loss and modification of riparian habitats (USFWS 2006). The species was considered for downlisting in 1983; however, severe flooding of the Lower Colorado River that year and unstable population numbers since has resulted in the proposal not being reconsidered (*ibid*). In addition to its protected status under the ESA, the Yuma clapper rail is classified as protected and endangered wildlife under Nevada Administrative Code 503.050. The Final Recovery Plan for the bird was made available on February 4, 1983 (USFWS 1983), and a draft revised version of the recovery plan was made available on February 10, 2010 (USFWS 2010).

The historic distribution of the Yuma clapper rail is unclear, but the species has recently been documented as far north as Las Vegas Wash, as well as tributaries of the Overton Arm of Lake Mead (Van Dooremolen 2014a).

During Southwestern willow flycatcher surveys along the Las Vegas Wash in 1998, a Yuma clapper rail was detected in the active floodplain of Las Vegas Wash downstream from Pabco Road (SWCA Environmental Consultants 1998). Subsequent surveys resulted in a single individual detected in 2005 and a single individual detected in 2006. Systematic surveys for

Yuma clapper rails conducted in 2000 and 2001 failed to detect any individuals, and no other incidental detections have taken place since 2006 (Van Dooremolen 2014a). The closest known population is present along the Muddy River approximately 40 miles northeast of the Las Vegas Wash (Van Dooremolen 2014a).

Yellow-billed Cuckoo

The yellow-billed cuckoo (*Coccyzus americanus*) was separated into eastern and western subspecies by Ridgway in 1887, based on physical attributes. However, in the late 1980s the USFWS initiated studies to determine the validity of this separation and determined that there were not significant differences phenologically or genetically between subspecies (USFWS 2011b).

The yellow-billed cuckoo was petitioned for listing as an endangered species on February 9, 1998. On July 25, 2001, the western distinct population segment of the yellow-billed cuckoo was found to warrant listing as threatened, but was precluded by higher priority listing actions (66 FR 38611-38626). The species was proposed for listing in 2013, and the listing rule was finalized in 2014. Critical habitat was proposed in 2014. No critical habitat was proposed in or near the project area.

The yellow-billed cuckoo has been recorded infrequently in the Clark County Wetlands Park, which would be crossed by the project. However, surveys in 2013 determined that suitable habitat was absent from nearly all of the Wetlands Park, including the portion crossed by the project, and no suitable habitat is present in the nearby Lake Las Vegas Mitigation Wetlands. The location of the detections and all suitable habitat is approximately 4.3 miles west of the project (Van Dooremolen 2014b).

3.10. Cultural Resources

3.10.1. Introduction

The term "cultural resource" refers to a broad category of historic property types that include 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. Cultural resources deemed significant for their contribution to broad patterns of history, prehistory, architecture, engineering, or culture are eligible for listing on the National Register of Historic Places (NRHP) and afforded certain protections under the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470 et seq.), and under the National Trails System Act (NTSA) of 1968 (16 U.S.C. 1241 et seq.). Because the project is a federal undertaking, it is subject to compliance with Section 106 (16 U.S.C. 470f) of the NHPA. Section 106 requires federal agencies to consider the effects of their undertakings on historic properties, and provide the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to such undertakings. The process for complying with Section 106 is outlined in the implementing regulations found at 36 CFR 800, and those regulations require consultation with the appropriate State Historic Preservation Officers (SHPO), Tribal Historic Preservation Officers (THPO), tribes, the public, and other interested parties, with respect to the identification, evaluation, and treatment of historic properties that may be affected by an undertaking. In

addition, Executive Order 13007 directs federal agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian practitioners and avoid adversely affecting the physical integrity of such sacred sites.

Properties eligible for listing on the NRHP possess characteristics that are significant under one or more of the following evaluation criteria (36 CFR 60.4): they are associated with events that have made a significant contribution to the broad patterns of history; or are associated with the lives of persons significant in our past; or embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or have yielded, or may be likely to yield, information important in prehistory or history.

In addition to demonstrating significance in one or more of the categories listed above, a property must demonstrate integrity. The historic property must be a "preservable entity" that demonstrates the qualities that make it significant; integrity is most often judged on location, setting, design, materials, workmanship, feeling, and association. In general, properties less than 50 years of age, unless of exceptional importance, are not eligible for listing on the NRHP.

3.10.2. Definition of the Area of Potential Effect

As defined in Section 106, the APE refers to the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties," is "influenced by the scale and nature of an undertaking," and "may be different for different kinds of effects caused by the undertaking" (36 CFR 800.16[d]). As specified in the programmatic agreement (PA) for the project, the APE shall be defined to include the area within which there are potential direct and indirect effects to historic properties from activities associated with the undertaking. The 200-foot-wide transmission line ROW and the disturbance limit of all access roads and of all work areas or other facilities for this project is considered the "direct effects APE." Because access roads, work areas, and other facilities have not yet been delineated through final engineering, only the 200-foot ROW has been considered in this EA. The "indirect effects APE" for assessing indirect effects on historic properties outside of the transmission line corridor will be defined in the Programmatic Agreement (PA) being prepared for the project. The PA will also specify measures to be taken to identify indirect effects to historic properties, as well as measures that will be taken to avoid or mitigate potential impacts to those historic properties.

3.10.3. Affected Environment

A Class I cultural resources records and literature review was conducted to identify previously recorded properties and projects conducted within a Class I review area, defined as a 1-mile area surrounding the direct effects APE for the Proposed Action and alternatives. This inventory involved a review of the records maintained in the following repositories:

- Harry Reid Center for Environmental Studies
- Nevada Cultural Resource Information System (NVCRIS) database
- BLM Nevada State Office (General Land Office [GLO]) Maps

The records review identified a total of 208 cultural resource projects that have been conducted in the Class I review area. The majority of these projects were surveys conducted for utilities, including pipelines, transmission lines, and generation stations. Other surveys were for water projects, land sales, mining, recreation (all-terrain vehicle and motorcycle races), communications, and transportation. Surveyed acreages for prior cultural resource projects range from less than 10 acres to more than 45,000 acres. As a result of these prior projects, approximately 36 percent of the combined direct effects APEs for the proposed project and alternatives have been surveyed in the past for projects such as the Harry Allen to Mead Transmission Line, the Dry Lakes Valley Transmission Corridor, and the Las Vegas Valley Disposal Boundary.

The records review also identified previously recorded sites in the Class I review area and in the direct effects APEs for the Proposed Action and alternatives. A total of 294 cultural resource sites have been recorded in the Class I review area, comprising 302 historic and/or prehistoric components. Of these, 59 sites with 60 components are likely to intersect the combined direct effects APEs of the Proposed Action and alternative routes. Table 3-7 summarizes the site types identified in the Class I review area, their eligibility, and the number of sites within the direct effects APE for the Proposed Action and alternatives.

Table 3-7. Cultural Resources in the Class I Review Area and Direct Effects APEs.

	Class I Review Area		**Proposed Action Direct Effect APE**		**Alternative Route Direct Effects APE**	
Component Type	**NRHP Eligible/ Unknown**	**NRHP Ineligible**	**NRHP Eligible/ Unknown**	**NRHP Ineligible**	**NRHP Eligible/ Unknown**	**NRHP Ineligible**
Historic Camp	3	1	1	-	(1)	-
Historic Mine/ Related	6	10	1	-	(1)	-
Historic Rail Road/ Related	1	2	1	1	(1)	1
Historic Structure	6	11	2	2	(2)	(1)
Historic Trail/Road	-	7	1	5	1	2 (2)
Historic Trash	-	16	-	1	-	(1)
Historic Utility	5	4	5	1	3 (1)	(1)
Prehistoric Artifact Scatter	2	1	1	1	1	(1)
Prehistoric Camp	1	2	-	-	-	(1)
Prehistoric Features	16	13	1	1	-	(1)
Prehistoric Fragile Pattern	11	8	5	-	(3)	-
Prehistoric Habitation	7	-	1	-	(1)	-
Prehistoric Lithic Scatter	21	43	4	8	2 (3)	1 (6)
Prehistoric Quarry	9	5	1	1	(2)	1 (1)
Prehistoric Rock Art	2	-	-	-	-	-
Prehistoric Rock Shelter	36	15	3	1	1 (1)	-
Isolated Find	1	26	-	1	-	1 (1)
Unknown Information	11	-	-	-	(1)	-
Totals	**138**	**164**	**27**	**23**	**8 (17)**	**6 (16)**

Table 3-7. Cultural Resources in the Class I Review Area and Direct Effects APEs.						
	Class I Review Area		Proposed Action Direct Effect APE		Alternative Route Direct Effects APE	
Component Type	NRHP Eligible/ Unknown	NRHP Ineligible	NRHP Eligible/ Unknown	NRHP Ineligible	NRHP Eligible/ Unknown	NRHP Ineligible
[1]Numbers in parentheses indicate site components intersecting the direct effects APE for the Alternative route in the 18-mile area of collocation on the existing NV Energy double-circuit transmission structures.						

A high density of cultural resource sites identified in the Class I records review are located within the boundaries of the Las Vegas Wash Archaeological District designated in 1977 and as expanded in 2001. Site types within the district include fragile pattern sites, stone circle features, rockshelters, historic and prehistoric artifact scatters, masonry structures, mining features, irrigation features, trails, and historic roads. Investigations in the area have revealed artifacts dating from the Paleoindian Period (as old as 12,000 years before present) through to historic times, including artifacts left by Spanish explorers and miners.

The density of known cultural resource sites is lower outside of the Las Vegas Wash Archaeological District. Site types identified north of the District include prehistoric rockshelters, lithic scatters, habitations, and features such as stone circles, as well as historic roads and railroads, a camp, and numerous trash scatters. Site types identified south of the District are similar to those present in the north, but also include prehistoric quarries, as well as historic homesteads and settlements, mining related sites, and numerous historic utilities related to irrigation and transmission lines originating at Hoover Dam.

Proposed Action

In the direct effects APE for the Proposed Action there are 27 cultural resource site components that are eligible for listing on the NRHP, or whose eligibility status is unknown or unevaluated. A total of 11 known historic components are present, consisting of a camp, a mining-related site, a railroad-related site, 2 sites with historic structures, 5 historic utility-related sites, and the Old Spanish National Historic Trail (OSNHT). A total of 16 known prehistoric components are present: 1 artifact scatter, 1 site with features, 5 fragile pattern sites, 1 habitation site, 4 lithic scatters, 1 quarry, and 3 rockshelters. It is likely that additional cultural resources sites are present in unsurveyed areas of the direct effects APE for the Proposed Action.

There are no known cultural resource sites eligible or potentially eligible for listing on the NRHP within the direct effects APE associated with the River Mountains East or Dutchman Pass West routing options.

Alternative 1

In the direct effects APE for Alternative 1 there are 25 cultural resource site components that are eligible for listing on the NRHP, or whose eligibility status is unknown or unevaluated. Of the 24 components, 17 are located in the area where the transmission line would be collocated on the existing NV Energy transmission structures. Of these 17 components, a total of 6 known historic components are present: 1 camp, 1 mining-related site, 1 railroad-related site, 2 sites with

historic structures, and 1 historic utility. A total of 10 known prehistoric components are present: 3 fragile pattern sites, 1 habitation site, 3 lithic scatters, 2 quarries, and 1 rockshelter. It is likely that additional cultural resources sites are present in unsurveyed areas of the direct effects APE for Alternative 1. Also present is a single cultural resource site for which no information could be obtained. The 8 components located outside of the collocation area are: 3 historic utility related sites, 1 prehistoric artifact scatter, 2 prehistoric lithic scatters, 1 prehistoric rockshelter, and the OSNHT.

3.11. Paleontological Resources

Geological units within 1 mile of the project centerline were inventoried for their paleontological potential based on the Potential Fossil Yield Classification (PFYC) assigned to them by the BLM. The PFYC system is a five-tiered system with a PFYC of 1 assigned to geological units with low to no potential for containing paleontological resources (igneous and metamorphic rocks); whereas a PFYC of 5 is assigned to geological units that consistently contain significant paleontological resources. The project area contains six geological units that have a moderate to high paleontological potential (PFYC 3 or 4) (Table 3-8). Geological units that have a moderate paleontological potential include deposits of Permian age (Kaibab, Toroweap, and Coconino formations), deposits of Triassic age (undifferentiated Chinle and Moenkopi formations), the Aztec Sandstone of Jurassic age, and Quaternary lakebed deposits. Geological units that have a high paleontological potential include the Horse Spring and Muddy Creek formations, both of Tertiary age (all geological units from Stewart and Carlson 1978).

The deposits of Permian age do not contain any known paleontological localities within the project area. However, there are other Paleozoic geological units with a lower paleontological potential that do contain paleontological localities within the project area. These paleontological localities contain marine invertebrate fossils. The deposits of Triassic and Jurassic age do not contain any known paleontological localities within the project area.

The Horse Spring Formation of Oligocene to Miocene age has not produced any paleontological localities within the project area. Elsewhere in southern Nevada, the Horse Spring Formation contains fossils of Myotis sp. (bat) and fossil trackways of dogs, camels, and birds (Czaplewski 1993; Kissel-Jones and Rowland 2003). Mollusk and plant fossils have also been found (Longwell et al. 1965).

The Muddy Creek Formation of Miocene to Pliocene age contains a number of paleontological localities in Clark County, Nevada. These localities include a number of fossil trackways made by carnivores, camelids, and birds north of the project area (Varhalmi 2007). Fossil materials described from the Muddy Creek Formation include two carnivores (Aelurodon sp. cf. A. validus [bone-crushing dog] and Indarctos sp. [bear]); an equid [horse]; and five artiodactyls (Megatylopus sp. [camel], Alforjas sp. [camel], Hemiauchenia sp. [llama], Texoceros sp. [pronghorn], and Neotragoceras sp. [bovid]) (Longwell et al. 1965; Reynolds and Lindsay 1999; Tedford et al. 2004).

Table 3-8. Geological Units and Associated Paleontological Potential within 1 mile of the Project Centerline.					
Geological Unit	**Map Symbol**	**Geological Age**	**PFYC**	**Paleontological Potential**	**Survey/ Monitoring**
Quaternary Terrestrial Sediments					
Alluvium, undifferentiated	Qal	Quaternary	2	Low	No
Playa, lakebed, alluvial-flat deposits	Qpl	Quaternary	3	Moderate/ Undetermined	Yes
Tertiary Igneous Rocks					
Basalt	Tb3	Miocene	1	Low	No
Younger andesite and intermediate flows and breccias	Ta3	Miocene	1	Low	No
Younger rhyolitic flows and shallow intrusive rocks	Tr3	Miocene	1	Low	No
Andesite and basalt flows	Tba	Miocene – Oligocene	1	Low	No
Felsic phaneritic intrusive rocks	Tfi	Miocene – Eocene	1	Low	No
Tertiary Sedimentary Rocks					
Muddy Creek Formation	Ts3	Pliocene – Miocene	4	High	Yes
Horse Spring Formation	Ths	Middle Miocene – Upper Oligocene	4	High	Yes
Mesozoic Igneous Rocks					
Felsic phaneritic intrusive rocks	Kfi		1	Low	No
Mesozoic Sedimentary Rocks					
Eolian crossbedded sandstone including Aztec Sandstone	Jas	Jurassic	3	Moderate/ Undetermined	Yes
Continentally derived siltstone and clay	JTRch	Lower Jurassic – Upper Triassic	3	Moderate/ Undetermined	Yes
Marine siltstone, limestone, and conglomerate including Chinle and Moenkopi formations	TRmt	Middle – Lower Triassic	3	Moderate/ Undetermined	Yes
Paleozoic Marine Sedimentary Rocks					
Cherty limestone, dolomite, shale, and sandstone	Pc	Middle – Lower Permian	2	Low	No
Siltstone, sandstone, limestone, and dolomite including Bird Spring Formation	Psc	Lower Permian	2	Low	No
Bioclastic limestone including Callville Limestone	IPMbc	Pennsylvanian – Upper Mississippian	2	Low	No

The proposed alignment crosses surface exposures of Quaternary lake sediments in Dry Lake Basin northeast of the Harry Allen Substation. This lithologic unit, which was likely deposited during the Pleistocene Epoch (approximately 1.8 million to 11,000 years ago), has an undetermined potential for paleontological resources. Pleistocene lake sediments in the American Southwest commonly contain significant fossils. Although Quaternary deposits tend to have a low paleontological potential (PFYC of 2), there is a paleontological locality of Quaternary age within the project area. Previous excavations of this locality, Gypsum Cave, have found fossils of land mammals that include *Camelops sp.* (camel), *Canis dirus* (dire wolf), *Nothrotheriops shastensis* (Shasta ground sloth), *Hemiauchenia sp.* (llama), *Equus sp.* (horse), and *Ovis canadensis* (bighorn sheep) (NSM record search; UCMP record search; Stock 1931; Laudermilk and Munz 1934; Harrington 1933; Hendrick et al. 1998).

3.12. Land Use, Recreation, and Access

3.12.1. Environmental Setting and Methodology

The proposed project is located in portions of the Apex Valley and the eastern Las Vegas Valley. It is primarily within unincorporated Clark County, but portions of the line would also be located within the city limits of the City of Henderson and Boulder City. The proposed project is located adjacent to multiple high-voltage transmission lines and is primarily within a BLM-designated utility corridor.

Land use information, including land ownership and jurisdiction, existing land use, and planned land use were collected within the proposed project study area. The study area was defined by applying a 0.75-mile buffer on either side of the reference centerline (creating a 1.5-mile corridor) of the proposed alternatives. Information on land uses in the study area was derived from existing literature, communications with various agencies, aerial photography interpretation, and field reconnaissance activities conducted during April and May 2009, and updated through aerial interpretation in August 2014.

3.12.2. Land Ownership and Jurisdiction

The land managing agencies within the study area include the BLM, Reclamation, Clark County, the City of Henderson, Boulder City, the National Park Service within the Lake Mead National Recreation Area, and the Moapa River Indian Reservation. The extent of lands within the study area is shown on Figure 2-1 and Figure 2-2, and is included in Table 3-9 and Table 3-10, below.

The BLM and Reclamation administer the majority of the public lands to be crossed by the proposed project. Land management mandates for the BLM stipulate that lands are to be managed in such a way as to foster multiple uses, including use of land and water resources, protecting fish and wildlife, preserving environmental and cultural values, providing for recreation, and managing energy and mineral resources. Reclamation is responsible for managing federal lands for Reclamation project purposes in accordance with all applicable laws, policies, and directives and standards.

Table 3-9. Land Ownership			
Proposed Action		**Alternative 1**	
Land Owner	**Miles Crossed**	**Land Owner**	**Miles Crossed**
BLM	45	BLM	44
Reclamation	6.6	Reclamation	6.3
Private	2.0	Private	2.0
Clark County	0.5	Clark County	0.5
Boulder City	4.0	Boulder City	4.0

Table 3-10. Local Government Jurisdiction			
Proposed Action		**Alternative 1**	
Land Jurisdiction	**Miles Crossed**	**Land Jurisdiction**	**Miles Crossed**
City of Henderson	7.6	City of Henderson	8.3
Boulder City	4.4	Boulder City	4.4
Clark County	46.5	Clark County	45.8

The Lake Mead National Recreation Area (NRA), managed by the National Park Service, is located approximately 1 mile east of the proposed ROW in the Lake Mead Boulevard/Highway 146 area. The Lake Mead NRA provides a variety of recreational opportunities, including boating, camping, hiking, fishing, water skiing, and wildlife viewing. The proposed route does not cross the Lake Mead NRA. The southern border of the Moapa River Indian Reservation is approximately 1 mile north of the proposed ROW as the alignment passes the Crystal Substation. However, the project does not cross the Moapa River Indian Reservation.

The portion of the study area under BLM jurisdiction is subject to the 1998 Las Vegas RMP, as amended. BLM is currently revising the 1998 Las Vegas RMP to update resource issues and address emerging issues not in the current plan. Scoping was conducted in 2010 and the Draft EIS and RMP Revision are forthcoming. Until a Decision Record is signed, however, the 1998 RMP will be the guiding document. The RMP provides a comprehensive framework for managing approximately 3.3 million acres of public lands administered by the BLM Las Vegas Field Office. The RMP Management Objective and Directions applicable for the Proposed Action are Objective RW-1, and Management Directions RW-1-e and RW-1-h, which provide for ACECs, and are ROW avoidance areas.

Additionally, this RMP identifies utility corridors. In January 2009, the West-wide Energy Corridor Programmatic EIS was approved. The utility corridor identified as part of that EIS amended the RMP for inclusion of these corridors. Corridor 39-231 is a multimodal corridor ranging in width between 500 and 3,500 feet, containing portions of a number of existing utility facilities that include 230 and 500 kV AC transmission lines, a 500 kV DC transmission line, and underground water and natural gas pipelines. The majority of the project alignment is located within this corridor.

Lands within the study area that are owned by the state of Nevada are areas managed by the Nevada Department of Transportation.

Local governments that have the authority to plan and control land uses on non-federal land within their jurisdiction through the development of land use planning and zoning ordinances include the City of Henderson, the City of Boulder City, and Clark County.

Private lands within the study area generally consist of residential communities near the Lake Las Vegas and Henderson area, and commercial/industrial areas, with intermittent industrial and commercial uses throughout. These specific existing land uses are discussed in more detail below.

3.12.3. Special Management Areas

The following special management areas are located within the project study area.

BLM Rainbow Gardens ACEC

The Rainbow Gardens ACEC is crossed by the proposed alignment between mile markers 22 and 34 (see Figure 2-1 and Figure 2-2), and is managed to protect the geologic, scientific, scenic, and cultural resources and sensitive plants. Unique cultural resources can be found in the ACEC. Gypsum Cave has been nominated to the NRHP based on its traditional importance to Southern Paiute and Chemehuevi tribes, and its importance to the early history of North American archaeology through the work done at the cave. It contains deposits of gypsum and sandy soils that support sensitive plant species, including the Las Vegas bearpoppy. Commonly referred to as "badlands" by locals, this area has historically been used as off-highway vehicle (OHV) play areas. The soils are very friable when disturbed, and the cyptobiotic surface is easily damaged. The ACEC protects a portion of this habitat.

BLM River Mountains ACEC

The River Mountains ACEC is crossed by the proposed alignment between mile markers 33 and 42, and is managed to protect habitat for the River Mountains desert bighorn sheep herd and to protect the scenic viewshed for the Cities of Henderson and Boulder City. It contains rough, rocky, and steep terrain, broken up by canyons and washes that provide the steep slopes where bighorn sheep can escape from predators. It shares an eastern boundary with lands managed for the herd in the Lake Mead NRA. This herd has suffered from loss of habitat due to the increase of urban development in its range, from the expansion of Boulder City and Henderson and the widening of US 95 (BLM 2011).

BLM Sloan Canyon National Conservation Area

The Sloan Canyon National Conservation Area (NCA) is located adjacent to the utility corridor between mile markers 47 and 57, and features unique scenic and geologic features and extraordinary cultural resources. The landscape varies from lowland dry lake beds to volcanic rock peaks reaching heights over 5,000 feet. The centerpiece of the area is the Sloan Canyon Petroglyph Site, one of the most significant cultural resources in Southern Nevada. Archaeologists believe that the more than 300 rock art panels with 1,700 individual design elements were created by native cultures from the Archaic to the Historic era.

3.12.4. Existing Land Use

This section describes BLM authorized projects and existing land uses (residential, commercial, etc.). The identification and verification of existing land uses was determined by using existing data sources, aerial interpretation, and field reconnaissance during April and May 2009. Aerial interpretation was used to update existing land use in August 2014.

Commercial

Commercial land uses within the study area include commercial development associated with Lake Las Vegas, and a mixture of commercial development in the City of Henderson. No commercial land use is crossed by the proposed route.

Industrial

The River Mountain Water Facility Treatment Plant is on the opposite side of the corridor from the proposed route. A variety of industrial uses fall within the limits of the City of Henderson. The Apex Industrial Area, located within the City of North Las Vegas, is within a portion of the study area around the Harry Allen Substation.

There are a number of extraction and mining operations within the study area, including the PABCO Gypsum operation. The PABCO Gypsum operation is located in the central portion of the proposed route, north of the Lake Las Vegas development. Several other operations in the southern portion of the study area are located on both BLM and Boulder City lands. None of the current operations are crossed by the proposed route, although several are adjacent to it.

Utilities

The proposed project is located in a designated utility corridor and parallels existing high-voltage transmission lines for almost the entire route. In addition, several electric generating stations and substations are in the vicinity of the study area.

Transportation

The transportation network in the project study area includes principal regional highways, paved and unpaved roadways, and the Union Pacific Railroad. Other transportation resources within the study area include nonmotorized transportation facilities such as bicycle paths, pedestrian sidewalks, hiking trails, and horse trails. The majority of the nonmotorized transportation facilities are located in the populated areas between mile markers 37 and 43 of the proposed alignment.

3.12.5. Recreation

A variety of recreational opportunities exists within or adjacent to the study area, including golf courses, parks, hiking and biking trails, OHV use, shooting ranges, resorts and casinos, and boating facilities. In several locations along the proposed route, existing trails are crossed; but in

these instances, the proposed route parallels existing high-voltage transmission lines and is within the BLM designated utility corridor.

Golf courses associated with Lake Las Vegas are located within the study area, adjacent to mile marker 35. Three golf courses are within the boundaries of Lake Las Vegas. Two of the courses, The Falls and Reflection Bay, are located in the western and central part of Lake Las Vegas respectively, and were closed in 2009 as part of Lake Las Vegas' bankruptcy reorganization. The Golf Club at South Shore is a private golf club located in the eastern part of Lake Las Vegas that remains open. The proposed route does not cross any of these courses. A driving range associated with the now-closed Falls Golf Course is crossed by the proposed alignment (Las Vegas Sun 2008, 2009).

The project area is located in hunting units 263 and 268, which allow for the hunting of mule deer and bighorn sheep (NDOW 2010).

The Clark County Wetlands Park is a 2,900-acre county park that includes paved and unpaved paths and a nature preserve. The park facilities and nature preserve are located approximately 5 miles west of the project area along the Las Vegas Wash, however the park extends along the Las Vegas Wash and has trails which are crossed by the Proposed Action (Clark County 2014).

The River Mountains Loop Trail is a multi-agency, multi-use trail located on City of Henderson, Reclamation, and City of Boulder City lands. This trail is a well-used recreation opportunity in the River Mountains area. All of the entities referenced above, along with the National Park Service, partner in the management of the trail. The River Mountains Loop Trail segments located on Reclamation land are managed by the City of Henderson under contract with Reclamation, and are crossed by the Proposed Action and multiple adjacent utility facilities in several locations.

The City of Henderson's Equestrian Park (South) is located approximately 0.5 miles from the project area, adjacent to mile marker 41. Equestrian Park (South) is a 5-acre park with a 1.8-mile dirt horse path, a lighted dog park, open grass areas, picnic tables, and a paved biking/walking trail that connects to other trails along the transmission line corridor (City of Henderson, Parks and Recreation 2012).

3.12.6. Planned and Future Land Use

Land management for private lands is only restricted by local land use controls or state or federal laws pertaining to specific activities. The City of Henderson and Clark County Comprehensive Plans and Boulder City's Master Plan govern the development of private lands within the respective jurisdictions. Following is a description of the plans, and specific planned land use designations within the study area.

Clark County

The Clark County Comprehensive Plan describes land uses throughout the county, provides for regional services and facilities, and governs development within unincorporated areas. The land use element of the comprehensive plan includes numerous planning documents that provide

guidance for land uses within communities throughout the county. Land use guidance has been prepared for the unincorporated towns/areas in the Las Vegas Valley and for the outlying areas of the county, as well as for rural areas outside the Las Vegas Valley, including the northeast, northwest, and south portions of the county. All planning documents are generally updated every 5 years.

With regard to electric transmission lines, the land use plan and development guidelines promote the combined use of corridors by utilities and the use of existing corridors whenever possible. Clark County works with local jurisdictions and Regional and Federal agencies to coordinate the planning and building of an extensive network of trails. The county trails system is part of the Neon to Nature regional system of trails in the Las Vegas Valley (Clark County 2014).

Planned industrial designations within the study area are generally associated with the Apex Industrial Park and the PABCO Gypsum operation in the central portion of the proposed route, between mile markers 23 and 26, within unincorporated Clark County (Clark County Department of Comprehensive Planning 2010).

City of Henderson

The City of Henderson Comprehensive Plan governs development of non-federal land within the incorporated area of the City of Henderson. The majority of the route through Henderson will run adjacent to areas with existing and planned low density residential development; however, the proposed route is on the opposite side of existing high-voltage transmission lines through these areas.

Planned residential land designations within the study area include low-to-medium density single-family residential development, within the incorporated boundaries of the City of Henderson, primarily within the Lake Las Vegas development. The Lake Las Vegas development is a 3,592-acre development built around Lake Las Vegas located north of SR 564 (Lake Mead Parkway), which is crossed by the proposed route between mile markers 31 and 34. It consists of single-family residential development, three hotels, a casino, a marina, and three golf courses (two of which are currently closed).

The proposed Jericho Heights development project is a 752-unit multi-family residential development on 81 acres located just south of Highway 93, which is crossed by the proposed route between mile markers 42 and 43. The development includes seven four-story residential structures, a boat storage facility, a tavern, and a restaurant with a drive-thru. The Jericho Heights development project was originally approved in 2008 and has had multiple approval extensions. There have been no building permits approved for the project.

The underlying zoning of the remaining City of Henderson parcels crossed by the project area is Development Holding Zone. A Development Holding Zone is defined as a district established to provide a suitable classification for limited service areas to avoid premature development; permitting only low-density development until utility and community services can be provided.

Planned commercial designations within the study area are located within the City of Henderson near Highway 93 and Lake Las Vegas. The project area also passes through a commercial planned land use corridor in the Lake Las Vegas area (City of Henderson 2014).

The Boulder City Bypass Project is a traffic improvement project for Highway 93 in the city of Henderson and Boulder City, Nevada. The western portion of the planned project would connect with Highway 93 approximately 0.75 miles east of the Proposed Action.

City of Boulder City

The Boulder City Master Plan governs development of non-federal lands within the incorporated area of the City of Boulder City. The only City of Boulder City land that falls within the study area is the southernmost portion, between mile markers 48 and 57. The entire route through Boulder City will run adjacent to existing high-voltage transmission lines and is identified as BLM land in the planned land use section of the Master Plan (Boulder City 2009).

3.13. Visual Resources

This section of the EA addresses the affected environment associated with visual resources that includes Visual Resource Management classes, planning level Visual Resource Inventory (VRI), and key observation points (KOP). Visibility related to the construction, operation, and maintenance of the proposed transmission line and ancillary facilities is also addressed in this section, because visibility of the project is one of several criteria used to select KOPs.

The inventory for the affected environment, including the planning level VRI and project level KOPs, considered visual resources potentially affected by the construction and operation of the proposed project. Consistent with methods based on the BLM's VRM System (Manual H-8410-1, 1986), the VRI focused on the identification of project-level KOPs and planning-level VRI information established to support BLM RMP decisions. Planning level VRI data characterizes the scenic value of BLM-administered land based on an evaluation of scenic quality, sensitivity levels, distance zones, and VRI and VRM classes. This visual assessment includes an inventory and assessment of visual resources within the study area for the Proposed Action and alternatives. Visual resource data was collected 2 miles on either side of the centerline of the route centerlines from existing and future land use plans, aerial photography, BLM data, and field review.

3.13.1. Environmental Setting

The study area is located entirely within the Basin and Range physiographic province in southeast Nevada (Fenneman 1931). This geographic province is characterized by its isolated roughly parallel mountain ranges separated by closed (undrained) desert basins. The mountain ranges often run 50 to 70 miles in length and generally traverse north to south.

The major topographic features that define the scenic quality for the project include rock escarpments associated with the Dry Lake Range and the southeast extents of the Arrow Canyon Range in the northern portion; River Mountains, Sunrise Mountain, Frenchman Mountain, and the western edge of the Muddy Mountains in the central portion; and the McCullough Mountains

and Sloan Canyon in the southern portion of the study area. The project is located entirely within the Mojave Desert, where vegetation is typically dominated by creosote, sagebrush, brittlebush, and cholla, with scattered occurrences of yucca on flat terrain. These communities may vary in density and size. Most of the foothills and mountainous areas are vegetated along their slopes with scattered creosote-bursage and other desertscrub, which become smaller and scarcer near the peaks. Greater density and diversity of vegetation is found along the Las Vegas Wash, including cottonwood, desert broom, reeds, riparian grasses, and invasive species such as tamarisk. The diversity of vegetation associated with the Las Vegas Wash along with the constant presence of surface water provides movement, texture, color, and interest in this otherwise arid and sparsely vegetated setting.

With minor exceptions, the project would be located adjacent to multiple extra-high-voltage transmission lines primarily within BLM-designated utility corridors on federal lands; hence the natural landscape setting has been heavily modified in the immediate vicinity of the Proposed Action and alternatives. The multimodal utility corridor contains portions of a number of existing utility facilities, including 500 kV, 230 kV, and less than 230 kV transmission lines, and a number of underground water and natural gas pipelines. The Crystal, Harry Allen, Marketplace, McCullough, and Eldorado substations, and the Nevada Solar One Power Plant are also located within the study area. Gravel extraction areas and the Northeast C-1 Detention Basin, which are highly visible, are located within the study area. The City of Henderson, a large community associated with the Las Vegas metropolitan area, is concentrated near the central portion of the study area.

3.13.2. Project-Level Inventory

Key Observation Points

KOPs represent critical or typical viewpoints within, or along, an identified location. The identification of KOPs is required by the BLM to assess and mitigate visual impacts of a proposed action and to demonstrate compliance with designated VRM classes. KOPs were identified in coordination with the BLM recreation/VRM specialist, resulting from land use investigations that included the identification of individual residences, communities, recreation areas, and travel routes. Agency-approved KOPs that will be used to describe the affected environment and demonstrate compliance with the RMP in Chapter 4 are referred to as KOPs 1 through 7. Following are characterizations of inventoried KOPs that have been organized by residences, recreation areas, and travel routes. A map displaying the location of each KOP is provided in Appendix B.

Residences

Residential development is concentrated in the central portion of the study area in the City of Henderson. The northernmost residences in the study area are located within the Lake Las Vegas development in Henderson.

KOP 3 – Lake Las Vegas is located on the east side of the route alignments with varying residential densities. Some residences occur within 900 feet (approximately) of the project centerlines and have unobstructed, superior, or elevated views of the landscape. The landscape in

this vicinity has been locally modified by an existing designated utility corridor that runs along the west side of the development on BLM VRM Class III lands.

KOP 4 – South of Lake Las Vegas, residences near Henderson are located on the west side of the route alignments, which are located within the utility corridor crossing BLM VRM Class IV lands. Other modifications near the utility corridor include a water treatment facility, a detention basin and associated drainage channel, and a number of underground water and natural gas pipelines. These residences are located within approximately 700 feet of the existing utility corridor and have unobstructed, level views of the landscape. BLM VRM Class IV lands would be viewed by these residences.

KOP 5 – Similar to KOP 4, residences in the southern portion of Henderson are located on the west side of the route alignments, which cross BLM VRM Class IV lands. An unobstructed, level view of the landscape, which has been modified by the existing utility corridor, is visible to these residences within 0.25 mile (approximately).

Recreation Areas

KOP 7 – Quo Vadis Trailhead and trail were formally designated or defined as high-sensitivity trails/trailheads within the study area. The Quo Vadis trailhead is located along the segment of the proposed route that leads to the McCullough and Marketplace Substations. The trailhead itself is located immediately adjacent to a designated utility corridor that is occupied by three existing transmission lines and designated as VRM Class III lands. An unnamed trail leads from the Quo Vadis trailhead into the Sloan Canyon NCA.

Travel Routes

There are no formally designated scenic roads or parkways within the study area. Lake Mead is in proximity to the study area, and travel routes that provide primary access to this recreation destination were inventoried as high sensitivity.

KOP 1 – I-15 is one of the main regional transportation routes into the Las Vegas metropolitan area from the northeast. Travelers on I-15 are typically frequent (local) commuters, and therefore I-15 was inventoried as a moderate-sensitivity travel route. The Proposed Action and Alternative 1 would cross I-15 near the Crystal and Harry-Allen substations in a landscape setting that has been modified by three existing transmission lines. BLM VRM Class III lands are designated for this utility corridor.

KOP 2 – Lake Mead Boulevard leads into the Lake Mead NRA and was inventoried as a high sensitivity recreation destination travel route. The proposed route would cross the road within the River Mountains ACEC in an area where views of the project would be modified by three existing transmission lines within a BLM-designated utility corridor classified as VRM Class III land.

KOP 6 – Boulder Highway is a local transportation route between Las Vegas and Boulder City. This travel route is associated with moderate sensitivity because it is primarily used by local commuters. Similar to KOP 1, Boulder Highway would be crossed by the Proposed Action and

Alternative 1 in a landscape setting that has been modified by three existing transmission lines within a designated BLM utility corridor classified as VRM Class IV land.

3.13.3. Planning-Level Inventory (BLM VRI)

The BLM VRM system requires the inventory of scenic values and the establishment of management objectives for those values through a VRM planning process. The VRI process and its resulting information provide the information necessary to characterize the existing or affected environment, and are required for management and project-level decisions. BLM manual H-8410-1 defines the criteria that define VRI components of scenic quality, sensitivity levels, distance zones, and VRI classifications that are summarized below.

Scenic Quality Rating Units

Scenic quality, as defined by the BLM, is the measure of the visual appeal of a tract of land and is used to describe scenery. In the VRI process, public land is given an A, B, or C rating, based on the evaluation of the following seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications.

The Proposed Action and alternatives would primarily traverse Class C scenic quality associated with the undeveloped creosote flats in North Las Vegas and Henderson. Class B scenery traversed by the Proposed Action is associated with the Rainbow Gardens ACEC. Here, geologic variety results in color and texture variations, which contributes to the scenic quality of this landscape.

Sensitivity-Level Rating Units

Sensitivity levels are a measure of public concern for the maintenance of scenic quality associated with a given tract of BLM land. 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, and special areas, among other factors.

The Proposed Action and alternatives would primarily traverse low-sensitivity areas in North Las Vegas and Henderson. High-sensitivity areas traversed by the project are associated with the Dutchman's Pass area.

Distance Zones

Per BLM guidance, landscapes are subdivided into three distance zones based on relative visibility from KOPs. The three distance zones are foreground-middleground (0 to 5 miles), background (15 miles), and seldom seen (greater than 15 miles).

The Proposed Action and alternatives are located in the foreground–middleground distance zone from predominant travel routes, including I-15, Lake Mead Boulevard, and Boulder Highway.

Visual Resource Inventory Classifications

VRI classes are created using GIS, incorporating the following components: (1) scenic quality, (2) sensitivity levels, and (3) distance zones. VRI classifications represent the inventoried scenic values of BLM administered lands, and have similar objectives as compared to VRM classes.

The Proposed Action and alternatives would primarily cross VRI Class IV lands. VRI Class II lands crossed by the project are generally within the former Sunrise ISA. It is important to note that at the scale in which the VRI classifications were derived, the existing extra-high-voltage transmission lines and designated BLM utility corridor were not taken into account in the Class II designation. VRI Class III lands crossed by the project are associated with BLM land near Dutchman's Pass.

Visual Resource Management Classifications

BLM VRM classifications are assigned to lands managed by the BLM through the RMP development (NEPA) process, and provide direction regarding levels of visual change as well as mitigation to decrease potential landscape change within each class. VRM classifications range from Class I, which is the most restrictive and typically assigned to wilderness areas; to Class 4, which is the least restrictive (i.e., assigned to areas planned for mines, infrastructure, etc.). VRM class designations are typically dictated by the scenic quality of the landscape, public concern for the maintenance of the scenic quality, distance zones and associated visibility, and specific management prescriptions based on land use, such as wilderness study areas or areas of critical concern (see Appendix A). Although the VRI provides important information that is used to make VRM class decisions, ultimately, other uses as described in the BLM RMP may dictate the final VRM classification.

VRM classes were inventoried within the study area using GIS data acquired from the BLM (Las Vegas Field Office, July 2008; BLM 2008). The majority of land crossed by the Proposed Action and alternatives is designated as Class III and is comprised of either open desert or the alluvial areas and foothills associated with the Dry Lake Range, Sunrise Mountain, River Mountain, or Eldorado Valley. Class IV areas that would be crossed are characterized by open desertscrub lands consisting of creosote-bursage. The Proposed Action and alternatives would not cross VRM Class I or Class II areas.

3.14. Socioeconomics

The socioeconomic analysis characterizes the human resources occupying the areas surrounding the proposed project and the project's economic impacts. Human resources such as residences, places of work, schools, and other facilities could be subject to potential changes due to the construction and operation of the transmission line. This section provides a brief inventory of the current status and trends of these resources. The study area considered for the proposed project includes census tracts crossed by the proposed centerline.

3.14.1. Demographics

Nine census tracts, as established by the 2010 U.S. Census Bureau, are crossed by the proposed project. The combined population of these tracts in 2010 was 28,541 people. Table 3-11 provides population figures for these tracts, the most populated of which are between the Las Vegas Wash and Highway 95 (from north to south: 56.13, 57.11, 53.60, and 54.35). Census tracts in these highly populated areas cover smaller areas than those tracts in less populated areas.

Table 3-11. Population by Census Tract

Census Tract	2010 Population	Percent of Total
53.60	4,111	14.4
54.35	3,415	12.0
54.37	2,981	10.4
56.13	4,657	16.3
57.03	1,440	5.0
57.11	4,348	15.2
59.02	1,433	5.0
61.04	3,399	11.9
78	2,757	9.7
Total Population	**28,541**	**100**

Source: U.S. Census 2010

During the 2010 census, there were 13,137 housing units within the nine census tracts. Of these units, 2,976 (22.7 percent) were vacant. This is an increase from the 12 percent of vacant housing units during the 2000 census, another sign of the recent economic downturn.

3.14.2. Economic Characteristics

Data from Clark County Comprehensive Planning illustrates that the county's economy is dominated by the tourism industry. The largest sectors of employers are leisure and hospitality, casino hotels and gaming industries, and trade, transportation and utilities (Table 3-12). From 2011 to 2013, Las Vegas hosted more than 38,000,000 visitors annually (LVCVA 2014). Resorts and casinos were the largest employers in Clark County in 2012, with other top employers including retail and government services (NDETR 2014).

Table 3-12. County Labor Market Summary as of 2012

Job Type	Number of Workers	Percent of Total
Arts, Entertainment, Recreation, Accommodation, and Food Services	262,336	29.2
Public Administration	36,978	4.1
Transportation and Public Utilities	42,746	4.8
Professional (Scientific and Management), Administrative, and Waste Management Services	97,335	10.8
Retail Trade	105,803	11.8

Table 3-12. County Labor Market Summary as of 2012		
Job Type	**Number of Workers**	**Percent of Total**
Construction	66,836	7.4
Education Services, Health Care, and Social Assistance	127,575	14.2
Finance, Insurance, and Real Estate (Rental and Leasing)	55,291	6.1
Other Services	40,606	4.5
Manufacturing	29,462	3.3
Wholesale Trade	16,602	1.8
Information	15,170	1.7
Agriculture, Forestry, Fishing, Hunting, and Mining	2,779	0.3
Total	**899,519**	**100.00**
Source: NV Energy Economic Development Department		

3.15. Environmental Justice

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) requires all federal agencies to assess whether their programs, policies, and activities have disproportionately high and adverse human health or environmental effects on minority and low-income populations in the United States. The criteria for a finding of possible environmental justice issues is the occurrence of more than 50 percent of the population affected by the Proposed Action being minority or low-income. Data was collected on the income and poverty status of the populations within the census tracts traversed by the proposed project.

Clark County and the Las Vegas Metropolitan Statistical Area have experienced tremendous growth over the past several decades. The population increased from 797,142 in 1990 to 1,428,690 in 2000, an increase of 79 percent over the decade; to 1,951,269 in 2010, an increase of 36.6 percent increase over the last decade. However, due to recent economic downturns, growth has slowed dramatically in the past few years. In 2008, there was a decrease in population; the first population decrease in decades.

The existing residential areas within the census tracts crossed by the project include a smaller proportion of minority (37.3 percent) populations when compared to the state (60.4 percent) and Clark County (68.3 percent); but a larger proportion when compared to the Boulder City population (14.8 percent). The existing residential areas within the census tracts crossed by the project have virtually the same minority populations when compared to the City of Henderson (38.0 percent) (Table 3-13).

The percentage of families living below the poverty line in the project study area in 2010 is estimated at 7.5 percent, which is similar to both the City of Henderson (8.2 percent) and Boulder City (7.3 percent), but below the percentage of families living below the poverty line in the state (11.9 percent) and Clark County (11.7 percent). The project study area represents a relatively diverse range of families living below the poverty line, ranging between 0.9 percent for

Census Tract 57.11, located within Boulder City, and 18.5 percent for Census Tract 78, which is composed entirely of Nellis Air Force Base (Table 3-14).

The median household income for the project study area was estimated at $78,784 in 2010, which is higher than the state ($55,726), Clark County ($56,258), the City of Henderson ($68,039), and Boulder City ($62,171). However, there are three census tracts within the project study area that have median household incomes below that of the state and Clark County: tract 57.03 ($32,228) located in Boulder City, where the project connects with the Eldorado Substation; tract 59.02 ($34,855) located in Northern Clark County, where the project begins at the Harry Allen Substation; and tract 78 ($40,029), which is Nellis Air Force Base. Alternatively, there are two census tracts within the project area that have median household incomes that are almost twice the median household income of Nevada and Clark County: tract 54.37 ($108,527), which includes the exclusive Lake Las Vegas development within the City of Henderson; and tract 57.11 ($104,946), which is located within Boulder City.

Table 3-13. Racial Breakdown 2010

	Total	White	Hispanic or Latino	Black or African American	American Indian/ Alaska Native	Asian	Native Hawaiian/ Other Pacific Islander	Other	Two or More Races	Percent Minority
Nevada	2,700,551	1,786,688	716,501	218,626	32,062	195,436	16,871	324,793	126,075	60.40
Clark County	1,951,269	619,468	568,644	204,379	14,422	168,831	13,628	262,506	99,391	68.30
City of Henderson	257,729	159,793	38,377	13,142	1,683	18,614	1,445	12,309	12,366	38.00
Boulder City	15,023	12,805	1,061	130	125	169	40	242	451	14.80
Tract 59.02	1,433	446	431	5	262	6	2	240	41	68.90
Tract 56.13	4,657	3,828	448	14	43	22	15	169	118	17.80
Tract 78	2,757	1,398	450	405	18	95	47	131	213	49.30
Tract 61.04	3,399	739	1,171	201	31	492	5	599	161	78.30
Tract 54.37	2,981	2,328	233	104	19	174	2	51	70	21.90
Tract 54.35	3,415	2,468	411	140	41	110	30	105	110	27.70
Tract 53.60	4,111	2,845	616	186	32	91	10	130	201	30.80
Tract 57.11	4,348	2,877	505	118	18	472	16	121	221	33.80
Tract 57.03	1,440	978	178	92	16	85	2	37	52	32.10

Source: U.S. Census 2010

Table 3-14. Poverty Level and Median Household Income (Estimates) in Study Area 2010					
	Population*	**Median household income**	**Income below poverty level**	**Income at or above poverty level**	**Percent below poverty level**
Nevada	2,594,953	$55,726	308,426	2,286,527	11.9
Clark County	1,870,566	$56,258	219,116	1,651,450	11.7
City of Henderson	15,125	$68,039	1,234	13,891	8.2
Boulder City	247,907	$62,171	18,127	229,780	7.3
Tract 59.02	939	$34,855	98	841	10.4
Tract 56.13	3,722	$66,953	343	3,379	9.2
Tract 78	2,784	$40,029	514	2,270	18.5
Tract 61.04	3,504	$84,770	158	3,346	4.5
Tract 54.37	2,624	$108,527	43	2,581	1.6
Tract 54.35	3,623	$85,255	265	3,358	7.3
Tract 53.60	3,682	$81,167	236	3,446	6.4
Tract 57.11	4,467	$104,946	40	4,427	0.9
Tract 57.03	1,180	$32,228	293	887	24.8

Source: U.S. Census 2010
*Population for whom poverty status is determined

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

This chapter contains a discussion of the type, duration, and intensity of potential impacts that could result from the construction, operation, and maintenance of the Proposed Action and alternatives. This analysis is based on the affected resources presented in Chapter 3. Proposed mitigation measures are also listed.

The project's contribution to global climate change was not assessed in detail since greenhouse gas emissions would not result from operation and would be negligible for maintenance of the project. However, project construction would result in greenhouse gas emissions; albeit temporary and with a negligible impact on global climate change. The precise mix of power generation sources whose electricity will be transmitted through the proposed transmission line can't be predicted. In general, however, the line is expected to help accommodate transmission of electricity created by a fleet of sources increasingly powered by renewable (e.g., solar, wind) and cleaner burning fossil fuels (e.g., natural gas), thus being part of an overall positive influence on climate change.

The specific location of transmission line structures and associated access roads cannot be determined until final design is complete. Estimates of permanent and temporary ground disturbance for single- and double-circuit structures were calculated to help assess and compare the potential impacts of the Proposed Action alternatives upon specific resources. These estimates were based on the Proposed Action, Alternative 1, and the following routing area options (see Figure 2-1 and Figure 2-2):

River Mountains Routing Area – Impacts are documented for the Proposed Action based on the western routing option. Changes to impacts based on the eastern routing option are discussed following the impact assessment for the Proposed Action.

Dutchman Pass Routing Area – Impacts are documented for the Proposed Action based on the western routing option. Changes to impacts based on the eastern routing option are discussed following the impact assessment for the Proposed Action.

Disturbance estimates were based on design specifications for a single- or double-circuit 500 kV transmission line (Table 4-1).

Table 4-1. Proposed Project Disturbance

	New Temporary Impact	New Permanent Impact
Proposed Action Single Circuit		
Structure and Other Work Areas*	420.8 acres	75.7 acres
New Access and Spur Roads	0.0 acres	62.2 acres
Maintain/Upgrade Existing Access Roads**	0.0 acres	93.5 acres
Totals	420.8 acres	231.4 acres
Proposed Action Double Circuit		
Structure and Other Work Areas*	442.9 acres	122.2 acres
New Access and Spur Roads	0.0 acres	86.2 acres
Maintain/Upgrade Existing Access Roads**	0.0 acres	93.5 acres
Totals	442.9 acres	301.9 acres

Table 4-1. Proposed Project Disturbance		
	New Temporary Impact	**New Permanent Impact**
Alternative 1 Single Circuit		
Structure and Other Work Areas*	363.4 acres	45.1 acres
New Access and Spur Roads	0.0 acres	45.7 acres
Maintain/Upgrade Existing Access Roads**	0.0 acres	93.5 acres
Totals	363.4 acres	184.3 acres
Alternative 1 Double Circuit		
Structure and Other Work Areas*	382.8 acres	81.3 acres
New Access and Spur Roads	0.0 acres	66.4 acres
Maintain/Upgrade Existing Access Roads**	0.0 acres	93.5 acres
Totals	382.8 acres	241.2 acres

* Area required for the addition of series compensation equipment either at Harry Allen Substation or within the proposed ROW near the northern terminus is included within these disturbance calculations.
** Existing roads are assumed to be an average of 12 feet wide. Upgrades could include up to 24-foot-wide roads (or larger, depending on terrain).

4.1. Air Quality

This section describes the potential air quality impacts that could result from the construction, operation, and maintenance of the proposed transmission line.

4.1.1. Proposed Action

The proposed project would be constructed and operated within the boundaries of Clark County and therefore under the jurisdiction of the DAQEM for purposes of air quality regulation. The proposed corridor is primarily located in an area of Clark County that is currently designated as maintenance for PM_{10}, CO, and O_3 (2008), and attainment for all other pollutants.

Air emissions associated with the Proposed Action are primarily short-term and chiefly associated with engine exhaust due to combustion of fossil fuel in construction equipment and fugitive dust during the construction period. While vehicles will be used to drive the transmission line ROW for periodic maintenance, impacts to air quality from vehicle emissions will be negligible.

An air quality conformity applicability analysis (Table 4-2) was performed to facilitate BLM's consideration of Clean Air Act conformity evaluation requirements for the project. The applicability analysis demonstrated that the emissions from the proposed project will be below the *de minimis* thresholds identified in 40 CFR §93.153(b)(2).

Table 4-2. Air Quality Conformity Applicability Analysis Summary				
	PM_{10} (tons/year)	**NO_X (tons/year)**	**CO (tons/year)**	**VOC (tons/year)**
Project-Wide Total	67.87	14.54	16.91	2.06

Table 4-2. Air Quality Conformity Applicability Analysis Summary				
	PM_{10} (tons/year)	**NO_X (tons/year)**	**CO (tons/year)**	**VOC (tons/year)**
De Minimis	*100*	*100*	*100*	*100*
NOx Nitrogen Oxides VOC Volatile Organic Compounds				

Before construction can commence, Great Basin would need to apply for a DAQEM Dust Control Permit for Construction Activities, and related Dust Mitigation Plan. Dust control permits are required by DAQEM when project disturbance exceeds 0.25 acre, or when 100 feet of trenching is planned. Dust Mitigation Plans are required by DAQEM when project disturbance exceeds 10 acres. As part of the dust permit, Great Basin will need to establish and implement Best Management Practices (BMPs) for dust control in order to stay compliant with the dust permit.

Great Basin would be required to maintain compliance with the stipulations of the permit and adhere to the BMPs set forth in the Dust Mitigation Plan. Enforcement of the permit would be the responsibility of DAQEM. As a result of the temporary nature of air emissions and through adherence to DAQEM regulations, impacts to air quality will be minimal.

4.1.2. Alternative 1

Alternative 1 would include using approximately 18 miles of NV Energy's existing Harry Allen to Mead 500 kV transmission line structures. Air quality impacts along this portion of the project area would be associated only with pulling and tensioning sites and access road upgrades. Therefore, the air quality impacts for Alternative 1 may be slightly less than the new ROW for the Proposed Action, although in both cases the impacts would be temporary and minimal.

4.1.3. Routing Area Options

The difference in air quality impacts among the potential routing options in the River Mountains and Dutchman Pass routing areas would be negligible.

4.1.4. No Action Alternative

Under the No Action alternative, there would be no construction or operation of the project; therefore, there would be no air quality impacts resulting from project-related activities.

4.1.5. Mitigation

Other than the requirements of the Clark County DAQEM Dust Control Permit and Dust Mitigation Plan, no additional mitigation is proposed.

4.2. Geology and Minerals

The potential effects on geology and minerals from the construction, operation, and maintenance of the project are discussed in this section.

4.2.1. Proposed Action

The major project activities involve (1) surface disturbance resulting from grading for access roads and work areas, and clearing small areas for staging; (2) construction activities at the tower locations; and (3) installation of wires and associated hardware. Although the potential for geologic hazards, including seismic, landslides, and subsidence, is low throughout the project area, there is always a chance these events could occur.

The Proposed Action may produce small amounts of mineral materials through excavation for structure foundations. Any excess materials will be used as backfill and spread around structure locations or put to use within the ROW.

The project area includes several mineral resource locations, such as the PABCO and Pioneer gypsum mines, and there are other placer claims scattered throughout the area. Impacts on mineral resources would be mitigated through the placement of towers and access roads, such that project construction and facilities do not restrict access to mineral resources within the project area.

4.2.2. Alternative 1

Impacts from the construction, operation, and maintenance of Alternative 1 would be similar to the Proposed Action.

4.2.3. Routing Area Options

The difference in geology/mineral impacts among the potential routing options in the River Mountains and Dutchman Pass routing areas would be negligible.

4.2.4. No Action Alternative

Under the No Action alternative, the project would not proceed and there would be no project-related impacts to geologic resources.

4.2.5. Mitigation

As mentioned above, impacts to mineral resources would be mitigated through the placement of project facilities and access roads such that the facilities do not restrict access to the mineral resources. All excess mineral materials will be used on site within the ROW. No other mitigation with respect to mineral resources is proposed.

4.3. Soils

This section discusses the potential impacts to soil resources that may occur from the construction, operation, and maintenance of the project.

The primary concern associated with soils is the potential for accelerated soil erosion. Construction activities may result in crushed vegetative cover, compacted soils, and rutting, which, when subject to wind or rain, can contribute to increased soil erosion. Physical effects of soil compaction would be short-term, minor to moderate, and include reduced permeability and porosity, damage to microbiotic crusts, increased bulk density, decreased available water holding capacity, increased erosion potential, reduced gaseous exchange, and loss of soil structure.

Soils that are highly susceptible to wind erosion can potentially impact air quality, if dust results from construction activities or in areas disturbed by construction activities. Air quality impacts and mitigation measures are addressed in section 4.1. The potential for project-related dust in areas where asbestos minerals are present will be addressed through BMPs identified in the Dust Mitigation Plan and Clark County Dust Control Permit.

4.3.1. Proposed Action

The proposed project area contains certain soils that are moderately to highly susceptible to water and wind erosion. Proper mitigation measures would be required during construction of the proposed project in order to avoid or minimize damage resulting from erosion and prevent acceleration of natural-erosion processes. The placement of tower sites and temporary access roads would be selected to avoid soils that are moderately or highly sensitive to accelerated rates of water or wind erosion.

Access roads would also be selected to minimize the clearing of vegetation and recontouring of the land surface. If new temporary roads or construction areas are cut in undisturbed areas, topsoil would be saved and used during restoration to promote vegetation regrowth, which would assist in stabilizing soils. Impacts from heavy land disturbance activities, such as road cutting, would be mitigated by restoring natural round contours, reseeding to hasten the recovery of surface vegetation, installing cross drains and water bars to limit water erosion, and filling and regarding any temporary ditches used during construction.

The anticipated ground disturbance for the Proposed Action is 420.8 acres of temporary disturbance and 231.4 acres of permanent disturbance if single-circuit structures are constructed, and 442.9 acres of temporary disturbance and 301.9 acres of permanent disturbance if double-circuit structures are constructed.

4.3.2. Alternative 1

Impacts to soils for Alternative 1 would be similar to those for the Proposed Action. The disturbance areas would be slightly less due to the 18-mile stretch where the existing double-circuit Harry Allen to Mead structures would be utilized; but with the application of impact avoidance and minimization measures as discussed above, the impacts from either alternative would be temporary and minimal. The anticipated ground disturbance for Alternative 1 is 363.4

acres of temporary disturbance and 184.3 acres of permanent disturbance if single-circuit structures are constructed, and 382.8 acres of temporary disturbance and 241.2 acres of permanent disturbance if double-circuit structures are constructed.

4.3.3. Routing Area Options

The River Mountains and Dutchman's Pass routing areas would have no discernible difference in disturbed acreage. The difference in soil impacts among the routing options would be minimal.

4.3.4. No Action Alternative

Under the No Action alternative, the project would not proceed and there would be no project-related impacts to soils.

4.3.5. Mitigation

No additional mitigation is proposed.

4.4. Water Resources

This section discusses effects on water resources/hydrology that may occur with implementation of the Proposed Action or alternatives.

4.4.1. Proposed Action

The Las Vegas Wash is the only perennial waterway that occurs within the project area. The Gypsum Wash and an unnamed minor wash along the project area corridor only flow during high precipitation events. To the extent reasonably practical, Great Basin would span all segments along the proposed transmission corridor that cross washes or the 100-year floodplain. If spanning would not be feasible, and if jurisdictional waters of the U.S. are identified through on-site delineation, Great Basin would secure the appropriate permits and authorizations from the United States Army Corps of Engineers prior to construction activities. Any required state permits or certifications would also be obtained.

Groundwater depth along the proposed project alignments is almost exclusively located below 20 feet bgs; although in some locations, a shallow aquifer may be present with a water table at less than 20 feet bgs (near the Las Vegas Wash).

Project activities include the construction of steel transmission structures that are imbedded in the ground up to 20 feet or more. Although these structures may be in contact with groundwater in areas where there is a shallow aquifer (e.g., Las Vegas Wash), the small footprint and the materials used for construction would ensure that any impacts to groundwater flows and groundwater quality would be negligible.

The potential for project activities to impact surface water or groundwater quality is minimal. Because the proposed project is a construction project that would disturb more than 1 acre, a

National Pollutant Discharge Elimination System (NPDES) permit is required. The project would be covered by the NDEP general stormwater permit for construction activities. The NPDES permit requires the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP), which would define the BMPs required for the project. BMPs may either be nonstructural or structural. Nonstructural BMPs include management and operational procedures regarding work activities, such as minimizing land disturbances, employing preventive maintenance, and preserving natural vegetation. Structural BMPs are physical structures designed to protect stormwater quality, and include diversions, silt fences, reseeding, and detention basins.

The BMPs for a site usually consist of the following major elements:

- Source controls, such as surface controls that stabilize disturbed soils and help minimize erosion
- Sediment controls, such as silt fence and sediment basins, that capture sediment that has been eroded
- Materials handling and spill prevention measures designed to prevent the release of petroleum products and other chemicals and substances into stormwater runoff
- Waste management measures designed to prevent the introduction of waste streams into stormwater runoff

General pollution prevention BMPs are designed to reduce pollutants introduced to runoff from ongoing operations (i.e., vehicle maintenance) and ensure that necessary operations are performed in a manner that reduces pollutants (i.e., temporary stream crossing, dewatering operations, and clear water diversion).

After implementation of site-specific BMPs, impacts to surface water, groundwater, and water quality are expected to be negligible to minimal. Impacts related to floodplains for individual structures and roads would be negligible.

4.4.2. Alternative 1 and Routing Area Options

Water quality impacts from Alternative 1 and the two routing options would be similar to the Proposed Action as they are located within the same watershed. The disturbance areas for Alternative 1 would be slightly less due to the 18-mile stretch where the existing double-circuit Harry Allen to Mead structures would be utilized; but with the application of impact avoidance and minimization measures as discussed above, the impacts from either alternative would be temporary and minimal.

4.4.3. No Action Alternative

Under the No Action alternative, the project would not proceed and there would be no project-related impacts to water resources.

4.4.4. Mitigation

No additional mitigation is proposed.

4.5. Vegetation, Excluding ESA-listed Species

This section discusses effects on vegetation resources that may occur with implementation of the Proposed Action.

4.5.1. Proposed Action

Construction activities including construction and use of access roads, construction of tower sites, temporary construction lay-down areas, and use of setup and pull-and-tension sites have the potential to impact vegetation resources. Direct impacts include loss of, or damage to, individual plants and the seed bank, loss or compaction of native soil, and permanent alteration and loss of plant species habitat. Indirect impacts include the introduction or spread of non-native invasive and noxious weeds that could compete with native plant species for resources.

Maintenance activities could impact vegetation during periodic access to the project area for routine inspection, repairs, and other activities. However, maintenance activities would occur infrequently and predominantly along access roads and areas of existing disturbance.

Applicant-proposed environmental protection measures were developed to avoid and minimize potential impacts to botanical resources from construction, operation, and maintenance of the proposed project. Existing roads and previously disturbed areas would be used for the proposed project alignments to the extent reasonably possible to minimize new surface disturbance. Areas that are to be excavated and backfilled or otherwise cleared of vegetation would be addressed in the Restoration Plan. To speed recovery of the native vegetation, the seed bank present in the topsoil in these areas would be stockpiled for replacement upon completion of construction. The stockpile zone would contain a double windrow of topsoil and spoil materials. This approach would integrate with the objectives of erosion control and mitigation of visual impacts. The Restoration Plan would identify methods to be followed during and after construction to minimize impacts to botanical resources.

Table 4-3 presents the approximate acres of impact to vegetation that would be disturbed under each alternative.

Table 4-3. Approximate Acres of Impact to Vegetation Resources by Alternative

	New Temporary Impact	New Permanent Impact
Proposed Action		
Single-Circuit	420.8 acres	231.4 acres
Double-Circuit	442.9 acres	301.9 acres
Alternative 1		
Single-Circuit	363.4 acres	184.3 acres
Double-Circuit	382.8 acres	241.2 acres
River Mountains Routing Area		
Single-Circuit	no discernable difference between routes	no discernable difference between routes
Double-Circuit	no discernable difference between routes	no discernable difference between routes

Table 4-3. Approximate Acres of Impact to Vegetation Resources by Alternative		
	New Temporary Impact	**New Permanent Impact**
Dutchman Pass Routing Area		
Single-Circuit	no discernable difference between routes	no discernable difference between routes
Double-Circuit	no discernable difference between routes	no discernable difference between routes

Sensitive Plant Species

Five sensitive plant species were observed along the proposed alignment. All five occur within the project area regardless of the alternative or routing option. Four of the five species are located primarily in gypsum and badland soils. Because these gypsum endemics have proven difficult to transplant or reseed, avoidance is the preferred mitigation for these species, as discussed below. The remaining species is associated with sand dunes and other areas with deep, sandy soils.

Acres of potential impact to rare plants or rare plant habitat (Table 4-4) were estimated based on the results of field surveys conducted in 2009, and modeled habitat provided by the BLM. Modeled habitat was not provided for the silverleaf sunray, which was widespread in gypsum soils in the project area in 2009, or Littlefield milkvetch, which was found in a small portion of the project area in 2009. Modeled habitat for the Southwestern ringstem and Las Vegas bearpoppy is scattered throughout much of the project area, but nearly all modeled habitat crossed by any alternative is within the Rainbow Gardens ACEC. Additionally, much modeled habitat for the Southwestern ringstem and Las Vegas bearpoppy outside the ACEC has been lost to urban development in and near Las Vegas. The Proposed Action would result in disturbance of an estimated 124.2 acres of modeled habitat for the Southwestern ringstem and Las Vegas bearpoppy inside the Rainbow Gardens ACEC, although surveys indicated that not all of this habitat is occupied. All of this disturbance would take place in a designated utility corridor. The ACEC protects a total of 20,712 acres of modeled habitat for these species.

The Beaver Dam breadroot and threecorner milkvetch occupy deep, sandy soils, and modeled habitat would be crossed by the project in the vicinity of the Crystal Substation. No threecorner milkvetch were found during surveys in 2009, but Beaver Dam breadroot is present in and near modeled habitat near the Crystal Substation.

Preconstruction surveys would be performed to flag sensitive plant species for avoidance, as well as to flag work areas. Project design measures such as tower location, span width, and access road location would be incorporated to avoid sensitive species where reasonably possible. In areas where avoidance is not reasonably possible, appropriate incidental take permits would be obtained from the NDF. For protected and sensitive plant species other than cacti and yucca, the BLM would determine whether preconstruction seed collection followed by post-construction seeding of restoration sites, or shrub propagation and live shrub plantings at restoration sites would occur.

To the extent reasonably possible, cacti and yucca are to be salvaged and replaced after disturbance. Individuals are to be properly moved, stockpiled out of harm's way, and then replaced within the disturbed area. The succulents would be salvaged by a BLM-approved contractor, stockpiled in a short-term area approved by the BLM or the permanent ROW, and then transplanted to the reclaimed site. The BLM's protocols for proper maintenance of the succulents would be followed according to the Restoration Plan that would be developed for the project.

If cacti and/or yucca are required to be removed from the project area and not replaced within the ROW, consultation with the BLM and NDF would take place to ensure full compliance with applicable laws. The plants will be handled with BLM and NDF guidance and in accordance with the Restoration Plan.

Table 4-4 presents the approximate acres of sensitive plant habitat that would be disturbed under each alternative. As no sensitive plants were located in the areas of the River Mountains and Dutchman Pass routing areas, there is no difference in acreage between those options and the Proposed Action. No habitat disturbance estimates are presented for the silverleaf sunray, as no habitat model was provided and occupied habitat was not measured. However, surveys indicated that the species was widespread in modeled habitat for the Southwestern ringstem and Las Vegas bearpoppy, and impacts are anticipated to be similar to modeled habitat for those species.

Table 4-4. Approximate Acres of Modeled and Occupied Sensitive Plant Habitat Disturbance by Alternative

	Southwestern (Sticky) Ringstem[1]	Las Vegas Bearpoppy[1]	Littlefield Milkvetch[2]	Threecorner Milkvetch[3]	Beaver Dam Breadroot[4]
Proposed Action	124.2 acres	124.2acres	9.9 acres	6.6 acres	14.3 acres
Alternative 1	48.3 acres	48.3 acres	7.3 acres	6.6 acres	14.3 acres
River Mountains Routing Area	no discernable difference between routes	no discernable difference between routes	no discernable difference between routes	no discernable difference between routes	no discernable difference between routes
Dutchman Pass Routing Area	no discernable difference between routes	no discernable difference between routes	no discernable difference between routes	no discernable difference between routes	no discernable difference between routes

[1]Modeled and occupied habitat in Rainbow Gardens ACEC

[2]Occupied habitat in Rainbow Gardens ACEC

[3]Modeled habitat

[4]Occupied and modeled habitat

4.5.2. Alternative 1 and Routing Area Options

Impacts to vegetation resources under the Proposed Action, Alternative 1, and routing options would be similar, with the sole difference being in acreage of impacts. The disturbance areas for Alternative 1 would be slightly less due to the 18-mile stretch where the existing double-circuit Harry Allen to Mead structures would be utilized. Alternative 1 also crosses less modeled habitat for the Southwestern ringstem and Las Vegas bearpoppy (Table 4-4), and would require less

ground disturbance per mile. Similar to the Proposed Action, all ground disturbance in rare plant habitat in the Rainbow Gardens ACEC for Alternative 1 would be within a designated utility corridor. Routing differences between the Proposed Action, and River Mountains and Dutchman Pass routing areas result in comparable acreage impacts to vegetation, but no rare plants would be affected by the Proposed Action or any alternatives in these routing areas.

4.5.3. No Action Alternative

Under the No Action alternative, the ROW would not be issued and there would be no disturbance to vegetation resources from the proposed project. Therefore, there would be no effect to vegetation resources and no impact would occur.

4.5.4. Mitigation

As mitigation for project impacts to BLM special status plant species (Las Vegas bearpoppy, sticky ringstem, silver leaf sunray, threecorner milkvetch, sticky buckwheat, and Beaver Dam breadroot) described in Table 4-4, the project proponent will provide conservation funds to BLM prior to initiating major ground disturbance in the amount of $300,000. The mitigation is intended to reduce the level of project-specific impacts to BLM special status plant species throughout the project alignment. Rehabilitation or protection of degraded rare plant habitat outside of the project footprint is intended to benefit the species by enhancing BLM management efforts. Off-site conservation could include (1) sponsorship of each species into the Center for Plant Conservation (CPC) National Collection of Endangered Plants, (2) seed collection from affected or adjacent populations near the ROW on BLM lands, necessary for sponsorship into the CPC (this will provide a benefit to the species and the public by preserving genetic diversity for future species management and habitat restoration efforts), and (3) acquisition of rare plant habitat.

In addition, applicant-proposed environmental protection measures are mentioned above in Section 4.5.1.

4.6. Invasive Species and Noxious Weeds

As noted in Section 4.5.1, ground disturbance, vehicle movement, water use, and other actions associated with construction and maintenance of the project may facilitate the introduction or spread of noxious weeds and invasive plants. In addition to reclamation actions described in Section 4.5.1, a Noxious Weed and Invasive Plant Management Plan would be prepared in consultation with and approved by the BLM and Reclamation. The plan would include, but not be limited to, a discussion of the (1) plan purpose, goals, and objectives; (2) noxious weed and invasive plant inventory; (3) noxious weed and invasive plant management practices; (4) monitoring; and (5) use of pesticides. Stipulations for weed control typically include the following and would be in compliance with both BLM and Reclamation standards:

- Vehicles and equipment would be cleaned prior to arrival on the work site
- If noxious weeds are identified, any cleared vegetation or topsoil would be separately stockpiled and disposed of properly

- Any seed or organic material used onsite would be obtained from a state-cleared source free of noxious weeds and invasive plant seeds
- Herbicide application would be applied in accordance with product labels, and would not be applied where prohibited (e.g., for resource protection)

4.7. Wildlife, Excluding ESA-listed Species

This section discusses effects on wildlife resources that may occur with implementation of the Proposed Action and alternatives. ESA-listed wildlife species are discussed separately in Section 4.8.

Impacts to most or all species of terrestrial wildlife would result from ground disturbance and altering the habitat in the project area from construction activities. In order to construct the proposed structures, soil would be compacted and vegetation cover would be removed at work areas within the ROW. The ground disturbance could alter soil characteristics, thus potentially changing some of the vegetation upon which local wildlife depends. Terrestrial wildlife would be exposed to a risk of mortality during construction, through mechanisms including vehicle and equipment traffic, ground-disturbing activities, and hazards such as excavations that may be present in work areas. Noise, vibration from drilling and blasting, and the presence of humans may disturb wildlife outside construction areas.

Maintenance activities also have the potential to impact wildlife during periodic access to the project area for routine inspection, repairs, and other activities. Impacts could include mortality from vehicles and equipment and/or disturbance to wildlife.

Mammals

No identified bat roosts would be directly disturbed by construction, operation, and maintenance of the proposed project. However, steep slopes in the project area could contain abandoned mines, rock crevices, or other features that could support bat colonies or provide habitat for solitary bat species. Potential foraging habitat would be lost to ground disturbance, although the aquatic and riparian foraging habitat that many bats prefer would not be directly affected. Noise, vibration, and lights during construction and maintenance activities could cause some foraging bats to avoid work areas, although other species will regularly capture insects around lights (Longcore and Rich 2004).

Although records exist of bat collisions with stationary man-made structures, no clear pattern has been observed that would indicate that a new transmission line adjacent to an existing utility corridor would increase the collision risk to bats, or which bat species, if any, might be particularly susceptible to collision for behavioral reasons. Typically, migratory bats or other bats engaged in long-distance flights where echolocation may be infrequent are assumed to be at the highest risk of collision.

Desert bighorn sheep prefer relatively steep terrain, and would only infrequently use habitat in the project area. However, desert bighorn sheep will disperse across valleys between mountain ranges, and could be disturbed or have movement patterns disrupted as a result of construction

activities. No information indicates that movement through the project area would occur during a specific season, and no sensitive lambing areas would be disturbed as a result of the project.

Migratory Birds

Impacts to migratory birds could result from construction, operation, and maintenance of the proposed project. Migratory bird nests could be abandoned or destroyed as a result of the activities at these times. The MBTA prohibits the take of protected migratory birds, including active nests. To minimize the likelihood of nest abandonment or other impacts to breeding, preconstruction surveys for nesting migratory birds would be conducted in areas where activities are proposed to occur during the nesting season. If active migratory bird nests are located, a protective buffer would be delineated and the area would be avoided until fledglings leave or the nests are no longer active.

Raptors

The project area contains known burrowing owl habitat. The burrows could be collapsed by ground-disturbing activities or construction traffic. Other potential impacts to the burrowing owl include loss of habitat and disturbance of breeding or foraging birds. Loss of individuals, including young, is possible if construction occurs during the breeding season. Mitigation measures implemented for the desert tortoise would also reduce impacts to the burrowing owl. If active burrowing owl nests are discovered during preconstruction surveys, they will be afforded a 250-foot buffer.

There is potentially suitable nesting habitat for golden eagles within and in the vicinity of the project area. Construction activities may disturb nesting activities through noise and activities within close proximity to active nests. Impacts may also occur as a result of alteration to foraging areas. In Southern Nevada, golden eagles nest from mid-February through early June. They frequently use the same nests for multiple years.

Prior to construction occurring during the eagle nesting season, known nest sites will be inspected for activity. Active nests will be afforded a 1-mile buffer from construction activity until the young have fledged, unless the view of the project activities from the nest is obstructed and a smaller buffer distance is deemed appropriate by agency officials.

Transmission structures may provide nesting and perching habitat for some species of raptors. Raptors and other large perching birds are susceptible to electrocution when coming in contact with power line structures, because of their size and behavior. Because these birds often perch on tall structures that offer optimal views of potential prey, the design characteristics of transmission poles appear to be a major factor in raptor electrocutions. Electrocution occurs only when a bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission pole with insufficient clearance between these elements.

Any transmission structures constructed for the proposed project would have clearances between phase conductors or between phase conductors and ground hardware, as recommended by the Avian Power Line Interaction Committee (2006), that are sufficient to protect even the largest

birds; and so would present little to no risk of bird electrocution. Typically, adequate spacing to avoid an electrocution risk is inherent to the design of a 500 kV system. With the application of appropriate construction designs for all transmission lines and their structures, impacts associated with bird electrocution would be minimized.

Reptiles and Amphibians

Impacts to all sensitive reptile species listed in Table 3-5 could include direct loss of individuals and habitat during construction and maintenance activities of the proposed project. Indirect effects could include increased predation by raptors perching on the transmission towers. Some of the mitigation measures implemented to avoid adverse impacts to desert tortoises would also reduce impacts to other sensitive reptile species.

4.7.1. Proposed Action

Single-Circuit

Under this alternative, 231.4 acres would be permanently disturbed by the Proposed Action. Temporary impacts would occur to 420.8 acres. While the utility corridor currently includes up to three other transmission lines, utilization of single-circuit structures would provide less surface area for nesting and roosting by raptors than double-circuit structures. This could result in less impact to prey species.

Double-Circuit

Under this alternative, 301.9 acres would be permanently disturbed and 442.9 acres would be temporarily disturbed by project-related activities. Double-circuit structures provide increased surface area for perching by raptors and other large birds, which may result in increased predation of prey species within the project area.

4.7.2. Alternative 1

Impacts to wildlife under this alternative would be similar to those described above, except the disturbance areas would be slightly less due to the 18-mile stretch where the existing double-circuit Harry Allen to Mead structures would be utilized and only line stringing would be necessary. Impacts within this area would be shorter in duration and lighter in intensity. This area includes the Las Vegas Wash, which provides habitat to numerous species of wildlife that do not occur elsewhere in the project area.

Single-Circuit

Under this alternative, 184.3 acres would be permanently disturbed by the project. Temporary impacts would occur to 363.4 acres.

Double-Circuit

Under this alternative, 241.2 acres would be permanently disturbed and 382.8 acres would be temporarily disturbed by project-related activities.

4.7.3. Routing Area Options

River Mountains Routing Area

Impacts to wildlife would be the same under this routing area as under the Proposed Action. There is no difference in acreage of impacts and the habitat impacted is similar.

Dutchman Pass Routing Area

Impacts to wildlife would be the same under this routing area as under the Proposed Action. There is no difference in acreage of impacts and the habitat impacted is similar.

4.7.4. No Action Alternative

Under the No Action alternative, the ROW would not be issued and there would be no disturbance to wildlife resources caused by the proposed project. Therefore, there would be no effect to wildlife, and no impact would occur.

4.7.5. Mitigation

Mitigation measures mentioned below in Section 4.8 will also serve to reduce impacts to wildlife as described in this section. For example, as noted above in the discussion of potential impacts to reptiles, mitigation measures that will be required for the desert tortoise may also reduce impacts to other wildlife species during construction. During migratory bird nesting season, preconstruction surveys will be conducted and appropriately sized avoidance buffers will be established around active nests. Should the final project design utilize a tower type that incorporates guy wires, appropriate types and locations of guy markers will be specified in the Final POD, as approved by the BLM. In addition, the measures discussed in the description of the Proposed Action would reduce ground disturbance and ensure construction and operation practices that do not cause unnecessary impacts to wildlife. The Restoration Plan and Noxious Weed Plan discussed in Section 4.5.1 would reduce impacts to wildlife habitat by contributing to the recovery of vegetation in areas of temporary disturbance.

4.8. Threatened, Endangered, Proposed, or Candidate Wildlife Species

This section discusses effects on threatened, endangered, proposed, or candidate wildlife species that may occur with implementation of the Proposed Action. Potential effects to these species were analyzed in detail through a Biological Assessment, prepared to support Section 7 consultation between the USFWS and the federal action agencies (BLM and Reclamation). Section 7 consultation concluded on November 7, 2014, when the USFWS issued a final Biological Opinion (BO). The USFWS determined in the BO that the project is not likely to

jeopardize the continued existence of the Mojave desert tortoise, and concurred that the project may affect, but is not likely to adversely affect, the southwestern willow flycatcher and yellow-billed cuckoo.

Mojave Desert Tortoise

Mojave desert tortoises were found along the ROW corridor during spring 2009 wildlife surveys. The highest densities of desert tortoises and their sign occurred north of mile-marker 26, with smaller clusters of desert tortoises and sign at mile-marker 36 and mile-markers 42–48. No desert tortoises or sign were observed south of mile-marker 48. This area contains extremely dense coverage of large rocks, often embedded in the soil, with little herbaceous cover for forage.

Potential impacts to the desert tortoise could include increased mortality or injury from vehicles or equipment; falls into excavated areas, utility borings, or trenches upon entering a construction site; burrows crushed by construction equipment; and removal or destruction of forage and water sources. Indirect impacts to desert tortoises could include habitat fragmentation and degradation, harassment, noise and vibration from vehicles, increased predation, and fire hazard.

The construction of transmission towers could provide perching areas for desert tortoise predators such as raptors and common ravens. Predation is a natural cause of desert tortoise mortality; however, the addition of transmission structures could increase predator access to desert tortoises. In this instance, the project facilities will be adjacent to existing lattice transmission towers that may already serve as perching substrate for raptors and common ravens.

Desert tortoise mitigation measures required for the project have been identified in the BO. The following description summarizes key mitigation measures that will be implemented to minimize effects to desert tortoise habitat and reduce risk to individual desert tortoises.

Prior to construction, a desert tortoise education program would be presented to all construction personnel. All field personnel will be educated about the desert tortoise and will be able to recognize signs indicating the potential presence of a desert tortoise. A preconstruction survey for desert tortoises and burrows would be conducted within 7 days of initial ground-disturbing activities during the desert tortoise inactive season and on the day of or the day prior to ground-disturbing activities during the desert tortoise active season. The active season is determined annually by the USFWS, but generally runs between March and October. All desert tortoises and their eggs encountered in the proposed ROW corridor would be relocated by an authorized biologist according to protocols provided in the Desert Tortoise Manual (USFWS 2009). All burrows encountered would be inspected for wildlife. If determined to be empty, burrows located in an area of ground disturbance would be collapsed to deter wildlife from re-entering the burrows.

An authorized biologist approved by the USFWS would be onsite during all construction activities during the active season. The authorized biologist would be present to monitor activities and minimize take of desert tortoises. They would be familiar with the protocols for handling and relocating desert tortoises and would have the authority to halt any activity that

would result in take. Desert tortoises that enter areas of construction activity would be relocated out of harm's way.

Outside of the peak desert tortoise activity season (generally November through February), a maximum 25-miles-per-hour speed limit would be enforced for all construction equipment and vehicles working within the project ROW and while traveling on associated project access roads. During the peak desert tortoise activity season, vehicle speed on project-related access roads and in the work area will not exceed 15 mph. Mitigation fees would be applied for each acre of surface disturbance in desert tortoise habitat. These remuneration fees are used to fund management actions that are designed to provide long-term direct and indirect benefits to the desert tortoise.

ESA-listed and Proposed Birds

Construction activities during the nesting season could result in a temporary direct impact to the southwestern willow flycatcher due to noise, vibrations, and traffic, in the area of Las Vegas Wash. To minimize impacts to potential nests and young, preconstruction surveys would be utilized to determine the presence of individual or nesting southwestern willow flycatchers in the vicinity of the proposed crossing location. If a nest is found, no construction activities would occur within 800 meters of the nest until a qualified biologist confirms that the nest is no longer active and construction activities are not likely to impact the individual(s).

There are no anticipated direct impacts to the Yuma clapper rail or yellow-billed cuckoo. The only potentially suitable habitat for these species occurs along the Las Vegas Wash outside the proposed crossing location.

The proposed transmission line would span the wash; therefore, it is anticipated that the wash and its riparian habitat would not be impacted, and no indirect effects to any of these bird species would occur through the modification of riparian vegetation.

4.8.1. Proposed Action

Single-Circuit

Under this alternative, 231.4 acres of Mojave Desertscrub would be permanently disturbed by the project. Temporary impacts would occur to 420.8 acres of Mojave Desertscrub. Utilization of single-circuit structures would provide fewer nesting and roosting opportunities for raptors and ravens, potentially resulting in less of an impact to desert tortoise. Transmission structures would be constructed on either side of Las Vegas Wash, resulting in potential noise and vibration disturbance to riparian birds, but no loss of habitat.

Double-Circuit

Under this alternative, 301.9 acres of Mojave Desertscrub would be permanently disturbed and 442.9 acres would be temporarily disturbed by project-related activities. Double-circuit structures provide increased surface area for perching by raptors and ravens, which may result in

increased predation of desert tortoises within the project area. Transmission structures would be constructed on either side of Las Vegas Wash, resulting in potential noise and vibration disturbance to riparian birds, but no loss of habitat.

4.8.2. Alternative 1

Impacts to the Mojave desert tortoise under this alternative would be similar to those described above, except that approximately 18 miles of the proposed alignment would not require construction of new towers. Therefore, impacts to this area would only result from the activities associated with stringing conductors along existing structures. Permanent ground disturbance would be reduced in this portion of the project, and an authorized biologist would be present to reduce potential direct loss of desert tortoises. Construction activities within this area would be shorter in duration and lighter in intensity.

New transmission structures would not be constructed in the area surrounding Las Vegas Wash. Therefore, noise and vibration levels would be reduced and would be shorter in duration, resulting in a lesser impact to riparian birds.

Single-Circuit

Under this alternative, 184.3 acres of Mojave desertscrub would be permanently disturbed by the project. Temporary impacts would occur to 363.4 acres of Mojave desertscrub.

Double-Circuit

Under this alternative, 241.2 acres of Mojave desertscrub would be permanently disturbed and 382.8 acres of Mojave desertscrub would be temporarily disturbed by project-related activities.

4.8.3. Routing Area Options

River Mountains Routing Area

Impacts to ESA-listed wildlife would be the same under this routing area as under the Proposed Action. There is no difference in acreage of impacts and the habitat impacted is similar.

Dutchman Pass Routing Area

Impacts to ESA-listed wildlife would be the same under this routing area as under the Proposed Action. There is no difference in acreage of impacts and the habitat impacted is similar.

4.8.4. No Action Alternative

Under the No Action alternative, the ROW would not be issued and there would be no disturbance to ESA-listed wildlife by the proposed project. Therefore, there would be no effect to ESA-listed wildlife, and no impact would occur.

4.8.5. Mitigation

A comprehensive set of avoidance and mitigation measures have been established in the Biological Assessment, and through BLM's consultation with USFWS in the BO. Examples of these mitigation measures are mentioned above in Section 4.8.

4.9. Cultural Resources

This section discusses effects on cultural resources that may occur with implementation of the Proposed Action or alternatives.

4.9.1. Proposed Action

Implementation of the Proposed Action could potentially impact NRHP-eligible cultural resource sites in the direct and indirect effects APE, including 27 known sites that are eligible or may be eligible for listing on the NRHP, or whose eligibility status is unknown or unevaluated. These consist of 11 known historic components (a camp, a mining-related site, a railroad-related site, 2 sites with historic structures, 5 historic utility-related sites, and the OSNHT) and 16 known prehistoric components (1 artifact scatter, 1 site with features, 5 fragile pattern sites, 1 habitation site, 4 lithic scatters, 1 quarry, and 3 rockshelters). It is likely that additional cultural resources sites are present in unsurveyed areas within the APEs for the Proposed Action.

As specified in the PA, a Class III cultural resources survey, NRHP eligibility determinations for identified cultural resources, and treatment to avoid and/or mitigate adverse direct and indirect effects to cultural resources, would be completed prior to construction. In addition, the PA includes provisions for consultation, unanticipated discoveries, and monitoring of sensitive cultural areas. Implementation of the Proposed Action in accordance with the PA would minimize potential adverse effects to historic properties.

4.9.2. Alternative 1

Implementation of Alternative 1 would have the potential for impacts to NRHP-eligible cultural sites in the direct and indirect effects APE, including 8 known site components outside the area of collocation on existing Harry Allen to Mead 500 kV structures, and 17 within the area of collocation. Known site components within the collocation area consist of 6 historic sites (a camp, a mining-related site, a railroad-related site, 2 sites with historic structures, and a historic utility) and 10 prehistoric sites (3 fragile pattern sites, 1 habitation site, 3 lithic scatters, 2 quarries, and a rockshelter). Also present is a single cultural resource site for which no information could be obtained. The potential for impacts to known sites within the collocation area is low. Known site components outside of the collocation area consist of 3 historic utility-related sites, 1 prehistoric artifact scatter, 2 prehistoric lithic scatters, 1 prehistoric rockshelter, and the OSNHT. It is likely that additional cultural resources sites are present in unsurveyed areas of the direct effects APE for Alternative 1.

As specified in the PA, a Class III cultural resources survey, NRHP eligibility determinations for identified cultural resources, and treatment to avoid and/or mitigate adverse direct and indirect effects to cultural resources would be completed prior to construction. In addition, the PA

includes provisions for consultation, unanticipated discoveries, and monitoring of sensitive cultural areas. Implementation of Alternative 1 in accordance with the PA would minimize potential adverse effects to historic properties.

4.9.3. Routing Area Options

Differences in the potential for impacts to cultural resources based on the project routing options are not currently known.

4.9.4. No Action Alternative

Under the No Action Alternative, the project would not proceed and there would be no project-related impacts to cultural resources.

4.9.5. Mitigation

Implementation of the Proposed Action and its associated facilities has the potential for impacts to cultural resource sites. To avoid and or mitigate potential impacts, mitigation measures and plans for addressing discoveries are detailed in the PA for the project. To the extent reasonably practicable, the project will avoid impacts to NRHP eligible or potentially eligible cultural resources sites through project design, or redesign, relocation of facilities, or by other means. Where sites cannot be reasonably avoided, project-related effects would be lessened or mitigated with the development and implementation of an appropriate Treatment or Data Recovery Plan.

As mitigation for project impacts to cultural resources including Gypsum Cave and the OSNHT, the project proponent will provide funds to BLM prior to initiating major ground disturbance in the amount of $200,000 for on-site mitigation. The mitigation is intended to reduce the level of project-specific impacts to cultural resources throughout alignment. Mitigation funds for the OSNHT could include development of interpretation material, signage, and protection for the trail. Mitigation funds for Gypsum Cave will include one or all of the following: (1) provide clean-up and graffiti removal, (2) post and cable fencing to further prevent vehicles from approaching the cave, (3) road closures and mitigation of road scars within the Traditional Cultural Property, (4) bat gates for the inner chambers of the cave, and (5) interpretation of the archaeological site. This compensatory mitigation does not relieve the project proponent of responsibilities under section 106 of the NHPA and project-specific best management practices for cultural resources.

4.10. Paleontological Resources

The Proposed Action may impact paleontological resources present in the project area. The paleontological inventory described in Section 3.11 demonstrates that paleontological resources are present within the project area. Six of the geological units identified within 1 mile of the project centerline have moderate/undetermined or high potential for paleontological resources.

The primary impact issue for paleontological resources is the loss of scientifically significant fossils and their contextual data. Two types of impacts could potentially affect paleontological resources:

- Direct impacts resulting from ground disturbance during construction
- Indirect impacts due to accelerated erosion

It is possible that ground disturbance, such as grading and cutting of access roads, auguring or blasting for tower footings and anchors, or preparing staging areas, could encounter paleontological resources. In addition, adverse impacts indirectly associated with construction are a concern. For example, fossils could be subject to damage or destruction by erosion that is accelerated by construction disturbance. Impacts to paleontological resources would be mitigated through survey, identification, collection, and deposition of recovered fossils in a museum repository.

4.10.1. Proposed Action

The Proposed Action would result in approximately 60 miles of new transmission line construction. New construction would cross approximately 22 miles of geological units with high potential for paleontological resources and 2 miles of geological units with moderate/undetermined potential for paleontological resources.

For all project alternatives, the use of single- and double-structure tower types would result in different levels of ground-disturbance and associated potential impacts to paleontological resources. Greater amounts of ground disturbance are directly associated with greater potential impacts to paleontological resources. The anticipated ground disturbance for the Proposed Action is 420.8 acres of temporary disturbance and 231.4 acres of permanent disturbance if single-circuit structures are constructed, and 442.9 acres of temporary disturbance and 301.9 acres of permanent disturbance if double-circuit structures are constructed.

4.10.2. Alternative 1

Alternative 1 would result in approximately 42 miles of new transmission line construction and would occupy 18 miles of previously constructed transmission line structures. New construction would cross 13 miles of geological units with high potential for paleontological resources and 0.5 miles of geological units with moderate/undetermined potential for paleontology.

The anticipated ground disturbance for Alternative 1 is 363.4 acres of temporary disturbance and 184.3 acres of permanent disturbance if single-circuit structures are constructed, and 382.8 acres of temporary disturbance and 241.2 acres of permanent disturbance if double-circuit structures are constructed.

4.10.3. Routing Area Options

River Mountains Routing Area

With regard to paleontological resources, there is no difference between the east and west options in the River Mountains routing area. Both of the options cross Quaternary Alluvium, which has a low potential for paleontological resources.

Dutchman Pass Routing Area

The western option in the Dutchman Pass routing area would cross 1.7 miles of Muddy Creek Formation; whereas the eastern option would cross 0.8 miles of the same geological unit.

4.10.4. No Action Alternative

Under the No Action alternative, the ROW would not be issued and there would be no disturbance to paleontological resources from the proposed project. Therefore, there would be no effect to paleontological resources, and no impact would occur.

4.10.5. Mitigation

To mitigate potential impacts to paleontological resources, a more-detailed inventory would be completed for those portions of the proposed route that warrant further investigation (i.e., areas containing geological units with a PFYC of 3, 4, or 5). A Paleontological Resources Treatment Plan would be developed and include: (1) a pre-construction survey in areas containing known fossil localities with a PFYC of 3, 4, or 5; (2) determination of areas that may require on-site paleontological monitoring during construction; and (3) mitigation of paleontological resources that may be discovered during construction, primarily through paleontological monitoring, fossil collection, curation, and deposition in a federally-approved repository (as stated in BLM Manual 8270 and BLM Handbook H-8270-1). In addition, in-field orientation workshops would be implemented to train construction personnel that would be presented by a BLM-approved paleontologist with schedules determined by the BLM. A rating of low residual impact assumes that scientifically significant fossil specimens and contextual information would be adequately collected from localities if they could not be avoided by the proposed route. Therefore, residual impacts on paleontological resources would be considered low to nonexistent, as long as proper mitigation procedures were implemented. The scientific and educational value of the fossils and their associated contextual data constitute the chief significance of the resource. Their collection, therefore, mitigates the impacts to paleontological resources.

4.11. Land Use, Recreation, and Access

This section describes the potential land use, transportation, and access impacts that could result from the construction and operation of the proposed transmission line.

4.11.1. Proposed Action

The majority of the length of the proposed ROW corridor is on federal land, within the designated utility corridor. The portions constructed on BLM lands would not conflict with any existing or planned facilities. The BLM has the authority to approve other compatible land uses within the ROW.

Indirect impacts from construction of the proposed transmission line would include conversion of undeveloped desert land to utility-related uses. Operation and maintenance of the proposed transmission line would not conflict with existing federal, state, or county land use plans, policies, or regulations applicable to the project area. The proposed transmission line would cross the Rainbow Gardens and River Mountains ACECs within the designated BLM utility corridor. Road access impact would be low because relatively few miles of new access roads would be required to be upgraded or constructed.

The construction and operation of the proposed transmission line is not anticipated to interrupt dispersed recreational activities on adjacent BLM lands. Vacant BLM lands are used for low-density informal recreation such as hiking, picnicking, off-road driving, and driving on existing paved and unpaved roads. The proposed project would not preclude the use of these areas, but rather would temporarily displace recreational users to surrounding recreation areas if access roads are restricted due to construction. Operation and maintenance of the project facilities would not limit public access to recreation opportunities in the surrounding area. The primary impact to parks, trails, OHV areas, and dispersed recreation areas will be visual impacts. Those visual impacts are further discussed in Section 4.12, Visual Resources.

The proposed project would cross the Clark County Wetlands Park adjacent to the existing transmission lines. Depending on final design, at least two transmission structures would be located on Clark County property. The transmission line conductors would span the Las Vegas Wash.

The now-defunct The Falls golf course driving range is oriented north-to-south and is on average approximately 450 feet wide. It will be crossed by the proposed project from north to south. The proposed transmission lines would be directly over the driving range and, depending on the tower placement, the towers may be placed within the driving range. The BLM has a ROW reservation within this area (Serial Number N-73903) granting BLM management, control, administration, and jurisdiction over the corridor, notwithstanding surface ownership. This reservation allows other facilities to be constructed within this corridor that would not conflict with the authorization of new ROW or facilities.

The Proposed Action would cross directly over the planned restaurant/bar of the Jericho Heights master planned development. While this planned development has been granted certain zoning approvals, final approvals have not been obtained. This potential conflict with a planned but not approved land use would be resolved by the City of Henderson zoning process. There is currently no schedule for planned final approval or construction of the development.

After completion of construction, temporary disturbance areas would be restored. The construction and operation of the transmission line would not affect the overall low-density recreation use of the surrounding vacant BLM lands.

4.11.2. Alternative 1

Alternative 1 would include using approximately 18 miles of the existing Harry Allen to Mead 500 kV transmission line structures and ROW. Therefore, the land use, transportation, and access impacts for Alternative 1 may differ slightly from the 60 miles of new ROW for the Proposed Action.

4.11.3. Routing Area Options

Effects to land use, transportation, and access from the different routing options would be similar in nature.

4.11.4. No Action Alternative

Under the No Action alternative, there would be no construction or operation of the project; therefore, there would be no land use, transportation, and access impacts resulting from project-related activities.

4.11.5. Mitigation

No mitigation is proposed.

4.12. Visual Resources

4.12.1. Impact Assessment Methodology

The purpose of the visual impact assessment is to identify and characterize the level of visual change in the landscape that could result from the construction, operation, and maintenance of the proposed project. Modification of the landscape is described in levels of visual contrast, which affects compliance with visual resource management classes and scenic quality. The impact assessment is based on the BLM VRM system 8400 series, BLM-approved and vetted visual resource assessments for 500 kV transmission line projects. The measure of visual impacts is based on visual contrast as defined by the BLM VRM system (BLM Manual 8431). Impact to the viewing public and compliance with VRM classifications was determined by performing contrast analysis from agency approved KOPs (KOPs 1–7). Visual simulations were prepared from each KOP to illustrate the range of typical impacts to viewers. Visual Contrast Rating Worksheets, Simulations, and a map of VRM Classifications are provided in Appendix B.

4.12.2. Visual Contrast

Visual contrast is defined as the degree of visual change that would occur in the landscape due to the construction and operation of the proposed project. In the context of extra-high-voltage

transmission lines, visual contrast typically results from (1) landform modifications that are necessary to prepare the ROW for construction; (2) the removal of vegetation to construct roads and maintain the transmission line; (3) the construction of temporary and permanent access roads required to erect the structures and maintain the conductors; and (4) the introduction of transmission line facilities (i.e., structures) into the landscape.

A project contrast assessment was conducted by comparing visual elements (form, line, color, and texture) of the existing landscape with the visual elements associated with the proposed project, including new structures (i.e., towers and conductors) and new or improved access. Changes in landform, vegetation, and structures were evaluated and assigned contrast levels. This evaluation of contrast considered the existing BLM designated utility corridor, which includes a number of existing utility facilities.

Project contrast levels for this type and size of project typically range from strong to weak; however, only minimal to weak-moderate project contrast is expected to occur for the Proposed Action because it would be located within the designated utility corridor. Generally, weak to weak-moderate project contrast would occur where a new ROW would parallel multiple existing transmission lines within the BLM designated utility corridor. This condition occurs for a majority of the Proposed Action. Weak-moderate project contrast may also occur in locations where the Proposed Action would cross areas that require landform modifications in moderate-to-steep terrain or where taller, double-circuit structures would be skylined and visible to the viewing public where no other existing facilities are visible. Minimal contrast would occur for the 18-mile shared area under Alternative 1, because the conductors would be co-located onto existing structures within the designated utility corridor. These levels of contrast were considered when assessing impacts to the VRI and KOPs, and demonstrating compliance with designated VRM classification, as described below. Impact differences between the Proposed Action and Routing Area Options are expected to be minimal.

4.12.3. Proposed Action

VRI (Scenic Quality, Sensitivity Levels, Distance Zones, and VRI Classes)

The majority of the Proposed Action would cross Class C scenery associated with desert plains, playas, and low desert hills. Impacts are anticipated to be minimal, because project contrast would be weak due to existing extra-high-voltage transmission lines associated with the utility corridor, which has similar form, line, color, and texture as compared to the proposed project. Portions of the Proposed Action that would cross Class B scenery, primarily characterized by desert mountains and foothills, would have low impacts in moderate terrain because project contrast would be weak. Isolated occurrences of low-moderate impacts are anticipated for portions of the route crossing steep terrain where landform modifications associated with spur roads and staging areas would result in stronger contrast. Impacts to Class A scenery is not anticipated for the Proposed Action, because the Las Vegas Wash could be spanned and removal of riparian vegetation and modification of the banks would not occur.

Sensitivity Levels, distance zones, and VRI Classes would not be affected by the Proposed Action because the local setting in which the project is proposed has been highly modified by existing transmission line facilities. The project added to this modified setting would not affect

these components of the VRI, and therefore existing VRI Classes are not expected to be impacted.

Key Observation Points

Residences

KOP 3 – Low impacts are anticipated for residences in Lake Las Vegas with unobstructed, superior, or elevated views of the Proposed Action. Project contrast would be weak due to similar structure types and existing access. In addition, the project would be backdropped by adjacent terrain, thus reducing contrast. Contrast Rating Sheet in Appendix B describes potential contrast in detail.

KOP 4 – Impacts for residences near Henderson (south of Lake Las Vegas) are anticipated to be low because the project would parallel three existing transmission lines with similar structure types in a skylined condition. Although the views of the project would be unobstructed, proposed facilities would be viewed through three existing transmission lines, which reduce the contrast of the project at this location. The Contrast Rating Sheet in Appendix B describes this condition in detail.

KOP 5 – Low impacts are anticipated for residences in the southern portion of Henderson where views would be primarily unobstructed. Partial screening may occur due to intervening terrain although a portion of the project would be skylined. Weak project contrast would occur because the project would parallel three existing transmission lines with similar structure types in a partially skylined condition. In addition, the Proposed Action would be viewed through three existing transmission lines; thus contrast would be reduced. See Contrast Rating Sheet in Appendix B for a description of this condition.

Recreation Areas

KOP 7 – Quo Vadis Trailhead and trail are anticipated to have low impacts for high sensitivity recreation viewers. The Proposed Action would parallel three existing transmission lines with similar structure types and would be backdropped by adjacent terrain for all single-circuit structure options. The upper portion of the double-circuit structure option may be partially skylined due to tower height; however, resulting contrast would be similar. Contrast Rating Sheet in Appendix B depicts the differences between the double-circuit and single-circuit tower options.

Travel Routes

KOP 1 – Overall, weak contrast would result for all single-circuit structure options because it would occur within the utility corridor with similar structure types. Contrast would increase to weak-moderate for the double-circuit structure option from this moderate-sensitivity travel route due to terrain and skylined conditions. In addition, contrast associated with access roads would be visible to travelers on I-15 where it crosses the highway; thus impacts are anticipated to be

low-moderate. Contrast Rating Sheet in Appendix B depicts the differences between the single- and double-circuit tower options.

KOP 2 – Low impacts are anticipated for high-sensitivity travel route viewers along Lake Mead Boulevard. The Proposed Action would cross the road, while parallel to three existing transmission lines with similar structure types in a skylined condition, resulting in a weak level of contrast. The high rate of speed expected on this travel route further reduces the visibility of the proposed facilities; thus minimal effects are anticipated.

KOP 6 – Similar to KOP 1, weak contrast is anticipated for the Proposed Action while crossing this moderate-sensitivity travel route. Low impacts are anticipated because the project would be parallel to three existing transmission lines with similar structure types in a skylined condition.

4.12.4. Alternative 1 and Routing Area Options

Impacts to VRI and KOPs from Alternative 1 are described below. There would be minimal difference in impacts between the Routing Area Options and the Proposed Action and Alternative 1.

VRI (Scenic Quality, Sensitivity Levels, Distance Zones, and VRICs)

Impacts to Class B and Class C scenery would be the same as specified for the Proposed Action for portions of this alternative that would require new ROW. For portions of Alternative 1 that would be co-located with the existing Harry Allen to Mead 500 kV transmission line structures, impacts to Class A, B, and C scenery are not anticipated because contrast associated with landform, vegetation, and structures would be greatly reduced as ground disturbance would be kept to a minimum.

Sensitivity Levels, distance zones, and VRI Classes would not be affected by Alternative 1, because the local setting in which the project is proposed has been highly modified by existing transmission line facilities. The project added to this modified setting would not affect these components of the VRI; therefore, existing VRI Classes are not expected to be impacted. Further, any changes for Alternative 1 resulting from the project would be nominal, as ground disturbance would be confined to those locations where wire-pulling operations would be required to install the conductors on the existing double-circuit within designated BLM utility corridors.

Key Observation Points

Residences

KOP 3 – Minimal impacts are anticipated for residences in Lake Las Vegas with unobstructed, superior, or elevated views of the Proposed Action. Project contrast would be minimal due to co-location with an existing transmission line in a backdropped condition. In addition, the project would be backdropped by adjacent terrain, thus reducing contrast. See Contrast Rating Sheet in Appendix B for detailed contrast assessment.

KOP 4 – Impacts for residences near Henderson (south of Lake Las Vegas) are anticipated to be minimal because the project would be co-located onto an existing transmission line. Although the views would be unobstructed, this alternative would be viewed through three existing transmission lines and contrast would be minimal. See Contrast Rating Sheet in Appendix B for detailed contrast assessment.

KOP 5 – Minimal impacts are anticipated for residences in the southern portion of Henderson, where views would be primarily unobstructed. Minimal project contrast would occur because the project would be co-located onto an existing transmission line. In addition, this alternative would be viewed through three existing transmission lines. See Contrast Rating Sheet in Appendix B for detailed contrast assessment.

Recreation Areas

KOP 7 – Impacts from Alternative 1 to KOP 7 are expected to be the same as for the Proposed Action.

Travel Routes

KOP 1 – Impacts are anticipated to be the same as for the Proposed Action.

KOP 2 – Minimal impacts are anticipated for high sensitivity travel route viewers along Lake Mead Boulevard. Alternative 1 would cross the road while parallel to three existing transmission lines; however, project contrast would be minimized because the conductors would be co-located onto an existing transmission line. See Contrast Rating Sheet in Appendix B for detailed contrast assessment.

KOP 6 – Similar to KOP 2, impacts are anticipated to be minimal for this moderate sensitivity travel route because project contrast would be minimized due to co-location with an existing transmission line. Furthermore, the typical speed on this travel route would reduce the visibility of the proposed facilities; therefore, contrast would be further reduced.

4.12.5. VRM Consistency

Portions of the alternatives that cross BLM VRM Class III or IV lands while within the designated utility would be consistent with VRM objectives. The alternatives do not cross any VRM Class I or II landscapes. The form, line, color, and texture of the proposed facilities associated with both alternatives, including structure and landscape modifications, would be minimal as described in the KOP descriptions; therefore, contrast levels of moderate for Class III and strong for Class IV would be achieved. Constructing the project (either alternative) with nonspecular conductors and using existing access to the greatest extent practicable, are mitigation measures that are consistent with Class III and Class IV managed lands.

4.12.6. No Action Alternative

Under the No Action alternative, the ROW would not be issued and the proposed project would not be constructed. Therefore, no visual resources would be affected, and no environmental consequences to visual resources would occur.

4.12.7. Mitigation

As mitigation for visual impacts to the scenic character of Rainbow Gardens ACEC, the project proponent will provide funds to BLM, prior to initiating major ground disturbance, in the amount of $100,000 to fund graffiti removal, and the application of Permeon and/or other surface coloring agents that will reduce the visual appearance of previously disturbed areas within the ACEC. This compensatory mitigation does not relieve the project proponent of the responsibility to implement project-specific design features and BMPs that will reduce project-specific visual impacts.

4.13. Socioeconomics

This section describes the potential socioeconomic impacts that could result from the construction and operation of the proposed transmission line.

4.13.1. Proposed Action

The Las Vegas area's population is large and diverse, and the local economy is mostly driven by tourism and public service employment; therefore, the economic effects of constructing the transmission line would have little discernible effect on the overall levels of personal income and employment in the region. Accordingly, the project would make a relatively small contribution to the overall economy of the region. More substantially, the project would benefit the economy over the long-term by maintaining reliable electric power service for the growing number of residents, industries, and renewable energy projects in the region. Apart from the benefits of reliable service to customers in general, benefits would accrue to jurisdictions along each ROW corridor in the form of property taxes. Payments would also be made to federal jurisdictions providing ROW easements. Additionally, some positive effects would result during construction, not only in the form of direct employment, but also from procurements of construction materials and services from local suppliers and businesses.

The effects to socioeconomic resources from the Proposed Action would be the same, regardless of the type of transmission structure used.

4.13.2. Alternative 1

Alternative 1 would include using approximately 18 miles of the existing Harry Allen to Mead 500 kV transmission line ROW. While the property taxes and fees associated with ROW easements for Alternative 1 may differ slightly from the 60 miles of new ROW for the Proposed Action, effects to socioeconomic resources would be similar.

4.13.3. Routing Area Options

Effects to socioeconomic resources from the construction and operation of the various routing options would be similar.

4.13.4. No Action Alternative

Under the No Action alternative, the ROW would not be issued and there would be no positive or negative socioeconomic effects from the proposed project.

4.13.5. Mitigation

No mitigation is proposed.

4.14. Environmental Justice

This section describes the potential environmental justice impacts that could result from the construction and operation of the proposed transmission line.

4.14.1. Proposed Action

The purpose of an environmental justice analysis is to determine whether adverse environmental impacts would disproportionately affect minority and low-income communities or populations, as compared to other communities or populations in a project area. Impacts related to environmental justice could be significant if environmental justice populations exist in the affected area.

Two of the nine census tracts crossed by the proposed project area contain a minority population over 50 percent. Census Tract 59.02 is located north of the Las Vegas Valley and continues to the Lincoln County line to the north. It encompasses more than 130,437 acres and consists of a 68.9 percent minority population, similar to the 68.3 percent minority population in Clark County as a whole. Census Tract 61.04, located in the eastern Las Vegas Valley, is 2,537 acres, and includes a 78.3 percent minority population.

Two of the nine census tracts crossed by the proposed project area contain a low-income population above the Clark County average (11.7 percent) and the state of Nevada (11.9 percent). Census Tract 78 encompasses Nellis Air Force Base and has 18.5 percent of its population living below the poverty rate. Census Tract 57.03 is located in the southernmost area of the proposed ROW corridor and has 24.8 percent of its population living below the poverty rate. The proposed ROW corridor traverses Census Tract 57.03 for approximately 500 feet before terminating at the Eldorado Substation, and the nearest established residences are located approximately 15 miles south of the termination point in the Town of Searchlight.

On average, the census tracts along the proposed route do not contain minority or low-income population groups significantly greater than Clark County or the state of Nevada as a whole; therefore, there would be no environmental justice impacts from implementation of the project.

The effects to environmental justice resources from the Proposed Action would be the same, regardless of the type of transmission structure used.

4.14.2. Alternative 1

Alternative 1 would include using approximately 18 miles of the existing Harry Allen to Mead 500 kV transmission line structures adjacent to the Proposed Action. Effects to environmental justice resources would be similar for both the Proposed Action and Alternative 1.

4.14.3. Routing Area Options

Effects to environmental justice resources from construction and operation of the various route options would not differ.

4.14.4. No Action Alternative

Under the No Action alternative, the ROW would not be issued and there would be no environmental justice effects from the project.

4.14.5. Mitigation

No mitigation is proposed.

4.15. Cumulative Impacts

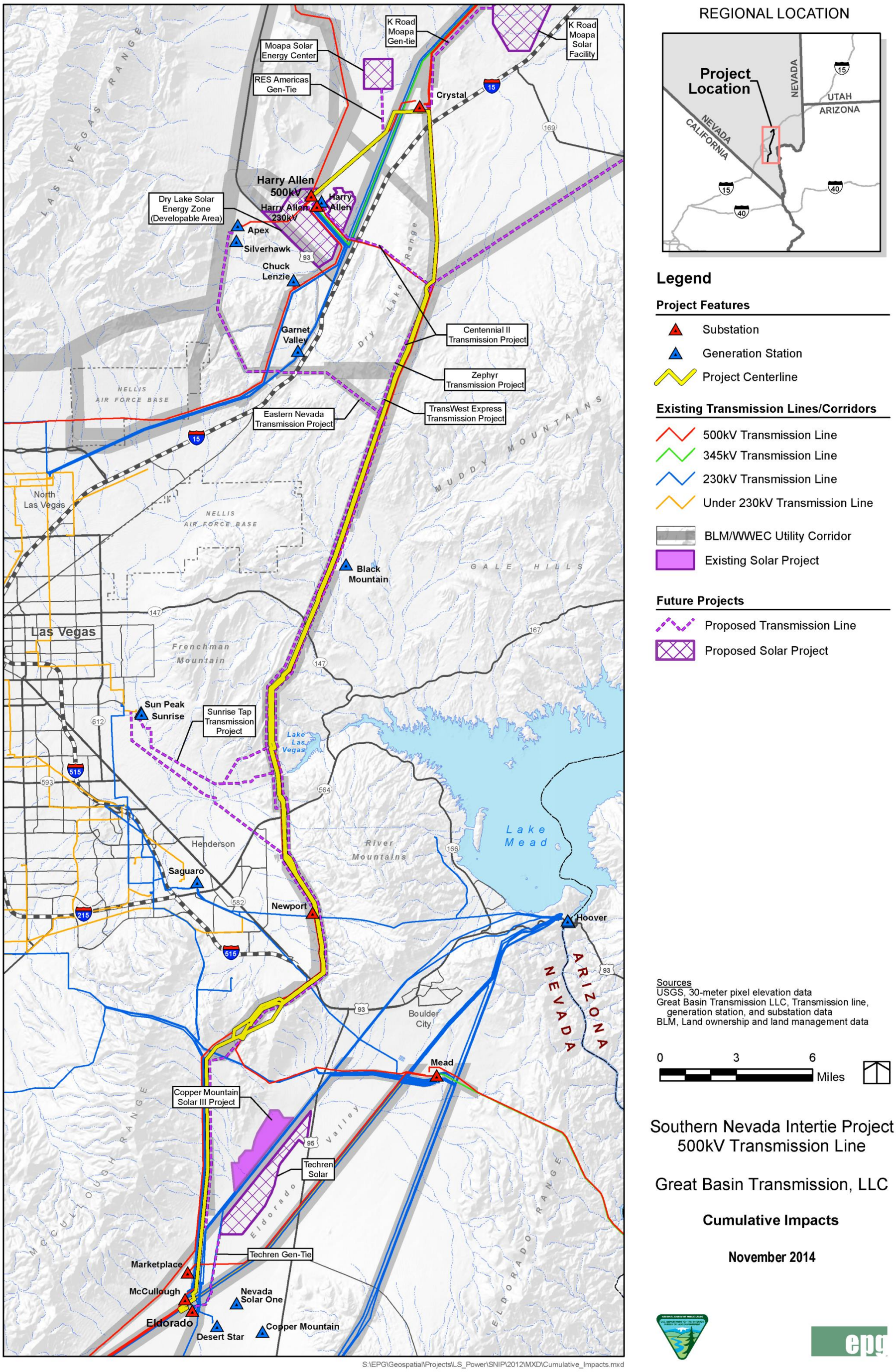
4.15.1. Impact Criteria

The analysis presented in this section addresses the potential cumulative impacts to resources from the construction, operation, and maintenance of the proposed project. The CEQ defines cumulative impacts as an "impact on the environment which 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" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time by various agencies (federal, state, and local) or individuals. Informed decision-making is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future. Information about past, present, and reasonably foreseeable future activities in the cumulative resource area were gathered from the BLM, Clark County, and other agencies; adopted plans; environmental documents; and personal communications with public agencies and utility companies.

The approach to cumulative impacts in this EA considers past actions to include projects or activities that have completed construction and are in operation. The impacts of past actions are already reflected in the baseline conditions identified in Chapter 3. Present actions include projects that are currently under construction or have been fully permitted such that they are likely to be part of the existing environment when the proposed project would begin

construction. Reasonably foreseeable future actions (RFFA) include projects for which a formal permit application has been filed. The BLM considers an RFFA on BLM lands as a project for which a ROW application has been submitted. However, the identification of reasonably foreseeable projects on BLM land does not end there; it also considers the status of such projects, the availability of data for such projects, and whether or not the impacts of such projects are too speculative to be considered reasonably foreseeable, based on the available information.

The cumulative impacts analysis in this EA generally considers actions and impacts within an approximately 4-mile corridor centered on the Proposed Action alignment (2 miles on either side). Most impacts from the proposed transmission line will occur during construction and are expected to be localized and short-term in nature (e.g., surface disturbance, fugitive dust, noise). A few impacts could be slightly more far reaching and longer term (e.g., visual impacts). A 4-mile-wide analysis corridor ensures that the potentially significant cumulative effect of the proposed project impacts combined with impacts from other actions are adequately assessed. Reasonably foreseeable projects within the analysis area that may have cumulative effects when added to the Proposed Action are shown on Figure 4-1.



REGIONAL LOCATION

Legend

Project Features

- Substation
- Generation Station
- Project Centerline

Existing Transmission Lines/Corridors

- 500kV Transmission Line
- 345kV Transmission Line
- 230kV Transmission Line
- Under 230kV Transmission Line
- BLM/WWEC Utility Corridor
- Existing Solar Project

Future Projects

- Proposed Transmission Line
- Proposed Solar Project

Sources
USGS, 30-meter pixel elevation data
Great Basin Transmission LLC, Transmission line, generation station, and substation data
BLM, Land ownership and land management data

0 3 6 Miles

Southern Nevada Intertie Project
500kV Transmission Line

Great Basin Transmission, LLC

Cumulative Impacts

November 2014

Figure 4-1. Cumulative Impacts

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4.15.2. Reasonably Foreseeable Future Projects

Transmission/Pipeline Projects

In response to Section 368 of the EPAct, the BLM, Department of Energy, and the USFS prepared the West-wide Energy Corridor Programmatic EIS, which evaluated issues associated with designation of energy corridors on federal lands in 11 western states, including Nevada. With few exceptions, the proposed SNIP alignment is located within a Section 368 corridor. In addition to the existing transmission lines and the proposed project, other transmission providers are considering future transmission projects within this same corridor. The projects listed below are those that have submitted applications or other filing documents with the BLM, Federal Energy Regulatory Commission, or the Public Utilities Commission of Nevada, and have showed continued progress in the development of the project. These projects share at least a portion of the same utility corridor as the SNIP and all have been or will be analyzed in their own NEPA evaluation. Those NEPA documents will help ensure that the public and the decision maker are aware of the impacts.

Silver State Energy Associates Eastern Nevada Transmission Project

The Silver State Energy Association intends to construct two separate 230 kV overhead transmission lines within a 130-foot ROW in Clark County, Nevada. The new 230 kV transmission lines would run from Gemmill Substation south of Coyote Springs in Clark County, Nevada, to the Tortoise Substation near Moapa in Clark County, Nevada; and also from the Silverhawk Substation located in northeast Las Vegas Valley in an unincorporated area of Clark County, Nevada, to the Newport Substation located in southeast Las Vegas Valley in the City of Henderson, Nevada. Portions of the proposed transmission line from the Silverhawk to Newport substations would most likely be located within the same utility corridor as the SNIP.

TransWest Express Transmission Project

TransWest Express, LLC intends to construct, operate, and maintain an extra-high-voltage direct-current transmission system along a route that is more than 700 miles long and 250 feet wide. The general route for this 500 to 600 kV transmission system begins in south-central Wyoming, extends through northwestern Colorado and central Utah, turns southwest into southern Nevada, and would end near or at the Marketplace Substation west of Boulder City. There are numerous alternative alignments proposed for this project. On January 4, 2011, the Notice of Intent to prepare an EIS was published in the Federal Register by the BLM and the Western Area Power Administration. A Draft EIS was issued on July 3, 2013. A Final EIS is anticipated in September 2014. Under all of the EIS alternatives, a portion of the TransWest Express Transmission Project would be located within the West-wide Energy Corridor, including areas where it would parallel the proposed SNIP alignment.

Duke-American Transmission Zephyr Transmission Line Project

Duke Energy recently acquired the proposed Zephyr Project, an approximately 950-mile-long 500 kV DC transmission line originating in southeast Wyoming and terminating in the Eldorado Valley south of Las Vegas. A preliminary application has been filed with the BLM, and the current in-service date is 2020. This project would most likely use the same West-wide Energy Corridors under consideration by other electric transmission providers in the area, including the proposed SNIP alignment.

Sunrise Tap Transmission Project

NV Energy has proposed to construct, operate, and maintain the Sunrise Tap Transmission Project. This project has several components, including (1) construction of a new double-circuit 500 kV transmission line between the existing Harry Allen to Mead 500 kV line near Lake Las Vegas and the Sunrise Substation on the northeast side of Las Vegas, (2) upgrading the existing Las Vegas #3 69 kV transmission line to a quad-circuit 230 kV/lower voltage line, (3) construction of a new quad-circuit 230 kV/lower voltage transmission line from the existing Las Vegas #3 to the Equestrian Substation on the southeast side of Henderson, (4) upgrading the existing Las Vegas #1 69 kV transmission line to a quad-circuit 230 kV/lower voltage between the Sunrise Substation and the Clark Substation, (5) upgrading the existing transmission lines between the Sunrise Substation and the Winterwood Substation to double-circuit 138 kV and quad-circuit 138/69 kV, and (6) upgrading four existing NV Energy substations (Sunrise, Winterwood, Clark, and Equestrian) to support the new 500 kV and 230 kV transmission lines. Portions of this project would be located in or near the corridor in which the SNIP is proposed to be located.

NV Energy Centennial 2 Project

NV Energy has proposed to construct, operate, and maintain a transmission line project known as the Centennial II Project. One component of the Centennial II Project is a double circuit 500 kV transmission line from the Harry Allen Substation to the Eldorado Substation. That component of the project is similar in size, scope, and location to the SNIP. Other than the expected routing of the project at the northern end of the alignment, the project would parallel SNIP in the utility corridor for the length of the project down to the Eldorado Substation. Other components of Centennial II are planned to run west of Harry Allen.

Renewable Energy Projects

There are seven proposed solar facilities within 2 miles of the proposed ROW corridors; two of the proposed solar facilities are in Eldorado Valley, two proposed solar facilities are near the Harry Allen Substation, and two proposed projects are near the Crystal Substation. One project, the Copper Mountain Solar III, is under construction in the Eldorado Valley. In addition, there are currently three proposed projects in BLM's Dry Lake SEZ west of I-15 and east of Highway 93. For those renewable energy projects located on federal lands, the entire projects have been or will be analyzed in project-specific NEPA documents. For those renewable energy projects located in Eldorado Valley, generally only the projects' transmission intertie is located on federal land or within federal corridors, and the projects' associated NEPA focuses primarily on that.

These NEPA documents will help ensure that the public and the decision maker are aware of the impacts.

Dry Lake Solar Energy Zone

The Dry Lake SEZ is located in an undeveloped rural area in Dry Lake Valley, which includes the Harry Allen Substation. The SEZ has a total area of 6,187 acres and is bounded on the northwest by the Arrow Canyon Range and on the southeast by the Dry Lake Range. On June 30, 2014, BLM held a competitive leasing auction for six parcels in the Dry Lake SEZ. Three bidders (NV Energy, First Solar, and Invenergy) were successful and are moving forward with permitting solar facilities. Both NV Energy and First Solar had previously submitted applications for solar facilities in the area of the Dry Lake SEZ, some portions of which overlapped with the parcels obtained during the SEZ auction. It is unknown whether those prior applications will continue to be pursued by NV Energy and First Solar, in addition to the projects with the SEZ.

Sempra – Copper Mountain Solar III (NVN-089424)

Sempra Generation is constructing a 220 MW solar energy-generating facility located on approximately 1,400 acres of land owned by Boulder City and leased by the applicant. The project includes approximately 7.6 miles of 500 kV transmission line from the generation facility across BLM-managed utility corridors. The transmission line interconnects with the Marketplace substation and would share a portion of the same utility corridor as SNIP. The solar facility is located in Eldorado Valley, approximately 1 mile east of the SNIP alignment.

K Road Power – K Road Moapa Solar Project (NVN-089176)

K Road Power has entered into an agreement with the Moapa Band of Paiutes to lease land, for up to 50 years, on the Moapa River Indian Reservation located in Clark County, Nevada, for the purposes of constructing and operating a 350 MW photovoltaic solar generating station and associated infrastructure. The project would disturb approximately 2,153 acres of land, including a solar facility footprint, a water pipeline, a 12 kV transmission line, and a 500 kV transmission line. The 500 kV transmission line would be approximately 5.5 miles long and interconnect at the Crystal Substation. A final EIS was issued for this project in March 2012. The project was acquired by First Solar in September 2013 and construction is expected to begin in 2014.

Moapa Solar Energy Project – (NVN-088870)

The Moapa Solar Energy Project is a planned 850-acre 200 MW photovoltaic solar generating station located on the Moapa River Indian Reservation located in Clark County, Nevada. The BIA signed a Record of Decision in May 2014 approving the project. The Moapa Band of Paiutes is approved to enter into a ground solar lease agreement and associated ROWs with Moapa Solar LLC.

Techren Solar, Inc. – (NVN-090395)

The Techren Solar Project is an up-to 300 MW solar generating facility located on approximately 2,200 acres of land owned by Boulder City and leased by the applicant. The project includes a 230 kV interconnection to both the McCullough and Eldorado substations. The solar facility will be located in Eldorado Valley, approximately 1.5 miles to the east of the SNIP alignment. The project's interconnection intertie would share a portion of the same utility corridor as SNIP.

4.15.3. Cumulative Impacts on Resources

Cumulative impacts on resources that would result from the construction and operation of the Proposed Action when added to other past, present, and reasonably foreseeable future actions described in the previous section are described below. Because of the uncertain nature of future projects in terms of size, number, location, and types of technology that would be used, cumulative impacts are discussed qualitatively or semi-qualitatively, with ranges given as appropriate. More detailed analyses of cumulative impacts would be performed in the environmental reviews for the specific projects in relation to all other existing and proposed projects in the cumulative effects area.

Air Quality

Cumulative impacts to air quality associated with construction and operation of the proposed project are anticipated to be minimal as air-related impacts are primarily short-term in duration, resulting from the construction of the proposed facilities. Cumulative impacts to air quality could occur if other projects within the corridor were constructed at the same time as the Proposed Action (e.g., other transmission line or solar energy projects); however, at this time the sequence for the construction of these facilities is unknown. If multiple projects were constructed during the same time period, adherence to air permit requirements, and mitigation measures, including dust suppression as outlined in their respective dust control permits, would effectively reduce these cumulative effects. Exceedance of regulatory standards is not anticipated.

Geology and Minerals

The proposed project is not expected to have impacts on geological resources; therefore, there would not be cumulative impacts with other projects.

There are active mining operations and mining claims within or near the proposed ROW corridor in a few locations. Great Basin is working with the existing operations to avoid or minimize impacts on mining, and other projects are expected to do the same, given the legal rights possessed by miners and owners of valid claims. Accordingly, the Proposed Action, when combined with other reasonably foreseeable future projects, would not have significant impacts on mining.

Soils

Cumulative impacts to soil resources would occur during project construction if multiple projects are constructed concurrently. Construction contractors working within Clark County would be required to obtain and comply with a state-issued NPDES permit, and prepare a site-specific SWPPP. Construction contractors would be required to implement site-appropriate BMPs to maintain compliance with their NPDES permit and SWPPP. While fugitive dust emissions may increase if overlapping construction periods were to occur, these events would be short-term in nature and would be mitigated through site-appropriate BMPs. In addition, all contractors would be required to implement soil erosion control measures in accordance with associated state permits for water quality and point source discharge to control erosion. Restoration of all land disturbances on BLM managed lands would be a requirement of each applicant's ROW grant.

Water Resources

The amount of water needed during construction of the project, primarily for dust control, is minimal. Water would be obtained from off-site locations and trucked to the construction site as needed. Similar activities would most likely occur for other reasonably foreseeable transmission line projects in the cumulative effects areas.

Other than short-term use of groundwater for dust suppression and construction, construction and operation of the proposed project and other reasonably foreseeable future transmission lines do not consume a large amount of water resources. The amount of water needed for solar projects in the cumulative effects area is unknown. Photovoltaic technology uses minimal water, while dry- or wet-cooled parabolic trough technology can require large amounts of water (estimated between several hundred to several thousand acre-feet per year). Most of the proposed projects are expected to be photovoltaic. Each solar developer would be required to secure a water supply source and obtain appropriate water right permits and approvals for their project. The state water rights process protects against water overuse and impacts on other water users. Therefore, the proposed project, when added to other reasonably foreseeable future projects, is not expected to contribute measurably to cumulative impacts to water resources.

Biological Resources

Vegetation

Mojave Desertscrub habitat, cacti, yuccas, and other sensitive plants in the analysis area may experience cumulative adverse effects due to the volume of projects proposed in the vicinity. This increase would result in an overall increase in use of public lands that may lead to compacted soils and increased soil erosion and crushed, removed, or destroyed vegetation.

The construction of numerous projects throughout the cumulative effects area presents increased opportunities for weed invasions. An increase in the volume of disturbed area created as a result of numerous projects in the region can leave the area susceptible to the proliferation of invasive and noxious weeds species resulting in a cumulative impact. Adherence by all projects to noxious weed management plans and restoration plans, including measures identified by the

BLM, will minimize the introduction and spread of noxious and invasive weeds during and following construction.

Wildlife

Cumulative effects to wildlife at a local level will vary. This is most evident within the BLM utility corridors where additional transmission lines are proposed to be constructed. However, by concentrating these projects in the designated corridors, habitat fragmentation would be minimized.

Desert Tortoise habitat is known to be present throughout the vast majority of the cumulative impacts study area. The Clark County Department of Comprehensive Planning and USFWS have addressed cumulative effects to biological resources from development and construction activities on a county-wide basis, and the Final MSHCP (prepared by Clark County; the Cities of Las Vegas, North Las Vegas, Boulder City, Mesquite, and Henderson; and the Nevada Department of Transportation) addresses sensitive species and protects biological resources and requires mitigation for effects to Desert Tortoise. Because plans and mitigation requirements have been, and will continue to be, developed to address potential impacts to the Desert Tortoise, and because consultation and detailed mitigation planning will occur on other future projects, including the solar projects listed above, cumulative effects associated with other future development should be minimized and/or mitigated.

Other non-federal projects occurring within Clark County would fall under the purview of the Clark County MSHCP and associated incidental take permit for impacts to Desert Tortoise and other covered wildlife and plant species. Other federal projects would require separate consultation for listed species pursuant to Section 7 of the ESA.

Opening up areas to casual vehicular access by the public causes indirect impacts. Increased hunting, wildlife harassment, vehicle collisions, and spread of noxious weeds can result in areas that had previously been inaccessible. Increased surface disturbance would result in cumulative loss of habitat for wildlife that inhabits the areas proposed for future projects. Displacement of wildlife into adjacent, occupied habitat outside newly developed areas can artificially increase densities of some species above carrying capacity, and increase competition for resources. When nest sites are a limiting factor, the construction of a transmission line may support locally increased densities of ravens and raptors, which may increase predation pressure in the vicinity of the line. Increased road density can cause wildlife mortality and allow increased human access and associated sources of disturbance. However, the proposed project follows existing transmission and access for a majority of its length and, therefore would add a relatively small number of new access roads.

Cultural Resources

The potential exists for cumulative impacts to NRHP-eligible properties as a result of the construction of the proposed project and other reasonably foreseeable projects. A number of contributing historic properties in the Las Vegas Wash Archaeological District, and a number of historic properties along the west front of the River Mountains have been impacted by past projects, particularly in BLM utility corridors where additional transmission lines are proposed

to be constructed. While restricting these projects to the designated corridors would reduce impacts to historic properties outside of the designated utility corridors, RFFA have the potential to create additional impacts to previously affected sites and new impacts to others that have not been previously affected.

Through implementation of mitigation measures, it is anticipated that potential direct impacts from project construction would be fully mitigated through commonly employed practices, such as data recovery, avoidance, or construction monitoring activities. Important resources that would be affected by construction activities would be avoided, or if this is not possible, recovered for their scientific value. Due to the applicability of the NHPA, RFFA will be under the same obligation to identify cultural resources, consult with stakeholders, and avoid or mitigate impacts to those resources, which will reduce cumulative impacts to individual historic properties and to groups of historic properties in the Las Vegas Wash Archaeological District and along the west front of the River Mountains. The potential exists that continuing mitigation to individual, contributing historic properties through data recovery could result in cumulative impacts to the integrity of the Las Vegas Wash Archaeological District.

Paleontological Resources

Effects to paleontological resources are localized and do not generally result in regionally cumulative effects. Paleontological resources vary according to the geological formations that contain them. Geological formations may also vary significantly over short distances, effectively limiting the geographic range of impacts to paleontological resources. Therefore, the impacts of the Proposed Action when added to other RFFA on paleontological resources would be localized within the project area.

While impacts on significant paleontological resources are unlikely to occur within the cumulative effects area, a review of the geological deposits in the footprint of each of the other projects would be performed to determine whether a paleontological survey was warranted. Any paleontological resources encountered would be mitigated to the extent possible, as determined through consultation with the BLM. Therefore, the potential construction impacts of the Proposed Action, in combination with other reasonably foreseeable projects in the area, would not contribute to a cumulatively significant effect to paleontological resources.

Land Use, Transportation, and Access

Most of the Proposed Action and the majority of foreseeable transmission and renewable energy projects would be located on BLM land, within or adjacent to designated utility corridors. Great Basin's selection of the proposed transmission alignment within designated utility corridors was intentionally designed to minimize potential cumulative impacts to multiple resources.

Other proposed transmission line projects that may utilize this corridor include the Eastern Nevada Transmission Project, the TransWest Express Transmission Line Project, the Sunrise Tap Transmission Project, the Centennial II Project, and the Zephyr Transmission Line Project.

The proposed project and cumulative projects would also result in a more reliable network of utilities, including renewable electric generating stations and increased reliability of electrical transmission lines.

Visual Resources

The majority of the proposed project would be located in a BLM-designated utility corridor that contains existing transmission lines. Increased modifications to the landscape, due to the addition of transmission towers within a multi-line corridor typically result in an increase in the visibility at longer distances because of the cumulative physical contrast with the natural landscape. Normally, the first constructed objects in a natural setting cause the most noticeable change because of the contrast of form, line, color, and texture with the surroundings. Each successive change becomes less noticeable than the first. However, the sum of all the changes (e.g., form, line, color, and texture) is more evident to the casual observer. Therefore, the first transmission line in a natural area normally causes the greatest incremental change, but the cumulative visual impact of a corridor increases with the addition of each new line.

The proposed transmission line would mostly parallel existing transmission lines within an existing designated utility corridor. Additional transmission lines within the designated corridor, if constructed, will add further to the visual cumulative impacts in these areas. Grouping of facilities within the designated utility corridor would minimize overall cumulative effects on a regional basis through consolidation. However, in the immediate viewshed of the corridor area, the cumulative visual contrast could be slightly increased as each new project is added, and the multiple lines become more noticeable to the casual observer. Measures to minimize these impacts, such as the selective location of towers within the corridor, the use of similar structures and the similar placement of structures (matching spans), dulled finishes on structures, and the use of nonspecular conductors will reduce these cumulative effects.

Socioeconomic Resources and Environmental Justice

Public services and public utilities in the area have the capacity to serve present and future projects, and thus cumulative impacts would not be measurable. Implementation of the Proposed Action and present and future projects would create socioeconomic effects in the form of increased employment, and increased local and state tax revenue associated with economic activity generated by these projects. However, these changes would have a relatively small socioeconomic impact within the area economy.

The proposed project, in addition to the other cumulative projects, would contribute to the orderly development in the region, as authorized under federal laws (Southern Nevada Public Land Management Act and Clark County Conservation of Public Land and Natural Resources Act) and by land use and related plans approved by local governments. Each of the cumulative projects requires federal action and associated environmental compliance documentation. Potential socioeconomic impacts have been or would be considered in the environmental analyses and approvals for each of the cumulative projects.

Depending on the progress regarding the development of the other proposed projects described above, additional long-term employment opportunities and income to Clark County could result in beneficial effects.

The proposed project would have no effect on environmental justice and therefore, would not contribute to cumulative impacts within the Las Vegas Valley.

4.15.4. No Action Alternative Impacts

Under the No Action alternative the proposed project would not be considered in any cumulative effects analysis; however, the No Action alternative for the proposed project does not preclude other facilities from being constructed and operated.

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CHAPTER 5. TRIBES, INDIVIDUALS, ORGANIZATIONS, OR AGENCIES CONSULTED

Various agencies and organizations in the project area were contacted to provide project briefings, coordinate for more formal consultations, and obtain any relevant information for inclusion in the EA. In October 2010, Reclamation accepted an invitation from the BLM to be a cooperating agency in the project's NEPA analysis. The following agencies and organizations are among those contacted following the filing of the ROW application:

Bureau of Land Management
Bureau of Reclamation
U.S. Fish and Wildlife Service
Nellis Air Force Base

Nevada Division of Wildlife
Nevada State Historic Preservation Office

Clark County, Nevada
City of Henderson, Nevada
Boulder City, Nevada

Southern Nevada Water Authority
Clark County Regional Flood Control District

In October 2014, letters were sent to various tribes requesting comments on the proposed project. A field visit was also arranged for tribal representatives interested in visiting the proposed project area. The following tribes were sent letters and invited to the field visit:

Las Vegas Paiute Tribe
Chemehuevi Indian Tribe
Moapa Band of Paiutes
Fort Mojave Indian Tribe
Colorado River Indian Tribe
Timbisha Shoshone Tribe
Pahrump Paiute Tribe
Paiute Indian Tribe of Utah

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CHAPTER 6. LIST OF PREPARERS

Table 6-1. List of Preparers

BLM Preparers/Reviewers		
Name	**Title**	**Responsible for the Following Section(s) of this Document**
Lisa Christianson	Air Resources Specialist	Air Quality, Greenhouse Gas Emissions
Jessie Stegmeier	Wildlife Biologist	Areas of Critical Environmental Concern/Fish and Wildlife (Excluding Federally Listed Species)/Migratory Birds/Threatened, Endangered or Candidate Animal Species
Sendi Kalcic	Wilderness Specialist	BLM Natural Areas/Wilderness/WSA/Areas with Wilderness Characteristics
Susanne Rowe	Archaeologist	Cultural Resources/Native American Religious Concerns/Paleontology
Susan Farkas	Planning and Environmental Coordinator	Environmental Justice/Socio-Economics
Krystal Johnson	Wild Horse and Burro Specialist	Farmlands (Prime or Unique)/Livestock Grazing/Rangeland Health Standards/Wild Horses and Burros
Sarah Peterson	Hydrologist	Floodplains/Hydrologic Conditions/Soils/Water Resources/Water Quality (drinking/surface/ground)/ Wetlands, Riparian Zones
Lucas J. Rhea	Fuels Technician	Fuels/Fire Management
George Varhalmi	Geologist	Geology/Mineral Resources/Energy Production
Nora Caplette	Weed Management Specialist	Invasive Species/Noxious Weeds
Phil Rhineheart	Realty Specialist	Lands/Access
Marilyn Peterson	Outdoor Recreation Planner	Recreation/Wild and Scenic Rivers
Fred Edwards	Botanist	Threatened, Endangered or Candidate Plant Species/Woodland/Forestry/Vegetation (Excluding Federally Listed Species)
Matthew Hamilton	Biologist	Vegetation, Wildlife, Threatened and Endangered Species
Mike Moran	Environmental Protection Specialist	Wastes (Hazardous or Solid)
Lauren Brown	Restoration Ecologist	Visual Resources

Consultant (EPG) Preparers		
Newton DeBardeleben	Senior Environmental Planner	Air Quality; Land Use, Recreation, and Access; Socioeconomics; Environmental Justice
Sandra Fairchild	Senior Environmental Planner	Water Resources
Allison Pruett	Biologist	Vegetation, Wildlife, Threatened and Endangered Species
David Kahrs	Biologist	Vegetation, Wildlife, Threatened and Endangered Species
Marc Schwartz	Visual Resource Specialist	Visual Resources
Steven Swanson Ph.D.	Archaeologist	Cultural Resources
Rebecca Halbmaier	Archaeologist	Cultural Resources
Mike Pasenko	Paleontologist	Geology and Minerals, Soils, Paleontology

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Appendix A BLM Affected Resource Form

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Proposed project Name: Southern Nevada Intertie Project (SNIP)

Project Information

NEPA (ePlanning) Number	DOI-BLM-NV-S010-2010-0091-EA
Project Name	Southern Nevada Intertie Project (SNIP)
Project Lead/Manager	Phil Rhinehart,
Project/Activity Type	Right-of-Way,
Case File Number	NVN-086359
Comment Due Date	Friday, May 07, 2010
Applicant/Proponent	Great Basin Transmission, LLC. c/o LS Power Development, LLC
Cost Code	L51010000 ER0000 LVRWF0900220
General Location	A transmission line stretching between a northern terminus at or near the Harry Allen Substation located in Dry Lake, Nevada (approximately 20 miles northeast of Las Vegas) to a southern terminus located at the existing Eldorado Substation located approximately 14 miles southwest of the city center of Boulder City, Nevada (a total project distance of approximately 60 miles). The northern terminus at or near the existing Harry Allen Substation will be located in Sec. 35, T. 17 S., R. 63 E., (or at an alternate location in Secs. 17 and 18, T. 17 S., R. 64 E.). The southern terminus will be at the existing Eldorado Substation located in Sec. 12, T. 25 S., R. 62 E. With minor exceptions the proposed Project alignment will be inside the existing BLM utility corridor which is a multimodal, 3,500-foot-wide corridor (West-Wide Energy Corridor).
Legal Description	See attached file for legal land description.
Map (7.5–mintue USGS topo map)	
Amount of new disturbance (acres)	1,454
Amount of previous disturbance (acres)	
Amount of TOTAL disturbance (acres)	1,454
Duration of project	Construction 12 to 24 months, conducted year-round
Tiered off EA/EIS/BO/ other	

Description: The project is a 500 kilovolt (kV) alternating current (AC) single or double circuit aboveground electric transmission line with necessary access roads, interconnection facilities, and an integrated fiber optic communications line. The proposed alignment is approximately 60 miles long within a 200-foot wide right-of-way. The project will operate year-round to provide delivery of electrical energy between northern and southern Clark County, Nevada. The construction of the project is anticipated to last 12 to 24 months and will be conducted year-round. The project will require small temporary work areas at each tower and three larger temporary work areas.

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions
NI = present, but not affected to a degree that detailed analysis is required
PI = present with potential for relevant impact that need to be analyzed in detail in the EA

Table 1. Affected Resources Form

Determination	Resource	Rationale for Determination	Digital check off	Date
NI	Air Quality	Ensure dust control permits are obtained and ensure compliance for all air quality regulations and stipulations for the duration of the project.	Lisa Christianson, Air Resources Specialist	04/12/2010
PI	Areas of Critical Environmental Concern	The proposed project area is not within any desert tortoise ACECs or any critical desert tortoise habitat. The proposed project is within the River Mountains ACEC containing bighorn sheep habitat. Per the Las Vegas Valley RMP, October 1998, ACECs are designated as ROW avoidance areas. Shapefiles will be needed for the proposed transmission lines, along with proposed acres of disturbance to complete analysis for ACECs. As there will be new surface disturbance associated with the proposed action, impacts to the River Mountain ACECs need to be analyzed in detail.	Jessie Stegmeier	5/7/2010

NP	BLM Natural Areas	No designated areas are present in the district.	Sendi Kalcic	04/16/2010
PI	Cultural Resources	A Class III cultural resources inventory must be conducted of all areas affected directly or indirectly by the project that have not been evaluated within the last ten years. Prior to any surface disturbing activity, those historic properties discovered within the area of potential effect (APE) will require mitigation subsequent to the development of an appropriate historic properties treatment plan (HPTP), which must be developed in consultation with the Nevada State Historic Preservation Office (SHPO).	Susanne Rowe	04/16/2010
NI	Greenhouse Gas Emissions	Currently there are no emission limits for suspected Greenhouse Gas (GHG) emissions, and no technically defensible methodology for predicting potential climate changes from GHG emissions. However, there are, and will continue to be, several efforts to address GHG emissions from federal activities, including BLM authorized uses.	Lisa Christianson, Air Resources Specialist	04/12/2010
PI	Environmental Justice	Proposed project may affect VRM and landscape characteristic for residents on nearby Native American Reservation.	Susan Farkas	04/14/2010
NP	Farmlands (Prime or Unique)	Proposed project area does not include any prime or unique farmlands.	Krystal Johnson	04/06/2010

PI	Fish and Wildlife Excluding Federally Listed Species	Wildlife species in the general area include small mammals, rodents, birds and reptiles. Additionally, the BLM sensitive species bighorn sheep, western burrowing owl, phainopepla, chuckwalla and banded Gila monster may be present in the general area. These species would be displaced as lands are disturbed within the project area. The primary direct impact of the proposed action on wildlife would be killing or maiming of ground dwelling animals during construction and the loss of habitat. Additional impacts associated with the mortality from vehicular traffic may also be realized upon the completion of construction and subsequent use of the project area.	Jessie Stegmeier	5/7/2010
NI	Floodplains	Construction and operation activities would result in minimal change to downstream flooding effects	Sarah Peterson	4/14/2010
NI	Fuels/Fire Management	Construction activities can increase the risk of a wildland fire event, please ensure that ROW holder is informed about fire restriction during the applicable time of year. Including but not limited to no smoking outside of enclosed vehicle, and permits are required for any welding or open flame torch activities. In addition when rehabbing construction road ensure, by working with BLM	Lucas J. Rhea	4/09/2010

		botanist, that native, non fire conducive, Mojave vegetation is used. Weed issues contribute to fuels and fire management issues.		
NI	Geology / Mineral Resources/Energy Production	Any necessary excavation that produces mineral materials within the ROW must be used within the ROW or stockpiled on site for sale by the BLM.	George Varhalmi	4/20/2010
PI	Hydrologic Conditions	New roads associated with line could increase road drainage densities	Sarah Peterson	4/14/2010
NI	Invasive Species/ Noxious Weeds	A weed plan must be in place to address construction and maintenance phases of this project. Due to desert tortoise habitat, control of weed populations may need to plan for mechanical or biological controls and increased preventive measures, rather than utilizing chemical methods.	Nora Caplette	4/19/10
PI	Lands/Access	The preferred, and alternative routes run through the area released from the Sunrise Mountain Instant Study Area (ISA) by Public Law (P.L.) 107–282, Section 207–C. P.L. 107–282 released from the ISA a 500–foot wide corridor for the State-regulated sponsor of the Centennial Project. Though released from consideration within the ISA there are limitations on uses within the corridor. These issues will have to be addressed in detail. If existing facilities within the corridor are to be used, a letter of	Phil Rhinheart	05/11/2010

		concurrence from the current right-of-way holder will be required. In as much as this project is to be considered a Federal Undertaking and there are private land owners over whose property the proposed transmission line will cross, these private holdings too, will be addressed in the EA. LS Power must have an agreement with them as to project impact and mitigation measures to be taken to keep them whole. BLM has no authority to issue a ROW grant on private property where the U.S. has not reserved the right to do so. Therefore, LS Power must obtain easements from all private property owners. Before the BLM will issue a ROW grant for the proposed project copies of these agreements MUST be filed with the BLM, and they will become a part of the case file. In instances where the proposed action crosses, or impacts existing authorizations those will have to be mitigated so as to protect existing rights. A segment of the proposed transmission line is on lands administered by the Bureau of Reclamation (BOR), therefore, a cooperating agency agreement will have to be completed between		

		the two Federal agencies, and BOR, as well as the BLM will have to agree to and sign the EA. For the segment of the transmission line located on BOR administered lands an authorization (right-of-way grant) from BOR will be required, as BLM has no authority to issue a ROW grant on these lands. An alternative that you might want to evaluate would be to place the line to the east of the ISA, within the Lake Mead National Recreation Area, administered by the National Park Service, as this would avoid the issues associated with the ISA.		
NP	Livestock Grazing	Proposed project area does not include any authorized grazing allotments.	Krystal Johnson	04/06/2010
PI	Migratory Birds	Migratory birds, including the BLM sensitive species the western burrowing owl (*Athene cunicularia*), may be present on the project site. 1) To prevent undue harm, habitat-altering projects or portions of projects should be scheduled outside bird breeding season. In upland desert habitats and ephemeral washes containing upland species, the season generally occurs between March 15th - July 30th. 2) If a project that may alter any breeding habitat has to occur during the breeding season, then a qualified	Jessie Stegmeier	5/7/2010

		biologist must survey the area for nests prior to commencement of construction activities. This shall include burrowing and ground nesting species in addition to those nesting in vegetation. If any active nests (containing eggs or young) are found, an appropriately-sized buffer area must be avoided until the young birds fledge.		
PI	Native American Religious Concerns	The BLM must conduct government-to-government consultation with tribes who traditional territory will be impacted by the project.	Susanne Rowe	04/16/2010
PI	Paleontology	Fossil bearing strata are present and may be impacted.	Susanne Rowe	04/16/2010
NI	Rangeland Health Standards	Proposed project area will be within an existing utility corridor, there should be no major impacts to rangeland health.	Krystal Johnson	04/06/2010
NI	Recreation	No Issues	Marilyn Peterson	4/6/2010
PI	Socio-Economics	Proposed project may provide benefit to the social and economic infrastructures of Southern Nevada — in form of additional employment and by strengthening the utility grid to prevent potential blackouts and other adverse effects due to additional usage that current infrastructure may not be able to support.	Susan Farkas	04/14/2010
PI	Soils	Applicant will need to utilize bmps to reduce potential for erosion	Sarah Peterson	4/14/2010

PI	Threatened, Endangered or Candidate Plant Species	Can not complete comments at this time. There is a potential for Las Vgeas buckwheat, Eriogonum corymbosum var. nilesii (a federal candidate species) to be present. If it has not already been completed, a rare plant survey will need to completed.	Fred Edwards	4/16/2009
PI	Threatened, Endangered or Candidate Animal Species	The proposed project area is not within any desert tortoise ACECs or any critical desert tortoise habitat. This project cannot be covered under existing Biological Opinions because it exceeds the acreage of disturbance they cover, therefore a biological assessment (BA) needs to be prepared and formal consultation with USFWS completed to get a BO. The BA should be contracted by the proponent as we do not have staff and funding available to do it in house. Once an acceptable BA is received, consultation with USFWS will take approximately 135 days to complete. The BA will analyze impacts to listed species and analyze impacts to BLM sensitive species in an appendix. The SOW for the surveys are provided in the ePlanning project folder "SOW". Shapefiles will be needed for the proposed transmission lines, along with proposed acres of disturbance to complete analysis for	Jessie Stegmeier	5/7/2010

		threatened and endangered species.		
NP	Wastes (hazardous or solid)	No Hazmat issues present. Include Standard Stipulations in ROW grant.	Per Mike Moran, entered by PR	04/04/2010
PI	Water Resources/ Quality (drinking/ surface/ground)	Applicant will need to utilize bmps to reduce impacts to water quality	Sarah Peterson	4/14/2010
NP	Wetlands/Riparian Zones	Not Present	Sarah Peterson	4/14/2010
NP	Wild and Scenic Rivers	Not Present	Marilyn Peterson	4/6/2010
PI	Wilderness/WSA	The proposed action is located adjacent to Sunrise Mountain Instant Study Area. The ISA is managed under the nonimpairment mandate and the existing wilderness values must not be degraded so far as to constrain Congress' decision to either designate as Wilderness or release for other purposes. The proposed action is within a corridor which was released from wilderness study and is no longer subject to section 603(c) of FLPMA and is instead managed under the current Land Use Plan. While no buffers are created around WSAs, the proposed action is located in close proximity to the ISA boundary, and activities outside need to be considered for impacts to wilderness characteristics within the ISA itself. Wilderness characteristics are commonly identified as: untrammeled, undeveloped, naturalness, outstanding opportunities for solitude or a primitive	Sendi Kalcic	04/26/2010

		and unconfined type of recreation. The proposed action would have a negative impact to the natural character resulting from becoming increasingly isolated within a "sea" of modern development. While there is currently a transmission line in existence within the corridor, construction of another transmission line would collectively decrease naturalness within the ISA. The proposed action would result in a decrease of opportunities for people to experience solitude, particularly during initial construction and following maintenance due to the sights and sounds of associated activities.		
NI	Woodland / Forestry	Cactus and yucca are likely to be present within the project impact area. Cactus and yucca are considered government property and are regulated under the Nevada BLM forestry program. All cactus and yucca within permanent and temporary impact areas must be salvaged and replanted in temporary impact areas or undisturbed portions of the project area. If this is not possible, cactus and yucca may be transported to a BLM stockpile for later use by BLM, sold to the public or another alternative may be developed in coordination with the BLM botanist. Unless otherwise directed	Fred Edwards	4/16/2010

		by the BLM botanist, all replanted cactus and yucca must be watered and otherwise maintained for a period of one year. To ensure successful salvage and transplant, all cactus and yucca must be salvaged using a contractor (or other approved by the BLM botanist) with at least three years experience salvaging and maintaining plant materials in the Mojave or Sonoran Deserts.		
PI	Vegetation Excluding Federally Listed Species	Can not complete comments at this time. There is a potential for BLM special status plants to be present. If it has not already been performed, a rare plant survey will need to completed.	Fred Edwards	4/16/2010
PI	Visual Resources	Can not complete comments without more information. Can not open the map in the maps folder to determine what VRM classes the project goes through. Visual Simulations, establishment of KOPs, and Visual Contrast Ratings will be required for this project. More information needed on where new disturbance will be located and what the finished transmission line will look like.	Lauren Brown	4/23/2010
NP	Wild Horses and Burros	Proposed project area does not include any herd management areas.	Krystal Johnson	04/06/2010

NP	Areas with Wilderness Characteristics	The proposed action is located within areas which do not meet the elements for wilderness characteristics.	Sendi Kalcic	04/20/2010

Appendix B Visual Contrast Rating Worksheets, Simulations, VRM Classifications and KOP Map

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VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM - Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project **Key Observation Point : 1** I-15 – Configuration 1& 2 **VRM Class: III**	**Location** Township 17S Range 64E Section 15	Location Sketch 

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground), Rolling hills to mountainous (middleground) Mountainous (background)	Small, low, sparse patches (foreground) Sparse, irregular patch (middleground)	Tall vertical, transparent (middleground)
Line	Smooth, straight, horizontal (foreground) Undulating; curving (middleground) Undulating, diagonal (background)	Irregular (foreground)	Geometric, vertical (middleground)
Color	Grey, tan, beige (foreground) Brown, tan (middleground) Grayish-dull brown (background)	Green, tan (foreground) Green (middleground)	Grey-matted (foreground)
Texture	Fine (foreground) Fine, smooth – medium (middleground) Fine texture (background)	Medium, uneven, random, (foreground) Even, random (middleground)	Fine, uniform (foreground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground), Rolling hills to mountainous (middle ground) Mountainous (background)	Small, low, sparse patches (foreground) Sparse, irregular patch (middle ground)	Tall vertical, transparent (middle ground)
Line	Smooth, straight, horizontal (foreground) Undulating; curving (middle ground) Undulating, diagonal (background)	Irregular (foreground)	Geometric, vertical (middle ground)
Color	Grey, tan, beige (foreground) Brown, tan (middle ground) Grayish-dull brown (background)	Green, tan (foreground) Green (middle ground)	Grey-matted (foreground)
Texture	Fine (foreground) Fine, smooth – medium (middle ground) Fine texture (background)	Medium, uneven, random, (foreground) Even, random (middle ground)	Fine, uniform (foreground)

Degree of Contrast

M = Minimal

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					M
	Texture			X				X					M

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
Match existing transmission line spans.

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM - Las Vegas Field Office
Activity (program): Electric Utility Facilities

Southwest View from I-15

Weak-moderate contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class III. The proposed single-circuit lattice structures would be similar in form and color as compared to existing lattice structures located within the utility corridor. Matching existing spans crossing over I-15 would further reduce impacts. The construction of the project would also result in some vegetation clearing and landform modification based on the use of existing access and sparse vegetation. Due to the occurrence of moderate terrain, portions of the proposed project will be partially skylined which would increase contrast, in particular, for the double-circuit structure because it would be taller.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project	**Location**	Location Sketch
Key Observation Point : 2 Lake Mead Boulevard within Sunrise ISA – Configuration 1	Township 20S Range 63E Section 22	
VRM Class: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat; gently rolling hills (foreground), Rolling hills (middleground) Mountainous (background)	Low, irregular (foreground)	Tall vertical, transparent (foreground/middleground)
Line	Straight, linear; flat, horizontal; diagonal (foreground) Diagonal; curving (middleground) Irregular, horizontal (background)	Weak, irregular (foreground)	Geometric, vertical (foreground/middleground)
Color	Dark grey, reds (foreground) Brown, tan, red, (middleground) Dull brown, beige, red (background)	Light green, dark green (foreground) Dark green (middle ground)	Grey, matted (foreground/middleground)
Texture	Medium to fine (foreground/middleground) Fine, smooth (background)	Medium, uneven sparse (foreground) Fine, sparse (middle/background)	Fine, uniform (foreground/middleground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat; gently rolling hills (foreground), Rolling hills (middleground) Mountainous (background)	Low, irregular (foreground)	Tall vertical, transparent (foreground/middleground)
Line	Straight, linear; flat, horizontal; diagonal (foreground) Diagonal; curving (middleground) Irregular, horizontal (background)	Weak, irregular (foreground)	Geometric, vertical (foreground/middleground)
Color	Dark grey, reds (foreground) Brown, tan, red, (middleground) Dull brown, beige, red (background)	Light green, dark green (foreground) Dark green (middleground)	Grey, matted (foreground/middleground)
Texture	Medium to fine (foreground/middleground) Fine, smooth (background)	Medium, uneven sparse (foreground) Fine, sparse (middle/background)	Fine, uniform (foreground/middleground)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
Match existing spans and restore lay down areas adjacent to Lake Mead Boulevard.

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Southeast View from Lake Mead Boulevard

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class III. The proposed single and double-circuit lattice structures would be similar in form and color as compared to existing structures located within the utility corridor. Matching existing spans crossing over I-15 would further reduce impacts. Matching existing spans and restoring lay down areas adjacent to Lake Mead Boulevard would further reduce contrast. The construction of the project would also result in minimal vegetation clearing and landform modification for the accommodation of lay down areas based on the use of existing access and sparse vegetation.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project	**Location**	Location Sketch
Key Observation Point : 2 Lake Mead Boulevard within Sunrise ISA – Configuration 2	Township 20S Range 63E Section 22	
VRM Class: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat; gently rolling hills (foreground), Rolling hills (middleground) Mountainous (background)	Low, irregular (foreground)	Tall vertical, transparent (foreground/middleground)
Line	Straight, linear; flat, horizontal; diagonal (foreground) Diagonal; curving (middleground) Irregular, horizontal (background)	Weak, irregular (foreground)	Geometric, vertical (foreground/middleground)
Color	Dark grey, reds (foreground) Brown, tan, red, (middleground) Dull brown, beige, red (background)	Light green, dark green (foreground) Dark green (middleground)	Grey, matted (foreground/middleground)
Texture	Medium to fine (foreground/middleground) Fine, smooth (background)	Medium, uneven sparse (foreground) Fine, sparse (middle/background)	Fine, uniform (foreground/middleground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat; gently rolling hills (foreground), Rolling hills (middleground) Mountainous (background)	Low, irregular (foreground)	Tall vertical, transparent (foreground/middleground)
Line	Straight, linear; flat, horizontal; diagonal (foreground) Diagonal; curving (middleground) Irregular, horizontal (background)	Weak, irregular (foreground)	Geometric, vertical (foreground/middleground)
Color	Dark grey, reds (foreground) Brown, tan, red, (middleground) Dull brown, beige, red (background)	Light green, dark green (foreground) Dark green (middleground)	Grey, matted (foreground/middleground)
Texture	Medium to fine (foreground/middleground) Fine, smooth (background)	Medium, uneven sparse (foreground) Fine, sparse (middle/background)	Fine, uniform (foreground/middleground)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
Restore lay down areas adjacent to Lake Mead Boulevard.

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Southeast View from Lake Mead Boulevard

Minimal contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class III. The proposed action for this configuration would have transmission lines co-located onto existing structures reducing contrast for color and form. Restoring lay down areas as a result of stringing new transmission lines adjacent to Lake Mead Boulevard would further reduce contrast. The co-location of the project would also result in minimal vegetation clearing and landform modification for the accommodation of lay down areas based on the use of existing access and sparse vegetation.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM - Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project	**Location**	Location Sketch
Key Observation Point : 3 Residential-Undeveloped Residential Lot – Configuration 1	Township 21S Range 63E Section 22	
VRM Class: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Highly developed residential (foreground), Rolling hills to mountainous (middleground) mountainous (background)	Irregular vertical (foreground) Sparse, irregular patch (background)	Geometric, vertical (foreground) Tall vertical, transparent (middleground)
Line	Linear, horizontal (foreground) Diagonal (middleground) Undulation, horizontal (background)	Irregular vertical (foreground)	Complex, geometric (foreground) Moderate vertical (middleground)
Color	Green, brown, grey, tan (foreground) Light/dark red (middleground) Browns, tans (background)	Green (foreground) Grey-green (middleground) Dark Green (wash)	Greens, reds, browns, light tan (foreground) Grey, matted (middleground)
Texture	Fine, smooth (fore/middleground) Course to fine texture (background)	Course, dense (foreground) Sparse, fine (middle/background)	Course, dense (foreground) Fine, uniform (middleground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Highly developed residential (foreground), Rolling hills to mountainous (middleground) mountainous (background)	Irregular vertical (foreground) Sparse, irregular patch (background)	Geometric, vertical (foreground) Tall vertical, transparent (middleground)
Line	Linear, horizontal (foreground) Diagonal (middleground) Undulation, horizontal (background)	Irregular vertical (foreground)	Complex; curving horizontal; geometric (foreground) Moderate vertical (middleground)
Color	Green, brown, grey, tan (foreground) Light/dark red (middleground) Browns, tans (background)	Green (foreground) Grey-green (middleground) Dark Green (wash)	Greens, reds, browns, light tan (foreground) Grey, matted (middleground)
Texture	Fine, smooth (foreground/middleground) Course to fine texture (background)	Course, dense (foreground) Sparse, fine (middle/background)	Course, dense (foreground) Fine, uniform (middleground)

Degree of Contrast

M = Minimal

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				M
	Texture			X					X			X	

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
No

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM - Las Vegas Field Office
Activity (program): Electric Utility Facilities

Southwest View from Undeveloped Residential Lot

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class III. The proposed single and double-circuit lattice structures would be similar in form and color as compared to existing lattice structures located within the utility corridor. The double-circuit structure would be slightly taller resulting in a partially skylined condition which would increase contrast slightly. Restoring lay down areas adjacent to residents would further reduce contrast. The construction of the project would also result in minimal vegetation clearing and landform modification for the accommodation of lay down areas based on the use of existing access and sparse vegetation.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM - Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project **Key Observation Point : 3** Residential-Undeveloped Residential Lot – Configuration 2 **VRM Class: III**	**Location** Township 21S Range 63E Section 22	Location Sketch 

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Highly developed residential (foreground), Rolling hills to mountainous (middleground) mountainous (background)	Irregular vertical (foreground) Sparse, irregular patch (background)	Geometric, vertical (foreground) Tall vertical, transparent (middleground)
Line	Linear, horizontal (foreground) Diagonal (middleground) Undulation, horizontal (background)	Irregular vertical (foreground)	Complex, geometric (foreground) Moderate vertical (middleground)
Color	Green, brown, grey, tan (foreground) Light/dark red (middleground) Browns, tans (background)	Green (foreground) Grey-green (middleground) Dark Green (wash)	Greens, reds, browns, light tan (foreground) Grey, matted (middleground)
Texture	Fine, smooth (foreground/middleground) Course to fine texture (background)	Course, dense (foreground) Sparse, fine (middle/background)	Course, dense (foreground) Fine, uniform (middleground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Highly developed residential (foreground), Rolling hills to mountainous (middleground) mountainous (background)	Irregular vertical (foreground) Sparse, irregular patch (background)	Geometric, vertical (foreground) Tall vertical, transparent (middleground)
Line	Linear, horizontal (foreground) Diagonal (middleground) Undulation, horizontal (background)	Irregular vertical (foreground)	Complex, curving horizontal, geometric (foreground) Moderate vertical (middleground)
Color	Green, brown, grey, tan (foreground) Light/dark red (middleground) Browns, tans (background)	Green (foreground) Grey-green (middleground) Dark Green (wash)	Greens, reds, browns, light tan (foreground) Grey, matted (middleground)
Texture	Fine, smooth (foreground/middleground) Course to fine texture (background)	Course, dense (foreground) Sparse, fine (middle/background)	Course, dense (foreground) Fine, uniform (middleground)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
No

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM - Las Vegas Field Office
Activity (program): Electric Utility Facilities

Southwest View from Undeveloped Residential Lot

Minimal contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class III. The proposed action for this configuration would have transmission lines co-located onto existing structures reducing contrast for color and form. Restoring lay down areas adjacent to residents as a result of stringing new transmission lines would further reduce contrast. The co-location of the project would also result in minimal vegetation clearing and landform modification for the accommodation of lay down areas based on the use of existing access and sparse vegetation.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project **Key Observation Point : 4** Residential- Roy Way – Configuration 1 **VRM Class: IV**	**Location** Township 21S Range 63E Section 33	Location Sketch 

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground), Irregular, undulating hills (middleground) Flat, undulating hills, mountainous (background)	Low, irregular, tall (foreground) Low, irregular, random (middleground) Irregular patch (background)	Geometric, tall, vertical (foreground) Geometric, tall, transparent (middleground) Low, geometric (background)
Line	Linear, horizontal (foreground) Undulating, horizontal (middleground) Undulating, irregular, weak (background)	Tall, vertical; low irregular (foreground) Diagonal, straight (middleground) Irregular, horizontal (background)	Complex, curving, horizontal, vertical Vertical, geometric (middleground) Weak horizontal (background)
Color	Dark-light grey, beige (foreground) Dark brown, red, beige (middleground) Tan, light red, brown (background)	Dark-light green, yellow (foreground) Dark green (middle-background)	Beige, red (foreground) Matted grey (middle ground) Pale reds (background)
Texture	Fine, smooth (foreground/background) Medium (middleground)	Medium, uneven random (foreground) Fine, dense (middle-background)	Medium, ordered (foreground) Medium to fine, uniform (middleground) Fine, dotted (background)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground), Irregular, undulating hills (middleground) Flat, undulating hills, mountainous (background)	Low, irregular, tall (foreground) Low, irregular, random (middleground) Irregular patch (background)	Geometric, tall, vertical (foreground) Geometric, tall, transparent (middleground) Low, geometric (background)
Line	Linear, horizontal (foreground) Undulating, horizontal (middleground) Undulating, irregular, weak (background)	Tall, vertical; low irregular (foreground) Diagonal, straight (middleground) Irregular, horizontal (background)	Complex, curving, horizontal, vertical (foreground) Vertical, geometric (middleground) Weak horizontal (background)
Color	Dark-light grey, beige (foreground) Dark brown, red, beige (middleground) Tan, light red, brown (background)	Dark-light green, yellow (foreground) Dark green (middle-background)	Beige, red (foreground) Matted grey (middleground) Pale reds (background)
Texture	Fine, smooth (foreground/background) Medium (middleground)	Medium, uneven random (foreground) Fine, dense (middle-background)	Medium, ordered (foreground) Medium to fine, uniform (middleground) Fine, dotted (background)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
Match existing spans and restore lay down areas adjacent to Lake Mead Boulevard.

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Southeast View from Roy Way

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class IV. The proposed structures for single and double-circuit options would be similar in form and color as compared to existing structures located within the utility corridor. Matching existing spans and restoring lay down areas adjacent to residents would further reduce contrast. The construction of the project would also result in minimal vegetation clearing and landform modification for the accommodation of lay down areas based on the use of existing access and sparse vegetation.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project	**Location**	Location Sketch
Key Observation Point : 4 Residential- Roy Way – Configuration 2	Township 21S Range 63E Section 33	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground), Irregular, undulating hills (middleground) Flat, undulating hills, mountainous (background)	Low, irregular, tall (foreground) Low, irregular, random (middleground) Irregular patch (background)	Geometric, tall, vertical (foreground) Geometric, tall, transparent (middleground) Low, geometric (background)
Line	Linear, horizontal (foreground) Undulating, horizontal (middleground) Undulating, irregular, weak (background)	Tall, vertical; low irregular (foreground) Diagonal, straight (middleground) Irregular, horizontal (background)	Complex, curving, vertical (foreground) Vertical, geometric (middleground) Weak horizontal (background)
Color	Dark-light grey, beige (foreground) Dark brown, red, beige (middleground) Tan, light red, brown (background)	Dark-light green, yellow (foreground) Dark green (middle-background)	Beige, red (foreground) Matted grey (middleground) Pale reds (background)
Texture	Fine, smooth (foreground/background) Medium (middleground)	Medium, uneven random (foreground) Fine, dense (middle-background)	Medium, ordered (foreground) Medium to fine, uniform (middleground) Fine, dotted (background)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground), Irregular, undulating hills (middleground) Flat, undulating hills, mountainous (background)	Low, irregular, tall (foreground) Low, irregular, random (middleround) Irregular patch (background)	Geometric, tall, vertical (foreground) Geometric, tall, transparent (middleground) Low, geometric (background)
Line	Linear, horizontal (foreground) Undulating, horizontal (middleground) Undulating, irregular, weak (background)	Tall, vertical; low irregular (foreground) Diagonal, straight (middleground) Irregular, horizontal (background)	Complex, curving, vertical (foreground) Vertical, geometric (middleground) Weak horizontal (background)
Color	Dark-light grey, beige (foreground) Dark brown, red, beige (middleground) Tan, light red, brown (background)	Dark-light green, yellow (foreground) Dark green (middle-background)	Beige, grey, red (foreground) Matted grey (middleground) Pale reds (background)
Texture	Fine, smooth (foreground/background) Medium (middleground)	Medium, uneven random (foreground) Fine, dense (middle-background)	Medium, ordered (foreground) Medium to fine, uniform (middleground) Fine, dotted (background)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?

Yes

Additional mitigating measures recommended?

Restore lay down areas and access roads adjacent to Lake Mead Boulevard.

Evaluators Names:

Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Southeast View from Roy Way

Minimal contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class IV. The proposed action for this configuration would have transmission lines co-located onto existing structures reducing contrast for color and form. Restoring lay down areas adjacent to residents would further reduce contrast. The co-location of the project would also result in minimal vegetation clearing and landform modification for the accommodation of lay down areas based on the use of existing access and sparse vegetation.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project	**Location**	Location Sketch
Key Observation Point : 5 Residential-Firth Avenue – Configuration 1	Township 22S Range 63E Section 4	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Highly developed residential (foreground), Rolling hills (middleground) Mountainous (background)	Low, irregular (foreground) Sparse, irregular (middleground)	Geometric; horizontal, narrow (foreground) Tall, transparent geometric; Solid geometric (middleground)
Line	Horizontal, straight; undulating (foreground) Diagonal, undulating (middleground) Weak, horizontal, undulating (background)	Irregular (foreground) Vertical, weak; irregular (middleground)	Simple geometric; staggered horizontal (foreground) Geometric, simple, vertical (middleground)
Color	Light grey, light tan (foreground) Light tan, tan (middleground) Dull grey (background)	Light and dark green (foreground/middleground)	Reds, tan, beige, light grey (foreground) Black, wood (?); matted grey (middleground)
Texture	Medium-fine (foreground/middleground)	Medium, sparse (foreground/middleground)	Medium, ordered; fine, smooth (foreground) Fine, uniform, smooth (middleground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Highly developed residential (foreground), Rolling hills (middleground) Mountainous (background)	Low, irregular (foreground) Sparse, irregular (middleground)	Geometric; horizontal, narrow (foreground) Tall, transparent geometric; Solid geometric (middleground)
Line	Horizontal, straight; undulating (foreground) Diagonal, undulating (middleground) Weak, horizontal, undulating (background)	Irregular (foreground) Vertical, weak; irregular (middleground)	Simple geometric; curving, staggered horizontal (foreground) Geometric, simple, vertical (middleground)
Color	Light grey, light tan (foreground) Light tan, tan (middleground) Dull grey (background)	Light and dark green (foreground/middleground)	Reds, tan, beige, light grey (foreground) Black, wood (?); matted grey (middleground)
Texture	Medium-fine (foreground/middleground)	Medium, sparse (foreground/middleground)	Medium, ordered; fine, smooth (foreground) Fine, uniform, smooth (middleground)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
No

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Northeast View from Firth Avenue

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class IV. The proposed single and double-circuit structures would be similar in form and color as compared to existing structures located within the utility corridor. The construction of the project would also result in minimal vegetation clearing and landform modification based on the use of existing access and sparse vegetation. It is unlikely that landscape contrast will be visible from this KOP due to intervening topography.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project	**Location**	Location Sketch
Key Observation Point : 5 Residential-Firth Avenue – Configuration 2	Township 22S Range 63E Section 4	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Highly developed residential (foreground), Rolling hills (middleground) Mountainous (background)	Low, irregular (foreground) Sparse, irregular (middleground)	Geometric; horizontal, narrow (foreground) Tall, transparent geometric; Solid geometric (middleground)
Line	Horizontal, straight; undulating (foreground) Diagonal, undulating (middleground) Weak, horizontal, undulating (background)	Irregular (foreground) Vertical, weak; irregular (middleground)	Simple geometric; curving, staggered horizontal (foreground) Geometric, simple, vertical (middleground)
Color	Light grey, light tan (foreground) Light tan, tan (middleground) Dull grey (background)	Light and dark green (foreground/middleground)	Reds, tan, beige, light grey (foreground) Black, wood; matted grey (middleground)
Texture	Medium-fine (foreground/middleground)	Medium, sparse (foreground/middleground)	Medium, ordered; fine, smooth (foreground) Fine, uniform, smooth (middleground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Highly developed residential (foreground), Rolling hills (middleground) Mountainous (background)	Low, irregular (foreground) Sparse, irregular (middleground)	Geometric; horizontal, narrow (foreground) Tall, transparent geometric; Solid geometric (middleground)
Line	Horizontal, straight; undulating (foreground) Diagonal, undulating (middleground) Weak, horizontal, undulating (background)	Irregular (foreground) Vertical, weak; irregular (middleground)	Simple geometric; curving, staggered horizontal (foreground) Geometric, simple, vertical (middleground)
Color	Light grey, light tan (foreground) Light tan, tan (middleground) Dull grey (background)	Light and dark green (foreground/middleground)	Reds, tan, beige, light grey (foreground) Black, wood; matted grey (middleground)
Texture	Medium-fine (foreground/middleground)	Medium, sparse (foreground/middleground)	Medium, ordered; fine, smooth (foreground) Fine, uniform, smooth (middleground)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
No

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Northeast View from Firth Avenue

Minimal contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class IV. The proposed action for this configuration would have transmission lines co-located onto existing structures reducing contrast for color and form. The construction of the project would also result in minimal vegetation clearing and landform modification based on the use of existing access and sparse vegetation. It is unlikely that the landscape contrast will be visible from this KOP due to intervening topography.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project	**Location**	Location Sketch
Key Observation Point : 6 Boulder Highway – Configuration 1	Township 23S Range 63E Section 2	
VRM Class: IV		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal; Gently rolling (foreground), Gently rolling (middleground)	Low, irregular (foreground) Irregular patch (middleground)	Tall, vertical, transparent (middleground)
Line	Straight, horizontal, diagonal (foreground) Diagonal, undulating (middleground)	Irregular, weak (foreground/middleground)	Simple, straight, vertical, curving horizontal; Geometric (foreground to middleground)
Color	Light grey, tan (foreground/middleground)	Light green, green (foreground) Green, brownish-yellow (middleground)	Grey, matted; dark brown (middleground)
Texture	Fine-medium (foreground) Medium (middleground)	Medium, sparse (foreground/middleground)	Fine, uniform (middleground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal; Gently rolling (foreground), Gently rolling (middleground)	Low, irregular (foreground) Irregular patch (middleground)	Tall, vertical, transparent (middleground)
Line	Straight, horizontal, diagonal (foreground) Diagonal, undulating (middleground)	Irregular, weak (foreground/middleground)	Simple, straight, vertical; Geometric (middleground)
Color	Light grey, tan (foreground/middleground)	Light green, green (foreground) Green, brownish-yellow (middleground)	Grey, matted; dark brown (middleground)
Texture	Fine-medium (foreground) Medium (middleground)	Medium, sparse (foreground/middleground)	Fine, uniform (middleground)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
No

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Northwest View from Boulder Highway

Weak contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class IV. The proposed single and double-circuit structures would be similar in form and color as compared to existing structures located within the utility corridor. The construction of the project would also result in minimal vegetation clearing and landform modification based on the use of existing access and sparse vegetation. It is unlikely that landscape contrast will be visible from this KOP due to the rolling topography.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project **Key Observation Point : 6** Boulder Highway – Configuration 2 **VRM Class: IV**	**Location** Township 23S Range 63E Section 2	Location Sketch 

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal; Gently rolling (foreground), Gently rolling (middleground)	Low, irregular (foreground) Irregular patch (middleground)	Tall, vertical, transparent (middleground)
Line	Straight, horizontal, diagonal (foreground) Diagonal, undulating (middleground)	Irregular, weak (foreground/middleground)	Simple, straight, vertical; horizontal, curving; Geometric (foreground to middleground)
Color	Light grey, tan (foreground/middleground)	Light green, green (foreground) Green, brownish-yellow (middleground)	Grey, matted; dark brown (middleground)
Texture	Fine-medium (foreground) Medium (middleground)	Medium, sparse (foreground/middleground)	Fine, uniform (middleground)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal; Gently rolling (foreground), Gently rolling (middleground)	Low, irregular (foreground) Irregular patch (middleground)	Tall, vertical, transparent (middleground)
Line	Straight, horizontal, diagonal (foreground) Diagonal, undulating (middleground)	Irregular, weak (foreground/middleground)	Simple, straight, vertical; horizontal, curving; Geometric (foreground to middleground)
Color	Light grey, tan (foreground/middleground)	Light green, green (foreground) Green, brownish-yellow (middleground)	Grey, matted; dark brown (middleground)
Texture	Fine-medium (foreground) Medium (middleground)	Medium, sparse (foreground/middleground)	Fine, uniform (middleground)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
No

Evaluators Names:
Lori Tuchman, Marc Schwartz

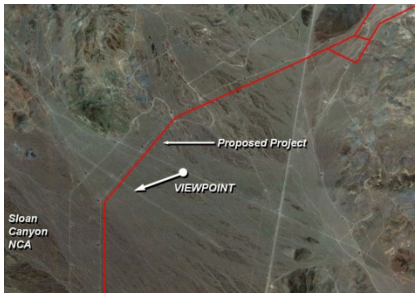
Date: March 2012
District: Southern Nevada
Resource Area: BLM – Las Vegas Field Office
Activity (program): Electric Utility Facilities

Northwest View from Boulder Highway

Minimal contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class IV. The proposed action for this configuration would have transmission lines co-located onto existing structures reducing contrast for color and form. The construction of the project would also result in minimal vegetation clearing and landform modification based on the use of existing access and sparse vegetation. It is unlikely that landscape contrast will be visible from this KOP due to the rolling topography.

VISUAL CONTRAST RATING WORKSHEET

Date: March 2012
Resource Area: Sloan Canyon NCA/N. McCullough Wilderness
Activity (program): Electric Utility Facilities

Project Name: Southern Nevada Intertie Project	**Location**	Location Sketch
Key Observation Point : 7 Quo Vadis Trailhead – Configuration 1 & 2	Township 23S Range 62E Section 13	
VRM Class: III		

Characteristic Landscape Description

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground/middleground), Mountainous (background)	Low, irregular (foreground/middleground) Irregular patch (background)	Tall, vertical, transparent (foreground) Indistinct, vertical (background)
Line	Straight, horizontal (foreground/middleground) Irregular, jagged; horizontal (background)	Irregular, horizontal (foreground) Horizontal (middleground) Horizontal, irregular (background)	Simple, straight, vertical; Geometric (foreground) Weak, vertical (background)
Color	Brown/Tan (foreground/middleground) Dark brown, tan (background)	Light green, green (foreground) Green-yellow to green (middleground) Dark green to light green (background)	Grey, matted (foreground) Dull/matted grey (background)
Texture	Fine, uniform (foreground/middleground) Course- medium; striated (background)	Even/random, medium (foreground) Dense, uniform, fine (middleground) Fine, smooth, patchy (background)	Fine, uniform (foreground) Very fine (background)

Proposed Activity Description (Facility)

	Landform/Water	Vegetation	Structures
Form	Flat, horizontal (foreground/middleground), Mountainous (background)	Low, irregular (foreground/middleground) Irregular patch (background)	Tall, vertical, transparent (foreground) Indistinct, vertical (background)
Line	Straight, horizontal (foreground/middleground) Irregular, jagged; horizontal (background)	Irregular, horizontal (foreground) Horizontal (middleground) Horizontal, irregular (background)	Simple, straight, vertical; Geometric (foreground) Weak, vertical (background)
Color	Brown/Tan (foreground/middleground) Dark brown, tan (background)	Light green, green (foreground) Green-yellow to green (middleground) Dark green to light green (background)	Grey, matted (foreground) Dull/matted grey (background)
Texture	Fine, uniform (foreground/middleground) Course- medium; striated (background)	Even/random, medium (foreground) Dense, uniform, fine (middleground) Fine, smooth, patchy (background)	Fine, uniform (foreground) Very fine (background)

Degree of Contrast

M = Minimal

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

Does project design meet visual resource management objectives?
Yes

Additional mitigating measures recommended?
No

Evaluators Names:
Lori Tuchman, Marc Schwartz

Date: March 2012
Resource Area: Sloan Canyon NCA/N. McCullough Wilderness
Activity (program): Electric Utility Facilities

West View from road leading to Quo Vadis Trailhead

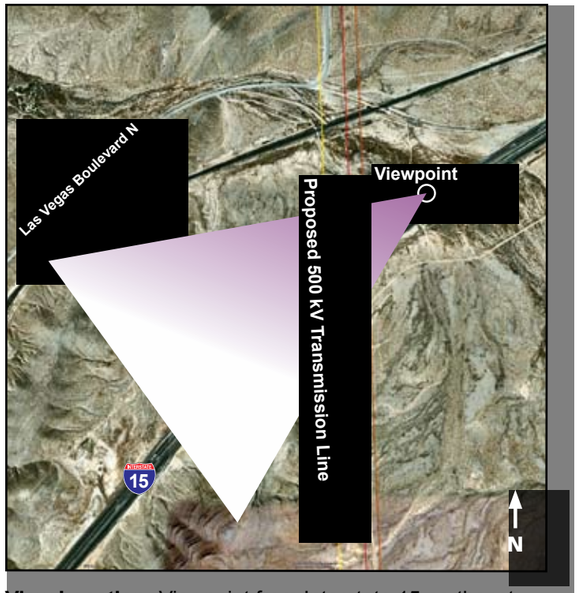
Weak contrast would result from the construction and operation of the proposed project within a modified setting designated as VRM Class III. The proposed single and double-circuit lattice structures would be similar in form and color as compared to existing lattice structures located within the utility corridor. Matching existing spans will also reduce the impacts. The construction of the project would also result in minimal vegetation clearing and landform modification for the accommodation of lay down areas based on the use of existing access. It is unlikely that landscape contrast will be visible from this KOP due to the distance of the project (approximately 1000-feet) east of this access the road and vegetation coverage over the valley floor.

Existing Condition - Existing IPP 500kV lattice structure transmission line and the existing Crystal-McCullough 500kV lattice structure transmission line crossing Interstate 15

Simulated Condition - Proposed Southern Nevada Intertie Project single-circuit 500kV steel lattice structure transmission line

This simulation is based on a typical project description for a 500kV transmission line.
Actual structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis based on final design.

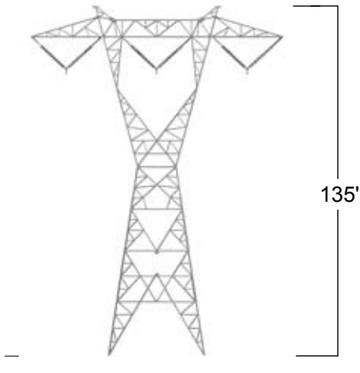
October 12, 2009



View Location: Viewpoint from Interstate 15 northeast of Dry Lake Mountains, facing southwest towards the existing transmission lines

Photographic Details:
Date: 7-23-09
Time: 3:30
Focal Length: 50mm
Atmospheric Conditions: Overcast

500kV Steel Galvanized Tower



Structure configurations based on specifications provided by Great Basin Transmission for the purposes of photographic simulations

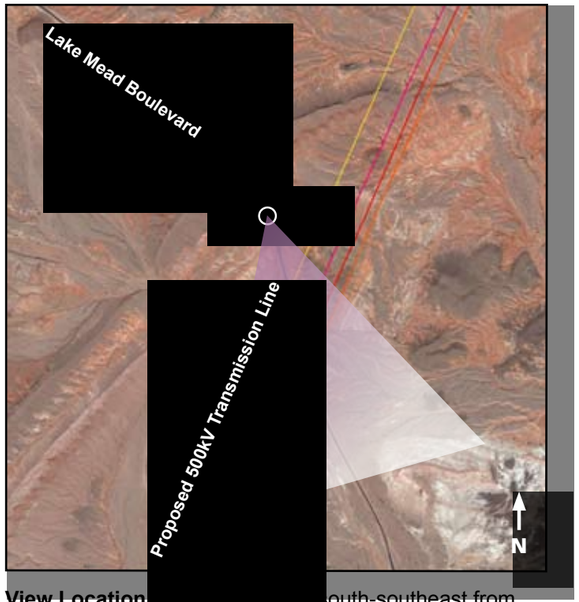
Southern Nevada Intertie Project
500kV Transmission Line
Viewpoint 1 – Interstate 15
Great Basin Transmission, LLC
Appendix A

Existing Condition - Existing IPP 500kV lattice structure transmission line, existing Crystal-McCullough 500kV transmission line (within the Sunrise Mountain Instant Study Area (ISA)) and existing Harry Allen to Mead double-circuit, 500kV transmission line

Simulated Condition - Proposed Southern Nevada Intertie Project double-circuit 500kV steel lattice structure transmission line

This simulation is based on a typical project description for a 500kV transmission line.
Actual structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis based on final design.

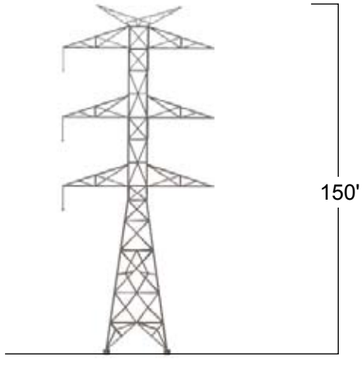
October 12, 2009



View Location ...outh-southeast from Lake Mead Boulevard within the Sunrise Mountain ISA, west of Lake Mead National Recreation Area, Nevada, towards the existing transmission lines

Photographic Details:
Date: 7-23-09
Time: 2:45 PM
Focal Length: 50mm
Atmospheric Conditions: Overcast

500kV Steel Galvanized Tower



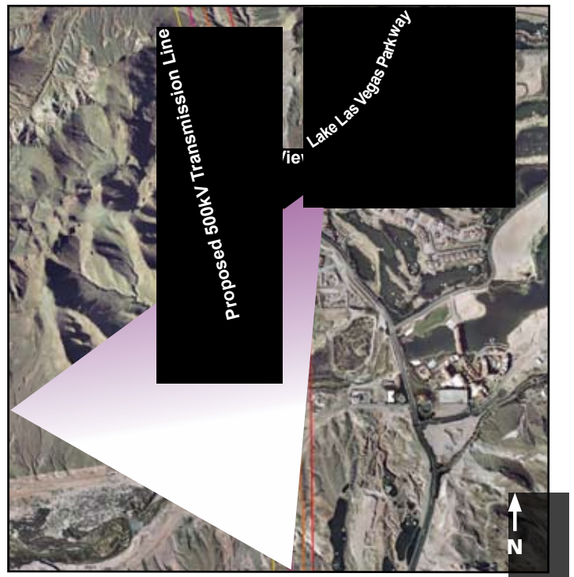
Structure configurations based on specifications provided by Great Basin Transmission for the purposes of photographic simulations

Southern Nevada Intertie Project
500kV Transmission Line
Viewpoint 2 – Sunrise ISA
Great Basin Transmission, LLC
Appendix A

Existing Condition - Existing IPP 500kV lattice structure transmission line, existing Crystal-McCullough 500kV transmission line and existing Harry Allen to Mead double-circuit 500kV transmission line adjacent to Lake Las Vegas Resort

Simulated Condition - Proposed Southern Nevada Intertie Project single-circuit 500kV steel lattice structure transmission line

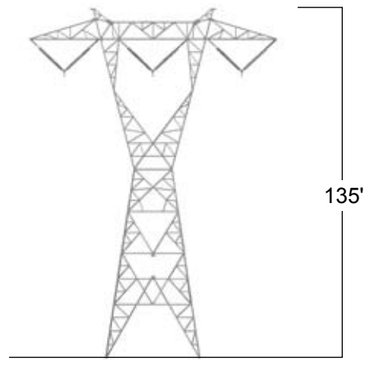
This simulation is based on a typical project description for a 500kV transmission line.
Actual structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis based on final design.



View Location: Viewpoint facing southwest from Lake Las Vegas Residential Area, towards the Las Vegas wash and adjacent existing transmission lines

Photographic Details:
Date: 5-13-09
Time: 1:33 PM
Focal Length: 50mm
Atmospheric Conditions: Clear

500kV Steel Galvanized Tower



Structure configurations based on specifications provided by Great Basin Transmission for the purposes of photographic simulations

October 12, 2009

epg

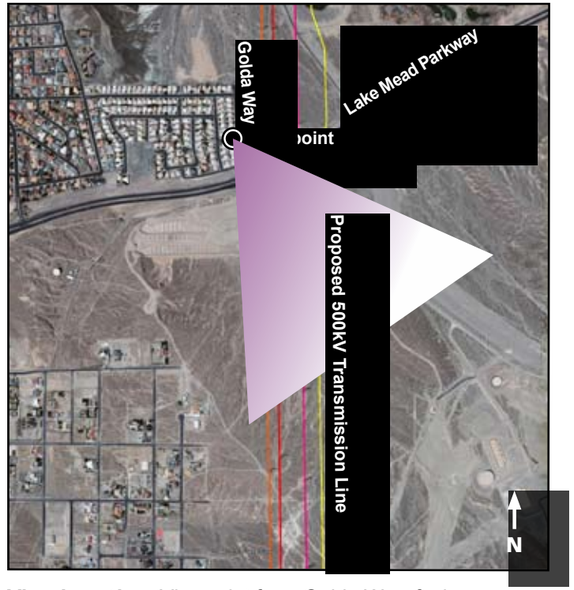
Southern Nevada Intertie Project
500kV Transmission Line
Viewpoint 3 – Lake Las Vegas Residential Community
Great Basin Transmission, LLC
Appendix A

Existing Condition - Existing IPP 500kV lattice structure transmission line, existing Crystal-McCullough 500kV transmission line, existing Harry Allen to Mead double-circuit 500kV transmission line, and existing 138kV line crossing East Lake Mead Parkway and adjacent to the Calico Ridge residential community

Simulated Condition - Proposed Southern Nevada Intertie Project single-circuit 500kV steel lattice structure transmission line

This simulation is based on a typical project description for a 500kV transmission line.
Actual structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis based on final design.

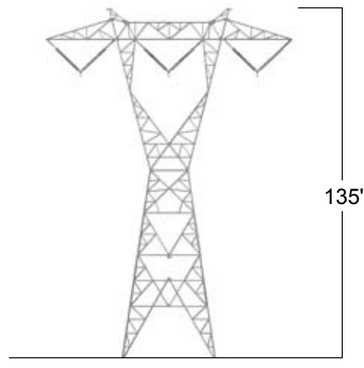
October 12, 2009



View Location: Viewpoint from Golda Way, facing southeast towards East Lake Mead Parkway, northeast of Henderson, Nevada

Photographic Details:
Date: 7-23-09
Time: 2:03 PM
Focal Length: 50mm
Atmospheric Conditions: Overcast

500kV Steel Galvanized Tower



Structure configurations based on specifications provided by Great Basin Transmission for the purposes of photographic simulations

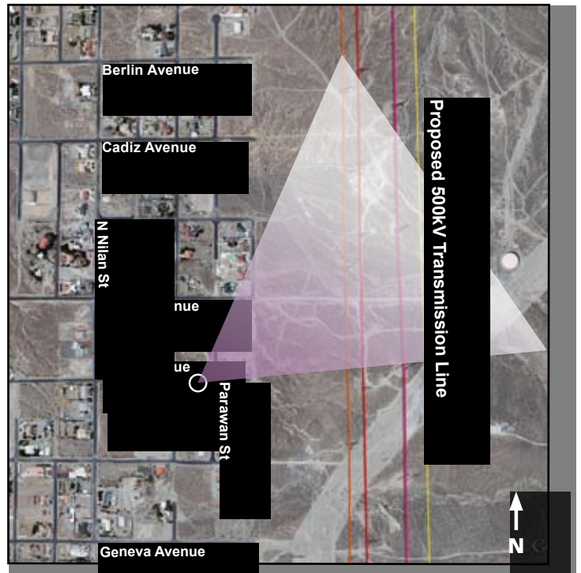
Southern Nevada Intertie Project
500kV Transmission Line
Viewpoint 4 – Calico Ridge Residential Community
Great Basin Transmission, LLC
Appendix A

Existing Condition - Existing IPP 500kV lattice structure transmission line, existing Crystal-McCullough 500kV transmission line, existing Harry Allen to Mead double-circuit 500kV transmission line, and existing 138kV line adjacent to Foothills Residential Community

Simulated Condition - Proposed Southern Nevada Intertie Project single-circuit 500kV steel lattice structure transmission line

This simulation is based on a typical project description for a 500kV transmission line.
Actual structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis based on final design.

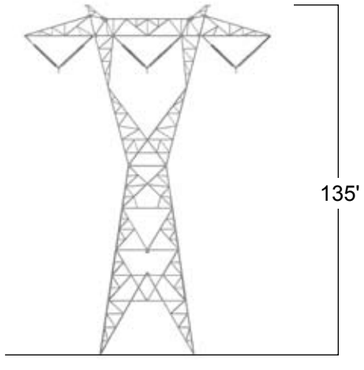
October 12, 2009



View Loc facing northeast from the corner of Firth Avenue and Paraway Street, Henderson, Nevada

Photographic Details:
Date: 7-23-09
Time: 2:03 PM
Focal Length: 50mm
Atmospheric Conditions: Overcast

500kV Steel Galvanized Tower



Structure configurations based on specifications provided by Great Basin Transmission for the purposes of photographic simulations

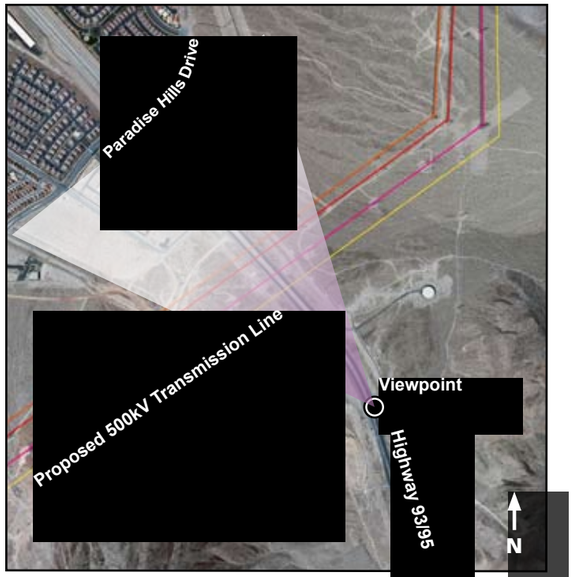
Southern Nevada Intertie Project
500kV Transmission Line
Viewpoint 5 – Foothills
Great Basin Transmission, LLC
Appendix A

Existing Condition - Existing IPP 500kV lattice structure transmission line, existing Crystal-McCullough 500kV transmission line and existing Harry Allen to Mead double-circuit, 500kV transmission line crossing Highway 93/95

Simulated Condition - Proposed Southern Nevada Intertie Project single-circuit 500kV steel lattice structure transmission line

This simulation is based on a typical project description for a 500kV transmission line.
Actual structure sizes, heights, materials, and conductor sag will vary on a case-by-case basis based on final design.

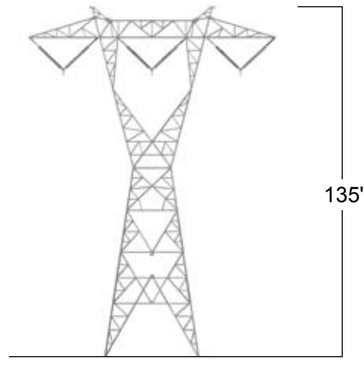
October 12, 2009



View Location: Viewpoint facing northwe ds the transmission line corridor crossing of Highway 93/95, southeast of Henderson, Nevada

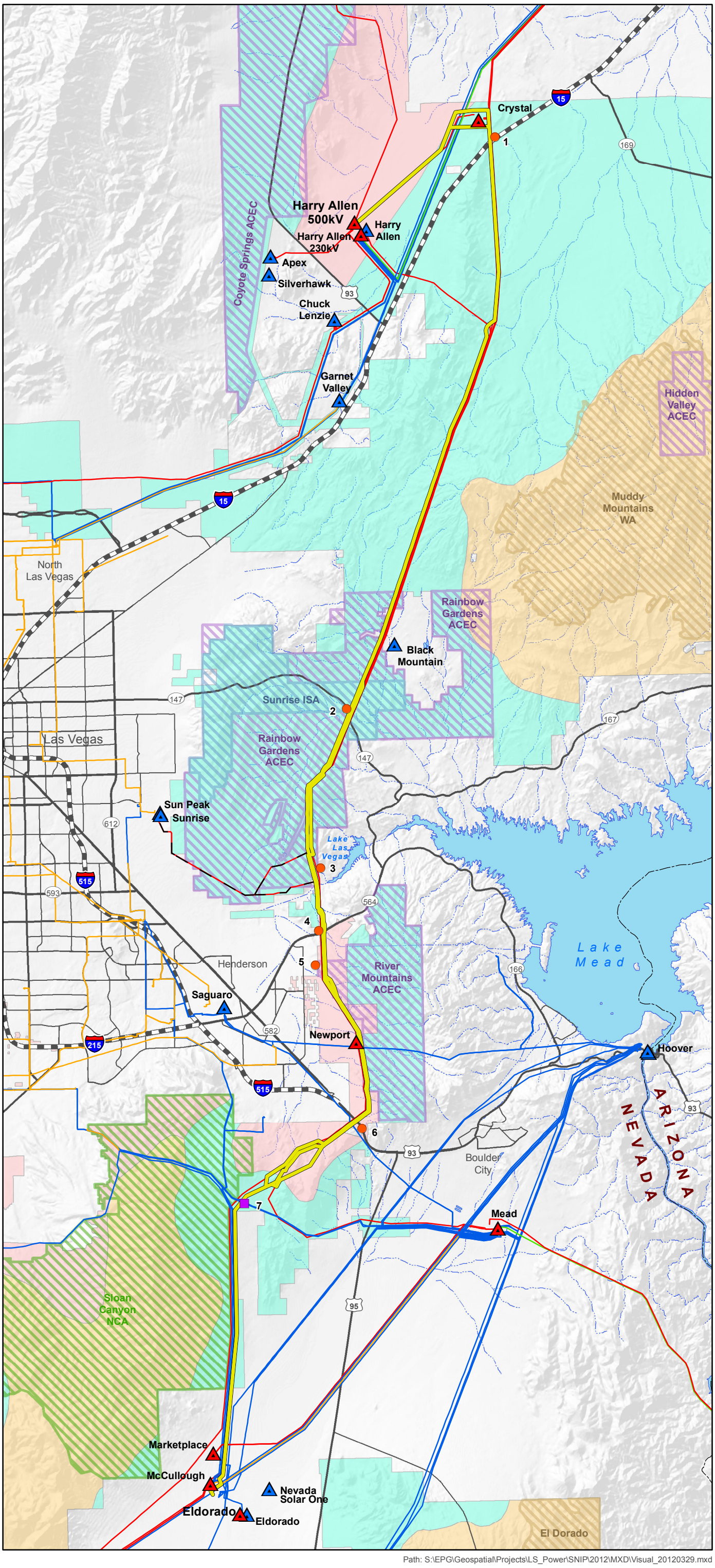
Photographic Details:
Date: 7-23-09
Time: 12:20 PM
Focal Length: 50mm
Atmospheric Conditions: Overcast

500kV Steel Galvanized Tower



Structure configurations based on specifications provided by Great Basin Transmission for the purposes of photographic simulations

Southern Nevada Intertie Project
500kV Transmission Line
Viewpoint 6 – Interstate 515
Great Basin Transmission, LLC
Appendix A



Path: S:\EPG\Geospatial\Projects\LS_Power\SNIP\2012\MXD\Visual_20120329.mxd

REGIONAL LOCATION

Legend

Project Features

- Substation
- Generation Station
- Project Centerline

Visual Inventory

- VRM Class II
- VRM Class III
- VRM Class IV
- Key Observation Point/ Simulation Point
- Key Observation Point
- ACEC
- Designated Wilderness Area
- Instant Study Area
- National Conservation Area

Transmission Lines

- 500kV Transmission Line
- Proposed 500kV Transmission Line
- 345kV Transmission Line
- 230kV Transmission Line
- Under 230kV Transmission Line

Sources
USGS, 30-meter pixel elevation data
LS Power, Transmission line, generation station, and substation data
BLM, Land ownership and land management data

0 3 6 Miles

Southern Nevada Intertie Project 500kV Transmission Line

Great Basin Transmission, LLC

Visual Inventory

April 2012

Figure A-1

epg