BLM

Volume I

Final Environmental Impact Statement for the Searchlight Wind Energy Project NVN-084626 and NVN-086777

Bureau of Land Management
Las Vegas Field Office

in cooperation with

Western Area Power Administration
National Park Service

December 2012

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Southern Nevada District Office
Las Vegas Field Office
4701 N. Torrey Pines Drive
Las Vegas, Nevada 89130
http://www.blm.gov/nv/st/en.html

In Reply Refer To:
2800 (NVS3100)
NVN-84626
NVN-86777

Dear Reader/ Interested Party:

I am pleased to announce the availability of the Final Environmental Impact Statement (EIS) for the Searchlight Wind Energy Project for permitting of wind energy resources. The Bureau of Land Management (BLM) Las Vegas Field Office has prepared this Final EIS in response to right-of-way applications submitted by Searchlight Wind Energy, LLC and Western Area Power Administration (Western). Searchlight Wind Energy, LLC is proposing to construct and operate an approximately 200-megawatt (MW) wind energy facility and associated infrastructure. Western is proposing to construct, operate, and maintain a new switching station to interconnect to the Searchlight Wind Energy Project. The site of the proposed project is located on 18,949 acres of federal land managed by the Bureau of Land Management near the town of Searchlight, NV. Western and the National Park Service were cooperating agencies during preparation of this Final EIS.

The Final EIS was prepared pursuant to the National Environmental Policy Act (NEPA), the Federal Land Management and Policy Act (FLPMA), and other regulations and statutes that establishes the land management authority of the BLM and provides guidance for how public lands are to be managed. The Draft EIS was released for public comment on January 20, 2012. The BLM received over 75 public comments on the Draft EIS. After careful consideration of comments, the BLM has prepared this Final EIS. Comments received during the public review period of the Draft EIS and responses to those comments are provided in Appendix A-4 of this Final EIS. Three alternatives are fully analyzed in this Final EIS: (1) the No Action Alternative which discloses the impacts if the applications are denied, (2) the 96-Wind Turbine Generator (WTG) Alternative, and (3) an 87-WTG Alternative. Based on additional engineering design constraints and other considerations, the action alternatives in the Draft EIS have been slightly modified with regards to the location of the switchyard, operations and maintenance building, and three turbines. The new locations are illustrated on the figures in the Final EIS.

The BLM will not issue a Record of Decision (ROD) making a decision on the Searchlight Wind Energy, LLC and Western applications until at least 30 days from the date of publication of a Notice of Availability in the Federal Register. The BLM's decision will be based on the range of alternatives described above. The BLM will provide additional information in the ROD regarding how the public may continue to stay involve in further decisions associated with the right-of-way applications.

Additionally hard copies or electronic versions of this Final EIS may be obtained by contacting Mr. Greg Helseth, BLM Renewable Energy Coordination Project Manager, at 4701 North Torrey Pines Drive, Las Vegas, NV 89130, (702) 515-5173, or by sending an email to BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov. The Final EIS will also be available on the Internet at http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html

Thank you for your continued interest in the management of public lands in Nevada. The BLM appreciates your involvement in this Final EIS.

Sincerely,

Robert B. Ross, Jr.
Field Manager

Executive Summary

The Final Environmental Impact Statement (FEIS) for the Searchlight Wind Energy Project is summarized in the following sections. This summary provides a general overview of the project and its purpose and need; briefly describes the Proposed Action and other alternatives; and summarizes major impacts for key resources.

Searchlight Wind Energy, LLC, (the Applicant) a wholly-owned subsidiary of Duke Energy has applied to the Bureau of Land Management (BLM) for a right-of-way (ROW) grant on public land to develop a wind energy generation project (ROW application NVN-084626). The Proposed Project consists of construction, operation and maintenance (O&M), and decommissioning of an approximately 200-megawatt (MW) wind energy facility and associated infrastructure. The Western Area Power Administration (Western) proposes to construct, operate, and maintain a new switching station to interconnect the Searchlight Wind Energy Project and has submitted a ROW application (NVN-086777) to the BLM for construction and operation of the switching station. Western's proposed interconnection switching station also is analyzed as part of this EIS.

BLM's Purpose and Need for the Proposed Action

In accordance with FLPMA (Section 103(c)), public lands are to be managed for multiple use that takes into account the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Interior is authorized to grant ROW on public lands for systems of generation, transmission, and distribution of electric energy (Section 501(a)(4)). Taking into account the BLM's multiple use mandate, the purpose and need for the proposed actions is to respond to two FLPMA right-of-way applications: one submitted by Searchlight Wind to construct, operate, maintain, and decommission a wind energy facility and associated infrastructure and one submitted by Western to construct, operate, maintain, and decommission a switching station that would conduct the power generated from the wind facility to Western's electrical grid system. Both proposed actions would be located on public lands administered by the BLM. Consideration of the ROW applications would be in compliance with FLPMA, BLM right-of-way regulations, and other applicable Federal laws and policies. These actions would, if approved, assist the BLM in addressing the management objectives in the Energy Policy Act of 2005 (Title II, Section 211) which establish a goal for the Secretary of the Interior to approve at least 10,000 MWs of electricity from non-hydropower renewable energy projects located on public lands. This proposed action, if approved, would also further the purpose of Secretarial Order 3285A1 (March 11, 2009, amended February 22, 2010) that establishes the development of environmentally responsible renewable energy as a priority for the Department of the Interior.

The BLM will decide whether to deny the proposed ROWs, grant the ROWs, or grant the ROWs with modifications. Modifications may include modifying the proposed use or changing the route or location of the proposed facilities (43 CFR 2805.10(a)(1)).

Western's Purpose and Need

The Applicant requests to interconnect its project with Western's Davis-Mead 230-kV transmission line. Western's purpose and need is to approve or deny the interconnection request in accordance with its Open Access Transmission Service Tariff (Tariff) and the Federal Power Act, as amended (FPA).

Under the Tariff, Western offers capacity on its transmission system to deliver electricity when capacity is available. The Tariff also contains terms for processing requests for the interconnection of generation facilities to Western's transmission system. The Tariff substantially conforms to Federal Energy Regulatory Commission (FERC) final orders that provide for non-discriminatory transmission system access. Western originally filed its Tariff with FERC on December 31, 1997, pursuant to FERC Order Nos. 888 and 889. Responding to FERC Order No. 2003, Western submitted revisions regarding certain Tariff terms and included Large Generator Interconnection Procedures (LGIP) and a Large Generator

BLM Mission Statement

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

Interconnection Agreement in January 2005. In response to FERC Order No. 2006, Western submitted additional term revisions and incorporated Small Generator Interconnection Procedures and a Small Generator Interconnection Agreement in March 2007. In September 2009, Western submitted yet another set of revisions to address FERC Order No. 890 requirements along with revisions to existing terms.

In reviewing interconnection requests, Western must ensure that existing reliability and service is not degraded. Western's LGIP provides for transmission and system studies to ensure that system reliability and service to existing customers are not adversely affected by new interconnections. These studies also identify system upgrades or additions necessary to accommodate the Proposed Project and address whether the upgrades/additions are within the project scope.

Applicant's Objective for the Proposed Project

The Applicant's objective to develop a 200-MW wind energy facility on a site located in southern Clark County, NV near the town of Searchlight, which is approximately 1.5 miles west of the western border of Lake Mead National Recreation Area (NRA); 60 miles southeast of Las Vegas; and 40 miles north of Laughlin. Specifically, the project area is to the northeast, east and southeast of Searchlight and encompasses approximately 18,949 acres of BLM-administered lands in the Eldorado Mountains and Piute Valley.

Project Description

The Proposed Project would use wind turbine generators (WTGs) s to generate electricity. WTGs consist of three principal components that would be assembled and erected during construction: the tower, the nacelle, and the rotor assembly. These modern WTGs would have maximum height of up to 427.5 feet with three mounted rotor blades, each 165 feet in length. Minimum blade height would be 96 feet. While the Applicant assumes that the Siemens 2.3-MW WTG model would be erected at the site, there remains the possibility that another similar WTG could be used. No WTG under consideration for the Proposed Project would exceed the maximum height of the Siemens 2.3-MW WTG (427.5 feet).

Under both action alternatives, the proposed Searchlight Wind Energy Project would consist of the following temporary (during construction) and permanent features:

- WTGs, including concrete foundations, tubular steel towers, nacelles (i.e., main WTG bodies), and rotor assembly
- Pad-mounted transformers (one located at the base of each WTG tower)
- Underground electrical collection system (34.5 kilovolt [kV])
- Underground communications system
- Two onsite electrical substations and 6.1-mile overhead transmission line connecting the substations
- A 2.6-mile overhead transmission line (230 kV) connecting to Western's proposed switching station
- Four meteorological masts
- Operations and maintenance building
- Two temporary laydown areas
- Temporary concrete batch plant
- Temporary portable rock crusher
- Access roads
- Western's proposed switching station and ancillary facilities

Public Involvement

The BLM filed a Notice of Intent to prepare this National Environmental Policy Act (NEPA) document in the Federal Register. This notice formally initiated a public scoping process during which public and agency input was solicited on the scope of issues to be addressed in the EIS. Comments received are summarized in the Scoping Report included as Appendix A to this EIS. The topics receiving the most comments were biological resources, project alternatives, socioeconomics, and visual resources.

The BLM published the Notice of Intent in the *Federal Register* on January 20, 2012, denoting the beginning of the scoping period for the project. The scoping period ended on April 18, 2012, totaling 60 days, which exceeds the BLM minimum requirement of a 45-day comment period. On February 21, 22, and 23, 2012, the BLM held public hearings in Laughlin, Searchlight, and the City of Boulder City, respectively. The BLM received over 75 public comments on the DEIS. All comments and BLM responses are presented in Appendix A-4.

Selection of the Agency Preferred Alternative

Two potential alternatives, a 161 WTG and a 140 WTG Alternative were abandoned by the Applicant for technical reasons and eliminated by BLM from detailed evaluation. The analyses presented in this document evaluated the remaining reasonable range of alternatives; the Applicant proposed 96-WTG Alternative and an 87-WTG Alternative. Based on the findings in the DEIS, BLM determined the 87-WTG Alternative to be the Preferred Alternative because it would have less land disturbance, less effect on sensitive biological resources, and still meet the Purpose and Need for the project. The No Action Alternative does not meet the Purpose and Need for the project.

Comparison between Proposed Action and BLM-preferred Alternative

Project Features	**Approximate Temporary Construction Disturbance (acres)[a]**		**Difference in Temporary Disturbance (acres)**	**Approximate Permanent Construction Disturbance (acres)**		**Difference in Temporary Disturbance (acres)**
	96 WTG Layout Alternative	87 WTG Layout Alternative		96 WTG Layout Alternative	87 WTG Layout Alternative	
WTG pads	72.6	66	6.6	3.6	3.2	0.4
New and upgraded project roads and crane pads[b]	123.6	111.4	12.2	149	141.6	7.4
Operations and maintenance facility	1.5	1.5	0	5	5	0
Equipment storage and construction laydown areas[c]	28.3	28.3	0	0	0	0
Overhead transmission line right-of-way	16.5	16.5	0	0	0	0
Substations	5	5	0	2.0	2.0	0
Batch plant	1	1	0	0	0	0
Meteorological towers	0	0	0	0.01	0.01	0
Totals	248.5	229.7	18.8	159.6	151.8	7.8
Totals Rounded[d]	**249**	**230**	**19**	**160**	**152**	**8**

Notes:
[a] Temporary construction impacts are in addition to permanent impacts.
[b] Restoration of roadsides.
[c] Includes temporary office trailers and crane assembly areas.
[d] Rounded totals will be used throughout the document for reader ease.

Summary of Potential Impacts and Mitigation

No Action Alternative	96 WTG Layout Alternative	87 WTG Layout Alternative	Mitigation Measures
Geology, Soils and Minerals (Section 4.1)			
Under the No Action Alternative, the ROW applications would be denied and the Proposed Project would not be built; therefore, no project related effects on geology, soils, and mineral resources would occur.	• Subsidence or collapse of alluvial deposits during seismic shaking • Increase in potential for landslides in cut and fill slopes resulting from grading for roads and WTG pads • Temporary and permanent disturbance of 409 acres for the proposed wind facility and 7 acres for the proposed Western Switching Station • Alteration of the existing topography • Exposure to contaminated soils • Restricted access to unpatented mining claims, locatable mineral exploration, saleable minerals, and fluid leasable minerals	Effects would be similar to those identified under the 96 WTG Layout Alternative. However, temporary and permanent disturbance would be less at 382 acres for the proposed wind facility.	• MM GEO-1: Engineering Design And Implementation • MM GEO-2: Inspections After Geologic Events • MM GEO-3: Applicant's Insurance Coverage • MM-GEO-4: Verify Mining Claims
Paleontological Resources (Section 4.2)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on paleontological resources would occur.	• Potential destruction or disturbance of buried or unknown paleontological resources	Effects would be similar to those identified under the 96 WTG Layout Alternative; however, temporary and permanent disturbance area would be less, 382 acres for the proposed wind facility.	• MM PALEO-1: Paleontological Mitigation

No Action Alternative	96 WTG Layout Alternative	87 WTG Layout Alternative	Mitigation Measures
Water Resources (Section 4.3)			
Under the No Action Alternative, the ROW applications would be denied and the Proposed Project and Western's proposed switching station would not be built; therefore, no project related effects on water resources would occur.	• Water usage would be 83 acre feet during construction and 0.15 acre feet per year during operation and maintenance • Chemical or petroleum spills could affect groundwater quality • Increased erosion and sedimentation due to construction and operation of new structures could affect surface water quality • Waters of the U.S. could be affected during construction activities or by project components	• Water usage would be 74 acre feet during construction and 0.15 acre feet per year during operation and maintenance. Other effects would be similar to those identified under the 96 WTG Layout Alternative.	• MM WATER-1: Wellhead Protection • MM WATER-2: Construction Phase Erosion Sedimentation and Control Measures • MM WATER-3: Construction Phase Petroleum and Hazardous Material Contaminated Water Prevention Control Measures • MM WATER-4: Operational Phase Erosion and Sedimentation Control Measures • MM WATER-5: Operational Phase Petroleum and Hazardous Material Contaminated Water Prevention and Control Measures • MM WATER 6: Drainage Crossing Design • MM WATER 7: Stormwater Monitoring and Response Plan
Vegetation (Section 4.4.1)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on vegetation would occur.	• Vegetation and habitat loss (408 acres total), degradation and fragmentation (mostly Mojave Creosotebush-White Bursage Scrub • Spread of noxious or invasive weed species	Effects would be similar to those identified under the 96 WTG Layout Alternative; however, temporary and permanent disturbance area would be less, 382 acres for the proposed wind facility.	• MM BIO-1: Interim Reclamation
Special-Status Plant Species (Section 4.4.2)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on cacti and yucca would occur.	• Removal of cacti and yucca	Effects would be similar to those identified under the 96 WTG Layout Alternative; however, temporary and permanent disturbance area would be less, 382 acres for the proposed wind facility.	• MM BIO-2: Cactus and Yucca Salvage Plan

No Action Alternative	96 WTG Layout Alternative	87 WTG Layout Alternative	Mitigation Measures
Wildlife Resources (Section 4.4.3)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on wildlife resources would occur.	• Removal and fragmentation to wildlife habitat • Injury or death to wildlife species during construction • Increases ambient noise levels may affect both the sending and receiving of acoustic signaling and sounds.	Effects would be similar to those identified under the 96 WTG Layout Alternative; however, temporary and permanent disturbance area would be less, 382 acres for the proposed wind facility.	See Mitigation Measures under Section 4.4.1-Vegetation, 4.4.2-Special Status Plant Species, and 4.4.4-Special Status Wildlife Species.
Special-Status Wildlife Species (Section 4.4.4)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on special status wildlife species would occur.	• Injury or death to desert tortoise, Gila monster or other special status wildlife species during construction activities. • Injury or death to birds and/or bats due to construction activities, operation of turbines, and collisions with new transmission lines • Bats may die due to baurotrama during turbine operation • Increased human presence may affectively serve as a barrier that suppresses or limits connectivity between populations of bighorn sheep • Increased noise, blasting activities, and increased human presence could cause animals to avoid the project area, altering normal behavior patterns.	Effects would be similar to those identified under the 96 WTG Layout Alternative; however, temporary and permanent disturbance area would be less, 382 acres for the proposed wind facility.	• MM BIO-3: Biological Opinion • MM BIO-4: Terrestrial Wildlife Plan • MM BIO-5: Bird and Bat Conservation Strategy • MM BIO-6: Burrowing Owl Protection During Construction • MM BIO-7: Transmission Line Design • MM BIO-8: Wildlife Water Developments

No Action Alternative	96 WTG Layout Alternative	87 WTG Layout Alternative	Mitigation Measures
Cultural Impacts (Section 4.5)			
Under the No Action Alternative, the ROW applications would be denied and the Proposed Project would not be built; therefore, no project related effects on cultural resources would occur.	• Construction, road grading, and other actions that may affect cultural sites that are eligible for NRHP listing • Increased visitation to the area may affect sites both within the project area and nearby • Increased visitation impacts include more people walking over sites and either knowingly or unknowingly adversely affecting sites.	Effects would be similar to those identified under the 96 WTG Layout Alternative; however, temporary and permanent disturbance area would be less, 382 acres for the proposed wind facility.	• MM-CR 1: Archaeological Monitor • MM-CR 2: Ethnographic/Ethnohisoric • MM-CR 3: Development of a Memorandum of Agreement
Air Quality Impacts (Section 4.6)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on air quality would occur.	• Adverse, short term effects to air quality due to construction and decommissioning activities, but would not contribute to regional air exceedances • Potential net benefit to regional air quality and climate	Effects would be similar to those identified under the 96 WTG Layout Alternative.	• MM-AIR 1: Secure All Vehicles Hauling Loose Material • MM-AIR 2: Reduce Vehicle Emissions • MM-AIR 3: Prohibit Equipment Tampering • MM-AIR 4: Use Low Sulfur Fuels • MM-AIR 5: Avoid Sensitive Air Quality Receptors • MM-AIR 6: Mitigation of GHG Emissions
Transportation Impacts (Section 4.7)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on transportation would occur.	• Short term increase in traffic volume on Cottonwood Cove Road during construction • Increased recreational traffic as a result of 29 miles of new roads	Effects would be similar to those identified under the 96 WTG Layout Alternative, although slightly less miles of new roads would be built in the proposed project area (27 miles)	• MM-TRAN 1: Traffic Management Plan • MM-TRAN 2: Repair Damaged Streets

No Action Alternative	96 WTG Layout Alternative	87 WTG Layout Alternative	Mitigation Measures
Land Use Impacts (Section 4.8)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on land use would occur.	• Proposed project has been sited to avoid private property • Proposed project has is in conformance with LV RMP, DOI directives and Instructional Memorandums • Construction could affect local transportation and community access • ACEC would remain a ROW avoidance area • Construction of an access road would effect disposal lands	Effects would be similar to those identified under the 96 WTG Layout Alternative	No additional mitigation is proposed
Visual Resources Impacts (Section 4.9)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on visual resources would occur.	• Short term change to the viewshed due to presence of construction vehicles, grading, and related activities • Long term change to the visual character of the environment; however, compliance with VRM Class II would be achieved.	Effects would be similar to those identified under the 96 WTG Layout Alternative	• MM-VIS 1: Minimize Surface Disturbance • MM-VIS 2: Select BLM-approved Flat Tone Colors for Structures • MM-VIS 3: Minimize Profiles of Site Design Elements • MM-VIS 4: Minimize Lighting
Noise Impacts (Section 4.10)			
Under the No Action Alternative, the ROW applications would be denied and the Proposed Project would not be built; therefore, no project related effects on noise levels would occur.	• Short term increase in ambient noise and vibration due to construction activities • Long term increase in ambient noise levels due to operation of the WTGs. Noise levels would not exceed Clark County noise ordinance at nearby residences	Effects would be similar to those identified under the 96 WTG Layout Alternative	• MM-NOI 1: Conduct Construction Activities • MM-NOI 2: Turn Off Idling Equipment • MM-NOI 3: Notify Adjacent Residences • MM-NOI 4: Install Acoustic Barriers • MM-NOI 5: Proper Maintenance • MM-NOI 6: Ensure Proper Installation of Transformer

No Action Alternative	96 WTG Layout Alternative	87 WTG Layout Alternative	Mitigation Measures
Recreation Impacts (Section 4.11)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on recreation resources would occur.	• Temporary restrictions within the project area during construction to reduce public safety hazards • New roads (29 miles) would provide for increased recreational access to the area • Change in the characteristics for recreationalist utilizing the area	Effects would be similar to those identified under the 96 WTG Layout Alternative, although slightly less miles of new roads would be built in the proposed project area (27 miles)	• MM-REC 1: Recreation Impacts Minimization Measures
Socioeconomic Impacts (Section 4.12)			
Under the No Action Alternative, the BLM would not grant the ROWs to the Applicant and Western, and thus there would be no change in existing socioeconomic conditions. The land would retain its rural desert qualities, and the habitats supporting ecosystems and species would not be altered from project-related encroachments. The purpose and need for the Proposed Project would be provided by other means. Under the No Action Alternative, the utility off-taker (the utility or bulk power purchaser and/or distributor) would not have access to the energy supply that would have been produced by the Proposed Project. Alternative renewable energy-generation projects developed elsewhere might not alleviate the Applicant's concerns for reliability, cost, and the environmental sustainability of this resource.	• Short term increase in population for construction workers • Long term increased economic output during project operation • Increase in expenditures by non-local labor • Increase in taxable sales from indirect or induced spending • Increased property and sales tax revenue	Effects would be similar to those identified under the 96 WTG Layout Alternative	No other mitigation is proposed.

No Action Alternative	96 WTG Layout Alternative	87 WTG Layout Alternative	Mitigation Measures
Environmental Justice Impacts (Section 4.13)			
Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built. There would be no change in current conditions for minority and low-income populations under this alternative. The opportunities for any minority and low-income persons to seek employment at higher wages would not occur.	No environmental justice communities were identified within the study area; therefore, no environmental justice populations would be affected as a result of the Proposed Action	Effects would be similar to those identified under the 96 WTG Layout Alternative	Impacts were beneficial therefore mitigation is not warranted
Health and Human Safety (Section 4.1414)			
Under the No Action Alternative, the ROW applications would be denied and the Proposed Project and would not be built; therefore, no project related effects on health and human safety would occur.	• Potential effects to human health and safety from the use of petroleum products, sewage, and other hazardous materials during construction, O&M, and decommissioning activities • Increase risk for fires or wildlife fires during construction, O&M, and decommissioning activities	Effects would be similar to those identified under the 96 WTG Layout Alternative	MM-SAFE 1: Hazardous Material Management MM-SAFE 2: Characterize Potentially Contaminated Soil MM-SAFE 3: Adherence of the Health and Safety Program with 29 CFR, Part 1910 MM-SAFE 4: Construction Fire Prevention Measures MM-SAFE 5: Aeronautical Consideration MM-SAFE 6: Adherence of the Health and Program with 29 CFR, Part 1926

Mitigation

Searchlight Wind has included a suite of APMs to avoid or minimize impacts of the Proposed Project on environmental resources. These APMs are an inherent part of the project and are distinguished from mitigation measures for impacts identified under NEPA. Should the Proposed Project or alternative be approved, the Applicant will implement the APMs regardless of whether potential significant impacts were identified in the NEPA process. Similarly, Western follows environmental compliance measures detailed in Western's Environmental Construction Standard 13, which is included as Appendix D.

Conclusion

Construction of the Proposed Project would result in a number of temporary impacts that would cease upon completion of the construction phase. Operation and maintenance of the Proposed Project or alternative could also result in temporary or permanent impacts.

Unavoidable adverse impacts that would occur from construction, operation, and decommissioning of the build alternatives are identified in this FEIS. For the Agency Preferred Alternative, potential impacts would be less than significant with implementation of APMs, Best Management Practices, Construction Standards, and other mitigation disclosed in this document.

Under Section 508 of the Rehabilitation Act of 1973, the Department of the Interior must insure that electronic and information technology allows individuals with disabilities (Federal employees and members of the public) access to and use of information and data that is comparable to individuals without disabilities. If you would like an electronic copy of this document that meets 508 compliance standards or a paper copy, please contact Greg Helselth at the Las Vegas Field Office (702) 515-5000.

Contents

Tables

Figures

Acronyms and Abbreviations

AADT	Average Annual Daily Traffic
ABPP	Avian and Bat Protection Plan
ACEC	Area of Critical Environmental Concern
acre-feet/year	acre-feet per year
AEC	Alphabiota Environmental Consulting
APE	Area of Potential Effect
APM	Applicant Proposed Measure
ASTM	American Society for Testing of Materials
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	best management practice
CAA	Clean Air Act
CC	Clark County
CCAQR	Clark County Air Quality Regulations
CCDAQEM	Clark County Department of Air Quality and Environmental Management
CCCPD	Clark County Comprehensive Planning Division
CCRFCD	Clark County Regional Flood Control District
CCWRD	Clark County Water Reclamation District
CDP	Census Designated Places
CEQ	Council on Environmental Quality
CNEL	Community Noise Equivalent Level
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CWA	Clean Water Act
DAQ	Department of Air Quality
dB	decibel
dBA	A-weighted sound level
DEIS	Draft Environmental Impact Statement
DEM	Digital Elevation Model
DOD	Department of Defense
DOI	Department of the Interior
DWMA	Desert Wildlife Management Area
EAC	Early Action Compact
e.g.	ergo
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency

ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
Est.	Estimated
etc.	etcetera
F	Fahrenheit
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FLPMA	Federal Land Policy and Management Act of 1976
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FR	Federal Register
Ft	Feet
fo_b	Convert feet to meters, multiply by 0.3048
FTA	Federal Transit Administration
FY	Fiscal Year
GAP	Southwest Regional Gap Project
GDP	Gross Domestic Product
GHG	greenhouse gas
GWP	global warming potentials
HCFC-23	hydrochlorofluorocarbon-23
HFC-134a	hydrochlorfluorocarbon-134a
Hz	Hertz
I	Interstate
ID#	Identification number
IEC	Independent Electrical Contractors
IHS	Institute for Housing Studies
I-O	Input-output
IMPLAN	Impact Analysis for Planning, Inc.
km	kilometers
KOPs	key observation points
kV	kilovolt
L_{dn}	daytime-nighttime average noise level
L_{eq}	equivalent sound pressure level
LLC	Limited Liability Company
LGIP	Large Generator Interconnection Procedures
L_{MX}	Maximum dBA level
LOS	Level of Service
LVFO	Las Vegas Field Office

LVMPD	Las Vegas Metropolitan Police Department
L_{xx}	Statistical measurement where $_{xx}$ represents the percentage of time the sound level is exceeded
L_{10}	Noise level exceeded for 10 percent of the measurement period
L_{90}	Noise level exceeded for 90 percent of the measurement period
m	meter
MBTA	Migratory Bird Treaty Act
MET	meteorological tower
m/s	meters per second
mgd	million gallon per day
mg/L	milligrams per liter
MM	Mitigation Measures
MP	Milepost
MSHCP	Multiple Species Habitat Conservation Plan
MSW	municipal solid waste
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NE	North East
NEC	National Electric Code
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NHPA	National Historic Preservation Act of 1966
NOHA	No Hazard to Air Navigation
NOI	Notice of Intent
NO_x	nitrogen oxides
NPS	National Park Service
NRHP	National Register of Historic Places
NRPS	Nevada Renewable Portfolio Standard
NRCS	Natural Resources Conservation Service
NRA	National Recreation Area
NRS	Nevada Revised Statutes
O_3	ozone
OHV	off-highway vehicle
O&M	Operation and maintenance
OSHA	Occupational Safety and Health Administration
PFYC	Potential Fossil Yield Classifications

POD	Plan of Development
PM_{10}	particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
ppm	parts per million
PSD	prevention of significant deterioration
PUCN	Public Utilities Commission of Nevada
PWL	Power Watt Level
RCI	RCI Concepts
RCRA	Resource Conservation and Recovery Act of 1976
RH	Relative humidity
RMP	Resource Management Plan
ROD	Record of Decision
ROI	Region of Influence
ROS	recreation opportunity spectrum
ROW	right-of-way
RSA	rotor sweep area
RV	Recreational Vehicle
SCADA	Supervisory Control and Data Acquisition
SF6	sulfur hexafluoride
SHPO	State Historical Preservation Office
SIA	Searchlight Project Impact Area
SIP	State Implementation Plan
SIR	Searchlight Project Impact Region
SMA	Special Management Areas
SNEI	Southern Nevada Environmental Inc.
SO_2	sulfur dioxide
SPCCP	Spill Prevention, Containment, and Countermeasures Plan
SPL	sound pressure level
spp.	Species
SR	State Route
SRMA	Special Recreation Management Area
SWPPP	Stormwater Pollution Prevention Plan
SWS	Searchlight Water System
TDS	total dissolved solids
UDC	Unified Development Code
UEPA	Nevada Utility Environmental Protection Act
URS	United Research Services
US-95	Interstate 95
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture

USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	volatile organic compound
VRM	Visual Resource Management
Western	Western Area Power Administration
WEAP	Worker Environmental Awareness Program
WOUS	Waters of the U.S.
WTG	wind turbine generator
$\mu g/m^3$	micrograms per cubic meter
°	degree
^{o}C	10 degrees Celsius
%	percent

1.0 Introduction and Purpose and Need

This Final Environmental Impact Statement (FEIS) has been prepared to analyze Searchlight Wind Energy, LLC 's (also referred to as the Applicant) proposal to construct the Searchlight Wind Energy Project and the Western Area Power Administration's (Western) proposal to build an interconnection switching station. For clarity, the term "Proposed Project" is the general term utilized throughout the document to refer collectively to the wind energy facility and the interconnection switching station. *Please note that when the Western's proposed switching station is referred to separately in this document it is because Western is a federal agency and as such has different National Environmental Policy Act (NEPA) or mitigation requirements than those associated with the wind energy facility.*

1.1 About This Document

This document follows federal regulations of the Council on Environmental Quality (CEQ) for implementing the procedural provisions of NEPA (40 CFR 1500-1508); the Bureau of Land Management's (BLM) NEPA Handbook, H-1790-1; Sections 201, 202, and 206 of the Federal Land Policy Management Act (FLPMA) (43 USC 1761); the BLM's planning regulations (43 CFR 1600); and the BLM Land Use Planning Handbook, H-1601-1. This FEIS describes the Proposed Action and reasonable alternatives and the environmental consequences associated with each.

For ease of reading and to clearly present information for decision-making, the FEIS is arranged as follows:

Chapter 1 – Purpose and Need provides general background information and explains the purpose of and need for the Proposed Project, decisions to be made, and authorities regulating the NEPA process. It also provides a summary of issues raised by the public during the scoping phase of the process that are addressed in the EIS.

Chapter 2 – **Proposed Action and Alternatives** defines the Proposed Action and presents a reasonable range of alternatives to address the stated purpose and need for the Proposed Project, including the No Action Alternative and one other action alternative. It also discusses alternatives not carried forward for detailed analysis and summarizes environmental effects for each alternative.

Chapter 3 – **Affected Environment** describes the affected environment in the project area and identifies projects with the potential to cause cumulative impacts.

Chapter 4 – **Environmental Consequences** discloses potential direct, indirect, and cumulative environmental effects associated with all of the alternatives and discusses potential mitigation measures to reduce or minimize effects. It also describes the cumulative effects associated with the Proposed Action and other alternatives when added to other past, present, and reasonably foreseeable future actions in the cumulative effects study area.

Chapter 5 – **Consultation and Coordination** lists state and federal agencies and other governmental bodies that were consulted or that contributed to the preparation of the EIS; describes public participation during scoping and public hearings; and lists agencies, organizations, and persons to whom the EIS will be sent or has been sent. This chapter includes a summary of all substantive public and agency comments received on the Draft Environmental Impact Statement (DEIS).

Chapter 6 – References

1.2 NEPA Process

A summary of the NEPA process is given below.

1. **Conduct Scoping:** This is the initial phase, in which the BLM announces its intent to prepare an EIS to consider the Applicant and Western's rights-of-way (ROW) applications. The purpose of scoping is to notify the public and federal, state, and local agencies and tribal governments of the Proposed Project and to gather information on potential impacts.
2. **Collect Data:** Based on the issues raised during scoping, all relevant resource data and management information are collected for the assessment of direct and indirect impacts.
3. **Develop Alternatives:** A range of reasonable alternatives is developed to meet the purpose and need for the EIS. This document will include a No Action Alternative and two action alternatives.
4. **Assess Impacts:** Using accepted scientific methods, the direct, indirect, cumulative, and residual impacts of the Proposed Action and alternatives are assessed.
5. **Circulate DEIS and Hold Public Comment Period:** The DEIS is circulated for public and agency review and comment. Meetings are usually held to explain the findings of the DEIS and to collect additional comments.
6. **Develop Final EIS:** The document is revised based on input from the public and other agencies.
7. **Circulate Final EIS:** The BLM circulates the Final Environmental Impact Statement, along with its preferred alternative.
8. **Issue Decision**: The BLM's authorized officer will sign the Record of Decision (ROD) for the EIS process, which includes all approved mitigation measures.
9. **Hold Appeal Period:** After the ROD is signed, participants in the FEIS process who have legal standing can, within 30 days, file an appeal of the decision to the DOI Board of Land Appeals.

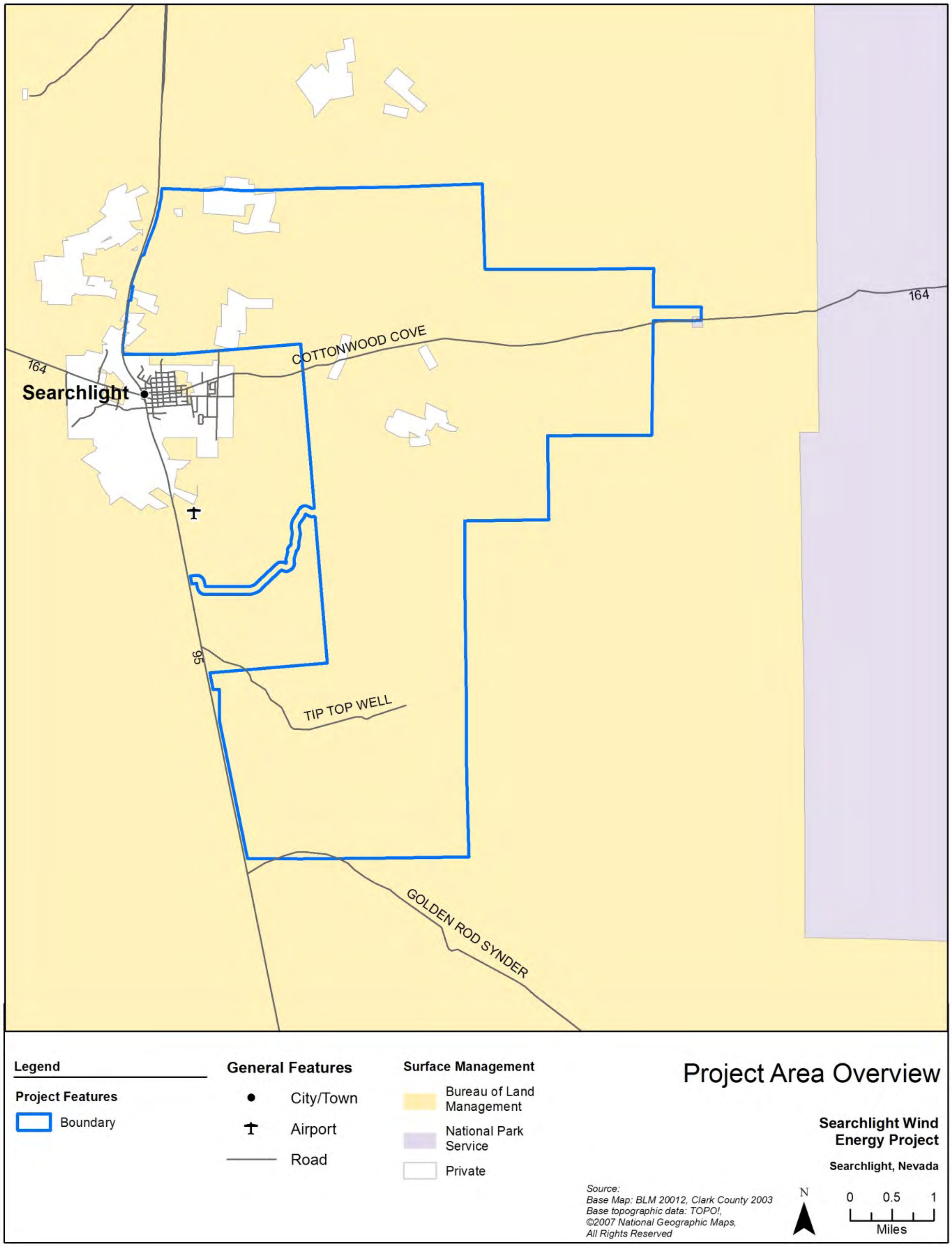
1.3 Background

Searchlight Wind Energy, LLC, a wholly owned subsidiary of Duke Energy has applied to the BLM for a ROW grant on public land to develop a wind energy generation project (ROW application NVN-084626). The Searchlight area was selected because it is considered the largest contiguous lower elevation region of good-to-excellent wind resources in southern Nevada near Las Vegas, and for its medium-to-high wind resource potential capable of supporting utility scale production Searchlight Wind Energy, LLC has conducted site specific testing (using meteorological data collected for 5 years) and determined that sufficient wind exists to support the project.

The Applicant's objective is to develop a 200-megawatt (MW) wind energy facility on a site located in southern Clark County, NV near the town of Searchlight (Figure 1.3-1), which is approximately 1.5 miles west of the western border of Lake Mead National Recreation Area (NRA); 60 miles southeast of Las Vegas; and 40 miles north of Laughlin. Specifically, the project area is to the northeast, east and southeast of Searchlight and encompasses approximately 18,949 acres of BLM-managed land in the Eldorado Mountains and Piute Valley (Figure 1.3-1 and Figure 1.3-2).

1

2 **Figure 1.3-1. Project Vicinity Map**



1
2 **Figure 1.3-2. Proposed Project Area Map**

The Proposed Project consists of construction, operation and maintenance (O&M), and decommissioning of a 200-MW wind energy facility and associated infrastructure. After assessing wind resources, proximity to electrical transmission, topography, land ownership, reduction of costs, and other factors, the Applicant filed the ROW application and Plan of Development (POD) with the BLM for this tract of public land. The Applicant has applied to Western to interconnect the wind power generating facility with Western's transmission system, and would deliver wind-generated electrical power via Western's Davis-Mead 230-kV transmission line near the crossing of Nevada State Route (SR) 164, also designated as Cottonwood Cove Road, east of Searchlight.

Western proposes to construct, operate, and maintain a new switching station to interconnect the Searchlight Wind Energy Project and has submitted a ROW application (NVN-086777) to the BLM. The interconnection switching station is analyzed as part of this EIS.

The Nevada Renewable Portfolio Standard (NRPS) provides the Applicant with the opportunity to propose this project because the NRPS mandates that state utilities provide for renewable energy offerings and consumption goals that meet prevailing market demand for renewable energy. The Proposed Project could help displace older fossil-fuel electric generating facilities with clean, renewable power, which would contribute to the reduction of greenhouse gas (GHG) emissions. Likewise, it could further the objectives of the federal government to eliminate or reduce GHG emissions and promote the deployment of renewable energy technologies.

1.3.1 BLM's Purpose and Need for the Proposed Project

In accordance with FLPMA (Section 103(c)), public lands are to be managed for multiple use that takes into account the long-term needs of future generations for renewable and non-renewable resources. The Secretary of the Interior is authorized to grant ROW on public lands for systems of generation, transmission, and distribution of electric energy (Section 501(a)(4)). Taking into account the BLM's multiple use mandate, the purpose and need for the proposed actions is to respond to two FLPMA right-of-way applications: one submitted by Searchlight Wind to construct, operate, maintain, and decommission a wind energy facility and associated infrastructure and one submitted by Western to construct, operate, maintain, and decommission a switching station that would conduct the power generated from the wind facility to Western's electrical grid system. Both proposed actions would be located on public lands administered by the BLM. Consideration of the ROW applications would be in compliance with FLPMA, BLM right-of-way regulations, and other applicable Federal laws and policies. These actions would, if approved, assist the BLM in addressing the management objectives in the Energy Policy Act of 2005 (Title II, Section 211) which establish a goal for the Secretary of the Interior to approve at least 10,000 MWs of electricity from non-hydropower renewable energy projects located on public lands. This proposed action, if approved, would also further the purpose of Secretarial Order 3285A1 (March 11, 2009, amended February 22, 2010) that establishes the development of environmentally responsible renewable energy as a priority for the Department of the Interior.

The BLM will decide whether to deny the proposed ROWs, grant the ROWs, or grant the ROWs with modifications. Modifications may include modifying the proposed use or changing the route or location of the proposed facilities (43 CFR 2805.10(a)(1)).

Additional applicable mandates include the following federal laws, regulations, and guidance pertaining to the development of renewable energy resources:

- Sec. 211 of Energy Policy Act of 2005, enacted in August 2005, which states that the Secretary of the Interior, should seek to have approved up to at least 10,000 MW of non-hydropower renewable energy projects on public lands by 2015.
- Instruction Memorandum 2009-043, "Wind Energy Development Policy," dated December 19, 2008, establishes BLM policy to ensure the timely and efficient processing of energy ROWs for wind power on the public lands.

- Secretarial Order 3283 “Enhancing Renewable Energy Development on the Public Lands,” signed January 16, 2009. This Secretarial Order facilitates the DOI efforts to achieve the goals established in Section 211 of the Energy Policy Act of 2005. Specifically, Secretarial Order 3285A1 “Renewable Energy Development by the DOI,” signed March 11, 2009 (as amended February 22, 2010), establishes the development of environmentally responsible renewable energy as a priority for the DOI and creates a departmental Task Force on Energy and Climate Change.
- Instruction Memorandum 2011-059 “National Environmental Policy Act Compliance for Utility-Scale Renewable Energy ROW Authorizations,” dated February 7, 2011, reiterates and clarifies existing BLM NEPA policy.
- Instruction Memorandum 2011-060 “Solar and Wind Energy Applications – Due Diligence,” dated February 8, 2011, provides updated guidance on the due diligence requirements of ROW applications for solar and wind development project on public lands.
- Instruction Memorandum 2011-061 “Solar and Wind Energy Applications – Pre-Application and Screening,” dated February 7, 2011, establishes process for protection of areas and resources of national interest and other specially designated areas that protect wildlife, visual, cultural, historic, or paleontological resource values.
- 43 CFR Part 2800 provides overall guidance for processing ROWs, including those for wind energy development. The Proposed Action requires a ROW to be processed under these regulations.

The BLM will use this EIS to analyze terms, conditions, and mitigation to determine which, if any, modifications to the Proposed Project would be effective and would protect resource values.

1.3.2 BLM Decisions to be Made

This FEIS provides the information and environmental analysis necessary to inform the BLM’s authorized officer and the public about the potential environmental consequences of the Proposed Action and alternatives. The BLM’s decision will either:

- Approve the Proposed Action or alternative and grant the ROWs to the Applicant and Western;
- Approve the Proposed Action or alternative and grant the ROWs with mitigation measures; or
- Deny the ROW applications.

Federal, state, and local permits and approvals would be required before construction and operation of the Proposed Project could proceed. The Applicant and Western would be responsible for obtaining all permits and approvals required to construct, operate and maintain, and decommission the Proposed Project if the ROW applications are approved by the BLM.

1.3.3 Western’s Purpose and Need

The Applicant requests to interconnect its project with Western’s Davis-Mead 230-kV transmission line. Western’s purpose and need is to approve or deny the interconnection request in accordance with its Open Access Transmission Service Tariff (Tariff) and the Federal Power Act, as amended (FPA).

Under the Tariff, Western offers capacity on its transmission system to deliver electricity when capacity is available. The Tariff also contains terms for processing requests for the interconnection of generation facilities to Western’s transmission system. The Tariff substantially conforms to Federal Energy Regulatory Commission (FERC) final orders that provide for non-discriminatory transmission system access. Western originally filed its Tariff with FERC on December 31, 1997, pursuant to FERC Order Nos. 888 and 889. Responding to FERC Order No. 2003, Western submitted revisions regarding certain Tariff terms and included Large Generator Interconnection Procedures (LGIP) and a Large Generator Interconnection Agreement in January 2005. In response to FERC Order No. 2006, Western submitted additional term revisions and incorporated Small Generator Interconnection Procedures and a Small

Generator Interconnection Agreement in March 2007. In September 2009, Western submitted yet another set of revisions to address FERC Order No. 890 requirements along with revisions to existing terms.

In reviewing interconnection requests, Western must ensure that existing reliability and service is not degraded. Western's LGIP provides for transmission and system studies to ensure that system reliability and service to existing customers are not adversely affected by new interconnections. These studies also identify system upgrades or additions necessary to accommodate the Proposed Project and address whether the upgrades/additions are within the project scope.

1.3.4 Western Decisions to be Made

Western must consider interconnection requests to its transmission system in accordance with its Tariff and the FPA. Western satisfies FPA requirements to provide transmission service on a non-discriminatory basis through compliance with its Tariff. Under the FPA, FERC has the authority to order Western to allow an interconnection and to require Western to provide transmission service at rates it charges itself and under terms and conditions comparable to those it provides itself.

Western, a Federal agency, is participating in the EIS process as a cooperating agency. Western will use this EIS, once adopted pursuant to CEQ regulations, to support its decision on whether or not to construct the interconnection switching station and approve or deny the Applicant's interconnection request.

1.3.5 Cooperating Agencies

The BLM is the lead federal agency, and in accordance with the BLM policies, Western and the National Parks Service (NPS) have been formally designated as cooperating agencies for this NEPA process. Although the NPS does not have a project-related decision or approval to make, they are a cooperating agency in the development of this document. As such, the BLM defines the collaborative process as one in which interested parties work together to "seek solutions with broad support for managing public and other lands" (BLM 2005a). Cooperating agency status provides a formal framework for governmental units to engage in active collaboration with the BLM for this project to implement the requirements of NEPA. The BLM together with the cooperating agencies has the lead responsibility to arrange for collection of resource, environmental, social, economic, and institutional data and information, or to share data that are already assembled and available. Collaboration mandates methods, not outcomes, and it brings diverse parties together to seek broadly acceptable solutions to what are usually complex issues. It does not imply that the parties will achieve consensus. The BLM is the final decision-maker on matters within its jurisdiction.

1.4 Summary of Public Scoping and Issue Identification

1.4.1 Public Scoping Process

Chapter 5, Consultation and Coordination, contains an in-depth discussion of the scoping process and the issues raised by the public and other agencies during that process (See Appendix A, Public Scoping Report). Specifically, potential issues identified during the public scoping process included the following:

- NEPA Process;
- Project Description;
- Project Alternatives;
- Purpose and Need;
- Air Quality and Climate Change;
- Noise/Vibration;
- Geology, Soils, and Minerals;
- Water Resources;
- Biological Resources;

- Cultural and Historic Resources;
- Land Use;
- Special Management Areas (SMA)
- Recreation;
- Visual Resources;
- Transportation;
- Human Health and Hazardous Materials;
- Socioeconomics and Environmental Justice; and
- Cumulative Effects

The CEQ regulations (40 CFR 1501.7 (a) 3) specifically require that environmental documents identify and eliminate from detailed study the issues that are not significant or which have been covered by prior environmental review (Sec. 1506.3), thus narrowing the discussion of these issues in the EIS to a brief presentation of why they would not have a significant effect on the human environment or providing a reference to their assessment elsewhere in the document.

In compliance with that directive and based on public scoping comments, the BLM environmental staff separated the issues to be examined in detail in this NEPA process into substantive and nonsubstantive groups. Substantive issues are defined as those impacts on resources directly or indirectly caused by implementing the Proposed Project. An issue or resource would be considered nonsubstantive if it was (1) outside the scope of the Proposed Action; (2) already decided by law, regulation, another NEPA document, or other higher level decision; (3) irrelevant to the decision to be made; or (4) conjectural and not supported by scientific or factual evidence.

Table 1.4-1. Potentially Affected Resources

Identified Resource	Substantive Potential Impact Identified	
	Yes	**No**
Air Quality and Climate Change	X	-
Biological Resources	X	-
Cultural Resources	X	-
Environmental Justice	X	-
Farmlands (Prime or Unique)	-	X
Fire/Fuels Management	-	X
Floodplains	-	X
Geology, Soils, and Minerals	X	-
Human Health and Safety/Hazardous Materials	X	-
Lands and Realty	X	-
Noise/Vibration	X	-
Weeds/Invasive Species	X	-
Paleontological Resources	X	-
Recreation	X	-
Special Management Areas	-	X
Socioeconomics and Environmental Justice	X	-
Transportation	X	-
Visual Resources	X	-
Night Sky Resources	X	
Water Resources	X	-

The Federal Register Notice of Availability of the Draft EIS was published on January 20, 2012, marking the beginning of the comment period for the project. The 90-day comment period ended on April 18, 2012. This period exceeds the BLM minimum requirement for a comment period (45 days). On February 21, 22, and 23, 2012, the BLM held public hearings in Laughlin, Searchlight, and the City of Boulder City, respectively. The BLM received over 75 public comments on the DEIS. All comments and BLM responses are presented in Appendix A-4. More information about the public and agency involvement can be found in Chapter 5 of this FEIS. In summary, most of the concerns were related to the following resources area: noise, visual, socioeconomic, and biological resources.

1.4.2 Issues Eliminated From Detailed Evaluation

In compliance with 40 CFR 1501.7 a (3), the following resources were eliminated from detailed evaluation and the rationale for their elimination is presented below.

Farmlands (Prime or Unique)

This resource was not considered for detailed evaluation because effects would be irrelevant to the decision to be made as no farmlands (prime or unique) occur within or near the Proposed Project area. Therefore, no further investigation is required.

Fire/Fuels Management

As prescribed in the BLM 1998 Las Vegas Resource Management Plan (RMP) and outlined in the Applicant's Draft POD, Applicant Proposed Measures (APMs), BLM-recommended best management practices (BMPs), and applicable federal, state, and local policies, laws, and ordinances would be adhered to during construction, O&M, and decommissioning to ensure safety in both the human and natural environments (see Section 4.8, Land Use Impacts, and Section 4.14 Human Health and Safety Impacts). Therefore, no detailed investigation is required.

Floodplains

This resource was not considered for detailed evaluation because effects would be irrelevant to the decision to be made. Federal Emergency Management Agency (FEMA) flood insurance hazard maps of the Proposed Project area were examined to determine if any floodplains exist. The maps indicate that none of the project locations are within a designated floodplain (FEMA 2009). Additionally per 10 CFR 1022, Western's siting of the switching station took into account the location of flood hazard zones. Therefore, no further investigation is required.

Special Management Areas

Detailed evaluation of this resource was not considered because the Proposed Project would not occur on BLM-administered lands with special management designations. The Desert Wildlife Management Area (DWMA) and the Piute-Eldorado Valley Area of Critical Environmental Concern (ACEC) are adjacent to and surround the project area. The ACEC is managed by the BLM to protect critical habitat of the desert tortoise. While the Las Vegas RMP (BLM 1998) considered the DWMA, and more specifically the ACEC surrounding the project site, to be ROW exclusion and/or avoidance areas, in December 2005 the 1998 Las Vegas RMP was effectively amended as part of the BLM Wind Energy Development Program. Thus, currently the project area does not include lands managed as exclusion or avoidance areas except as allowed within 0.5-mile of a designated federal aid roadway as defined in the LV RMP. However, indirect effects on adjacent lands, if any, are considered in Chapter 4 of this document.

SMAs do occur on adjacent NPS-administered lands, specifically Lake Mead NRA. Instruction Memorandum 2011-061 provides direction on wind energy development project pre-application and screening criteria for public lands of national interest and other specially designated areas that protect wildlife, visual, cultural, historic or paleontological resource values. As a cooperating agency in this

NEPA effort, NPS has participated in discussions, site visits, and preliminary resource investigations to assist in the identification of potential environmental and siting constraints that would result in the fewest possible resource conflicts and the greatest likelihood of success in the permitting process. Potential resources issues and mitigations specifically associated with NPS SMAs are addressed in appropriate sections in Chapters 3 and 4. These may include, but not be limited to, biological, and cultural resources, land use, viewsheds, noise, or recreation.

1.5 Land Use Plan Conformance Determination

The Proposed Project is in full conformance with applicable BLM land use plans and policies as described below.

Typically, guidance regarding the development of wind energy on BLM-managed public lands would be published in the Las Vegas RMP and the Land Use Planning Handbook. However, policies regarding the development of renewable resources have been published more recently. This section explains these updated policies and how they amend the current RMP, which is currently undergoing revision.

The BLM prepared a Wind Energy Development Programmatic EIS (PEIS) to address the National Energy Policy recommendations to increase renewable energy production capability specifically regarding the development of wind energy resources. The PEIS analyzed the potential impacts of wind energy development to public lands. This PEIS was published in June 2005, and in December 2005 the ROD was signed. The ROD implements a comprehensive Wind Energy Development Program for the development of wind energy resources on BLM-managed public lands in 11 western states including Nevada. Additionally, the ROD amended 52 BLM land use plans including the Las Vegas Field Office RMP. The amendment to the Las Vegas RMP includes the adoption of the programmatic policies of the Wind Energy Development Program and BMPs to address the administration of wind energy development actions on BLM lands and identifies the minimum requirements for mitigation measures. Both of these elements allow project-specific analysis to focus on the site-specific issues and concerns of individual projects. This FEIS serves as the site-specific analysis of the Searchlight Wind Energy Project.

Additionally on March 11, 2005, BLM released an updated Land Use Planning Handbook (H-1601-1) that supersedes the previous version. This handbook requires that land use planning efforts address existing and potential development areas for renewable energy projects, including wind energy (see H-1601-1, Appendix C, II. Resource Uses, Section E. Lands and Realty).

Because the 1998 Las Vegas RMP is currently undergoing revision, the existing land use plans decisions (i.e. Land Use Planning Handbook [H-1601-1]) and amendments to the RMP remain in effect during the revisions to the RMP (BLM 2005a).

1.6 Policies, Plans, and Laws

1.6.1 Relationship to Policies, Plans, and Laws

The Proposed Project is considered a major federal action that, under NEPA, requires an EIS. This FEIS complies with the CEQ regulations for implementation of NEPA (40 CFR 1500-1508), Department of Interior NEPA regulations 43 CFR Part 46, and BLM's NEPA Handbook (H-1790-1) (BLM 2008a). Table 1.6-1 lists the federal, state, and local policies, plans, and laws potentially applicable to the Proposed Action or alternative.

Table 1.6-1. Potentially Applicable Polices, Plans, and Laws

Policies, Plans, and Laws	Reference
Federal	
Administrative Procedures Act	5 United States Code (USC) 511-599
American Indian Religious Freedom Act of 1978	42 USC 1996 and 1996a

Policies, Plans, and Laws	Reference
Antiquities Act of 1906	16 USC 431 et seq.
Archaeological and Historic Preservation Act of 1974	16 USC 469-469c
Archaeological Resources Protection Act of 1979	16 USC 470aa-470mm
Bald and Golden Eagle Protection Act	16 USC 668; 50 CFR 22 et seq.
Bureau of Land Management *NEPA Handbook* H-1790-1	
Cactus and Yucca Removal Guidelines, BLM	
Clean Air Act	42 USC 7401 et seq., as amended
Clean Water Act	33 USC 1251 et seq.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980	42 USC 9601 et seq.
Council on Environmental Quality (CEQ) general regulations implementing NEPA	40 Code of Federal Regulation (CFR) Parts 1500-1508
Department of the Interior Fish and Wildlife Policy	CFT 43 Part 24
Endangered Species Act	16 USC 1531-1544; 50 CFR 17.1-17.95(b)
Energy Policy Act of 2005	Public Law 109-58
Enhancing Renewable Energy Development on the Public Lands	Secretarial Order 3282
Environmental Justice	Executive Order 12898
Federal Aviation Administration	14 CFR Part 77
Federal Land Policy and Management Act (FLPMA) of 1976	FLPMA 1976 (PL 94-579) 43 USC 1761-1771; 43 CFR Part 2800
Federal Noxious Weed Act of 1974 as amended by the Food, Agriculture, Conservation, and Trade Act of 1990, Section 1453 "Management of Undesirable Plants on Federal Lands"	USC 2801 et seq.; BLM Executive Order 13112
Materials Act of 1947	30 USC 601 et seq., as amended
Hazardous Management and Resource Restoration Program, BLM	
Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans	49 CFR 172.800
Las Vegas Resource Management Plan, BLM	
Migratory Bird Treaty Act	16 USC 7.3-712; 50 CFR 10
General Mining Law of 1872	30 USC 21 et seq., as amended
Mining and Mineral Policy Act of 1990	30 USC 21
National Electrical Code, National Fire Protection Association 780	
National Environmental Policy Act (NEPA) of 1969	NEPA 43 USC 4321 et seq.; 40 CFR Part 1500; 516 DM Parts 1-15, 43 CFR Part 46
National Environmental Policy Act Compliance for Utility-Scale Renewable Energy Right-of-Way Authorizations	Instruction Memorandum 2011-059
National Historic Preservation Act and implementing regulations	16 USC 470 et seq.; 36 CFR 800
Native American Graves and Protection and Repatriation Act of 1990	25 USC 3001 et seq.; 43 CFR Part 10
Noise Control Act of 1972, as amended	42 USC 4901 et seq.
Objects Affecting Navigable Airspace, Federal Aviation Administration	14 CFR 77
Occupational Health and Safety Act	29 CFR 1910 and 1926
Paleontological Resources Preservation Act of 2009	Public Law 111-011
Pollution Prevention Act of 1990	42 USC 13101 et seq.
Preserve America	Executive Order 13287

Policies, Plans, and Laws	Reference
Protecting Wilderness Characteristics on Lands Managed by the BLM	Executive Order 3310
Protection and Enhancement of the Cultural Environment	Executive Order 11593
Protection and Preservation of Native American Sacred Sites	Executive Order 13007
Renewable Energy Development by the Department of Interior	Secretarial Order 3285A1, as amended February 22, 2010
Resource Conservation and Recovery Act of 1976	42 USC 6901 et seq.
Safe Drinking Water Act	42 USC 300f et seq.
Solar and Wind Energy Applications – Pre-Application and Screening	Instruction Memorandum 2011-061
Superfund Amendments and Reauthorization Act of 1986, Emergency Planning and Community Right to Know Act	Title III
Surface Resources Act of 1955	30 USC 611 et seq.
Wild Horses and Burros: Protection, Management, and Control	16 USC 1331; 43 CFR 4700
Wilderness Act of 1964	16 USC 1131(c)
Wind Energy Development Policy	Instruction Memorandum 2009-043
State	
Nevada Hazardous Materials Disposal Statute	Nevada Revised Statute (NRS) 459 and 477
Nevada Critically Endangered Flora Law	NRS 527.060-527.120
Nevada Occupational Safety and Health Administration (OSHA) Program	NRS Chapters 459-477
Nevada Wildlife Action Plan	Annual Interior and Related Agencies Appropriations law (beginning P.L. 106-291 to present) for Land and Water Conservation Funds to State Wildlife Grants
Local	
Clark County Fire Code	Unified Development Code Title 79 and 80
Clark County Comprehensive Plan	Energy Policy CV7-1.6
Clark County Site Environmental Standards, Noise	Unified Development Code Title 30.68.020
Clark County Air Pollution Control Program	NRS 445B.500
Clark County Conservation of Public Land and Natural Resources Act of 2002	Public Law 107-282
Clark County	Multi-Jurisdictional Hazard Mitigation Plan
BLM Las Vegas Field Office	Noxious Weed Plan 2006
Southern Nevada	Regional Airport System Plan

1.6.2 Federal, State and Local Permitting

If the Proposed Project is approved by BLM, the Applicant and Western would be required to obtain the applicable permits and other authorizations listed in Table 1.6-2 from federal, state, and local regulatory agencies prior to construction.

Table 1.6-2. Potential Federal, State, and Local Permits for the Proposed Project

Permit or Authorization	Project Action Requiring Permit	Mandate	Permit Requirement	Status
I. Federal Permits or Authorizations				
Bureau of Land Management (BLM)				
Right-of-Way (ROW)	Lease of federal lands for the wind energy generation facility, access road, transmission line	BLM Wind Energy Development Policy, dated December 19, 2008, stipulates that Applications for commercial wind energy facilities will be processed as ROW authorizations under Title V of the FLPMA 43 USC 1761-1771 and Title 43, Part 2804 of the CFR. BLM's "…policy is to facilitate environmentally responsible commercial development of wind energy projects on public lands and to use wind energy systems on BLM facilities where feasible…to ensure the timely and efficient processing of energy ROW for wind power on the public lands.	Applicant prepares a Plan of Development describing the Proposed Action. BLM conducts environmental and other reviews before considering awarding a grant.	Notice of Intent (NOI) issued on December 16, 2008 in 73 Federal Register 76, 377
ROW	Lease of federal lands for the switching station	Required for permanent and temporary use of BLM administered lands.	Western prepares a Plan of Development describing the Proposed Action. BLM conducts environmental and other reviews before considering awarding a grant.	NOI issued on December 16, 2008.
EIS Record of Decision ROW grant for use of Federal Lands	National Environmental Policy Act (NEPA) requires environmental review leading to a Record of Decision for major projects on federal lands that might significantly affect the quality of the human environment	Lead agency (BLM) prepares an EIS that assesses the potential environmental effects of constructing and operating the project leading to the BLM's Record of Decision. 40 CFR 1505.2 and 10 CFR1021.315.	None.	EIS in progress.

Permit or Authorization	Project Action Requiring Permit	Mandate	Permit Requirement	Status
BLM/ State Historic Preservation Office (SHPO) National Historic Preservation Act (NHPA) Section 106 Compliance	Ground disturbance associated with wind turbine generators (WTGs), switching stations, access road(s), and transmission line could affect eligible historic properties	NHPA Section 106 requires that federal agencies take into consideration the effects of their undertakings on historic properties, which are properties eligible for listing in the National Register of Historic Places (NRHP) 16 USC 470 and 36 CFR 800.3	The Applicant and Western, on behalf of the federal agency (BLM), conducts an inventory of cultural resources within the APE evaluates these to determine which are historic properties (significant properties), and determines potential project effects on these properties. The agency consults with SHPO to resolve any adverse effects on historic properties.	Cultural Report has been submitted to SHPO.
Federal Aviation Administration (FAA)				
FAA Aviation Hazard Clearance	Commencement of Construction all structures requiring a no-hazard determination	Required by 14 CFR Part 77	The Applicant submits an application to the FAA.	Not yet applied for
Notice of Proposed Construction or Alteration (Form 7460.1)	Required for vertical structures greater than 200 feet tall	49 USC, 44718 and, if applicable, 14 CFR 77 (2005), to determine whether the structure exceeds obstruction standards or is a hazard to air navigation	The Applicant submits an application to the FAA.	Not yet applied for
Federal Communications Commission (FCC)				
Radio Station License	Operation of two-way radio Communication system	47 CFR Part 90.	The Applicant prepares a license application for FCC review.	Not yet applied for
U.S. Fish and Wildlife Service (USFWS)				
Endangered Species Act (ESA) Section 7 Biological Opinion/Incidental Take Permit	Required for construction on BLM-administered public lands that would disturb and result in the loss of habitat for the federally threatened desert tortoise and may result in harm or harassment of resident tortoises	ESA (16 USC 1531) requires that federal agencies consult with the USFWS regarding any undertaking or action having the potential to cause a take of species listed as threatened or endangered.	BLM submits a Biological Assessment that considers a project’s potential impacts on species listed under the ESA and proposes measures to mitigate potential take of listed species. USFWS issues a Biological Opinion and, if required, an Incidental Take Permit describing the conditions under which take of a listed species would be allowed.	The USFWS has issued a Biological Opinion for the proposed project, which is included in Appendix B-2: USFWS Biological Opinion.

Permit or Authorization	Project Action Requiring Permit	Mandate	Permit Requirement	Status
Bald and Golden Eagle Act	Project activities on BLM administered land that might affect bald or golden eagles	Bald and Golden Eagle Protection Act (16 USC 668-668c).	Applicant prepares a Bird and Bat Conservation Strategy (formerly referred to as an Avian Protection Plan) in coordination with BLM and USFWS. USFWS will comment on the plan. Decision as to whether the applicant will apply for an eagle take permit is between the Spplicant and USFWS.	Applicant has prepared a Bat and Bird Conservation Strategy (formerly referred to as an Avian and Bat Protection Plan). It is included in Appendix B-4: Bird and Bat Conservation Strategy.
U.S. Army Corps of Engineers (USACE)				
Clean Water Act (CWA) Section 404 Permit	Project construction would alter existing drainage channels that the USACE considers to be "waters of the United States."	CWA Section 404 (33 United States Code [USC] 1344) requires a permit for dredging or filling waters of the United States.	Applicant prepares a report including a detailed delineation of wetlands and an analysis of whether or not they meet requirements to be considered jurisdictional (i.e., waters of the United States). USACE determines whether drainage features are jurisdictional.	Applicant report submitted to BLM. USACE has made jurisdictional determination. 404 Application is pending.
II. State of Nevada Permits or Authorizations				
Nevada Department of Transportation (NDOT)				
ROW Encroachment Permit	Required for construction activities within the NDOT ROW Category IV permit required for commercial development	Nevada Administrative Code (NAC) 408.403; 408.407.	Applicant and Western applies for an NDOT Encroachment Permit	Clark County Department of Public Works will apply for this permit.
Traffic Barricade Plan Approval	Required for NDOT ROW Encroachment Permit	NAC 408.413	Contractor submits a Traffic Barricade Plan	Clark County Department of Public Works will submit the Plan.
Over-Dimensional Vehicle (ODV) Permit	Required for vehicles that exceed regulatory established limits	Nevada Revised Statute (NRS) 484D.615 and NRS 484D.635	Contractor applies for ODV Permit	Construction Contractor applies for this permit 2 business days in advance, 30-days for Special Purpose or Super Load ODV

Permit or Authorization	Project Action Requiring Permit	Mandate	Permit Requirement	Status
Nevada Department of Wildlife (NDOW)				
Special Purpose Permit authorizing removal of wildlife out of harm's way	Project construction would disturb habitat of state-protected wildlife and the ability for project proponent to move affected wildlife individuals out of harm's way is a desirable impact minimization measure	NAC 503.597 and 503.093	Department conducts a project review that includes a wildlife and habitat consultation. Permit or written approval is necessary prior to handling any wildlife as defined by the State of Nevada for the purpose of removal out of harm's way. A survey for state-listed species within the Proposed Project area is required. Other information required includes project alignment, area of disturbance, and the state-listed species to be disturbed.	Applicant will apply for this permit prior to construction of the wind facility and Western's switching station.
Industrial Artificial Pond Permit	Project construction and operation activities may include use of lined holding or evaporation ponds for containing/disposing of process and/or other accumulated wastewater.	NRS 502.390, NAC 502.460 through 502.495 as applicable	NDOT authorizes program to manage process water or other wastewater where solutions may become hazardous to wildlife	Applicant will apply for this permit prior to construction.
Nevada Division of Environmental Protection (NDEP)				
Stormwater Discharge Permit	Construction of the wind energy facilities has the potential to discharge sediment in stormwater and will involve disturbance of more than 1 acre.	National Pollutant Discharge Elimination System requires filing an NOI to use the General Stormwater Discharge Permit and the preparation of an stormwater pollution prevention plan (SWPPP). NRS 445A.228.	Applicant prepares the SWPPP and notifies the NDEP of its intention to use the General Stormwater Permit. SWPPP must be kept on the construction site and available for inspection.	Applicant will prepare a SWPPP and file NOI 3 months before construction of the wind facility and switching station begins.
CWA Section 401 Water Quality Certification	Project construction would alter drainage in existing drainage channels that might be considered waters of the United States.	CWA Section 401 (33 USC 1341) requires a water quality certification to accompany the Section 404 permit.	Applicant(s) prepares a permit application that describes any construction-related discharges and the methods proposed to protect water quality.	Applicants will apply for this permit 3 months before construction begins, if needed.
NEV permits	Construction, operation, and maintenance facilities such as individual sewage disposal systems and artificial ponds have the potential to affect groundwater quality.	NRS 445A.415	Proposed projects are evaluated to ensure that the background water quality is not degraded or that drinking water quality standards are not exceeded.	Applicant will apply for this permit before construction.

Permit or Authorization	Project Action Requiring Permit	Mandate	Permit Requirement	Status
Nevada Division of Forestry				
Permit to remove fully protected native flora	Project construction might disturb habitat of state-protected plants.	NRS 527.260-300	Department conducts a project review that includes a wildlife and habitat consultation.	Applicants will apply for this permit 3 months before construction begins.
Nevada Public Utilities Commission (PUCN)				
Nevada Utility Environmental Protection Act Permit (UEPA)	UEPA permits are required for all utility facilities of 70-MW or greater in the State of Nevada.	NRS 704.820 – 704.900.	Applicant prepares an engineering project description and environmental impacts analysis. UEPA permit must be obtained prior to commencement of construction.	Applicant submitted the Initial UEPA permit application to the PUCN. A revised application will be submitted when the Record of Decision is issued for the project.
Nevada State Fire Marshal				
Hazardous Materials Storage Permit	Project would involve handling of hazardous materials.	NRS 477.045.	Applicant applies for permit to store materials above the threshold quantities established by the State Fire Marshal.	Applicant and Western will apply for this permit 3 months before construction begins.
III. Clark County and Regional Permits or Authorizations				
Clark County Department of Air Quality and Environmental Management				
Dust Control Permit	Grading the WTG foundation pads, access road, and transmission access.	Clark County Air Quality Regulations - Section 94.	Applicant submits an assessor's map, owner's designation, and per-acre fee.	Applicant and Western will apply for this permit 3 months before construction begins.
Stationary Source Permit (Minor Source)		Clark County Air Quality Regulations– Section 12	Applicant submits an assessor's map, owner's designation, and per-acre fee.	Applicant will apply for this permit 3 months before construction begins.

Permit or Authorization	Project Action Requiring Permit	Mandate	Permit Requirement	Status
Clark County Regional Flood Control District				
Land Development Review	Project construction would alter drainage in existing drainage channels.	Any development that is not a subdivision shall be required to meet the requirements for subdivisions as outlined in these regulations if the Local Administrator determines that the flood hazard so requires. If the proposed development would affect the implementation of the Master Plan, the Local Administrator shall defer to the Chief Engineer for a final determination. Clark County Regional Flood Control District Uniform Regulations for the Control of Drainage.	Applicant submits development proposals to the District for review if the development has regional flood control significance, meaning those facilities, land alterations, portions of the natural drainage system, and regulatory actions that affect the implementation of the Master Plan, or lie within Special Flood Hazard Areas.	Applicant will apply for this review 6 months before construction begins.
Clark County Development Services Department				
Permit for Temporary Structures	Required for installation of temporary facilities.	Clark County Code, Title 22.02.120, Unified Development Code.	Applicant obtains a third-party plan review/approval and files an application for a temporary building with Fire Prevention Bureau.	Applicant will apply for this permit 3 months before construction begins.
Building Permit for Permanent Structures	Required for construction and occupancy of project facilities.	Clark County Code, Title 30.32.030, Unified Development Code.	Applicant and Western submit building permit application and plans.	Applicant and Western will apply for this permit 6 months before construction begins.
Use Permit and Design Review	The wind energy facilities would be considered a major construction project.	Clark County Code, Title 30, Unified Development Code.	Applicant provides a Title 30 Land Use Application and site plan, elevation, floor plan, etc.	Applicant will apply for this permit 6 months before construction begins.
Waiver of Development Standards	Needed only if the facility would need to deviate from the Development Code.	Clark County Code, Title 30, Unified Development Code.	Applicant provides a Title 30 Land Use Application.	Applicant will apply for this waiver 6 months before construction begins, if needed.
Grading Permit	Grading the WTG foundation pads, access road, and transmission access.	Clark County Code, Title 30.32.040, Unified Development Code.	Applicant and Western submit grading and drainage plans to the County.	Applicant and Western will apply for this permit 6 months before construction begins.

Permit or Authorization	Project Action Requiring Permit	Mandate	Permit Requirement	Status
Civil Division Encroachment Permit (contingent)	Would be required only if construction would encounter public ROW.	Clark County Code, Title 30.80 and 0.32, Unified Development Code.	Applicant submits plans and assessor's parcel maps.	Applicant will apply for this permit 6 months before construction begins.
Land Disturbance Permit Report (contingent)	This applies only if the project were to affect non-federal lands (not planned) that are habitat for the desert tortoise.	Clark County Code, Title 30.32.050, Unified Development Code.	Applicant must document payment of fees required under the Clark County MSHCP and the County's Section 10(a) Incidental Take Permit.	Unlikely to be needed, as Proposed Project would not affect habitat on private land.
Pad Certification for Grading and Earthwork	Shall be submitted and approved prior to any inspection being made.	Clark County Building Administrative Code 22.02.780A and Clark County Code 22.02.460(A).	Certify that construction is in accordance with geotechnical investigation.	Applicant and Western will obtain prior to construction.
Soils Report Submittal	Required for Grading Permit	Clark County Building Administrative Code 20.02.430(7)(10) and Clark County Code 22.02.235.	Applicant and Western will prepare and submit soils report to Clark County for review and approval.	Applicant and Western will prepare and submit prior to construction.
Temporary Sign Permit	Required for construction of onsite and offsite temporary signs.	Clark County Code, Title 30.72.070, Unified Development Code.		Applicant will obtain prior to construction.
Clark County Fire Department, Fire Prevention Bureau				
Flammable/ Combustible Liquid Aboveground Storage Tanks Permit	Applies to all development projects	Clark County Fire Code Article 79.	At the time of permit application, Applicant will submit three (3) sets of plans, drawn to an indicated scale, for review and approval relating to the installation and permitting of flammable/combustible aboveground storage tanks, including diesel generators.	Applicant will obtain prior to construction.
Permit Survey Form	Applies to all development projects	Clark County Fire Code.	Applicant and Western fill out Permit Survey Form and submit to Fire Department for the department to determine what hazards exist that warrants a permit. Additionally, Project owner completes/submits Application for Permit/Plan Review or Other Services for all permit application submittals.	Applicant and Western will apply for this permit 3 months before construction begins.
Hazardous Materials Permit	Storage and use of hazardous materials at the facility.	Clark County Fire Code, Article 80.	Applicant and Western prepare and submit site plans and Hazardous Materials Information Sheets for hazardous materials with quantities in excess of permitting thresholds.	Applicant and Western will apply for this permit 3 months before construction begins.

Permit or Authorization	Project Action Requiring Permit	Mandate	Permit Requirement	Status
Clark County Public Works Department				
Drainage Permit	Site drainage associated with construction of a new facility requiring more than 2 acres within Clark County ROW.	Clark County Code Title 30.52.050, requiring compliance with the Uniform Regulations for the Control of Drainage & Hydrologic Criteria & Drainage Design Manual.	Department reviews and approves drainage plan.	Applicant and Western will obtain prior to construction.
Southern Nevada Health District				
Small Commercial Septic System Permit		NAC 444.8302.	Applicant submits plans for a small commercial system to the Southern Nevada Health District for review.	Applicant will obtain prior to construction.

2.0 Proposed Action and Alternatives

This chapter describes two action alternatives and the No Action Alternative, as required by the NEPA of 1969. It briefly discusses other alternatives that were considered by the Applicant, Western, and the BLM but eliminated from further analysis and the rationale for elimination. This chapter also describes the elements for construction, O&M, and decommissioning of the Proposed Project, which includes the wind energy facility and Western's proposed switching station. *Please note that although the switching station is a component of the Proposed Project, it is often referred to separately throughout this document because Western is a federal agency whose statutory, regulatory, and policy direction are distinct from the BLM's, including procedures and mitigation requirements that may differ from those associated with the BLM's ROW authorization for the wind energy facility*.

Subject to the BLM approval of the ROW application, construction of the Searchlight Wind 200-megawatt (MW) wind energy generation facility would commence in 2012, with generation and delivery of electricity to the grid by 2013. When completed, the wind energy facility would operate year-round for up to 30 years. Western proposes to construct and operate a new switching station as a separate federal action evaluated in this document. This new switching station will interconnect the Searchlight Wind Energy Project with Western's transmission grid system. Western would deliver the electricity to markets via the existing Western's Davis-Mead 230-kilovolt (kV) transmission line.

Unless otherwise cited, details regarding the Proposed Action are drawn from the Searchlight Wind Plan of Development (POD) (Duke Energy Corporation 2011), the Western ROW application, clarification meetings between BLM and the Applicant, Western and as appropriate, other agencies.

2.1 Description of the Proposed Action and Alternatives

2.1.1 Alternatives Development

This section outlines the process used by the BLM to develop alternatives to the Proposed Action. Under NEPA regulations (40 CFR § 1502.14), the BLM is required to evaluate not only the Proposed Action, but also reasonable alternatives including the No Action Alternative. Federal agencies are required to explore a range of alternatives, which are alternatives that are "practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the Applicant."

The range of alternatives considered was bounded on the upper end by the maximum number of turbines that the site could accommodate based on turbine manufacturer spacing recommendations, safety considerations, and topography. This project is subject to expensive development, transmission upgrade, and construction costs which add to the overall costs. In order for the project to achieve minimum commercial viability for purposes of meeting potential financing criteria, the minimum power generation requirement is 200 MW. The project achieves this minimum threshold of 200 MW using 87 Siemens 2.3 MW turbines. Below the 87-turbine threshold, therefore, the project becomes uneconomic.

2.1.2 Alternatives Considered and Carried Forward for Detailed Analysis in the Environmental Impact Statement

This section describes the No Action Alternative, the Proposed Action (96 Wind Turbine Generator [WTG] Layout Alternative), and the BLM Preferred Alternative (87 WTG Layout Alternative). Proposed Project features, construction methods, and O&M and decommissioning elements common to both action alternatives are detailed in Section 2.4. Proposed Project features, construction methods, and O&M and decommissioning elements detailed in Section 2.4 serve as the basis of the environmental impact analysis in Chapter 4, Environmental Consequences.

2.1.2.1 No Action Alternative

Under NEPA, the BLM must consider an alternative that assesses impacts that would occur if the Proposed Action was not approved and the application was rejected. The No Action Alternative assumes that the Searchlight Wind ROW application for the construction, O&M, and decommissioning of a wind-powered electrical generation facility and for Western's proposed switching station, would not be granted, and the Proposed Project would not be constructed. This alternative would maintain current BLM management practices for resources and allow for the continuation of resource uses at levels identified in the BLM 1998 Las Vegas RMP. This alternative would also incorporate any management decisions that have been made subsequent to revision of the 1998 Las Vegas RMP. It includes moderate levels of resource protection and development, including wildlife habitat protection, range improvements, vegetation treatments, soil erosion controls, and fire management. In addition, recreation activities (including off-highway vehicle [OHV] use), and land development (mining, energy, and communication) efforts would continue at present levels.

This alternative generally satisfies most commodity demands of public lands, while mitigating impacts on sensitive resources. However, it does not meet specific provisions and goals of the Energy Policy Act of 2005 and recent Department of the Interior Instruction Memoranda (IM) and Secretarial Orders regarding renewable energy development (see Section 1.3.1-BLM's Purpose and Need). Under the No Action Alternative, the purpose and need for the Proposed Project would be provided by other means.

2.1.2.2 Proposed Action – 96 WTG Layout Alternative

The 96 WTG Layout Alternative was developed because this is the maximum numbers of turbines that can be placed in the Proposed Project area. Originally, the Applicant had considered alternatives with more turbines in the area; however, more turbines were not technically feasible (See Section 2.2-Alternatives Considered, but not Analyzed in Detail).

Under this alternative, BLM would authorize the Applicant to construct, operate and maintain, and decommission an approximately 220 MW wind energy facility on in an area encompassing approximately 18,949 acres of BLM-managed land in Nevada, approximately 60 miles southeast of Las Vegas, and 2 miles east of Searchlight, Nevada. The project site is accessible from US Interstate 95 (US-95) and Nevada SR 164 (also designated as Cottonwood Cove Access Road east of Searchlight and within the Lake Mead NRA boundary) (Figure 1.3-1). The Searchlight Wind energy facility would begin generating power as soon as the WTGs and associated infrastructure (including Western's proposed switching station) were constructed. It is anticipated that the wind energy facility would operate year-round for up to 30 years. Western's proposed switching station would remain in service even after decommissioning of the wind energy facility.

This alternative would involve the construction of up to 96 2.3-MW WTGs that would provide up to 220 MW of electricity. The linear strings of WTGs would be sited on ridgelines and plateau areas bounded by Golden Rod Snyder Road on the south, US-95 on the west, Fourth of July Mountains in the east, and extending a few miles north of Cottonwood Cove Road (SR 164). The towers within each string would be sited approximately 750 feet apart (Figure 2.1-1). The locations of depicted proposed WTGs, roads, power lines, and other facility-related construction elements could slightly vary based on environmental, engineering, meteorological, and/or permit requirements.

Electrical power generation from the 96 WTGs and associated infrastructure would be collected, converted, and delivered to Western's proposed switching station as outlined under the Proposed Action.

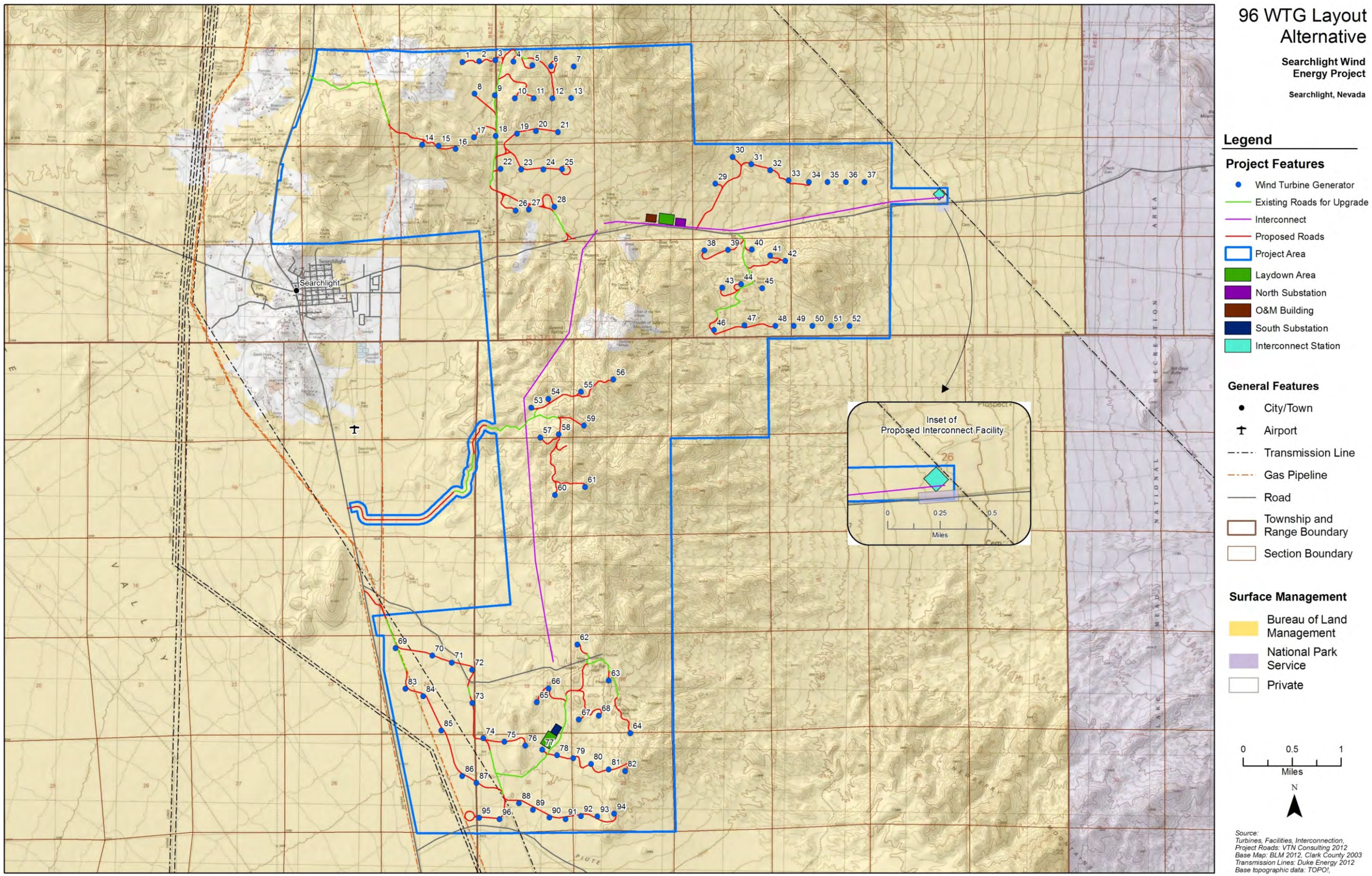


Figure 2.1-1. 96 WTG Layout Alternative

Four permanent wind-speed measuring MET towers and an O&M facility would be sited within the Proposed Project area. All WTG control systems would be connected by an underground communications system to the O&M facility for computerized automated monitoring of the entire project. A temporary cement batch plant, rock crusher, and construction operations trailer pad would also be located on site.

A total of 37.6 miles of gravel roads would be needed to access, operate, and maintain the Proposed Project. Under the 96 WTG Layout Alternative, 9.2 miles of road reconstruction would be required, and 29 miles of new roads constructed. Facilities associated with the 96 WTG Layout Alternative would permanently occupy approximately 160 acres. Additionally, approximately 249 acres would be affected during construction. All project features associated with the 96 WTG Layout Alternative are outlined in Table 2.1-1.

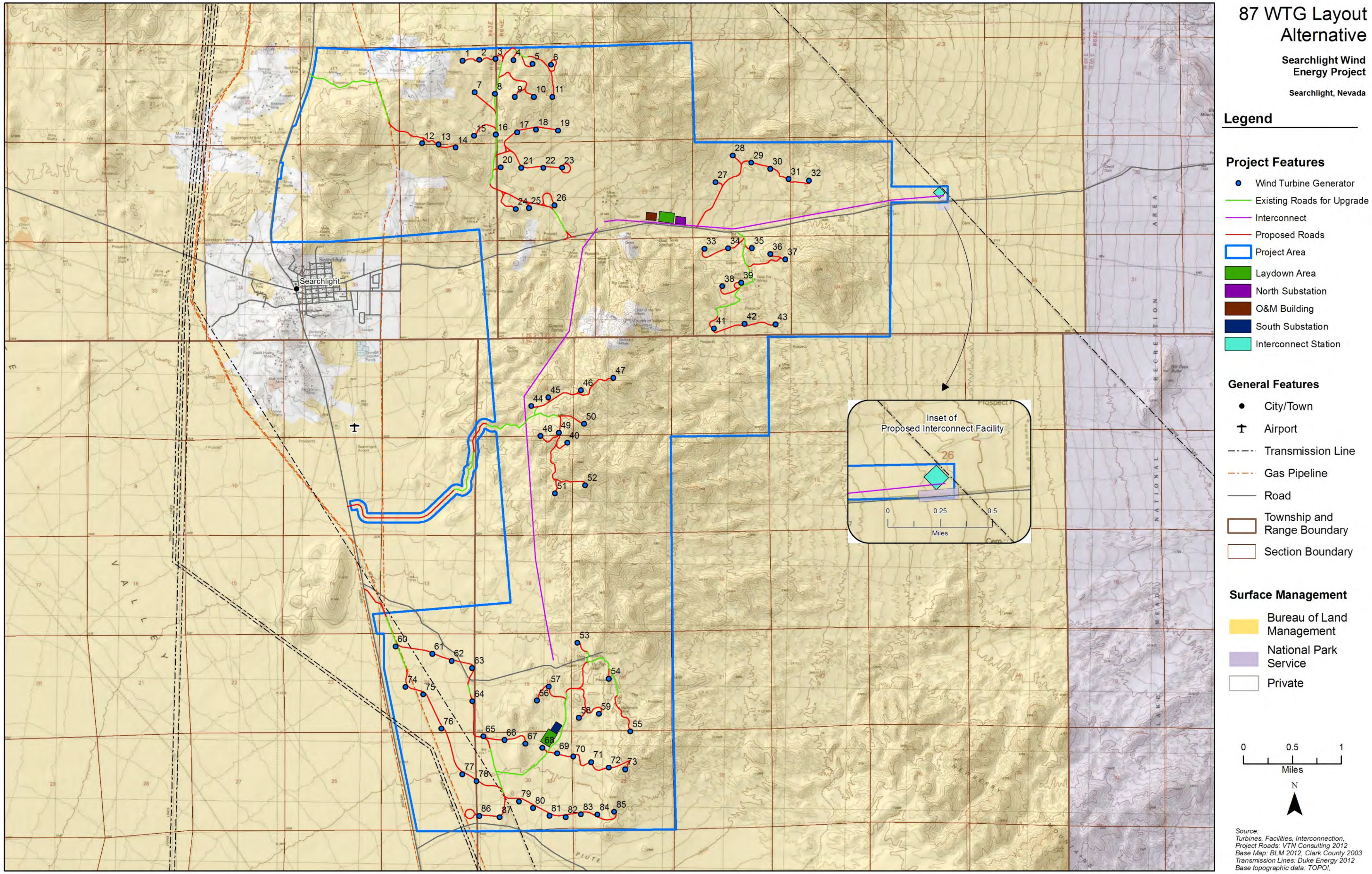
Table 2.1-1. 96 WTG Layout Alternative Project Features

Project Feature	Amount
Project production capacity (MW)	220.8 MW
Number of WTGs	96
WTG nameplate (each)	2.3 MW
Project roads	37.6 miles (total)
Existing (modified to 16 feet width)	0.5 miles
Existing (modified to 36 feet width)	8.7 miles
New (16 feet width)	1.7
New (36 feet width)	27.3 miles
Number of substations	2
Number of operations and maintenance facilities	1
New overhead transmission lines (230 kV)	8.7 miles (total)
North Substation to Western's Interconnection Switching Station	2.6 miles
South Substation to North Substation	6.1 miles
New Collection Lines (34.5 kV)	7.9 miles (total)
New overhead collection lines	5.2 miles
Underbuild collection lines	2.7 miles
Number meteorological stations	4

2.1.2.3 BLM Preferred Alternative – 87 WTG Layout Alternative

Under this alternative, BLM would authorize the Applicant to construct, operate and maintain, and decommission an approximately 200 MW wind energy facility on BLM-administered lands within the same location as described under the Proposed Action. This alternative would begin generating power as soon as the wind energy facility and associated infrastructure, including the Western's proposed switching station and ancillary facilities, were constructed. It is anticipated that the wind energy facility would operate year-round for up to 30 years. Western's switching station portion of the project would remain in service even after decommissioning of the wind energy facility.

The 87 WTG Layout Alternative would involve the construction of up to 87 2.3-MW WTGs that would provide up to 200-MW of electricity. The linear strings of WTGs would be sited on ridgelines and plateau areas bounded by Golden Rod Snyder Road on the south, US-95 on the west, Fourth of July Mountains in the east, and extending a few miles north of SR 164. The towers within each string would be sited approximately 750 feet apart (Figure 2.1-2. The locations of depicted proposed WTGs, roads, power lines, and other facility-related construction elements could vary slighly based on environmental, engineering, meteorological, and/or permit requirements.



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2 **Figure 2.1-2. 87 WTG Layout Alternative**

Electrical power generated from the WTGs would be delivered from transformers at the base of each WTG to two project electrical substations via an underground collection system. The substations would convert the voltage of the wind energy facility electrical collection system into the transmission line voltage. A 6.1-mile overhead transmission line would connect the two project substations. A 2.6-mile-long transmission line would interconnect the Searchlight Wind Energy Project with Western's existing Davis-Mead 230-kV transmission line east of the project site. Western proposes to construct a new switching station and associated access road, transmission service distribution line, and development area adjacent to the existing Davis-Mead transmission line.

Four permanent wind-speed measuring meteorological towers (MET) and an O&M facility would be sited within the Proposed Project area. All WTG control systems would be connected by an underground communications system to the O&M facility for computerized automated monitoring of the entire project. A temporary cement batch plant, rock crusher, and construction operation trailer pad would also be located on the site.

A total of 35.9 miles of gravel roads would be needed for construction, O&M, and decommissioning activities. Under this alternative, 8.6 miles of road widening and improvement would be required, and 27.3 miles of new roads would be constructed.

Facilities associated with the 87 WTG Layout Alternative would permanently occupy approximately 152 acres. Construction of the facilities would affect approximately 230 acres. All project features associated with the 87 WTG Layout Alternative are outlined inTable 2.1-2.

In accordance with NEPA, the BLM is required by the CEQ (40 CFR 1502.14) to identify their preferred alternative for a project in the Draft EIS, if a preference has been identified. The preferred alternative is not a final agency decision; rather, it is an indication of the agency's preference. The BLM has selected the 87 WTG Layout Alternative as the BLM-preferred alternative based on the analysis in this FEIS because this alternative best fulfills the agency's statutory mission and responsibilities, considering economic, environmental, and technical factors. It is the alternative with the least environmental effects regarding noise, biological resources, and visual resources that meets the purpose and need..

Table 2.1-2. 87 WTG Layout Alternative Project Features

Project Feature	Amount
Project production capacity (MW)	200.1 MW
Number of WTGs	87
WTG electric generating capacity nameplate	2.3 MW
Project roads Existing (modified to 16 feet width) Existing (modified to 36 feet width) New (16 feet width) New (36 feet width)	35.9 miles (total) 0.5 mile 8.1 miles 1.7 miles 25.6 miles
Number of substations	2
Number of operations and maintenance building	1
New overhead transmission lines (230 kV) North Substation to Western's Interconnection Switching Station South Substation to North Substation	8.7 miles (total) 2.6 miles 6.1 miles
New collection lines (34.5 kV) New overhead collection lines Underbuild collection lines	7.9 miles (total) 5.2 miles 2.7 miles
Meteorological towers	4 (existing)

2.2 Action Alternatives Considered But Not Analyzed in Detail

In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than whether the Applicant prefers or is capable of performing a particular alternative. Reasonable alternatives include those that are practicable or feasible from a technical and economic standpoint and using common sense, rather than those that are simply desirable from the standpoint of the Applicant (CEQ 1981).

Initially, the BLM considered two additional alternatives: 161 WTG Layout Alternative and 140 WTG Layout Alternative. The 161 WTG Alternative was the Applicant's original proposed action developed to maximize the power generation potential of the site. Additionally, the 140 WTG Alternative was developed to reduce impacts on visual resources and air traffic safety in the area. However, based on public scoping meeting input, agency discussions, and further analyses both of these alternatives were rejected based on the potential for environmental impacts and technical and economic considerations and eliminated from further analysis. See Sections 2.2.1 and 2.2.2 for detailed discussion on elimination of these alternatives.

In addition, Western considered three additional alternatives for siting of the proposed switching station, but eliminated these sites from further analysis for technical reasons, as discussed below in Section 2.2.3. Western's primary selection criteria was to locate the switching station close to the Davis-Mead 230-kV transmission line and meet BLM resource planning requirements, including siting the switching station outside of special management designation lands, except for a 0.5-mile area adjacent to a federally designated highway.

2.2.1 161 WTG Layout Alternative

The 161 WTG Layout Alternative, originally proposed by the Applicant in their ROW application to the BLM, specified siting 161 WTGs with a maximum project power-generating capacity of 370 MW (Figure 2.2-1). During public scoping, community concerns were raised regarding the potential visual impacts on the town of Searchlight and surrounding landscapes. Specifically, residents and tourists/recreationists were assumed to potentially be negatively affected by direct facility impacts (density of WTGs to the north and east of Searchlight) and scenic quality impacts within and surrounding the project area. Specifically, residents were concerned because the 161 WTG Layout "surrounded" the town of Searchlight, and this configuration received opposition from town residents. Additionally, public concerns regarding air traffic safety resulting from facility height, lights, or communication/signal interference were raised during the public scoping process. These concerns were raised at several public meetings conducted by the BLM and the Clark County Commissioner for the project area, in meetings with town residents and in the scoping process.

Additionally the Applicant conducted detailed engineering and technical analysis of this alternative. This involved consideration of turbine locations and heights, wind direction, terrain roughness and wind shear. Wind shear is the difference in wind speed and direction over a relatively short distance in the atmosphere, which commonly occurs over areas featuring marked changes in elevation. Excessive wind shear is important because it can interfere with the normal operation of a wind turbine and may decrease its efficiency and lifetime. Additionally, the wind created from 1 turbine can affect the operation of another turbine. This potential turbine-turbine interaction was evaluated for both turbulence and turbine wake, which also can create wind shear and impair their effectiveness. This evaluation was accomplished in coordination with the turbine manufacturer and through use of tools such as wind resource analysis and digital terrain models. Based on the results of the analysis, the Applicant abandoned this alternative because it was not technically or economically feasible so BLM eliminated this alternative from detailed consideration.

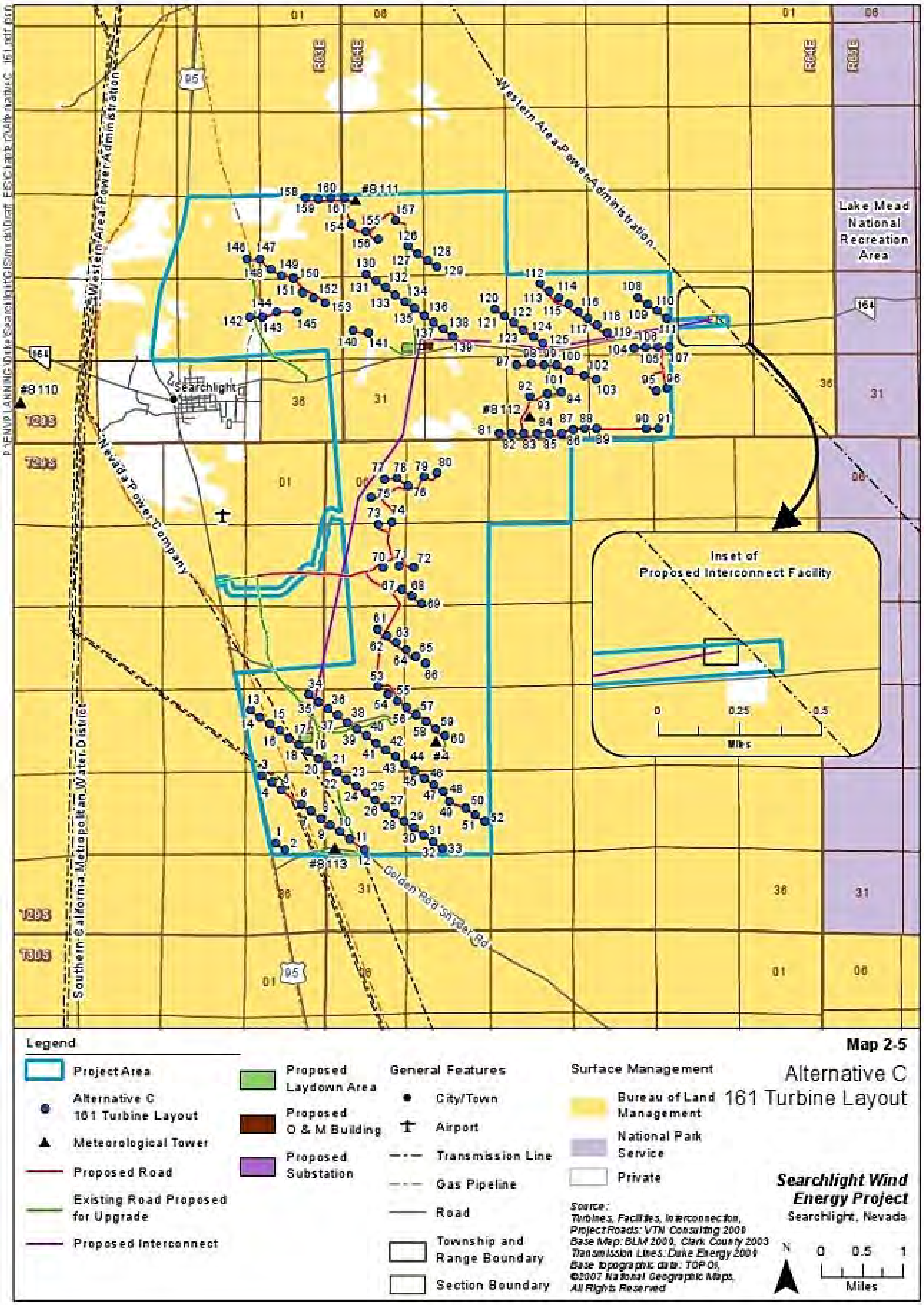


Figure 2.2-1. 161 WTG Layout Alternative

2.2.2 140 WTG Layout Alternative

The 140 WTG Layout Alternative was developed based on early public input and the elimination of the 161 WTG Alternative, and consisted of 140 WTGs with a maximum project power-generating capacity of 325 MW (Figure 2.2-2). This alternative would reduce the number of WTGs by 21 from the original proposal, thereby attempting to address the concerns regarding density, visual and scenic quality impacts, and air traffic safety, and the technical considerations previously discussed. Through additional consultations with the public, further concerns were raised regarding the potential impacts on aesthetics. This layout, like the 161 WTG configuration, had turbines on ”surrounding” the town of Searchlight particularly on the north and east, and town residents raised the same concerns with regards to the aesthetics of such a configuration. Likewise, the same public concerns were raised with regard to air traffic considerations associated with the Searchlight airport.

In response to concerns raised, and as more detailed site information was developed, the Applicant conducted further detailed engineering and technical analyses of the 140 WTG configuration. In these analyses individual turbine placement or ‘micrositing” was conducted. Considerations included slope, construction access, and costs. The wind on steep slopes tends to be turbulent and has a vertical component that can affect turbines. Specific setbacks from the edges of ridgelines and hilltops are needed to avoid the impacts of this vertical wind component. Then the turbine-turbine interaction and spacing were evaluated in an iterative process because as a single turbine location was moved the effects on the neighboring turbines and the entire array was necessarily reevaluated. The terrain is rocky and mountainous therefore slopes were evaluated as important element of access for construction and maintenance. To create a safe and stable road surface on steep slopes to each turbine location and transmission alignment, engineering was conducted to determine the required amount and extent of cut and fill material need. Cut, or excavation, creates space for the road driving surface. Fill is the use of the cut material on the roadway to create embankments for stability and erosion control. The objective is to balance the amount of material from cuts so it roughly matches the amount of fill to minimizing the amount of construction labor and costs, avoid costly hauling and disposal, and minimize surface disturbance and associated air quality effects from construction generated particulate matter and dust. The fill volume of excavation increases significantly as the depth of the cut increases, particularly on steep slopes; therefore, construction costs on steep slopes would be greatly and disproportionally increased. The 140 WTG Layout was abandoned by the Applicant because it was not technically or economically feasible and BLM subsequently eliminated it from detailed consideration.

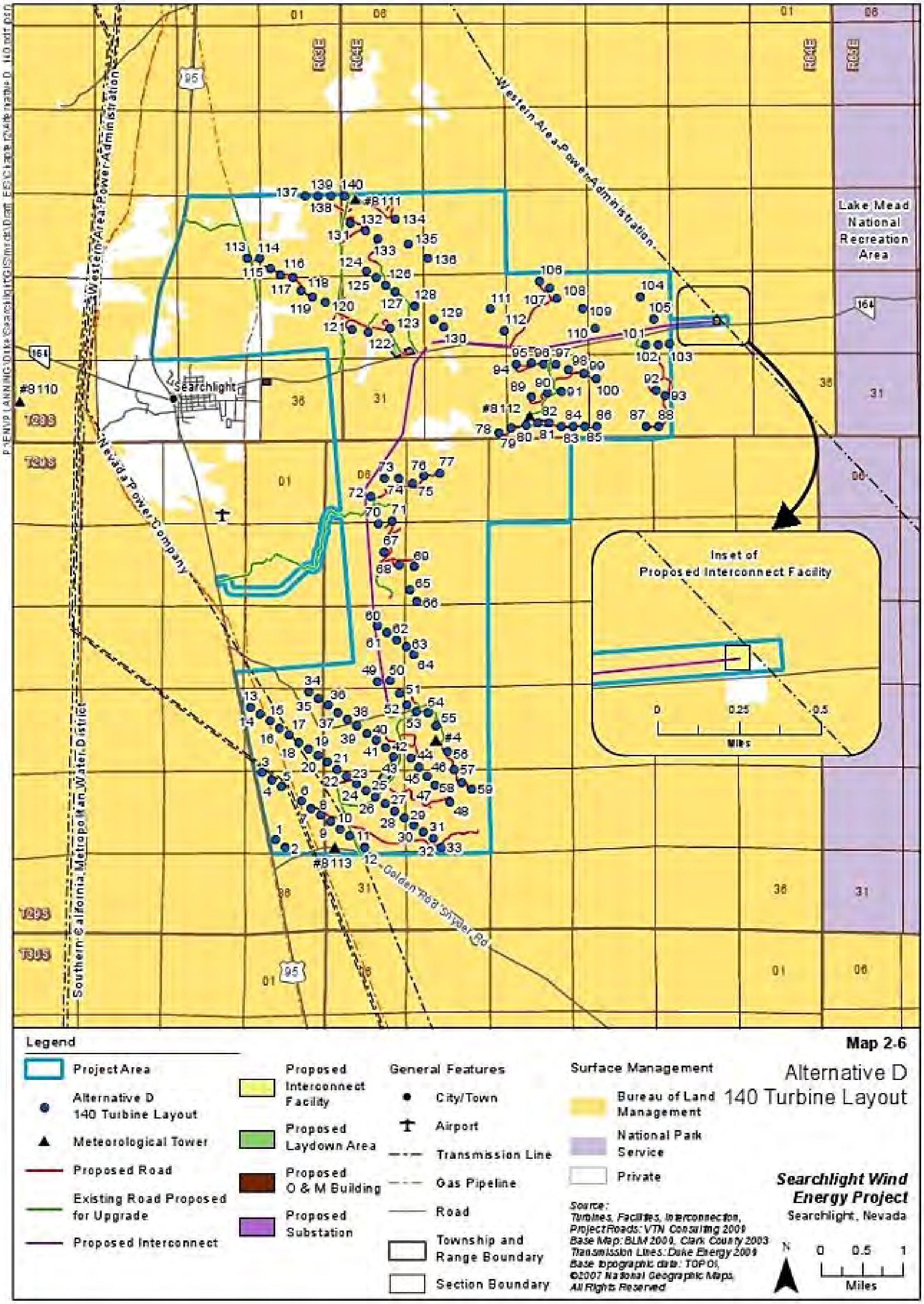


Figure 2.2-2. 140 WTG Layout Alternative

2.2.3 Western's Interconnection Switching Station Location Alternatives

Western's primary selection criteria was to site its proposed switchyard within close proximity to the Davis-Mead 230-kV transmission line and meet BLM resource planning requirements, including siting the switchyard outside the Area of Critical Environmental Concern (ACEC), except for ½-mile area adjacent to a federally-designated highway, per the BLM Resource Management Plan. In addition, Western's site must comply with Federal and utility regulation, which governs the power industry. Interconnections must have redundant and diversely routed communications for reliability; therefore, the switchyard location must have line-of-sight to one of Western's nearby mountaintop communication sites for the primary communication path. The second, redundant communication path is less restrictive but also guided by regulation. Other operational requirements also impact location, including all-weather access to the switchyard during storm events and access to distribution power lines to provide primary station service power.

Western identified three additional switching station locations outside the Piute-Eldorado Valley ACEC including:

1. A site located at the northeast corner of Section 27 near the existing Davis-Mead 230-kV transmission line
2. A site along Cottonwood Cove Road (SR 164), between the proposed WTG collection substation and the existing Davis-Mead transmission line, and near the proposed Searchlight generation tie line in Sections 27, 28, and 29
3. A site south of SR 164 in the southeast corner of Section 34

Each of these sites was evaluated based on the following criteria: available electrical service, access to existing communication facilities, road access, topography and cost. Site descriptions and rationale for elimination are provided below:

Site 1 (NE Corner Section 27)

This location was considered due to its close proximity to the existing Davis-Mead transmission line and a clear microwave path to one of Western's existing communication facilities. However, the access road from SR 164 (i.e. Cottonwood Cove Road) to this location crosses two major drainages and would require bridges, channelizing structures and large box culverts to maintain access to the site during storms events. The ground surface in the northeast corner of Section 27 is thin soil or exposed bedrock. Blasting would be required to level the switchyard, build the access road, and for most (possibly all) foundations which would easily double the cost of construction. A new power line would be necessary to connect the site with the existing NV Energy power line that is located along the north side of SR 164. The additional costs from wash crossing infrastructure and blasting make this site unreasonable from an engineering and cost perspective.

Site 2 (Sections 27, 28, and 29)

A location along the Searchlight generation tie (gen-tie) line was also considered. Being close to both the gen-tie line and the NV Energy distribution line is advantageous. However, development along the gen-tie line would require construction of a new access road from SR 164 over to the site, including box culverts, channelizing structures and/or a bridge for one major desert wash crossing. Depending on how far west along the gen-tie line the site was located, the existing Davis-Mead line would have to be re-routed up to 2-miles to the west requiring new double-circuit transmission line with an estimated cost of about $1.25 million/mile. There would also no clear microwave path to existing Western communication sites along the gen tie route, requiring development of a new mountain top communication site nearby, estimated to cost about $700,000. Site 2 was eliminated due to the unreasonable costs of the Davis-Mead line relocation and new communication site requirements. Further, it was anticipated that recreational users would use the new road to bypass the NPS fee station resulting in unauthorized access to the park and additional disturbance relatively close to Lake Mead.

Site 3 (SE Corner Section 34)

This location was considered because it has a clear microwave path to Western's existing communication facilities. However, this site is also located approximately 2 miles away from the Davis-Mead transmission line and thus would require 2 miles of double-circuit transmission line to connect with Davis-Mead with an estimated cost of about $1.25 million/mile. Other site development constraints would require a new access road from SR 164 along the east boundary of the proposed site, including box culverts, channelizing structures and/or bridges for crossing several minor washes and one major wash. Finally, the location would require 3.5 miles of new Searchlight gen-tie line and 1.5 miles of new distribution line for station service power. Site 3 was eliminated due to unreasonable costs for an all-weather access road, a new distribution line for station service, and the double-circuit transmission line to connect with the Davis-Mead transmission line. In addition to the technical and economic reasons for elimination, it was anticipated that recreational users would use the new road to bypass the NPS fee station resulting in unauthorized access to the park and additional disturbance relatively close to Lake Mead. (similar to Site 2).

2.3 Proposed Project Features Common to Action Alternatives

Under both action alternatives, the proposed Searchlight Wind Energy Project would consist of the following temporary (during construction) and permanent features:

- Wind turbine generators (WTGs), including concrete foundations, tubular steel towers, nacelles (i.e., main WTG bodies), and rotor assembly
- Pad-mounted transformers (one located at the base of each WTG tower)
- Underground electrical collection system (34.5 kV)
- Underground communications system
- Two onsite electrical substations and 6.1-mile overhead transmission line connecting the substations
- A 2.6-mile overhead transmission line (230 kV) connecting to Western's proposed switching station
- Four meteorological masts
- Operations and maintenance building
- Two temporary laydown areas
- Temporary concrete batch plant
- Temporary portable rock crusher
- Access roads
- Western's proposed switching station and ancillary facilities

Proposed Project features, construction methods, and O&M and decommissioning elements are detailed below.

2.3.1 General Features of the Proposed Project

Wind Turbine Generators (WTG)

WTGs consist of three principal components that would be assembled and erected during construction: the tower, the nacelle, and the rotor assembly. For the purpose of analysis, both action alternatives would use the Siemens Model 2.3-101 MW WTG with a 331-foot rotor diameter on a 262-foot tower (WTG hub height) (Figure 2.3-1). These modern WTGs would have maximum height of up to 427.5 feet with three mounted rotor blades, each 165 feet in length. Minimum blade height would be 96 feet. While the Applicant assumes that the Siemens 2.3-MW WTG model would be erected at the site, there remains the possibility that another similar WTG could be used. No WTG under consideration for the Proposed Project would exceed the maximum height of the Siemens 2.3-MW WTG (427.5 feet).

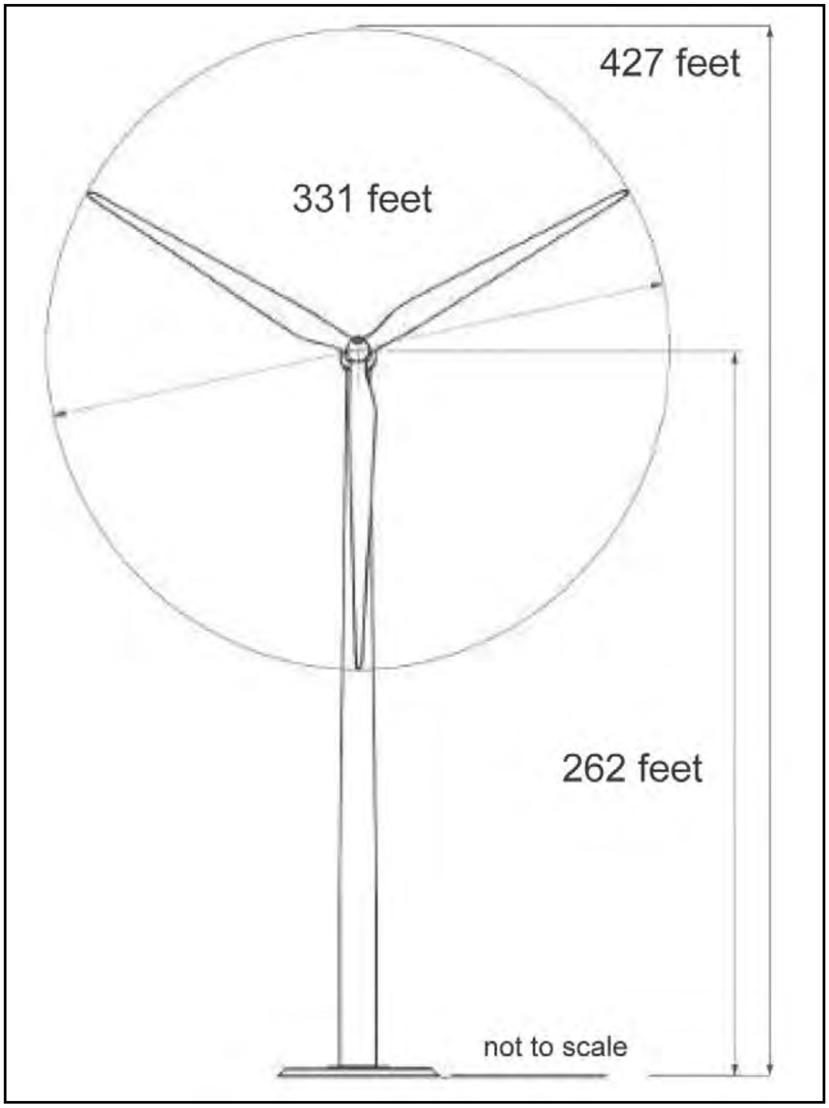


Figure 2.3-1. Diagram of a Siemens 2.3-101 WTG

Towers

The tower would be a freestanding tubular, painted steel structure manufactured in multiple sections, depending on the required height. Towers would be delivered to the site and erected in two or three sections each. Each section would be bolted together via an internal flange. An access door would be located at the base of each tower. An internal ladder would run to the top of the tower just below the nacelle. The tower would be equipped with interior lighting.

Nacelle

The gearbox, generator, and various control equipment would be enclosed within the nacelle, which is the housing of the unit that protects the WTG mechanics from environmental exposure. A yaw system would be mounted between the nacelle and the top of the tower on which the nacelle would reside. The yaw system consists of a bearing surface for directional rotation of the WTG, and a drive system consisting of a drive motor(s) to keep the WTG pointed into the wind to maximize energy capture. A wind vane and anemometer would be mounted at the rear of the nacelle to signal the controller with wind speed and direction information.

Rotor Assembly

The WTGs would be powered by three composite or fiberglass blades connected to a central rotor hub. Wind would create lift on the blades, thus causing the rotor hub to spin. This rotation would be transferred to a gearbox where the speed of rotation is increased to the speed required for the attached electric generator housed in the nacelle. The rotor blades would turn slowly, typically less than 20 revolutions per minute. Although the blades would be nonmetallic, typically made from a glass-reinforced polyester composite, they would be equipped with a sophisticated lightning suppression system.

Roads

All roads would be constructed for the specific purpose of the Proposed Project and be used as primary access routes for the larger WTG components delivered to the project area, as well as for construction and O&M crews and smaller materials delivery. They would be located to minimize ground disturbance, avoid sensitive resources (e.g., biological habitat, cultural resource sites), and maximize transportation efficiency.

Regional and local access to the area would be via US-95 and Cottonwood Cove Road (also known as SR 164 west of Searchlight) (Figure 1.3-2). Access to the Proposed Project facilities would be provided by newly constructed extensions of existing north and south access roads, and upgraded or partially realigned (to reduce maximum grade to 10% or less, or to increase the inside radius of turns on the road) existing access roads that begin at US-95 and Cottonwood Cove Road. New roads would link the individual WTGs, substations, and other project facilities.

From the north end of Fourth of July Mountains, the existing road from Cottonwood Cove Road would be upgraded to a gravel road and would be the primary access route for larger WTG components. New gravel WTG string roads would be constructed to link the WTGs. The WTG string roads would be designed to enable the transport of large cranes between each individual WTG site. New short spur roads would be constructed along the WTG strings to access each individual WTG.

Each WTG manufacturer has slightly different equipment transport and crane requirements. These requirements dictate road width and road turn radius. Turning radius refers to the amount of roadway space a truck needs to make a u-turn while road width refers to the extent of the road from side to side. A 148’ minimum inside radius was used in design guidelines for all access roads. The road widths for the Proposed Project would range between 16’ and 36’, which is sufficient to meet the inside turning radius requirements. A diagram of a typical interstate semitrailer is provided in Figure 2.3-2. Turning Radius Example (Source: http://www.automation-drive.com/truck-turning)

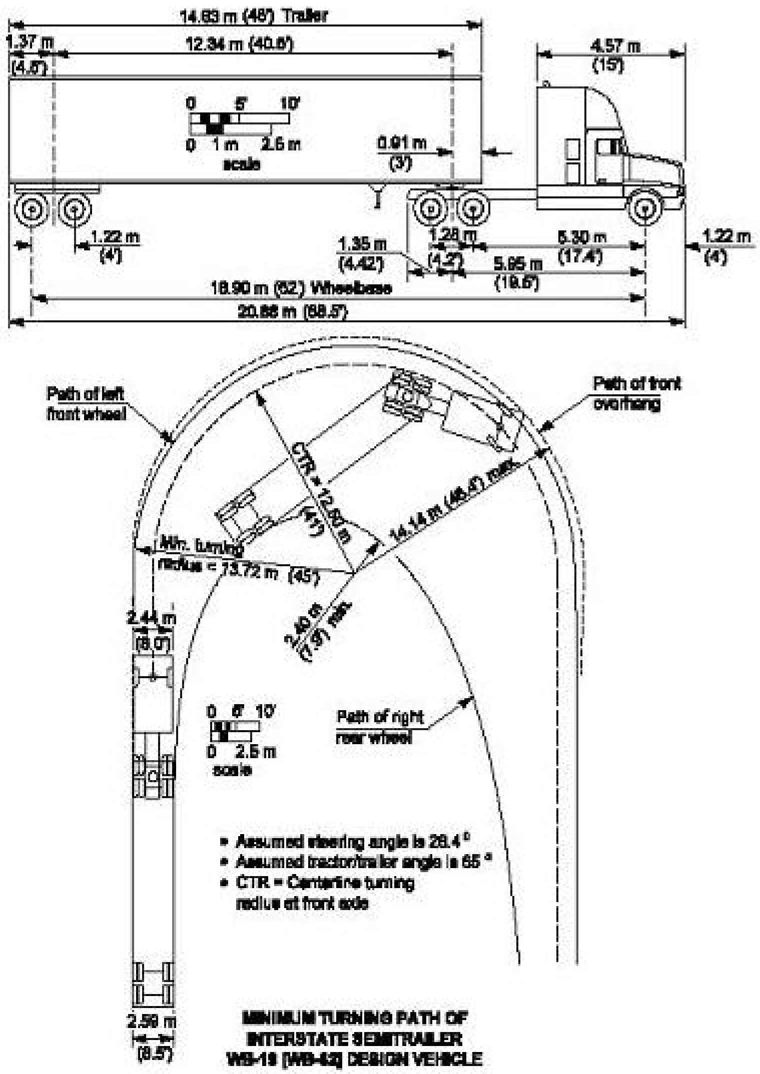


Figure 2.3-2. Turning Radius Example

The turnout general requirements were provided from the turbine manufacturer, Siemens, General Site Requirements. Their specification is to have a turnout every 1640' for the 16' wide roads. Most of the proposed roads are 36' wide, so in essence there is a 16' turnout included in the width of the proposed road. Calculations of ground disturbance considered turnouts.

The type and brand of WTGs installed would be determined by commercial factors within the timeframe of the Proposed Project schedule. To allow safe passage of the large transport equipment used in construction, gravel roads would be built consisting of an aggregate road base over compacted native material in accordance with geotechnical recommendations, and with adequate drainage and compaction to handle 15-ton-per-axle loads. Road widths would range between 16 and 36 feet. The BLM would require that all roads be designed, built, surfaced, and maintained to minimize ground disturbance, and to provide safe operating conditions at all times (e.g., speed limits of 15 miles per hour would be posted on all project roads).

2.3.1.1 Electrical System

Each WTG would generate electricity at approximately 690 volts. The low voltage from each WTG would be increased to the 34.5-kV level required for the medium-voltage collector system via a pad-mounted transformer located at each WTG. The power collection system would consist of medium-voltage, high-density, insulated underground cables that connect each WTG transformer to one of two onsite substations. These underground cables would be buried in trenches located adjacent to the roadbed of the WTG connector roads, wherever technically feasible. At the substations, voltage would be further increased to 230 kV. The two onsite substations would be connected with a 6.1-mile, 230-kV overhead transmission line. The stepped-up power would then be delivered from the northern substation through the 2.6-mile transmission interconnect line to the Western's proposed switching station, which would provide an interconnection with Western's Davis-Mead 230-kV transmission line.

Underground Communications System

The WTGs would be operated via a Supervisory Control and Data Acquisition (SCADA) system mounted on the control panel inside the tower of each WTG. Each WTG would be connected via fiber-optic cable to a central computer in the O&M building. Data could be accessed and the WTGs could be controlled, either on site or remotely. The fiber-optic communications cable would be co-located with the electrical collection system to reduce environmental impacts. Where feasible, collection cabling and communication lines would be co-located with roads to minimize environmental impacts.

Substations

Two project substations are proposed: one in the northeastern portion of the project area (adjacent to Cottonwood Cove Road) and one in the southern portion of the project site (south of Tip Top Well Road). The proposed substations' main functions would be to step-up the voltage from the collection lines (34.5 kV) to the transmission line level (230 kV) and to provide electrical fault protection. Based on the transmission system studies conducted by Western, the Applicant would install capacitor banks at each of the two project 230-kV substations. The basic elements of the step-up substation facilities would be a control house, one or two main transformers, outdoor breakers, capacitor banks, relaying equipment, high-voltage bus work, steel support structures, an underground grounding grid, and overhead lightning suppression conductors. All of the main outdoor electrical equipment and control house would be installed on a concrete foundation.

The specific footprint of the substations would depend largely on the utility requirements, number of WTGs used, and resulting nameplate capacity (the amount of energy the generator is capable of producing), which would affect the number of 34.5-kV feeder breakers. Each substation site would consist of a graveled footprint area of approximately 1.5 acres, a 12-foot-tall chain-link perimeter fence, and an outdoor lighting system.

Transmission Lines

Overhead 230-kV transmission lines are proposed for the 6.1-mile transmission line, which would connect the two project substations, and the 2.6-mile transmission line to Western's proposed switching station to connect with the Davis-Mead 230-kV transmission line. The Applicant proposes to support the transmission line conductors from steel monopole structures (Figure 2.3-3). Each monopole structure would be approximately 80 to 100 feet tall and be spaced at approximately 500-foot intervals. The 230-kV transmission line conductors would maintain the required National Electrical Safety Code (NESC) clearances of 22.5 feet for 230 kV over terrain subject to vehicular traffic, plus an additional safety buffer (typically 5 feet). The conductor would be attached to the structures at varying heights to maintain the required NESC wire-to-ground clearances between structures. The design for the 2.6-mile transmission line to Western's proposed switching station would be subject to Western's review and may be modified to meet Western's requirements during the design phase for the Proposed Project. In addition, Western would require the installation of an overhead optical groundwire containing fiber optics to provide communication between Western's proposed switching station and the Applicant's system.

Figure 2.3-3. Proposed Steel Monopole Structure

In some situations an underbuilt circuit (34.5-kV collection line hung on the steel monopole underneath the 230-kV transmission line) would be used. For the most part, the collection system would be buried conductor tying several of the WTGs together in a circuit to collect the power generated at the WTGs and routing that power to the project substation, where it would be stepped up to the 230-kV transmission voltage. At several locations along the transmission lines, it might be advantageous to install the collection system conductor above ground due to elevation changes, limited easement, cost of installation, minimization of environmental impact, and geotechnical conditions that will not allow it to be buried. An underbuilt circuit on the 2.6-mile transmission line to Western's proposed switching station would be subject to Western's review.

Meteorological Towers

Four anemometer (wind measurement) towers have been installed at strategic locations along the WTG strings. These meteorological towers are approximately 180 to 200 feet in height and have anemometers mounted at varying distances above the ground. Information collected from the anemometers would be relayed to the O&M building via the Proposed Project's communication system. The meteorological towers have been constructed of tubular steel structures and are designed to discourage perching for raptors and other large birds.

Operations and Maintenance Facility

The O&M facility would be located east of Searchlight and along the south side of Cottonwood Cove Road. It would include a main building with offices, spare parts storage, restrooms, a septic system, a shop area, outdoor parking facilities, a turnaround area for larger vehicles, outdoor lighting, and a gated access with partial or full-perimeter fencing. Power for the O&M facility would come from the local electric grid. The O&M building would have a foundation footprint of approximately 60 feet by 140 feet. The projected permanent footprint of the O&M facility (including parking area) would be approximately 5 acres. The building would be of composite materials constructed or painted to match the surrounding landscape color. Potable water supplies would be used in the building, and sewage disposal would be by means of an onsite septic tank. Telecommunication lines and the SCADA system would also be installed.

2.3.2 Construction

The Proposed Project would employ standard construction procedures used for other wind power projects in the western United States. These procedures, with minor modification to allow for site-specific circumstances and differences among WTG manufacturers, are summarized below. Additionally, project construction and operations would follow the BLM's BMPs. Project construction is anticipated to take approximately 8 to 12 months.

Laydown Areas

Two laydown areas would be required near the proposed electrical substation locations (Figure 2.1-1 and Figure 2.1-2).Figure 2.3-4 delineates a typical laydown area. Access to the laydown areas would be via existing but upgraded roads leading from US-95 north of Searchlight and Cottonwood Cove Road east of Searchlight. The southern laydown area would be temporary and used during construction only. However, the laydown area near the north substation might be permanent and could be used for extra storage and spare parts during the life of the project. Each laydown area would be approximately 10 acres and might be fenced for security for the duration of its use.

During construction, items such as construction equipment, cable, foundation parts, components, towers, blades, and nacelles might be temporarily stored either at one of the laydown areas, or in temporary laydown areas at the base of each WTG location. All equipment and components would be supported on wooden frames, pallets, or straw bales, which would be placed on the ground while WTG components are loaded, pre-assembled, or awaiting installation. A mobile concrete batch plant and rock crusher would be located within one laydown area and relocated to the other as necessary during construction.

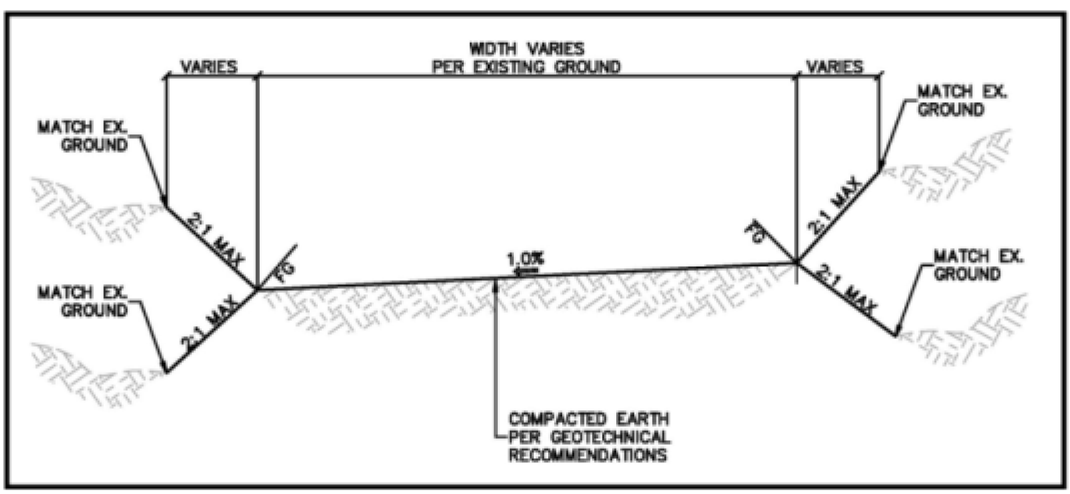


Figure 2.3-4. A Typical Laydown Area

Road Construction

To obtain preliminary roadway footprints, profiles and sections were developed for the Proposed Project roads. From these preliminary profiles and sections, estimates of cut-and-fill required to construct the roads were calculated using AutoCad Civil 3-D 2010. Two-foot-elevation contour interval data were used to develop a digital terrain model to represent the existing ground surface in AutoCad Civil 3-D 2010. A horizontal alignment was created and overlaid on the digital terrain model. This alignment meets the requirements for the type and size of trucks that would be delivering and constructing the proposed project.

The typical cut-and-fill volumes for the Proposed Project roadways were based on typical assumptions and approximate locations of the project features. These numbers are for analysis purposes only. Final locations of the roads and associated cut-and-fill volumes would be based on topography and sound engineering principles. Should shallow bedrock be encountered, blasting may be necessary. Figure 2.3-5 and Figure 2.3-6 illustrate typical cross-sections of the proposed access roads and WTG string roads.

The maximum and minimum full-surfaced widths for project access and WTG string roads would be 36 feet and 16 feet, respectively. The roadways connecting WTG sites would be 16 feet wide with 10-foot shoulders. Cut-and-fill slopes would be at a ratio of 2 horizontal to 1 vertical (H:V). Equipment clearance would require a minimum inside radius of 148 feet at all turns, and would be graded to within no more than 6 inches of rise or drop in any 50-foot length. Turnouts might be needed to allow for safe passing of construction vehicles and would be 16 feet wide and 210 feet long.

No material quarries would be located on BLM or other federal lands. Any needed fill or road base material in excess of that generated from road cut activities would be obtained from a licensed offsite private source. Topsoil removed during road construction would be stockpiled at project laydown areas. The stockpiled topsoil would be spread on cut-and-fill slopes, and then revegetated after road construction.

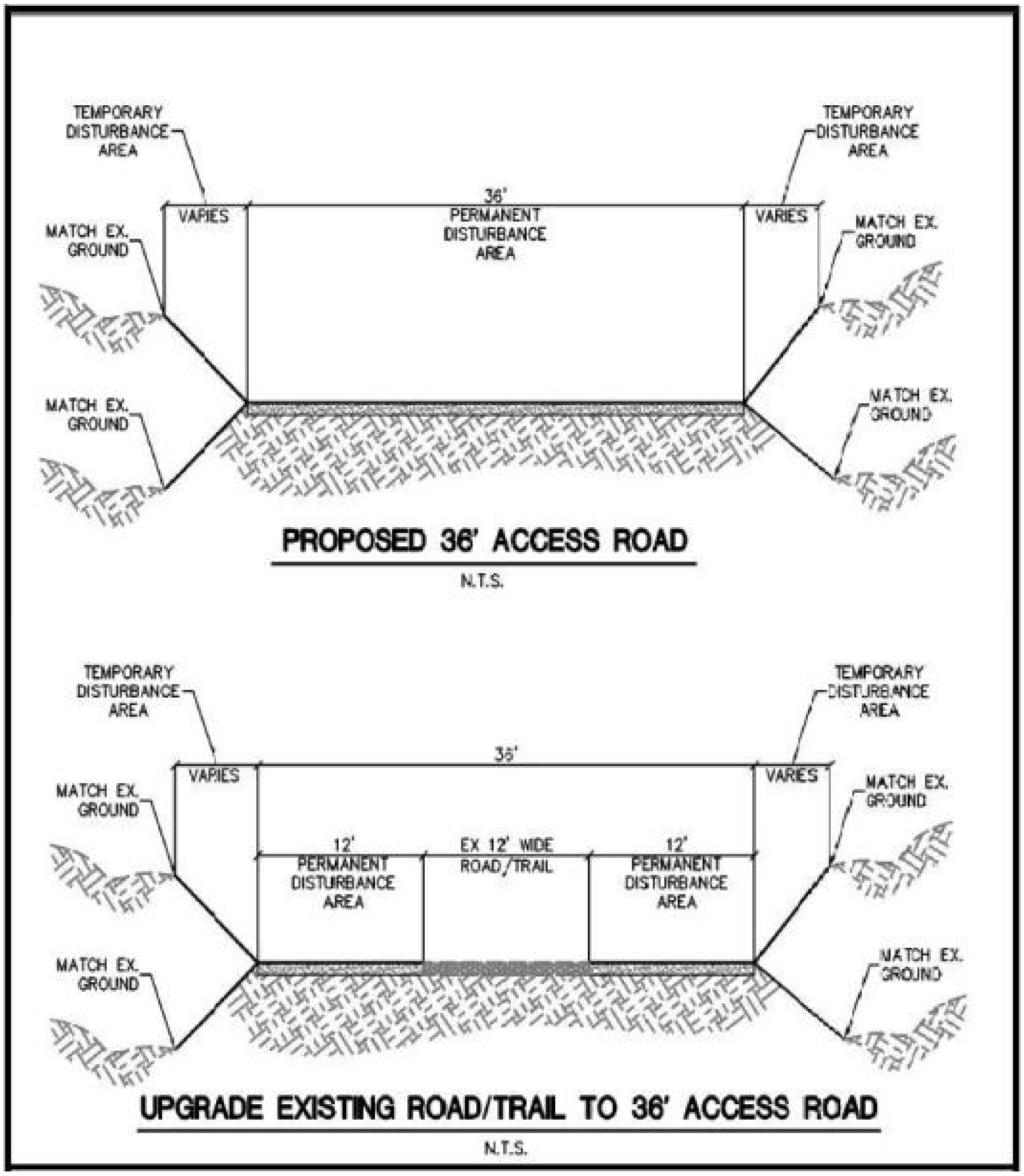


Figure 2.3-5. Typical Cross-Section for Project's 36-Foot-Wide Access Roads and WTG Entry Roads

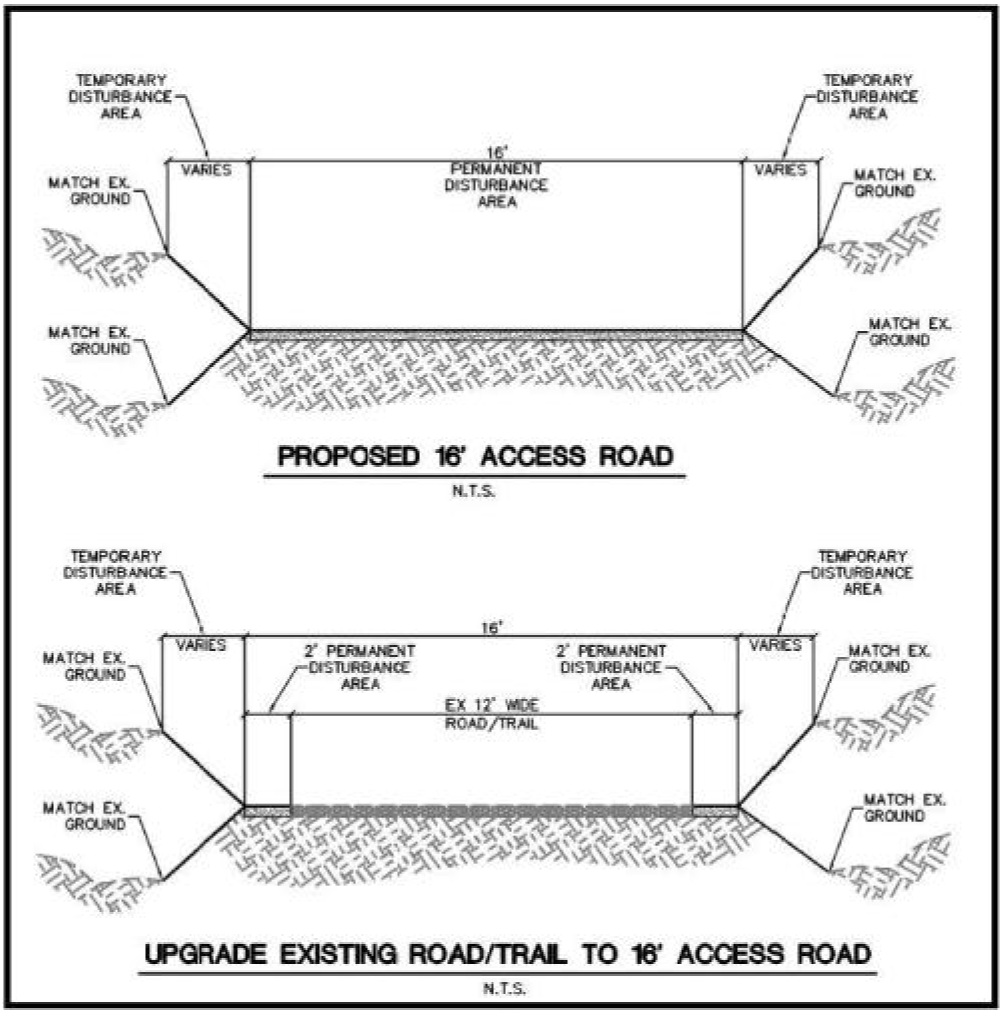


Figure 2.3-6. Typical Cross-Sections for Project's 16-Foot-Wide Access Roads

Construction traffic would be restricted to the roads developed for the project. Use of existing, unimproved roads would be for emergency situations only. Along all roads, flaggers with two-way radios would control construction traffic and thus reduce the potential for accidents. A speed limit of 15 mph would be set commensurate with road type, traffic volume, vehicle type, and site-specific conditions, as necessary, to ensure safe and efficient traffic flow.

To avoid unnecessary impacts on vegetation, construction equipment would be limited to construction corridors and to designated staging/equipment laydown area footprints. Where possible, any BLM-sensitive plant species would be transplanted from road ROWs and WTG pad sites to areas outside of the project impact area, as approved by BLM.

To help limit the spread and establishment of an invasive plant species community within disturbed areas, prompt establishment of the desired vegetation would be required. Seeding and transplanting would occur as soon as possible during the optimal period after construction using certified “weed-free” seed and native species to the extent possible, in a mix prescribed by BLM (Appendix B, Biological Resources).

WTG Pads and Foundations

At each WTG pad, an assembly area would be required for offloading, storage, and assembly of up to three tower sections, nacelle, rotor hub, and blades (Figure 2.3-7). In level or near-level terrain, this laydown area would not need to be graded or cleared of vegetation. Construction access to this area would be limited to wheeled vehicles. Some vegetation crushing and soil compaction would be expected. Within this laydown area, an approximate 60-foot by 60-foot area would be cleared of vegetation and graded to facilitate construction of the WTG foundation.

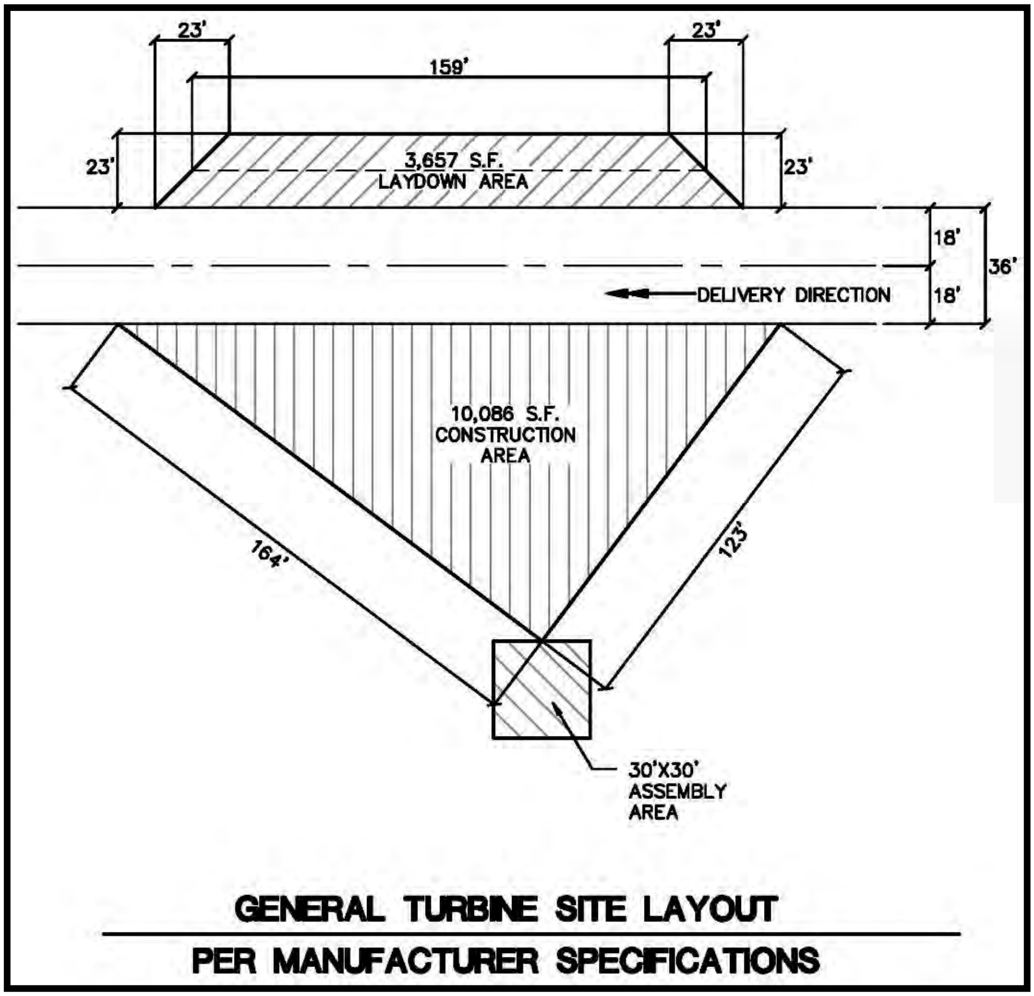


Figure 2.3-7. Typical WTG Pad Laydown and Construction Area

To allow a large, track-mounted crane to access the WTG foundations, a crane pad would be constructed adjacent to the WTG access road using standard cut-and-fill compacted road construction procedures. To allow the crane to safely lift the large and extremely heavy WTG components, the crane pad must be nearly flat.

WTG foundation designs would be based on the load requirements of the selected WTG and the load-bearing characteristics of the soil. Prior to construction, geotechnical investigations would be conducted to determine the soil characteristics at each WTG location. These geotechnical data would assist the project proponent in the selection of the appropriate WTG foundation type.

Figure 2.3-8. Typical WTG Spread Foundation During Construction

A typical foundation for a 2.3-MW WTG would be a reinforced concrete spread foundation resting directly on soil approximately 10 feet below ground. The foundation generally would be an octagon shape from 40 to 60 feet wide with a concrete pier on the top of the mat extending to ground level. Each foundation would require approximately 300 cubic yards of concrete. Figure 2.3-8 shows a typical WTG foundation during construction. Figure 2.3-9 and Figure 2.3-10 show the dimensions of a typical foundation.

In the northern area of the Proposed Project site, bedrock might be present within a few inches to 2 feet of the ground surface at some WTG locations. In these instances, a “rock anchor”- type foundation could be required. In the rock anchor design, the rock would be removed to a depth of approximately 5 feet and a diameter of approximately 24 feet by mechanical removal methods and possibly engineered blasting. After removal of the rock material, a series of 20 to 24 rock borings, 6 inches in diameter, would be made along the 20-foot diameter of the excavation area. These borings would be installed to a depth of 33.5 feet. Then a 40-foot-long by 2.5- to 3-inch-diameter anchor bolt would be installed in each of the borings, which are supported vertically, and grout would be installed in the anchor bolt boring to secure the anchor bolts.

After the anchor bolts are grouted in the borings, the 5-foot-long anchor bolt sleeves on the top of the anchor bolts, the rebar, conduit, the WTG bolt cage, and other embedments would be installed. At the end of this work, the 5-foot-thick concrete cap would be installed.

After the concrete cap cures, the anchor bolt base plate and nuts would be installed to hold the concrete cap securely to the anchor bolts. After this is complete, the WTG base tower section could be installed on the WTG bolts embedded in the rock anchor foundation.

In the southern portion of the project site, the Applicant plans to use the tensionless tube foundation design. With this foundation design, either by mechanical or explosive means, a 20-foot-diameter by 30-foot-deep excavation would be made, then two concentric corrugated metal pipes, 12 feet and 16 feet in diameter, would be installed in the excavation. The inside of the smaller pipe and the outside of the larger pipe would then be backfilled with the excavation materials. The WTG bolt cage consisting of 144 1.5-inch-diameter by 33-feet-long bolts would be placed in the annulus of the two corrugated metal pipes as well as any conduit and other embedments. After securing and aligning the bolts to accept the WTG base tower section and placing rebar for the cap, the annulus would be filled with concrete and the 1-foot-thick concrete cap placed.

If the soils of the southern portion of the project site are not conducive to a tensionless tube foundation, the spread foundation design would be used in this area.

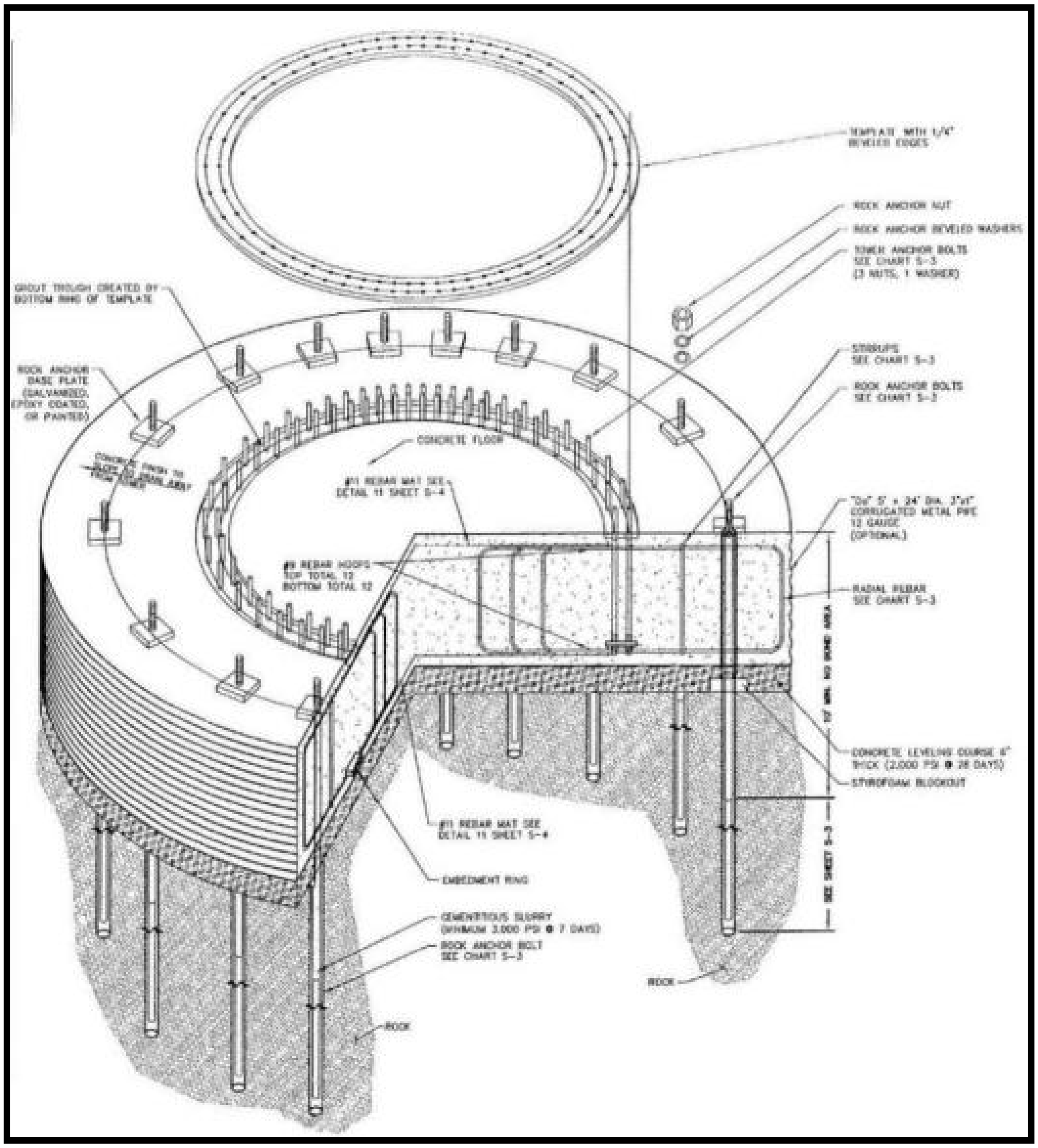


Figure 2.3-9. Typical WTG Rock Anchor Foundation

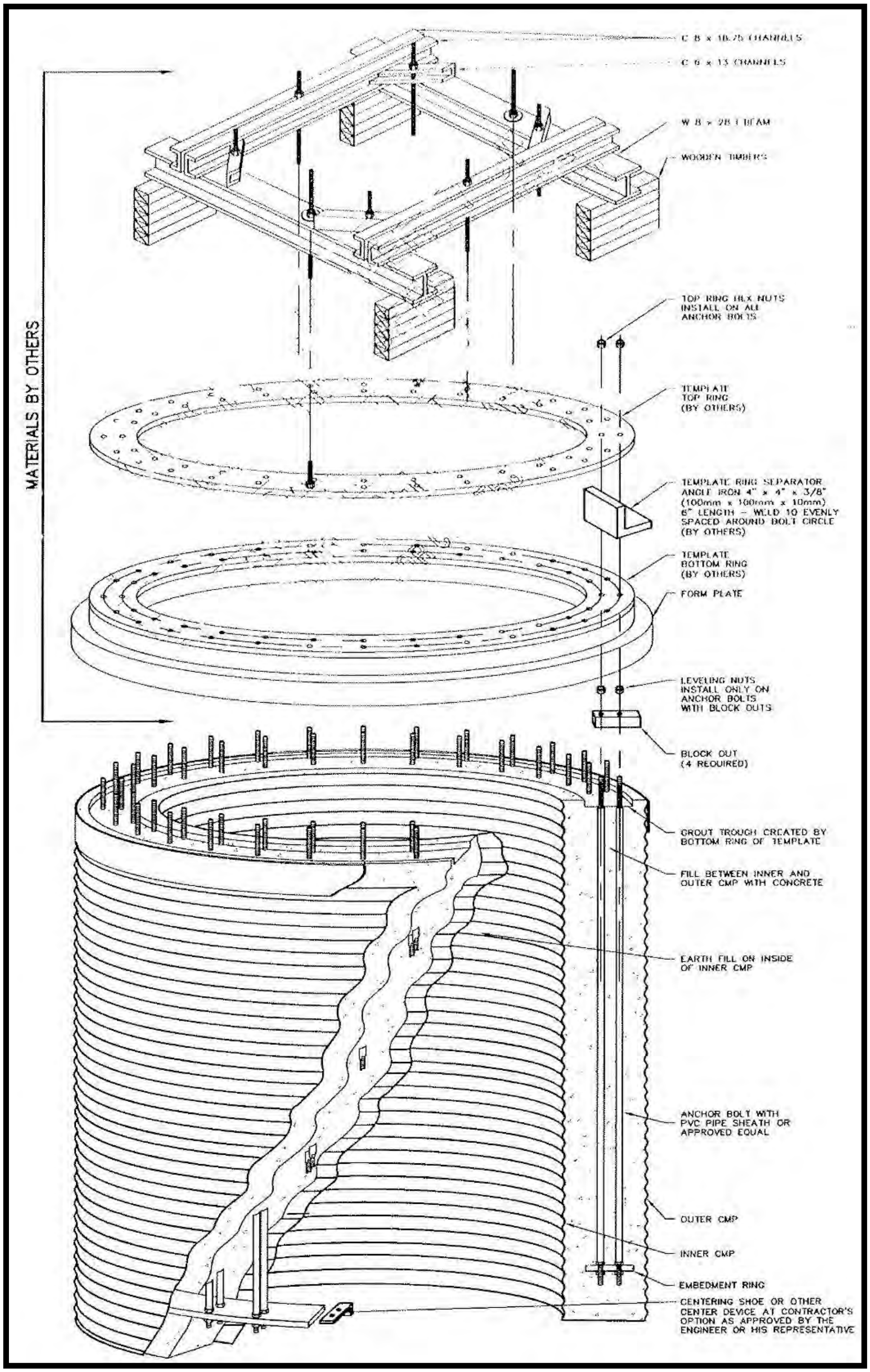


Figure 2.3-10. Typical WTG Tensionless Tub Foundation

To adequately ground the WTGSs and prevent damage from electrical storms, 3-inch-diameter, 30-foot-deep holes might be required for placement of WTG grounding rods as needed. These holes would be located adjacent to the WTG foundations within the 60-foot diameter area to be cleared for foundation construction. Following placement of the grounding rods, the holes would be backfilled and capped with concrete.

WTG Tower Erection

WTG tower erection would require the use of one large, track-mounted crane and two small-wheeled cranes. Two smaller-wheeled cranes would be used to offload WTG components from trucks, and to assist in the precise alignment of tower sections. The smaller crane would be used first to raise and install the two bottom tower sections, and then to lower these sections over the threaded foundation bolts. The large crane would then raise the upper mid- and upper-tower sections to be bolted through the attached flanges to the lower tower section, and to raise the nacelle, rotor hub, and blades to be installed atop the towers.

Underground Communication and Electrical Cables

Trenching equipment would be used to excavate trenches within or near the access road bed to bury the insulated underground cables that would connect each WTG transformer to one of the two project substations. Trenches for the large conductor cable would be backfilled with engineered trench material to protect the cables from damage or possible contact. Fiber optic communication links would be placed in the same trenches as the conductor cables. The depth, number of trenches, and backfill requirements would be determined by the size of the cable required and the thermal conductivity of the soil or rock surrounding the trench.

Transmission Line Construction

Overhead 230-kV transmission lines construction would use standard industry procedures, including surveying, ROW preparation, materials hauling, structure assembly and erection, ground wire, conductor stringing, cleanup, and restoration. All transmission lines and structures would be designed to prevent birds from perching on them. Construction procedures described below would be the same for the proposed 6.1-mile transmission line between the onsite substations and the 2.6-mile transmission line connecting to Western's proposed switching station.

Overhead 230-kV transmission interconnection lines would be constructed on monopole structures. The monopole structures typically would be set in augered holes approximately 3.6 feet in diameter and about 10 feet deep; if consolidated rock is encountered, then structure holes would be advanced using mechanical removal methods and possibly engineered blasting. All blasting would be conducted by a permitted contractor, and would be in compliance with state and federal regulations. Structures would be assembled on the project site. Structure erection and conductor stringing would occur sequentially along the ROW.

Existing public would be used to transport materials and equipment from laydown areas to ingress points along the proposed transmission line ROW using the shortest distance possible. The ROW would be used to access transmission line construction sites. The transmission lines would require the installation of temporary access routes. The access routes would be 12 feet wide and cleared of large boulders to allow high-clearance, four-wheel-drive vehicles to pass. The routes would be installed to allow access to support the construction of the transmission lines. Clearing of vegetation and minor grading might be necessary at some of the transmission line structures to facilitate their construction. When construction is complete, some access routes would be used approximately twice a year for inspection and maintenance. Native vegetation would be allowed to re-establish over the routes to the extent that four-wheel-drive vehicle travel remains practical. Barriers would be placed where the ROW intersects roads to prevent unauthorized traffic onto the transmission line ROW.

Temporary Concrete Batch Plant

The Proposed Project would require more than 40,000 cubic yards of concrete for construction of the wind tower foundations, substations, and O&M facility. Depending upon weather conditions, concrete typically needs to be poured within 90 minutes of its mixing with water. Delivery time to pour locations would likely exceed 90 minutes from existing concrete suppliers in the vicinity of the Proposed Project area. Therefore, a temporary, mobile concrete batch plant would be located within the laydown areas to facilitate the sub-90 minute delivery time needed. If concrete were to be mixed at the mobile batch plant, as opposed to existing concrete suppliers, then cement, water, and aggregate also would be staged in the laydown areas.

The batch plant would operate during project construction hours for approximately 4 to 5 months of the anticipated 8-month construction period. To construct the mobile batch plant, vegetation would be cleared and the ground leveled. For the containment of process water, a 1-foot-high earth berm or other appropriate erosion control devices, such as silt fences and straw bales, would be installed around the area. Diversion ditches would be installed as necessary to prevent stormwater from surrounding areas running onto the site.

The batch plant would require a stand-alone, diesel-powered 250-kW generator. The generator would draw diesel fuel from an approximately 500-gallon aboveground storage tank, with secondary storage for spill prevention. It is estimated that the batch plant would consume 2,000 to 4,000 gallons of water per day. An onsite 4,000-gallon water tank would be replenished as needed. The Nevada Division of Environmental Protection (NDEP) would permit the batch plant operation.

Stockpiles of sand and aggregate would be located at the batch plant in a manner that would minimize exposure to wind. Cement would be discharged via screw conveyor directly from an elevated storage silo without outdoor storage. Construction managers and crew would use BMPs to keep the plant, storage, and stockpiles clean, and to minimize the buildup of fine materials. Cement trucks would be cleaned and washed at the batch plant. Cement residue would be washed from the cement delivery trucks into an aboveground lined and bermed settling pond. Cement residue would be collected from the settling pond and trucked off site for disposal, as needed.

The pond perimeter would be fenced to discourage wildlife from entering. Additionally, pond would be equipped with textured ramps to provide wildlife with an exit route should wildlife enter. If required, the contractor would obtain an Industrial Artificial Pond Permit from Nevada Department of Wildlife (NDOW) and adhere to all mitigation specified in the permit conditions.

Following completion of construction activities requiring cement, the batch plant would be demobilized, and the batch plant area would be restored. The area would be recontoured, stockpiled topsoil would be replaced, and the area would be reseeded with a certified-weed free BLM approved mixture of native grasses, forbs, and shrubs species and/or salvaged cactus and yucca.

Portable Rock Crusher

To construct the Proposed Project's roads, a rock crusher would be required to provide appropriately sized aggregate for fill and road base. The rock crusher would have an average capacity that could be more than 30,000 tons per day. The crusher would be located within the laydown areas and operated during project construction hours for approximately 4 to 5 months of the anticipated 8-month construction period. In accordance with BMPs, a water truck to suppress dust would spray the rock crushing area. Additionally, the crusher would contain several dust-suppression features, including built-in dust control measures on the crusher, screens, and water sprayers, which would be operated at all emission points during crusher operation, including startup and shutdown periods, as required by the Clark County Department of Air Quality and Environmental Management (CCDAQEM).

Water Use

During construction, water would be needed for dust control, making concrete, and equipment washing. All needed water would be transported from an offsite municipal or private source. No wells would be drilled or springs developed for the Proposed Project.

Traffic

Construction of the Proposed Projects roads, facilities, transmission lines, and electrical/communication lines would occur at approximately the same time, using individual vehicles for multiple tasks. During the construction period, there would be approximately 60 daily round trips by vehicles transporting construction personnel and small equipment to the site. Over the entire construction period, there would be a maximum of 625 trips of large trucks delivering the WTG components and related equipment to the project site. In addition, there would be more than 9,025 truck trips by dump trucks, concrete trucks, water trucks, cranes, and other construction and trade vehicles (Table 2.3-1). When constructed, O&M of the Proposed Project would require three round trips per day using pickups or other light-duty trucks.

Table 2.3-1. Estimated Vehicle Trips for Consturction[1]

WTG Component Types	Number of Components Required per WTG	Number of Components per Truck Load	Number of Truck Loads per WTG	Proposed Action 96 WTG	87 WTG Alternative
Tower sections	3.0	1.0	3.0		
Blades	3.0	2.0	1.5		
Nacelle	1.0	1.0	1.0		
Rotor hub	1.0	2.0	1.0		
Control cabin	1.0	1.0	1.0		
Truck trips to deliver WTG above-ground components			7.5	720	653
Truck trips to build project (WTG foundations, substations, O&M facility, transmission, and appurtenances)				6,541	5,952
Water delivery (for dust control and concrete mixing)				2,670	2,420
Estimated Vehicle Trips for Construction				**9,931**	**9,025**

[1] Applicant's estimates included contingency of 10%. Supplemental contingency of about 3-4% added to provide conservative estimate for analyses.

A traffic management plan would be prepared for project construction to minimize hazards from the increased truck traffic and to minimize impacts on traffic flow on local roads and highways. This plan would incorporate measures, such as informational signs, traffic flaggers when equipment might result in blocked throughways, traffic cones, and flashing lights, to identify any necessary changes in temporary road configuration. During construction, refueling and maintaining vehicles that are authorized for highway travel would be performed off site at an appropriate facility. On the project site, a maintenance crew using a specially designed vehicle maintenance truck would service construction vehicles that are not highway-authorized.

Post-Construction Clean Up

Final cleanup and restoration of the Proposed Project area would occur immediately following construction. Waste materials would be removed from the area and recycled or disposed of at appropriate facilities. All construction-related waste would be properly handled in accordance with county, state, and federal regulations and permit requirements. This waste might include vegetation, trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials. Excess material, such as soil and rocks activated during the construction of the project, would be stockpiled at a location on site and made available as a saleable material.

Construction Work Force

A peak of approximately 250 to 300 workers per day would be required for construction of the Proposed Project. The beginning and end of the construction period would involve a slightly lower number of workers than required during the middle months. Construction of the Proposed Project would be completed over an approximate 8- to 12-month period.

The Applicant would contract with a county- or state-approved local sanitation company to provide and maintain appropriate sanitation facilities. During construction, the sanitation facilities would be located at the batch plant, the substations, and the O&M facility, and, when necessary, additional facilities would be placed at specific construction locations.

2.3.3 Public Access and Safety

At project access roads from US-95 and Cottonwood Cove Road, the Applicant and Western would be responsible for posting safety and warning signs informing the public of construction activities and recommending that the public stay off the site. Similar signage would be posted throughout active project work areas. During the Proposed Project construction period, off-highway vehicle (OHV) use is likely to remain unchanged from current activity levels. Because the entire area is public land with open access, the project would be designed to coexist with current and anticipated future land uses.

Temporary fencing and warning signs would be erected, as needed, in areas where public safety risks could exist and where site personnel would not be available to control public access (such as at excavated foundation holes and electrical collection system trenches). Permanent fencing would be installed around the proposed permanent laydown area, the O&M building site, and the two project electrical substations. The electrical interconnection switching station would also have permanent fencing installed. Temporary fencing around unfinished WTG bases and excavations would be designed primarily to warn people of potential danger associated with construction; such fencing is typically high-visibility plastic mesh. Permanent fencing would be chain-link with locking gates. Project fencing will be designed and constructed to meet appropriate hydrologic performance standards both for flows and to protect water quality and meet regulatory requirements. Other areas presenting safety concerns or where security or thefts could be of concern might also be fenced. The Applicant and Western would coordinate fencing with the BLM.

The final WTG layout would be submitted to the Federal Aviation Administration (FAA) for review and approval prior to construction. The FAA could recommend that tower markings or aviation safety lighting be installed on all or some of the WTG towers. FAA regulations generally require lighting on structures taller than 200 feet. The WTGs proposed under the action alternatives would be higher than 200 feet and, therefore, would require appropriate obstruction lighting. However, the FAA may determine that the absence of marking and/or lighting would not threaten aviation. Recommendations on marking and lighting structures vary depending on terrain, local weather patterns, geographic location, and, in the case of wind farms, the cumulative number of towers and overall site layout.

Based on the lighting and marking requirements for similar projects and the FAA Obstruction Marking and Lighting Advisory Circular (AC70/7460-1K), determination of an adequate lighting setup for the Proposed Project is expected. It is anticipated that the probable lighting setup would consist of two medium-intensity, flashing white lights operating during the daytime and at twilight, and two flashing red beacons operating during the night. The intensity of the lights would be based on a level of ambient light, with illumination below 2 foot-candles being normal for the night, and illumination of above 5 foot-candles being the standard for the day. It is anticipated the lights would be located on several strategically selected WTGs to adequately mark the extent of the facility, rather than on every WTG.

2.3.4 Operations and Maintenance

Following installation and startup, routine maintenance of the WTGs would be necessary to maximize performance and detect potential difficulties. Routine activities primarily would consist of daily visits by maintenance workers who would test and maintain the wind facilities. O&M staff would travel in pickups or other light-duty trucks. Most servicing and repair would be performed within the nacelle, without using a crane to remove the WTG from the tower. Occasionally, the use of a crane or equipment transport vehicles might be necessary for cleaning, repairing, adjusting, or replacing the rotors or other components of the WTG.

Monitoring the Proposed Project operations would be conducted from computers located in the base of each WTG tower and from the O&M building using telecommunication links and computer-based monitoring. Over time, it would be necessary to clean or repaint the blades and towers, and periodically exchange lubricants and hydraulic fluids in the mechanisms of the WTGs. All lubricants and hydraulic fluids would be stored, used, and disposed of in accordance with applicable laws and regulations. Any necessary repainting would be performed by licensed contractors in compliance with applicable laws and regulations.

The WTG gearboxes would be sealed to prevent lubricant leakage. The gearbox lubricant would be sampled periodically and tested to confirm that it retains adequate lubricating properties. When the lubricants have degraded to the point where they no longer contain the needed lubricating properties, the gearbox would be drained and new lubricant would be added. Transformers contain oil for heat dissipation, and are sealed and contain no moving parts. The transformer oil would be subject to periodic inspection but should not need replacement. If necessary, moats may be constructed around the gearbox to insure hazardous materials are contained. If moats are constructed, they will be equipped with textured ramps to insure that wildlife, if entrapped, has an exit route.

O&M equipment and vehicles would be properly maintained at all times to prevent leaks of motor oils, hydraulic fluids, and fuels. During operations, O&M vehicles would be serviced and fueled at the O&M building or at an offsite location. A Spill Prevention, Containment, and Countermeasures Plan (SPCCP) would be prepared for the Proposed Project and would contain information regarding training, equipment inspection and maintenance, and refueling for construction vehicles, with an emphasis on preventing spills.

The Proposed Project would produce nonhazardous waste during O&M activities, which might include rags, broken or used metal machine and/or electrical parts, empty containers, typical refuse generated by employees in the field and office, and miscellaneous solid wastes. This waste would be properly disposed of at an approved landfill accepting Class I Municipal Solid Waste (MSW) and/or Class III Industrial Waste within Clark County, Nevada.

2.3.5 Hazardous Materials

Hazardous materials are those chemicals listed in the Environmental Protection Agency Consolidated List of Chemicals Subject to Reporting under Title III of the Superfund Amendments and Re-authorization Act of 1986. No hazardous or extremely hazardous materials (as defined by 40 CFR; Section 355) are anticipated to be produced, used, stored, transported, or disposed of as a result of this project.

2.3.6 Department of Defense Airborne Radar Testing

The Department of Defense (DoD) conducts important training and testing activities in the general area of the proposed Searchlight Wind Project. The DoD evaluated the proposed wind project to assess potential impact to the DoD training and testing mission and determined that construction and decommissioning activities would not impact DoD's training and testing mission. However, operation of the proposed wind project could have some adverse effect during limited periods of airborne radar testing. The BLM and

DoD, in consultation with the applicant, examined numerous options to mitigate the potential impact to airborne radar testing and determined that a curtailment of wind turbine operations during limited periods of airborne radar flight-testing operations was potentially feasible. The Applicant and the DoD have agreed as a condition of the BLM right-of-way authorization to negotiate a mutually acceptable Wind Turbine Curtailment Agreement. The right-of-way authorization would require the operator to comply with the terms and conditions of any Wind Turbine Curtailment Agreement. In the event other more effective mitigation options are developed in the future, DoD will no longer require curtailment of wind turbine operations.

2.3.7 Reclamation

Reclamation refers to the restoration or rehabilitation of lands used temporarily during a construction activity (such as laydown areas) to their approximate condition prior to construction. After construction is complete, temporary work areas, trenches, and tower pads would be graded to the approximate original topographic contours, and the areas would be revegetated with a certified weed-free BLM-approved mixture of native grass, forbs, and shrub species. Reclamation goals and strategies would be prescribed in the Applicant's Site Rehabilitation Plan, including implementation of all applicable BLM-recommended BMPs.

2.3.8 Decommissioning

When the proposed Searchlight Wind Energy facility is determined to be no longer cost-effective, the project would be decommissioned, and the existing equipment would be removed. Although project owners may want to work with the BLM to repower the site (i.e., replace existing wind energy project equipment with a new project on the same site), repowering is not considered in this analysis. The goal of project decommissioning is to remove installed power generation equipment and return the site to a condition as close to its preconstruction state as feasible. The major onsite activities required for the decommissioning would be:

- WTG and meteorological tower (MET) removal
- Pad-mounted transformer, electrical, and communications system removal
- Structural foundation removal in accordance with ROW grant requirements
- O&M building removal
- Road removal
- Regrading and revegetation

Generally, WTGs, electrical components, and towers are either refurbished and resold, or recycled for scrap. All unsalvageable materials would be disposed of at authorized sites in accordance with applicable laws and regulations.

To ensure that permanent closure of the facility would not have an adverse effect, a Site Rehabilitation Plan and Facility Decommissioning Plan would be developed and approved by the BLM prior to commencement of site closure activities. The Facility Decommissioning Plan would be consistent with the goals and requirements mandated in the Site Rehabilitation Plan.

WTG towers would be removed and at a minimum the upper 3 feet of the substation foundations and WTG pads would be removed. Assuming that the transmission line would not be used for other potential developments, all structures, conductors, and cables would be removed. Abandoned roads would be reclaimed or left in place based on BLM's preference at the time of decommissioning. Site reclamation after decommissioning would include treating all disturbed areas with a BLM-approved certified weed-free native seed mix. The ROW would then be terminated.

2.3.9 Project Design and Best Management Practices

The action alternatives would be subject to BLM-recommended BMPs (Appendix C). The BMPs represent standards from the BLM Right-of-Way Management Manual 2801, Handbook H-2801-1 and the Wind Energy Development Program Policies and BMPs. These BMPs are designed to guide construction activities and development of facilities to minimize environmental and operational impacts. These include standards associated with overall project management, surface disturbance, facilities design, erosion control and revegetation, hazardous materials, project monitoring, and responsibilities for environmental inspection. As part of the Avian and Bat Protection Plan (ABPP), bird and bat fatality monitoring using methods and protocols similarly employed at other operating wind energy projects in the U.S. but tailored to the Searchlight site would be required for 3 years, commencing after calibration trials of search methodologies and effort occurs prior to project setup.

2.4 Western's Proposed Federal Action

2.4.1 Western's Interconnection Switching Station

Western proposes to construct, own, and operate a new switching station to interconnect the Proposed Project with Western's transmission system. It is anticipated that the switching station would become a permanent part of the Western Transmission system. The proposed switching station would be located just west of Western's existing Davis-Mead 230-kV transmission line, approximately 7.5 miles east of the town of Searchlight, north of Cottonwood Cove Road approximately 150 feet north of the NPS Fee Station (Figure 2.1-1). Access to the proposed switching station would be along the existing Davis-Mead transmission line road, entering off Cottonwood Cove Road. The transmission line road would require improvement for approximately 0.5 mile to be suitable for traffic to the site by construction vehicles, equipment delivery, and Western construction and maintenance personnel.

Facilities would include a control building, microwave tower, take-off structures and other steel support structures, buswork, and electrical and control equipment for switching, protection, metering, safety, and O&M purposes. The switching station would occupy approximately 3.5 acres, with an additional 2.5 acres outside the security fence required for site preparation, drainage, and road access. An 8-foot-tall chain-link fence topped with razor wire would provide security for the switching station. Adequate space would be provided inside the fence to maneuver construction and maintenance vehicles. Additionally, the facility would be sized to accommodate additional bays for future interconnections.

The terrain at the proposed location of the switching station features rolling hills and dry washes. Substantial civil design and earth moving would be required to level the station yard and provide for site drainage and roads, including excavation, grading, and other site improvements to accommodate the required electrical equipment. Construction would be performed by a Western-managed contractor in accordance with Western's standard environmental protection provisions (Standard 13, July 2009) and safety standards. A representative from Western would be present at all times while a contractor was working on site.

Three power circuit breakers would be installed at the switching station to facilitate two interconnections for the existing transmission line and one for the proposed wind energy facility line. These breakers would be used to automatically interrupt power flow in the event of an electrical fault. Gas breakers planned for the proposed switching station would be insulated by special nonconducting gas (sulfur hexafluoride [SF_6]). During normal operation of the new switching station, authorized Western personnel would conduct periodic inspections and service equipment as needed. Western would monitor and manage the use, storage, and replacement of SF6 to minimize any releases to the environment. Gas used in switching station circuit breakers is contained in sealed units that are factory-certified to not leak; equipment would be monitored nonetheless. Seven disconnect switches used to mechanically disconnect or isolate equipment would be installed. A 3-inch deep layer of gravel surfacing selected for its insulating properties would be placed on the ground within the substation to protect O&M personnel from electrical danger in the event of electrical faults.

Power would move within the substation and between breakers and other equipment on bus tubing (smooth aluminum pipe less than 6 inches in diameter). Bus tubing would be elevated by supports called bus supports. Buswork within the proposed switching station would route the wind energy facility's output to the Davis-Mead transmission line. The buswork would be approximately 30 feet high.

Electric/electronic controls and monitoring equipment for the power system would be housed in a building approximately 30 feet by 60 feet within the switching station. The control building would be environmentally controlled to provide a suitable environment for the equipment housed there. Station service power would be supplied by a tap on an adjacent local utility distribution line and/or from a 230-kV power voltage transformer within the switching station. A new distribution line approximately 1000 feet long would be constructed between the switching station and the existing distribution line on single wood-pole (monopoles) structures. The primary station service source would be determined during the design phase for the switching station.

2.4.2 Western's Transmission Interconnection

Western proposes to install two new transmission line structures to tie in the new switching station with the Davis-Mead 230-kV transmission line. Each turning structure would be a steel monopole structure, self-supporting with no down-guys. These structures would provide for turning the line into the station at angles of 90 degrees or more to line up and connect with the take-off structures within the proposed switching station. It is envisioned that the new structures would be located within the existing Davis-Mead transmission line ROW in the span between the two existing structures east of the proposed switching station.

A temporary line (often referred to as a "shoo-fly") might be built in order to keep the Davis-Mead transmission line operational while the bulk of the switching station construction is being completed. When the new switching station is complete and ready for energization, the existing Davis-Mead transmission line conductors in the span east of the station would be cut and attached to the new turning structures. New conductors would be installed from the new turning structures to the steel take-off structures within the switching station.

2.4.3 Western's Communication Facilities

Western requires redundant communication with its substations from its Phoenix Operations Center. Microwave communications require an unobstructed line-of-sight between antennas. A microwave communication tower under 100 feet high would be installed within the switching station to provide the primary communications path via microwave to an existing communications site at Christmas Tree Pass, about 16 miles southeast of the proposed switching station. The exact height of the tower would be determined during the design. New communication equipment would be provided at the switching station.

The second, or redundant path, would be provided by a fiber-optic cable to the Searchlight regeneration site, located under Western's Davis-McCullough 230-kV transmission line, located just west of Searchlight. The fiber-optic cable would be under-built on a portion of the tie line between the new switching station and the wind energy facility. From there, the fiber-optic cable would use existing utility pole lines through Searchlight west to the regeneration site.

2.4.4 Western's Other System Improvements

Details, requirements, and environmental impacts for other system improvements are unknown at this time because they would be dictated by the ongoing transmission system studies and future design work. Installations could include new concrete foundations, substation buswork, cable trenches, buried cable grounding grid, and new surface grounding material; and/or replacing existing equipment to accommodate the proposed interconnection. It is anticipated that the installations would be set up within previously developed areas within existing substations. However, if it is determined that work outside an existing facility is required, then Western would address the work in accordance with regulatory requirements.

2.5 Comparison of Alternatives

Table 2.5-1 provides a comparison of the action alternatives by Proposed Project features. Table 2.5-2 provides a summary of acres of permanent and temporary ground disturbance by Proposed Project feature.

Table 2.5-1. Comparison of Action Alternatives by Proposed Project Feature

Project Features	96 WTG Layout Alternative	87 WTG Layout Alternative
Project power-generating capacity (in MW)	220.8	200.1
Number of WTGs	96	87
WTG capacity (in MW)	2.3	2.3
WTG hub height (in feet)	262	262
WTG rotor diameter (in feet)	331	331
Project roads total (in miles) [a]	37.6	35.9
Existing (modified to 16 feet width)	0.5	0.5
Existing (modified to 36 feet width)	8.7	8.1
New (16 feet width)	1.7	1.7
New (36 feet width)	27.3	25.6
New overhead transmission lines (230 kV) North Substation to Western Switching Station South Substation to North Substation	8.7 miles (total) 2.6 miles 6.1 miles	8.7 miles (total) 2.6 miles 6.1 miles
New Collection Lines (34.5 kV) New Overhead Collection Lines Underbuild Collection Lines	7.9 miles (total) 5.2 miles 2.7 miles	7.9 miles (total) 5.2 miles 2.7 miles
Underground collection lines (34.5 kV) [b]	28.2 miles	28.2 miles
Substations	2	2
Meteorological towers	4	4
O&M building	1	1
Laydown areas	2	2
Temporary ground disturbance (in acres) [c d]	248.5	229.7
Permanent ground disturbance (in acres) [e]	159.21	151.81
Western's switching station temporary ground disturbance (in acres)	2.5	2.5
Western's switching station permanent ground disturbance (in acres)	3.5	3.5
Generating Facility Construction Features		
Truck trips to build project roads and WTG foundations	9,211	8,372
Truck trips to build project (WTGs, substations, O&M facility, other)	720	653
Total truck trips	9,931	9,025
Number of temporary concrete batch plants	1	1
Number of rock crusher stations	1	1

Notes:

Project Features	96 WTG Layout Alternative	87 WTG Layout Alternative

a. Existing road/trail area was based upon an existing width of 12 feet.
b. Underground collection/communication lines are assumed to be contained within access roads; therefore, they do not generate additional disturbance.
c. Temporary disturbance for WTG pads includes the assembly areas for the WTGs in accordance with Siemens Typical Specifications.
Temporary construction impacts would be in addition to permanent impacts.
Permanent disturbance for WTG pads are based upon a 40' x 40' pad.
kV = kilovolts; MW = megawatts

Table 2.5-2. Approximate Acreages that would be Affected by Development of Action Alternatives

Project Features	Approximate Temporary Construction Disturbance (acres)[a]		Approximate Permanent Construction Disturbance (acres)	
	96 WTG Layout Alternative	87 WTG Layout Alternative	96 WTG Layout Alternative	87 WTG Layout Alternative
WTG pads	72.6	66	3.6	3.2
New and upgraded project roads and crane pads[b]	123.6	111.4	149	141.6
Operations and maintenance facility	1.5	1.5	5	5
Equipment storage and construction laydown areas[c]	28.3	28.3	0	0
Overhead transmission line right-of-way	16.5	16.5	0	0
Substations	5	5	2.0	2.0
Batch plant	1	1	0	0
Meteorological towers	0	0	0.01	0.01
Totals	248.5	229.7	159.61	151.81
Totals Rounded	249	230	160	152

Notes:
[a] Temporary construction impacts are in addition to permanent impacts.
[b] Restoration of roadsides.
[c] Includes temporary office trailers and crane assembly areas.

2.6 Mitigation Measures

For the wind facility component of the Proposed Project, mitigation measures have been proposed and committed to by the Applicant as best management practices and design features (Table 2.6-1). The APMs were developed in close coordination with BLM and drawn from a variety of sources including state and federal lists of standard BMPs. Those agencies publish these lists that include the recognized best available management practices. The APMs were incorporated as inherent elements of the project to eliminate, minimize, reduce, and/or rectify anticipated impacts. Additionally, the wind energy portion of the project would adhere to the BLM wind energy development program policies and BMP (Appendix C). For Western's proposed switching station portion of the project, Western requires its construction contractors to implement standard environmental protection provisions. These provisions are provided in Western's Construction Standard 13 (Appendix D). Table 2.6-2 describes additional project-specific mitigation measures (MMs) that would be implemented as part of the project. The APM's were particularly selected because they have the highest likelihood of being effective, based on based on BLM's past experience with numerous projects.

Table 2.6-1. APMs (common to action alternatives)

APM-1 EROSION CONTROL AND TOPSOIL MANAGEMENT

Soil stabilization measures will be used to prevent soil being detached by stormwater runoff. The Applicant will employ BMPs to protect the soil surface by covering or binding soil particles. The Project will incorporate erosion-control measures required by regulatory agency permits and contract documents as well as other measures selected by the contractor. The contractor will design site-specific BMPs, and associated figures are to be included in the final Project stormwater pollution prevention plan (SWPPP). At a minimum, the Project will implement the following practices for temporary and final erosion control:

During Construction:

- Proper removal and storage of topsoil
- Proper reapplication of topsoil

Year-round:

- Monitor the weather using National Weather Service reports to track conditions and alert crews to the onset of rainfall events.
- Preserve existing vegetation where required and when feasible. Conduct clearing and grading only in areas necessary for project activities and equipment traffic. Install temporary fencing prior to construction along the boundaries of the construction zone to clearly mark this zone, preventing vehicles or personnel from straying onto adjacent offsite habitat.
- Sequence construction activities with the installation of erosion control and sediment control measures. Arrange the construction schedule as much as practicable to leave existing vegetation undisturbed until immediately prior to grading.
- Protect slopes susceptible to erosion by installing controls such as hay bales, fiber rolls, and gravel bags.
- Stabilize non-active areas as soon as feasible after construction is complete and no later than 14 days after construction in that portion of the site has temporarily or permanently ceased. Reapply as necessary to maintain effectiveness.
- Place covers over stockpiles prior to forecasted storm events and during windy conditions. Place sediment controls (fiber rolls or gravel bags) around the perimeter of stockpiled materials year-round. Excess sand and gravel will be stockpiled for BLM material sale.
- Maintain sufficient erosion control materials on site to allow implementation in conformance with General Permit requirements and as described in the SWPPP. This includes implementation requirements for active areas and non-active areas that require deployment before the onset of rain.
- Promptly repair and reapply controls according to BMPs in areas for which erosion is evident.

During the rainy season:

- Implement temporary erosion control measures such as fiber rolls, straw bales, geotextiles and mats, and gravel bags at regular intervals throughout the defined rainy season and as needed determined by site conditions.
- Inspect and stabilize disturbed areas with temporary or permanent erosion control measures before rain events.

During the non-rainy season:
Conduct construction activities that will have an impact on waters of the United States during the dry season to the extent feasible to minimize erosion.

- A combination of the following erosion controls may be used at the site:
- Scheduling of activities to avoid times of erosion susceptibility
- Preservation of existing vegetation
- Mulch and hydraulic mulch
- Straw mulch
- Geotextiles and mats
- Earth dikes and drainage swales
- Velocity dissipation devices

Table 2.6-1. APMs (common to action alternatives)

- Slope drains

Streambank stabilization
BMPs will be deployed in a sequence to follow the progress of grading and construction. As the locations of soil disturbance change, erosion controls will be adjusted accordingly to control stormwater runoff at the downgrade perimeter.

Sediment Control Measures
Sediment controls are intended to complement and enhance selected erosion control measures and reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. The Project will incorporate sediment control measures required by regulatory agency permits and contract documents as well as other measures selected by the contractor. The Project will implement the following practices for temporary sediment control:

Year-round:

- The installation of detention ponds to control all stormwater flow off site. The ponds will be designed to control sediment transport off site. Sediment will be removed from the ponds periodically and transported off site to a designated fill area.
- Maintain the following temporary sediment control materials onsite: silt fence materials, gravel bags for linear barriers, and fiber rolls in sufficient quantities throughout the Project to implement temporary sediment controls in the event of predicted rain and to respond to failures or emergencies, in conformance with General Permit requirements and as described in the SWPPP. Install gravel filter berms at the base of slopes adjacent to delineated sensitive areas (wetlands, dry washes), if any. Native onsite stones/rocks will be used in construction of gravel filter berms or check dams.
- Install gravel filter berms along the boundaries of delineated sensitive areas, if any, within the boundaries of the project site or areas that receive runoff from the project site. Native onsite stones/rocks will be used in construction of gravel filter berms or check dams.

During the rainy season:
Implement temporary sediment controls at the draining perimeter of disturbed soil areas, at the toe of slopes, and at outfall areas.

During the non-rainy season:
Implement temporary sediment controls such as hay bales, fiber rolls, or gravel bags at the draining perimeter of disturbed soil areas. A combination of the following sediment controls may be used at the site:

- Silt fence
- Sediment basin
- Sediment trap
- Check dam
- Fiber rolls
- Gravel bag berm
- Street sweeping and vacuuming

**BMPs will be deployed in a sequence to follow the progress of grading and construction. As the locations of soil disturbance change, sedimentation controls will be adjusted accordingly to control storm water runoff at the downgrade perimeter.

Table 2.6-1. APMs (common to action alternatives)

APM-2 EXCAVATION/GRADING

Prior to trench excavation, the area to be trenched will be graded and organic matter removed. Organic matter will be mulched and re-deposited within the site fill except under foundations and in trenches. Trench excavation will be performed with conventional trenching equipment. Excavated soil will be maintained adjacent to the trench and used to backfill the trench once conductors are installed and tested. Excavated soil will not be removed from the project site. Temporary sheeting or bracing shall be used as necessary to support trench sidewalls in areas where soils are soft or collapsible. The trench itself will be first backfilled with 3 to 4 inches of sand to provide suitable bedding for installed conductors, and then 3 to 4 inches of sand will be deposited on top of installed conductors. The remaining backfill will be composed of the native excavated soils and compacted to 90 percent of standard proctor density. During the backfill, underground utility marking tape will be installed 12 inches below grade to indicate the type of conductors installed beneath.

APM-3 AIR QUALITY / DUST CONTROL

In accordance with Section 12 of the Air Quality Regulations, the applicant would obtain an air quality permit for any emission units or stationary sources (e.g., concrete plants, rock crushers, boilers, emergency generators) on the project capable of emitting regulated pollutants. The Applicant would use water to control dust to comply with Clark County dust control requirements. Where water is insufficient to control dust, soil stabilizers approved by the BLM and USFWS would be used within project area to control dust to Clark County standards. The Project would implement the following practices for fugitive dust and wind erosion control:

- Minimize grading and vegetation removal, and limit surface disturbance during construction to the time just construction;
- Limit vehicular speeds on non-paved roads;
- Apply water to disturbed soil areas of the project site to control dust and maintain optimum moisture levels for compaction, as needed. Apply the water using water trucks. Minimize water application rates as necessary to prevent runoff and ponding;
- Apply dust control suppressants approved by the BLM and USFWS;
- During windy conditions (forecast or actual wind conditions of approximately 25 miles per hour or greater), apply dust control to haul roads to adequately control wind erosion. Cover exposed, stockpiled, material areas;
- Suspend excavation and grading during periods of high winds; and
- Cover all trucks hauling soil and other loose material or maintain at least 2 feet of freeboard.

APM-4 STORMWATER POLLUTION PREVENTION PLAN

The project design and plans will include BMPs to mitigate potential soil erosion caused by construction and operation of the Project. SWPPPs will be developed to assist with the management and protection of water resources throughout construction and the life of the Project.

APM-5 SPILL PREVENTION, CONSTROL, AND COUNTERMEASURES PLAN (SPCCP)

The Applicant would prepare a SPCCP in accordance with Federal regulations to protect the environment from spills of petroleum products.

APM-6 HEALTH AND SAFETY PROGRAM

The Applicant considers the health and safety of its employees and contractors to be the highest priority for project construction and operation and will require that all employees and contractors adhere to appropriate health and safety plans and emergency response plans. All construction and operation contractors will be required by the Applicant to operate under a health and safety program that is approved by the Applicant and that meets industry standards. All contractors will be required to maintain and carry health and safety materials including the Material Safety Data Sheets (MSDSs) of hazardous materials used on site.

Table 2.6-1. APMs (common to action alternatives)

APM-7 EMERGENCY RESPONSE PLAN

An Emergency Response Plan will be prepared for the Project. The Plan will contain a section that presents the results of a comprehensive facility hazard analysis and, for each identified hazard, a response plan. Emergencies may include brush or equipment fires, transformer oil leaks or spills, attempted acts of sabotage, and airplane crashes. The Emergency Response Plan will assign roles and actions for onsite personnel and responders and will designate assembly areas and response actions.

APM-8 WASTE MANAGEMENT PLAN

The Applicant would prepare a Waste Management Plan that would describe the storage, transportation, and handling of wastes and would emphasize the recycling of wastes, where possible, and would identify the specific landfills that would receive wastes that could not be recycled. Construction wastes will be managed in accordance with the Resource Conservation and Recovery Act (RCRA) (42 USC 6901, et seq. and RCRA's implementing regulations at 40 CFR 260, et seq.) and other applicable state and local regulations.

APM-9 WEED CONTROL PLAN

The Applicant would prepare a Weed Control Plan which would be submitted to the BLM for review and approval before construction begins. The following are project-specific measures that the Applicant would implement to control weeds:

- **Weed Risk Assessment Form.** This form provides information about the types of weed surveys to be conducted and weed treatment and prevention method schedules appropriate for the types of weeds likely to be present. This form identifies and evaluates the level of weed management necessary.
- **Herbicide Use Proposal.** The Applicant shall prepare, submit, obtain, and maintain a herbicide use proposal for the Project. The Applicant would coordinate weed control activities with the BLM Weed Coordinator, particularly regarding proposed herbicide treatments.
- **Weed Management Plan.** Before ground-disturbing activities begin, the Applicant would prepare a weed management plan. The plan would identify potential weed infestations at the project site and along the Project-associated linear facilities and would prescribe treatment.
- **Weed Infestation Prevention.** The Applicant would limit ground disturbance to the minimum necessary to safely construct and operate the Project. The Applicant would avoid creating soil conditions that promote weed germination and establishment.
- **Equipment Cleaning Sites.** In coordination with the BLM Southern Nevada District Weed Manager, the Applicant would determine and establish equipment cleaning sites to remove weed seeds, plant parts, or mud and dirt from vehicles. Project-related equipment and machinery would be cleaned using compressed air or water to remove mud, dirt, and plant parts before moving into and from relatively weed-free areas. Seeds and plant parts would be collected, bagged, and deposited in dumpsters destined for local landfills, when practical.

The following measures would be implemented to prevent infestations of weeds at the project site and to control any potential infestations that may occur during project construction and operation:

- Project construction workers would inspect, remove, and dispose of weed seed and plant parts found on their clothing and personal equipment, bag the product, and dispose of in a dumpster for deposit in a local landfill;
- Certified weed-free hay bales would be used for erosion control and to contain vehicle station wash water.

APM-10: SITE REHABILITATION PLAN AND FACILITY DECOMMISSIONING PLAN

To ensure that the permanent closure of the facility does not have an adverse effect, a Facility Decommissioning Plan would be developed at least 6 months prior to commencement of site closure activities. The Facility Decommissioning Plan would be developed in coordination with the BLM, with input from other agencies as appropriate. The Facility Decommissioning Plan would address future land use plans, removal of hazardous materials, impacts and mitigation associated with closure activities, schedule of closure activities, equipment to remain on the site, and conformance of the plan with applicable regulatory requirements and resource plans. The Facility Decommissioning Plan

Table 2.6-1. APMs (common to action alternatives)

would be consistent with requirements and goals set in the Site Rehabilitation Plan. The activities involved in the facility closure would depend on the expected future use of the site. Certain facility equipment may be utilized for future uses of the site, such the operation and maintenance (O&M) building, electrical transmission lines, and roads. Therefore, the extent of site closure activities would be determined at the time of the closure, in accordance with the Facility Decommissioning Plan. Closure activities may include:

- Removal of WTG's and supports;
- Removal of foundations;
- Removal of underground facilities to a depth of at least 2 feet below the ground surface;
- Removal of electrical equipment such as inverters and transformers;
- Removal of the substation;
- Disposal of chemicals and hazardous waste;
- Draining of transformers and disposal of dielectric oils (if transformers cannot be resold);
- Demolition and removal of the O&M building and removal of building foundations;
- Removal of onsite wooden transmission poles and conductors;
- Removal of 220kv/230kv steel transmission poles and conductors, and removal of foundations to a depth of at least 2 feet below the ground surface;
- Closure and abandonment the septic tank;
- Removal of site fencing;
- Regrading and restoration of original site contours; and
- Revegetation of areas disturbed by closure activities in accordance with the Site Rehabilitation Plan.

APM-11 AERONAUTICAL CONSIDERATIONS.

Due to the proximity to the Searchlight Airport to the Project, prior to construction, the Applicant would file Notices of Proposed Construction or Alternation (Form 7460s) and receive a Determination of No Hazard to Air Navigation (NOHA) from the Federal Aviation Administration (FAA) for each WTG for Project lighting and marking requirements in accordance with the FAA Obstruction Marking and Lighting Advisory Circular (AC70/7460-1K).

APM-12 CULTURAL

If archaeological properties are found to be eligible for National Register for Historic Properties (NRHP) listing, the Applicant would assess the potential adverse impact of the Project and would prepare a plan to mitigate any potentially adverse impacts, in consultation with the BLM and Nevada State Historic Preservation Officer (SHPO).

APM- 13 ENVIRONMENTAL CLEARANCE

Initial site mobilization activities in each construction section would include environmental clearance in which site activities are reviewed and approved for compliance with resource protection plans and approved construction-compliance documents. Environmental clearance activities would:

- Be performed in each of the project construction sections as they are constructed;
- First be obtained for the site access roads, WTG sites, transmission line corridors, substations, Western switching station, and O&M area. Subsequent clearances would be obtained for each of the remaining major tasks; and
- Delineate and mark the boundaries of each construction area during each phase of environmental clearance;
- Conduct surveys for special status plant species and bird nests. If special status plant species are found, the applicant would notify the BLM to determine appropriate action. If an active bird nest is located, a buffer would be established where no construction activities would occur. The buffer will be established in coordination with the BLM, USFWS, and NDOW for each species deterred nesting in the project area and maintained until the birds have fledge or the onsite biologist makes a

Table 2.6-1. APMs (common to action alternatives)

recommendation to the agencies to increase or decrease the buffer distance based on nest monitoring.
APM–14 GENERAL DESIGN AND CONSTRUCTION STANDARDS The Project would be designed in accordance with federal and industrial standards including American Society of Mechanical Engineers (ASME), National Electric Code (NEC 2005), International Energy Conservation Code (IECC 2006), International Building Code (IBC 2006), Uniform Plumbing Code (UPC 2006), Uniform Mechanical Code (UMC 2006), National Fire Protection Association (NFPA) and Occupations Safety and Health Administration (OSHA). Construction will be in accordance with the federal codes listed above and all applicable state and local codes. Local Clark County codes will include Title 13 – Fire and Fire Prevention, Title 22 – Buildings and Construction, Title 24 – Water, Sewage and Other Utilities and Title 25 – Plumbing and Electrical Regulations.

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
4.1 Geology, Minerals, and Soils	
MM GEO-1: ENGINEERING DESIGN AND IMPLEMENTATION	To minimize or avoid the hazard of landslides in cut-and-fill slopes, or settlement of fill materials, the Applicant will conduct BLM-approved geotechnical engineering and geologic design studies to assess the stability of planned cut-and-fill slopes. This will include geotechnical observations and materials testing of the compaction and placement of fill materials for roads and WTG pads. The Applicant would document that the grading and earthwork were in accordance with the engineering design specifications.
MM GEO-2: INSPECTIONS AFTER GEOLOGIC EVENTS	To minimize or avoid potential hazards from earthquakes and other geologic events, the Applicant will have inspections performed by a BLM-approved appropriate professional (e.g., geologist, geologic engineer, geotechnical engineer, or structural engineer) following geologic events in the vicinity of the Proposed Project site. The appropriate professional will perform the appropriate inspection and make recommendations to see that hazards are minimized for the next comparable or larger event. The Applicant will implement the recommended corrective actions..
MM GEO-3: APPLICANT'S INSURANCE COVERAGE	The Applicant shall acquire the appropriate insurance coverage to address potential offsite damage to structures or injury to people by facility structures that are moved offsite by a geologic event such as an earthquake, windstorm, or flash flood event.
MM GEO-4: VERIFY MINING CLAIMS	The Applicant shall ground-truth existing mining operations before construction and coordinate with mine operators to reduce impacts to these existing mining claims.
4.2 Paleontological Resources	
MM PALEO-1: PALEONTOLOGICAL MITIGATION	The Applicant will immediately notify the BLM authorized officer of any paleontological resources discovered as a result of operations under this authorization. The Applicant will suspend all activities in the vicinity of such discovery until notified to proceed by the authorized officer, and will protect the locality from damage or looting. The authorized officer will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than five working days after being notified. Appropriate measures to mitigate adverse effects on significant paleontological resources will be determined by the authorized officer after consulting with the Applicant. The Applicant is responsible for the cost of any investigation necessary for the evaluation and for any mitigation measures, including museum curation. The Applicant may not be required to suspend operations if activities can avoid further impacts on a discovered locality or be continued elsewhere (BLM 2009: Attachment 1-4).
4.3 Water Resources	
MM WATER-1: WELLHEAD PROTECTION	Development of the O&M building and its associated septic system would require a wellhead protection plan. The State of Nevada's Wellhead Protection Ordinance encourages protection of public health and water supplies by ensuring there are appropriate distances between wells and potential sources of contamination (Clark County 2008).

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description

MM WATER-2: CONSTRUCTION PHASE EROSION AND SEDIMENTATION CONTROL MEASURES.	The Applicant will develop and implement erosion and sedimentation control measures to be used to minimize impacts during the construction of the Project. At a minimum, this plan will include the following:
	• Implement soil stabilization measures to offset loss in vegetation including the following
	  ◦ BMPs
	  ◦ install silt fences
	  ◦ install temporary earthen berms,
	  ◦ install straw bale barriers to reduce water velocity and flows,
	  ◦ install temporary water bars,
	  ◦ install sediment traps,
	  ◦ install stabilized entrances from public roads to minimize track-out
	  ◦ stone check dams, or other equivalent measures (including installing erosion-control measures around the perimeter of stockpiled fill material) as necessary;
	• Maintain or reduce salt yields originating from public lands to meet State-adopted and Environmental Protection Agency-approved water quality standards for the Colorado River (BLM 1998);
	• Implement BMPs, as identified by the state of Nevada, to minimize contributions from both point and non-point sources of pollution (including salts) from public lands (BLM 1998);
	• Ensure that any nonpoint source BMPs and rehabilitation techniques meet state and local water quality requirements (BLM 2005a);
	• Implement BMPs such as locating waste and excess excavated materials outside drainages to avoid sedimentation;
	• Conduct regular site inspections during the construction period to see that erosion-control measures were properly installed and are functioning effectively;
	• Consider use of landscape for buffering, erosion control, and stormwater runoff control for maintaining acceptable water quality conditions (Clark County 2008);
	• Obtain and comply with necessary permits in accordance with the Clean Water Act Section 404 (dredge and fill) and Section 401 (water quality) from the USACE and Nevada Division of Environmental Protection (NDEP 2010; and
	• Implement adaptive management of actions if erosion and sedimentation control measures are found to be insufficient to control surface water at the site (any changes must be approved by the BLM).

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
MM WATER-3: CONSTRUCTION-PHASE PETROLEUM AND HAZARDOUS MATERIAL CONTAMINATED WATER PREVENTION AND CONTROL MEASURES.	The Applicant will develop and implement contaminant control measures to be used to minimize impacts during the operation and maintenance of the Proposed Project. At a minimum, these measures will include the following: • Prepare and comply with a Spill Prevention, Containment, and Countermeasures Plan (SPCCP) that outlines procedures to prevent the release of hazardous substances into the environment, thereby avoiding contaminating water resources (U.S. Environmental Protection Agency [EPA] 2010); • Stage heavy maintenance equipment over impermeable surfaces and inspect regularly for petroleum releases; • Conduct regular site inspections during operations and maintenance to see that petroleum and hazardous materials products are properly stored and inventoried in accordance with local, state, and federal regulations; and • Implement BMPs, as identified by the state of Nevada, to minimize contributions from both point and nonpoint sources of pollution (including salts) from public lands (BLM 1998).
MM WATER-4: OPERATIONAL PHASE EROSION AND SEDIMENTATION CONTROL MEASURES	The Applicant will develop and implement erosion and sedimentation control measures to be used to minimize impacts during the operations and maintenance of the Proposed Project. At a minimum, this plan will include the following: • Implement and maintain soil stabilization measures developed for MM WATER-2 to offset loss in vegetation; • Conduct biannual and post-storm monitoring of erosion and sedimentation; and • Conduct regular site inspections during operation and maintenance to see that erosion-control measures installed during the construction-phase (MM WATER-2) are properly installed and are functioning effectively.
MM WATER-5: OPERATIONAL-PHASE PETROLEUM AND HAZARDOUS MATERIAL CONTAMINATED WATER PREVENTION AND CONTROL MEASURES.	The Applicant will develop and implement contamination control measures to be used to minimize impacts during the construction of the Proposed Project. At a minimum, these measures will include: • Prepare and comply with a SPCCP that outlines procedures to prevent the release of hazardous substances into the environment, thereby avoiding contaminating water resources (EPA 2010); • Stage heavy equipment and O&M vehicles over impermeable surfaces and inspect regularly for petroleum releases; • Conduct regular site inspections during the O&M phase to see that petroleum and hazardous materials products are properly stored and inventoried in accordance with local, state, and federal regulations; and • Implement BMPs, as identified by the State of Nevada, to minimize contributions from both point and nonpoint sources of pollution (including salts) from public lands (BLM 1998).

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
MM WATER-6: DRAINAGE CROSSING DESIGN.	If drainages cannot be avoided by infrastructure placement, then the Applicant will design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon post-construction restoration. This measure is necessary to minimize the amount of erosion and degradation to which drainages are subject.
MM WATER-7: STORMWATER MONITORING AND RESPONSE PLAN	The Applicant will develop and implement a stormwater monitoring and response plan to be used to minimize impacts from flood damage during the life of the Project. At a minimum, this plan will include: • Visual surveys of all structures for scour following major storm events; • Visual surveys of drainage crossings and fencing to check for damage; • Cleanup of broken equipment if failures do occur; • Inspection and cleanup of downstream areas if debris is transported off site; and • Adaptive management of flood protection and erosion actions if the monitoring plan reveals routine damage to project components due to flooding (Any changes must be approved by the BLM).
4.4 Biological Resources	
MM BIO-1: INTERIM RECLAMATION	Interim reclamation actions are intended to reclaim areas of temporary use such as construction staging areas, and road widening areas. Interim reclamation actions will be initiated upon cessation of area use and no later than 12 months from commencement of operation, weather permitting. Interim reclamation will include the following: • Areas that were cleared for staging or road widening and that are not needed for operation of the proposed project will be recontoured to the original contour, if feasible, or if not feasible, to an interim contour that bends with the surrounding topography. • Wastewater, solids, and pond liners will be removed and disposed of at a proper facility. Areas that were occupied by evaporation ponds will be backfilled with native soil to match the existing surrounding grade and restore drainage function. • Stockpiled topsoil will be spread evenly over the entire disturbed area to within a few feet of the production facilities. Salvaged cactus and yucca would be replanted in these disturbed areas.

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
MM BIO-2: CACTUS AND YUCCA SALVAGE PLAN	The Applicant will prepare and implement a cactus and yucca salvage plan. Removal of cacti and yucca in Nevada is governed by Nevada Revised Statute 527.060 - .120 ("Protection of Christmas Trees, Cacti and Yucca") and the associated regulations (Nevada Administrative Code [NAC] Chapter 527). NAC 527.090 requires that all cacti and yucca removed or possessed for commercial purposes have a tag attached thereto. When a cacti or yucca is removed for commercial purposes from BLM-administered land, a tag for the plant is issued by the BLM. "Commercial purposes" is defined as the removal or possession of six or more cacti or yucca on any one calendar day or the removal or possession of less than six plants each for seven or more consecutive days, except when such removal or possession is for scientific or education purposes. See NRS 527.070. Accordingly, to the extent that cacti or yucca removed during the construction of the Proposed Project meet the definition of "commercial purposes", Nevada law requires that tags be obtained from the BLM for each such plant. The Applicant will conduct the following plan for all cactus and yucca species that are salvaged within the Proposed Project area: • The proponent will salvage sufficient cacti and yucca to restore all project temporary impacts to 1.5 times the density of cacti and yucca present in the adjacent native plant community. These cacti and yucca will be held in either an on-site temporary nursery or maintained in an off-site location. Once replanted in the temporary impact areas, the proponent will be responsible for maintaining them so that 80% survivorship is achieved. This activity will be conducted in conjunction with any other revegetation requirements. • The proponent will transplant and maintain cacti and yucca at naturally occurring densities into approximately of 30 acres of BLM identified reclaimed mines, closed roads, and burn scars within 15 miles of the project site. Maintenance will include monitoring and watering for a period of one year. • Any remaining cacti and yucca not salvaged from temporary and permanent impact areas will be purchased by the proponent using BLM Nevada forestry program pricing. • The cactus and yucca salvage will follow SNDO cactus and yucca salvage best management practice guidelines and will be conducted by a qualified contractor with at least three years' experience performing this work in the Mojave Desert.
MM BIO-3: BIOLOGICAL OPINION	• Conservation Measures - proposed by the Applicant and BLM (and denoted in the BO) are as follows: 1 *Waste Management Plan.* The Applicant will prepare a Waste Management Plan, in accordance with applicable laws and regulations, which will describe the storage, transportation, and handling of hazardous materials and wastes; will emphasize the recycling of wastes, where possible; and will identify the specific landfills that will receive wastes that cannot be recycled. 2 *Weed Management Plan.* An Invasive Plant Management Plan will be developed for construction and O&M activities and include results of noxious weed inventories, identification of problem areas, preventative measures, treatment methods, agency specific requirements, monitoring requirements, and herbicide treatment protocol. 3 *Site Rehabilitation and Facility Decommissioning Plan.* The applicant will develop a Reclamation, Restoration, and Revegetation Plan in consultation with appropriate agencies prior to adoption of the Final Environmental Impact Statement that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project. 4 *Water Usage*. If water is used for fugitive dust control, it will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
	5 *Minimize Overhead Collection Line.* Collection lines will be buried to the greatest extent feasible to reduce the opportunity for perches for raptors and ravens. 6 *Reduce Night Lighting.* Night lighting will be reduced in all natural areas to avoid unnecessary visual disturbance to wildlife using directed lighting, shielding methods, and/or reduced lumen intensity except as required by regulatory agencies such as the Federal Aviation Administration. 7 *Clean up.* SWEF will ensure that all unused material and equipment will be removed upon completion of construction activities or maintenance activities conducted. Upon completion, all construction equipment and refuse, including, but not limited to wrapping material, cables, cords, wire, boxes, rope, broken equipment parts, twine, strapping, buckets, metal or plastic containers will be removed from the site and disposed of properly. Any unused or leftover hazardous products will be properly disposed of offsite. 8 *Desert Tortoise Fencing.* Desert tortoise fencing will be installed around permanent facility structures including the O&M building and Western's proposed switching station. 9 *Desert Tortoise Measures.* The applicant or a qualified consultant will provide for the following to reduce impacts to desert tortoise: a. A compliance manager will be designated and will oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities will at a minimum include conducting preconstruction surveys, assuring proper handling of desert tortoise, adequate staffing of biological monitors during construction, and upholding all authorized conditions. The compliance manager will oversee all compliance documentation including daily observation reports, non-compliance and corrective action reports, and final reporting to any authorized agency upon project completion. b. Construction monitoring will employ a designated compliance inspection contractor and authorized desert tortoise biologist(s) during the construction phase. A qualified biologist is defined as a person with appropriate education, training, and experience to conduct tortoise surveys, monitor project activities, provide worker education programs, and supervise or perform other implementing actions. An authorized desert tortoise biologist is defined as a wildlife biologist who has been approved to handle desert tortoises by the Service. A minimum of one monitor per crew is needed for construction crews using heavy equipment (e.g., backhoes, large trucks). One roving monitor will monitor multiple times per day in other active construction zones where heavy equipment is not in use. c. All work area boundaries associated with temporary and permanent disturbances will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers will strictly limit activities and vehicles to the designated work areas. d. Crushing or removal of perennial vegetation in work areas will be avoided to the maximum extent practicable. e. Trash and food items will be contained in closed lid (raven- and coyote-proof) containers. Trash will be removed regularly (at least once a week) to reduce the attractiveness to the site to opportunistic tortoise predators such as common ravens and coyotes and to reduce the possibility of animals ingesting or becoming entangled in foreign matter. f. Pets will not be allowed in working areas unless restrained in a kennel. g. Where possible, motor vehicles will be limited to maintained roads and designated routes. h. Desert tortoise caution signs will be installed on turbine access roads.

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
	i. Desert tortoise clearance surveys at the project site must consist of at least two consecutive surveys of the site. Surveys shall involve walking transects less than or equal to 15-feet (5-meters) wide under typical conditions. In areas of sense vegetation or when conditions limit the ability of the surveyors to locate desert tortoise, transects should be reduced in width accordingly. Clearance surveys should be conducted when desert tortoises are most active (April-May or September-October). If desert tortoise are observed during the second pass, the USFWS and the appropriate State wildlife agency may require a third survey. j. All methods used for handling desert tortoises during the clearance surveys must be in accordance with the Desert Tortoise Field Manual (USFWS 2009). Anyone that handles desert tortoises during clearance activities must have the appropriate authorizations from the Service and the State. k. During the clearance surveys, desert tortoises in burrows may be removed through tapping or careful excavation. Multiple visits may be necessary if desert tortoises are inaccessible in deep caves or burrows. During all handling procedures, desert tortoises shall be treated in a manner to ensure that they do not overheat or exhibit signs of overheating (e.g., gaping, foaming at the mouth, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises shall be kept shaded at all times until it is safe to release them. Ambient air temperature shall be measured in the shade, protected from wind, at a height of2 inches (5 centimeters) above the ground surface. All clearance activities (capture, transport, release, etc.) shall occur when ambient temperatures are below 95°F {35°C) and not anticipated to rise above 95°F {35°C) before handling and processing desert tortoises are completed. l. For desert tortoises that need to be relocated out of harm's way, the tortoise should be placed out of the path of project activity as per the instructions and guidance from the authorized desert tortoise biologist. m. The area cleared and number of desert tortoises located within that area must be reported to the local Service and the appropriate State wildlife agency. The report should be made in writing, either by mail or email. Notification should be received within one week. n. For activities conducted between March 15 and November 1 in desert tortoise habitat, all activities in which encounters with tortoises might occur will be monitored by an authorized desert tortoise biologist. The biologist will be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The authorized desert tortoise biologist will watch for tortoises wandering into the construction areas, check under vehicles, examine excavations and other potential pitfalls for entrapped animals, examine exclusion fencing, and conduct other activities to ensure that death or injuries of tortoises were minimized. o. For open trenches, earthen escape ramps will be maintained at intervals of no greater than 0.25 mile. A biological monitor will inspect all trenches, auger holes, or other excavations a minimum of twice per day, and also immediately prior to back filling. Any wildlife species located will be safely removed and relocated out of harm's way, using a suitable tool such as a pool net when applicable. For safety reasons, biological monitors will under no circumstance enter open excavations. p. No overnight hazards to desert tortoises (e.g., auger holes, pits, or other steep sided depressions) will be left unfenced or uncovered; such hazards will be eliminated each day prior to the work crew and biologist leaving the site. Plywood board will be used to cover open hazards. All excavations will be inspected for trapped desert tortoises at the beginning, middle, and end of the workday. Should a tortoise become entrapped, the authorized

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
	desert tortoise biologist will remove it immediately. q. If blasting is required in desert tortoise habitat, a biological monitor will be assigned to each blasting crew or area in which blasting will occur. Prior to any blast, a 200-foot area around the blast site will be surveyed for desert tortoises. Aboveground tortoises will be relocated at least 500 feet from the blast site. Tortoises in burrows within 50 feet of the blast site will be relocated at least 75 feet away from the blast site to an unoccupied existing or artificial burrow. Burrows located between 50 and 150 feet away from the blast site will be flagged and stuffed with newspaper prior to the blast. The newspaper will be removed immediately after the blast and burrows assessed for damage. r. Routine inspection and maintenance of transmission lines will be limited to the desert tortoise inactive periods of November through February and June through August. All access roads with re-established native vegetation that are used for scheduled, routine maintenance activities will be cleared by a tortoise monitor ahead of any vehicular movement. Should unscheduled, emergency maintenance become necessary, a tortoise monitor will clear the route ahead of vehicular movement. s. Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with the mitigation plan will be documented immediately by the biological monitor. The compliance manager will ensure that appropriate corrective action was taken. Corrective actions will be documented by the monitor. The following incidents will require immediate cessation of the construction activities causing the incident, including 1) imminent threat of injury or death to a desert tortoise; 2) unauthorized handling of a desert tortoise, regardless of intent; 3) operation of construction equipment or vehicles outside a project area cleared of desert tortoise, except on designated roads; and 4) conducting any construction activity without a biological monitor where one is required. If the monitor and compliance inspection manager do not agree, the BLM's compliance officer will be contacted for resolution. All parties would refer the resolution to the BLM's authorized officer. t. Worker Environmental Awareness Program. A Worker Environmental Awareness Program (WEAP) will be prepared. Construction crews and contractors associated with the SWEF or the W APA switching yard or power line will be required to participate in WEAP training prior to starting work on the project. This instruction will include specific desert tortoise training on distribution, general behavior and ecology, identification, protection measures, reporting requirements, and protections afforded by State and Federal endangered species acts. u. Parked vehicles will be inspected prior to being moved. If a tortoise is observed beneath a vehicle, the authorized desert tortoise biologist will be contacted to move the animal from harm's way, or the vehicle will not be moved until the desert tortoise left of its own accord. The authorized desert tortoise biologist will be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes that could be harmful to the animal. v. Should any desert tortoise be injured or killed, all activities will be halted, and the compliance inspection manager and/or authorized desert tortoise biologist immediately contacted. The compliance inspection manager and/or authorized desert tortoise biologist will be responsible for reporting the incident to the authorizing agencies. w. A report to the Service will be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
	locations of live tortoises will be reported. x. The applicant will implement a Raven Management Program that will consist of: 1) an annual survey to identify raven nests on towers and any tortoise remains at tower locations; this information will be relayed to BLM so that the ravens and/or their nests in these towers would be targeted for removal, 2) SWEF making an annual or one time contribution to an overall raven reduction program in the Nevada desert, with an emphasis on raven removal in the vicinity of this project. y. BLM will hold a preconstruction meeting with Duke Energy and the compliance inspection contractor (CIC) to discuss implementation of the terms and conditions of the biological opinion. 10 Transportation Plan. The transportation plan will be implemented during construction, O&M, and reclamation. The year will be divided into three periods based on Mojave desert tortoise activity levels as follows: a. High activity period – April 1st to May 31st and September 1st to October 31st b. Moderate activity period – March 1st to March 31st and June 1st to August 31st c. Low activity period – November 1st to February 28th or 29th During the high activity periods, a speed limit of 15 miles per hour will be maintained on all roads related to access for construction, post-construction (i.e., operation), and restoration. One biological monitor will travel in front of each piece of construction, post-construction, and restoration equipment and other construction-related vehicles entering and exiting the construction areas. If possible, construction, post-construction, and restoration equipment will be grouped while being escorted by a biological monitor entering and exiting the construction areas. Vans, busses, or carpooling will be employed to reduce the number of worker-related vehicles within the construction, post-construction, and restoration areas. These vehicles will be grouped and escorted by a biological monitor entering and exiting the construction, post-construction, and restoration area. During the moderate activity period of March 1 to March 31, low activity measures (see below) will be in effect until the temperature exceeds 68°F for three consecutive days or a tortoise is observed. If a tortoise is observed or the temperature exceeds 68°F for three consecutive days, minimization measures for the high activity period will take effect unless the weather forecast for the next day is for the temperature to drop below 68°F. During the moderate activity period of June 1 to August 31, high activity measures will be in effect until the temperature exceeds 95°F. After the temperature exceeds 95°F, minimization measures for the low activity period will take effect. During the low activity periods, a speed limit of 20 miles per hour will be maintained on all roads related to access for construction, post-construction, and restoration. Construction, post-construction, and restoration equipment entering and exiting a construction site will not need to be escorted by a biological monitor. Vans, busses, or carpooling will be optional to reduce the number of worker-related vehicles within the construction, post-construction, and restoration areas. Vans, busses, or carpooling will still be recommended to reduce the number of worker-related vehicles in construction areas. 11 Remuneration Fees. BLM will ensure payment by the project proponent of remuneration fees (see Tetra Tech 2012 for more details).

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
MM BIO-4: TERRESTRIAL WILDLIFE PLAN	A Terrestrial Wildlife Plan has been prepared for the proposed project (Appendix B-3: Terrestrial Wildlife Plan). This Terrestrial Wildlife Plan includes a risk assessment and mitigation measures for the banded Gila monster, chuckwalla, and bighorn sheep. Mitigation in this plan shall be implemented to reduce impacts on chuckwalla and Gila monster. Mitigation measures in the plan include the following: • As part of the WEAP identified under the Biological Opinion Desert Tortoise Measure t, construction site personnel will be given a packet, which includes NDOW's Gila Monster Status, Identification and Reporting Protocol for Observations (NDOW 2007). The packet will also contain information describing the distinguishing features of a banded Gila monster and instructions on distinguishing a banded Gila monster from chuckwallas and banded geckos, as well as information on the protection status of the species and the consequences of a potential bite. • All sightings of banded Gila monster and circumstances under which it was encountered, will be immediately reported to NDOW using the Gila Monster Reporting Form. Gila Monsters found dead will be preserved in a freezer-safe container or plastic bag and delivered to NDOW as soon as is feasible. When handling dead Gila monsters, hands shall be kept clear of the lizard's mouth to avoid a reflex-induced, painful and venomous bite. • Upon finding a Gila monster, all construction activities will be halted in the immediate vicinity of the animal until the animal moves to safety of its own accord, undisturbed. • During construction activities, qualified on-site biologists conducting desert tortoise monitoring will also monitor for chuckwalla and direct construction workers to allow the animal to move to safety of its own accord, undisturbed. • If construction occurs during the nesting period, on-site desert tortoise monitors will investigate potential chuckwalla nesting habitat (sandy, well-drained soils) in July and August for signs of nests. These areas will be marked as sensitive areas and avoided to the extent practicable during construction to avoid disturbing eggs. • Appropriate fencing will be installed around guy wire anchor points of existing met towers. • Upon finding bighorn sheep in the area proposed for construction, all construction activities will be halted in the immediate vicinity of the animal until the animal moves to safety of its own accord, undisturbed. If sheep do not move within two hours from areas proposed for construction, Pat Cummings at NDOW (702-486-5127 x3212) will be contacted to determine the appropriate measures to encourage sheep to move from the construction area.
MM BIO-5: BIRD AND BAT CONSERVATION STRATEGY	A Bird and Bat Conservation Strategy (formerly called an Avian and Bat Protection Plan [ABPP]) has been developed for the Proposed Project (Appendix B-4: Bird and Bat Conservation Strategy). The BBCS includes a risk assessment and provides for pre-construction surveys (immediately prior to construction as described in APM-13), post-construction monitoring, and adaptive management measures. The intention is not to predict the number of fatalities due to turbine collision as pre-construction data poorly predicts fatalities for birds (Ferrer et al. 2012), but to determine if any species is at high risk to inform post-construction fatality monitoring. The BBSC also includes monitoring requirements and provisions for adaptive management measures based on mortality rates. The final BBCS is included in Appendix B-4: Bird and Bat Conservation Strategy.
MM BIO-6: BURROWING OWL PROTECTION DURING CONSTRUCTION	For burrowing owls, biological monitors will use USFWS survey methods and mitigation measures presented in Protecting Burrowing Owls at Construction Sites in Nevada's Mojave Desert Region (USFWS no date specified).

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
MM BIO-7: TRANSMISSION LINE DESIGN	All overhead power lines will be designed using the Suggested practices for Avian Protection on Power Lines: State of the Art in 2006 manual and Mitigating Bird Collisions with Power Lines: The State of the Art in 1994.
MM BIO-8: WILDLIFE WATER DEVELOPMENTS	If construction and operations effect the water developments directly, the applicant would compensate NDOW to relocate the water development inclusive of any administrative clearances (i.e. NEPA, Cultural) required by the BLM.
4.5 Cultural Resources	
MM CR-1: ARCHAEOLOGICAL MONITOR	An archaeological monitor will be required during access road construction, widening of existing roads, and any other ground-disturbing activities in order to protect known or unidentified cultural resources from project impacts.
MM-CR 2: ETHNOGRAPHIC/ETHNOHISTORIC STUDY	An ethnographic/ethnohistoric study will be conducted to better understand the relationship of Native peoples to the cultural landscape in this region.
MM CR 3: DEVELOPMENT OF A MEMORANDOM OF AGREEMENT	Development of a Memorandum of Agreement would outline the roles and responsibilities of the affected parties. The Project Proponent would be required to fund an interpretive kiosk to be placed along Cottonwood Road (Highway 163) and an interpretive brochure on the history of the New Era Mine and its illustrious owner Sam Yet. The interpretive materials will be prepared by the BLM in partnership with the Lake Mead National Recreation Area. The MOA would also include an ethnographic/ethnohistoric study of the Searchlight Wing Energy Project region. The Memorandum of Agreement would need to be completed prior to the signing of the Record of Decision for this EIS. The mitigation measures would need to be completed prior to a BLM Notice to Proceed for project construction is authorized.
4.6 Air Quality and Climate	
MM AIR-1: SECURE ALL VEHICLES HAULING LOOSE MATERIALS.	The Applicant will cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard, which is the distance from the top of the truck bed in the material being hauled.
MM AIR-2: REDUCE VEHICLE EMISSIONS.	The Applicant will turn off idling equipment when not in use.
MM AIR-3: PROHIBIT EQUIPMENT TAMPERING	The Applicant will prohibit any tampering with engines to increase horsepower, and require continuing adherence to manufacturer's recommendations.
MM AIR-4: LEASE NEW EQUIPMENT.	If practicable, the Applicant will lease new, clean equipment that meet the most stringent of applicable federal or state standards.
MM AIR-5: USE LOW SULFUR FUELS.	The Applicant will use and require contractors to use low-sulfur diesel fuel (45 ppm) for vehicles and equipment, if available.
MM AIR-6: AVOID SENSITIVE AIR QUALITY RECEPTORS.	The Applicant will locate diesel engines, motors, and equipment as far as possible from possible sensitive receptors.

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
MM AIR-7: MITIGATION OF GHG EMISSIONS.	The Proposed Action would minimize greenhouse gas (GHG) emissions through the long-term generation of renewable electricity, which would provide a potential net benefit to regional air quality.
4.7 Transportation	
MM TRAN-1: TRAFFIC MANAGEMENT PLAN.	A Traffic Management Plan will be prepared for the project that identifies BMPs to minimize construction-related traffic impacts. Specifically, the BMPs would ensure an adequate flow of traffic in both directions by providing sufficient signage to alert drivers of construction zones, notifying emergency responders prior to construction, conducting community outreach, and controlling traffic around affected intersections. The Plan will include the following: • Consideration of the turbine manufacturer-provided dimensions and weight; maximum axle loads; and local regulations. • Obtaining requisite transportation permits. • Providing escort for components as required by the length, weight, or width. • To further reduce effects to the US-95/Cottonwood Cove Road intersection, the Plan will identify an alternate access route to the Proposed Project site during peak construction if possible. • Truck traffic will be phased throughout construction. • Truck traffic will be restricted to the roadways developed or upgraded for the Proposed Project. • Existing unimproved roads not associated with the Proposed Project would be used in emergency situations only. • Deliveries of materials will be scheduled for off-peak hours to reduce effects during periods of peak traffic. Truck traffic will use designated truck routes when arriving to and departing from the proposed work sites. • Providing alternate transportation routes should temporary road closures be required. • The Applicant will encourage the construction workforce to carpool or vanpool. • Signs and public notices regarding construction work will be distributed before disruptions occur and will identify detours to maintain access. • To minimize the effects on local and Lake Mead traffic the Transportation Plan will mandate the use of flagmen or escort vehicles to control and direct traffic flow, and provide schedules that show roadway work will be done during periods of minimum traffic flow. • Ongoing ground transportation planning will be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.
MM TRAN-2: REPAIR DAMAGED STREETS.	Before construction, the Applicant, a BLM representative, and a local representative will document the condition of the access route, noting any preconstruction damage. After construction, any damage to public roads will be repaired to the road's preconstruction condition, as determined by the local representative and BLM.
4.8 Land Use - No additional mitigation measures are proposed or required	

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
4.9 Visual Resources	
MM VIS-1: MINIMIZE SURFACE DISTURBANCE.	Operators will reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving vegetation to the greatest extent possible; using undulating surface disturbance edges; stripping, salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression techniques; and restoring exposed soils as closely as possible to their original contour and vegetation.
MM VIS-2: SELECT BLM-APPROVED FLAT TONE COLORS FOR STRUCTURES	All structures (including Western's proposed switching station) will be constructed of materials that restrict glare and will be finished with a BLM-approved Standard Environmental Color intended to blend with the surrounding environment. Due to the height of the WTGs and the oscillating motion of the blades, it is difficult to make the towers blend into the landscape; however, a flat gray paint color will tone down the usual white design and reduce glare. Any color other than white will need to be approved by the FAA. If a color is not easily distinguishable for pilots, daytime strobe lights will be needed, thus negating the mitigation (FAA 2007).
MM VIS-3: MINIMIZE PROFILES OF SITE DESIGN ELEMENTS	Site design elements will be integrated with the surrounding landscape, such as minimizing the profile of the ancillary structures, burial of cables, and use of timed, motion-sensor, and directional lighting.
MM VIS-4: MINIMIZE ROAD AND GRAVEL CONTRAST	The colors of the asphalt and gravel used for circulation and parking areas at the O&M building will be selected to minimize contrast with the site's soil colors. Roads will be contoured to blend into the existing topography.
MM VIS-5: MINIMIZE LIGHTING	Efforts will be made to minimize the need for and amount of lighting on ancillary structures. • When possible, lighting will be associated with motion sensors to minimize constant lighting effects. • The only exterior lighting on the WTGs will be the aviation warning lighting required by the FAA. The warning lighting will be the minimum required intensity to meet the current FAA standards. • Outdoor night lighting at the O&M facility or other ancillary structures will be the minimum necessary for safety and security. All lights will be shielded to reduce offsite light pollution. Motion sensor lighter will be used when possible. Bluish lighting will be avoided and warm white or amber lighting will be used instead for general security and human vision needs. Facility lighting should be less than Kelvin color temperature (warm white or amber in color). Lighting will have screens that do not allow the bulb to shine up or out. All lighting fixtures shall be hooded and shielded, face downward, located within soffits, and directed on to the pertinent site only, and away from adjacent parcels or areas. All proposed lighting shall be located to avoid light pollution onto any adjacent lands as viewed from a distance.
4.10 Noise	
MM NOI-1: CONDUCT CONSTRUCTION ACTIVITIES DURING DAYTIME HOURS.	The Applicant will conduct construction activity only during daytime hours at the property boundary closest to the nearest residence(s). Construction activities (including truck deliveries, pile driving, and vibration equipment use) shall be restricted to the least noise-sensitive times of day-weekday daytime hours between 7:00 a.m. and 10:00 p.m., near residential or recreational areas. Blasting activities would be further limited to between the hours of 7:00 a.m. and 5:00 p.m. during weekdays only. Restrictions on air braking, down shift braking, stopping or staging in Searchlight will be enforced in compliance with the local traffic laws and the Traffic Control Plan that will be prepared by the construction contractor for review and approval by Nevada Department of Transportation (NDOT).

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
MM NOI-2: TURN OFF IDLING EQUIPMENT.	The Applicant will turn off idling equipment when not in use.
MM NOI-3: NOTIFY ADJACENT RESIDENCES.	The Applicant will notify adjacent residents in advance of construction work through public mailings and signs directed toward residents, landowners, and recreational users within 1 mile of the site prior to construction. The notice will state specifically where and when construction activities will occur in the area. The Applicant will also provide a communication line or procedures to enable individuals to contact the contractor in the event that construction noise levels affect them.. The Applicant will use an audible warning system to notify public of pending blasting activities.
MM NOI-4: INSTALL ACOUSTIC BARRIERS.	The Applicant will install acoustic barriers around stationary construction noise sources as necessary to maintain a noise level not to exceed 43 dBA at the property boundary closest to the nearest residence.
MM NOI-5: PROPER MAINTENANCE AND WORKING ORDER OF EQUIPMENT AND VEHICLES.	Construction equipment will be maintained according to manufacturers' recommendations. The Applicant will ensure that all equipment is adequately muffled and maintained, to include: • Use of noise controls on standard construction equipment and shielding on impact tools; • Use of broadband noise backup alarms on mobile equipment; and • Installation of mufflers on exhaust stacks of all diesel and gas-driven engines.
MM NOI-6: ENSURE PROPER INSTALLATION OF TRANSFORMER EQUIPMENT.	Construction equipment will be maintained according to manufacturers' recommendations. The Applicant will ensure that all equipment is adequately muffled and maintained, to include: • Use of noise controls on standard construction equipment and shielding on impact tools; • Use of broadband noise backup alarms on mobile equipment; and • Installation of mufflers on exhaust stacks of all diesel and gas-driven engines.
4.11 Recreation	
MM REC-1: RECREATION IMPACTS MINIMIZATION MEASURES	The Applicant and their contractor(s) shall reduce recreation impacts during construction by: • Clearly delineating construction boundaries and minimizing areas of surface disturbance; • Preserving vegetation to the greatest extent possible; • Utilizing undulating surface disturbance edges; • Stripping, salvaging and replacing topsoil; • Employing contoured grading; • Controlling erosion; • Using dust suppression techniques; • Restoring exposed soils as closely as possible to their original contour and vegetation; and • Preserving access to roads and trails in the project area that are used for recreational purposes.
4.12 Socioeconomics – No adverse effects on Socioeconomic conditions are anticipated; therefore, no mitigation measures are proposed.	
4.13 Environmental Justice – No adverse effects on environmental justice populations are anticipated; therefore, no mitigation measures are proposed.	

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
4.14 Human Health and Safety	
MM SAFE-1: HAZARDOUS MATERIALS MANAGEMENT.	The Applicant will implement a Hazardous Materials Handling Management Program or incorporate within their other program the item outlined below. Hazardous materials used and stored on site for the Proposed Action activities will be managed according to the specifications outlined below as follows: • Hazardous Materials Handling Program. A project-specific hazardous materials management program will be developed prior to initiation of the Proposed Action construction. The program will outline proper hazardous materials use, storage, and disposal requirements. The program will identify types of hazardous materials to be used during construction activities. All personnel will be provided with project-specific training. This program will be developed to ensure that all hazardous materials are handled in a safe and environmentally sound manner. Employees will receive hazardous materials training and will be trained in hazardous waste procedures; spill contingencies; waste minimization procedures; and treatment, storage, and disposal facility training in accordance with OSHA Hazard Communication. • Transport of Hazardous Materials. Hazardous materials that will be transported by truck include fuel (diesel fuel and gasoline) and oils and lubricants for equipment. Containers used to store hazardous materials will be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used will be established in accordance with U.S. Department of Transportation (USDOT) and NDOT regulations. A qualified transporter will be selected to comply with federal and state transportation regulations. • Fueling and Maintenance of Construction Equipment: Written procedures for fueling and maintenance of construction equipment will be prepared prior to construction. Vehicles and equipment will be refueled on site or by tanker trucks. Procedures will include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling stations will be located in designated areas where absorbent pads and trays will be available. The fuel tanks will also contain a lined area to ensure that accidental spills do not occur. Drip pans or other collection devices will be placed under the equipment at night to capture drips or spills. Equipment will be inspected daily for potential leakage or failures. Hazardous materials such as paints, adhesives, and solvents, will be kept in an approved locker or storage cabinet.
MM SAFE-2: CHARACTERIZE POTENTIALLY CONTAMINATED SOIL.	To ensure that workers, the public, and wildlife are not exposed to potential contaminants, if soil is unearthed that is discolored or has an odor, work will be stopped in that area. In this event, the Applicant will retain a Certified Environmental Manager approved by the State of Nevada to characterize the type and extent of potential contamination. The soil should then be sampled and characterized prior to further site excavation activities in the area with discolored or odorous soils. If the soil is found to be contaminated based on federal or state regulations, then the Applicant will implement the appropriate and relevant procedures to properly characterize, contain, and dispose of the contaminated material.
MM SAFE-3: ADHERENCE OF THE HEALTH AND SAFETY PROGRAM WITH 29 CFR, PART 1910.	The Applicant and Western will ensure that all health and safety and emergency plans required for employees and contractors during construction, operations, and decommissioning of the Proposed Action will comply with the OSHA Standards provided in federal regulation 29 CFR, Part 1910, as well as with applicable state and local occupational health and safety regulations.

Table 2.6-2. Mitigation Measures

Mitigation Measure No.	Mitigation Measure Description
MM SAFE-4: CONSTRUCTION FIRE PREVENTION MEASURES.	The following fire prevention measures will be implemented by the Applicants or its contractor during Proposed Project construction: • Maintain a list of all relevant firefighting authorities near the Proposed Project site. The closest resources to respond to a wildland fire threatening the town of Searchlight would come from Clark County Fire Department Rural Station 75 located in Searchlight. This fire station is staffed by volunteers. In the event of a fire on site, the Applicant will contact both BLM Fire and the Clark County Fire Department ; • Have and maintain available fire suppression equipment in all construction areas, including but not limited to water trucks, potable water pumps, and chemical fire extinguishers. Ensure an adequate supply of fire extinguishers for welding and brushing crews; • Include mechanisms for fire suppression in all heavy equipment, including fire extinguishers and spark arresters or turbo-charging (which eliminates sparks in exhaust); • Vehicle catalytic converters, on vehicles that enter and leave the project site on a regular basis, will be inspected on a regular basis and cleared of all flammable debris; • Remove any flammable wastes generated during construction on a regular basis; • Accomplish vegetation clearing in a manner that reduces vegetation and does not create a fire hazard; • Store all flammable materials used at the construction site; • Allow smoking only in designated smoking areas; • Require all work crews to park vehicles away from flammable vegetation, such as dry grass and brush. At the end of each workday, heavy equipment should be parked over mineral soil, asphalt, or concrete, where available, to reduce the chance of fire; • All cutting/welding torch use, electric-arc welding, and grinding operations shall be conducted in an area free, or mostly free, from vegetation and an ample water supply and shovel shall be on hand to extinguish any fires created from sparks. At least one person, in addition to the cutter/welder/grinder, shall be at the work site to promptly detect fires created by sparks. In the O&M area, all hot work will require a special operator permit.
MM SAFE-5: AERONAUTICAL CONSIDERATIONS.	The Applicant will notify FAA by filing FAA Form 7460 at least 30 days before construction is to begin or the date that applications for construction permit is to be filed.
MM SAFE-6: ADHERENCE OF THE HEALTH AND SAFETY PROGRAM WITH 29 CFR, PART 1926.	The Applicant will ensure that all health and safety and emergency plans required for employees and contractors during construction, operations, and decommissioning of the Proposed Action will comply with the OSHA Standards provided in federal regulation 29 CFR, Part 1926, as well as with applicable state and local occupational health and safety regulations.

3.0 Affected Environment

This chapter describes the existing physical, biological, social and economic environment in the project vicinity that would be affected by implementation of the alternatives. The chapter focuses on current resource conditions as well as environmental trends based on current management. For some resource values, the discussion addresses conditions beyond the Proposed Project area to ensure an adequate analysis of offsite and cumulative impacts subsequently discussed in Chapter 4, Environmental Consequences. The information in this chapter is based on existing resource data or the reports the BLM specifically required for the Searchlight Wind Energy Project.

Geographic Setting

The Proposed Project is located within southernmost Nevada in an unincorporated portion of Clark County More specifically, the proposed site is 0.5 miles northeast to 3 miles southeast of the town of Searchlight which is at the junction of US-95 and Cottonwood Cove Road. This is approximately 60 miles south-southeast of Las Vegas, 40 miles north of Laughlin, and 1.5 miles east of the western boundary of the Lake Mead National Recreation Area. Western's proposed Federal action is located within the eastern boundary of the Proposed Project area. If descriptions for the affected environment for the proposed switching station differ, the differences are noted in this chapter.

Clark County extends over 8,091 square miles within the Basin and Range geomorphic province, an area of broad, flat valleys bordered by block-faulted bedrock mountains. Clark County borders with: Lincoln County, Nevada to the north; Nye County, Nevada to the west; the Arizona state line to the east; and the California state line to the southwest.

Clark County's elevation varies from approximately 482 feet above mean sea level (msl) at the Colorado River below Hoover Dam to 11,918 feet above msl atop Mount Charleston in the Spring Mountains (for topography refer to Figure 1.3-1 and Figure 1.3-2). . Clark County is predominantly terrestrial, (approximately 98 percent or 7,911 square miles), with only 2 percent (180 square miles) of the land area covered by water features. The most dominant water feature consists of the lower Colorado River inclusive of Lake Mead and Lake Mohave. The primary desert habitat within Clark County consists of creosote bush scrub (*Larrea tridentata*). Terrain consists of desert valleys, basins, alluvial fans/valleys, and mountain ranges.

The Proposed Project site comprises approximately 18,949 acres of BLM-administered lands. Terrain of the project location consists of the northeast edge of the Piute Valley and the low, west flanking hills of the southernmost portion of the Eldorado Mountains, inclusive of Fourth of July Mountain. Area elevations vary from approximately 1,700 feet msl to more than 3,450 msl feet. Existing land uses in the Proposed Project area and vicinity are characterized by a rural-recreation service community, limited livestock grazing on private lands, dispersed recreation, traditional and renewable utilities, and mineral exploration and development. Transportation and utility corridors and facilities predominate along the western edge of the project area. A north-south oriented major transmission line corridor is located to the east of the project area.

3.1 Geology, Soils, and Minerals

3.1.1 Region of Influence

This section identifies the geology, soils, and mineral resources within and adjacent to the Proposed Project site that would be affected by construction, O&M, and decommissioning of the Proposed Project, and discusses applicable regulations. Information in this section is largely based on information collected by the U.S. Geological Survey (USGS) and the Nevada Bureau of Mines and Geology.

3.1.2 Existing Environment

3.1.2.1 Topography

The Proposed Project site is located on the east side of the Piute Valley in the low hills bordering the western flank of an unnamed range of mountains that includes Fourth of July Mountain. This area is within the Basin and Range geomorphic province, an area of broad, flat valleys bordered by block-faulted bedrock mountains.

Elevations in the Searchlight area range from approximately 1,700 feet to more than 3,450 feet for the unnamed highlands on part of the Proposed Project area. Part of the area is occupied by the Piute Valley, which drains to the south. The sediments that fill the Piute Valley are relatively thin compared to other valleys in the Basin and Range physiographic province, no deeper than about 700 m (Ludington et al. 2006). The sediments that fill the Las Vegas Valley range up to 1,500 m in depth (Plume 2000)

3.1.2.2 Geologic Setting

The geology of the Searchlight area is summarized in the Geology and Mineral Deposits of Clark County, Nevada (Longwell et al. 1965). The following geological formations of the Searchlight area are greatly simplified from descriptions from the geologic figures of the area (Ruppert and Faulds 1998, Faulds et al. 2006). The bedrock and valley-fill deposits may be categorized into five types: (1) alluvial deposits, (2) older gravels, (3) volcanic bedrock, (4) granite bedrock, and (5) metamorphic bedrock. Alluvial deposits occur in the valley floor area and include interbedded gravel, sand, silt, and clay. These deposits are generally unconsolidated but may be cemented with calcite or silica where mineralized water was present. Older alluvial gravels of early Tertiary (from 65 to 1.8 million years before present) to early Quaternary age (1.8 million years or younger) crop out near the Searchlight area. These deposits are generally weakly consolidated conglomerate and sandstone. Volcanic bedrock of Quaternary and Tertiary age crop out in the Searchlight area. These rocks include different types of extrusive volcanic lava and extrusive air-fall tuff, along with intrusive volcanic rock. Granite bedrock is Tertiary and Precambrian (older than 540 million years) in age, and metamorphic rocks comprising schists and gneisses are Precambrian in age.

The major geologic structures in the Searchlight area include normal faults (Ruppert and Faulds 1998, Faulds et al. 2006). The major recognized fault is the Searchlight fault, located about 1.5 miles northwest of Searchlight, which is thought responsible for truncation and significant offset of orebodies in the Searchlight mining district (Faulds et al. 2001). Several unnamed normal faults (displacement down on the east) are mapped trending northeast through the Project Site (Faulds et al. 2006). None of the major normal faults in the area (e.g., Searchlight fault or unnamed faults) cut Quaternary deposits. Geological relations in the area suggest that fault movement on the Searchlight Fault had probably ceased by approximately 11 million years ago (Faulds et al, 2001).

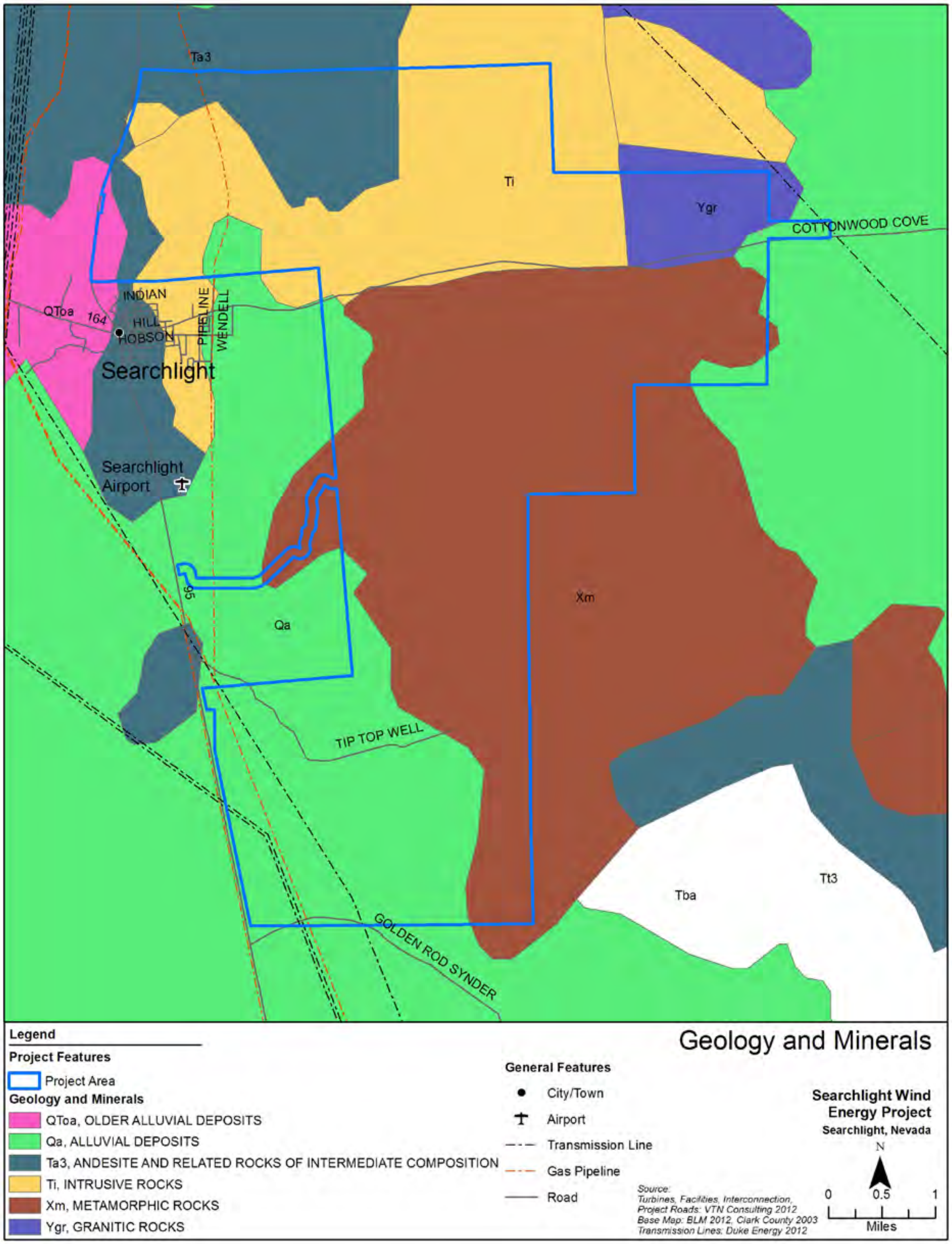


Figure 3.1-1. Geology and Minerals within the Proposed Project Area

3.1.2.3 Seismicity

A published map showing the location of earthquakes in Nevada from 1852 to 1996 (DePolo and DePolo 1999) shows historical earthquakes in the vicinity of Hoover Dam. As noted by DePolo and DePolo (1999), “Another earthquake area of note in Nevada is the Lake Mead area, where earthquakes may be partly reservoir induced by the filling of Lake Mead.” This map shows no mapped historical earthquakes within a 20-mile radius of the town of Searchlight.

3.1.2.4 Faulting

The nearest potentially active fault (activity in last 1.8 million years) is the Black Hills Fault located about 30 miles north of the site. According to the USGS (2009), it is a normal fault. On the basis of estimated ages of faulted deposits and scarp profile interpretation, the most recent surface faulting event on the Black Hills Fault probably occurred in the mid to late Holocene (less than 5,000 years before present). This is the nearest reported fault with the potential to produce earthquakes that might affect the Project Site. The faults at the site are Pre-Quaternary faults (not active in the last 1.8 million years) with a very low risk for displacement.

3.1.2.5 Seismic Shaking

The Proposed Project site, as well as most of the southern Nevada region, might experience ground shaking from possible future earthquakes in the region. Searchlight is located within Seismic Zone 2B (ground acceleration of 0.15g), defined by the Uniform Building Code as an area of moderate damage potential from seismic hazards. Seismic zones range from Zone 0 (ground acceleration of 0.0g) to Zone 4 (ground acceleration of 0.40g).

3.1.2.6 Liquefaction and Seismic Ground Failure

Liquefaction is a form of seismic ground failure that occurs when there is a sudden loss of strength of saturated soils during seismic shaking. Saturated granular soils with low strength might be susceptible to liquefaction. The potential for liquefaction at the project site is low for the portion of the site underlain by bedrock because the igneous and metamorphic rocks are generally not susceptible to liquefaction. The potential for liquefaction is also low in the Quaternary alluvium at the site because the alluvium is generally unsaturated to depths greater than 250 feet, based upon review of water levels in local water wells.

Other types of seismic ground failure include lateral spreading, seismic subsidence, and collapse. Lateral spreading is a form of ground failure that involves lateral movement of soil towards a free face during seismic shaking. Because the site is underlain by either bedrock materials or alluvial materials that are gently sloping, without a free face, the potential for lateral spreading at the site is very low. Seismic subsidence and collapse can occur as a result of compaction of loosely compacted materials during seismic shaking. Seismic subsidence and collapse are not likely in areas of volcanic, igneous, and metamorphic rock at the site because of the density and strength characteristics of these bedrock materials. There might be a moderate potential for seismic subsidence and collapse of areas of the site underlain by Quaternary alluvial deposits.

3.1.2.7 Landslides

There are no mapped landslides in the project area. Landslides usually occur on steep slopes underlain by materials that have a potential for failure due to saturation from rainfall, loss of strength during seismic shaking, or loss of support of graded slopes. The potential for landslides at the project site is low because the slopes are generally composed of volcanic, igneous, and metamorphic rocks, which have a low potential for slope failure. The potential for landslides in areas mapped as Quaternary alluvium is also low because of the absence of steep slopes and unsaturated conditions.

3.1.2.8 Soils

The soils in the Searchlight area are medium-textured saline and alkaline soils in the lowland areas; shallow, gravelly coarse-textured soils over the alluvial fans; and discontinuous, rocky gravelly coarse-textured soils in the mountain areas (BLM 1992).

Thirteen soil figure units have been characterized in the Proposed Project area by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (USDA 2009) (Figure 3.1-2). A figure unit is a delineation of an area dominated by one or more major soil types. The objective of figuring is not to delineate pure taxonomic soil classes but rather to separate the landscape into landforms that have similar use and management requirements. The different kinds of soils found within a figuring unit are called soil series, which is a group of soils that have horizons similar in arrangement and characteristics. Ranges in properties of soils of a series vary over a relatively narrow range. Figure units often consist of two or more soil series.

The soils in the Searchlight area are susceptible to erosion by wind and water. The potential for erosion is generally slight except where the soils have been disturbed or along the banks of washes. There is also the potential for localized landslides of surficial soils on the steep slopes of the upland areas. The erosion susceptibility of the soils in the area ranges from low to moderate (BLM 1992).

The project area soil types have the following general characteristics:

- Thicknesses of less than 2 feet
- Located on slopes ranging from 4% to 75%
- Slight erosion potential by surface runoff
- Slight erosion potential by aeolian processes

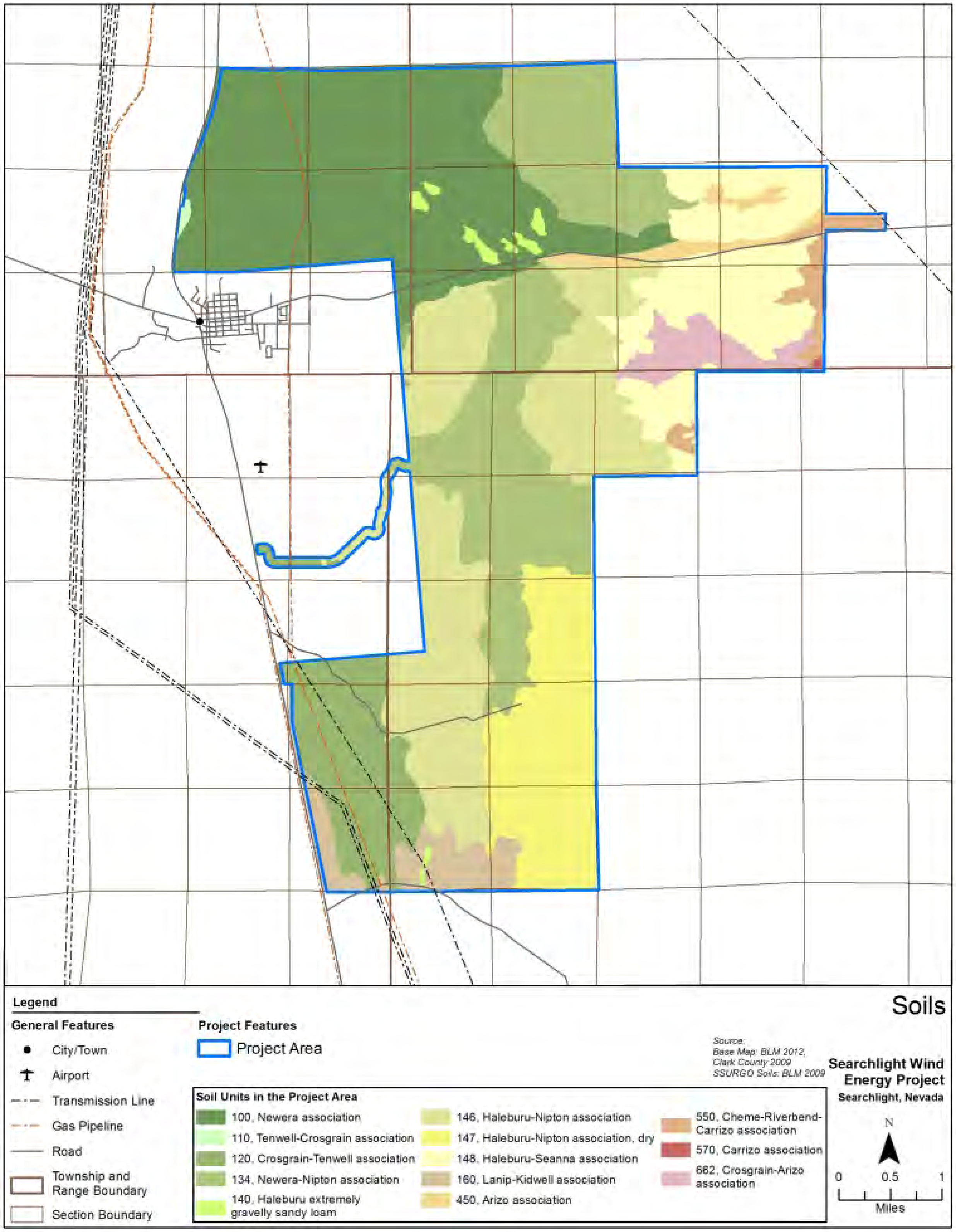


Figure 3.1-2. Soil Figure Units within the Proposed Project Area

These data were obtained from the USDA NRCS Web soil survey (USDA 2009) and the Clark County soil survey (USDA 2006). Table 3.1-1 summarizes the surficial areal extent of each figure unit within the project area, including the area of Western's proposed switching station, which would be located on the Cheme-Riverbend-Carrizo association (Figure unit 550).

Table 3.1-1. Lateral Extent of Soil Figure Units within the Proposed Project Area

Figure Unit Symbol	Figure Unit Name	Percentage within Project Area	Acreage within Project Area
100	Newera association	24.6	4,274.9
110	Tenwell-Crosgrain association	0.1	23.9
120	Crosgrain-Tenwell association	7.6	1,311.8
134	Newera-Nipton association	19.4	3,377.0
140	Haleburu extremely gravelly sandy loam, 4 to 15% slopes	0.6	106.9
146	Haleburu-Nipton association	19.3	3,347.5
147	Haleburu-Nipton association, dry	9.7	1,690.2
148	Haleburu-Seanna association	10.2	1,771.6
160	Lanip-Kidwell association	3.2	563.3
450	Arizo association	1.4	241.7
550	Cheme-Riverbend-Carrizo association	1.4	248.4
570	Carrizo association	0.1	8.2
662	Crosgrain-Arizo association	2.3	403.9
	Total	**100.00**	**17,369.3**

Biological crusts or biological soil crusts are a community of organisms that live at the surface of desert soils. No biological crusts have been figured by the NRCS within the project area (USDA 2006). However biological soil crusts may occur within the project area.

3.1.2.9 Minerals

The Proposed Project site lies on undeveloped lands administered by the BLM in Clark County, Nevada. The BLM (1998) indicates there is a low potential in the Searchlight area for fluid minerals (oil, gas, and geothermal resources), a high potential for leasable minerals, saleable minerals (common sand, gravel, and rock), and a high potential for locatable minerals (metallic and nonmetallic mineral deposits). The BLM has defined the level of potential for development of these mineral types (BLM 1998). The area includes part of the historic Searchlight mining district, which has produced millions of dollars in gold, silver, copper, and lead since 1897 (Ludington et al. 2006). Mineral deposits in the Searchlight mining district are in gold-bearing veins that are hosted primarily in Tertiary volcanic rocks. There is potential for undiscovered gold deposits and other minerals within the Searchlight mining district (Ludington et al. 2006). Identified mineral resources within the Proposed Project site are described below.

The BLM defines three types of mineral resources (leasable, locatable, and saleable):

- Leasable minerals are divided into solid and fluid resources and include, but are not limited to, solid (such as coal and oil shale) and fluid (such as oil and natural gas and geothermal resources) that are extracted through a competitive leasing program managed under 43 CFR 3100.
- Locatable minerals consist of metallic and non-metallic minerals such as gold, silver, copper, and gypsum that are developed within a defined geographic area and must be located on a mining claim. They are managed under 43 CFR 3800.
- Saleable minerals consist of common varieties of sand, gravel, and other aggregates that are sold at fair market value. They are managed under 43 CFR 3600.

Locatable Minerals

The areas surrounding Searchlight have a mix of high and low potential for locatable minerals. A high potential for locatable minerals exists in the historic Searchlight mining district. The area to the south of Searchlight has a mix of high and low potential for locatable mineral materials (BLM 1998). Therefore, a high potential for locatable minerals occur within the portions of the Project Site generally northeast of Searchlight, north of highway 164 and east of Searchlight.

Locatable mineral resources available within the Proposed Project site were identified by compiling data from the BLM's Land & Mineral Legacy Rehost 2000 System-LR2000. There are 561 active mining claims that have been filed and 1,872 closed mining claims on land within/adjacent to the Proposed Project (Table 3.1-2, Figure 3.1-3).

Table 3.1-2. Active and Closed Mining Claims

Township	Section	Number of Active Claims	Closed Claims
T28S, R63E	23	4	126
	24	0	38
	25	18	72
	26	20	106
	27	51	160
	36	163	260
T28S, R64E	19	0	102
	20	0	0
	27	0	61
	28	0	5
	29	0	21
	30	9	72
	31	4	85
	32	0	82
	33	0	72
	34	0	7
T29S, R63E	01	40	131
	11	32	56
	12	26	44
	13	36	4
	14	36	51
	24	34	2
	25	14	2
T29S, R64E	04	0	30
	05	0	29
	06	0	47
	07	18	59
	08	0	27
	17	0	23
	18	36	26
	19	19	5
	20	0	22
	29	0	0
	30	1	0
	TOTALS	**561**	**1,827**

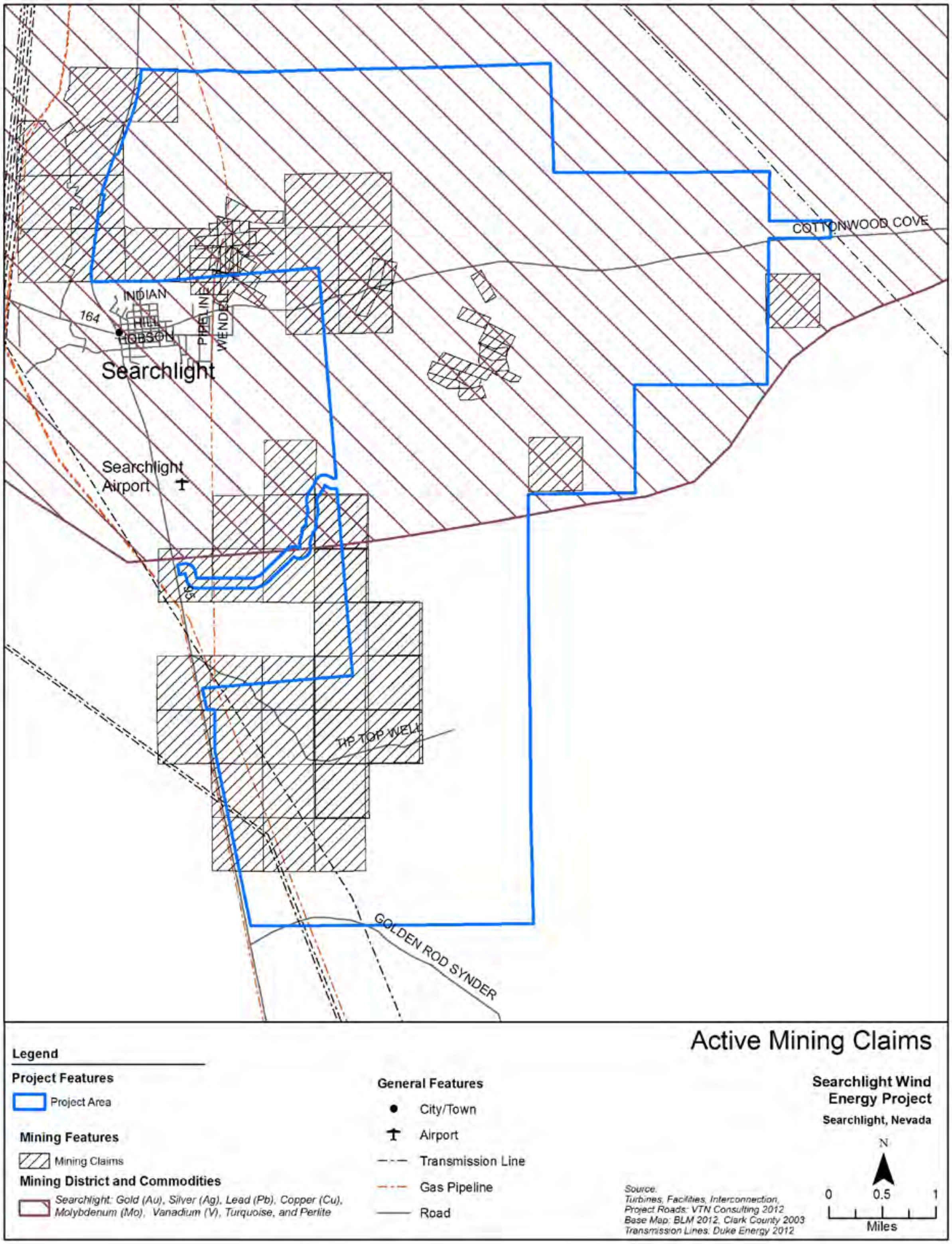


Figure 3.1-3. Active Mining Claims

The BLM requires that a mining claim be properly located, although its precise location cannot be mapped easily because the Mining Law of 1872 did not have an orientation system and the claimants are not required to survey their corners with a global positioning system and submit this data to be incorporated on maps. A claim has specific dimensions equaling approximately 20 acres, unless it is an association claim, and can be located in any orientation on the ground and, due to its size, is not defined by traditional legal land descriptions, except down to quarter-section resolution.

Saleable Mineral Resources

Saleable materials, such as sand, gravel, and other construction materials, are sold and permitted under the Mineral Materials Sale Act of 1947. Much of the project area has a high potential for saleable mineral materials, but the BLM's 1998 RMP (BLM 1998) restricts free-use saleable mineral mining permits to government agencies within 0.5 mile of U.S. Interstate 95 (US-95) and Nevada SR 164 within the Piute-Eldorado ACEC. However, the area around Searchlight, including the Project Site, is not within the Piute-Eldorado ACEC. Therefore, the area of the Project Site remains open for mineral sales. The potential for saleable minerals is identified on 1998 Las Vegas RMP Map (Figure 3.1-4) . The nearest commercial source of sand and gravel is Silver State Materials Corporation, which is located approximately 36 miles north of the project site near Boulder City, Nevada.

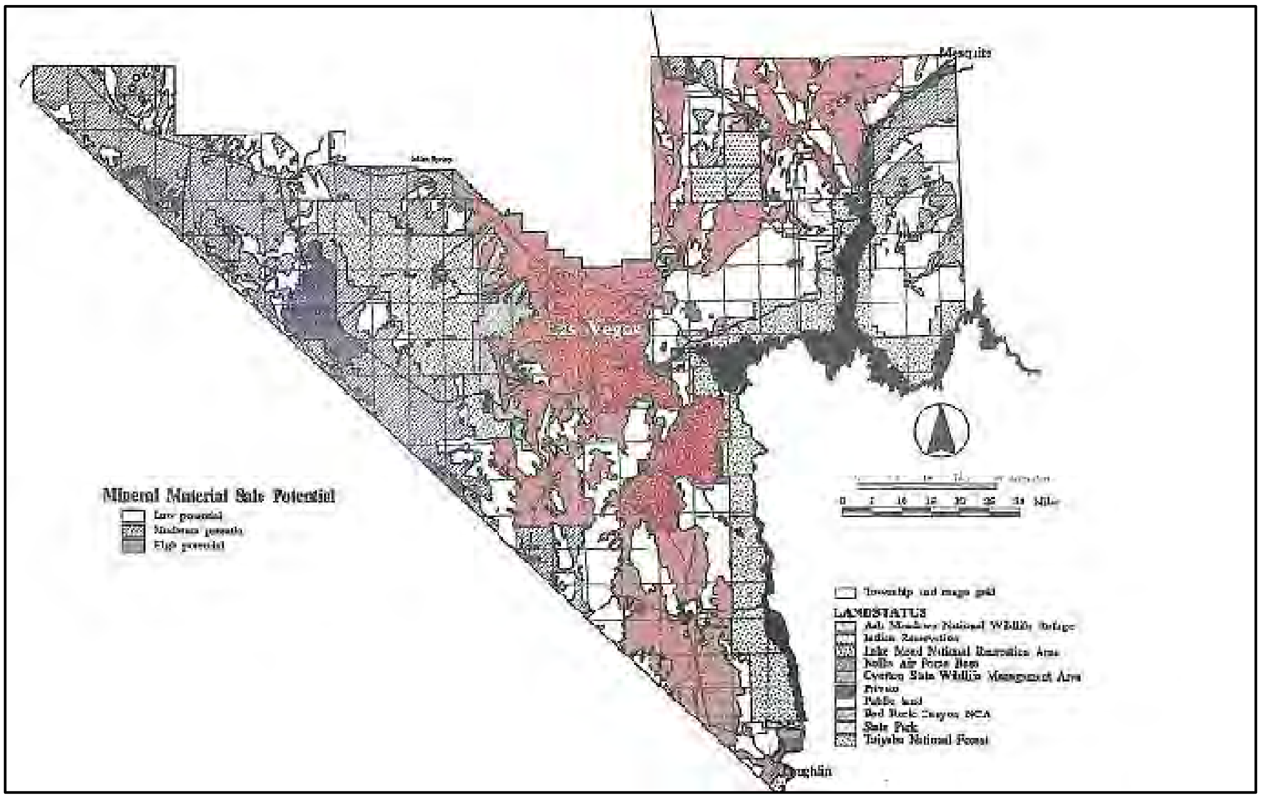


Figure 3.1-4. Saleable Minerals

Fluid Leasable Mineral Resources

The project area, as well as the surrounding BLM Las Vegas Field Office (LVFO) planning area, has a low potential for oil and gas deposits (BLM 1998). Currently, there are no fluid mineral leases within the Proposed Project Area.

3.2 Paleontological Resources

This section describes potential impacts on paleontological resources within and adjacent to the Proposed Project site. Additionally, this section discusses applicable regulations governing paleontological resources.

3.2.1 Region of Influence

The ROI evaluated for paleontological resources encompass those locations within the project area that might be disturbed by construction, O&M, and decommissioning of the Proposed Project.

3.2.2 Existing Environment

For this analysis, paleontological resources can be defined as the remains of prehistoric life preserved in the geologic record. These resources include fossilized plant and animal remains, casts or impressions of such remains, and unmineralized remains. Paleontological resources are classified as nonrenewable scientific resources and are protected by several federal and state statutes, which are described below.

The Potential Fossil Yield Classification (PFYC) system is used to determine the potential impacts on paleontological resources on BLM-administered lands (BLM 2007b). This system provides the ability to review the geology and attribute a general assumption as to the potential for this type of geology (at the surface) to provide for paleontological resources. There are five classes, with Class 1 being Very Low Potential and Class 5 being Very High Potential. These are defined by BLM as follows:

- A Class 1 paleo-resource area provides a very low potential for significant paleontological resources.
- A Class 2 paleo-resource area indicates a low potential for significant paleontological resources.
- A Class 3 paleo-resource area is defined as a moderate (3a), or unknown (3b) potential for significant paleontological resources (i.e., [a] the geology is known to have sporadic occurrences of fossils, or [b] there is not adequate information to determine the potential for paleontological resources). Work in both Class 3a and 3b areas may require preconstruction surveys.
- A Class 4 paleo-resource area has a moderate to high potential for significant paleontological resources, but has a varying potential for human or environmental degradation due to the presence or absence of protective covering, such as soil or vegetation. Work in Class 4 areas requires preconstruction surveys.
- A Class 5 paleo-resources area has a high potential to contain fossiliferous geologic units that consistently and predictably produce scientifically significant vertebrate or invertebrate fossils.

Based on literature reviews and record searches, the Proposed Project area is composed of geology that results in a PFYC of Class 1 and Class 2. As described above, a paleo-resource area classified as Class 1 is considered to be of very low potential for paleontological resources. The Class 1 areas of the Proposed Project site are designated as Quaternary alluvium. This indicates that there is rapid movement of sediment from flowing water, which would likely have carried away any potential paleontological resources. Also, the sediments might be too young to yield fossils of scientific significance. The majority of the Proposed Project area is classified as a Class 2 paleo-resource area. These Tertiary igneous rocks generally do not contain fossils of any kind. Based on the results of the literature and records reviews for the Proposed Project, no paleontological resources have previously been identified on the surface in this area, and the likelihood of such resources occurring belowground is low.

3.3 Water Resources

Water resources encompass surface water and groundwater systems that could be affected by water withdrawals and discharges, and spills or stormwater runoff associated with construction and O&M of the Proposed Project. Existing water resources in the Proposed Project area include surface water, groundwater, floodplains, and wetlands.

3.3.1 Region of Influence

While the ROI for the water resources analysis is focused on the project area, it includes a discussion on water resources within the watersheds (hydrologic basins) to establish a regional setting for the Proposed Project.

3.3.2 Existing Environment

The existing conditions described herein are based on the BLM's resource management concerns within the BLM 1998 Las Vegas RMP and associated ROD and the 2009 BLM Land Use Handbook standards. Specific issues raised during scoping for this project include protection of water quality and quantity during construction and appropriate issuance of permits.

3.3.2.1 Watershed Boundaries and Water Quality

The Watershed Protection and Flood Prevention Act (16 United States Code [USC] Sections 1001-1009) and the Nevada Water Quality Standards in the Nevada Administrative Code (NAC), Chapter 445A.118-445A.225, are the primary regulations governing activities that could affect water quality. The Clean Water Act (Section 303[d]) requires states, tribes, and territories to develop lists of impaired waters that do not meet set water quality standards. According to Nevada's 2006 303(d) list of impaired waters, none occur within or adjacent to the Proposed Project area. A draft 2008-2010 list is not yet available for review.

The project area encompasses approximately 30 total square miles (18,949 acres of BLM-managed land), spread across portions of two Hydrographic Flow Regions; the Central Region and the Colorado River Basin Region, both of which are a part of the greater Colorado Regional Flow System (Harrill et al. 1988). Figure 3.3-1 depicts the project area relative to hydrologic basin boundaries. The administrative hydrographic basins, or sub-basins, in the project area include (1) the Central Flow System's Eldorado Valley (31,608 acres) to the north, (2) Piute Valley (20,052 acres) to the west, and (3) Colorado River Valley (33,217 acres) to the east, both part of the Colorado River Basin. Western's proposed switching station is located in Colorado River Valley.

The chemical character and quality of a natural water source is determined by mineral content of the rock that water flows across or through and the ease with which the rock minerals dissolve into the water. Among the variables that influence the concentrations of dissolved constituents in water are contact time between water and rock minerals, evaporation (which reduces the volume of water and causes salts to concentrate), temperature (which influences solubility), and the concentration and character of the mineral constituents in the rock or sediment. Existing data in the project area are inadequate to characterize groundwater quality in the project area, which is set across variable geologic conditions and varying elevations. Both surface water and groundwater quality in and around the project area can be expected to vary significantly.

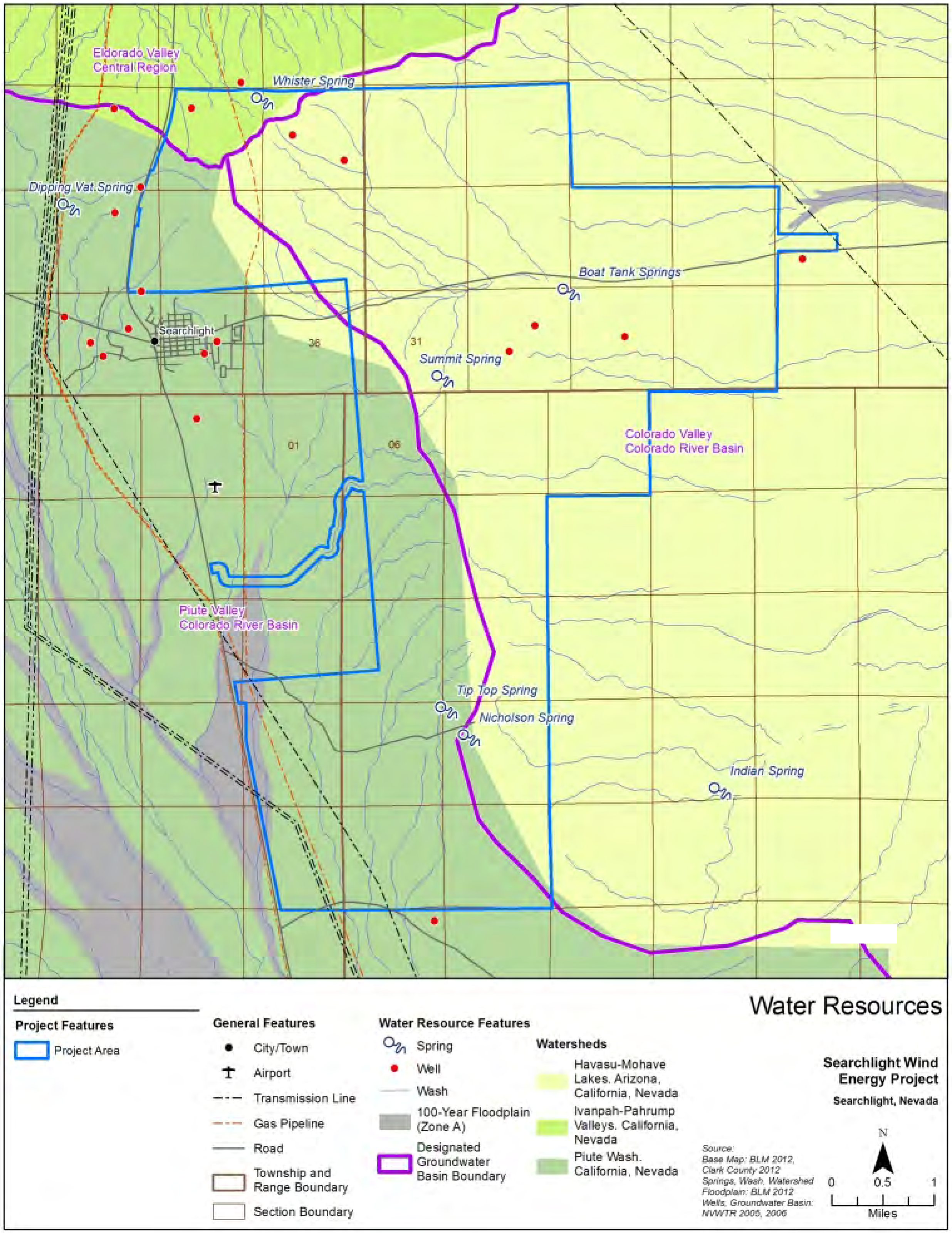


Figure 3.3-1. Project Area Water Resources

Watershed health is important to federal and state agencies as a means for protecting water quality. The BLM's Land Use Planning Handbook encourages a watershed-based approach for managing its lands and requires the BLM to identify watersheds that might need special protections for human health concerns, ecosystem health, or other public uses. Further, the BLM must ensure that proper measures are taken for enhancing watershed functions and conditions (BLM 2005a).

In October 2005, the U. S. Environmental Protection Agency (EPA) developed the *Draft Handbook for Developing Watershed Plans to Restore and Protect our Waters*. The handbook describes how to develop and implement a watershed plan to meet water quality standards that protect water resources. Because the project area encompasses multiple watersheds, it is important that the Proposed Project analysis includes consideration of the BLM's management directives for developing sites within watersheds that include proper hydrologic functions and conditions.

BMPs are identified by the State of Nevada to minimize contributions from both point and non-point sources of pollution from public land management actions (BLM 1998). The BLM also must ensure that any nonpoint source BMPs and rehabilitation techniques meet state and local water quality requirements (BLM 2005a). Clark County's 2008 Land Use Plan encourages the use of landscaping for buffering, erosion control, and stormwater runoff control for maintaining acceptable water quality conditions. In addition, use of conservation programs via water reuse is encouraged in the Clark County Land Use Plan. Application of these local measures and programs for the Proposed Project would be encouraged by the BLM in support of local water quality requirements. For example, the Applicant would need to see that construction and use of access roads for the Proposed Project do not negatively affect water quantity and quality. These measures could be achieved by implementing a Clark County-approved stormwater protection plan during construction, O&M, and decommissioning of the Proposed Project.

3.3.2.2 Surface Water

Within the Proposed Project area, no perennial surface waters are present. However, numerous ephemeral desert washes pass through the project area. These washes flow only in conjunction with storm events and are known locations of flash floods. When these washes flow, much of the water percolates into the coarse alluvium overlying the valley slopes. Because evaporation greatly exceeds rainfall in the valleys, salts tend to be transported from the higher elevations to the valleys, where they accumulate. Therefore, water quality tends to decline as it moves downstream within the basins. The BLM supports the Clark County Regional Flood Control District (CCRFCD) Master Plan as a means to lessen damages caused by flash floods (CCRFCD 2008a). In some instances, the CCRFCD Master Plan requires the installation of flood control features such as conveyance measures and detention basins.

According to the USGS data, five springs occur within the project area: Whister Spring in Southern Eldorado Valley, Boat Tank Springs and Summit Spring in the Colorado River Valley, and Tip Top Spring and Nicholson Spring in Piute Valley (Nevada Division of Water Resources [NDWR] 2006) (Figure 3.3-1). Springs could be a source for wetland conditions, and some are known to have an average flow of 5.5 gallons per minute (gpm), with high flows of up to 75 gpm (CCRFCD 2008a).

3.3.2.3 Floodplains

FEMA designates floodplain zones. Zone A indicates an area is "subject to inundation by the 1-percent-annual-chance flood event," and mandates the purchase of flood insurance. The Zone A designation does not include floodways, which occur within floodplains and inhibit development encroachment activities (FEMA 2009). Figure 3.3-1 shows 0.32 square mile of a FEMA-designated 100-year floodplain within and along the southwestern boundary of the Proposed Project area. Another designated 100-year floodplain lies immediately outside the northeastern boundary of the project area (north of Cottonwood Cove Road). Western's proposed switching station site does not lie within a designated 100- or 500-year floodplain.

Although the project area is not located within the boundaries of the CCRFCD, the CCRFCD is updating the *2003 Flood Control Facilities Pla*n for the town of Searchlight (Clark County 2008a). Because Searchlight is nearby and down-gradient from a portion of the Proposed Project, any flood control conveyance plans designed for the project within the 100-year floodplain would need to complement a finalized flood control plan for Searchlight. For example, the CCRFCD Master Plan includes proposed detention and conveyance structures designed to detain a 100-year flow event and reduce downstream flows (Clark County 2008a). Application of this Master Plan supports the BLM's watershed approach to managing its lands, as discussed above in Section 3.3.1.

3.3.2.4 Groundwater Resources

The Proposed Project area encompasses portions of the Central Region and Colorado River Basin hydrographic areas, which includes the Eldorado Valley, Piute Valley, and the Colorado Valley groundwater basins.

Groundwater in Eldorado Valley is derived primarily from two sources: recharge over the basins and subsurface inflow from Hidden Valley (Rush and Huxel 1966). The recharge derived from flow from Hidden Valley is believed to be less than 300 acre-feet per year (acre-feet/year) (Rush and Huxel 1966). Piute Valley is recharged by precipitation and snowmelt runoff from the Piute Range, the Castle Mountains, and the McCullough Range, as well as groundwater flows from the adjacent, upgradient Ivanpah Valley. The Colorado River Valley is recharged primarily from precipitation and snowmelt runoff from the Eldorado Mountains, as well as groundwater inflow from Eldorado Valley.

The depth to water in the project area is believed to be highly variable. NDWR on-line records list several wells located within the project area (NDWR 2011). Static water depths in these wells range from approximately 170 feet to over 270 feet below surface grade.

Groundwater in Eldorado Valley is predominantly a sodium-bicarbonate type with high concentrations of total dissolved solids (TDS) and a medium-to-high salinity hazard (Rush and Huxel 1966). Groundwater in the southern and southeastern parts of Piute Valley is sodium bicarbonate in character and ranges in TDS content from 196 to 329 milligrams per liter (mg/L). Analyses of water from one well near Goffs, California, shows fluoride concentrations ranging from 1.0 to 1.7 mg/L. Water from a well near Searchlight has calcium-sodium sulfate-bicarbonate character with a TDS content of 698 mg/L (DWR 1954). Historic analyses of the groundwater in some areas of the surrounding valleys indicate that concentrations of TDS, sulfate, and chloride exceed drinking water standards. The presence of historic mining districts suggests that soluble metals and other trace constituents might be present in portions of the bedrock aquifer. According to information on file with the Clark County Department of Health Services, iron, lead, manganese, mercury, and nitrate have been detected in groundwater at levels exceeding their respective maximum contaminant levels in the Searchlight area (Buqo and Giampaoli 1988). However, the annual *Water Quality Report for Searchlight Water System* (SNWA 2010), the water service provider closest to the project area, shows that the treated water meets all primary Safe Drinking Water Act standards. The report does not, however, present influent data from the two supply wells.

There are a number of springs in the project area, but the combined discharge rate of these springs varies seasonally and should not be relied upon for a consistent source of operational water. The more significant springs include Whister Spring in Southern Eldorado Valley, Boat Tank Spring and Summit Spring in the Colorado Valley, and Tip Top Spring and Nicholson Spring in Piute Valley. These springs are an important source of water and habitat for wildlife.

Water for the Proposed Project would be obtained from an existing utility or an existing water right. Based on NDWR well log data, eight groundwater wells occur within the project area. Unfortunately, the well logs do not specify quality of water for the wells. None of the eight wells drilled on public lands within the project area are located within the Proposed Project's construction area footprint (BLM 1998).

The Searchlight Water System (SWS) is owned and operated by the Las Vegas Valley Water District. The SWS service area is supplied by two wells located in Piute Valley. It should be noted that these two wells are set in an alluvial aquifer, whereas the eight wells located within the project area are likely to be screened in either fractured granite or thermally altered bedrock. Well S-2 is the primary well, and the backup well, S-1, is used mainly in emergencies.

3.3.2.5 Water Use and Discharge

The Nevada State Water Engineer has recorded the Eldorado Valley and the Piute Valley as Designated Groundwater Basins. The Colorado River Valley is Irrigation Denied.

The Eldorado Valley has committed groundwater resources of 2,390 acre-feet/year, which is more than four times the estimated perennial yield of 500 acre-feet per year. The Piute Valley has committed groundwater resources of 5,039 acre-feet/year, which is over 16 times the estimated perennial yield of 300 acre-feet/year. The Colorado River Valley has committed groundwater resources of 4,547 acre-feet/year, which is over 22 times its estimated perennial yield of 200 acre-feet/year. Appropriated water rights are registered primarily to mining and milling operations and municipalities, with minor quantities of water appropriated for quasi-municipal, stock watering, and industrial use (NDEP 2011).Table 3.3-1 presents a summary of appropriated water rights, in acre-feet, for the three valleys in the project area.

Table 3.3-1. Summary of Appropriated Water Rights (in acre feet)

Manner of Use	Eldorado Valley	Piute Valley	Colorado Valley
Commercial	-	10.08	5.71
Environmental	-	-	3605.47
Industrial	2.95	-	128.14
Mining/Milling	1743.14	299.17	58.18
Municipal	500	4358	3.28
Quasi Municipal	0.12	311.19	610.1
Recreation	-	-	134.45
Stock Water	9.83	60.65	-

Source: NDEP 2011

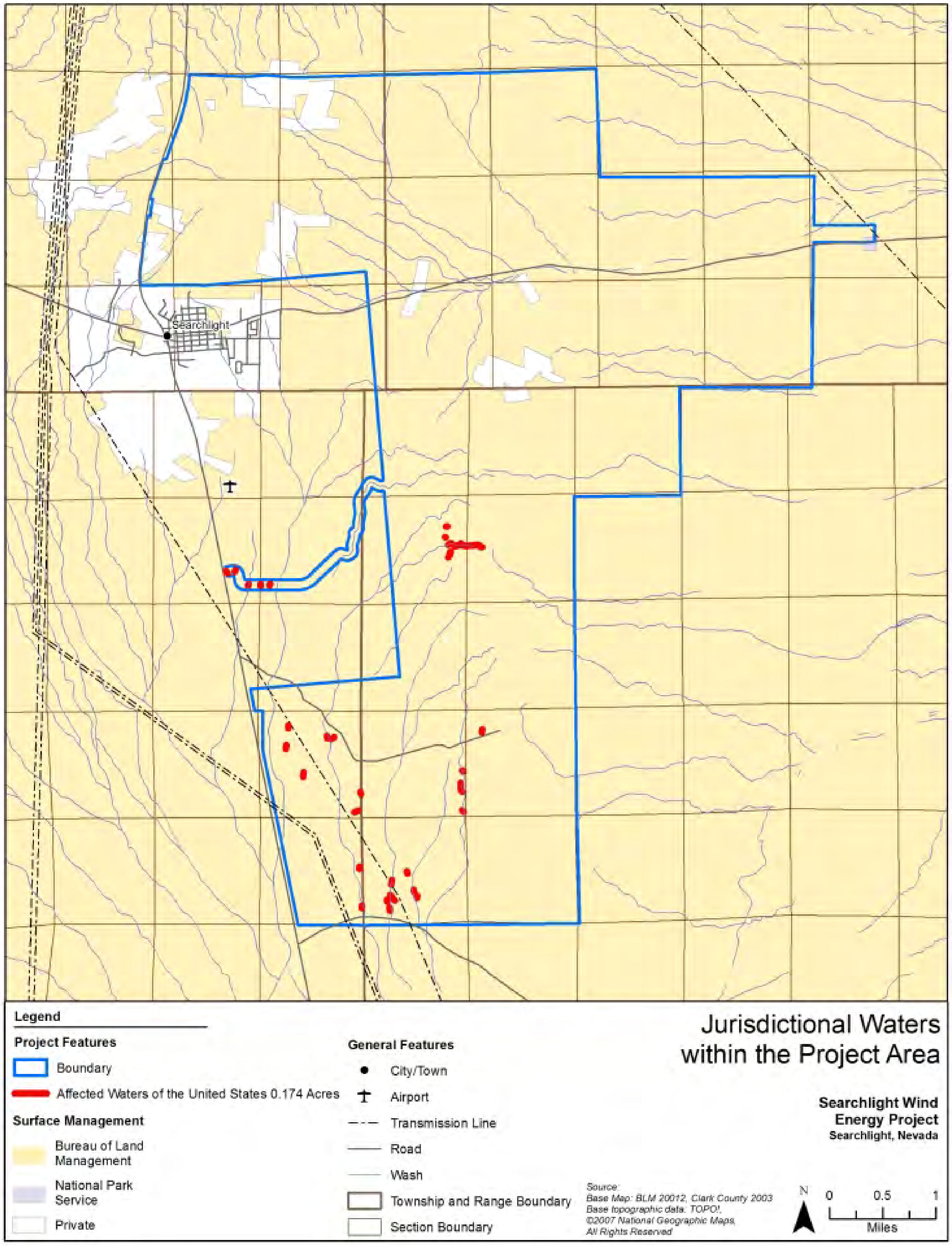
Clark County Water Reclamation District (CCWRD) operates a wastewater treatment facility located in the southwestern portion of Searchlight. Water users not connected to the Searchlight Water Resource Center sewer system discharge their wastewater to private septic systems. The CCWRD system treats an estimated 500,000 gallons of wastewater per day. The wastewater is treated in a series of oxidation ponds, where the effluent either evaporates or flows into an adjacent wash.

3.3.2.6 Jurisdictional Waters, Drainages, and Riparian Areas

The Proposed Project area encompasses approximately 8 unnamed ephemeral desert washes and approximately 15 tributaries (USGS 2003 data). As shown on Figure 3.3-1, the project area lies across a portion of the 100-year return flood zone; therefore, a jurisdictional delineation was required by the U. S. Army Corps of Engineers (USACE) in accordance with the Clean Water Act (33 USC Section 1251). Delineations are done to assess the existing conditions and document the presence of potential jurisdictional waters of the United States.

A formal jurisdictional delineation was conducted within the project area and identified areas under the jurisdiction of the USACE throughout the southern portion of the project area. No USACE jurisdictional wetlands occur within the project area. The USACE jurisdictional non-wetland waters of the U.S. (WOUS) within the project area total 0.174 acre (Figure 3.3-2) That comprise a tributary to Piute Wash, a named wash located approximately 3 miles south-southeast of the project area (Figure 3.3-2). The

USACE will require a Section 404 Permit for the construction of an access road and drainage system crossing jurisdictional waters located within the boundaries of the Proposed Project.



1
2 **Figure 3.3-2. Jurisdictional Waters in the Proposed Project Area**

Additionally, application of BMPs would be necessary to see that activities upstream (in the project area) do not negatively affect water quality standards downstream. Such management practices would be mandated by the NAC, Chapter 445A.118-445A.225, and enforced by the CCDAQEM through NDEP Bureau of Water Quality Planning, if determined to be necessary.

Eldorado Valley is topographically closed. Surface water drains primarily toward a dry playa in the northeast portion of the valley. Groundwater flow in the valley is presumed to flow eastward through the volcanic rocks of the Eldorado Mountains into the Colorado River Valley. The Piute Valley is open to the southeast. Groundwater flow in the Piute Valley is believed to flow westward from the mountain toward the valley floor, where flow bends toward the southeast. Groundwater in this valley is presumed to discharge into the Colorado River near Needles, California. In the project vicinity, the Colorado River Valley groundwater presumably flows east and discharges into the Colorado River.

Spring systems and ephemeral washes are important ecosystems in arid environments. These resources provide water and habitat for wildlife and plant species. Based on review of aerial images, minor, isolated riparian areas exist in the vicinity of the springs located within the project area. These riparian areas may act as filtering zones, removing sediment and nutrients from spring waters. The vegetation communities, which might include cottonwood, willow, and brush, provide stability and protect from erosion and bank sloughing, which reduces the potential for nutrient loading. For further discussion on vegetation resources, see Section 3.4, Biological Resources.

3.4 Biological Resources

This section discusses existing conditions relative to the biological resources within and adjacent to the Proposed Project area that would be affected from construction, O&M, and decommissioning of the Proposed Project. For organizational purposes, general vegetation communities and special-status plant species are addressed first, followed by general wildlife resources and special- status wildlife species.

3.4.1 Vegetation

This section addresses vegetation resources within and adjacent to the project area. Vegetation resources discussed in this section include plant communities and noxious and invasive plant species. Special-status plant species, cacti, and yucca are discussed in Section 3.4.2.

3.4.1.1 Region of Influence

The ROI evaluated for vegetation resources encompasses those locations within the project area that might be disturbed by construction, O&M, and decommissioning of the Proposed Project.

3.4.1.2 Existing Environment

Vegetation resources data were obtained from the Southwest Regional Gap Project (GAP) (USGS 2004; Lowry et al. 2005). According to the GAP data, vegetation communities and land cover types identified within the Proposed Project area include North American Warm Desert Bedrock Cliff and Outcrop; Mojave Mid-Elevation Mixed Desert Scrub; Sonora-Mojave Creosote Bush-White Bursage Desert Scrub; Sonora-Mojave Mixed Salt Desert Scrub; Inter-Mountain Basins Semi-Desert Shrub Steppe; and North American Warm Desert Wash

Listed below are the abbreviated GAP land cover type descriptions for all vegetation communities or land cover types found within the Proposed Project area (USGS 2004).

North American Warm Desert Bedrock Cliff and Outcrop

This ecological system extends from subalpine to foothill elevations and includes barren and sparsely vegetated landscapes (generally less than 10% plant cover) of steep cliff faces; narrow canyons; and smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock types. Botanical species present are diverse and might include elephant tree (*Bursera microphylla*), ocotillo (*Fouquieria splendens*), Bigelow's nolina (*Nolina bigelovii*), teddybear cholla (*Opuntia bigelovii*), and other desert species, especially succulents. Lichens are predominant life forms in some areas.

Mojave Mid-Elevation Mixed Desert Scrub (Shrub/Scrub Class)

This ecological system represents the extensive desert scrub in the transition zone above creosote bush – burrobush (*Ambrosia dumosa*) desert scrub and below the lower montane woodlands (elevations of 2,300 to 5,900 feet) that occur in the eastern and central Mojave Desert. It is also common on lower piedmont slopes in the transition zone into the southern Great Basin. The vegetation in this ecological system is quite variable. Examples of codominants and diagnostic species include blackbrush (*Coleogyne ramosissima*), Eastern Mojave buckwheat (*Eriogonum fasciculatum*), rough jointfir (*Ephedra nevadensis*), spiny hopsage (*Grayia spinosa*), buckhorn cholla (*Opuntia acanthocarpa*), Mexican bladdersage (*Salazaria mexicana*), Joshua tree (*Yucca brevifolia*), or Mojave yucca (*Y. schidigera*). Desert grasses, such as Indian ricegrass (*Achnatherum hymenoides*), desert needlegrass (*A. speciosum*), or Sandberg bluegrass (*Poa secunda*) might form an herbaceous layer. Scattered Utah juniper (*Juniperus osteosperma*) or desert scrub species may also be present.

Sonora-Mojave Creosote Bush–White Bursage Desert Scrub

This ecological system forms the vegetation matrix in broad valleys, lower alluvial fans, plains, and low hills in the Mojave and lower Sonoran Deserts. Desert scrub is characterized by a sparse to moderately dense layer (2% to 50% cover) of xenomorphic microphyllous and broad-leaved shrubs. Creosote bush and burrobush are typically dominants, but many different shrubs, dwarf-shrubs, and cacti may codominate or form typically sparse understories. Associated species may include fourwing saltbush (*Atriplex canescens*), desert holly (*A. hymenelytra*), brittlebush (*Encelia farinosa*), rough jointfir, ocotillo, water jacket (*Lycium andersonii*), and beavertail pricklypear (*Opuntia basilaris*). The herbaceous layer is typically sparse, but might be seasonally abundant with early season annual plants. Herbaceous species such as sandmat (*Chamaesyce* species [spp.]), desert trumpet (*Eriogonum inflatum*), low woollygrass (*Dasyochloa pulchella*), threeawn (*Aristida* spp.), cryptantha (*Cryptantha* spp.), fiddleleaf (*Nama* spp.), and phacelia (*Phacelia* spp.) are common.

Sonora–Mojave Mixed Salt Desert Scrub

This system includes extensive open-canopied shrublands of typically saline basins in the Mojave and Sonoran Deserts. Stands often occur around playas. Substrates are generally fine-textured, saline soils. Vegetation is typically composed of one or more Atriplex species, such as fourwing saltbush and cattle saltbush (*Atriplex polycarpa*). Species of allenrolfea (*Allenrolfea* spp.), pickleweed (*Salicornia* spp.), seepweed (*Suaeda* spp.), or other halophytic plants are often present to codominant. Graminoid species might include alkali sacaton (*Sporobolus airoides*) or saltgrass (*Distichlis spicata*) at varying densities.

Inter-Mountain Basins Semi-Desert Shrub-Steppe

This ecological system occurs throughout the intermountain western U.S. at evaluations ranging from 980 feet to 8,200 feet on alluvial fans and flats with moderate to deep soils. Semi-arid shrub-steppe is typically dominated by graminoids (more than 25% cover) with an open shrub layer. Characteristic grasses include Indian ricegrass, blue grama (*Bouteloua gracilis*), saltgrass, needle and thread (*Hesperostipa comata*), James' galleta, Sandberg bluegrass, and alkali sacaton. The shrub or woody layer is often a mixture of shrubs and dwarf-shrubs. Characteristic species include fourwing saltbush, big sagebrush (*Artemisia tridentata*), Greene's rabbitbrush (*Chrysothamnus greenei*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), jointfir (*Ephedra* spp.), rubber rabbitbrush (*Ericameria nauseosa*), broom snakeweed (*Gutierrezia sarothrae*), and winterfat (*Krascheninnikovia lanata*). Big sagebrush might be present but does not dominate. The general aspect of occurrences might be either open shrubland with patchy grasses or patchy open herbaceous layer.

North American Warm Desert Wash

This ecological system is restricted to intermittently flooded washes or arroyos that dissect alluvial fans, mesas, plains, and basin floors throughout the warm deserts of North America. Although often dry, the intermittent fluvial processes define this system, which are often associated with rapid sheet and gully flow. The vegetation of desert washes is quite variable, ranging from sparse and patchy to moderately dense, and typically occurs along the banks but might occur within the channel. The woody layer is typically intermittent to open and might be dominated by shrubs and small trees such as catclaw acacia (*Acacia greggii*), desert broom (*Baccharis sarothroides*), desert willow (*Chilopsis linearis*), Apache plume (*Fallugia paradoxa*), burrobrush (*Hymenoclea salsola*), singlewhorl burrobrush (*Hymenoclea monogyra*), mesquite (*Prosopis* spp.), smoketree (*Psorothamnus spinosus*), desert almond (*Prunus fasciculata*), littleleaf sumac (*Rhus microphylla*), or greasewood (*Sarcobatus vermiculatus*).

Vegetation in the Proposed Project Area

The distribution of the vegetation community types within the project area boundary is shown in Figure 3.4-1.

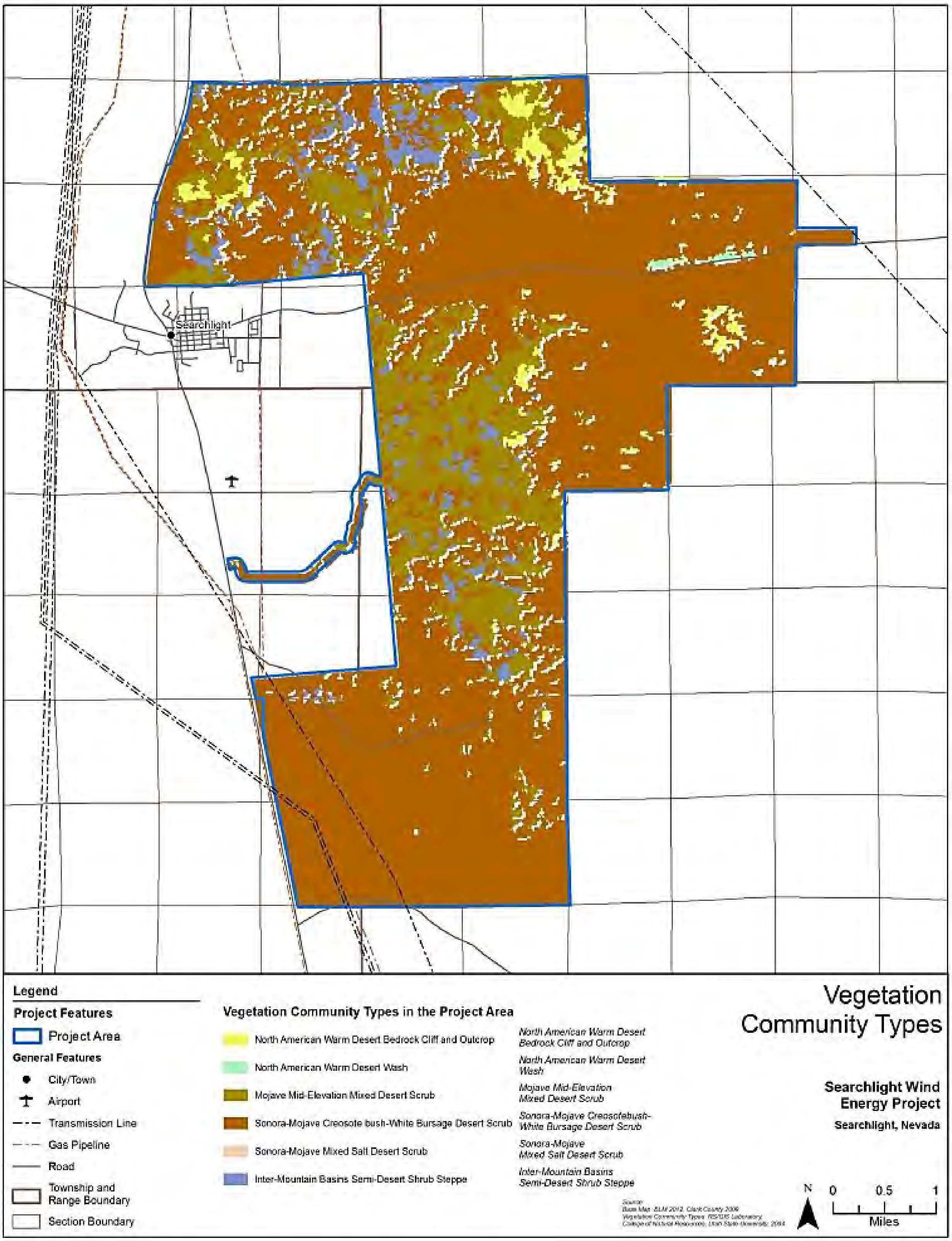


Figure 3.4-1. Vegetation Community Types

As illustrated byFigure 3.4-1, Sonora-Mojave Creosote Bush-White Bursage Desert Scrub covers 73.2% and is the dominant ecological system in the project area. Mojave Mid-Elevation Mixed Desert Scrub is the second most common ecological system (19%); the third most common is the Inter-Mountain Basin Semi-Desert Shrub Steppe (4.7%). The three remaining ecological systems comprise the remaining 3% of the project area. Ecological systems, acres, and percentages of each land cover type within the project area are displayed in Table 3.4-1.

Table 3.4-1. Vegetation Community Types of the Proposed Project Area

Ecological System	Acres (in Project Study Area)	Acres (at Western's Switching Station)	% of Project Area
Sonora-Mojave Creosote Bush-White Bursage Desert Scrub	13,860	7	73.2
Mojave Mid-Elevation Mixed Desert Scrub	3,608	N/A	19.0
Inter-Mountain Basins Semi-Desert Shrub Steppe	892	N/A	4.7
North American Warm Desert Bedrock Cliff and Outcrop	494	N/A	2.6
North American Warm Desert Wash	76	N/A	0.4
Sonora-Mojave Mixed Salt Desert Scrub	19	N/A	0.1
Total	**18,949**	**7**	**100.0**

N/A = not applicable

Noxious and Invasive Species

A noxious weed is a legal and regulatory designation. Nevada Revised Statute (NRS) 555.005 states that noxious weeds are “any species of plant which is, or is likely to be, detrimental or destructive and difficult to control or eradicate.” The State of Nevada maintains a list of designated state noxious weeds (NAC 555.010). Currently 47 species are included on the Nevada Noxious Weed List.

Sahara mustard (*Brassica tournefortii*) was the only Nevada noxious weed species observed in the Proposed Project area. This species is considered a Category B; therefore, control is required by the State in areas where populations are not well established or previously unknown to occur.

Additionally, several non-native invasive species were observed throughout the Proposed Project area including Mediterranean grass (*Schismus sp.*), red brome (*Bromus rubens*), and red-stemmed filaree (*Erodium cicutarium*). An invasive species has no legal designation and therefore, no requirements for control or eradication. However, they can be defined as a species that can out-compete native vegetation, establish monocultures, alter fire regimes, and cause other harm to the natural ecosystem.

For more detailed information on botanical survey methods and results within the Proposed Project area, refer to the 2010 Searchlight Botanical Survey (Alphabiota Environmental Consulting [AEC] 2010). A copy of this report can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

3.4.2 Special-Status Plant Species

Special-status plant species are protected under Nevada state law, BLM policies, and the Endangered Species Act (ESA). For the purposed of this EIS, special-status species are defined as:

- Species listed or proposed for listing as threatened or endangered under ESA (50 Code of CFR 17.12 for listed plants and various notices in the Federal Register [FR] for proposed species); FR 40657, June 13, 2002);
- Species that are candidates for possible future listing as threatened or endangered under the ESA (967, FR 40657, June 13, 2002);
- Species that are federal species of concern ;

- Species or habitats included in BLM Manual 6840, Special Status Species Management;
- Species that are listed or proposed for listing by the State of Nevada as threatened or endangered (NRS 527.260-3000 and NRS 527.0600-120);
- Species listed in the Clark County Multiple Species Habitat Conservation Plan (MSHCP) (Clark County, 2000); and
- Species that are protected under NRS 527.060-527.120, Nevada State Protection of Christmas Trees, Cacti, and Yucca.

3.4.2.1 Methodology and Survey Results

In order to assess the special-status plant species (excluding cactus and yucca) that have the potential to occur within the Proposed Project area, a biologist reviewed several data sources. Some of these sources included the Nevada Natural Heritage Program, U.S. Fish and Wildlife Service (USFWS) special status species and critical habitat database, Nevada Native Plant Society online database, BLM on-line resources, and the USFWS National Wetlands Inventory Geographic Information System database (AEC 2010). After comparing potential plants species' soil requirements with the soils types in the area, a list of target species was developed (AEC 2010). It was determined that three species had a high likelihood of occurring within the Proposed Project area, including white-margined beardtongue (*Penstemon albomarginatus*), yellow two-toned beardtongue (*Penstemon bicolor* spp. *bicolor*), and rosy two-toned beardtongue (*Penstemon bicolor* spp. *roseus*). Subsequently, botanical surveyors used this list of target species to focus survey efforts.

AEC conducted botanical surveys from March 2, 2010 through April 4, 2010, and May 1, 2010 through May 10, 2010. Surveys were conducted to locate and identify potential sensitive plants species and/or populations that could potentially occur within the Proposed Project area. Nevada BLM Intuitive Controlled Survey Protocols were used to survey for special-status plant species. According to the BLM, this method includes a complete survey in habitats with the highest potential for having target species. Teams of biologists walked meandering pedestrian transects at 50 to 100 foot intervals.
Four hundred foot-wide survey corridors were developed around the proposed center line of turbine strings, roads, collector lines, and transmission lines. Other features such as the O&M building, substation, and laydown area were buffered by 200 feet from the outer edge. Surveyors determined necessary spacing based on the visual cues of the habitat, topography, and/or accessibility of the terrain.

No special-status plants (excluding cacti and yucca) were found in the Proposed Project area. For more detailed information on botanical survey methods and results within the Proposed Project area, refer to the 2010 Searchlight Botanical Survey (AEC 2010). A copy of this report can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

3.4.2.2 Cacti and Yucca Methodology and Survey Results

AEC biologists completed a Cactus and Yucca Count Estimate Survey within the project area. Cacti and yucca counts were conducted by pedestrian survey within six different areas based on topography and vegetation. Estimates were based on counting the number of each species of cacti and/or yucca within 30 feet of a transect (15 feet on either side of the transect centerline). In total, 69 linear transects (approximately 32 miles) were completed. Cacti and yucca estimates were calculated by extrapolating the transect area data to account for numbers of each species per acre.

Thirteen species of cacti and yucca were detected during the survey count. Table 3.4-2 summarizes the species of cacti and yucca found within the project area and the estimated number of individuals per acre in the survey area.

Table 3.4-2. Cacti and Yucca Species Found in the Proposed Project Area and Estimated Number per Acre

Scientific Name	Common Name	Average Estimated Number per Acre
Yucca brevifolia	Joshua Tree	14.38
Yucca schidigera	Mojave Yucca	38.92
Cylindropuntia acanthocarpa var. *coloradensis*	Buckhorn Cholla	9.21
Opuntia basilaris var. *basilaris*	Beavertail Cactus	3.04
Sclerocactus johnsonii	Pineapple Cactus	0.14
Cylindropuntia echinocarpa	Silver or Golden Cholla	0.32
Echinocactus polycephalus var. *polycephalus*	Cottontop Cactus	0.33
Mammalaria tetrancistra	Fishhook Cactus	0.03
Ferocactus cylindraceus	Barrel Cactus	0.34
Echinocereus engelmannii	Engelmann Hedgehog Cactus	0.17
Grusonia parishii	Parish club-Cholla, Horse Crippler	0.06
Cylindropuntia bigelovii	Teddybear Cholla	0.55
Cylindropuntia ramosissima	Pencil Cholla	0.29

Joshua tree (approximately 14 individuals per acre) and Mojave yucca (approximately 39 individuals per acre) were estimated to be the most abundant species with the Proposed Project area. Collectively, cactus plants were estimated at approximately 15 individual plants per acre, with Buckhorn cholla having the highest cactus estimated abundance at approximately 9 plants per acre.

For more detailed information on botanical survey methods and results within the Proposed Project area, refer to the 2010 Searchlight Botanical Survey (AEC 2010). A copy of this report can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

3.4.3 Wildlife Resources

This section addresses general wildlife resources. It describes common wildlife, specifically reptiles, and small mammals. These species are relatively abundant and do not have state or federal protections. Special-status species, including migratory birds and game, are addressed in 3.4.4-Special-Status Wildlife Species.

3.4.3.1 Region of Influence

The ROI for wildlife varies by species, depending on range, mobility, or migratory behavior. Generally, the ROI for small wildlife such as reptiles and small mammals (excluding bats) is limited to the Proposed Project area. Existing Environment

Wildlife found in the Proposed Project area are typically associated with the Sonora-Mojave Creosote Bush-White Bursage Desert Scrub (13,901 acres) and Mojave Mid-Elevation Mixed Desert Scrub (3,608 acres), Inter-mountain Basins Semi-Desert Shrub Steppe (892 acres), and North American Warm Desert Bedrock Cliff and Outcrop (494 acres), which collectively encompass approximately 99%of the Proposed Project area. General wildlife observations were made during terrestrial wildlife surveys and desert tortoise surveys conducted in the spring of 2010 by Southern Nevada Environmental Inc. (SNEI).

3.4.3.2 Existing Environment

Reptiles

A wide variety of reptiles may be present in the Proposed Project area. Lizards commonly observed during terrestrial field surveys are representative of typical Mojave wildlife. Species observed included side-blotched lizard (*Uta stansburiana*), Great Basin whiptail (*Aspidoscelis tigris*), zebra-tailed lizard (*Callisuarus draconoides*), long-nosed leopard lizard (*Gambelia wislizenii*), desert spiny lizard (*Sceloporus magister*), desert horned lizard (*Phrynosoma platyrhinos*), chuckwalla (*Sauromalus ater*), and desert iguana (*Dipsosaurus dorsalis*) (Tetra Tech 2011b).

Common snakes observed during field surveys included the western ground snake (*Sonara semiannulata*), Mojave rattlesnake (*Crotalus scutulatus*), speckled rattlesnake (*Crotalus mitchellii*), western patch nosed snake (*Salvadora hexalepis*), and shovel nosed snake (*Chionactis occipitalis occipitalis*) (Tetra Tech 2011b). A variety of other snakes could occur in the vicinity.

Small Mammals

The creosote desert scrub communities provide forage and cover for a number of small mammal species within the Proposed Project area. Species that were observed during terrestrial field surveys are representative of those that can be found throughout the Mojave Desert. Species observed include white-tailed antelope ground squirrel (*Ammospermophilus leucurus*), black-tailed jackrabbit (*Lepus californicus*), and pack rat (*Neotoma lepida*). Other small mammals might also be found within the project area, including kangaroo rats (*Dipodomys* spp.), pocket mice (*Chaetodipus* spp. and/or *Perognathus* spp), and ground squirrels (*Spermophilus* spp.).

Bats

Thirteen out of 16 bat species found in the Proposed Project area have some federal or state special status, and bats are one of the principal wildlife concerns associated with wind energy generation facilities. Bats are addressed in Section 3.4.4, Special-Status Wildlife Species.

Birds

As most birds are protected under the Migratory Bird Treaty Act (MBTA) as well as other federal and state laws, and birds are often a primary concern associated with wind energy generation facilities, birds are specifically discussed in Section 3.4.4, Special-Status Animal Species.

3.4.4 Special-Status Wildlife Species

Special-status animal species are legally protected under Nevada state law, BLM policies, and the ESA. For the purpose of this EIS, special-status species are defined as:

- Wildlife species that are listed as threatened or endangered or species proposed or candidates for listing under the Endangered Species Act of 1973 as amended (50 CFR 17.11 and subsequent notices published in the Federal Register);
- Species or habitats included in BLM Manual 6840, Special Status Species Management, BLM Instruction Memorandum 2008-050, MBTA – Interim Management Guidance (DOI, BLM 2007a);
- Wildlife classified by the State of Nevada as protected and which may have further classification as sensitive, threatened, or endangered (under NAC 503.030-503.080, NRS 501.100-503.104, NRS 527.050, and NRS 527.60-527.300); and
- Game species that are regulated under NRS 503.120 and NAC 502.020-503.025.

To develop a concise list of special-status wildlife species that could occur within the Proposed Project area, data were compiled from the *USFWS Nevada's Protected Species by County (*2011), the Nevada BLM Sensitive Species list, the Nevada State Protected Species List, and the Nevada Natural Heritage Program database. Several biologists reviewed the data to determine which species could occur within the Proposed Project area. Additionally, agency biologists from the USFWS, NDOW, and the BLM were consulted to provide additional input and direction. Species with no potential to occur within the project area due to lack of habitat or limited range were eliminated from this analysis.

3.4.4.1 Region of Influence

The ROI for wildlife varies by species, depending on range, mobility, or migratory behavior. Generally, the ROI for reptiles was limited to the Proposed Project area. Birds and bats, however, are more mobile and migrate over longer distances; therefore, the ROI was considered the project area boundary to the eastern edge of the Pacific Flyway. For game species, the ROI was the relevant hunt unit(s) with which the hunt area overlaps.

3.4.4.2 Existing Environment

Desert Tortoise

Pre-project desert tortoise surveys were conducted from April 4 to May 16, 2011, in accordance with USFWS 2010 guidelines. The survey area included a 400-foot wide corridor around the proposed centerline of linear features such as the WTG strings, roads, collector line, and transmission lines; and a 200-foot buffer around other project features such as the O&M building, substation, Western's proposed switching station, and staging areas. Additionally, interior islands (i.e., areas enclosed by project features) were included in the survey area. In total, approximately 3,612 acres were surveyed with 100 percent coverage. Additional belt transects were surveyed at 200, 400, and 600 feet around the perimeter of the survey corridor. Locations of all tortoises and signs of tortoise were recorded with a global positioning system unit.

The results of the Spring 2011 surveys documented that desert tortoises were present within the Proposed Project area. A total of 122 tortoises were found within the survey area (95 in the action area, 19 in the exterior belt transects, and 8 incidentals). Other observed and documented desert tortoise sign included 240 pieces of scat, 95 carcasses, 750 tortoise burrows, and 22 pieces of miscellaneous sign (1 courtship ring, 2 egg shell fragments, and 19 bone/scute fragments).

Tortoise density was calculated using methods found in USFWS 2010 *Preparing for Any Action that may Occur within the Range of the Mojave Desert Tortoise*. Using the USFWS model, the actual number of adult tortoises above 160 millimeters mean carapace length (mcl) in the Proposed Project area was predicted to be approximately 119, with a 95% confidence interval of approximately (60, 234) and an approximate density of 8.2 tortoises per square kilometer (km^2) (SNEI 2011).

For more detailed information on desert tortoise survey methods and results within the Proposed Project area, refer to the Desert Tortoise Inventory Survey of the Proposed Duke Energy Searchlight Wind Farm (SNEI 2011). A copy of this report can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

Chuckwalla

Chuckwalla (*Sauromalus ater*) are classified as a BLM Nevada Sensitive Species. The chuckwalla is restricted to rocky areas in desert flats, hillsides, and mountains where crevices are available for shelter. The common chuckwalla is widely distributed across western Arizona, southern Nevada, southeastern

California, Baja California, and northwestern Sonora. The chuckwalla is likely to occur anywhere in the Proposed Project area where suitable rocky habitat is present.

During terrestrial surveys (April 3 through May 16, 2011), biologists specifically surveyed the preferred chuckwalla habitat (i.e., rocky outcrops and lava flows) for chuckwalla and their sign. The surveyor corridor and exterior belt transects covered a total of 4,370 acres.

Twenty chuckwallas were observed in the survey area. Additionally, 54 instances of chuckwalla scat were documented. The common chuckwalla was frequently detected within the survey corridor and exterior belt transects. A high proportion of live chuckwallas and chuckwalla scat were concentrated in the northwest section of the project area. This area includes lava flows, rocky outcrops, rocky washes, and large rocky slopes. Additionally, a smaller proportion of chuckwalla were documented on rocky outcrops in the middle and southern end of the project area.

The density of live chuckwalla within the survey area was 0.005 chuckwalla per acre. However, if chuckwalla densities are calculated using only the acreage of suitable habitat (i.e., North American Warm Desert Bedrock Cliff and Outcrop) within the project area, the density is higher at 0.043 chuckwallas per acre. Although little current data are available on chuckwalla abundance throughout its range, older studies suggest chuckwalla densities can be as high as 3 to 6 individuals (Johnson 1965, Berry 1974). This comparison suggests that chuckwalla densities in the Proposed Project areas that were surveyed are low.

For more detailed information on chuckwalla survey methods and results within the Proposed Project area, refer to the Terrestrial Wildlife Survey Report (Tetra Tech 2011b). A copy of this report can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

Gila Monster

The Gila monster (*Heloderma suspectum*) is classified as a state-sensitive reptile (NAC 503.080) and is protected under Nevada state law (NAC 503.090 and NAC 503.093). Gila monsters prefer habitat comprised of undulating rocky foothills, bajadas, canyons, and desert wash habitats and tend to avoid open sandy plains (Beck 2005).

During desert tortoise and terrestrial surveys (April 3 through May 16, 2011), biologists specifically looked for Gila monster and their sign. Tortoise burrows, mammal holes, and caliche dens were checked for Gila monsters while also looking for desert tortoise. No Gila monsters or sign were located in the survey area. However, the Gila monster rarely is observed and is difficult to detect (NDOW 2007b). Gila monster habitat is present within the Proposed Project area, so it is possible that Gila monsters reside in the area.

Bats

To determine bat use within the Proposed Project area, bat acoustic surveys were conducted April 2008 through April 2011 at 12 different locations including 3 MET towers and around 2 abandoned mine entrances. In order to capture data on low-flying and high-flying bats, the MET tower locations housed two passive acoustic detectors, one mounted low (approximately 6 feet), and one mounted high (approximately 120 to 150 feet). To examine bat activity in abandoned mines, acoustic detectors near the mine entrances were placed strategically near washes, which bats use for foraging areas and movement corridors. The dispersion of monitoring stations provided an adequate examination of general bat usage over the entire project area. Acoustic bat surveys consist of setting up bat detector devices (Anabat SD1 and supporting equipment), which record bat calls and allow them to be displayed graphically based on call duration and frequency. Recorded calls are identified to species level using the methods of O'Farrell et al. (1999), which are based on frequency characteristics, call shape, and comparison with a comprehensive library of vocal signatures. Although quite useful and important for collecting bat data, there are some limitations, including but not limited to: zone/range of detection verses the height of the rotor-swept area (approximately 164-197 ft.) of airspace not sampled), ability to detect Townsend's big-eared bats and other difficult to detect species, and the restriction of only being able to provide an index of activity.

A total of 14 species were detected in 2008-2009 surveys, and 15 species were detected in 2009-2010 surveys (Table 3.4-3). Five year-round residents were recorded during the study including California myotis (*Myotis califonicus*), western small-footed myotis (*Myotis ciliolabrum*), Yuma myotis (*Myotis yumanensis*), caynon bat (*Parastrellus Hesperus*), and Brazilian free-tailed bat (*Tadarida brasiliensis*). The big brown bat (*Eptisicus fuscus*) and the pallid bat (*Antrozous pallidus*) were observed to be breeding species in the area, but were absent during the winter.

Table 3.4-3. Bat Species Recorded During Acoustic Surveys

Scientific Name	Common Name	Status
Phyllostomidae		
Macrotus californicus	California leaf-nosed bat	Nevada Protected Sensitive, BLM sensitive species
Vespertilionidae		
Myotis californicus	California myotis	State sensitive species
Myotis ciliolabrum	Western small-footed myotis	Federal Species of Concern BLM sensistive species
Myotis thysanodes	Fringed myotis	Federal Species of Concern, State Protected
Myotis yumanensis	Yuma myotis	Federal Species of Concern BLM sensitive species
Lasiurus blossevillii	Western red bat	State-sensitive species, BLM sensitive species
Lasiurus cinereau	Hoary bat	BLM sensitive species
Lasionycteris noctivagans	Silver-haired bat	BLM sensitive species
Parastrellus hesperus	Canyon bat	BLM sensitive species
Eptesicus fuscus	Big brown bat	BLM sensitive species
Corynorhinus townsendii townsendii	Pacific western big-eared bat	Federal Species of Concern, State protected sensitive
Antrozous pallidus	Pallid bat	State Protected, BLM sensitive species
Molossidae		
Tadarida brasiliensis	Brazilian free-tailed bat	State-protected species
Nyctinomops femorosaccus	Pocketed free-tailed bat	None
Nyctinomops macrotis	Big free-tailed bat	Federal Species of concern
Eumops perotis californicus	Greater western mastiff bat	Federal species of concern, State protected-sensitive

Each bat species varied in its contribution of use among the monitoring stations and between survey seasons. Most bat activity was recorded at the low monitoring sites, approximately 60% to 80% in 2008-2009 and 76% to 81% in 2009-2010. Four species accounted for most of the bat activity (≥ 6%) recorded at acoustic survey stations, including Brazilian free-tailed bat, canyon bat, California myotis, and Yuma myotis. Additionally, the big brown bat exceeded this threshold at one monitoring station. Other species accounted for less than 6% of all bat activity.

In 2008-2009, the Brazilian free-tailed bat, a State of Nevada protected species, was the primary species at most low monitoring stations, accounting for 26% to 63% of all bat activity; however, during the 2009-2010 monitoring surveys, this species only accounted for only 9% to 29% of activity. In both years of acoustic surveys, Brazilian free-tailed bat accounted for most of the activity at the high monitoring stations. Although Brazilian free-tailed bat activity varied between survey years and monitoring stations, it was recorded at all heights and all but one monitoring station in the project area. Recent surveys in Nevada confirm that spatial and temporal use of an area by this species is variable (O'Farrell et al. 2003, Hall et al. 2005, O'Farrell 2006a-d, Williams et al. 2006, O'Farrell 2009).

The canyon bat, a BLM sensitive species, is common and widely distributed throughout southern and western Nevada (Bradley et al. 2006). This species primarily roosts in rock outcrops and cliff faces, but they disperse widely to forage. Throughout the present study, canyon bats were recorded at all stations and heights, with the majority of activity occurring at the low stations. This species is known to be a year-round resident in southern Nevada, active throughout the year (O'Farrell et al. 1967, O'Farrell and Bradley 1970, O'Farrell and Bradley 1977). This pattern was evident during the acoustic monitoring study.

California myotis is common throughout southern and western Nevada (Simpson 1993, Bradley et al. 2006). It is considered to be a lower elevation species that roosts in crevices, mainly in rock faces, mines, and buildings. From April 2008 through April 2009, it was recorded at almost all stations and heights (except one low station), with the vast majority of activity restricted to the low stations. During the 2009-2010-survey period, the California myotis was absent from all the high stations but prevalent at all low stations, including the mine sampling stations. This species are known to be a year-round resident in southern Nevada, active throughout the year (O'Farrell et al. 1967, O'Farrell and Bradley 1970, O'Farrell and Bradley 1977). This pattern was confirmed during these surveys.

Yuma myotis, a Federal Species of Special Concern, is abundant in proximity to large reservoirs, lakes, rivers, or substantial streams primarily in southern and west-central Nevada (Bradley et al., 2006). It is known to use abandoned mines, rock crevices, and buildings as day roosts. From April 2008 through April 2009, the Yuma myotis was recorded at almost all stations (excepting one) and heights, with the majority of activity restricted to the low stations. During the 2009-2010 study period this species was found at all stations and heights, including the mine sampling stations. The data confirm this species as a year-round resident.

The big brown bat, a Nevada BLM sensitive species, is found throughout Nevada. This species is primarily associated with woodland or urban areas and tend to be sparser in low desert habitats (Kurta and Baker 1990, Bradley et al. 2006). During the 2008-2009-survey period, it was recorded at all stations and heights, but activity was more prevalent at the low stations. During the 2009-2010-survey period, it was also recorded at almost all stations (excepting one) and heights, including all mine stations. This species was recorded from April into October, which suggests that it is likely breeding in the area.

For more detailed information on methods and results of the bat acoustic monitoring surveys, refer to *Final Progress Report April 2008 to April 2009 Baseline Acoustic Monitoring of Bat Populations within the Duke Energy Searchlight Wind Energy Project Site, Clark County, Nevada* (O'Farrell Biological Consulting 2009), and *Final Report May-2009 to April 2010 Baseline Acoustic Monitoring of Bat Populations within the Duke Energy Searchlight Wind Energy Project Site, Clark County, Nevada* (O'Farrell Biological Consulting 2010). A copy of these reports can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

Migratory Birds

Nevada has over 467 documented bird species (Nevada WAP 2006) and is situated within the Pacific Flyway, one of the main bird migratory routes in the U.S. (USFWS 2008). The Pacific Flyway extends through the western portion of the U.S. and the western portion of the Proposed Project area. Millions of birds and waterfowl use the Pacific Flyway to migrate each spring and fall. Most birds moving along the Pacific Flyway travel from Alaska through the western states and eventually reach Mexico and Central America. For organizational purposes, birds are addressed in two sections: non-raptors and raptors.

Non-Raptors

Fixed-point surveys were conducted over two years to document bird diversity and use (i.e., activity) during the primary migration periods in the fall (August through November) and spring (March through June). Surveys were conducted in fall of 2007, spring of 2008, fall of 2008 through winter of 2009, and spring of 2009, for a total of four seasonal surveys (Tetra Tech 2010). Selection of survey points was closely coordinated with NDOW and BLM biologists to ensure that a wide variety of habitats were surveyed. In addition to recording bird species, biologist recorded estimate flight heights so that bird species flying within the rotor-sweep area (RSA) could be identified.

A total of 57 non-raptor species were observed within the Proposed Project area. Table 3.4-4 lists the non-raptor bird species observed within the project area and any additional special status (e.g., BLM-sensitive or Nevada State-sensitive species etc.). No federally endangered, threatened, or candidate species were detected during avian surveys. All species, with the exception of House Sparrow, European Starling, California quail, Gambel’s Quail, and Rock Pigeon, are protected under the MBTA. Birds that are State of Nevada protected are at least all species of wild birds protected by the Migratory Bird Treaty Act, as amended, 16 USC §§ 703 et seq., and listed in 50 C.F.R. § 10.13, unless such wild birds are migratory game birds as described in subsection 2 of NAC 503.045. Birds species regulated under this NAC are discussed under the Upland Game species section following this discussion on birds. Further state or federal protection or classification of birds is denoted in the table by superscript.

Table 3.4-4. Non-Raptor Birds Recorded in the Proposed Project Area

Common Name (*Scientific Name*)	
American crow (*Corvus brachyrhynchos)*	House finch (*Carpodacus mexicanus*)
American pipit (*Anthus rubescens)*	House wren (*Troglodytes aedon*)
Ash-throated flycatcher (*Myriarchus cinerascens)*	Ladder-backed woodpecker (*Picoides scalaris*)
Bank Swallow (*Riparia riparia)*	Lark sparrow (*Chondestes grammacus*)
Barn Swallow (*Hirundo rustica)*	Le Conte's thrasher[a] (*Toxostoma lecontei*)
Bendire's thrasher (*Toxostoma bendirei)*[a]	Lesser nighthawk (*Chordeiles acutipennis*)
Bewick's wren (*Thryomanes bewickii)*	Loggerhead Shrike[a,b] *(Lanius ludovicianus*)
Black-chinned hummingbird (*Selasphorus platycercus)*	Mourning dove (*Zenaida macroura*)
Black-headed grosbeak (*Pheucticus melanocephalus)*	Northern flicker (*Colaptes auratus*)
Black-tailed gnatcatcher (*Polioptila melanura*)	Northern mockingbird (*Mimus polyglottos*)
Black-throated sparrow (*Amphispiza bilineata*)	Northern rough-winged swallow (*Stelgidopteryx serripennis*)
Blue-gray gnatcatcher (*Polioptila caerulea*)	Oranged-crowned warbler (*Vermivora celata*)
Brewer's sparrow (*Spizella breweri*)[a, b]	Phainopepla [a,c] *(Phainopepla nitens*)
Brown-headed cowbird (*Molothrus ater*)	Rock pigeon (*Columba livia*)
Bullock's oriole (*Icterus bullockii*)	Rock wren (*Salpinctes obsoletus*)
Cactus wren (*Campylorhynchus brunneicapillus*)	Ruby-crowned kinglet (*Regulus calendula*)
California quail (*Callipepla californica*)[d]	Sage thrasher (*Oreoscoptes montanus*)[a, b]
Chipping sparrow (*Spizella passerine*)	Say's phoebe (*Sayornis saya*)
Common grackle (*Quiscalus quiscula*)	Scott's oriole (*Icterus parisorum*)
Common raven (*Corvus corax*)	Tree swallow (*Tachycineta bicolor*

Common Name (*Scientific Name*)	
Crissal thrashers[a] (*Toxostoma crissale*)	Verdin[c] (*Auriparus flaviceps*)
Curve-billed thrasher (*Toxostoma curvirostre*)	Violet-green swallow (*Tachycineta thalassina*)
Dark-eyed junco (*Junco hyemalis*)	Western kingbird (*Tyrannus verticalis*)
European starling (*Sturnus vulgaris)*	Western tanager (*Piranga ludoviciana*)
Gambel's quail (*Callipepla californica*)[d]	White-crowned sparrow (*Zonotrichia leucophrys*)
Gray flycatcher (*Empidonax wrightii*)	Wilson's warbler (*Wilsonia pusilla*)
Greater roadrunner (*Geococcyx californianus*)	Yellow warbler (*Dendroica petechial*)
Horned lark (*Eremophila alpestris*)	Yellow-rumped warbler (*Dendroica coronate*)

[a] Nevada BLM Sensitive Species, [b] State of Nevada Protected Sensitive, [c] State of Nevada Protected,[d] Nevada State Protected under NAC 503.045, Game Species

Overall mean bird use in the project area was 5.97 birds/20 minutes (min) and ranged from 0 to 44 birds/20 min. Songbirds had the highest mean use out of all the species groups (4.44 birds/20 min). Species with the greatest mean use of the area included the black-throated sparrow (*Amphispiza bilineata*), house finch (*Carpodacus mexicanus*), ash-throated flycatcher (*Myriarchus cinerascens*), and horned lark (*Eremophila alpestris*).

Non-Raptor Flight Height within the RSA. For flying non-raptor species, only 9.9% of birds observed flew within the anticipated RSA (Tetra Tech 2008). Common ravens were observed the most frequently (0.14 birds flying within the RSA/20 minute). Songbirds that were observed (between 0.01 and 0.09 bird flying within the RSA/20 minutes) were the northern rough-winged swallow, loggerhead shrike, and verdin.

For more detailed information on bird survey methods and results within the Proposed Project area, refer to the 2007-2009 Avian Surveys Report (Tetra Tech 2010). A copy of this report can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

Raptors

Raptor observations were also recorded during point count surveys for four seasons (Table 3.4-5). The turkey vulture had the highest mean use among raptors (0.12 birds/20 min) and was the most commonly observed raptor species. Red-tailed hawks had the second highest mean use among raptor species (0.11 birds/20 min) and were the most common nesting species within the Proposed Project area.

Table 3.4-5. Raptors Observed in the Proposed Project Area

Common Name	Scientific Name
American kestrel	*Falco sparverius*
Burrowing owl[a]	*Athene cunicularia*
Cooper's hawk	*Accipiter cooperii*
Golden eagle[a]	*Aquilia chrysaetos*
Red-tailed hawk	*Buteo jamaicensis*
Sharp-shinned hawk	*Accipiter striatus*
Turkey vulture	*Cathartes aura*

[a] Nevada BLM Sensitive Species

In 2009, Tetra Tech and a NDOW biologist conducted a helicopter survey for raptor nests within the project boundary and along a 2-mile buffer (Tetra Tech 2010). In 2011, an additional helicopter survey for raptor nests was conducted from the 2-mile buffer to a 10-mile buffer around the project area. Habitat surveyed included cliffs, rocky outcrops, and transmission line towers. Unsuitable habitat such as creosote scrub was not surveyed for raptor nests.

The red-tailed hawk was the most common nesting raptor observed within 10 miles of the project area. Twenty of the 23 active red-tailed hawk nests were located on transmission line towers. All golden eagle nests were located on cliffs at least 4 miles from the project area; two nests were located approximately 10 miles from the project site boundary.

Raptor Activities within the Turbine Rotor Sweep Area. During spring surveys, 72.2% of raptors flew within the RSA, 14.4% flew below, and 13.4% flew above (Tetra Tech 2008). Turkey vultures accounted for the most raptors flying in the RSA (0.13% birds flying within the RSA/20 minute). Other common raptor species observed in the RSA were the red-tailed hawk and Cooper's hawk (between 0.09% and 0.01% birds flying within the RSA/20 minute) (Tetra Tech 2008).

For more detailed information on bird survey methods and results within the Proposed Project area, refer to the 2007-2009 Avian Surveys Report (Tetra Tech 2010) and the 2011 Searchlight Raptor Nest Survey Report (Tetra Tech 2011a). A copy of this report can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

Upland Game

Upland game species observed in the proposed project area include Gambel's quail, California quail, and cottontail rabbit. NDOW manages these species as upland game with designated hunting seasons (NDOW 2011a). NDOW maintains three wildlife water sources (i.e. guzzlers) in the area that support game and other species.

Gambel's Quail

Gambel's quail are native to southern Nevada desert and typically found on alluvial fans at elevations from 2,000 to 4,500 feet. According to NDOW, the Proposed Project area contains approximately 12,217 acres of crucial Gambel's quail habitat (NDOW 2007a). During bird surveys, many quail were noted in the project area. See Section 3.4.4.4 for bird survey methodologies. Gambel's quail had a relatively high mean use (0.54 birds/20 min) observed during avian surveys.

California Quail

According to NDOW's map of California Quail Distribution in Nevada and other sources, the range of the California quail does not overlap the proposed project area as this species prefers habitat such as chaparral, sagebrush, oak woodlands, and foothill forests (NDOW No Date, Cornell Lab of Ornithology 2011). However, 20 individuals of this bird species were observed during bird surveys illustrating a low mean use (0.03 birds/20 min).

Desert Cottontail Rabbit

Desert cottontail rabbits (*Sylvilagus audubonii*) occur in a wide variety of habitats including dry desert shrub lands, riparian areas, and pinyon-juniper forests throughout western and central Nevada (NDOW 2010). This species was observed commonly in the Proposed Project area during terrestrial surveys.

Big Game

Many big game species are common throughout the Mojave Desert, including Mountain lions (*Puma concolor*), mule deer (*Odocoileus hemionus*), and bighorn sheep (Ovis canadensis).

Mountain Lion

Mountain lions might be found throughout the Proposed Project area, notably on the rocky ridgelines and in the valleys. Typical mountain lion home ranges in the Mojave Desert are likely very large. A home range for an adult male lion can be over 100 square miles. Females travel a smaller range of 20 to 60 square miles (Digital Desert 2009). Mountain lion activity in the project area is most likely transitory given the proximity to Searchlight; however, at any given time, the area could support more than one lion. Mountain lions are found in nearly all habitats except the driest, most inhospitable regions of the Mojave and Colorado Deserts. Mountain lion use of the project area is unknown.

Mule Deer

There is remote likelihood of mule deer (*Odocoileus hemionus*) regularly using the Proposed Project area. Although the Proposed Project area is located within NDOW Hunt Management Units 263, 264, and 265 (NDOW 2009c), the nearest crucial summer habitat for mule deer is approximately 14 miles northwest and southeast of Searchlight with winter range located approximately 11 miles northwest and approximately 13 miles southeast of Searchlight (BLM 1998). No mule deer or sign were documented in the project area during terrestrial field surveys.

Bighorn Sheep

Desert bighorn, a BLM-Nevada sensitive species, utilizes rugged, open, mountainous terrain where adequate forage, water, and escape terrain are available. Steep slopes and cliffs are used to escape from predators (NDOW 2009b). The subspecies of desert bighorn sheep that occurs in the Southwest desert regions of the United States is Nelson's bighorn sheep.

Unit 264, Newberry Mountains: Southern Clark County. Portions of NDOW Management Unit 264 are in the Proposed Project area. In October 2008, an aerial survey in the Newberry Mountains of this unit was conducted for bighorn sheep. The sample consisted of 23 rams, 17 ewes, and 11 lambs totaling 51 individuals. The population in the Newberry Mountains was estimated at 50 to 60 individuals, and approximates the NDOW 2007 estimate. Population data over the long term suggest the small herd is stable (NDOW 2009a). Recently in an aerial survey conducted in October 2010, the highest number of bighorn sheep was recorded (99 sheep) consisting of 34 rams, 54 ewes, and 11 lambs. In light of this information, the revised bighorn population inhabiting the Newberry Mountains is approximately 90. The larger than expected aerial survey sample in 2010 may have been due, in part, to bighorn ingress from the adjacent Dead Mountains in California and/or the Eldorado Mountains.

Unit 265, South Eldorado Mountains: Southern Clark County. Portions of NDOW Management Unit 265 are in the Proposed Project area. In October 2003, two rams, six ewes, and four lambs were observed during a 4.5-hour survey. In October 2010, 19 rams, 9 ewes, and 1 lamb were observed during a 2.4-hour survey (NDOW 2011b). Since 1969, survey sample sizes have varied widely, ranging from 0 to 50 animals. In some years, aerial survey data portrayed a disproportionate number of rams in the unit. In many of the 20 aerial surveys conducted since 1969, the number of rams observed either equaled or far exceeded the number of ewes. The NDOW 2009 population estimate for the herd inhabiting the entire Eldorado Mountains (Units 265 and 266) is 180 sheep, and approximates the estimate reported in 2008 (NDOW 2009a).

Proposed Project Area. The bighorn sheep data described above was used to determine that bighorn sheep utilize the area. To determine the extent of suitable habitat in the project area, GAP land cover data and topographic relief were examined. North American Warm Desert Bedrock and Outcrop land cover areas with slopes greater than 60% grade were identified as suitable habitat for bighorn sheep (Figure 3.4-2). As illustrated in Figure 3.4-2, six large areas of habitat for desert bighorn sheep totaling 6,041 acres were delineated within and adjacent to the project boundary. Approximately 416 acres of suitable habitat were within the proposed project boundary.

The project area spans the movement corridor for bighorn sheep (Units 264 and 265) linking the Newberry Mountains and Eldorado Mountains (NDOW 2009c). Approximately 503 acres of bighorn sheep winter range occurs within the project area. One sighting of a desert bighorn sheep in the project area was noted in the NDOW's database. In separate observations, bighorn sheep (a ram and a ewe) were reported in the spring of 2009 during aerial raptor nest surveys in the project area (Taylor 2009a). In the spring of 2011 during terrestrial wildlife surveys, large rocky hills and mountains were surveyed for bighorn sheep and signs of these sheep (Tetra Tech 2011b). Biologists reported four desert bighorn sheep in two separate groups outside of the survey corridor and one pile of unidentified ungulate scat (presumably desert bighorn sheep) within the survey corridor.

For more detailed information on bighorn sheep survey methods and results within the Proposed Project area, refer to the Terrestrial Wildlife Survey Report (Tetra Tech 2011b). A copy of this report can be obtained from the BLM Searchlight Wind Energy Project website (http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html) or by emailing a request to the Las Vegas BLM Field Office at BLM_NV_SNDO_SearchlightWindEnergyEIS@blm.gov.

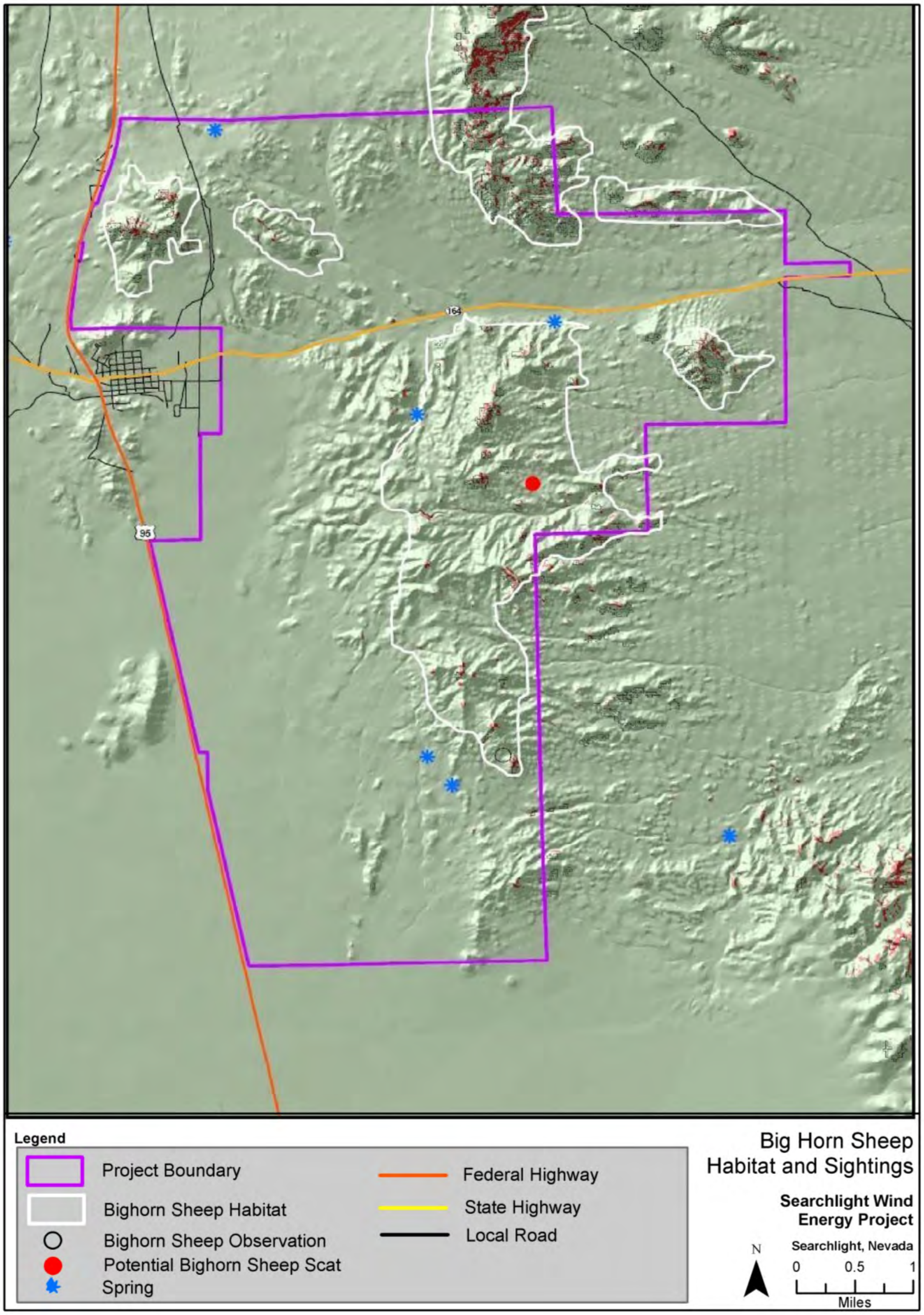


Figure 3.4-2. Bighorn Sheep Habitat within the Project Area

3.5 Cultural Resources

This section discusses existing cultural resources conditions, objectives, laws and applicable regulations within and adjacent to the Proposed Project area. Cultural resources are prehistoric and historic archaeological sites, districts, structures, or locations considered important to a culture, a subculture or a community for scientific, traditional, religious, or other reasons. In the Project area, prehistoric archaeological resources may include rock shelters, lithic scatters, habitation sites, rock rings or alignments, tool stone procurement sites, thermal features/roasting pits, and rock art locations. Historic sites may include buildings, structures, mines, mine shafts or adits (horizontal passages into mines for access or drainage), transportation routes, and refuse deposits.

3.5.1 Region of Influence

The ROI evaluated for cultural resources encompasses those locations within the linear project area that might be disturbed by construction, O&M, and decommissioning of the Proposed Project. The Area of Potential Effect (APE) for this linear project is defined as a 200-ft. buffer on both sides of the access roads, above and below ground transmission lines, and within and around all project facilities, which totals approximately 2,762 acres.

3.5.2 Laws, Regulations, and Policies

The National Historic Preservation Act of 1966 (NHPA), as amended [16 USC 470 et seq.], requires federal agencies to determine the effects of their actions on cultural resources and to take certain steps to ensure these resources are located, identified, evaluated, and protected. Section 106 of the Act requires federal agencies to identify historic or archaeological properties near proposed project sites, including properties listed or eligible for listing in the National Register of Historic Places (NRHP). If the proposed Action has an adverse effect on listed or eligible properties, the agency must consult with the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation to develop alternatives or mitigation measures.

Other legislation pertinent to cultural resources includes the Archaeological Resources Protection Act of 1979 (ARPA), as amended [16 USC 470aa-mm], the American Antiquities Act of 1906 [16 USC 431-433], the Executive Order on Protection and Enhancement of the Cultural Environment [EO 11593], and the Native American Graves Protection and Repatriation Act of 1990 (25 USC 300).

3.5.3 Existing Environment

The information in this and following sections is based on BLM Cultural Resource Report No. 5-2653, an archaeological inventory conducted by Stegner and Bevill (URS 2012). They provide a cultural context and discuss their findings within the approximately 2,762-acre APE (URS 2012).

3.5.3.1 Prehistoric Period

The archaeological record of southern Nevada documents human use of the region beginning about 12,000 years ago. A cultural framework proposed by Roberts and colleagues (2007:29) divides the cultural sequence of southern Nevada into four major periods: the Paleo-Archaic (9500 to 5500 B.C.), the Archaic (5500 B.C. to A.D. 500) the Ceramic (A.D. 500 to 1850) and the Historical (A.D. 1500 to 1900).

3.5.3.2 Historic Period (A.D. 1500 to 1900)

Ethnographic

When Euro-Americans and other groups first entered southern Nevada, people of two different language groups occupied it. The Project area lies within the traditional hunting and gathering use areas of the

Numic-speaking Southern Paiute and Chemehuevi and Yuman-speaking Colorado River groups, specifically the Mojave and Hualapai Indians.

Spirit Mountain, known as *Avikwame* by the Mojave people and *Wikame* by the Hualapai, is the spiritual birthplace of Yuman groups. The sacred mountain is the highest peak in the Newberry Mountains and is located approximately 12 miles southeast of the Searchlight Wind Energy Project. Spirit Mountain is a National Historic Place and is listed as a Traditional Cultural Property (26CK5388) for its significance to the Mojave, Hualapai, Yavapai, Havasupai, Quechan, Pai pai and Maricopa. Although Spirit Mountain will not be physically affected by the proposed project, the BLM consulted with the affiliated Tribes to determine potential visual impacts to the landscape and/or cultural concerns associated with the proposed project.

Exploration/Transportation

In the early Historic Period, explorers, traders, and trappers moved through the area, primarily along the Colorado River. Some focused on developing new trails to California, while others searched for beaver pelts and mineral riches. The Colorado River, located 14 miles east of the town of Searchlight, served as a significant travel corridor for early European-American exploration and missionary and economic expeditions as early as 1540. The next successful crossing of southern Nevada was made by mountain man Jedediah Smith and his party in 1826. Smith followed a route from the Great Salt Lake area south to the Virgin and Colorado rivers, across the Mojave Desert to Spanish southern California. The route connected the earlier Spanish Dominques-Escalante route, which originated in the Spanish settlements of New Mexico with the Garces route from the Spanish settlements of southern California, and stimulated trade between these regions (Wright 1982). In 1829-30, New Mexico merchant Antonio Armijo traveled into the Las Vegas Valley, establishing the northern branch of the Old Spanish Trail. Later, in the 1840s, Lieutenant (Lt.) John C. Frémont traveled through the region on three journeys, including an expedition through Las Vegas Springs via the northern route of the Old Spanish Trail in 1844 (Myhrer et al. 1990; Roske 1986). Later, travel through Las Vegas Valley continued on the Mormon Road, a variant of the Old Spanish Trail, which linked Mormon headquarters in Salt Lake City with southern California (Paher 1971).

In 1830, William Wolfskill and George C.Yount and their beaver trapping party of about twenty men followed established routes from Taos, New Mexico to along the Virgin and Colorado Rivers to reach Mojave villages. From the river, they followed an Indian trail west into California and crossed the Mojave River to Cajon Pass into San Bernardino and Los Angeles (Hafen 1954:146-147). This route is known as the Mojave Road Variant of the Old Spanish Trail, (a National Historic Trail as designated by Congress) heads south from Las Vegas Valley through the Eldorado Valley, Searchlight, and Paiute Valley where it connects with the “Old Mojave Trail” in California.

In 1875, Lieutenant Bergland’s military route (depicted on an 1889 Lt. George Wheeler’s exploration map) passed through the project area, possibly along the current route of Highway 163, from Cottonwood Island to Paiute Valley. This route of Highway 163 was also used for the Quartette Mining Company’s 16-mile long narrow gauge railroad built in 1901-1902 to carry ore from the mine to a 20-stamp mill at the edge of the Colorado River. In 1906, a new processing mill was built in Searchlight and the rails were sold to J.F. Kent and moved to build the Yellow Pine Railroad line from Jean to Goodsprings in 1910. No segments of these transportation routes were observed within the area of potential effect for the proposed project.

Mining

During the latter half of the 19th century, vigorous mining efforts occurred across southern Nevada long before the discovery of low-grade ore at Searchlight. By the 1870s, a number of mining districts had been established. Mining of gold, silver, lead, and other metals occurred in El Dorado Canyon, 20 miles to the north, while turquoise mines were established at Crescent, 10 miles west of Searchlight (Reid 1998:6-7). An example of this early mining is the Homestake Mine in the Newberry Mountains southeast of Searchlight, which is listed on the NRHP for activities between 1850 and 1924. In the 1930s, the mine operated an amalgamation and cyanide plant on Cottonwood Island for processing gold and silver ore. Mining operations ceased in 1953 following the completion of Davis Dam that created Lake Mojave (NPS 2010). In 1897, gold was discovered at the Duplex Mine in the town of Searchlight. Between 1907 and 1910, the mines in the Searchlight Mining District produced some $7,000,000 in gold and other precious minerals.

During its heyday, Searchlight maintained a population of approximately 1500. Mine production and the town's population began to decline after 1917, but the community survived as a stop along an early route of the Arrowhead Highway (roughly following Highway 95 and 163 west). This first all-weather highway linked Los Angeles to Salt Lake City via Las Vegas. In 1927, the town's population dropped to 50 when the newly created Highway 91, now part of Interstate 15, bypassed the town of Searchlight. Construction of Hoover Dam led to a minor resurgence in the town's population in the 1930s and 1940s. Evidence of mining is present throughout the area and small-scale mining continues in the region. Searchlight's last major gold mine, however, ceased operation around 1953. A more comprehensive overview of the Searchlight Mining District is detailed in Stegner and Bevill (2012).

In addition to the mining, military efforts to assist in World War II also occurred in the project area. The Desert Training Center (DTC) and later the California-Arizona Maneuver Area (C-AMA) encompassed 20,000 square miles of land in southeastern California, southern Nevada, and Arizona. Here more than a million U.S. Army troops were trained in the tactics and techniques of desert warfare from April 1942 to April 1944 under General George Patton. After it was expanded to 31,500 square miles, the DTC became the largest army post and training maneuver area in U.S. military history. In 1943, the DTC was expanded and split into three areas and Searchlight fell into Area A, part of the original 19,000 acre area. General Patton and his troops departed from Area A in 1942 to join the military campaign in North Africa (URS 2012). On April 1, 1944, the C-AMA was declared surplus and the troops were evacuated and the equipment and materials were removed.

3.5.4 Previous Archaeological Investigations

The records search results indicated that 55 previous investigations have been conducted within a 2-mile radius surrounding the project area. Of these, 14 projects (25%) included portions of the APE. The 14 surveys are primarily linear inventories undertaken for public motorcycle and off-road vehicle racecourses, transportation rights-of-ways, and utility transmission corridors. Smaller block surveys were recently completed for meteorological tower placement and the LMNRA fee station development.

Of particular note for the project area is White's (2008) recent study of 380 hazardous mine features in the Alunite, Charleston, Crescent, Eldorado, Goodsprings, and Searchlight Mining Districts in Clark County, Nevada. The study provides a valuable historic context and a framework for the NRHP evaluation process of mining sites within these districts, including 43 sites and features in the Searchlight Mining District. Also relevant to the project area is the study by Yoder and Brosman (2007) that focused on the re-visitation and re-recording of 11 prehistoric sites around the Piute Valley, near Searchlight.

The records search indicated that 35 previously recorded cultural resources were located within a 2-mile radius surrounding the project area, 7 of which are within or near the APE. Collectively, these 35 resources include 31 historic mining-related features and 4 prehistoric sites. Of these, 5 sites have been recommended as eligible for listing in the NRHP, 24 sites are considered ineligible, and the remaining 6 sites are unevaluated.

Seven previously recorded archaeological sites fall within the project APE. These consist of five historic and two prehistoric properties. A review of historic maps indicates that four segments of historic transportation routes are within the project application area. These paths include the Mojave Route of the Old Spanish National Historic Trail, Lieutenant Bergland's 1875 military trail, Quartette Mining Company narrow-gauge railroad, and the Arrowhead Trail.

The Mojave Road Variant of the Old Spanish Trail traverses the western edge of the proposed project boundary near the town of Searchlight. This Congressional route is reported to parallel U.S. Highway 95 on its eastern side, along the east side of the town of Searchlight, where it followed a north-south alignment. No surface evidence of the trail has been found within the Project's Area of Potential Effect that was inventoried.

3.5.5 Archaeological Survey Results

Stegner and Bevill conducted a standard BLM Class III cultural resources survey within the linear 2,670-acre APE. The linear project is defined as a 200-ft. buffer on both sides of the access roads, above and below ground transmission lines, and within and around all project facilities, which amounts to approximately 2,762 acres. Professional archaeologists surveyed the project area walking parallel transects spaced at 30 m (100-foot) intervals. The actual final Project ROW and disturbance area, if granted by BLM, would be a smaller amount of land within the inventoried areas. (See Figure 3.5-1)

Sixty-five sites, including seven previously recorded sites, were recorded in the project area. Cultural resources consist of six prehistoric sites, 52 historic, and seven multi-components sites. The prehistoric sites are small lithic or ceramic scatters and a rock shelter. The historic sites include early to mid-20th century mining complexes, small prospecting areas and associated refuse scatters. Two of the historic sites were associated with the Desert Training Center during World War II. The seven multicomponent sites include mining sites with prehistoric artifacts such as bifaces or handstones, and prehistoric sites with historic debris such as tin cans. One site has multiple mining cairn markers and indigenous rock alignments.

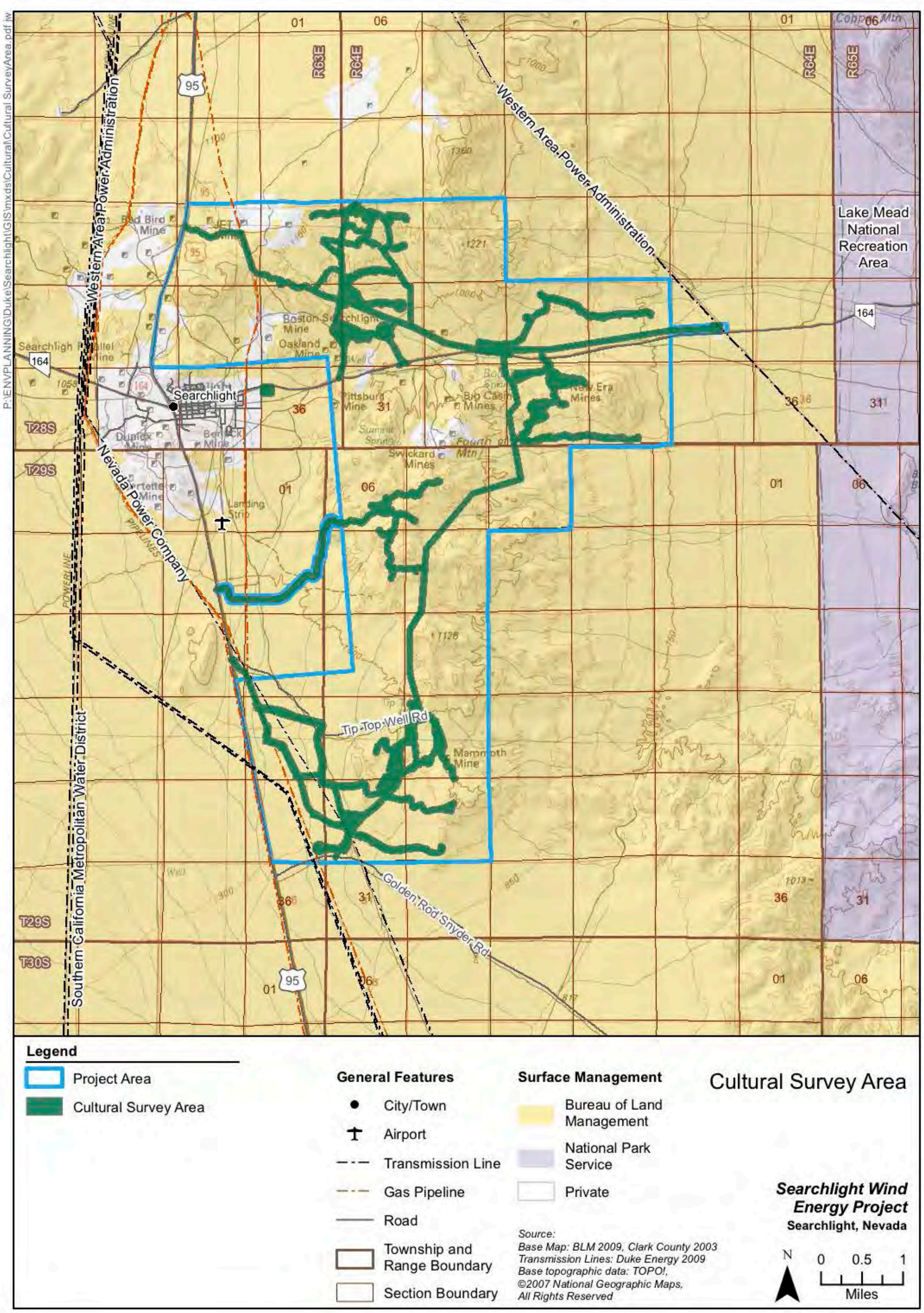


Figure 3.5-1. Cultural Resources Survey Area

Sites Determined Eligible for the National Register of Historic Places

The NRHP is the Nation's official list of cultural resources deemed worthy of preservation. It is a list of districts, sites, buildings, structures, and objects significant to American history, architecture, archaeology, engineering, and culture. National Register properties have significance to the prehistory or history of a community, state, tribe, or the Nation.

The National Register Criteria for Evaluation are standards for evaluating the significance of a site to determine if it qualifies for the NRHP. In addition to meeting one or more eligibility criteria, a site must possess integrity of location, design, setting, materials, workmanship, feeling, and association and are:

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

Four sites have been determined eligible for the NRHP. These include the historic mines of JET (26CK7718) eligible under criterion d, New Era (26CK7654) eligible under criteria b and d, and Oakland (26CK9294) eligible under c and d, and a small prehistoric rock shelter (26CK3635) eligible under criterion d. None of the other prehistoric or historic sites met the criteria for listing on the National Register of Historic Places.

3.6 Air Quality and Climate

The affected environment for air quality and climate depends on emission source characteristics, pollutant types, emission rates, and meteorological and topographical conditions. This analysis considered air quality and climate impacts that would occur during construction and operations of the Proposed Project.

3.6.1 Region of Influence

As air quality impacts would be primarily temporary, the ROI is limited to the local airshed surrounding the Proposed Project.

3.6.2 Existing Environment

3.6.2.1 Climate

The Proposed Project area is located approximately 60 miles south of Las Vegas at the southern tip of Clark County, in the eastern Mojave Desert. The closest meteorological monitoring station to the nearby town of Searchlight is located approximately 48 miles to the northwest, at the Henderson Executive Airport in Henderson, Nevada.

The summer season in Searchlight displays classic Southwest desert characteristics: daily high temperatures typically exceed 100 degrees Fahrenheit (°F), with lows in the 70°F range. The summer heat is tempered somewhat by the extremely low relative humidity; however, humidity can increase markedly for several weeks each summer in association with a moist "monsoonal flow" from the south, typically during July and August. These moist winds support the development of desert thunderstorms associated with significant flash flooding and/or strong downburst winds. Strong wind episodes in the summertime are usually connected with thunderstorms, and are thus isolated and localized (DAQEM 2009b).

Winters, overall, are mild and pleasant. Afternoon temperatures average near 60°F, and skies are mostly clear. Pacific storms occasionally produce rainfall in Searchlight, but in general, the Sierra Nevada Mountains of eastern California act as effective barriers to moisture. Snow accumulation is rare in Searchlight. Flurries are observed once or twice during most winters, but snowfall of an inch or more occurs only once every four to five years. However, freezing temperatures occur regularly each year: the valley has a 30-year average of 24 days with low temperatures at or below 32°F. Strong winds are the most persistent weather hazard in the area. Winds over 50 miles per hour (mph) are infrequent but can occur with vigorous storms. Winter and spring wind events often generate widespread areas of blowing dust and sand.

3.6.2.2 Air Quality

Air quality in a given location is described by the concentrations of various pollutants in the atmosphere, expressed in units of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). Air quality is determined by the type and amount of pollutants emitted into the atmosphere; the size, surface cover, and topography of the air basin; and meteorological conditions related to the prevailing winds, which are normally from the southwest or north for the Proposed Project area. The significance of a pollutant concentration is determined by comparison with federal and/or state air quality standards. These standards represent the maximum allowable concentrations of various pollutants necessary to protect public health and the environment with a reasonable margin of safety.

The Clean Air Act (CAA), passed by the United States Congress in 1970, and amended in 1990, authorized the EPA to establish National Ambient Air Quality Standards (NAAQS) for pollutants that threaten human health and the environment (40 CFR, Part 50). The CAA established two types of NAAQS: (1) primary standards to protect public health, including the health of “sensitive populations” such as individuals with respiratory conditions, children, and the elderly; and (2) secondary standards that set limits to protect the environment, including protection against "decreased visibility, damage to animals, crops, vegetation, and buildings" (EPA 2009b).

The following six pollutants, referred to as "criteria pollutants," currently have NAAQS (EPA 2009b):

- Ozone
- Carbon monoxide (CO)
- Nitrogen oxides (NO_x)
- Sulfur dioxide (SO_2)
- Particulate matter with an aerodynamic diameter equal to or less than 10 microns (PM_{10})
- Particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ($PM_{2.5}$)
- Lead

The EPA Office of Air Quality Planning and Standards has set NAAQS for the six criteria pollutants as described in Table 3.6-1.

Table 3.6-1. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Concentration	Averaging Time	Concentration	Averaging Time
Carbon monoxide	9 ppm (10 mg/m^3) 35 ppm (40 mg/m^3)	8-hour [1] 1-hour [1]		None
Lead	0.15 $\mu g/m^3$ [2]	Rolling 3-month average	Same as primary	
Nitrogen dioxide	0.053 ppm	Annual (arithmetic mean)	Same as primary	
	1 ppm	1-hour	None	
Particulate matter (PM_{10})	150 $\mu g/m^3$	24-hour [3]	Same as primary	
Particulate matter ($PM_{2.5}$)	15.0 $\mu g/m^3$ 35 $\mu g/m^3$	Annual [4] (arithmetic mean) 24-hour [5]	Same as primary Same as primary	
Ozone	0.075 ppm (2008 standard) 0.12 ppm	8-hour [6] 1-hour [8]	Same as primary Same as primary	
Sulfur Dioxide	0.03 ppm 0.14 ppm 0.075 ppm	Annual (arithmetic mean) 24-hour [1] 1-hour [9]	0.5 ppm	3-hour [1]

Source: EPA 2011
mg/m^3 = milligrams per cubic meter, $\mu g/m^3$ = micrograms per cubic meter, ppm = parts per million by volume
Assumptions/Notes:
(1) Not to be exceeded more than once per year.
(2) Final rule signed October 15, 2008.
(3) Not to be exceeded more than once per year on average over three years.
(4) To attain this standard, the three-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu g/m^3$.
(5) To attain this standard, the three-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 $\mu g/m^3$ (effective December 17, 2006).
(6) To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).
(7) (a) To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
(7) (b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(8) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than 1.
(8) (b) As of June 15, 2005, EPA has revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone nonattainment Early Action Compact (EAC) Areas. For one of the 14 EAC areas (Denver, Colorado), the 1-hour standard was revoked on November 20, 2008. For the other 13 EAC areas, the 1-hour standard was revoked on April 15, 2009.
(9) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 parts per billion.

The EPA assigns classifications to geographic areas with respect to air quality conditions. When an area is considered for classification, there are three possible outcomes of the designation process for each of the criteria pollutants:

- Attainment – Any area that meets the national primary or secondary ambient air quality standard for the pollutant.
- Non-attainment – Any area that does not meet (or that contributes to ambient air quality in an area that does not meet) the national or secondary standard for the pollutant.
- Unclassified – Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

All areas throughout the United States are assigned to one of three different classes of air quality protection. These are called prevention of significant deterioration (PSD) Classes I, II, and III. Essentially, they help to insure that the air quality in clean air areas remains clean and does not deteriorate to NAAQS levels.

- Class I: very little additional pollution allowed (e.g., areas include wilderness areas (larger than 5,000 acres) and national parks (larger than 6,000 acres).
- Class II: moderate pollution is allowed.
- Class III: pollution approaching but not bypassing NASSQS is allowed (e.g., attainment areas to allow maximum industrial growth while maintaining compliance with NAAQS).

In addition to NAAQS, the maximum allowable increases over baseline conditions in a clean air area for a particular pollutant to prevent significant deterioration of air quality are promulgated as PSD increments at 40 CFR, Part 52.21(c). The Proposed Project can be accommodated within the increments set for PSD Class II areas.

The State of Nevada has granted authority to enforce clean air regulations in Clark County to the CCDAQEM (DAQEM 2009a), as overseen by the EPA. DAQEM currently collects data from eleven air-monitoring stations located throughout Clark County. Nine are located in the greater Las Vegas metropolitan area; two are located near the towns of Jean and Boulder City (DAQEM, 2009b), which 54 miles and 36 miles, respectively, from the project area.

The geographic areas (or airsheds) for NAAQS compliance are defined by hydrographic basins. The Proposed Project is located in portions of the Eldorado Valley, the Colorado River Valley, and the Piute Valley, which have been designated as Hydrographic Basins 167, 213, and 214, respectively. The Colorado River, Piute Valley, and parts of the Eldorado airsheds are designated non-attainment for the 8-hour ozone standard and unclassified for the other criteria pollutants according to EPA's Region 9 Air Quality Maps. The USEPA has designated these three airsheds as management areas for CO, PM_{10}, nitrogen oxide (NO_x), and volatile organic compounds (VOC) (precursor to ozone). This designation is a measure to address an area that was once designated as non-attainment of the NAAQS limits, and has achieved emission reductions meeting the NAAQS. The Las Vegas Valley, located northwest of the project area, is the only non-attainment area in Clark County for PM_{10} and CO. On March 29, 2011, the USEPA published a direct final rule in the Federal Register determining that the Clark County, Nevada non-attainment area has attained the 1997 8-hour ozone National Ambient Air Quality Standards (NAAQS). This direct final action is effective May 31, 2011. On July 21, 2010, EPA determined that the Las Vegas Valley had attained the PM-10 NAAQS as of its applicable attainment date of December 31, 2006 and continues to attain the standard. This determination was based on three years of quality-assured, certified air quality monitoring data. On September 16, 2010, the U.S. Environmental Protection Agency finalized the rule to redesignate Las Vegas Valley to attainment for the National Ambient Air Quality Standard (NAAQS) for CO and approved the maintenance plan showing maintenance of the CO standard though 2020.

The main sources of air pollutants within the vicinity of the project area are vehicles traveling along US-95 and SR 164, off-OHV use in the area, and winds that entrain dust.

Under the Clark County Air Quality Regulations (CCAQR), all soil-disturbing activities of 0.25 acres or greater (aggregate) require a Dust Control Permit (CCAQR 94). The permit application requires, among other things, submission of a Dust Mitigation Plan, listing all soil disturbing activities for construction (DAQEM, 2009b). The permit application requires, among other things, a Dust Mitigation Plan, listing all soil disturbing activities for construction projects of 50 acres of actively disturbed soil if they are: (a) under common control and are either contiguous or separated by a public or private roadway and cumulatively have fifty (50) acres or more of actively disturbed soil; or (b) under common control and not contiguous, but are contained within a common master-planned community and cumulatively have fifty (50) acres or more of disturbed soil. (DAQEM 2011).

Class I areas are to receive special protection from degradation of air quality, and the most stringent PSD increments apply in these areas. No areas designated as Class I airsheds are present in the project area; however, Class I airsheds do occur in the vicinity. Class 1 federal lands include areas such as national parks, national wilderness areas, and national monuments. These areas are granted special air quality protections under Section 162(a) of the federal Clean Air Act (EPA 2011). Prior to 1977, all wilderness areas were managed as Class I Areas. After 1977, the following applies: (BLM Manual 8560.36),

B. Air Quality

1. Classification. Under the Clean Air Act (as amended), BLM-administered lands were given Class II air quality classification, which allows moderate deterioration associate with moderate, well-controlled industrial and population growth. The BLM manages designated wilderness areas as Class II unless they are reclassified by the State as a result of the procedures prescribed in the Clean Air Act.

2. States Reclassify. According to the Clean Air Act, air quality reclassification is the prerogative of the States. The States must follow a process mandated by the Clean Air Act Amendments of 1977, involving a study of health, environmental, economic, social, and energy effects, a public hearing, and a report to the Environmental Protection Agency.

3. Compliance. Administrative actions within wilderness areas must comply with the air quality classification for that specific area.

Six designated wilderness areas are located relatively close to the project area: Ireteba Peaks Wilderness (approximately 6 miles northeast), Nellis Wash Wilderness (approximately 5 miles east), Spirit Mountain Wilderness (approximately 8 miles southeast), and Bridge Canyon Wilderness (approximately 12 miles southeast). The Wee Thump Joshua Tree Wilderness (approximately 8 miles west) and the South McCullough Wilderness (approximately 12 miles northwest) are located on the western boundaries of the Piute-Eldorado Valley.

Climate Change

Climate change refers to any notable change in measures of climate (temperature, precipitation, or wind) that lasts for an extended period (i.e., decades or longer). Climate change might be affected by a number of factors, including natural cycles (e.g., changes in the sun‘s intensity or Earth’s orbit around the sun), natural processes within the climate system (e.g., changes in ocean circulation), and human activities that change the atmosphere‘s composition (e.g., burning fossil fuels) or land surface (e.g., deforestation, reforestation, urbanization, and desertification). Potential emissions of primary manmade GHGs (CO_2, methane, NO_x, and specific hydrofluorocarbons) can be estimated from a project design, and calculated as total carbon dioxide equivalent (CO_2e) emissions based on the global warming potentials (GWP) for each individual GHG. The current GWPs are as follows:

- CO_2: 1
- methane: 25
- NO_x: 298
- hydrochlorofluorocarbon-23 (HCFC-23): 14,800
- hydrochlorfluorocarbon-134a (HFC-134a): 1,430
- SF6: 22,800

Water vapor also has a GWP, but because the amount of water vapor in the atmosphere is caused primarily by the ambient temperature (a natural phenomenon), it is not included in the calculation of CO_2e emissions.

Currently there are no emission limits for suspected 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.

3.7 Transportation

This section identifies existing transportation and motorized vehicle access conditions in the Proposed Project area that would be affected by construction, O&M, and decommissioning of the Proposed Project.

3.7.1 Region of Influence

The ROI evaluated for transportation resources encompasses those locations within or near the project area where roadways may be affected by construction, O&M, and decommissioning of the Proposed Project.

3.7.2 Methodology

The Annual Average Daily Traffic (AADT) was used to characterize existing traffic volumes. The Nevada Department of Transportation (NDOT) calculates the AADT by dividing the total volume of traffic at a particular point (i.e., both traveling directions of a highway segment) by the number of days in the year. Additionally, the level of service (LOS) was used to define the existing environment. The LOS expresses the operational conditions within a traffic stream, taking into consideration speed, travel time, traffic interruptions, freedom to maneuver, and comfort and convenience (Transportation Research Board 1995). The LOS for the highways are then converted to a letter classification identifying best-to-worst operating conditions, expressed as LOS A through F (defined in Table 3.7-1). Both the ADDT and LOS are used to assess potential effects on transportation and access within the project area and vicinity.

Table 3.7-1. Level of Service Classifications and Definitions

Classifications	Level of Service Classification Definitions
A	Free flow with low volumes and high speeds.
B	Reasonably free flow, but speeds beginning to be restricted by traffic conditions.
C	In stable flow zone, but most drivers are restricted in the freedom to select their own speeds.
D	Approaching unstable flow; drivers have little freedom to select their own speeds.
E	Unstable flow; may be short stoppages.
F	Unacceptable congestion; stop-and-go; forced flow.

Source: Transportation Research Board 1995.

3.7.3 Existing Environment

3.7.3.1 Major Traffic Routes and Existing Traffic Volumes

The Proposed Project site is located in a largely undeveloped area and major transportation routes are limited. The primary access road leading to the Proposed Project area from the north and south is US-95 from Boulder City south through Searchlight, and south beyond the Nevada state line to US Interstate 40 (I-40) in California. Access to the project area from the east and west is via Cottonwood Cove Road, also known as Cottonwood Cove Access Road, which extends from Lake Mohave on the east through Searchlight and west beyond the Nevada state line to Interstate 15 (I-15) in California. US-95 is a major regional corridor (from Oregon to California) and a key element of Nevada’s principal highway freight network delivering commercial, public, and private drivers and their cargo north to Las Vegas and beyond, and south to California and Arizona. Cottonwood Cove Road (SR 164) is classified by the NDOT as a rural major collector roadway. The closest NDOT traffic count stations illustrate the AADT along US-95 and SR 164 (Table 3.7-2).

Table 3.7-2. AADT at NDOT Traffic Count Stations near the Proposed Project Area

Station Number	Location	2006	2007	2008	2009	2010
0033130	US-95, 0.7 mile north of SR 164	9,500	9,500	8,600	8,700	8,700
0030236	Cottonwood Cove Road, 1 mile east of US-95 and 0.2 mile east of the road to Searchlight Cemetery	740	820	550	740	500

Source: Nevada Department of Transportation 2010
Note: The declines in traffic at all counters in 2008 is believed to result from the spike in fuel prices in spring of 2008 and continuing into fall of 2008, combined with the effects of the recession. Existing LOS within the project vicinity is C or better at all times (Transportation Research Board 2000). When the Hoover Dam crossing was closed to truck traffic in 2001, truck traffic between Las Vegas and I-40 was diverted through Searchlight and Laughlin, Nevada. With the opening of the Hoover Dam bypass in October 2010, traffic volumes on US-95 area are expected to drop and there should be an improvement to LOS within the project vicinity that is not represented in the current traffic volume data.

3.7.3.2 Off-Highway Vehicle Use

Several unimproved dirt, improved unpaved, and paved access routes within the Proposed Project area provide access for recreation activities. Vehicle volume is low due to the rural nature of the area. The primary users of the unimproved routes are hunters, OHV users, recreationists, utility maintenance and land managers.

There are several utility lines in the vicinity typically associated with an improved unpaved access road. These roads provide access for periodic routine inspections, maintenance, and repairs. These roads are typically in good to very good condition and provide primary access for recreational travel as well as utility service.

OHVs are used throughout the project area for recreation (e.g., motorcycle racing, rock climbing, hunting, camping). OHV use is one of the fastest growing recreational activities on public lands. OHV use is prominent near the urban-wildland interface adjacent to populated areas, and within Clark County, considerable OHV use occurs near Searchlight. The BLM objectives for OHV management are to protect the resources of public lands, promote the safety of all users of those lands, and minimize conflicts among the various uses of those lands (BLM 1998).

Land can be designated as open to OHV use, closed to OHV use, open to OHV use but limited to existing roads and trails, or open to OHV use but limited to designated roads and trails. All BLM land in the project area is currently designated as open to OHV use but limited to designated roads and trails. Although OHV use in the area is limited, increased OHV use in the vicinity of Searchlight has resulted in a growing network of unauthorized trails. Unauthorized use of motorized vehicles has damaged resources within the project area by crushing vegetation, disturbing wildlife, increasing noise and airborne particulates, and increasing erosion potential.

3.8 Land Use

This section identifies existing land use goals, objectives, and policies within and adjacent to the Proposed Project area and discusses applicable regulations. The analysis is focused on existing federal, state, and Clark County land use zoning, ROWs, grants, claims, permits, and general land use guidance. This section includes a general discussion on land use in Clark County to establish a regional setting for the Proposed Project.

3.8.1 Region of Influence

The ROI evaluated for land use encompasses the Proposed Project area and vicinity that might be affected by construction, O&M, and decommissioning of the Proposed Project.

3.8.2 Existing Environment

The Proposed Project area encompasses BLM-administered lands in Clark County, Nevada, approximately 60 miles southeast of Las Vegas, and 0.5 miles northeast to 3 miles southeast of the town of Searchlight, Nevada. Existing land uses in the project area are characterized by, dispersed recreation, traditional and renewable utilities, and mineral exploration and development. Utility and transportation corridors and facilities predominate along the western and eastern edges of the project area. The closest developed area is Searchlight, which is composed of private residences and commercial enterprises such as gas stations and general stores, casinos, and community facilities. The Nevada community of Cal-Nev-Ari is approximately 6.5 miles south of the project area. Boulder City, Nevada, is approximately 30 miles northeast of the project area, and Laughlin, Nevada, is approximately 40 miles south of the project area.

The land use type throughout the project site includes undeveloped desert alluvial valleys on the east side of the Piute Valley in the low hills bordering the western flank of an unnamed mountain range that includes Fourth of July Mountain. This area is within the Basin and Range geomorphic province, an area of broad, flat valleys bordered by block-faulted bedrock mountains. Elevations in the Searchlight area range from approximately 1,700 feet to more than 3,450 feet for the unnamed highlands in part of the project area. The majority of the lands surrounding the project area are federally administered.

3.8.2.1 Land Ownership

The Proposed Project area encompasses approximately 30 total square miles of private, NPS, and BLM-administered lands east of Searchlight, and is surrounded by BLM specially designated lands; however, the proposed project components would be located only on BLM-managed land (18, 949 acres). The project area includes several small parcels (totaling approximately 644 acres) of privately owned lands. Table 3.8-1 lists the land ownership status within the project area.

Table 3.8-1. Land Ownership Status within the Proposed Project Area

Land Status Category within Clark County	Acres	Percent
BLM	18,949	96
Forest Service, National Park Service, Bureau of Indian Affairs, Department of Defense	10	.0006
Private	644	4
State Of Nevada	0	0

Source: BLM, LR2000 data

3.8.2.2 Governing Land Management Plans

The Proposed Project area is located within the BLM Southern Nevada District Planning Area and is managed by the BLM LVFO under the jurisdiction of the 1998 Las Vegas RMP and ROD (BLM 1998).

The LVFO management area encompasses approximately 3,332,000 acres of public lands in Clark, Nye, and Lincoln Counties.

Updates or amendments to the Las Vegas RMP and ROD include national programmatic EISs regarding development of wind energy and energy corridors. The *Final Programmatic Environmental Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States* (BLM 2005b) sets parameters for determining where wind energy projects can occur and allows adoption of programmatic policies and BMPs regarding wind energy development. The Final Programmatic EIS and the ROD (entitled *Designation of Energy Corridors on Federal Lands in the 11 Western States*) define energy development corridors to expedite applications to construct or modify oil, gas, and hydrogen pipelines, and electricity transmission and distribution facilities. The Las Vegas RMP was effectively amended in December 2005 as part of the BLM Wind Energy Development Program.

The Las Vegas RMP consists of a combination of management directions, allocations, and guidelines that direct where actions may occur, the resource conditions to be maintained, and use limitations required to meet management objectives. The Las Vegas RMP specifies that multiple-use management includes conservation of cultural resources; riparian areas; desert tortoise, special status species, and fish and wildlife habitat; and resource development where consistent with desert tortoise recovery.

The BLM LVFO manages over 94.5% of the lands within the project area. The remaining private lands are zoned by Clark County as Open Lands and are subject to policies set forth in the Clark County Unified Development Code (UDC). The Open Lands zone has highly limited public services and facilities. Grazing, open space, and recreational uses may occur in areas zoned as Open Lands (CCCPD 2005). The purpose of this zone is to regulate lands in private ownership by limiting dwelling units to only single-family/farm uses at densities no greater than one dwelling unit per 10 acres, the lowest density residential land use defined in the South County Land Use Plan (Clark County Comprehensive Planning Division [CCCPD] 2005).

3.8.2.3 Utility Corridors and Rights-of-Way

ROWs for utilities and roads cross the project area and are concentrated along the eastern edge of the project area, north and south of Searchlight (see Figure 3.8-1). Existing ROWs (that are either wholly or partially within the project area) include roadways, telephone lines, electrical transmission lines, pipelines, and other uses. Table 3.8-2 provides data on all ROWs, both existing and pending within the project area.

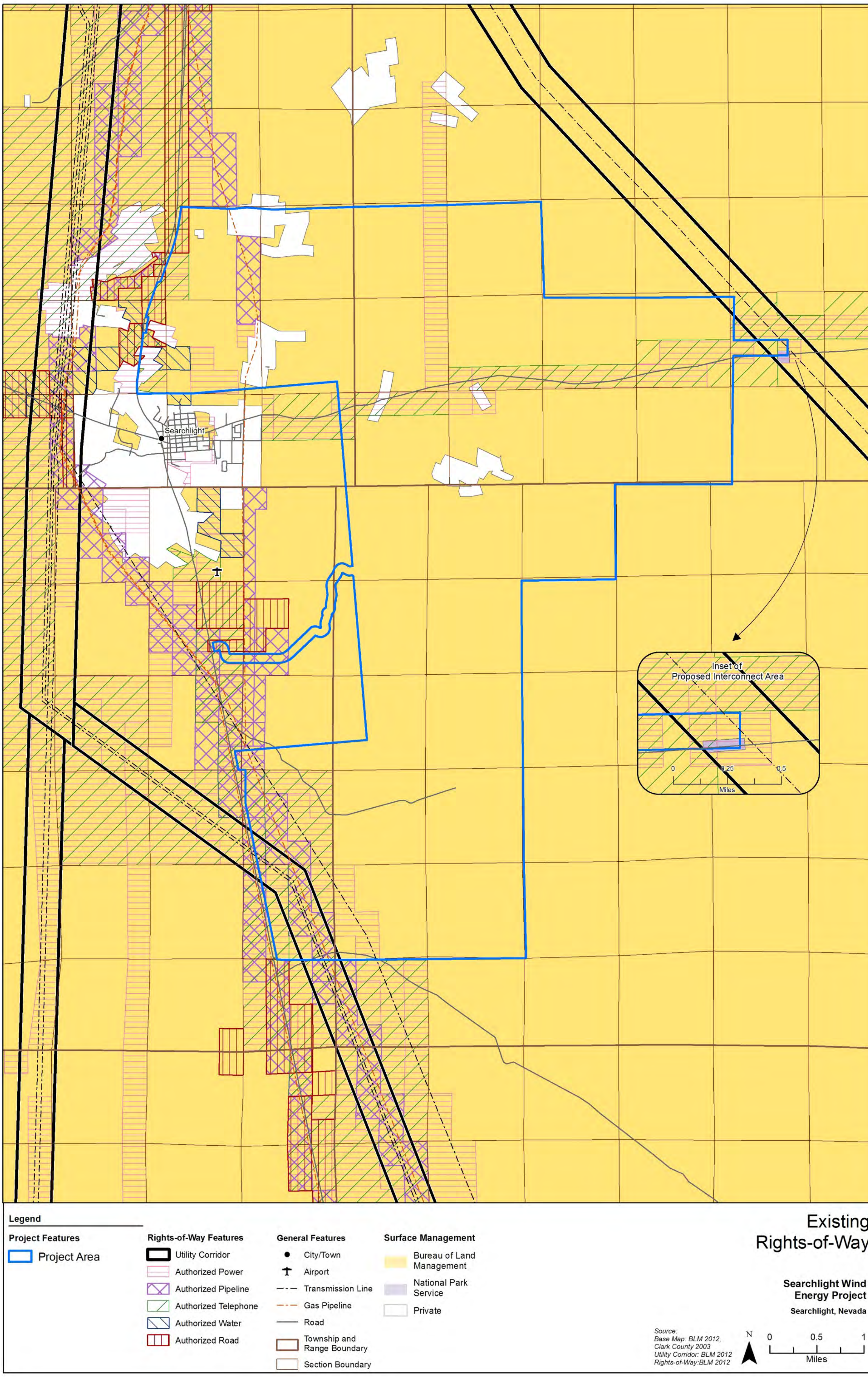


Figure 3.8-1. Existing ROWs in the Project Area.

Table 3.8-2. ROWs within or adjacent to the Proposed Project Area

Serial Nr Full	Cust Nm	Address	City	St.	Zip	Case Disp	Commodity	Case Type	Acres
NVN 087330	AGER CARL	2441 W HORIZON RIDGE PKWY 120	HENDERSON	NV	89052	AUTHORIZED	TO BE DEFINED	SURFACE MGT- PLAN	1
NVN 052050	AT&T CRE LEASE ADMIN	ONE AT&T WY RM 1B201	BEDMINSTER	NJ	07921	AUTHORIZED	FIBER OPTIC FACILITIES	ROW-TEL & TELEG,FLPMA	60.531
NVN 076881	BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	89130 2301	AUTHORIZED	SUBJECT TO PRIOR RIGHTS	RESOURCE MGT PLANNING	325,271.5
NVN 083979	BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	89130	AUTHORIZED	SUBJECT TO PRIOR RIGHTS	WDL-BLM-SPECIAL DESIGNAT	944,343
NVN 061968FD	BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	89130 2301	PENDING	NONE	EX-BLM SEC 206, FLPMA	2,000
NVN 079316	BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	89130 2301	PENDING	SAND AND GRAVEL,S&G LCS	COMMUNITY PIT -ALL	6,762.899
NVN 083547	BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	89130 2301	PENDING	OCCUPANCY, RESIDENTIAL	UNAUTHORIZE D OCCUPANCY	3
NVN 084115	BLM	4701 N TORREY PINES DR	LAS VEGAS	NV	89130	PENDING	OTHER ENERGY FACILITIES	UNAUTHORIZE D OCCUPANCY	0.1
NVN 029605	BOR	BOX 9980	PHOENIX	AZ	85068	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-PWR LINE FED FAC	1,100.52
NVN 033410	BREEDLOVE MURPHY	824 EUGENE CERNAN ST	LAS VEGAS	NV	89145 6129	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	0.92
NVN 008079	CENTRAL TELE DBA CENTURYLINK	6700 VIA AUSTI PKWY	LAS VEGAS	NV	89119 3545	AUTHORIZED	NON-ENERGY FACILITIES	ROW-TELEPHONE-TELEGRAPH 4	8.302
NVN 051417	CENTRAL TELE DBA CENTURYLINK	6700 VIA AUSTI PKWY	LAS VEGAS	NV	89119 3545	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	0.311
NVN 052985	CENTRAL TELE DBA CENTURYLINK	6700 VIA AUSTI PKWY	LAS VEGAS	NV	89119 3545	AUTHORIZED	FIBER OPTIC FACILITIES	ROW-TEL & TELEG,FLPMA	78.194
NVN 088114	CHARLES COLLIER	2182 N PECOS RD TRLR 38	LAS VEGAS	NV	89115 0612	PENDING	TO BE DEFINED	SURFACE MGT- PLAN	1
NVN 058109	CHRISTENSEN MILTON	BOX 548	PROVO	UT	84603	EXPIRED	NON-ENERGY FACILITIES	ROW-ROADS	0.551
NVN 090180	CHRISTENSEN MILTON	BOX 548	PROVO	UT	84603	PENDING	NON-ENERGY FACILITIES	ROW-ROADS	0.551
NVN 021747	CLARK CNTY	PO BOX 554000	LAS VEGAS	NV	89155	AUTHORIZED	PUBLIC PURPOSES	R&PP CLASS	56

Table 3.8-2. ROWs within or adjacent to the Proposed Project Area

NVN 02174701	CLARK CNTY	PO BOX 554000	LAS VEGAS	NV	89155	EXPIRED	PUBLIC PURPOSES	R AND PP LEASE	56
NVN 051027	CLARK CNTY	PO BOX 554000	LAS VEGAS	NV	89155	PENDING	OTHER ENERGY FACILITIES	ROW-TRANS SOLID	160
NVN 054503	CLARK CNTY	PO BOX 554000	LAS VEGAS	NV	89155	PENDING	LITTER, TRASH, REFUSE	UNAUTHORIZE D DEVELOPMEN T	160
NVN 083130	COGENTRIX SOLAR SERVICES LLC	701 N GREEN VALLEY PKY STE 200	HENDERSON	NV	89074	PENDING	SOLAR ENERGY FACILITIES	ROW-SOLAR DEV FAC	4,480
NVN 046709	COYOTE MINES INC	1201 SYCAMORE DR SE	ISSAQUAH	WA	98027	AUTHORIZED	NON-ENERGY FACILITIES	ROW-ROADS	3.953
NVN 048555	COYOTE MINES INC	1201 SYCAMORE DR SE	ISSAQUAH	WA	98027	AUTHORIZED	NON-ENERGY FACILITIES	ROW-O&G PIPELINES	3.953
NVN 050229	COYOTE MINES INC	1201 SYCAMORE DR SE	ISSAQUAH	WA	98027	AUTHORIZED	NONE	MIN PAT APLN-MILLSIT BLM	14.35
NVN 058566	ELECTRIC LIGHTWAVE LLC	1201 NE LLOYD BLVD STE 500	PORTLAND	OR	97232	EXPIRED	FIBER OPTIC FACILITIES	ROW-TEL & TELEG,FLPMA	62.567
NVN 071928	HARLAN NEAL	BOX 215	SEARCHLIGHT	NV	89046	EXPIRED	GOLD LC	SURFACE MGT- NOTICE	0
NVN 061851	IXC CARRIER GROUP INC	1122 S CAPITAL OF TEXAS HWY	AUSTIN	TX	78746 6426	AUTHORIZED	FIBER OPTIC FACILITIES	ROW-POWER TRAN-FLPMA	40.45
NVN 062110	IXC COMM INC	1122 S CAPITOL OF TEXAS HWY	AUSTIN	TX	78746	AUTHORIZED	FIBER OPTIC FACILITIES	ROW-TEL & TELEG,FLPMA	1,100.29
NVN 003827	LA DEPT OF WATER & POWER	111 N HOPE ST RM 1031	LOS ANGELES	CA	90012 2607	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN LINE	961.43
NVN 084617	LAS VEGAS VALLEY WATER DIST	PO BOX 99956	LAS VEGAS	NV	89193 9956	AUTHORIZED	NON-ENERGY FACILITIES	ROW-WATER FACILITY	37.31
NVN 08461701	LAS VEGAS VALLEY WATER DIST	PO BOX 99956	LAS VEGAS	NV	89193 9956	AUTHORIZED	NON-ENERGY FACILITIES	ROW-WATER FACILITY	8.18
NVN 088158	NEVADA POWER CO (NV ENERGY)	PO BOX 98910	LAS VEGAS	NV	89151 0001	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	7.733
NVN 078928	NPS LAKE MEAD NAT REC AREA	601 NEVADA HWY	BOULDER CITY	NV	89005	AUTHORIZED	SUBJECT TO PRIOR RIGHTS	WDL-NPS NATL REC AREAS	10
NVN 086337	NPS LAKE MEAD NAT REC AREA	601 NEVADA HWY	BOULDER CITY	NV	89005	AUTHORIZED	NON-ENERGY FACILITIES	ROW-OTHER FEDERAL FAC	10

Table 3.8-2. ROWs within or adjacent to the Proposed Project Area

NVCC 0020730	NV DEPT OF TRANS	1263 S STEWART ST	CARSON CITY	NV	89712	AUTHORIZED	NON-ENERGY FACILITIES	MATERIAL SITES(SEC 17)	40
NVCC 0020733	NV DEPT OF TRANS	1263 S STEWART ST	CARSON CITY	NV	89712	AUTHORIZED	NON-ENERGY FACILITIES	FED AID HIGHWAY(SEC 17)	726.18
NVCC 0020818	NV DEPT OF TRANS	1263 S STEWART ST	CARSON CITY	NV	89712	AUTHORIZED	NON-ENERGY FACILITIES	MATERIAL SITES(SEC 107)	140
NVCC 0020736	NV POWER CO	PO BOX 98910	LAS VEGAS	NV	89151	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	884.036
NVN 003274	NV POWER CO	PO BOX 98910	LAS VEGAS	NV	89151	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	0.408
NVN 003827	NV POWER CO	PO BOX 98910	LAS VEGAS	NV	89151	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN LINE	961.43
NVN 051417	NV POWER CO	PO BOX 98910	LAS VEGAS	NV	89151	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	0.311
NVN 077274	NV POWER CO	PO BOX 98910	LAS VEGAS	NV	89151	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	2.26
NVN 088104	NV POWER CO	PO BOX 98910	LAS VEGAS	NV	89151	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	0.2
NVN 08810401	NV POWER CO	PO BOX 98910	LAS VEGAS	NV	89151	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	0.4
NVN 0045212	NV POWER CO	PO BOX 98910	LAS VEGAS	NV	89151	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	62.054
NVN 071928	PARKER JUNE	BOX 215	SEARCHLIGHT	NV	89046	EXPIRED	GOLD LC	SURFACE MGT- NOTICE	0
NVN 071921	PEPPERTREE CONST & MNG CORP	PO BOX 848	ACTON	CA	93510	EXPIRED	GOLD LC	SURFACE MGT- NOTICE	2
NVN 087918	PEPPERTREE CONST & MNG CORP	PO BOX 848	ACTON	CA	93510	PENDING	GOLD,LODE LC	SURFACE MGT- PLAN	0.77
NVN 071990	PHOENIX METALS USA II USA INC	BOX 936	SEARCHLIGHT	NV	89046	EXPIRED	GOLD LC	SURFACE MGT- NOTICE	0
NVN 088186	ROYAL M & M - MATHESON	2580 ANTHEM VILLAGE DR	HENDERSON	NV	89052 5503	PENDING	GOLD LC	SURFACE MGT- PLAN	1
NVN 003827	SALT RIVER PROJECT	BOX 1980	LAS VEGAS	NV	85001	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN LINE	961.43
NVN 081843	SEARCHLIGHT AIRPARK DEV LLC	2278 TEDESCA DR	HENDERSON	NV	89052	AUTHORIZED	NON-ENERGY FACILITIES	AIRPORT LEASES	21.4

Table 3.8-2. ROWs within or adjacent to the Proposed Project Area

NVN 087330	SEARCHLIGHT MINERALS CORP	2441 W HORIZON RIDGE PKWY 120	HENDERSON	NV	89052	AUTHORIZED	TO BE DEFINED	SURFACE MGT- PLAN	1
NVN 082648	SEARCHLIGHT WIND ENERGY PROJEC	71 ALLEN ST STE 101	RUTLAND	VT	05701 4570	EXPIRED	WIND ENERGY FACILITIES	ROW-WIND PROJ TEST	24,382.56
NVN 084626	SEARCHLIGHT WIND ENERGY PROJEC	71 ALLEN ST STE 101	RUTLAND	VT	05701 4570	PENDING	WIND ENERGY FACILITIES	ROW-WIND DEV FAC	24,382.56
NVN 089747	SEARCHLIGHT WIND ENERGY PROJEC	71 ALLEN ST STE 101	RUTLAND	VT	05701 4570	PENDING	WIND ENERGY FACILITIES	ROW-WIND PROJ TEST	24,382
NVCC 0018307	SO CA METRO WATER DIST	BOX 54153	LOS ANGELES	CA	90054	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-BOULDER CAN PROJ	3,598.69
NVN 003827	SOUTHERN CALIFORNIA EDISON	2131 WALNUT GROVE AVE GO3 FL 2	ROSEMEAD	CA	91770 3769	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN LINE	961.43
NVN 007841	SOUTHWEST GAS CORP	PO BOX 98510	LAS VEGAS	NV	89193 8510	AUTHORIZED	OIL & GAS FACILITIES	ROW-O&G PIPELINES	359.29
NVN 025616	SOUTHWEST GAS CORP	PO BOX 98510	LAS VEGAS	NV	89193 8510	AUTHORIZED	OIL & GAS FACILITIES	ROW-O&G PIPELINES	6.606
NVN 0015814	SOUTHWEST GAS CORP	PO BOX 98510	LAS VEGAS	NV	89193 8510	AUTHORIZED	OIL & GAS FACILITIES	ROW-O&G PIPELINES	192.54
NVN 0043645	SOUTHWEST GAS CORP	PO BOX 98510	LAS VEGAS	NV	89193 8510	AUTHORIZED	OIL & GAS FACILITIES	ROW-O&G PIPELINES	210.77
NVN 0060005	SOUTHWEST GAS CORP	PO BOX 98510	LAS VEGAS	NV	89193 8510	AUTHORIZED	OIL & GAS FACILITIES	ROW-O&G PIPELINES	83.128
NVCC 0024550	WAPA	BOX 6457	PHOENIX	AZ	85005	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	1,054.637
NVN 0046127	WAPA	BOX 6457	PHOENIX	AZ	85005	AUTHORIZED	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	511.043
NVN 090114	WESTERN AREA POWER ADMIN (DSW)	PO BOX 6457	PHOENIX	AZ	85005 6457	PENDING	NON-ENERGY FACILITIES	PERMITS SEC 302 FLPMA	7
NVN 086777	WESTERN AREA POWER ADMINISTRAT	PO BOX 6457	PHOENIX	AZ	85005 6457	PENDING	OTHER ENERGY FACILITIES	ROW-POWER TRAN-FLPMA	5.7
NVN 089703	WESTERN AREA POWER ADMINISTRAT	PO BOX 6457	PHOENIX	AZ	85005 6457	PENDING	OTHER ENERGY FACILITIES	ROW-PWR LINE FED FAC	654.55
NVN 071921	WINELAND ROBERT B	PO BOX 848	ACTON	CA	93510 0848	EXPIRED	GOLD LC	SURFACE MGT- NOTICE	2

Table 3.8-2. ROWs within or adjacent to the Proposed Project Area

NVN 087918	WINELAND ROBERT B	PO BOX 848	ACTON	CA	93510 0848	PENDING	GOLD,LODE LC	SURFACE MGT- PLAN	0.77
									1,371,404.748

The most prominent features within the ROWs are the largely north-south trending electrical transmission lines of the Nevada Power Company, Western, and Southern California Metropolitan Water District. Four existing transmission lines currently cross portions of the project area. The Western Davis-Mead 230-kV transmission line crosses the extreme eastern portion of the project area at the location of Western's proposed switching station, approximately 7.5 miles east of Searchlight. Two additional Western-owned transmission lines and a Nevada Energy transmission line cross the southwestern portion of the project area. There are currently 371 acres of designated utility corridors within the project area (see Figure 3.8-1).

The other prominent utility ROWs are for telephone lines that cross the project area both east-west and north-south parallel to Cottonwood Cove Road and US-95 ROWs. The total acreage of existing authorized ROWs within the project area is 8,910 acres. Many of the authorized ROWs overlap one another or are directly adjacent to one another. Table 3.8-3 includes the acreages for each of the different utility ROWs.

Table 3.8-3. Authorized ROW Acreage Calculations within the Proposed Project Area

Authorized Right-of-Ways	Total Acres
Utility Corridor	371.1
Authorized Power	4,343.2
Authorized Pipeline	1,259.8
Authorized Telephone	3,024.7
Authorized Water	77.7

Source: BLM, LR2000 data

The Las Vegas RMP does not identify specific projects, such as ROW applications for wind energy. There are no renewable energy developments within the project area for geothermal, wind, hydroelectric, or solar power. To date, the only identified federally authorized use granted for this type of development is ROW NVN-082648, issued to Searchlight, LLC, for construction of the three MET towers now situated at specific locations within the project area. These MET towers collect data that supplement computer simulations and measure wind speed and direction within the project area. Western's proposed switching station is located mainly within an existing Western ROW.

The BLM manages ROWs through a system of designated corridors and designated ROW exclusion and avoidance areas. To facilitate the development of priority renewable energy projects on federally administered lands (in accordance with the BLM Wind Energy Development Program), the LVFO has encouraged the placement of new facilities within established corridors, including within SMAs such as ACECs. Utility corridors within ACECs are limited to 3,000 feet or less in width. Exceptions have been based on the type of and need for a proposed project, and the absence of conflict with other resource values and uses. The project area does not include lands managed as exclusion or avoidance areas.

Material site ROWs are allowed only within 0.5 mile of the centerline of Federal Aid Highways and specified county roads, including US-95 and Cottonwood Cove Road (SR 164) (BLM 1998).

3.8.2.4 Special Designations

Special designations can either be congressionally designated or administratively designated. Congressionally designated areas include National Wilderness Areas, National Wild and/or Scenic Rivers, National Conservation Areas, National Scenic Trails, and National Historic Trails. Administrative designations include Wilderness Study Areas, ACECs, DWMAs, Outstanding Natural Areas, Research Natural Areas, and Special Recreation Management Areas (SRMAs).

The Piute-Eldorado Valley ACEC surrounds the project area; a small portion of the Proposed Project extends into the ACEC along the eastern border of the project area (Figure 3.8-2). Western's proposed switching station and associated transmission line would be located within the ACEC, but within ½ mile of a federally designated highway that allows development of facilities per the BLM RMP (1998). The ACEC is managed by the BLM to protect critical habitat of the desert tortoise (Figure 3.8-2). For a discussion of potential impacts on desert tortoise see Section 4.4, Biological Resources Impacts.

Six designated wilderness areas are located relatively close to the project area: Ireteba Peaks Wilderness (approximately 6 miles northeast), Nellis Wash Wilderness (approximately 5 miles east), Spirit Mountain Wilderness (approximately 8 miles southeast), and Bridge Canyon Wilderness (approximately 12 miles southeast). The Wee Thump Joshua Tree Wilderness (approximately 8 miles west) and the South McCullough Wilderness (approximately 12 miles northwest) are located on the western boundaries of the Piute-Eldorado Valley.

SMAs occur on adjacent NPS-administered lands—the Lake Mead NRA, namely, the Nellis Wash Wilderness, Ireteba Peaks Wilderness, and Spirit Mountain Wilderness. Instruction Memorandum 2011-061, Solar and Wind Energy Applications – Pre-Application and Screening (IM 2011-061 Solar and Wind Energy Applications) provides direction on wind energy development project preapplication and screening criteria for public lands of national interest and other specially designated areas that protect wildlife, visual, cultural, historic or paleontological resource values. Although the NPS does not have a project-related decision or approval to make, as a cooperating agency in this NEPA effort, the NPS has participated in discussions, site visits, and preliminary resource investigations. Through these efforts, the NPS has assisted the BLM in identification of potential environmental and siting constraints that would result in the fewest possible resource conflicts and the greatest likelihood of success in the permitting process.

3.8.2.8 Exchange Areas

Under the federal Recreation and Public Purposes Act, the BLM issues leases and patents of public land to governmental and nonprofit entities for public purposes such as parks, building sites, schools, and landfills. No exchange areas were identified in the Proposed Project area.

3.8.2.9 Disposal Lands

The Las Vegas RMP provides for disposal of public land within Clark County, with priority to the Santini-Burton Act area. The total number of acres identified for disposal, which are divided into close but separate isolated parcels and located adjacent to the northern and southern boundaries of Searchlight is 1,944 acres (Figure 3.8-3). No turbines would be located on the disposal lands, although one access road would traverse a small portion the southernmost land disposal area from Highway 95 northeast to the project boundary.

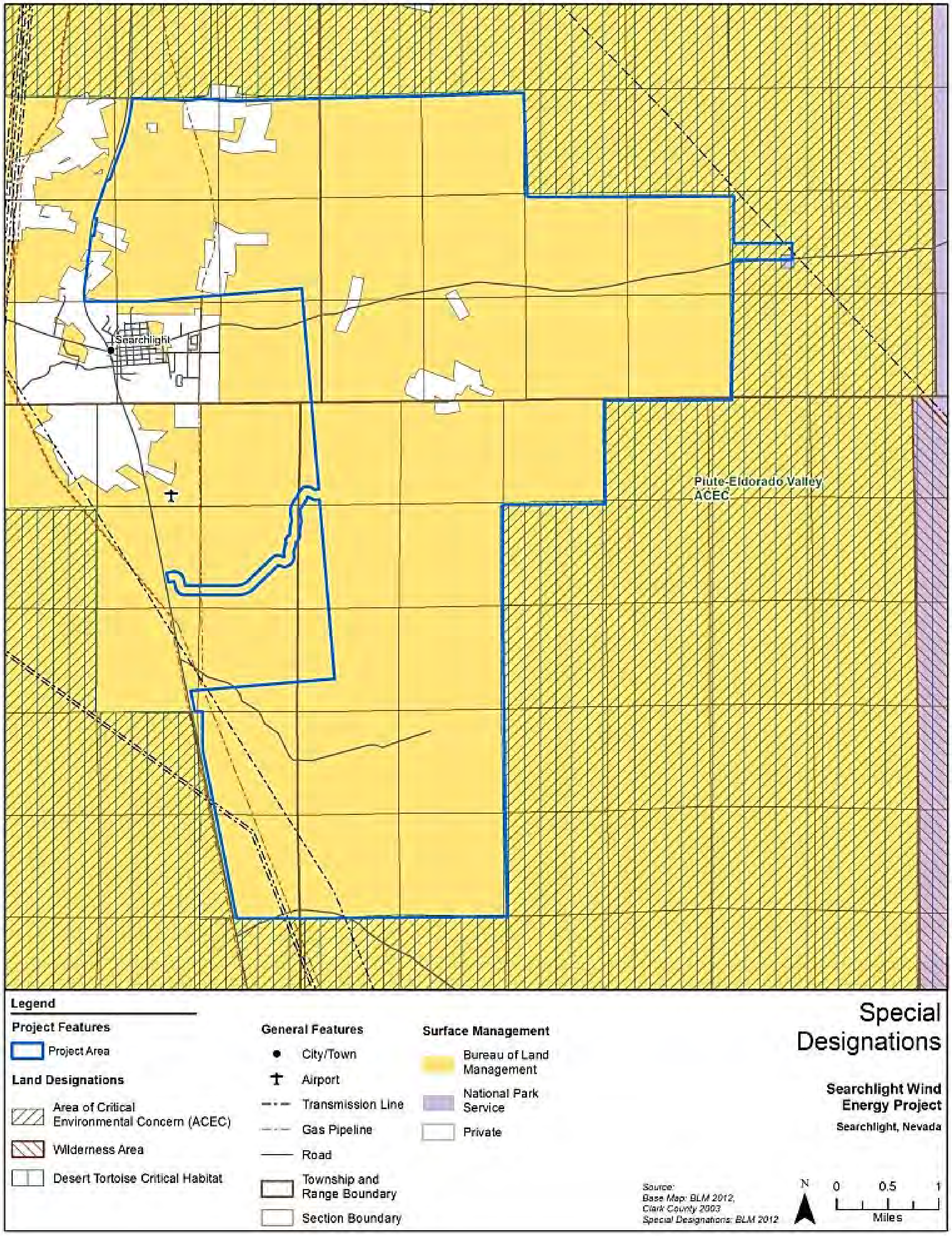


Figure 3.8-2. Special Designations Areas within the Proposed Project Vicinity

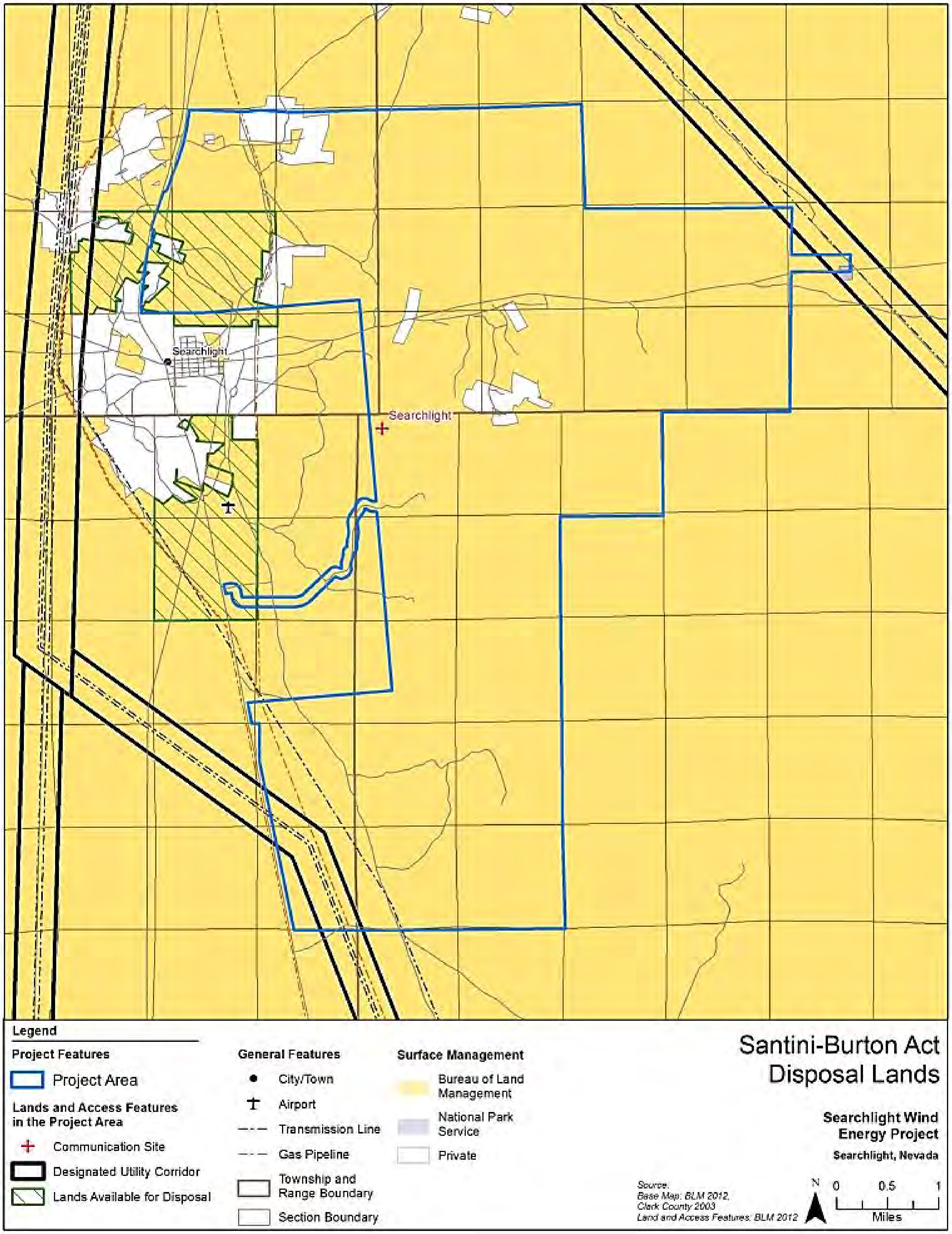


Figure 3.8-3. Disposal Lands within the Proposed Project Vicinity

Airports

The airport closest to the Proposed Project area is the Searchlight Airport, which is located on BLM-administered lands approximately 2 miles south of Searchlight. Originally built by the U.S. Air Force in the early 1950s as an emergency alternate paved airstrip for Nellis Air Force Base, the airport was operated by Clark County Department of Aviation until 2006. This 179-acre, public-use airport has one approximately 5,040-foot-long asphalt runway. It offers no services and is uncontrolled, unmanned, and unlighted. Aircraft operations at the airport consist of approximately 25 flight operations per month, with 100 percent general aviation usage (AirNav 2011). The Searchlight Airport is designated by the FAA as a 1L3 facility and is outside the FAA category B (Speed 91 knots or greater but less than 121 knots) traffic pattern airspace.

Because of the close proximity of the Proposed Project area to the Searchlight Airport, Part 77 of the Federal Aviation Regulations provides that any party proposing to construct an object or structure (e.g., WTGs and MET towers) near a public-use airport must notify the FAA before construction begins. In turn, the FAA is obligated to examine whether the structure would interfere with air navigation facilities and equipment or the navigable airspace. The Applicant is thus required to file a Hazard/No Hazard Determination for each structure closer than 20,000 feet to the airport boundary and for each structure that is 200 feet tall or taller.

A DOD Preliminary Screening was conducted for the Searchlight Airport. This screening tool provides developers with information regarding potential impacts to long-range and weather radars, military training routes, and special airspace prior to OE/AAA filing. This review indicates that there are no likely impacts to military airspace from the proposed action.

3.9 Visual Resources

This section identifies existing visual resources within and adjacent to the Proposed Project site that could be affected by construction, O&M, and decommissioning of the Proposed Project and discusses applicable regulations. The baseline visual setting was developed based on the BLM guidelines for visual resource management (VRM), with input from agencies and members of the public during the scoping process. The methodology used for this visual analysis is based on the BLM's *Visual Resource Inventory Handbook* and *Visual Resource Contrast Rating* handbooks (BLM manuals H-8410 and H-8431-1, 1980).

3.9.1 Region of Influence

The ROI was defined as the area wherein potential visual effect from construction, O&M, and decommissioning of the Proposed Project may be observed. A viewshed analysis was prepared for the Proposed Project. The analysis consists of a digital elevation model (DEM) that accounts for topography, WTGs height (427 feet), and viewer height (approximately 6 feet). The output of this analysis illustrates areas within 50 miles from which viewers might have clear line-of-sight to project features (Figure 3.9-1). The radius of 50 miles was chosen to ensure that potentially sensitive viewpoints were included in the viewshed analysis.

3.9.2 Methodology

NEPA requires that all actions sponsored, funded, permitted, or approved by federal agencies undergo planning to ensure that environmental considerations such as impacts related to aesthetics and visual quality are given due weight in project decision making (42 USC Section 4231). NEPA Section 101(b)(2) states that it is the "continuous responsibility" of the federal government to "use all practicable means" to "assure for all American's safe, healthful, productive, and aesthetically and culturally pleasing surroundings". Additionally, the FLMPA requires the BLM to protect the scenic quality on public lands (43 USC 1701). To comply with these requirements, the BLM has developed the VRM process. The BLM's VRM system provides the outline for describing visual resources and establishing appropriate management goals. Additionally, the VRM system guides the visual impact assessment of the Proposed Project and determines whether such a project would conflict with established management goals. The VRM describes the visual resource management goals associated with the project area; the VRM classes were established as part of the BLM planning process and take into consideration, among other factors, the visual resources inventory.

The analysis of impacts to visual resources is included in Section 4.9 of this document. This analysis involves measuring the degree of contrast that would be introduced by the project from Key Observation Points (KOPs). These KOPs are introduced and described below in Section 3.9.4.

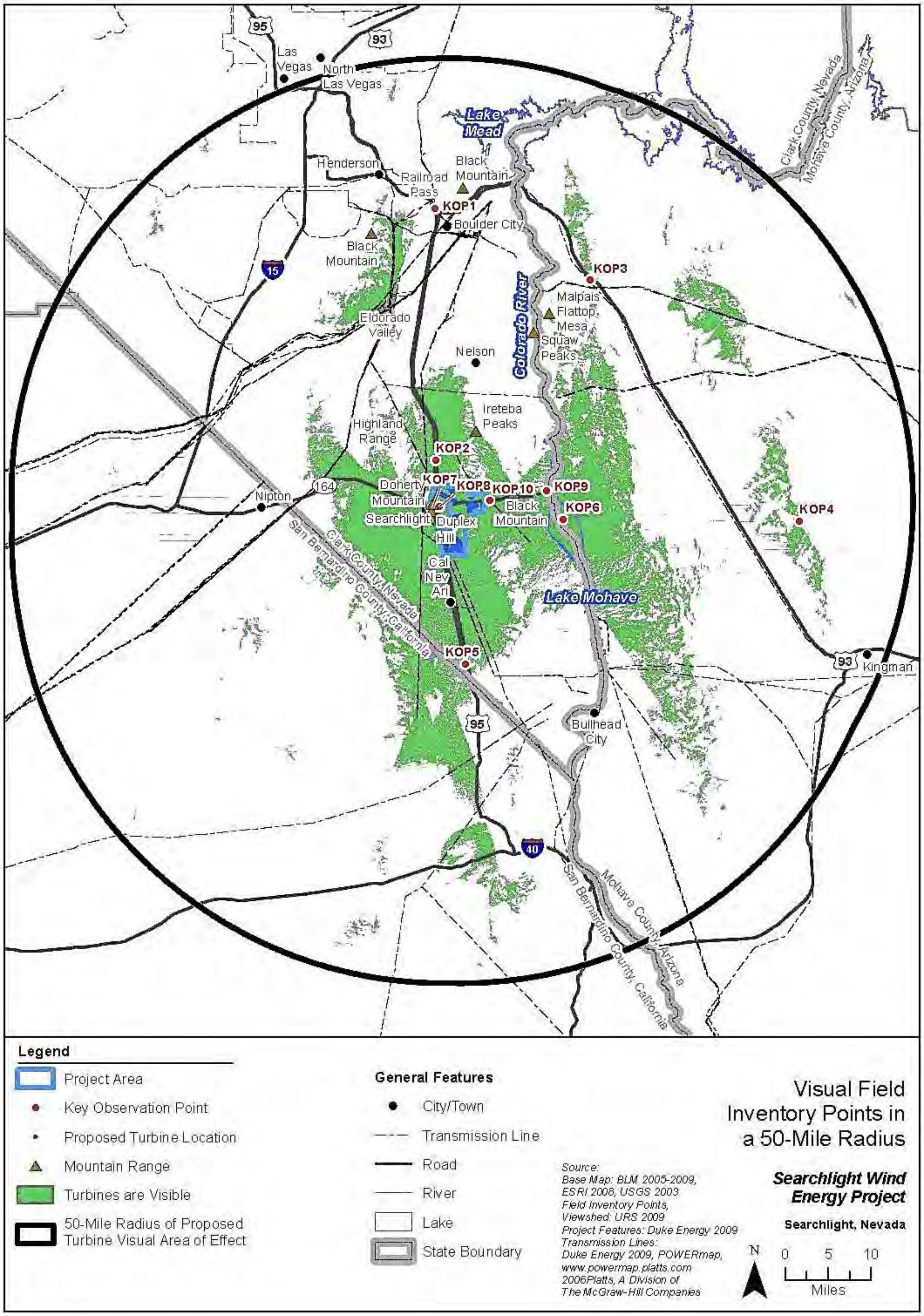


Figure 3.9-1. Areas from which the Proposed Project would be visible within 50 miles

3.9.3 Visual Resources Management Classes

Because the FLMPA requires the BLM to protect the scenic quality on public lands (43 USC 1701), the BLM has developed a process that identifies the visual resources and set objectives for managing those resources. To accomplish this, the BLM conducts an inventory that evaluates visual resources on all BLM-managed lands, and subsequently lands are assigned a VRM classification. This information is included in the Las Vegas RMP. The VRM classifications are associated with an allowable degree of change that guides the BLM on land management decisions. For example, Class I resources are the most valuable and are afforded the most amount of protection (i.e., the level of change to the characteristic landscape should be very low and must not attract attention), whereas Class IV provides for the most modification to the existing landscape.

The project area is located on BLM-administered land mostly designated as VRM Class III in the Las Vegas RMP (BLM 1998). VRM classes for the project site and adjacent lands are depicted in Figure 3.9-2. Within the project area, a small area in the southeast and northeast are designated as VRM Class II land. The BLM objectives of the Class II and Class III ratings are described below:

- Class II Objective. The objective of this VRM class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- Class III Objective. The objective of this VRM class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Some of the land in the Proposed Project vicinity is not managed by the BLM, such as private land in Searchlight or NPS land west of the project area. On Figure 3.9-2 these areas are depicted as white, because this land does not have established VRM Classes. For this evaluation, the goals associated with BLM's VRM classifications were applied to adjacent non-BLM-managed lands to maintain consistency and to standardize the analysis. For example, impacts on private land in Searchlight, which is surrounded by VRM Class III land, are evaluated using the goals associated with VRM Class III.

3.9.4 Existing Environment

3.9.4.1 Visual Character

Visual or aesthetic resources are the natural and built features of the landscape that contribute to the public's experience and appreciation of the environment. Visual resources or aesthetic impacts are generally defined in terms of a facility's physical characteristics and potential visibility, and the extent to which the facility's presence would change the perceived visual character and quality of the environment in which it would be located. To provide a basis for assessing the Proposed Project's potential effects on the visual resources of the Proposed Project area and the surrounding area, this section documents the existing visual conditions in the area and analyzes the existing landscape for its basic elements of form, line, color, and texture.

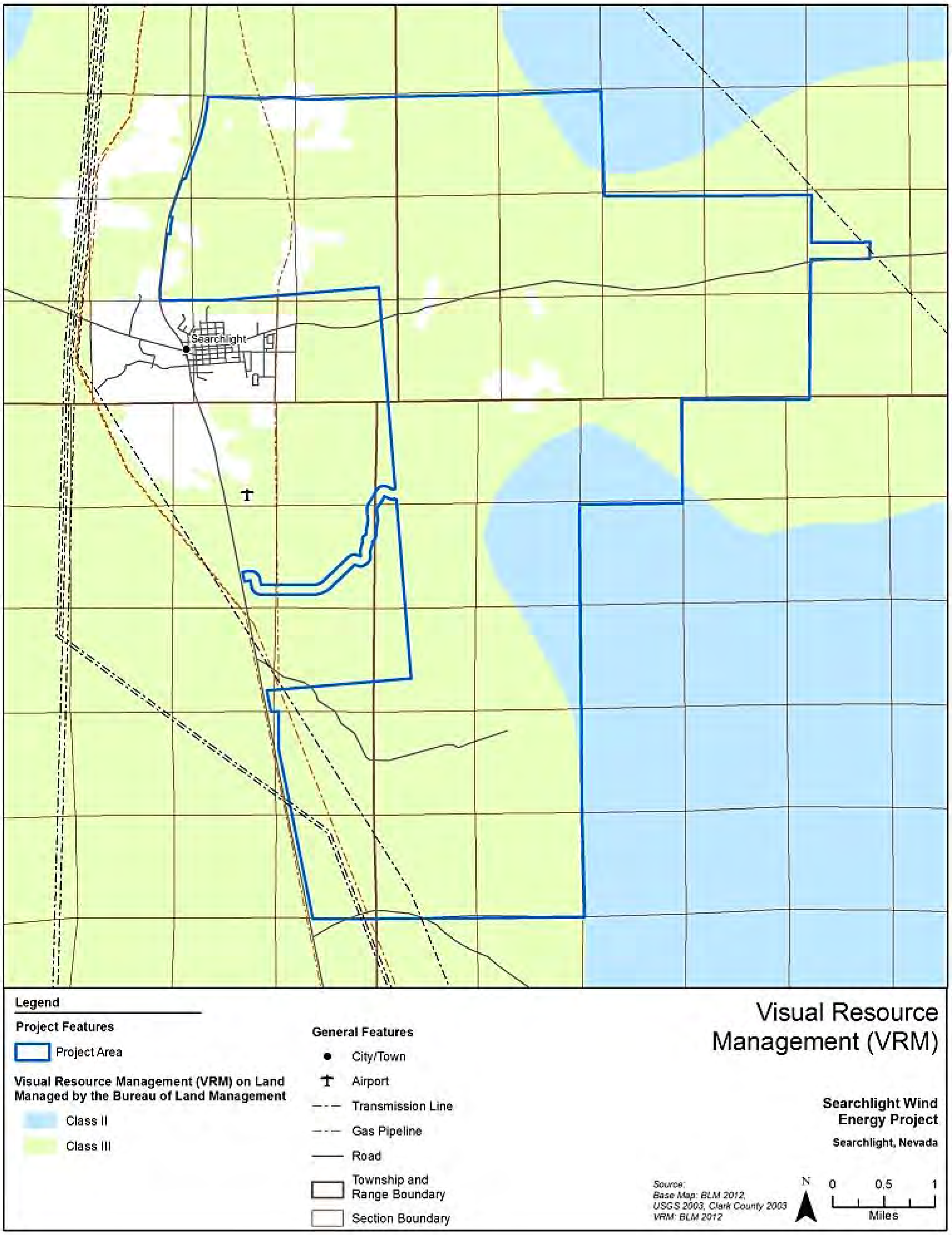


Figure 3.9-2. Visual Resource Management Classes near the Proposed Project Area

3.9.4.2 Landscape Characteristics

According to the USGS data, the project area is located in the Basin and Range Province, which is common throughout much of the southwestern U.S. including Nevada. Vast flat desert valleys surrounded by high fault-block mountains characterize this province. Many high mountain ranges surrounding the project area include the Black Mountains, Newberry Mountains, New York Mountains, and Eldorado Mountains as well as other smaller ranges. The landscape is panoramic, and expansive vistas of distant mountains are common. From the lower elevations and inferior viewpoints, mountainous features appear massive and steep due to perspective. These features tend to dominate the horizontal and shallow diagonal lines of the horizon, often creating silhouettes.

3.9.4.3 Vegetation

Creosote bush forms the dominant vegetation matrix, particularly at the lower elevations. The Proposed Project area also includes white bursage, cacti, yucca, ephedra, salt brush, and Indian rice grass (Kuchler 1964). These low-statured and regularly spaced shrubs are medium to coarsely textured and display muted hues of olive green and browns across the alluvial plains and rugged terrain of the project area. Trees and shrubs (i.e., Mojave yucca and Joshua trees) intermingle with the sagebrush at higher elevations, thus increasing color and texture contrasts compared to the monotone flats at lower elevations adjacent to Lake Mohave. Expansive vistas are common along the upper elevations, where the proportions of features at lower elevations are diminished due to viewing angle and orientation (Kuchler 1964).

3.9.4.4 Development

The Proposed Project is located directly east of Searchlight, Nevada. Searchlight is a small rural town with a population of approximately 500 residences, consisting of mostly retirees, miners, ranchers, artists, and small business owners (Nevada Commission on Tourism 2011). Amenities in the Searchlight include a community center, senior citizens center, post office, elementary school, the Searchlight Nugget Casino, Terrible's Casino, and some small shops. Searchlight also boasts several historic features including the Mining Park Entrance to Searchlight, Searchlight Historical Museum founded in 1898, and a historic hospital building. Several major roadways intersect Searchlight including U.S. 95, SR 164, and Cottonwood Cove Road. U.S. 95 is the major thoroughfare through between Las Vegas, California, and Arizona. SR 164 connects U.S. 95 with Interstate 15. Cottonwood Cove provides access to Lake Mead NRA.

In addition to Searchlight, other small communities in the Eldorado Valley include Cal-Nev-Ari, approximately 6.5 miles south of the project site and Boulder City, approximately 30 miles to the north.

The remainder of the Project area is largely undeveloped, but has an extensive network of dirt roads utilized by OHVs and outlying residences of the north and west sides of the project area. These roads have exposed soil and left linear scars on the landscape. Additionally, numerous mining areas are located within the project area, some of which have tailings and might draw the attention of a casual observer. The most common structures on the landscape are linear and horizontal. These include paved and dirt roads and the Davis-Mead electrical transmission line.

Additionally, three communication towers sites are located in the project vicinity including U.S. Coast Guard LORAN Station, approximately 10 miles southeast; Christmas Tree Pass Communication Site, which has multiple tower sites approximately 15 miles southeast; and two communication sites in the mountains approximately 10 miles west of the project area; and Nelson Communication approximately 15 miles north or the project area.

3.9.4.5 Lake Mead Recreational Area

Lake Mohave, which is part of the NPS-administered Lake Mead NRA, lies over 6 miles east of the project area. Lake Mohave forms a distinct water feature visible from the eastern extremities of the project area and includes recreational structures (such as picnic sites, marina, boat ramps, and a hotel), which are concentrated in the Cottonwood Cove area of Lake Mead NRA. The community of Searchlight is adjacent to the project area to the west. According to the NPS, Cottonwood Cove receives over 300,000 visitors annual (unpublished data provided by NPS).

3.9.4.6 Scenic Highways

No designated scenic vistas or state-designated scenic highways are within or within view of the Proposed Project area (http://www.nevadadot.com/Traveler_Info/Scenic_Byways/Nevada_Scenic_Byways.aspx).

3.9.4.7 Dark Skies

The BLM does not have a formal dark skies policy; however, the BLM recognizes that dark skies are a valuable resource especially within rural Nevada. Because the project area is largely undeveloped, nighttime is darker than more metropolitan areas. Small light sources are dappled throughout the valley including those from radio towers on surrounding hills; the Cal-Nev-Ari Airport; Cottonwood Cove marinas and boats; and private residences near and within the town of Searchlight.

3.9.4.8 Selection of KOPs

The BLM methodology for assessing impacts on visual resources (BLM Manual 8431) analyzes the level of contrast that would be introduced by the Proposed Project through a comparison of existing and simulated visual conditions from select KOPs. In the areas where the project could be visible, KOPs were selected for the visual analysis. KOPs represent both typical and critical viewpoints taking into account distance, angle of observation, number/types of viewers, length of time the project is in view, spatial relationship, relative project size, season of use, and atmospheric and light conditions. To establish the visual resource baseline for the Proposed Project, the views from all the KOPs are described below in detail. Views from KOPs are described in terms of distance zones identified by the BLM and are based on perception thresholds. Perception of changes in form, line, color, and texture varies with distance. Landscape elements tend to become less obvious and less detailed at greater viewing distances, and the elements of form and line become more dominant than color or texture as distance from the observer increases. Additionally, the views from KOPs are described in terms of scenic quality evaluation from low to high.

In addition to the KOPs selected based on the viewshed analysis, three additional KOPs were selected due to concerns raised during coordination between the BLM and Native American community. These KOPs represent views from the Christmas Tree Pass Communication Site in the Newberry Mountains (to replicate the view of the project area from Spirit Mountain, a sacred peak and registered Traditional Cultural Property [Sprowl 2010]), a view from the historic Searchlight Hospital toward the east, and a view from Cal-Nev-Ari toward the project area.

Additionally, the NPS has concerns about the project features on views from the Cottonwood Cove entrance (fee) station to Lake Mead NRA western boundary. To address these concerns, three more KOPs were added, including two from the Cottonwood Cove entrance station and one from Cottonwood Cove Road milepost (MP) 4 toward the project area.

Table 3.9-1 presents a list of the KOPs, the direction of view to the proposed project area, and the distance to the proposed project area.

Table 3.9-1. Location of KOPs

KOP#	KOP	Direction of View to the Proposed Project Area	Distance to the Project Area
1	Railroad Pass Hotel/Casino	Southeast	36 miles
2	U.S. 95 approximately 3 miles north of the project area	South	3 miles
3	U.S. 93 near Boulder City	Southwest	28 miles
4	Windy Point Camping Area	West	35 miles
5	View from Palm Gardens at the junction of SR 163 and U.S. 95	North	12 miles
6	Lake Mohave	West	10 miles
7	Searchlight Nugget Casino	Southeast	2 miles
8	Searchlight residential area	East	2 miles
9	The new dock and pier facility on Lake Mohave	West	10 miles
10	Cottonwood Cove Road	Southwest	1 mile
11	Communications towers close to Spirit Mountain	Northwest	11 miles
12	U.S. 95 south of Searchlight	North	5 miles
13	Historic Searchlight hospital	East	2 miles
14	Cottonwood Cove Road	West	1 mile
15	Cottonwood Cove Road	South	0.1 mile
16	Cottonwood Cove Road	North	0.5 mile
17	Cottonwood Cove Road	East	0.1 mile

KOP 1 – View from Railroad Pass Hotel/Casino Looking Southwest

KOP 1 represents views for motorists at the Railroad Pass Hotel and Casino's parking lot or traveling south on U.S. Interstate 93 (US-93) (Figure 3.9-3). From this vantage point, there are open panoramic and partially framed views from Railroad Pass flanked by the Black Mountains across the broad Eldorado Valley, with mountainous terrain such as McCullough Mountain, Knob Hill, and the Ireteba Peaks in the background. There are numerous manmade features in the view, including the highway, a high-voltage transmission line, industrial facilities in the foreground, and the Nevada Solar One Project in the background, which resembles a body of water from this distance. Vegetation is low growing and appears scattered throughout the undisturbed landscape. Open panoramic and partially framed views of rolling hills, dramatic mountainous terrain, and the broad, almost flat Eldorado Valley, offer low to moderate scenic quality due to the visible level of manmade disturbance within the view, which also disturbs the variation of form, line, color, and texture of the natural landscape elements.

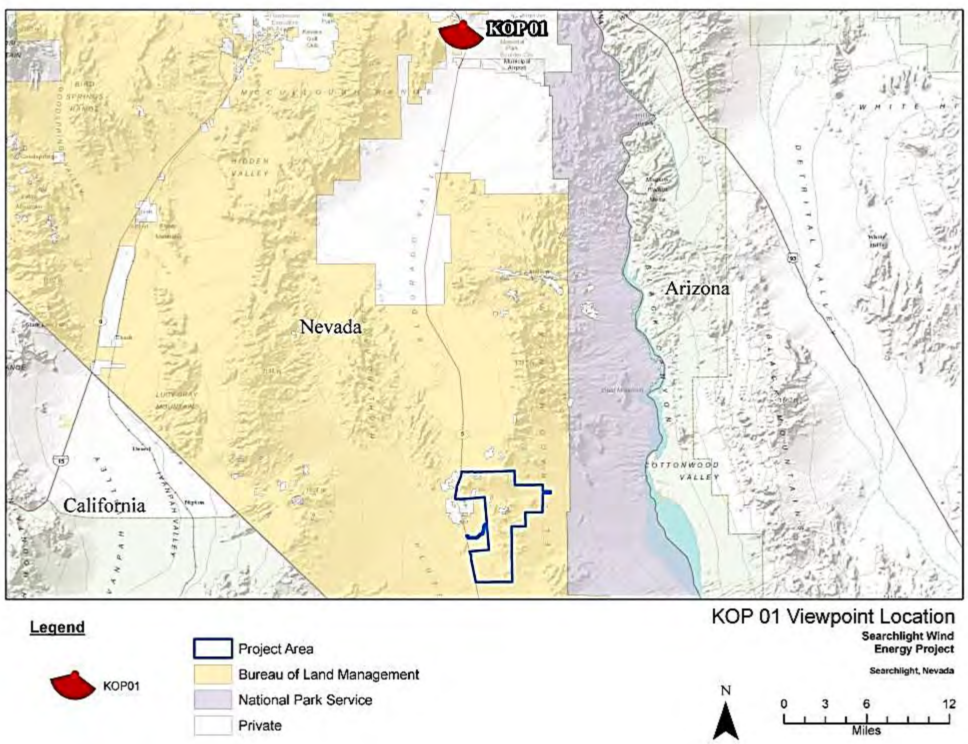


Figure 3.9-3. KOP 1 – View from Railroad Pass Hotel/Casino Looking Southwest

KOP 2 – View from US-95 Looking Southwest

KOP 2 represents views of motorists traveling south on US-95 approximately 3.5 miles north of Searchlight (Figure 3.9-4). The open panoramic views across the Eldorado Valley toward Doherty Mountain, Duplex Hill, and the Highland Range in the middle ground-to-background distance zone exhibit moderate levels of variation in form, line, color, and texture. There are scattered manmade features in the view, not including the highway, such as a high-voltage transmission line and industrial/residential structures in the background, which are not easily identified from this distance. Views of some distinct landscape features interrupted by surrounding manmade alterations are of moderate scenic quality.

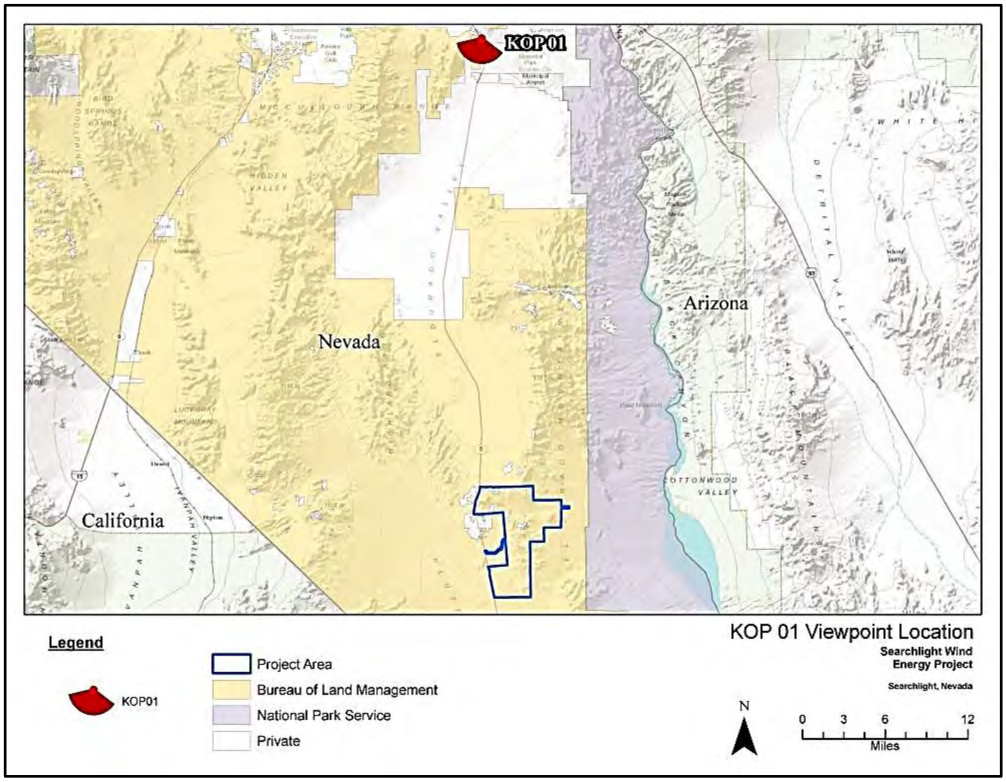


Figure 3.9-4. KOP 2 – View from US-95 Looking Southwest

KOP 3 – US-93 Hillside Curve

KOP 3 represents the views of motorists traveling south on US-93 adjacent to the Colorado River (Figure 3.9-5). From this vantage point, there are open panoramic views from US-93 to the highly visible Malpais Flattop Mesa and the Squaw Peaks, which flank the Colorado River in middle ground and background distance zones. The Colorado River is not visible from this KOP because of the terrain. Mount Duncan is also visible in the distant background. The only manmade features in the view other than the highway itself are numerous high-voltage transmission lines, which connect to Hoover Dam, located approximately 14 miles northwest from this KOP. The steel lattice transmission structures are much less visible than the wood H-frame designs due to back dropping provided by the terrain. Views are considered to be of high scenic quality due to the relative complexity of variation in form, line, color, and texture and relative lack of manmade alterations.

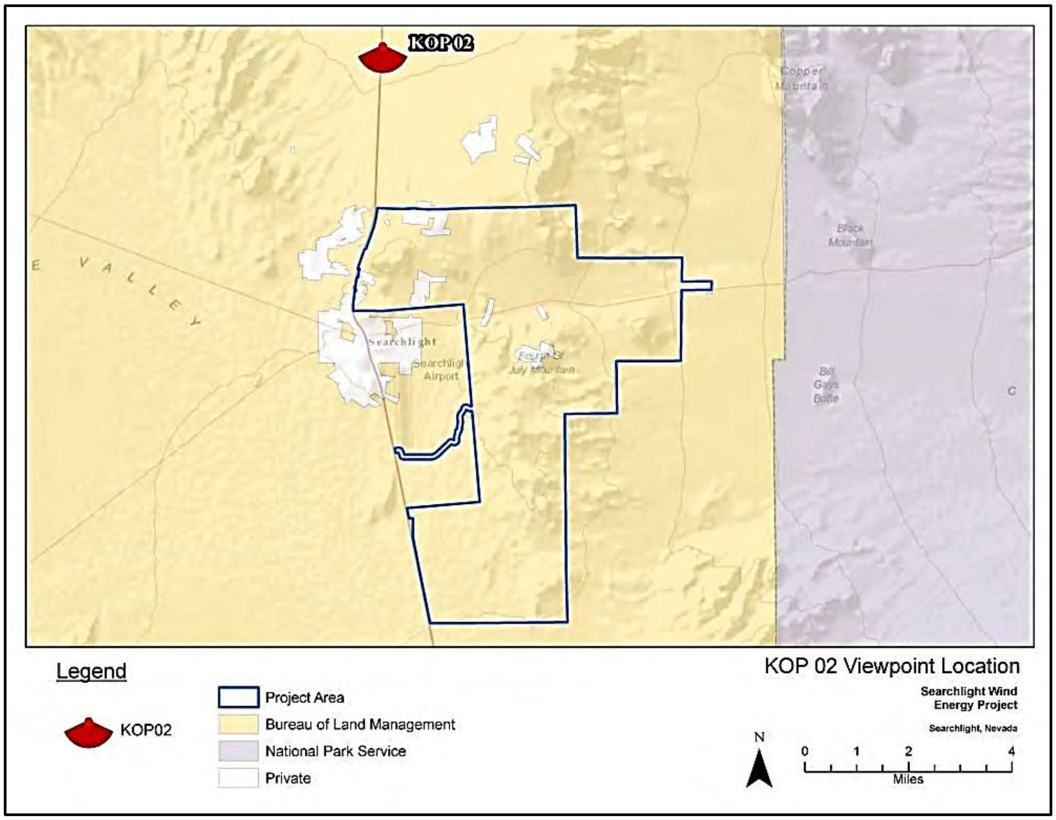


Figure 3.9-5. KOP 3 – View from US-93 Hillside Curve

KOP 4 – Windy Point Campground

KOP 4 represents the views of recreational campers at the BLM's Windy Point campsite in the Cerbat Mountains adjacent to the town of Chloride, Arizona. From this vantage point, there are open panoramic views across the Golden Valley to Sugarloaf Mountain and Twin Mills on the Arizona side of the Colorado River (Figure 3.9-6). Views of mountainous terrain in Nevada, such as Spirit Mountain, Fourth of July Mountain, and the Devil's Thumb, are more distant and too far away to determine an accurate location for each peak. Searchlight is more than 36 miles west of this KOP. The only manmade feature in view, other than US-93, is Chloride, approximately 3 miles in the foreground distance zone. There are numerous residences and structures that dot the valley floor below this KOP. Views are considered to be of moderate to high scenic quality due to the relative complexity of variation in form, line, color, and texture and low to moderate landscape contrast, which make the manmade alterations slightly subordinate visual features.

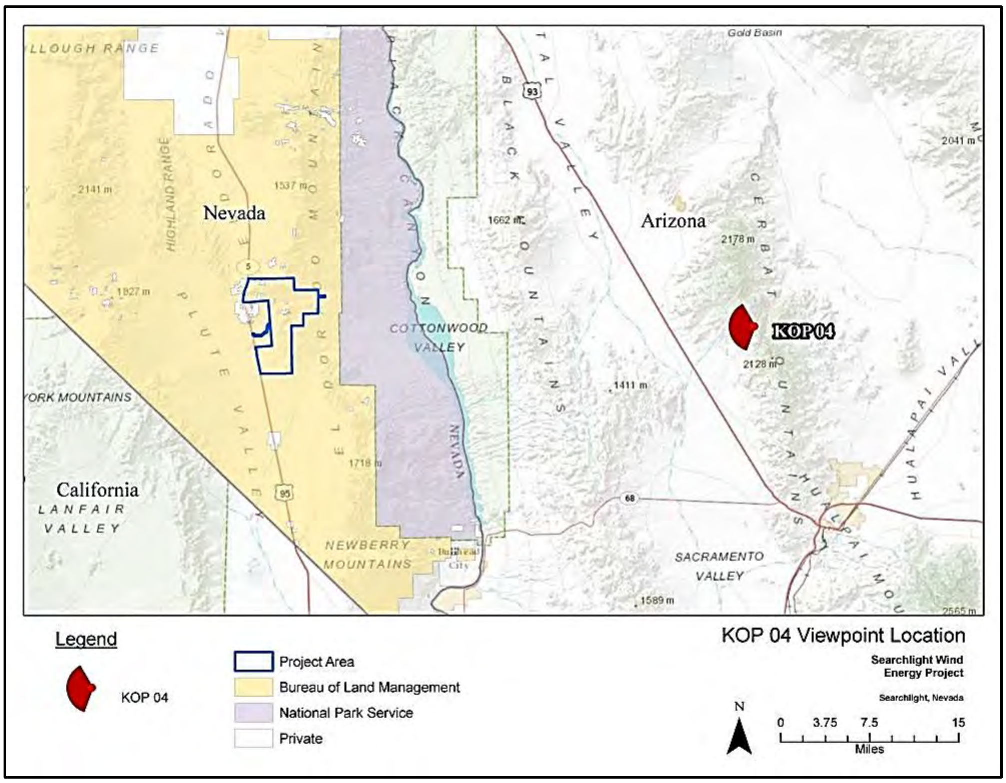


Figure 3.9-6. KOP 4 – View from Windy Point Campground

KOP 5 – Palm Gardens Community (US-95/SR 163 Intersection)

KOP 5 represents the views of residences in the Palm Gardens Community adjacent to the intersection of US-95 and Nevada SR 163 and approximately 1.6 miles north of the Nevada and California state borders and the Chiquita Hills (Figure 3.9-7). From this KOP, there are open panoramic views across the Piute Valley, which is bordered on the west by the Piute Range and on the east by the Newberry Mountains. Searchlight is more than 13 miles northwest of this KOP. The only manmade features in the view, though very subtle, are portions of US-95. Views are considered to be of moderate scenic quality due to the lack of complexity in variations of form, line, color, and texture.

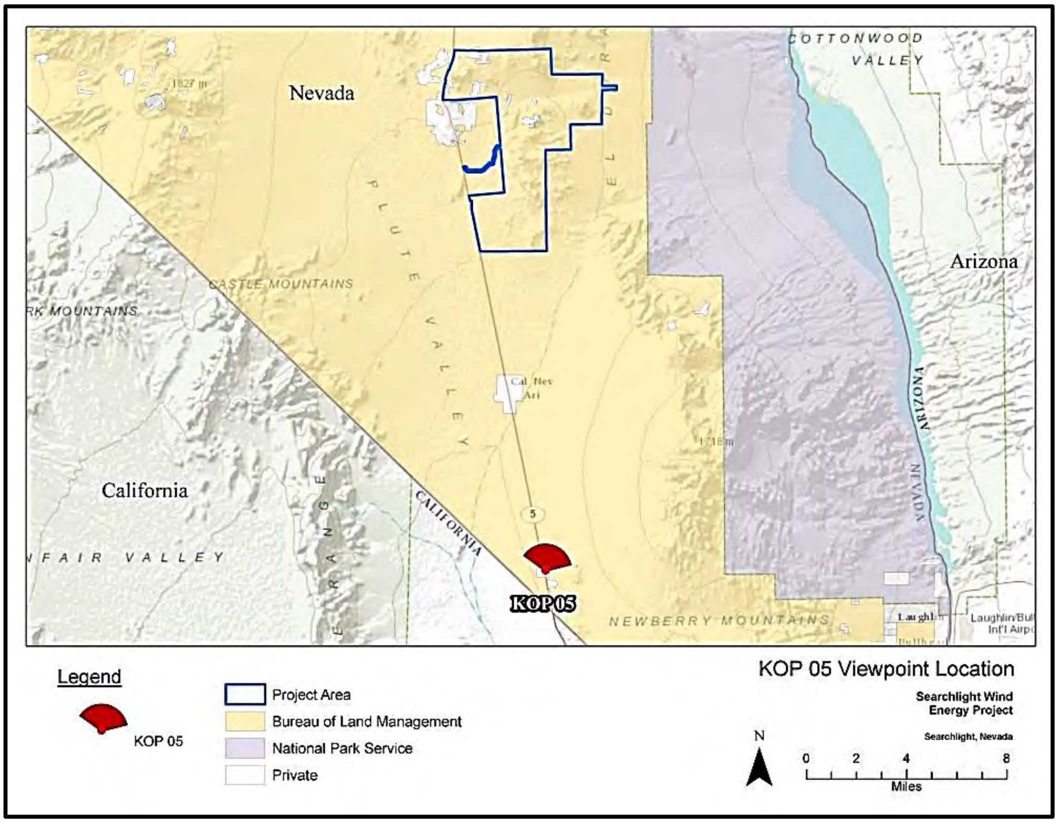


Figure 3.9-7. KOP 5 – View from Palm Gardens Community (US-95/SR 163 Intersection)

KOP 6 – View Across Lake Mohave

KOP 6 represents the views of recreational boaters on Lake Mohave, which is part of the Lake Mead NRA, located approximately 14 miles east of Searchlight (Figure 3.9-8). From this KOP, there are open panoramic views across Lake Mohave to the Cottonwood Valley and farther toward Fourth of July Mountain and the Ireteba Peaks in the background, as well as to Black Mountain and Bill Gays Butte, which are clearly distinguished silhouettes in the middle ground valley. The only visible manmade feature in the view is Cottonwood Cove Road. The station is subtle and not easily distinguished. Open panoramic views of the broad valley rising up from the large waterbody with rolling hills and rugged mountainous terrain and silhouettes offer high scenic quality due to interesting variations of form, line, color, and texture in the region, and a low level of visible manmade disturbance within the view.

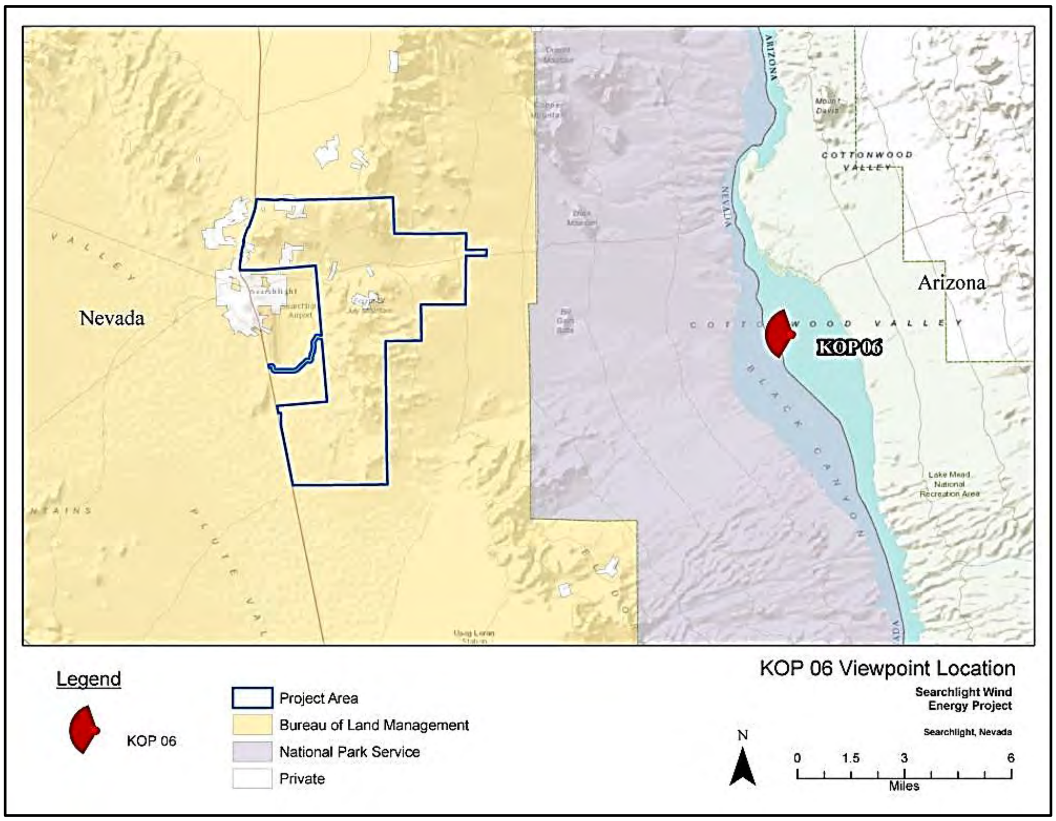


Figure 3.9-8. KOP 6 – View from Lake Mohave

KOP 7 – View from Nugget Casino to the Southeast

KOP 7 represents the views of residents and tourists in the parking lot of the Searchlight Nugget Casino at the intersection of US-95, SR 164, and Cottonwood Cove Road in the heart of Searchlight (Figure 3.9-9). From this KOP, there are partially screened views of the surrounding terrain from structures in Searchlight or the Duplex Hills. The surrounding terrain, which is partially screened by manmade features within the semi-urban interface, can be observed where higher elevation topography is visible in the background. Partially screened views of the rolling hills offer low scenic quality due to the view having little variations of natural form, line, color, and texture and a high level of visible manmade disturbance within the view foreground.

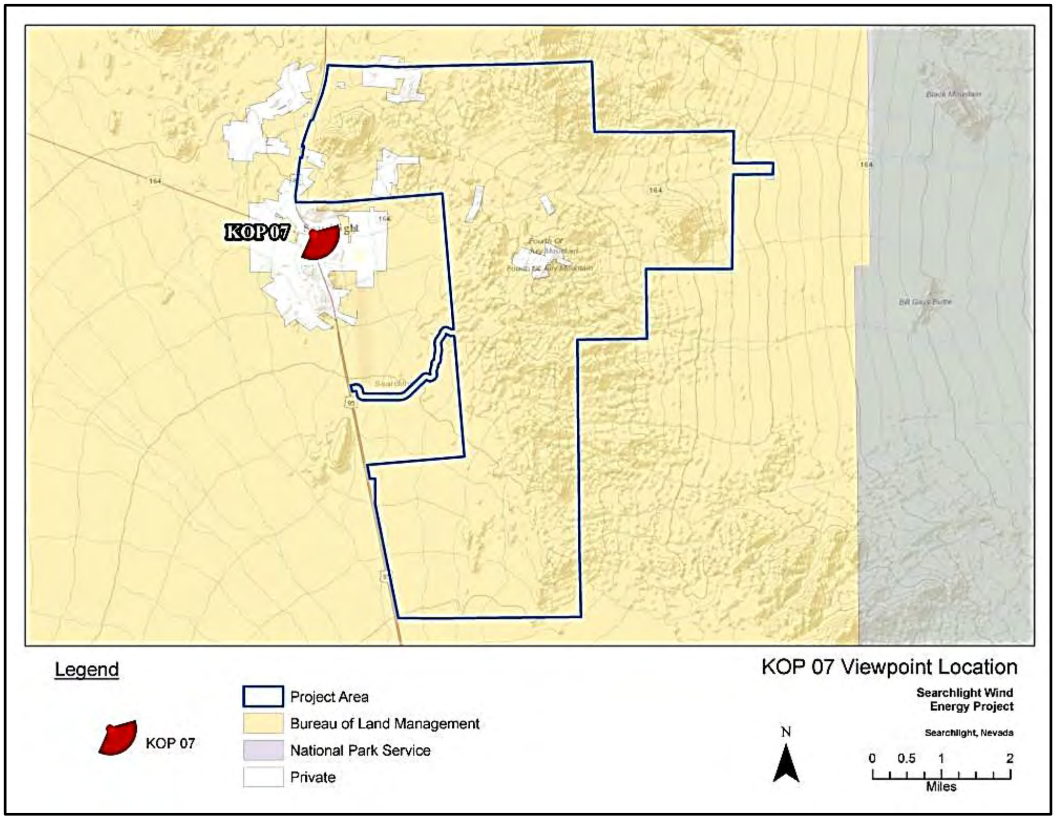


Figure 3.9-9. KOP 7 – View from Nugget Casino to the Southeast

KOP 8 – New Housing Development in Searchlight – Looking South to Southeast

KOP 8 represents the views of residents in a new residential community being developed on the eastern edge of Searchlight (Figure 3.9-10). From this KOP, there is very little screening of the surrounding terrain, with the exception of a privacy wall. This neighborhood is under construction and it can be assumed that when it is complete, more of the natural topography will likely be screened from this view. Open views toward Fourth of July Mountain and the surrounding foothills are partially screened by the visible manmade features, which when developed, may block views of Fourth of July Mountain almost entirely. Partially screened views of the rolling hills offer moderate scenic quality due to the view having variations of natural form, line, color, and texture and a high level of discordant manmade disturbance within the view.

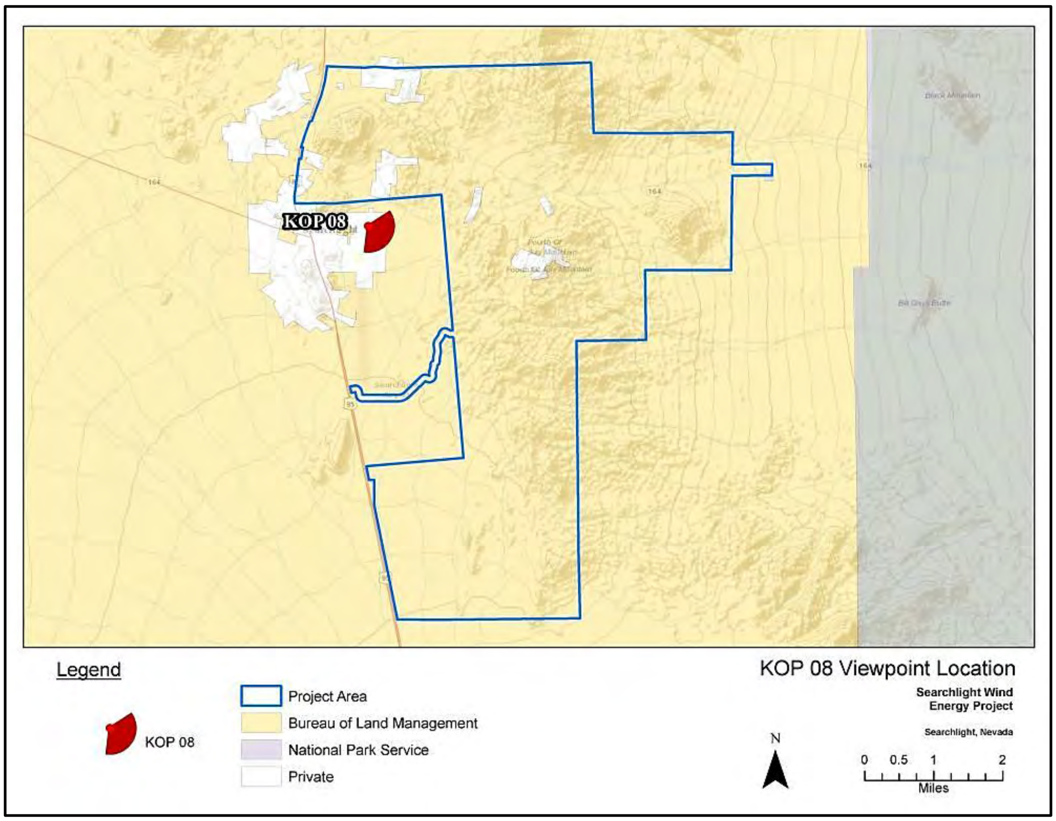


Figure 3.9-10. KOP 8 – View from New Housing Development in Searchlight – Looking South to Southeast

KOP 9 – View from Cottonwood Cove Marina Looking West

KOP 9 represents the views of seasonal residents and recreationalists in the Cottonwood Cove Marina/NRA on Lake Mohave, approximately 10.5 miles east of Searchlight (Figure 3.9-11). From this KOP, there is no screening of the surrounding water or terrain, and open views toward the surrounding foothills and banks rising up from Lake Mohave are developed with visible manmade features (recreation facilities, dock structures, mobile homes, parking). Vegetation is both natural and planted. Open panoramic views of the rolling hills and water offer moderate to high scenic quality due to the view having variations of natural form, line, color, and texture, and a high level of discordant manmade disturbance within the view.

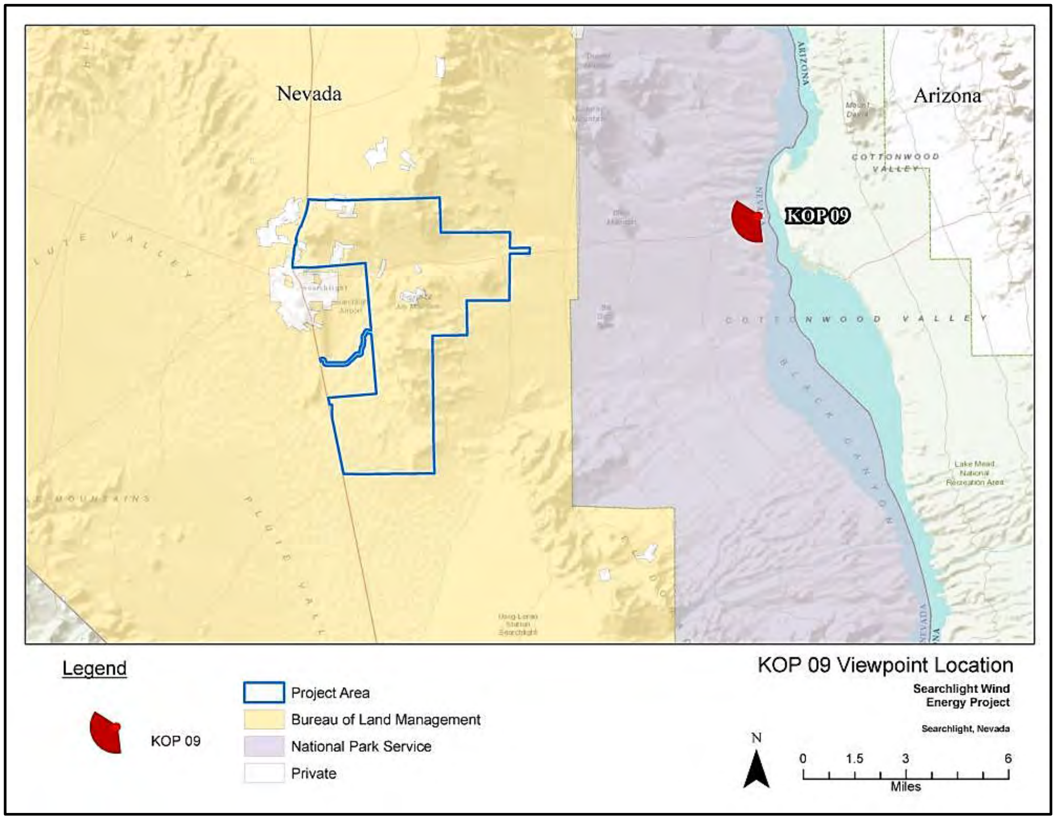


Figure 3.9-11. KOP 9 – View from Cottonwood Cove Marina Looking West

KOP 10 – View of Travelers Exiting the Lake Mead NRA and Lake Mohave on Cottonwood Cove Access Road

KOP 10 represents the views of recreational travelers exiting the Lake Mead NRA and Lake Mohave on Cottonwood Cove Access Road, adjacent to where Western's proposed switching station would be located and where the NPS has developed a new entrance station for the NRA (approximately 6 miles east of Searchlight and 6.5 miles west of Lake Mohave) (Figure 3.9-12). From this KOP, there is no screening of the surrounding terrain, and open views toward the surrounding foothills and mountains (Fourth of July Mountain) are only slightly interrupted by manmade alterations, such as the new entrance station. The entrance station might offer some screening from this KOP; the entrance station is small in scale and subordinate in the overall view. Open panoramic views of the rolling to rugged terrain offer moderate scenic quality due to the view having some variation of natural form, line, color, and texture and a low to moderate level of visible manmade disturbance.

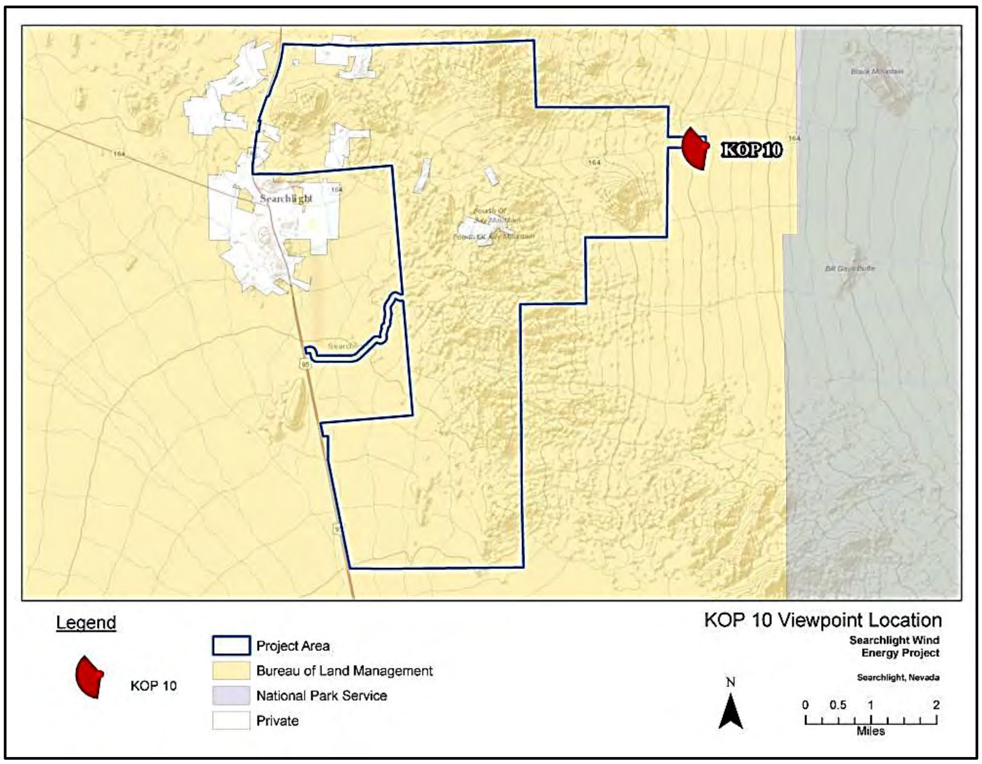
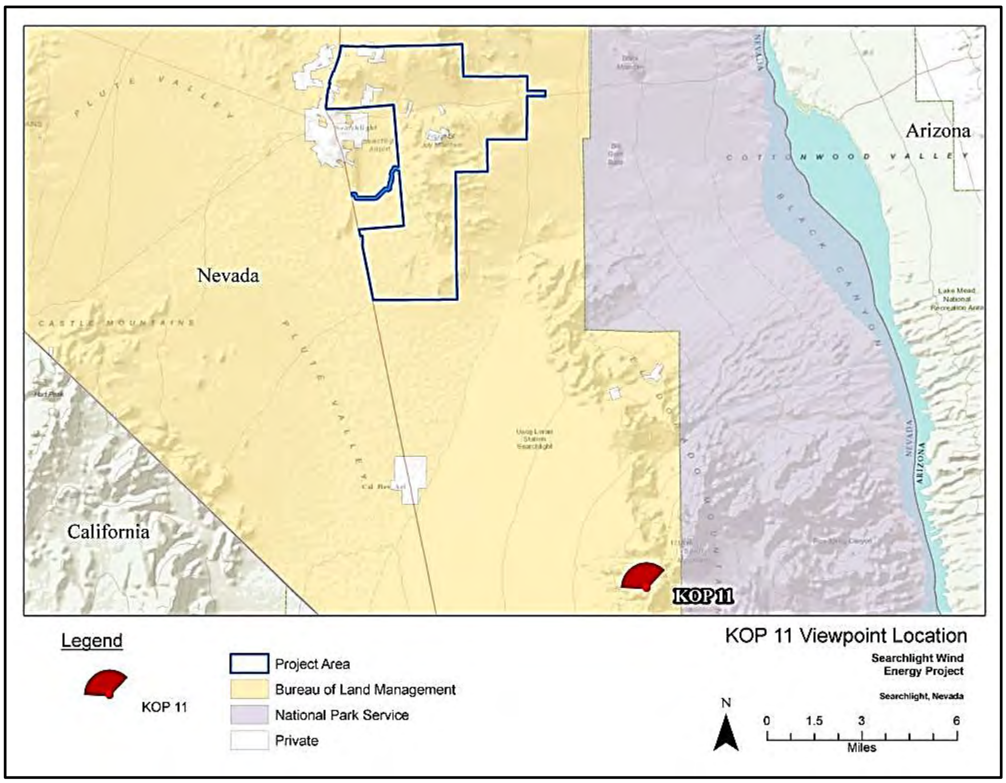


Figure 3.9-12. KOP 10 – View of Travelers Exiting the Lake Mead NRA and Lake Mohave on Cottonwood Cove Access Road

KOP11 – View from Communication Towers near Spirit Mountain

KOP 11 represents the view from communication towers located in Christmas Tree Pass toward the Proposed Project area (Figure 3.9-13). From this KOP, the rugged hills and peaks of the Newberry Mountains obstruct views toward the project area. A small portion of Lake Mohave is visible in the distance. Manmade features visible from this KOP include graded dirt roads, the communication towers, and transmission line towers that are barely visible in the valley bottom. Searchlight and the project area are approximately 17 miles from this KOP when looking across Piute Valley to the north. Views across Piute Valley toward Fourth of July Mountain and the Devil's Thumb are distant and too far away to determine an accurate location for each peak. Partially screened views of the mountainous terrain extending to the valley bottom offer moderate to high scenic quality due to the view having variations of natural form, line, color, and texture and a moderate level of discordant manmade disturbance within the view.



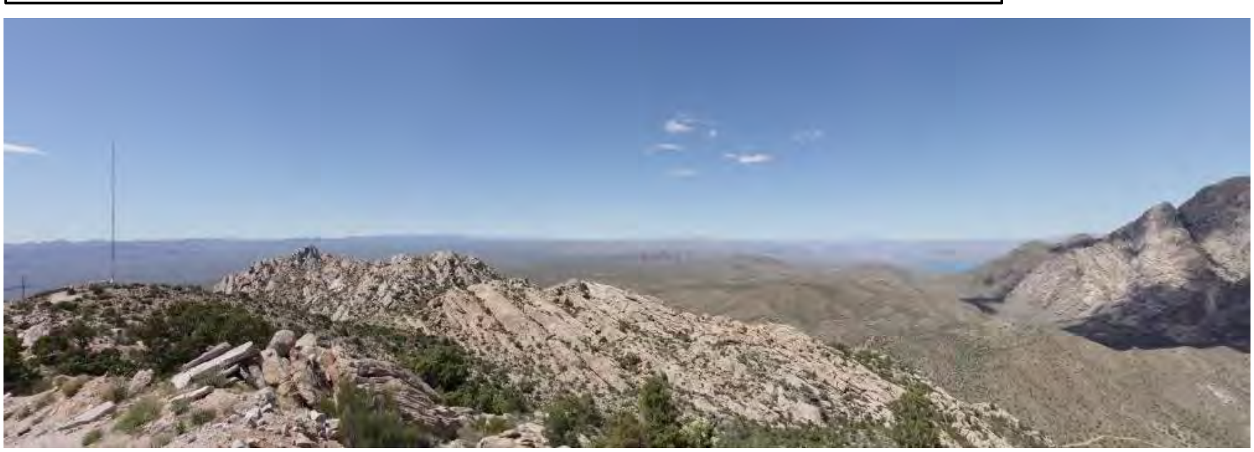


Figure 3.9-13. KOP 11– View from Communication Towers near Spirit Mountain Looking Northwest

KOP 12 – View from Cal-Nev-Ari North toward Searchlight

KOP 12 represents the views of residences in Cal-Nev-Ari adjacent to US-95 and approximately 11 miles south of Searchlight (Figure 3.9-14). From this KOP, there are open panoramic views across the Piute Valley, which is bordered on the west by the Piute Range and on the east by the Newberry Mountains. Manmade features in the view include US-95 and the buildings, fences, and trailer homes that comprise Cal-Nev-Ari. Views are considered to be of moderate scenic quality due to the lack of complexity in variations of form, line, color, and texture and because of a moderate to high level of visible manmade disturbance.

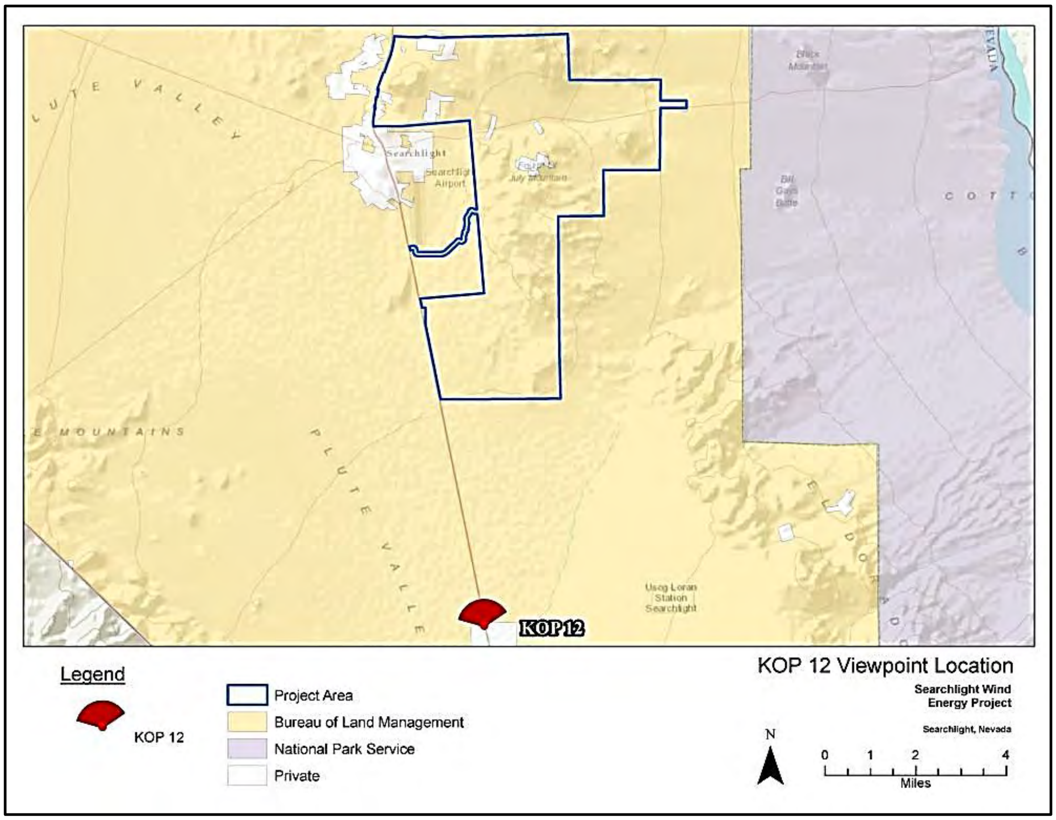


Figure 3.9-14. KOP 12 – View from Cal-Nev-Ari North toward Searchlight

KOP 13 – View from Historic Searchlight Hospital toward the East

KOP 13 represents the view of residents and visitors from the historic Searchlight Hospital toward Lake Mohave and Cottonwood Cove (Figure 3.9-15). Cottonwood Cove is located approximately 14 miles from the KOP to the east. From this KOP, manmade features such as roads, light poles and buildings obscure views toward Lake Mohave. Partially screened views of the rolling hills offer moderate scenic quality due to the view having variations of natural form, line, color, and texture and a high level of discordant manmade disturbance within the view.

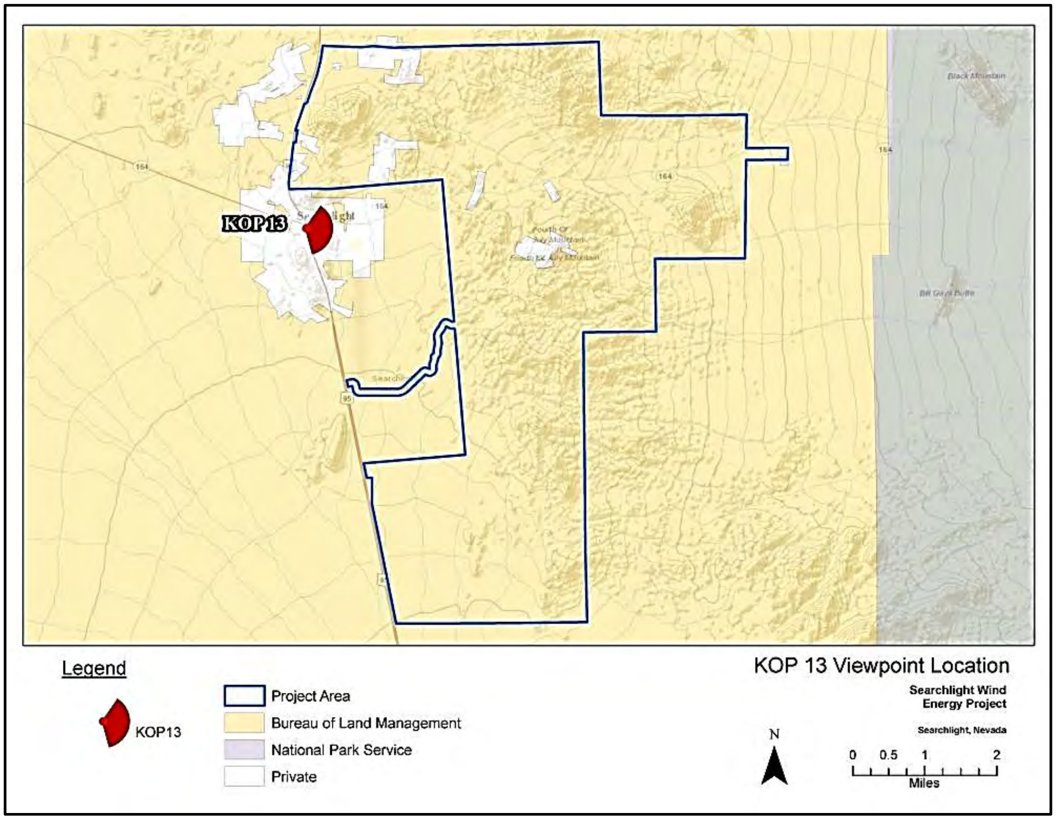


Figure 3.9-15. KOP 13 – View from Historic Searchlight Hospital toward the East

KOP 14 – View from Cottonwood Cove Entrance (Fee) Station Looking West

KOP 14 represents the view of recreationists or travelers heading from Cottonwood Cove to Searchlight west on Cottonwood Cove Road (Figure 3.9-16). From this KOP, views toward the mountain pass are vast and expansive. From this KOP, there is no screening of the surrounding terrain, and open panoramic views of the rolling to rugged terrain offer moderate scenic quality due to the view having some variation of natural form, line, color, and texture and a low level of visible manmade disturbance.

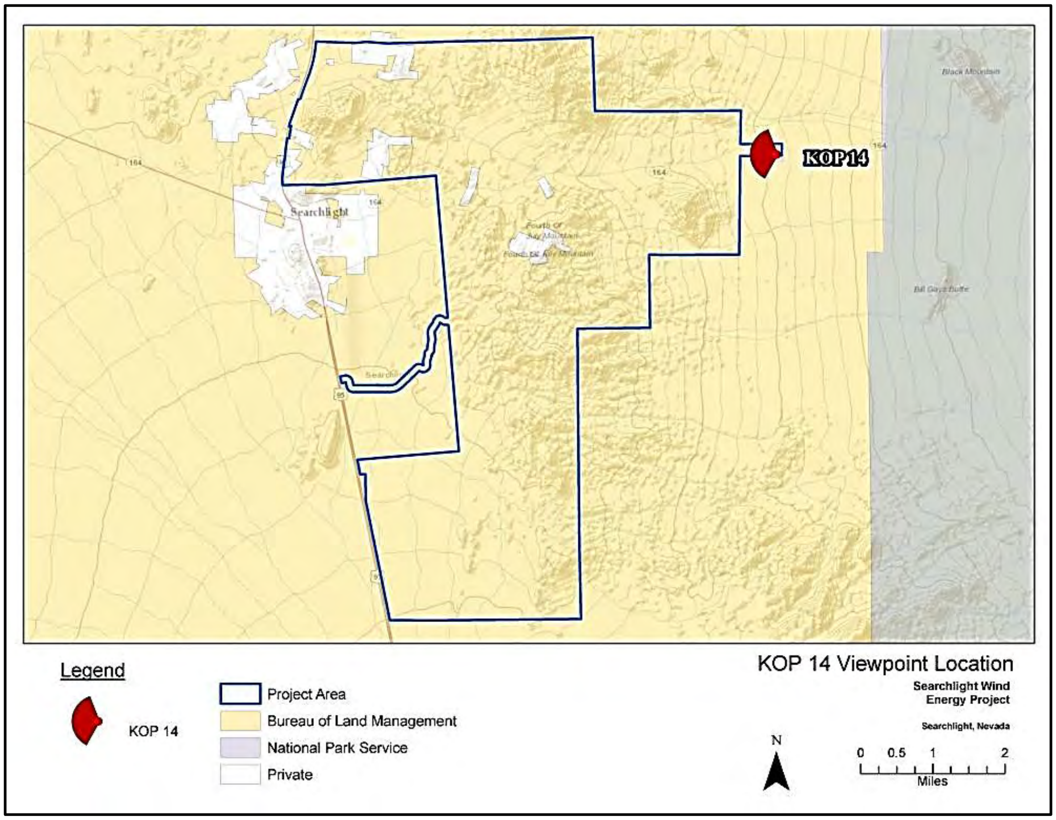


Figure 3.9-16. KOP-14 – View from Cottonwood Cove Entrance (Fee) Station Looking West

KOP 15 – View from Cottonwood Cove Road Looking South, KOP 16 – View from Cottonwood Cove Road Looking North, and KOP 17 – View from Cottonwood Cove Access Road at MP 4 Looking East

KOP 15, KOP 16, and KOP 17 represent the southern, northern, and eastern view (respectively) of recreationists or travelers along Cottonwood Cove Road near the Cottonwood Cove entrance station to Lake Mead NRA (Figure 3.9-17, Figure 3.9-18, and Figure 3.9-19). Since the surrounding landscape is similar for these KOPs, they are summarized together. From these KOPs, views toward the mountain pass are panoramic, with a transmission line being the only manmade disturbance to the south. No screening of the surrounding terrain exists, and views of the rolling-to-rugged terrain offer moderate scenic quality due to the view having some variation of natural form, line, color, and texture and a low level of visible manmade disturbance.

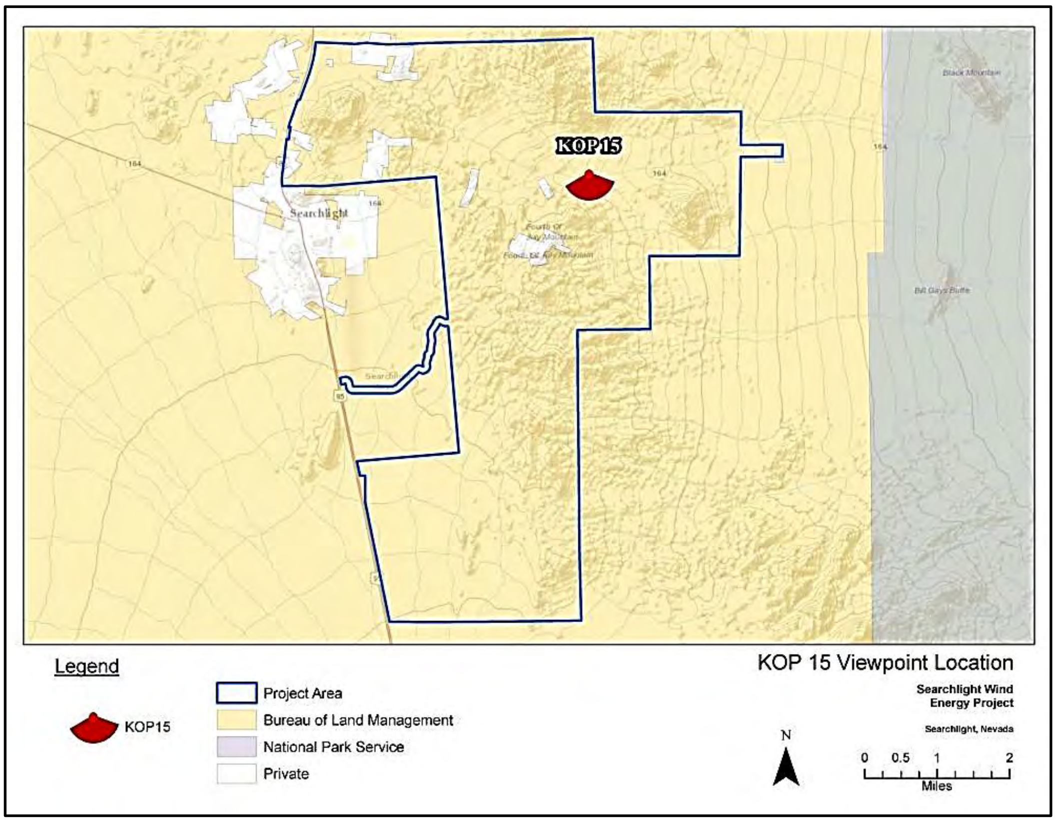


Figure 3.9-17. KOP 15 – View from Cottonwood Cove Road Looking South

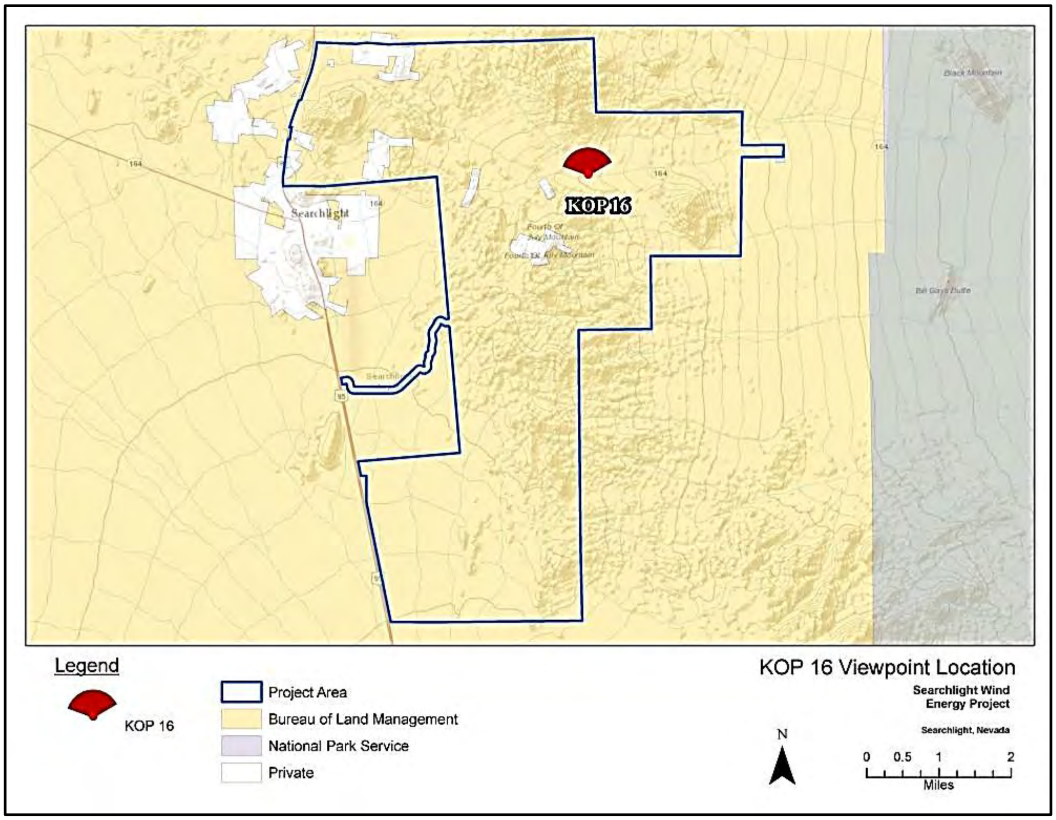


Figure 3.9-18. KOP 16 – View from Cottonwood Cove Road looking North

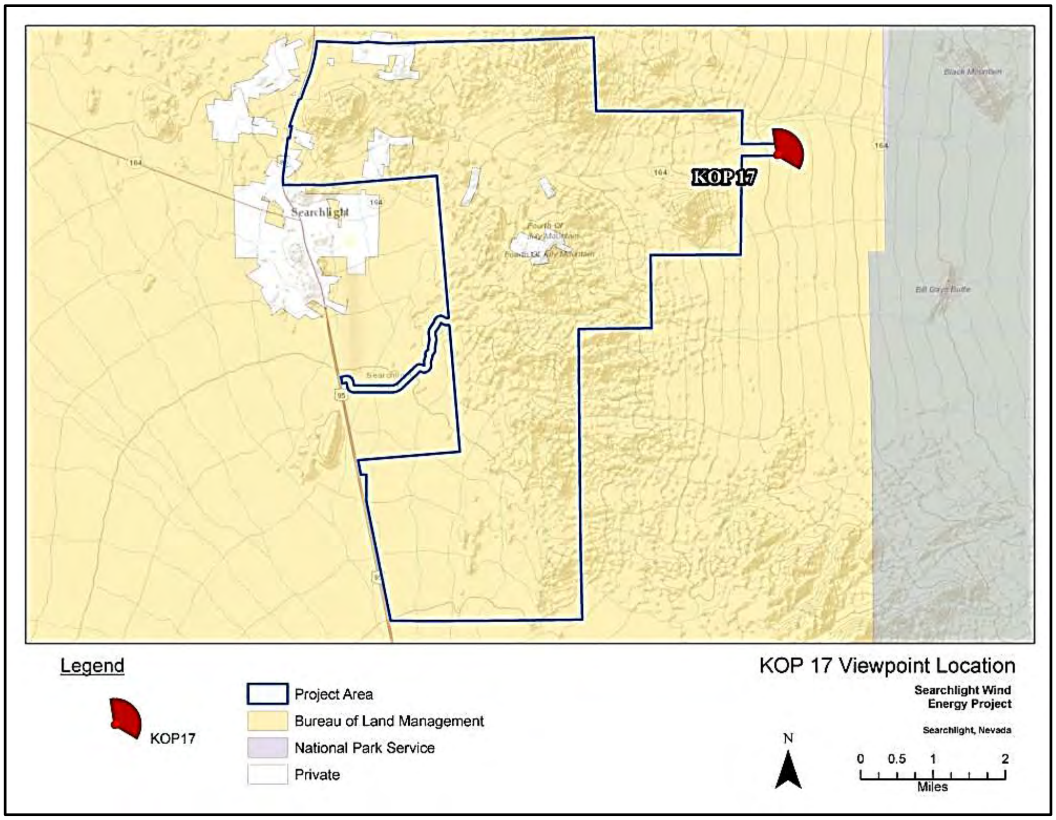


Figure 3.9-19. KOP 17 – View from Cottonwood Cove Access Road at MP 4 Looking East

3.10 Noise

This section identifies the existing area and provides estimated and measured ambient noise levels within and adjacent to the Proposed Project site, and at the nearby Lake Mead National Recreation Area.

3.10.1 Region of Influence

For the purposes of this analysis, the ROI for noise from construction, O&M, and decommissioning also includes sensitive receptors (residences, schools, businesses, or public buildings) within 2 miles of project facilities.

3.10.2 Existing Environment

3.10.2.1 General Information on Noise

To describe environmental noise at the regional and local levels, and to assess impacts on areas sensitive to community noise, an understanding of noise fundamentals is necessary. Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. There are several ways to measure noise, depending on the source, the receiver, and the reason for the noise measurement. The most common metric is the overall A-weighted sound level measurement that has been adopted by regulatory bodies worldwide. The A-weighted network measures sound similar to how a person perceives sound, thus achieving good correlation with acceptable and unacceptable sound levels.

A-weighted sound levels are typically measured or presented as the equivalent sound pressure level (L_{eq}), which is the average noise energy level for a defined period of time. The L_{eq} is commonly used to measure steady-state sound or noise that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Lxx typically denotes statistical measurements, where $_{xx}$ represents the percentage of time the sound level is exceeded. The L_{90} represents the noise level exceeded during 90 percent of the measurement period. Similarly, the L_{10} represents the noise level exceeded for 10 percent of the measurement period. The relative A-weighted noise levels of common sounds measured in the environment and industry for various qualitative sound levels are provided in Table 3.10-1.

Table 3.10-1. Common Noise Levels and Subjecting Human Response

Noise Source (at a given distance)	A-Weighted Sound Pressure Level in Decibels	Reference Location	Human Judgment of Noise Loudness (relative to a reference SPL of 70 decibels)
Military jet take-off with after-burner (50 feet), Civil-defense siren (100 feet)	140, 130	Aircraft carrier flight deck	
Commercial jet take-off (200 feet)	120	Thunderclap	Threshold of pain 32 times as loud
Pile Driver (50 feet)	110	Rock music concert	Average human ear discomfort 16 times as loud
Ambulance siren (100 feet), newspaper press (5 feet), power lawn mower (3 feet)	100	Sidewalk, plant, yard	Very loud 8 times as loud
Motorcycle (25 feet), propeller plane flyover (1,000 feet), diesel truck, 40 miles per hour (50 feet)	90	Boiler room, printing press, plant	Operational Safety and Health Administration threshold for 8-hour exposure 4 times as loud
Garbage disposal (3 feet)	80		2 times as loud

Noise Source (at a given distance)	A-Weighted Sound Pressure Level in Decibels	Reference Location	Human Judgment of Noise Loudness (relative to a reference SPL of 70 decibels)
Passenger car, 65 miles per hour (25 feet), vacuum cleaner (10 feet)	70	Data processing center, department store	Reference loudness moderately loud
Normal conversation (5 feet), air-conditioning Unit (100 feet)	60	Private business office, restaurant	1/2 as loud
Light traffic (100 feet)	50	Lower limit of daytime urban ambient sound	1/4 as loud
Bird calls (distant)	40	Quiet urban nighttime	1/8 as loud
Soft whisper (5 feet)	30	Recording studio, library	Very Quiet 1/16 as Loud
	20	Whistling, rustling leaves	Just audible 1/32 as loud
	10	Breathing	Barely audible 1/64 as loud
	0		Threshold of hearing 1/128 as loud

Source: URS internal information and Caltrans TeNS (1998) p. 18, Table N-2136.2
SPL = sound pressure level

Another metric used to determine the impact of environmental noise considers the differences in human responses to daytime and nighttime noise levels. During the evening and at night, exterior background noises are generally lower than during the day. However, most household noise also decreases at night and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are, therefore, more sensitive to intrusive noises. To account for human sensitivity to evening and nighttime noise levels, the L_{dn} and community noise equivalent level (CNEL) metrics were developed by the State of California in the 1970s. The L_{dn} accounts for the greater annoyance of noise during the night (10:00 p.m. to 7:00 a.m.). The CNEL accounts for the greater annoyance of noise during the evening (7:00 p.m. to 10:00 p.m.) and nighttime hours.

The effects of noise on people can be listed in three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as startling and hearing loss.

In most cases, environmental noise might produce effects in the first two categories only. No completely satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is primarily due to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person's subjective reaction to a new noise is to compare it to the existing or "ambient" environment to which that person has adapted. In general, the more the level or the tonal (frequency) variations of a noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

The general human response to changes in noise levels that are similar in frequency content (for example, comparing increases in continuous [L_{eq}] traffic noise levels) is summarized as follows:

- A 3-dB change in sound level is a barely noticeable difference.

- A 5-dB change in sound level is typically noticeable.
- A 10-dB change is perceived by the listener as a doubling in loudness.

3.10.2.2 Noise Standards and Guidelines

Federal Standards

The NEPA requires an analysis of local ambient noise levels and effects associated with elevated noise levels in a Proposed Project area; however, NEPA does not specify a threshold for "significant adverse effect" for noise. Decibel levels must be evaluated as must the effects of noise levels on a variety of species, and on property values, residences, and recreational use. The NPS has established noise standards pertaining to national parks. The standards are codified in 36 CFR 2.12, 36 CFR 2.18, and 36 CFR 3.15. The standards, although not directly applicable to the proposed action on BLM lands, are discussed below.

36 CFR 2.12 regulates and prohibits certain sounds that may be generated by users of the park system. Sources such as motorized equipment, radios and stereos, musical instruments, etc., may not exceed a sound level of 60 dBA at 50 feet. Even if below that level, the sound must not be unreasonable. Unreasonable criteria include the nature and purpose, time of day or night, purpose for with the area was established, etc.

36 CFR 2.18 provides noise level limits and certain prohibitions pertaining to snowmobiles within the park system. 36 CFR 3.15 similarly provides sound level limits for motor boats.

In addition to the above federal standards, the Lake Mead NRA has proposed that noise levels from adjacent wind farms do not exceed an L_{eq} level of 35 dBA during nighttime hours on park lands.

While not applicable to the proposed action, other federal regulations and guidelines exist that limit overall environmental noise levels. The only energy-facility-specific requirements are those of the FERC for interstate electrical transmission lines, natural gas pipelines, and petroleum pipelines. The FERC limits specifically address compressor facilities associated with pipelines under FERC jurisdiction. Under these regulations, the noise attributable to any new natural gas compressor station; added compression to an existing station; or any modification, upgrade, or update of an existing station must not exceed a daytime-nighttime noise level (L_{dn}) of 55 decibels on the A-weighted scale (dBA) at any pre-existing noise-sensitive area (FERC 2002). Federal Highway Administration (FHWA) (CFR Title 23 Part 772) and FAA regulations (CFR Title 18 Part 150) have established federal highway and aircraft guidelines and regulations.

State of Nevada

The State of Nevada has a nuisance type noise standard that limits unnecessary or intrusive sounds that disturb the peace and quiet of a neighborhood. There is no state numerical performance standard.

Clark County

The Clark County UDC establishes maximum permitted sound levels within residential districts. The Clark County Noise Ordinance (Sec. 30.68.020) establishes permissible sound pressure levels (SPLs) of any continuous, regular, or frequency source of sound produced by any activities by time period and type of zoning district (Table 30.68-1 in the Clark County UDC Section 30.68.020). Likewise, impulsive type noises are subject to the maximum permitted sound level standards by time and type of zoning district (Table 30.68-2 in the Clark County UDC Section 30.68.020). Relative to the Proposed Project, sound level limits do not apply to construction and/or demolition activities when conducted during daytime hours.

The Clark County ordinance was developed on an octave band basis, meaning each octave band was given a separate sound level limit as opposed to an overall limit. The most restrictive limitations are for residential districts during nighttime hours. For informational purposes, if the individual octave bands are combined into a single dBA number, this would result in a limit at a residential property line of 43 dBA.

Town of Searchlight

The Town of Searchlight does not have a noise ordinance.

Summary of Noise Guidelines and Regulations

Table 3.10-2. Guidelines and Regulations for Exterior Noise (dBA)

Agency	Type of Activity/Measure	Permissible Noise Levels			
		Land Use	Hours	L_{eq}	L_{dn}
Federal Energy Regulatory Commission	NS	NS	NS	[49]	55
Federal Highway Administration	NS	NS	NS	67	[67]
Federal Aviation Administration	NS	NS	NS	[59]	65
U.S. Department of Transportation - Federal Rail and Transit Authorities[a,b]	NS	NS	NS	Sliding scale	Sliding scale
U.S. Environmental Protection Agency	NS	NS	NS	[49]	55
U.S. Department of Housing and Urban Development	NS	NS	NS	[59]	65
Nevada Public Utilities Commission	NS	NS	NS	NS	NS
National Park Service Suggested Level	Wind Energy	National Park	Nighttime	35	NS
National Park Service CFR 2.12	Motorized Equipment	National Park	NS	60 dBA at 50 feet	NS
National Park Service CFR 2.18	Snowmobile Operation	National Park	NS	78 dBA at 50 feet	NS
National Park Service CFR 2.12	Boat Operation	National Park	NS	75 dBA underway, 88 dBA stationary	NS
Clark County	Construction	Any	7 a.m.-7 p.m. (Mon-Sat)	NA	NA
	O&M/Maximum Sound (dBA)	Residential, Business & Industrial	Depends on octave band frequency	NA	Depends on octave band frequency
	O&M/Impulsive Noise	Residential	Daytime	56	NA
		Residential	Nighttime	46	NA
		Business/ Industrial	Daytime	65	NA
		Business/ Industrial	Nighttime	61	NA
Town of Searchlight	NS	NS	NS	NS	NS

Sources:
a FRA 2005 [Updated to latest revision 2005]
b Federal Transit Administration (FTA) 2006
c U.S. EPA 1974
d CFR Title 24 Part 51B (U.S. Department of Housing and Urban Development 1991)
Note: Brackets around numbers (e.g. [59]) indicate calculated equivalent standard. Because FHWA regulates peak noise level, the DNL is assumed equivalent to the peak noise hour.
dBA = A-weighted decibels, Ldn = daytime-nighttime noise level, Leq = equivalent sound pressure level , NS = Not specified, NA= Not applicable

3.10.2.3 Surrounding Land Uses and Potential Noise-Sensitive Receivers

The land uses surrounding the Proposed Project area are largely rural in nature, with some residential areas associated with the town of Searchlight and unincorporated Clark County. The nearest residences to any proposed WTGs are located off of Cottonwood Cove Road, Oregon Trail Road, and Grandpa's Road, east and north of Searchlight, respectively. All of the identified residences are over 1000 feet from any proposed WTG.

Apparent residences, schools, and other potential noise-sensitive receivers identified within 2 miles of the nearest project area WTGs are shown on Figure 3.10-1. The number of potential noise-sensitive receivers with similar distance ranges to the nearest WTG are listed in Table 3.10-3.

Table 3.10-3. Approximate Locations of Identified Apparent Noise-Sensitive Receivers

Distance to Nearest WTG Ranges	Number of Potential Noise Sensitive Receivers
0 to 0.25 mile	2
0.25 to 0.5 mile	12
0.5 to 0.75 mile	4
0.75 to 1.0 mile	3
1.25 to 1.5 miles	1
1.5 to 1.75 miles	1
1.75 to 2.0 miles	2

Source: URS (2009).
WTG = wind turbine generator

Lake Mead National Recreation Area is located east of the Proposed Project area. The Recreation Area boundary is approximately 11,000 feet from the nearest proposed WTG. Lake Mohave and the associated lakeside camping areas are located approximately 7.5 miles from the nearest WTG. The NPS also manages the Nellis Wilderness Wash, which is approximately 2 miles from the nearest WTG.

The Proposed Project area is remote from large metropolitan centers and, is likely to be represented by relatively low ambient noise levels that are consistent with the geographical character, presence of two major roadways, and population density of the vicinity. Contributors to the ambient noise environment are likely to include the following:

- Passenger vehicle, bus, and truck traffic on Cottonwood Cove Road (aka. SR 164 west of Searchlight) and US-95. The NDOT reports that AADT volume on US-95 for 2008 was 8,600 vehicles (NDOT 2009). The same NDOT Annual Traffic Report lists that the following approximate vehicle mix for a principal arterial (such as US-95): 95% passenger cars, 4% trucks, and 1% other (light trucks, busses, and motorcycles) (NDOT 2009).
- Searchlight Airport traffic, which is expected to be limited due to its lack of offered services and its current uncontrolled, unmanned, and unlighted status (AirNav.com 2009).
- Commercial and civilian aircraft overflights, the nearest of which follow Vector V8-514 that traverses Searchlight and the project area vicinity along a north-northeast and south-southwest path. Vectors V210 and V237 are farther away by several miles to the south and east, respectively (www.skyvector.com 2009b), and are less likely to contribute.
- Natural sounds such as wind-generated turbulence, resulting from wind interaction with vegetative ground cover and exposed rocky surfaces, birds and insects.
- Occasional OVH traffic, as permitted on either privately-owned or BLM-managed lands, associated with recreational activities that use unimproved roads, which traverse the project area.

- Commercial (e.g., Searchlight community businesses) and industrial (e.g., potentially active mining and/or mineral processing) activities that involve impulsive, intermittent, or continuous electromechanical equipment operation. Pumps, refrigeration systems, and heating, ventilation and air-conditioning systems are usual noise generators.

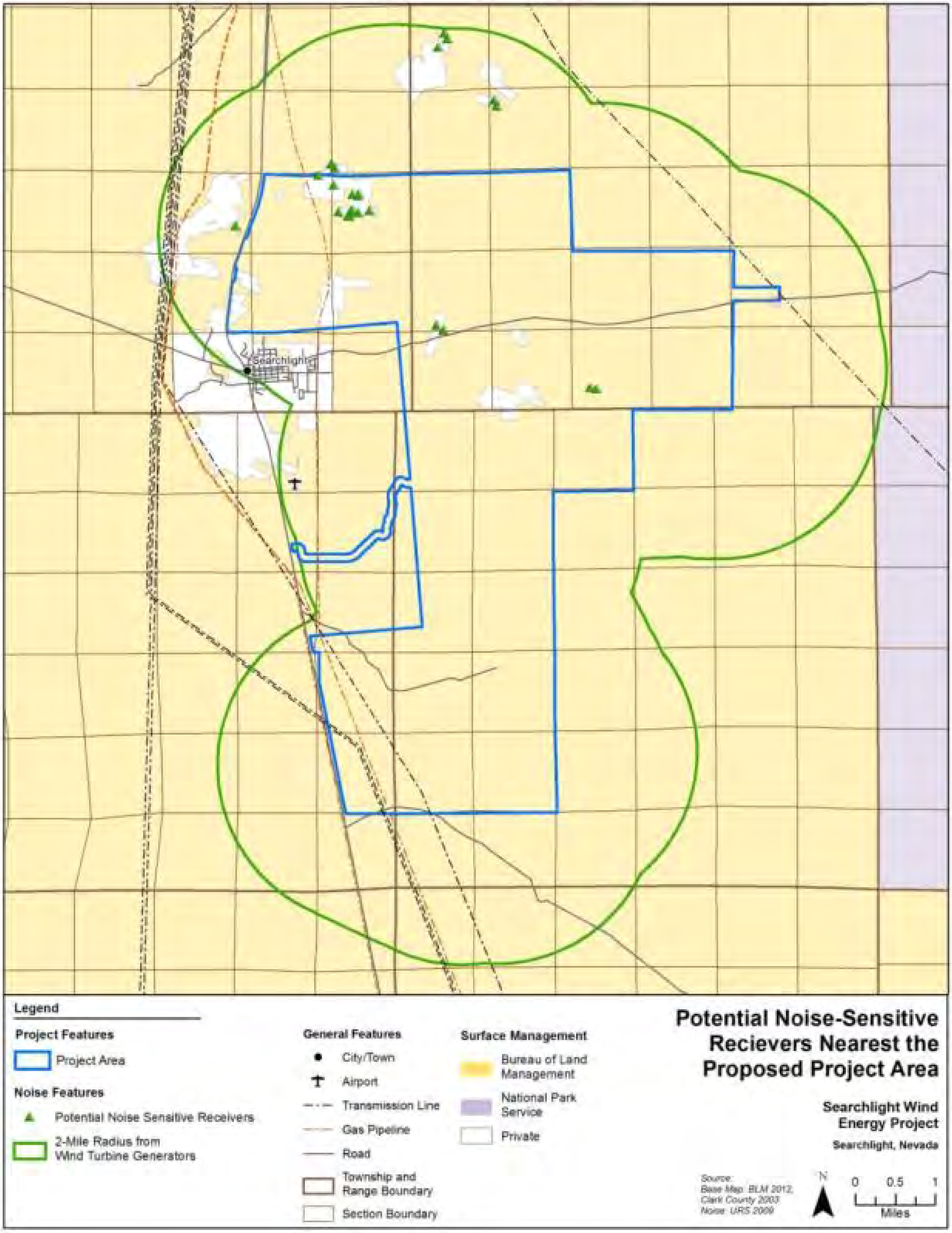


Figure 3.10-1 Potential Noise-Sensitive Receivers Nearest the Proposed Project Area

3.10.2.4 Ambient Sound in the Project Area Vicinity

Searchlight and Nearby Residential Areas

In the absence of measurement data, the existing sound level environment in the vicinity of the Proposed Project area was coarsely estimated with both roadway proximity and population density methods published by the Federal Transit Administration (FTA) in its Transit Noise and Vibration Impact Assessment (FTA 2006).

The project area is within the southern portion of Clark County, Nevada, with rural major collector SR 164, also known as Nipton Road west of Searchlight and Cottonwood Cove Access Road east of Searchlight), and principal arterial US-95 as vicinity roadways. In downtown Searchlight, some apparent residential land uses are within 50 feet of either of these sources of road traffic noise, which would be considered comparable to the "Other Roadways" classification according to the FTA guidance.

According to the U.S. Census Bureau, the population of Searchlight was 576 as of the 2000 Census, and the encompassed land area is 13.1 square miles (U.S. Census Bureau 2009). These parameters can yield an average per-square-mile population density of 44. Downtown Searchlight might be considered to have an increased population density and, hence, be represented by a different category according to FTA ambient noise estimation guidance.

Table 3.10-4 indicates the estimated upper and lower sound level ranges in the vicinity of the project area from using each of the two aforementioned FTA general estimation methods. When a noise-sensitive receiver is much greater than 400 feet away from either Cottonwood Cove Road or US-95, the estimates from the population density method would probably be more accurate representations of ambient sound levels.

Table 3.10-4. Estimated Existing Ambient Sound Levels (dBA)

Estimation Method	Representative Area	L_{eq} Day	L_{eq} Evening	L_{eq} Night	L_{dn}
Roadway Proximity Method					
10 to 50 feet from other roadways	Adjacent to main arteries	70	65	60	70
More than 400 feet from other roadways	Downtown Searchlight	50	45	40	50
Population Density Method					
1 to 100 persons per-square-mile	Remote rural areas such as nearest residences to WTGs	35	30	25	35
100 to 300 persons per-square-mile	Searchlight	40	35	30	40

Source: FTA 2006
L_{eq} = equal sound level
L_{dn} = daytime-nighttime noise level

The above data, particularly for the residential areas nearest the WTGs, are believed to be representative even though they are estimates. In particular, the estimated sound levels for the 1 to 100 people per square mile land use represents very low ambient conditions.

Lake Mead National Recreation Area

The NPS initiated an ambient noise-monitoring program in 2010 at two locations within the Lake Mead National Recreation Area (NPS, 2010). The meters were installed at two remote locations on the Nevada side of Lake Mohave. The meter locations are approximately 10 miles northeast and 10 miles southeast of the nearest Project boundary line. As would be anticipated in such remote locations, ambient sound levels were found to be very low, generally ranging from about 15 dBA to 25 dBA, with some short-term levels above 35 dBA. Notably, the NPS did not include sound level data measured when wind speeds near the microphone exceeded 5 meters per section (m/s) (11 mph), in compliance with national standard ANSI 12.18 Section 4.4.1.1. As such, the ambient data presented reflect conservative levels, including times when the WTGs would be in part load operation, thereby generating lower sound levels, or not operating at all.

3.11 Recreation

This section identifies existing recreational resources and opportunities in the Proposed Project vicinity, including direct, onsite recreation activities and dispersed recreation activities that might be affected during construction, O&M, or decommissioning of the Proposed Project.

3.11.1 Region of Influence

The ROI evaluated for recreation encompasses those locations within or adjacent to the Proposed Project area that are utilized for recreation or as access to recreational opportunities. Both BLM and NDOW data and relevant management plans were used to characterize the recreational uses in the project area and vicinity.

3.11.2 Existing Environment

Demand for recreational opportunities in southern Nevada and Clark County has increased due to the expansion of the Las Vegas metropolitan area over the last decade. Regional recreation opportunities and sites are composed primarily of federal and state agency lands that serve the dual function of protecting resources and providing recreation opportunities. Such sites include Lake Mead NRA, Red Rock Canyon National Conservation Area, Spring Mountains NRA, Desert National Wildlife Refuge, Valley of Fire State Park, and Overton Wildlife Management Area. Water-based recreation takes place primarily at Lakes Mead, and Mojave, and on the Colorado River.

The Proposed Project would be constructed primarily (94.5%) on desert lands administered by the BLM LVFO in Clark County, Nevada, within the relatively undeveloped east side of the Puite Valley, and in the low hills bordering the western flank of an unnamed mountain range that includes Fourth of July Mountain. The town of Searchlight, located approximately 0.5 miles to the west of the project boundary, is the nearest community from which to access the project area. Major access routes to the project area include US-95 and Cottonwood Cove Access Road, also known as SR 164 (west of Searchlight). Approximately 14 miles east of Searchlight, within the NPS-managed Lake Mead NRA, are Cottonwood Cove and Lake Mohave. This area offers a wide variety of recreational activities and provides public boat launch facilities, commercial marina services, and other public use and support facilities. The Lake Mead NRA Cottonwood Cove visitor entrance (fee) station is located approximately 6 miles east of Searchlight.

The southern Nevada desert is characterized by a sparse human population and large expanses of open space that provide outstanding opportunities for casual and organized recreational activities. This area attracts recreation visitors seeking a primitive recreation experience of natural beauty, solitude, and freedom from the regulations of structured urban environments. People residing in Searchlight and the surrounding area, as well as visitors from other regions, rely on the land within and adjacent to the project area for recreational opportunities. Casual or dispersed recreation opportunities include photography, backpacking, bird watching, horseback riding, hunting, primitive camping, hiking, rock climbing, and competitive and non-competitive OHV use.

A portion of the Old Spanish National Historic Trail is located in the northwest part of the project area; it offers recreation opportunities such as hiking and wildlife viewing. While, a variant of the Old Spanish Trail is said to traverse the area, there is no physical manifestation of the trail on the ground surface. There are no backcountry byways or developed recreation sites within or adjacent to the project area. Table 3.11-1 provides the best available visitor use data for recreation activities in the BLM LVFO, which includes the project area.

Table 3.11-1. Estimated Annual Visitor Use in the BLM Las Vegas District

Activity	Visits	Visitor Hours
OHV Travel	73,300	4,088,000
Other Motorized	665,000	2,450,000

Activity	Visits	Visitor Hours
Non-motorized	260,000	2,080,000
Camping	13,300	478,800
Hunting	32,800	393,600
Site Based	106,400	1,276,800
Total	**1,150,800**	**10,276,800**

Source: BLM Las Vegas District Files, 1994

The BLM's recreation goal is to serve the diverse outdoor recreation demands of visitors and provide recreational opportunities while maintaining the sustainable conditions needed to conserve public lands and visitor recreation choices (BLM 2003). The recreation setting and experience and the BLM guidance for recreation lands management are described below.

3.11.2.1 Recreational Setting and Experience

A recreational setting includes accessible natural and manmade features associated with recreational use. Providing a wide range of recreational settings varying in the type and quality of scenery, topography, development, and access ensures that the broadest segment of the public will find satisfying recreational experiences. The recreational setting in the project area includes ecologically diverse landscapes that include mountains and hills, local bedrock, volcanic outcrops, alluvial fans, and washes.

3.11.2.2 Recreational Opportunity Spectrum

The BLM classifies all land available for recreational purposes according to the Recreation Opportunity Spectrum (ROS). The ROS is a scale of classifications "…used to characterize recreation opportunities in terms of setting, activity, and experience opportunities" (BLM 1998). A recreation opportunity includes qualities provided by nature (vegetation, landscape, topography, water bodies, scenery), qualities associated with recreational use (levels and types of use), and conditions provided by land managers (developments, roads, regulations). By combining variations of these qualities and conditions, management can provide a variety of opportunities for recreationists. The ROS identifies these opportunities on the basis of the area's setting and activities:

- Primitive or semi-primitive non-motorized use is characteristic of areas designated for Wilderness, and Wilderness Study Areas. These areas are typically roadless, of rugged terrain, and lack ready access. Uses include hiking, camping, rock climbing, nature study, and hunting.
- Semi-primitive motorized use is typical in areas adjacent to Wilderness Study Areas and Wilderness. Uses are similar to those of the non-motorized areas but include OHV touring on roads, trails, and dry washes.
- Roaded natural areas comprise the majority of the jurisdiction of the BLM as well as portions of the Spring Mountains NRA, Red Rock Canyon National Conservation Area and Lake Mead NRA. Visitor use can be moderate to high with specific opportunities for picnicking, hiking, OHV touring, free play, organized events, camping, and interpretive activities. Vehicle use is restricted to approved roads within the Lake Mead NRA.
- Rural recreational areas typically have some ambient human presence; there are developed recreation facilities and the natural environment is less important. Visitor use is moderate to high with competitive games and events, spectator sports, OHV touring, free play, and events. Sunrise Mountain/Rainbow Gardens, Nellis Dunes, and organized recreational shoreline areas along Lake Mead are examples of this level of recreation.
- Urban sites are those within the jurisdiction of the local governments and allow for playing fields, tennis courts, swimming pools, stables, golf courses, and arenas.

The ROS designation within the project area is Roaded Natural. The Roaded Natural class offers roughly equal opportunities for organized, group recreational activities, or recreation in a natural setting, generally away from other human activities. Opportunities for both motorized and non-motorized recreation are present, but OHV use in the project area is limited to designated roads, trails, and dry washes. Some routes utilized by recreational users have not been formally designated for such use. Semi-primitive motorized recreation areas are located adjacent to and southwest of the project areas.

3.12 Socioeconomics

This section discusses effects on social and economic resources that might occur with implementation of the Proposed Action or alternatives. The indicators used to identify and analyze effects are presented. This discussion format is organized separately for both social and economic conditions.

3.12.1 Region of Influence

The ROI for socioeconomic impacts has been defined as Clark County, Nevada. This geographic area contains stakeholders and resources that could be affected by the Proposed Project, and the majority of project impacts would be most apparent there. The portion of the ROI closest to the Proposed Project site is the town of Searchlight. More broadly, the region includes the Piute-Eldorado Valley and the South County Planning area.

3.12.2 Existing Social Conditions

The social profile functions as the existing environment baseline against which action alternatives are assessed, and focuses on the demographic and social trends, and groups represented in the ROI and their attitudes. Clark County is profiled because the assets of the action alternatives would be incorporated into the physical energy infrastructure serving Clark County and would potentially provide electrical power to the region. The Proposed Project might also use resources (land, labor, and materials) from Clark County, and would provide revenue to the County through taxes on procured resources and as part of the County's tax base.

The ROI for social and economic conditions is described using several levels of analysis and baseline comparisons. The Proposed Project is adjacent to Searchlight, Nevada. Where possible, characteristics are compared across the following areas:

1. Searchlight Project Impact Area (SIA): This is an aggregation of 18 Census Tracts, defined for the 2000 Census, that cover the area most likely to be directly affected by the Proposed Project, either in terms of providing housing to the workers employed for construction and O&M, or being within visual lines of sight either in residence or while traveling between larger communities, or experiencing the traffic of equipment and materials flowing onto the site. The SIA is shown on Figure 3.12-1 and is composed of 10 Census Tracts comprising the southern tip of Clark County, south of Henderson but including Boulder City, as well as 8 Census Tracts in that portion of Mohave County, Arizona, across the Colorado River from Laughlin, Nevada. This area includes Bullhead City and several smaller places (see item 6 of this list). Also included are those portions of the Fort Mohave Indian Reservation located in Arizona and Nevada, but excluding Reservation areas in California. The SIA covers 2,052 square miles of land.

2. Two-County Region or Searchlight Impact Region (SIR): This is the aggregation of Clark County, Nevada, and Mohave County, Arizona. This larger region is especially relevant for data that are only available at the county level.

3. Clark County, Nevada, and Mohave County, Arizona: Each county is a larger containing area for that portion of the SIA located within it, and is the source of useful comparisons.

4. State of Nevada and State of Arizona: Each state has a unique profile and serves as an introduction to the broader region.

5. United States: Comparisons to baseline U.S. patterns are enabled by including national data.

6. Places: Concentrations of population are referred to as either Incorporated Places or Census Designated Places (CDPs) by the Census Bureau. The boundaries for the latter are informal estimates generated by the Census Bureau, and are generally larger than the town sites in the sparsely populated American West. Data are presented for Bullhead City and Boulder City, as

well as for the Nevada CDPs of Searchlight, Cal-Nev-Ari, and Laughlin. The Arizona CDPs are Mohave Valley, Willow Valley, Arizona Village, and Mesquite Creek. Mohave Ranch Estates, a CDP located within the Mohave Valley CDP, is a small, near-zero population area excluded from this analysis.

7. Census Tracts, Block Groups, and Blocks1: Decennial census data are gathered at the level of Blocks, extremely small units of geography originating with city blocks. Block Groups are aggregates of Census Blocks, but their boundaries are drawn in part to respect political subdivisions including the boundaries of counties, cities, and American Indian Reservations. Block Groups, in turn, form Census Tracts, which are even larger units of geography that divide a county into population areas of approximately 3,000 persons.

[1] Decennial census data are gathered by the U.S. government at the level of Blocks, extremely small units of geography defined by impermeable features like rivers, streets, and mountain ridge lines. The term itself is drawn from the rectangular city block, but generalized to the entire U.S. Information gathered from the so-called “short” census form is generalized to census block units, and then aggregated to political units for which reapportionment and redistricting are mandated. Approximately 15% of residents receive a so-called “long” census form containing a wide array of items dealing with income, education, family size, etc. The sampling that determines who gets the long form is calculated at a higher unit of geography than the census block, namely the block group. The rich array of socioeconomic data used here and elsewhere is drawn from the long form.

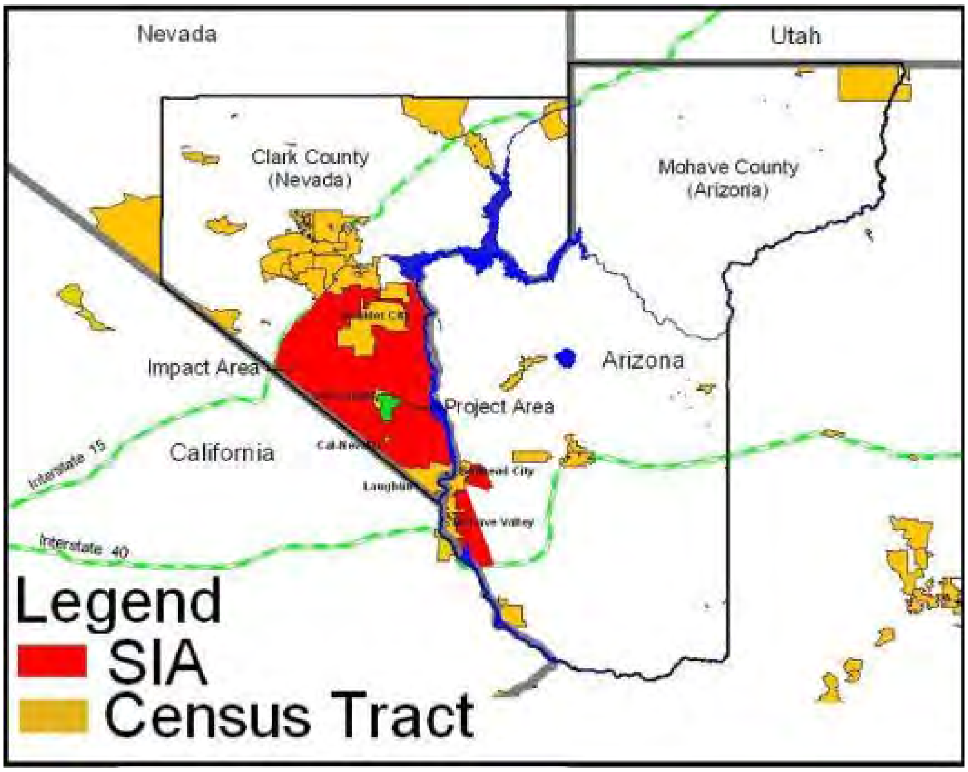


Figure 3.12-1. Searchlight Project Impact Area for Social and Economic Impact

Assessment

Figure 3.12-1 shows the SIA shaded in red, including the portions of Clark and Mohave counties incorporated within the 18 Census Tracts that define the SIA components. The SIA includes Boulder City, which may draw resident workers for construction, as well as Bullhead City, Arizona. It extends to the unincorporated communities of Searchlight, Cal-Nev-Ari, Laughlin, and Mohave Valley, both for the potential of construction workers and because these residents will drive regularly through Searchlight en route to Las Vegas. Those living in the vicinity of Searchlight and Cottonwood Cove would be the most directly impacted.

3.12.2.1 Community Setting

The town of Searchlight has fewer than 1,000 permanent residents, but this historic mining town was once larger than Las Vegas. Gold ore was first discovered here in 1897, and the town began its boom five years later. By 1907, Searchlight had reached its peak. In the ensuing years, as gold production costs rose and ore quality dropped, its population dwindled.

A mix of miners, ranchers, artists, small business owners, and retirees reside in this unassuming community, which features such small town amenities as an historic museum, senior citizens' center, post office, elementary school, and two churches. Of greater note to visitors is Searchlight's prime location, which establishes it as the gateway to the popular Lake Mohave in the Lake Mead NRA. Just 14 miles from Searchlight is Cottonwood Cove, which is known as one of the best largemouth bass fisheries in the American West. Camping, hiking, horse and OHV riding, and other lake activities are equally popular in the Searchlight area.

3.12.2.2 Demographics and Social Trends

Clark and Mohave counties had populations of 1,951,269 and 200,186, respectively, in 2010, for a combined population of 2,151,455 in the two-county SIR (Table 3.12-1). The population in the total SIA in 2010 was much smaller, at 155,606. The Searchlight CDP had a population of 539 in 2010. Note that this area is somewhat larger than the locally defined area known as the town of Searchlight.

Table 3.12-1. ROI Areas: Population for 1990, 2010, and 2016

ROI Component Areas	Resident Population				Annualized Population Change		
	1990 Census	2000 Census	2010 Census	2016 Projection	1990-2000 (Actual)	2000-2010 (Actual)	2010-2016 (Est.)
Searchlight Impact Area	49,327	78,792	155,606	163,479	6.0%	9.7%	0.8%
Clark County Nevada Portion:	19,097	27,537	84,307	90,240	4.4%	20.6%	1.2%
Boulder City	12,570	14,966	15,023	15,709	1.9%	0.0%	0.8%
Laughlin	4,800	7,076	7,323	7,194	4.7%	0.3%	-0.3%
Searchlight	547	576	539	567	0.5%	-0.6%	0.9%
Cal-Nev-Ari	60	278	244	259	36.3%	-1.2%	-0.1.0%
Remainder Clark County Unincorporated Portion	1,120	4,641	61,178	66,511	31.4%	121.8%	1.5%
Mohave County Arizona Portion:	30,230	51,255	71,299	73,239	7.0%	3.9%	0.5%
Bullhead City	22,147	33,769	39,540	39,722	5.2%	3.1.7%	0.1%
Mohave Valley	6,413	13,694	2,616	2,798	11.4%	-8.1%	1.2%
Willow Valley	355	585	1,062	1,246	6.5%	8.2%	2.9%
Arizona Village	275	351	946	1,063	2.8%	17.0%	1.2.1%
Mesquite Creek	69	205	416	411	19.7%	10.3%	-0.2%
Remainder Mohave County Unincorporated Portion	971	2,651	26,719	27,999	17.3%	90.8%	0.8%
Searchlight Impact Region	834,956	1,530,797	2,151,455	2,301,180	8.3%	4.1%	1.2%
Clark County, Nevada	741,459	1,375,765	1,951,269	2,095,797	8.6%	4.2%	1.2%
Mohave County, Arizona	93,497	155,032	200,186	205,383	6.6%	2.9%	0.4%
State of Nevada (millions)	1.202	1.998	2.701	2.877	6.6%	3.5%	1.1%
State of Arizona (millions)	3.665	5.131	6.392	6.808	4.0%	3.2.5%	1.1%
United States (millions)	248.7	281.4	308.7	321.3	1.3%	1.0%	1.0.7%

Source: Bureau of the Census, 2016 projections by ESRI

Table 3.12-1 provides population totals for the four years of 1990, 2000, 2010, and 2016, and the annualized percentage population change for the three periods 1990-2000, 2000-2010, and 2010-2016 for several units of geography important to this analysis. Data for 1990, 2000, and 2010 are drawn from the

U.S. decennial censuses for those years. The 2016 projections (sometimes called forecasts) are prepared by ESRI.[2]

As shown in Table 3.12-1, the geographic component areas are listed beginning with the SIA, followed by population data for the several incorporated and unincorporated places, organized first by county and then arranged with each county roughly by population size. A residual or unincorporated remainder category is defined for each county component of the SIA. The remainder category is particularly important in identifying the significant population growth experienced by the unincorporated areas of southern Clark County, Nevada. For comparison purposes, the populations and annualized population change percentages for Arizona, Nevada, and the United States are also provided.

The average U.S. growth rate is approximately 1% per year, with growth slowing over the 1990-2016 period. This growth rate is regarded as healthy but modest. By comparison, the SIR experienced annual growth of 8.3% throughout the 1990s. From 2000 through 2010, growth was half as fast at 4.1% per year. For the 2000-2010 period, growth within the SIA was a very rapid 9.7% annually.

There is much local variation in population increases within these large counties. From 2000 through 2010, unincorporated areas of Clark County grew from 4,641 to 61,178 persons — a dramatic average annual growth rate of 121.8%. This growth occurred primarily in the area south of Henderson and west of Boulder City, in the northern part of the SIA. This growth was influenced by the Las Vegas economy extending across southern Clark County and included families of professional commuters and retirees.

The population centers contained within the SIA, identified by the two cities and seven CDPs, have experienced less explosive and, in some cases, flat growth during the same period. The lowest growth rates occur nearest the project area. Boulder City, Searchlight CDP, and Cal-Nev-Ari CDP experienced flat or negative growth from 2000 to 2010, with only modest growth projected to 2016. By comparison, Bullhead City (and especially the Mohave Valley CDP) has grown at more than 3% annually.

Population growth rates are expected to slow for most areas from 2010 to 2016, as migration patterns slowed during the Great Recession, which officially lasted from December 2007 through June 2009, though lingering effects such as high unemployment continued to plague the United States well beyond that date. The SIA is expected to grow at only a 0.8% annual rate, below the 1.2% rate forecasted for the broader two-county region.

Nevada and Arizona have slightly lower proportions of family households than the U.S. average of 66.4%, while at the same time these states display lower proportions of single person households than the 26.7% characterizing the U.S. (Table 3.12-2). This apparent contradiction is explained by the much higher proportion of nonfamily households with two or more persons, particularly in Nevada as compared to the U.S. overall. Such households contain unmarried partners and are distributed across most adult age

[2] Source: ESRI, www.esri.com

groupings. The SIA has the smallest average household size of any of the comparative areas, at 2.35 persons per household compared to 2.67 for the two-county SIR.

Table 3.12-2. ROI Areas: Resident Household and Age Data in 2010

	Clark County Nevada	Mohave County Arizona	Searchlight Impact Region	Searchlight Impact Area	State of Nevada	State of Arizona	United States
Total Households	715,365	82,539	797,904	65,419	1,006,250	2,380,990	116,716,292
% Family Households	65.4%	65.5%	65.4%	66.4%	65.3%	66.2%	66.4%
% Single-Person Households	25.3%	26.7%	25.5%	25.9%	25.7%	26.1%	26.7%
% 2+ Person Households	74.7%	73.3%	74.5%	74.1%	74.3%	73.9%	73.3%
2010 Average Household Size	2.70	2.39	2.67	2.35	2.65	2.63	2.58
2010 Median Age	35.5	47.6	41.6	48.3	36.3	35.9	37.2
% Under Age 18	34.9%	24.5%	33.8%	23.9%	33.9%	33.6%	33.4%
% Age 65 and Over	23.0%	39.9%	24.7%	39.3%	24.0%	26.4%	24.9%

Source: U.S. 2010 Census

This pattern is supported when the median age of the SIA is examined. Compared to the U.S. and both Arizona and Nevada, the SIA has a higher median age (48.3), a higher proportion of seniors (39.3%), and a correspondingly lower proportion of children (23.9%). Absent the substantial influence of the Las Vegas area, Mohave County as a whole displays an age structure similar to the SIA. Clearly, retirees currently play a significant role in the population dynamics of the SIA. In contrast, Clark County, Nevada, and Arizona each have median ages younger than the U.S. overall.

Table 3.12-3 describes the population by race and by origin for the several units of geography identified for the project area.

Table 3.12-3. ROI Areas: 2010 Resident Population by Race and Origin

	Clark County Nevada	Mohave County Arizona	Searchlight Impact Region	Searchlight Impact Area	State of Nevada	State of Arizona	United States
2010 Population by single race classification	1,851,878	194,693	2,046,571	150,193	2,574,476	6,173,717	299,736,465
White Alone	64.2%	89.3%	66.5%	86.1%	69.4%	75.6%	74.6%
Black or African American Alone	11.0%	1.0%	10.1%	2.4%	8.5%	3.4.2%	13.0%

	Clark County Nevada	Mohave County Arizona	Searchlight Impact Region	Searchlight Impact Area	State of Nevada	State of Arizona	United States
American Indian and Alaska Native Alone	0.8%	2.3%	1.0.9%	1.3%	1.2%	4.8%	1.0%
Asian Alone	9.1%	1.1%	8.4%	4.6%	7.6%	2.9%	4.9%
Native Hawaiian and Other Pacific Islander Alone	0.7%	0.2%	0.7%	0.3%	0.7%	0.2%	0.2%
Some Other Race Alone	14.2%	6.2%	13.4%	5.4%	12.6%	12.3%	6.4%
Two or More Races	5.4%	2.8%	5.1%	3.6%	4.9%	3.5%	3.0%
Hispanic or Latino	30.7%	15.2%	29.2%	15.0%	27.8%	30.7%	16.8%

Source: U.S. 2010 Census

Arizona is quite similar to the U.S. in terms of its percentage of White Alone population (about 75%). Mohave County and the SIA are much less diverse, with 89.3% and 86.1%, respectively, identifying themselves as White Alone. Clark County, the SIR, and the state of Nevada are more diverse with only 64.2%, 66.5% and 69.4% White. While the African American population of the U.S. numbers 13.0%, African Americans are far fewer in Arizona (4.2%) and Nevada (8.5%). The SIA was 2.4% African American in 2010. The Asian population constituted 4.9% of the U.S. population in 2010, and is known to be the fastest growing racial minority in the country. Concentrating in and around Las Vegas, Asians total 7.6% in Nevada and 9.1% in Clark County, but number 4.6% in the SIA. The presence of the Fort Mojave Indian Reservation gives Mohave County a higher proportion of Native Americans, at 2.3% of its population, than the U.S. average (1.0%). The Arizona Village CDP is a Native American enclave and is located entirely within Reservation boundaries.

As shown in Table 3.12-3, the concentration of Hispanics in Arizona (30.7%), Clark County (30.7%) and Nevada (27.8%) are nearly double that of the U.S. proportion of 16.8%. The SIA's 15% concentration of Hispanic residents is more similar to the 15.2% for Mohave County than it is to the 30.7% characterizing Clark County.

3.12.2.3 Area Housing Characteristics

The SIA's proportion of owner-occupied homes is 70.9%, which is well above the U.S. national average of 65.1 percent. Clark County has fewer owner-occupied homes and more renters, characteristic of large urban areas. The SIA has fewer renter-occupied homes (29.1%) than either the state or the U.S. average, and is similar in this regard to Mohave County. Typical values for owner-occupied homes vary primarily based on the presence of very expensive homes within Clark County and the Las Vegas area. Still, median housing values for this part of the nation are at least 10% higher than the national average $188,400. The SIA had a 2010 median value of $250,684, close to the comparable figure for Nevada ($254,200) and exceeding the value for the U.S. ($188,400). Homes in Mohave County are much less expensive, with a median value of $170,600. A significant number of homes are for seasonal, recreational, or occasional use, although renter-occupied homes might be smaller and with fewer amenities than primary residences (Table 3.12-4).   Home values in general have continued to decline since 2010, but appear to be stabilizing in 2012.

Table 3.12-4. ROI Areas: Tenure and Value of Owner-Occupied Housing Units (2010)

	Clark County Nevada	Mohave County Arizona	Searchlight Impact Region	Searchlight Impact Area	State of Nevada	State of Arizona	United States
2010 occupied housing units	715,365	82,539	797,904	65,419	1,006,250	2,380,990	116,716,292
Owner-occupied	57.1%	69.9%	58.4%	70.9%	58.8%	66.0%	65.1%
Renter-occupied	42.9%	30.1%	41.6%	29.1%	41.2%	34.0%	34.9%
2010 median owner-occupied housing unit value	$257,300	$170,600	$213,950	$250,684	$254,200	$215,000	$188,400

Source: U.S. 2010 Census

3.12.3 Affected Groups and Attitudes

This section discusses some of the groups who might be affected by the Proposed Project. Classifying stakeholders into groups does not imply that other stakeholders who do not fit into a particular group are being overlooked or are outside of the social and environmental review process. Discussion of the affected groups is simply a means to highlight and facilitate issue framing related to the social concerns of some stakeholders who may have a particular local or regional relationship to the host landscape (the Proposed Project area) that might be developed to harness wind energy. Social concerns were heard during the scoping process.

3.12.3.1 Public Land Recreational Users / Off-Highway Vehicle Users / Organizations and Supporting Industries

OHV enthusiasts have a unique historic relationship to the land. These recreationists depend on having physical connectivity to trails and courses that are unimpeded by any structures. Social concerns for this group relate to the potential loss of recreational resources. Moving beyond the immediate OHV users, social concerns relate to the social and economic welfare of supporting industries that depend on OHV demand (events and usage patterns) for their livelihoods and form an important part of the regional economy.

3.12.3.2 Environmental Groups and Stewards

Environmental groups and stewards have concerns about the potential loss of desert habitat that supports numerous species, including threatened and endangered species. These groups are also concerned with mitigation measures and the potential cumulative impacts on the host environment’s ability to support biodiversity in the face of renewable energy development on a large-utility scale. Some environmental groups are also concerned with the loss of desert open space areas, the potential impacts on the carbon sequestration function of the unimpeded desert soils, and the potential loss of vegetation and drainage impacts. The social aspect relates to the feelings of unease in how the groups’ historic stewardship role might be compromised by developments that may be perceived to be outside of their control.

3.12.3.3 Project Construction Workers and Suppliers to the Renewable Energy Industry

Many members of this group of stakeholders are either unemployed (out of work) or underemployed (not making full use of their skills, experience, training, or education). These stakeholders view the clean energy economy transition and projects such as renewable energy as potential future economic opportunities that will also improve their social welfare. Since the area is still struggling with the consequences of the Great Recession, social attitudes towards future employment opportunities and cross-training are favorable and hopeful. Suppliers to the renewable energy industry are firms and establishments that can provide goods or services necessary to build, operate, and decommission the Proposed Project or other renewable projects in the area. These firms can potentially be local, regional, or national in origin and have a vested interest in participating in renewable energy development. The livelihood of this group depends on economic opportunities for sustainably developing renewable energy in the region.

3.12.3.4 Utility Off-Taker and End-Use Energy Consumers

The processors, distributors, and ultimate consumers of electricity to be generated by the Proposed Project are a social group that is considered in the socioeconomic impact evaluation. The Proposed Project's energy output would be delivered to a grid system for use by final retail consumers. These consumers have various social attitudes toward renewable energy that relates to its reliability, cost, and the environmental sustainability of this resource. These attitudes also include concerns for the resources consumed (e.g., water) and the tradeoffs necessary to achieve emission-free wind power generation. The average consumer is concerned with how their local energy bill or electricity rates might potentially change with the introduction of wind energy assets. It is possible that power generated by the Proposed Project may flow to grids serving regions outside of Nevada, including California and Arizona.

3.12.3.5 Local Private Land Owners / Large Lot Owners / Residents

In the Proposed Project vicinity, private landowners, large lot owners, and residents from Nevada, Arizona, and California have various attitudes toward renewable energy development.

Some support renewable energy development, some oppose a change to the desert environment, while others are indifferent to the proposed development. Local landowners are also concerned about effectively permanent changes to the natural high desert environment (given the 30-year lease aspect of the ROW grant), wildlife, and potential impacts on property values.

3.12.4 Economic Existing Conditions

The immediate project vicinity landscape has been significantly altered by human use. Because of its location between Las Vegas and Arizona communities and tourist attractions, this portion of the Puite-Eldorado Valley has historically been used as a major transportation thoroughfare and utility corridor. Modern and built-environment features of the landscape include an interstate highway (US-95 corridor); a mainline railroad track; the historic resort and mining communities of Boulder City, Laughlin, Cal-Nev-Ari, and Searchlight, Nevada, with their various casinos, gas stations, and small businesses; and several high-voltage transmission lines that converge in and transverse the area. The economy of Searchlight is based on its casinos, which cater to gaming tourists traveling between Nevada, Arizona, and California.

3.12.4.1 Economic Base and Trends: Employment, Earnings, and Income

The economic base describes the industries, jobs, earnings, and wealth that collectively define the economy of the region. Since the most comprehensive economic indicators are compiled at the county level, county-level data have been used to describe the regional economy. Key industries and economic trends that are relatively more important to the character of the region are highlighted in more detail.

3.12.4.2 Area Income Levels

Two measures are most commonly used to assess the relative prosperity of a population. The first, per capita income, is calculated by taking total personal income from all sources for the region and dividing it by the total number of people living there. It is best used in comparing a large number of diverse areas, but its interpretation is sensitive to differences in family size, which can affect the size of the denominator of the measure.

Table 3.12-5 shows that the SIA has the highest per capita income of all the areas included in the table, with its $31,642 income exceeding the national average of $27,334 by 16 percent. With its older population and smaller household size, SIA households might not be so much in greater economic prosperity than their neighbors elsewhere, but rather their household incomes are divided among fewer householders and certainly fewer children. In contrast, Mohave County had a 2010 per capita income of only $21,523.

Table 3.12-5. ROI Areas: 2010 Household Income

	Clark County Nevada	Mohave County Arizona	Searchlight Impact Region	Searchlight Impact Area	State of Nevada	State of Arizona	United States
2010 Estimated Average Household Income	$72,600	$51,979	$70,467	$74,498	$72,112	$67,436	$70,883
2010 Estimated Median Household Income	$56,258	$39,785	$54,554	$57,800	$55,726	$50,448	$51,914
2010 Estimated Per Capita Income	$27,422	$21,523	$26,873	$31,642	$27,589	$25,680	$27,334

Source: U.S. 2010 Census

The second useful measure of income is median household income, which reflects the halfway point in incomes as they might be arranged from the lowest to the highest. It tends to be a more accurate reflection of the community than average household income, which can be skewed by a few very rich individuals. Both average household income and median household income are shown in Table 3.12-5. When considered together, these two measures provide information that one measure alone cannot. The SIA displays the highest average household income of all the areas ($74,498), above the national average of $70,883, and higher than Clark County's average household income of $72,600. This pattern supports the previously cited observation that the SIA consists of older, more established households with fewer children and comparatively higher income earners, including pensioners.

By comparison, the median household income of $57,800 in the SIA removes the dramatic impact of a few very high incomes. Clark County's median household income is nearly as high as that for the SIA, suggesting that many of the SIA's retiree incomes are relatively high and are comparable to professional incomes in the Las Vegas area.

The region's economy can also be examined by levels of personal income instead of employment, as shown on Figure 3.12-2. Between 1970 and 2000, the services sector of the economy grew much faster than the non-services-related sectors or government, to account for 72.1% of the two-county SIA's economy in 2000. Since then, the accommodation and food services sector and construction sector have continued to grow. Overall during this period, the relative level of prosperity in the region was improving.

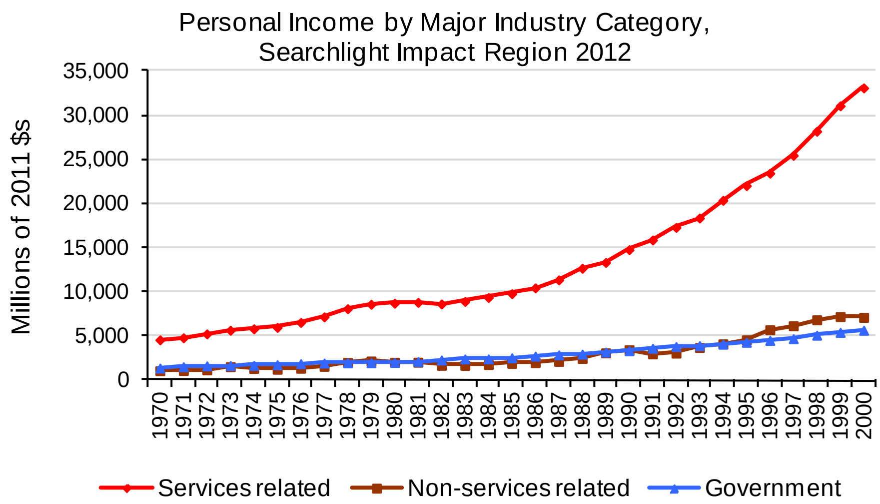


Figure 3.12-2. Personal Income by Major Industry Category, Two-County SIR (Headwaters Economics 2012)

A second sector growing rapidly in the region is non-labor income, i.e., payments to owned assets that come as dividends, interest, rent, and transfer payments. The majority of transfer payments go to senior citizens and veterans as Social Security, Medicare, and pensions. In 2010, non-labor income comprised 36.5% of the SIR's $77.4 billion economy and was growing (Figure 3.12-3). This is less than the 38% non-labor income for the combined economy of Arizona and Nevada (Headwaters, 2012). Note that the sudden rise in transfer payments beginning around 2008 is the effect of countercyclical social welfare programs increasing payments as the Great Recession began. Dividends, interest, and rent fell a bit later as first stock prices, and then interest rates declined.

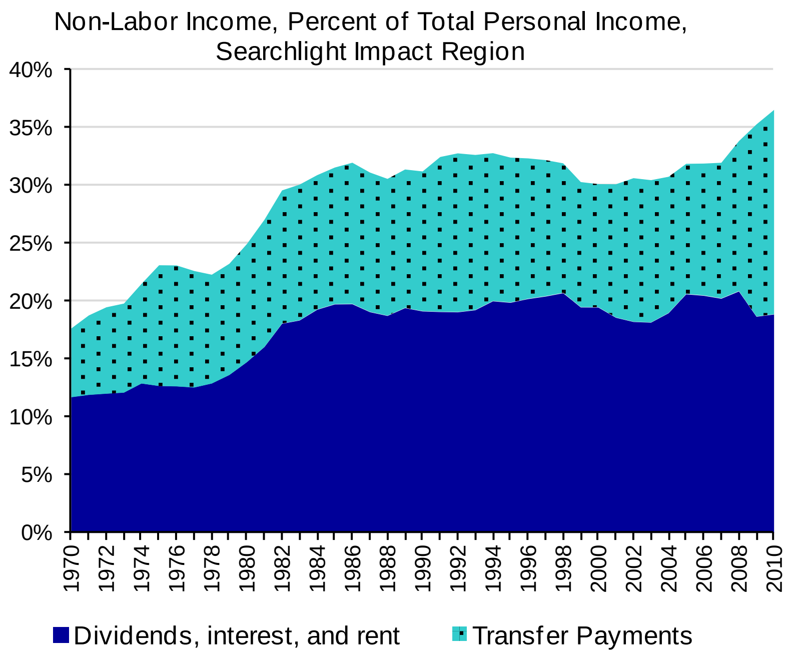


Figure 3.12-3. Non-labor Income as a Percent of Total Personal Income, Two-County SIR (Headwaters Economics 2012b)

Figure 3.12-4 illustrates 2006-10 Census American Community Survey estimates of the most prevalent job classifications in the SIA and Searchlight two-county region, with the U.S. average for comparison. Both have more people involved in service jobs than the U.S. as a whole, as would be expected in a region where gaming and tourism dominate the local economies. Bureau of Labor Statistics (BLS) data show that 29.8% of jobs in the SIA are in the tourism sector, compared to a U.S. average of 7.9%. Note that the BLS data refer to all types of jobs that might fall into a given industry sector, including management, technical services, and laborers, while the 2006-10 census estimates on Figure 3.12-3 refer to occupations that cut across many different sectors. Both the SIA and region lag the U.S. markedly in professional jobs and in production, transportation, and material moving. Within the SIR, travel and tourism accounts for 36.4% of employment, which is far greater than the 14.9% U.S. average. There are pockets within the SIR with even greater tourism dependence. Arts, entertainment, recreation, accommodations and food service employment accounts for 27.3% of jobs in the Seachlight CDP, 35.7% in the Arizona Village CDP, and 53.7% of jobs in the Laughlin CDP. Both the Searchlight area and region have very little employment in farming, fishing, and forestry. Both have proportions of jobs in construction and management similar to the rest of the nation.

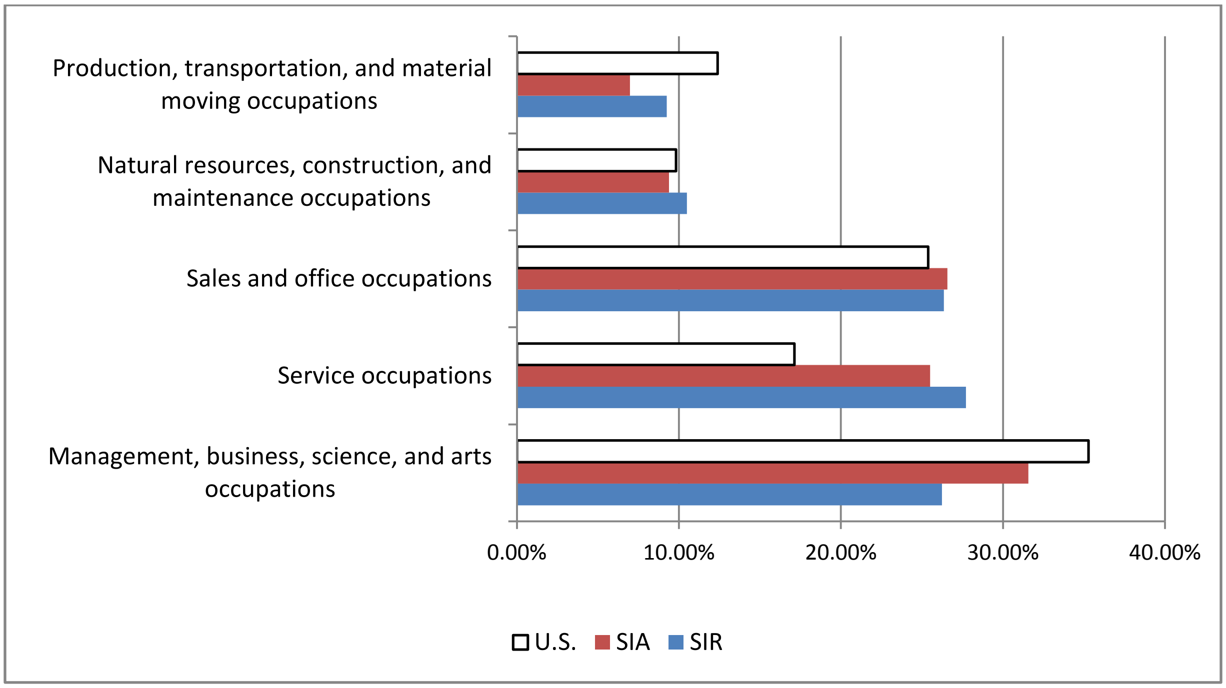


Figure 3.12-4. 2006-10 Estimated Employed Population Aged 16 and Over by Occupation (U.S. Census Bureau, American Community Survey, 2006-10)

Unemployment rates for the two-county region in 2011 were higher at 13.6% than the rate for Arizona and Nevada at 10.8% (Headwaters Economics 2012). Nevada has been affected especially severely during the Great Recession. In April 2012 according to BLS data, unemployment rates were 11.6% in Clark County, 8.8% in Mohave County, 11.7% in Nevada, 8.2% in Arizona, and 8.1% for the U.S.

3.12.4.3 Agriculture

In 2000, the employment share for agriculture and agricultural services was 1.2% for the two-county region. Table 3.12-6 contains data released by the 2007 Census of Agriculture, showing that while the region has nearly a million acres in farms, most of the land is dryland pasture used to support cattle. Judging by the low value of crops sold, most of the cropland in the region is devoted to growing hay, which is fed on-farm to cattle. Within the SIA, only the area south of Bullhead City appears to have significant irrigated cropland. Agriculture is not an important industry to the economy or culture of the SIA in terms of employment or personal income.

Table 3.12-6. Two-County Region Agriculture 2007

	Clark County Nevada	Mohave County Arizona	Searchlight Impact Region
Number of farms	193	334	527
Land in farms (acres)	88,381	858,392	946,773
Irrigated land (acres)	65,206[a]	159,053	224,259
Cattle and calves inventory	5,018	15,488[a]	20,506
Value of crops sold	$4,723,000	$12,157,000	$16,880,000
Value of livestock sold	$5,517,000	$6,475,000	$11,992,000
Net cash farm income	$1,619,000	$1,051,000	$2,670,000

Source: Census of Agriculture 2007.
[a] Non-disclosed for 2007. Figure is for 2002.

3.12.4.4 Commuting and Traffic

Commuting patterns in and out of Clark and Mohave County were examined to determine the level of movement between the counties and through the SIR (Census Bureau, Local Employment Division [LED] Origin-Destination Data Base 2010). Looking only at primary jobs in 2010, 1,174 Clark County residents commuted to Mohave County to work, primarily to the communities of Bullhead City and Mohave Valley. A much larger stream of 9,897 Mohave County residents commuted to work in Clark County, especially to Laughlin, Las Vegas, and Boulder City. Many of these commuters would drive within view of the Proposed Project area.

3.12.4.5 Public Revenues

Clark County funds numerous public services. These services include traditional governmental activities such as those of the County Recorder, Clerk, Assessor, Treasurer, airports, hospital, Family Services, Social Services, and criminal justice system, including courts, District Attorney, Public Defender, and Juvenile Justice Services. For the large portion of the County's population residing in its unincorporated areas, the County provides a full range of local services, such as fire and police protection, road maintenance and construction, animal control, parks and recreation, building inspection, and water and sewage systems. County revenues totaled $7.25 billion in 2009. Ad valorem (combined real and personal property tax revenues) totaled $870 million or 29 percent of total Clark County revenues (Comprehensive Annual Financial Report 2009).

3.13 Environmental Justice

This section presents descriptive information about communities within the Proposed Project area and their racial compositions. Data were obtained from the 2010 Decennial Census for the analysis of existing conditions relevant to environmental justices. Minority populations are considered to be anywhere not classified as "white alone" in the U.S. decennial census. At the national, state, county, and place geography levels and base count updates are based on estimates from the U.S. Census Bureau and, in some cases, state demographers. At the Census Tract and Block Group levels, base count information is established on sources such as local estimates, trends in U.S. Postal Service deliverable address counts, and counts from the Nielsen Claritas Master Address File. For the environmental justice study, the ROI is the same as that described in Section 3.12, Socioeconomics.

3.13.1 Region of Influence

The ROI for the environmental justice analysis is the communities near the Proposed Project area.

3.13.2 Existing Environment

3.13.2.1 Minority Populations

In 2010, the U.S. Census classified 35.8% of the population of Clark County, Nevada, and 10.7% of the population of Mohave County, Arizona, as belonging to racial minorities, compared to 30.6% for the State of Nevada and 24.4% for the State of Arizona. The SIA population was 13.9% nonwhite[3] in 2010, and generally less racially diverse than either southern Nevada or northwestern Arizona.

Table 3.12-3 in Section 3.12-Socioeconomics, provides 2010 Census populations by race and origin for the several units of geography defined for the Proposed Project. In the following paragraphs, changes that have occurred in the size and distribution of minority populations since 2000 are evaluated.

By 2010, nonwhite racial minorities had increased in Clark and Mohave counties, respectively, from 28.4 to 35.8%. For the SIA, racial minorities in 2010 comprised 13.9% of the total population, a modest increase over 11.9% in 2000.

Regardless of race, total populations grew faster than the cumulative 9.7% growth rate that typified the U.S. from 2000–2010. The SIA is estimated to have grown by 197.5%, outpacing their containing

[3] Minority populations include Hispanic, Black (or African American), American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, and other nonwhite races. Categories of race include White, Black, American Indian/Alaska Native, Asian, Hawaiian/Pacific Islander, and Other. Beginning with the 2000 Census, individuals were given the option to identify more than one race, resulting in 72 distinct race combinations. For purposes of this report, the concept "racial minority" is analogous to "nonwhite," and is defined by subtracting the number of White Alone (single race is White) persons from the sum total of all individuals reporting their race for the geographic area in question.

counties of Clark (41.8%) and Mohave (29.1%). Certain racial minority populations grew even faster. Within the SIA, Asians increased by 711% from 977 to 6,947 persons, and the African American population expanded by 312% in the SIA.

The Hispanic population of the two counties grew as a percentage of the total population from 22% to 30.7% in Clark County and from 11% to 15.2% in Mohave County. The comparatively greater growth in Clark County is attributed to the concentration of Hispanic service workers within the Las Vegas area.

Hispanics and American Indians have experienced a higher rate of population growth within the SIA than they have within the SIR, and each group appears to be growing at about the same pace. Blacks and Asians, while constituting very small portions of the population, have shown the highest statistical growth.

3.13.2.2 Low-Income Populations

A common measure of the absence of income at the household level is whether families meet the federal definitions for poverty. Within the SIA, an estimated 8.1% of families lived at poverty level in 2010 (Table 3.13-1). This rate was lower than the U.S. rate (10.1%) for 2010, slightly lower than the rates for Nevada (8.6%) and Clark County (8.7%), and sharply lower than the rates for Arizona (10.9%) and Mohave County (11.6%) for the same year.

Table 3.13-1. Estimated 2010 Families with Incomes Below National Poverty Level

	Clark County Nevada	Mohave County Arizona	Searchlight Impact Region	Searchlight Impact Area	State of Nevada	State of Arizona	United States
All families	8.7%	11.6%	9.0%	8.1%	8.6%	10.9%	10.1%
Married-couple families	4.7%	6.5%	4.9%	4.8%	4.6%	6.2%	4.9%
Male householder families	10.1%	10.5%	10.1%	10.0%	10.0%	15.6%	14.7%
Female householder families	22.4%	39.4%	23.8%	28.9%	23.5%	28.6%	28.9%
Families with children	13.1%	22.3%	14.3%	24.2%	13.3%	17.2%	15.7%
Families without children	1.7%	3.5%	1.9%	2.5%	1.7%	2.3%	2.2%

Source: U.S. 2010 Census

Senior citizens have comparatively lower poverty rates than do families with children. The preponderance of persons over the age of 60 in the SIA partially explains the lower overall poverty rates for this area as compared to the wider region and U.S. (see Table 3.12-2 in Section 3.12-Socioeconomics) For instance, within the Searchlight CDP the median age was 63.6 years in 2010, yet there were no people or households living below the poverty level in the Census year of 2010. Consistent with national patterns, the poverty rates of families with children (14.3%) in the SIA were considerably higher than those without children (1.9%). Family poverty rates were highest among female-headed families, where 23.8% of families in the SIA lived below the poverty line in 2010.

3.14 Human Health and Safety

This section defines existing conditions relative to human health and safety to establish a baseline against which potential impacts may be measured. The Proposed Project would be located on undeveloped lands administered by the BLM and would be potentially affected by existing hazards in the Proposed Project area, including earthquakes, flooding, wildfire, and existing soil or groundwater contamination. Hazards associated with seismic conditions are addressed in Section 3.1, Geology, Soils, and Minerals; Flood-related hazards are detailed in Section 3.3, Water Resources; and fire management risks are outlined in 3.8 Land Use. Other potential natural hazards, hazards related to existing infrastructure, and hazards associated with uses of the site and its vicinity are discussed below.

3.14.1 Region of Influence

The ROI for solid and hazardous wastes is within the boundaries of the Proposed Project area. In order to assess the potential for offsite conditions to affect the project footprint, federal and state environmental regulatory record searches were conducted within a 1-mile radius from the project boundary. According to the NDEP Bureau of Corrective Actions online site list, no hazardous waste facilities subject to corrective action are located on the proposed site (NDEP 2011). Additionally, results of an Environmental FirstSearch™ Report prepared on August 3, 2011, showed that the project site was not located in any of the referenced environmental databases and that no properties of environmental concern were located within 1 mile of the project site (FirstSearch 2011). A Phase 1 Environmental Site Assessment is currently under preparation and will be completed prior to project construction.

3.14.2 Existing Environment

3.14.2.1 Potential Hazardous Materials and/or Wastes

Hazardous material is defined as any material that, because of its quantity, concentration, or physical or chemical characteristics, might pose a real hazard to human health or the environment. Hazardous materials include flammable or combustible material, toxic material, poisonous and infectious materials, corrosive material, oxidizers, aerosols, biohazards, and compressed gasses.

Exposure to hazardous materials or wastes could occur due to existing conditions at the project site and due to project-related activities. There would be a potential for encountering hazards and hazardous material sites in the Proposed Project area during construction and O&M if existing and past land use activities possess indicators of hazardous material storage and use. Examples of past and current land uses that could have resulted in unknown contamination include the following:

- Storage or use of petroleum products (fuels and lubricants), solvents, paints, explosives, and cleaning chemicals;
- Rural residences and farms that commonly have old or inactive underground storage tanks (USTs);
- Pesticide and/or herbicide-polluted runoff from residential or agricultural properties;
- Illegal dumping;
- Land actions involving ROW leases and permits (e.g., gasoline and natural gas pipelines, telecommunication sites, military sites, and transportation facilities);
- Commercial and industrial sites (historic and current) that could have soil or groundwater contamination from unreported hazardous substance spills; and
- BLM-authorized minerals program.

The primary reason to define potentially hazardous sites is to protect worker health and safety and to minimize public exposure to hazardous materials associated with waste handling during construction, O&M, and decommissioning activities. If encountered, contaminated soil may qualify as hazardous waste, thus requiring handling and disposal according to local, state, and federal regulations.

Hazardous materials management involves the prevention, investigation, and remediation of illegal hazardous materials actions on public lands; the proper authorization, permitting, and regulation of the uses of hazardous materials; and timely, efficient, and safe responses to hazardous material incidents. Although the BLM issues authorizations that could result in the direct storage, and potential use, of hazardous materials on public lands, the unexpected release or disposal of these materials is proactively addressed through standard operating procedures, stipulations, and terms and conditions that are included in authorization documents.

The BLM Hazardous Materials Program has the responsibility for compliance with federal, state, and interstate, and local management requirements. All non-DOI groups whose activities are on BLM-managed lands and facilities (such as claimants, concessionaires, contractors, permitees, and lessees) are responsible for meeting the same requirements. The Hazardous Materials Program is also responsible for aggressively pursuing potentially responsible parties to correct their contamination of the BLM-administered lands and to facilitate or recover cleanup costs (BLM 1998).

A hazardous wastes and materials evaluation was conducted to attempt to identify potential environmental issues located in the project area and at locations identified within a 1-mile radius from the project boundary. The purpose of this task was to identify database listings present within the project area or on adjoining land that might have the potential to affect the environmental condition of the defined project area. As part of this evaluation, a regulatory database report conforming to the requirement set for by the American Society for Testing and Materials (ASTM), Standards on Environmental Site Assessments for Commercial Real Estate E1527-05 and the EPA rule for All Appropriate Inquiry standards as set forth in Title 40 of CFR Section 312.10, was performed. The objective of the database report was to identify recognized environmental conditions, which are defined by ASTM International as "the presence or likely presence of any hazardous substance or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property." The work was also conducted in general accordance with EPA's AAI standards, whose objective is to identify conditions indicative of releases and threatened releases of hazardous substances on, at, in, or to the site. In addition, a Phase I Environmental Site Assessment is currently being prepared for the project area.

A review of the environmental database report prepared by FirstSearch (2011), in addition to a review of NDEP Bureau of Corrective Actions (NDEP 2011) and EPA (2011) online databases, indicates that no active leaking UST sites, brownfields, active remediation sites, or waste management facilities have been identified within a 1-mile radius of the Proposed Project site. Two historical corrective action cases were listed in the FirstSearch report within a 1-mile radius of the Proposed Project site boundaries, as shown in Table 3.14-1. Both facilities reported release of petroleum to soil and were granted regulatory closure by NDEP in 2001 following cleanup. Given the regulatory status of these two facilities, and their location downgradient to the west of the project site boundary, these two facilities do not represent an environmental condition for the Proposed Project. In addition, review of NDEP Bureau of Corrective Actions active UST online databases indicated that four active registered USTs were located within 1-mile radius of, but greater than 0.44 mile from, the project boundary, as shown in Table 3.14-1. No facilities of environmental concern to the Proposed Project were found.

Table 3.14-1. Potentially Contaminated Sites in the Proposed Project Vicinity

Site Name	Site Address	Town	Site Type	Status	Distance from Proposed Project Site
Searchlight Nugget Shell	230 Highway 95 North	Searchlight	Leaking UST Facility	Granted Regulatory Closure	0.49 mile
Clark County Metro Station	210 North US-95	Searchlight	State Corrective Action (Soil)	Granted Regulatory Closure	0.52 mile
Searchlight Boat & RV	250 East Cottonwood Cove Road	Searchlight	Regulated UST Facility	Active Permit	0.45 mile
Terrible Herbst #243	670 South US-95	Searchlight	Regulated UST Facility	Active Permit	0.83 mile
Rebel Oil #47	650 South US-95	Searchlight	Regulated UST Facility	Active Permit	0.89 mile
Colton's General Store	675 South US-95	Searchlight	Regulated UST Facility	Active Permit	0.94 mile

Note: US-95 = U.S. Interstate 95; UST = underground storage tank

The BLM LVFO reported no knowledge of any existing problematic dumping or spills in the project area. No improvements have been implemented to address illegal dumping. However, the amount of solid waste illegally dumped in the project area is projected to become more common due to increases in population, especially as urban areas expand closer to public land boundaries (BLM personal communication 2009).

3.14.2.2 Fire Hazards

The Clark County Community Wildfire Risk/Hazard Assessment Project, commissioned by the Nevada Fire Safe Council, was published in 2005. The purpose of the assessment was to evaluate the risk of communities located in Clark County and adjacent to federal lands most vulnerable to wildfire risks. The assessment considered five primary indicators of risk and/or hazards as follows: (1) community design; (2) construction material; (3) defensible space; (4) availability of fire suppression resources; and (5) physical conditions such as vegetation, fuel loads, and topography (RCI Concepts [RCI] 2005).

The Clark County Community Wildfire Risk/Hazard Assessment Project identified the town of Searchlight as a 'Moderate Hazard' community. This rating was based on the steep topography in the project area and the limited availability of adequate wildfire suppression resources. Searchlight is classified as an intermix wildland-urban interface based on the scattering of structures in the wildland interface and the lack of a clear demarcation between buildings, open and undeveloped spaces, and potential wildland fuels. Fuel hazards in the community are considered low, with widely spaced vegetation consisting primarily of annual grasses and shrubs (bursage, creosote bush, and Joshua trees), in addition to rocky terrain. However, steep mountain slopes surrounding and within the community, with southwest facing slopes of 10 to 40 percent, can intensify fire behavior in the Propose Project area. The worst-case scenario for wildfire in the Searchlight area, according to the assessment, is described as occurring on a summer afternoon during standard working hours when local volunteer firefighting resources might be unavailable for quick fire suppression response. This worst-case scenario would be intensified on windy days and in a year with above normal annual grass growth (RCI 2005).

Clark County Fire Department Rural Station 75, a volunteer station located in Searchlight, provides fire response resources for the Searchlight area. Additional fire response resources can be requested from the BLM, NPS, and U.S. Forest Service through the Las Vegas Interagency Communications Center, in addition to the Nevada Division of Forestry, the Boulder City Fire Department, and the Cal-Nev-Ari volunteer fire station. Water for fire suppression resources in Searchlight consists of 500 gallons per minute (gpm) hydrants located within 500 feet of structures, community water supply wells, and two 1-million-gallon storage tanks (RCI 2005).

3.14.2.3 Searchlight Airport

The Searchlight Airport is located approximately two miles south of Searchlight, with a portion of the airport runway located on the western extent of the Proposed Project area. The airport is located on public lands owned by the BLM and offers no services. The runway is composed of asphalt, is approximately 5,040 feet long, and is unlighted. Aircraft operations at the airport consist of approximately 25 flight operations per month, with 100% general aviation usage (AirNav 2011). Due to the proximity of Proposed Project WTG locations to the Searchlight Airport, coordination with the FAA would be necessary to ensure the safety of general aviation users, construction workers, and the public.

3.14.2.4 Transmission Lines and Pipelines

Four existing electrical transmission lines currently cross portions of the Proposed Project area. The Western Davis-Mead 230-kilovolt transmission line crosses the extreme eastern portion of the project area at the location of the proposed Western switching station, approximately 7.5 miles east of Searchlight. Two additional Western-owned transmission lines and a Nevada Energy transmission line cross the southwestern portion of the project area.

3.14.2.5 Mining

Nevada's mineral deposits have attracted the attention of miners and prospectors for more than 150 years, leaving behind a legacy of shafts, adits, glory holes, stopes (excavation in the form of steps), mill sites, and other features. In particular, the Searchlight Mining District was founded in 1898 after the discovery of gold ore in the area. The exploration and mining for gold, silver, and other precious metals and minerals has continued in the vicinity to the present day. According to a review of readily available mining claim information from the BLM (2011), currently there are approximately 561 active mining claims located within the Proposed Project site boundaries, in addition to 1,827 closed mining claims. Numerous active and closed mining claims are additionally located within the immediate project vicinity. The actual locations would be verified by on-the-ground surveys prior to WTG tower construction to ensure there is no overlap with an existing mining claim.

The BLM LVFO reported no knowledge of existing environmental concerns related to past or active mine sites identified within the project area (BLM 2009). The BLM has been addressing abandoned mine lands closures through bat gating/cupolas and backfill/foam closures. Some of the described closures have occurred in the Searchlight area. Historical mining concerns include water quality impacts, biological impacts, and the presence of explosives and/or hazardous gases that are typically associated with underground workings.

4.0 Environmental Consequences

The Proposed Action, alternatives, and Western's proposed switching station outlined in Chapter 2, may cause, directly or indirectly, changes in the human and physical/natural environment. This DEIS assesses and analyzes these potential changes and discloses the impacts to decision makers and the public. This process of disclosure is one of the fundamental aims of NEPA.

The following sections define and clarify the concepts and terms used in this EIS when discussing the impacts assessment.

Impacts

Impacts may refer to ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the Proposed Action or alternatives. Impacts may be direct, indirect, or cumulative.

Direct Impacts

A direct effect occurs at the same time and place as the action. Direct and indirect impacts are discussed in combination under each affected resource.

Indirect Impacts

Indirect impacts are reasonably foreseeable impacts that occur later in time or are separated by some distance from the action. Direct and indirect impacts are discussed in combination under each affected resource.

Cumulative Impacts

Impacts on a resource are cumulative when added to the impacts (or anticipated impacts) from other past, present, or future projects in the cumulative impacts area for the Proposed Project. The cumulative impacts area may be larger than the direct impacts area.

Residual Impacts

Impacts are considered residual when the effect from the Proposed Project cannot be completely avoided or minimized and remains after or despite mitigation.

Significance

"Significant" has a very particular meaning when used in a NEPA document. Significance is defined by the CEQ (40 CFR 1508.27) as a measure of the *intensity* and *context* of the impacts of a major federal action on, or the importance of that action to, the human environment. Significance is a function of the beneficial and adverse impacts of an action on the environment.

Intensity refers to the severity or level of magnitude of impact. Public health and safety, proximity to sensitive areas, level of controversy, unique risks, or potentially precedent-setting effects are all factors to be considered in determining the intensity of the effect.

Context means that the effect(s) of an action must be analyzed within a framework or within physical or conceptual limits. Resource disciplines, location, type, or size of area affected (e.g., local, regional, national), and affected interests are all elements of context that ultimately determine significance. Both long- and short-term impacts are relevant.

Impact Indicators

Use of the term "significant" when referring to impacts indicates that some threshold was exceeded for a particular impact indicator. Impact indicators are the consistent currency used to determine quality, intensity, and duration of change in a resource. Working from an established existing condition (i.e., the baseline conditions described in Chapter 3), this indicator would be used to predict or detect change in a resource related to causal impacts of proposed actions.

Mitigation

Where applicable, mitigation measures are proposed in this document. Mitigation measures are solutions to environmental impacts that are applied in the impact analysis to reduce intensity or eliminate the impacts. To be adequate and effective, CEQ regulations (40 CFR 1508.20) require that mitigation measures fit into one of five categories:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or
5. Compensating for the impact by replacing or providing substitute resources or environments.

4.1 Geology, Soils, and Mineral Impacts

This section discusses impacts on existing geology, soils, and minerals that might occur with the implementation of the Proposed Action or alternatives.

4.1.1 Indicators

The Proposed Action would affect geologic, soils, and mineral resources or be affected by geologic-, soils- or mineral-related hazards if it:

- Is located on a geologic unit that is unstable or would become unstable as a result of the Proposed Action and result in on- or offsite landslides, lateral spreading, subsidence, liquefaction, or collapse;
- Results in physical alteration of or damage to geologic features;
- Presents a significant threat to public safety due to damage to project components by geologic hazards;
- Is located on existing unpatented mining claims and on Notices or Plans of Operations that have been approved by the BLM for the unpatented claims;
- Permanently removes locatable mineral exploration and appropriation acreage underneath some of the proposed WTG foundations;
- Permanently removes locatable mineral exploration and appropriation acreage adjacent to the proposed WTG foundations necessary for their structural stability (structural set-back); or
- Permanently removes locatable mineral exploration and appropriation acreage adjacent to the proposed WTG foundations necessary for a safety set-back area to protect mining claim holders working on their claims from potentially being injured from a WTG blade throw hazard (safety set-back).

In order to compare effects associated with the Proposed Action and alternatives project elements, the indicators were considered both independently and in conjunction with one another using the following assumptions.

The area of the WTG footprint and the necessary structural set-back was conservatively estimated as follows: Each WTG foundation would consist of a footprint of about 2,500 square feet of rebar-reinforced concrete, if the foundation is in unconsolidated rock. Each WTG foundation footprint located in competent rock would be much less because the foundation would consist of an excavation into the rock; the depth and circumference of each rock foundation excavation would depend on site-specific geotechnical conditions. A 2,500-square-foot WTG footprint would be about 56 feet in diameter. The structural set-back was estimated by adding 104 feet to the footprint diameter. This 160-foot diameter (footprint plus set-back) would equal 0.46 acre. For simplicity, the area of each WTG footprint plus its set-back was rounded up to 0.5 acre.

A blade throw safety set-back for each WTG was estimated by using a circle around each WTG with a radius of 886 feet. This is a conservative safety set-back using an estimated maximum blade height of 295 feet multiplied by a factor of 3 (based on blade throw studies summarized in Larwood [2006]). The safety set-back area based on an 886-foot radius would be approximately 57 acres for each WTG. This safety set-back was used to evaluate potential impacts on unpatented mining claims touching or within the safety set-back for each alternative.

4.1.2 Geology Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for geology, soils, and mineral resources.

4.1.2.1 No Action Alternative

Under the No Action Alternative, the ROW applications would be denied and the Proposed Project would not be built; therefore, no project related effects on geology, soils, and mineral resources would occur.

4.1.2.2 Proposed Action – 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Action and Western's proposed switching station would be carried forward. Effects that could result from the implementation of Proposed Action and Western's proposed switching station during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the following APMs (including BLM BMPs are included) to avoid and minimize impacts on the geology, soils, and mineral resources of the Proposed Project area:

- APM-1 Erosion Control
- APM-2 Excavation/Grading
- APM-3 Air/Dust Control
- APM-4 Stormwater Pollution Prevention (SWPP) Plan
- APM-5 Spill Prevention and Countermeasures Control (SPCC) Plan
- APM-6 Health and Safety Program
- APM-7 Emergency Response Plan
- APM-8 Waste Management Plan
- APM-9 Weed Control Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan

For construction of Western's proposed switching station, Western will require the construction contractor to incorporate specific provisions to mitigate impacts related to geology and soils resources in Western's Environmental Construction Standard 13, specifically the following sections:

- 13.3 Landscape Preservation
- 13.4 Noxious Weed Control

Landslides, Lateral Spreading, Subsidence, Liquefaction, or Collapse

Construction. The Proposed Project site is located primarily on hills underlain by volcanic, igneous, and metamorphic rock. The southern portion of the project site is located on gently sloping alluvial deposits that are composed of sediments derived from adjacent upland areas. The areas of the development that are underlain by volcanic, igneous, and metamorphic rock have a low potential for erosion and landslides, and because of the strength and characteristics of bedrock materials, are not subject to liquefaction, lateral spreading, subsidence, or collapse. The potential for liquefaction and lateral spreading in the area underlain by alluvial deposits is low. There might be a moderate potential for subsidence or collapse of alluvial deposits during seismic shaking.

Grading for access roads and WTG construction pads would create cut-and-fill slopes in areas underlain by bedrock materials. There is a potential for a short- and long-term increase in landslides in cut-and-fill slopes.

Geologic Features and Hazards

Construction. Under this alternative, 249 acres would be temporarily disturbed and 160 acres would be permanently disturbed. In total, earth grading and excavation for 96 WTG sites, laydown areas, substations, and O&M facilities would encompass 409 acres of disturbance. This total includes the construction of 29 miles of new road and the widening of 9 miles of exiting road (to either 16 or 36 feet).

The Proposed Action would result in alteration of the existing topography to create access roads, WTG foundations, and building pads. The altered topography would remain throughout the lifetime of the Proposed Project, but would be restored during decommissioning of the facility. The geology of the proposed grading area does not contain unique geologic features; therefore, impacts to geological or topographical features would be short-term and restored with the implementation of appropriate APMs. No permanent impacts are anticipated.

Similar to the effects described above, construction of Western's proposed switching station would result in the alternation of existing topography (7 acres). The geology of the proposed grading area does not contain unique geologic features; therefore, impacts to geological or topographical features would be short-term. Western requiring the construction contractor to comply with Western's Environmental Construction Standard 13 will mitigate potential impacts to soils and geologic features at the Western switching station site, which is located on alluvial deposits. Western proposes to reclaim approximately one half of the area of soil disturbed (2.5 acres) after construction.

O&M and Decommissioning. Project components, including WTGs, substations, interconnect facilities and the Western switching station could be damaged by potential geologic hazards, including seismic ground shaking, seismic ground failure, settlement, and landslides. A safety zone would be established around each WTG location for protection of the public from failure of the WTGs as a result of mechanical failure or geologic hazard, such as seismic shaking and ground failure. Substations and Western's proposed switching station facilities would be fenced and secured to prevent public access and limit potential hazards to the public. Implementation of appropriate APMs and Western's Construction Standard 13 would reduce potential short- or long-term adverse effects related to damage by geologic hazards, and ensure that any damage that does occur would be short term and localized. Western proposes to limit access by construction of a fence to secure the switching station from public access.

Soils

Construction. Under the Proposed Action, approximately 409 acres of soil would be disturbed, mixed structurally, compacted, and exposed to erosion during construction. This represents approximately 2% of the total ROW boundary area. Approximately 160 acres would remain permanently impacted by project components (access roads, WTGs, crane pads, and overhead poles). This represents approximately 0.8% of the total ROW boundary area. The construction of roads and WTGs would affect soils by mechanically breaking down the soil structure, which would increase the erosion potential. This might result in a temporary increase in erosion and windblown dust on up to 409 acres until construction is completed. Following construction, 249 acres would be reclaimed. This represents approximately 1.2% of the total ROW boundary area. Impacts on soils would indirectly affect vegetation and the ability to revegetate after construction (see Biological Resources Section 4.4 for additional impact related to vegetation).

The primary impacts on soils associated with the Proposed Project are tied to the area of surface disturbance identified for each alternative. Although the type of surface disturbance would be similar for each WTG location and roadway, the impacts would be dependent on the number of acres of associated soil disturbance, as well as the number and distribution of WTGs and roadways proposed. These impacts would be mitigated through the implementation of APMs 1-5 and APM-9. Following construction, areas not maintained as permanent facilities would be reclaimed to their prior land use. The increased potential for soil erosion would remain throughout the lifetime of the Proposed Project but would be minimized by removal of WTGs, by regrading of roads and WTG sites, and through revegetation of the impacted areas during decommissioning of the facility (APM-10)

The proposed action could increase the potential of exposure to contaminated soils. According to the NDEP Bureau of Corrective Actions online site list, no hazardous waste facilities subject to corrective action are located on the project site (NDEP 2011). Additionally, results of an Environmental FirstSearch™ Report prepared on August 3, 2011, showed that the project site was not located in any of the referenced environmental databases and that no properties of environmental concern were located within 1 mile of the site (FirstSearch 2011). A Phase 1 Environmental Site Assessment is currently being prepared and will be completed for the Proposed Project. Because the project site includes areas that have been historically mined, there remains a potential for the presence of contaminated soils. The Applicant and Western would incorporate procedures into the site grading plan to include notification of a BLM-approved environmental professional (such as a Nevada-Certified Environmental Manager or Environmental Engineer) if suspect contaminated soil is encountered (soil with observable stains or odors). The potential for contaminated soils exposure will be mitigated by immediately terminating grading operations where suspect contaminated soils are encountered, notifying the BLM, and proposing to implement remedial actions proposed by the environmental professional (APMs 1 and 2, and APMs 7–9).

Impacts on soils from construction of Western's proposed switching station would be similar as those described for the Proposed Action, although 7 acres would be disturbed. Western proposes to minimize short and long term erosion by graveling the fenced area and the access road for Western's proposed switching station and reclaiming approximately half of the disturbed soil area by revegetation.

Minerals

Potentially, the proposed project could affect existing unpatented mining claims. Under the Proposed Action, the following 18 WTGs might be located on unpatented mining claims (Figure 4.1-1).

- WTGs 22, 23, 24. 26 and 27, proposed to be located east of Searchlight, and
- WTGs 69, 70, 71, 72, 73, 74, 75, 76, 83, 84, 85, 86, and 87, proposed to be located south of Searchlight.

These 18 WTGs represent approximately 16% of the proposed total 96 WTG layout. To reduce the effects on unpatented mining claims, the Applicant would implement APMs 1 and 2, APMs 4–7, and APM-10.

The Proposed Action would have a potential long-term impact on an unknown number of existing unpatented mining claims by permanently removing locatable mineral exploration and appropriation acreage underneath some of the proposed WTG foundations and any set-backs to the foundations necessary for their structural stability (structural set-back). The 96 WTG Layout Alternative would exclude about 8 acres from mineral prospecting and development from underneath the WTGs and the estimated structural set-back.

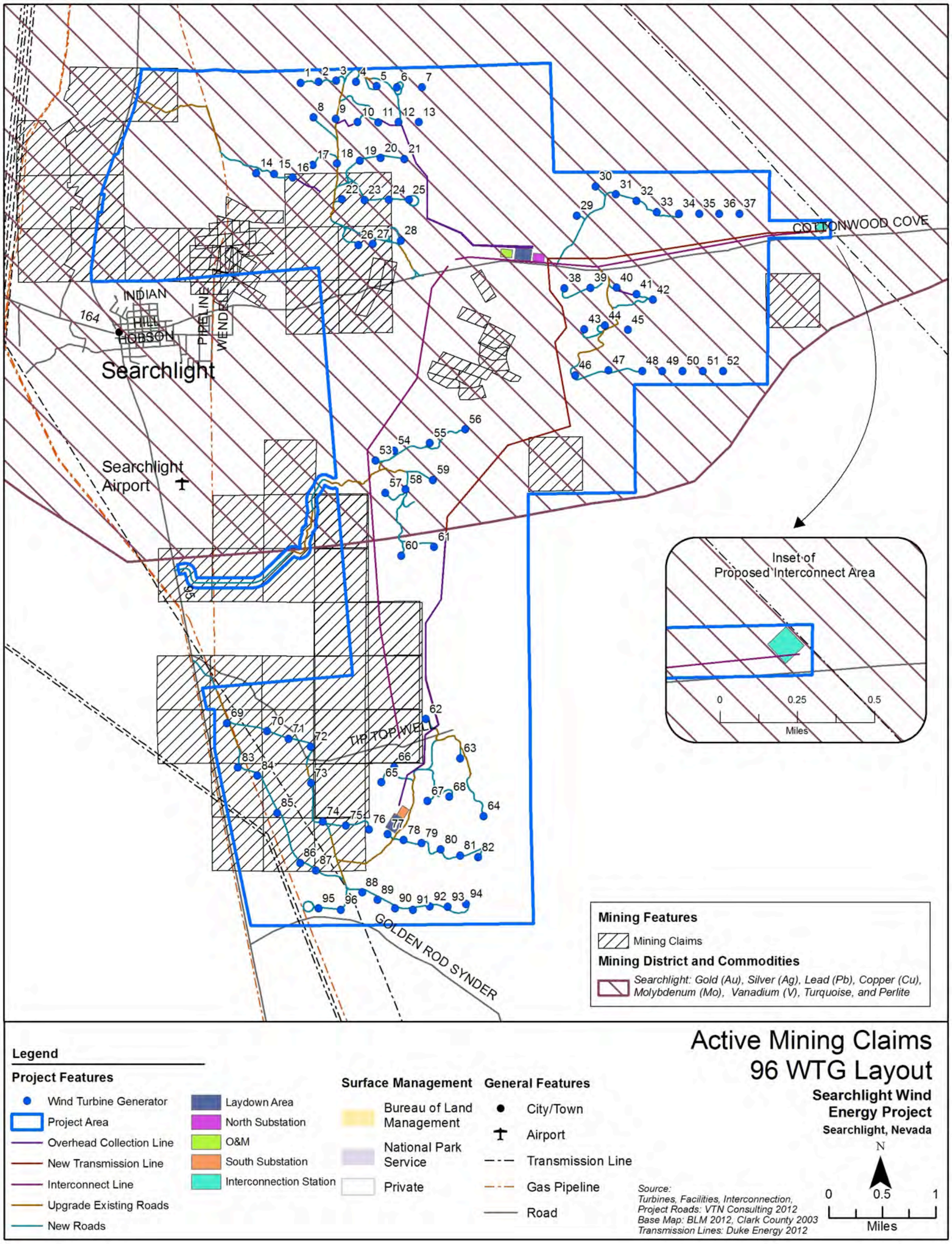


Figure 4.1-1. Mining Claims Potentially Affected by 96 WTG Layout Alternative

In addition, under the 96 WTG Layout Alternative, there might be a potential long-term impact on an unknown number of existing unpatented mining claims by removing locatable mineral exploration and appropriation of acreage underneath a safety set-back area (which may be deemed necessary to protect mining claim holders working on their claims from potential injury from a WTG blade throw hazard). The Proposed Project might require a blade throw safety set-back onto about 849 acres covered by unpatented mining claims.

There might be a potential for long-term impacts on an unknown number of existing unpatented mining claims by removing locatable mineral exploration and appropriation of acreage beneath Western's proposed switching station during the lifetime of the proposed action. Following decommissioning and removal of the Switching Station, access for potential mining would be restored.

Additionally, the Proposed Project may restrict access to locatable mineral exploration and appropriation acreage or, alternatively, locatable mineral resources may permanently be removed within the proposed project area. Locatable resources available near the Proposed Project site were identified by compiling data from the *BLM's Land & Mineral Legacy Rehost 2000 System-LR2000*. There are 561 active and 1,827 closed mining claims within the Proposed Project area (see Figure 3.1-3). The project area includes part of the historic Searchlight mining district, which has produced millions of dollars in gold, silver, copper, and lead since 1897 (Ludington et al. 2006). There is potential for undiscovered gold deposits within the Searchlight mining district (Ludington et al. 2006).

Locatable lode and placer mineral deposits in the Proposed Project area are under claim as valuable deposits subject to exploration and development, as determined by the General Mining Law of 1872 and its amendments. Mineral deposits are located either by lode or placer claims (43 CFR 3832). The 1872 Mining Law requires a lode claim for "veins or lodes of quartz or other rock in place" (30 USC 26) and a placer claim for all "forms of deposit, excepting veins of quartz or other rock in place" (30 USC 35). The project area also has mill site claims that are located to occupy non-mineral land for use in milling or processing of mined materials (43 CFR 3832). The project area also has patented lode and millsite mining claims. A patented mining claimholder receives clear title to the claim area, making the claim area private land (30 USC 29-38, 42, 43 USC 661).

According to federal law (30 USC 612), the purpose of an unpatented mining claim is for mineral prospecting, mining or processing operations, and other reasonable mining-related uses. Unpatented mining claims remain public land under multiple-use management, as defined by the BLM. Specifically, permanent project components and their required safety set-back may limit future access to and use of portions of existing unpatented mining claims. Lode mining claims also provide for extralateral rights to any lodes, veins, or other minerals whose apex or top lies within the area of the claim (30 USC 26). These extralateral rights allow the locator to follow any vein or lode that has its top within the claim area downward and beyond the side boundary line of the claim for an unspecified distance. There are many legal complications to lode claim extralateral rights. A mining claim holder has the right to prevent others from prospecting and mining on his or her claim but cannot prevent others from crossing his or her claim for uses recognized under the Multiple Surface Use Act of 1955 (30 USC 611-615).

The BLM's Land & Mineral Legacy Rehost 2000 System-LR2000 BLM Geographic Index to Mining Claims was searched to assess the proximity of unpatented lode, placer, and mill site claims to the proposed WTG locations, access roads, and electrical interconnect lines. The mining claims shown on Figure 3.1-3 are the approximate areas covered by claims. The precise location of the unpatented mining claims listed in the Geographic Index cannot be determined by a review of that index alone. The Geographic Index only shows that a recorded mining claim lies within a given quarter section (160 acres). To evaluate the location of the unpatented claim within the quarter section, the map that accompanied the Notice of Location must be reviewed. These maps are available for review in the Nevada State Office.

Generally, the long axis of a lode claim should be along and parallel to the mineral vein or lode, and the claim should extend 300 feet on both sides of the centerline of the vein or lode. The location monument can be placed anywhere along the centerline of the claim, but for convenience it is often placed near one end of the claim (30 USC 23).

An individual can locate 20 acres per placer claim, and groups (e.g., associations, companies, etc.) can locate placer claims up to 160 acres in size (30 USC 35; 43 CFR 3832.22). For a placer claim, Nevada State law requires that a monument similar to those used for a lode claim be established at any point along the north boundary of the placer claim (NRS 517.030). There are no unpatented mining claims in the project area that predate the Multiple Surface Use Act.

There is a potential for long-term impacts to mining by removing potential locatable mineral exploration and appropriation of acreage beneath Western's proposed switching station during the lifetime of the proposed action. Following decommissioning and removal of the Switching Station access for potential mining would be restored. Currently, no mining claims are located near the switching station; therefore, no impacts to existing mining claims are anticipated.

Also the Proposed Project may restrict access to availability of saleable mineral resources within the project area. Data compiled by USGS (2005a) was used to identify saleable resources available near the Proposed Project site and Western's proposed switching station. Sand, gravel, and stone have been extracted or processed at locations in the vicinity of the Proposed Project site. However, because none of these locations fall within the Proposed Project site, the Proposed Action, and Western's proposed Federal Action, would have no effect on saleable mineral resources.

The Proposed Project may restrict access or the availability of fluid leasable mineral resources within the project area. Oil and gas resources in the region were identified using data produced by the Nevada Bureau of Mines and Geology. There are no oil or gas producers or seeps in the vicinity of the Proposed Project site. The Proposed Project area is considered to have a low potential for the occurrence of fluid minerals and non-energy leasable minerals, as defined by the BLM (1998). Impacts on these resources from the Proposed Action are not anticipated. Exploration for fluid minerals would not be precluded by project components, even though fluid minerals are unknown within the area around the project site (Garside and Hess 2007). The Proposed Project site is in a geothermal resource area with maximum geothermometer temperatures of less than 100 degrees (°) Centigrade; therefore, the Proposed Project site is in an area of lower regional geothermal potential and is considered less favorable than other areas in Nevada for hosting high-temperature geothermal systems (Zehner et al. 2009). Proposed Project components would not limit exploration technologies used to assess fluid mineral and geothermal resources.

4.1.2.3 87 WTG Layout Alternative

Effects to geology and soils under the 87 WTG Layout Alternative would be similar to those identified under the Proposed Action. Approximately 230 acres of would be disturbed during construction. This represents approximately 1.8% of the total ROW boundary area. Approximately 152 acres would remain permanently affected by project components (access roads, WTG foundations, crane pads, and overhead poles). This represents approximately 0.8% of the total ROW boundary area. Effects for construction would be less under this alternative compared to the Proposed Action, but the type, intensity, and duration of the effects would be similar.

Regarding existing unpatented mining claims, the effects of the 87 WTG Layout is similar however the WTG's that could potentially affect mining claims differ. The 87 WTG Alternative would also have 18 wind WTGs with safety set-backs including areas covered by mining claims (Figure 3.1-3). This would exclude about 8 acres from mineral prospecting and development from underneath the WTG foundation and the estimated structural set-back, and might require a blade throw safety set-back onto about 849 acres covered by unpatented mining claims.

Under this alternative, the following 18 WTGs might be located on unpatented mining claims (Figure 4.1-2).

- WTGs 14, 20, 21, 22, 24 and 25, proposed to be located east of Searchlight, and
- WTGs 60, 61, 62, 63, 64, 65, 66, 74, 75, 76, 77, and 78, proposed to be located south of Searchlight.

These 18 WTGs represent approximately 18% of the proposed total 87 WTG layout alterantive area.

4.1.3 Mitigation Measures

To further reduce effects to geology, soils, and minerals, the Applicant will adhere to the following mitigation measures:

MM GEO-1: ENGINEERING DESIGN AND IMPLEMENTATION.

To minimize or avoid the hazard of landslides in cut-and-fill slopes, or settlement of fill materials, the Applicant will conduct BLM-approved geotechnical engineering and geologic design studies to assess the stability of planned cut-and-fill slopes. This will include geotechnical observations and materials testing of the compaction and placement of fill materials for roads and WTG pads. The Applicant would document that the grading and earthwork were in accordance with the engineering design specifications.

MM GEO-2: INSPECTIONS AFTER GEOLOGIC EVENTS

To minimize or avoid potential hazards from earthquakes and other geologic events, the Applicant will have inspections performed by a BLM-approved appropriate professional (e.g., geologist, geologic engineer, geotechnical engineer, or structural engineer) following geologic events in the vicinity of the Proposed Project site. The appropriate professional will perform the appropriate inspection and make recommendations to see that hazards are minimized for the next comparable or larger event. The Applicant will implement the recommended corrective actions.

MM GEO-3: APPLICANT'S INSURANCE COVERAGE

The Applicant shall acquire the appropriate insurance coverage to address potential offsite damage to structures or injury to people by facility structures that are moved offsite by a geologic event such as an earthquake, windstorm, or flash flood event.

MM-GEO-4: VERIFY MINING CLAIMS

The Applicant shall ground-truth existing mining operations before construction and coordinate with mine operators to reduce impacts to these existing mining claims.

4.1.4 Residual Effects

The short-term, localized impacts on geology, soils, or minerals during the lifetime of the Proposed Project and Western's proposed switching station would be minimized during decommissioning of the facility, so there would be no residual impacts from the Proposed Project.

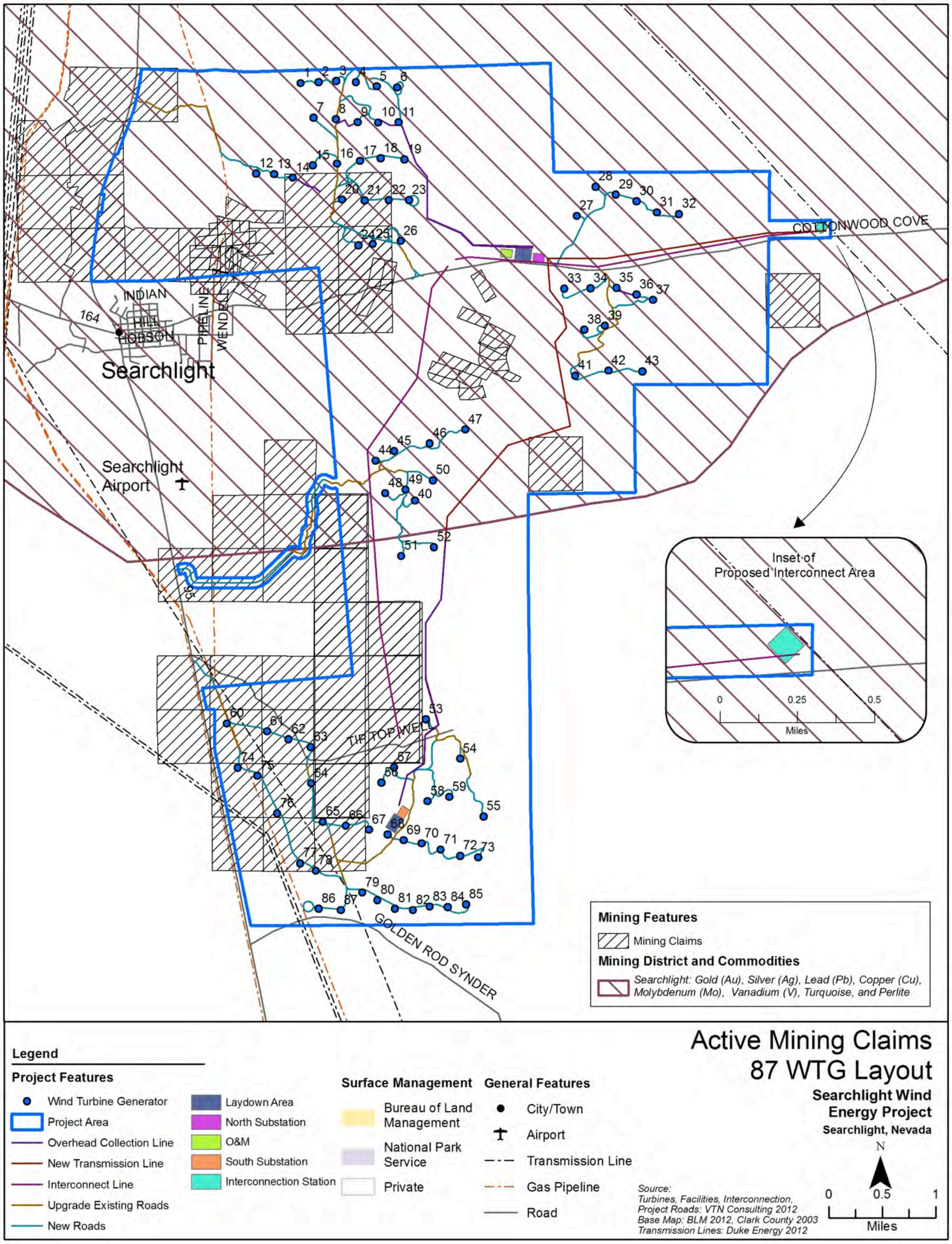


Figure 4.1-2. Mining Claims Potentially Affected by 87 WTG Layout Alternative

4.2 Paleontological Resources Impacts

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

4.2.1 Indicators

NEPA requires that important natural attributes of our national heritage are considered when assessing the environmental consequences of any Proposed Action and alternatives. NEPA does not refer to paleontological resources specifically; however, NEPA Section 101(b)(4) states that it is the responsibility of the federal government to "preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice." NEPA does not provide impact indicators specifically for paleontological resources. However, it is the policy of the BLM that potential effects on scientifically significant paleontological resources be identified and proper mitigation is implemented (BLM 2007b). Pursuant to BLM policy, the Proposed Project would adversely affect paleontological resources if it:

- Damages or destroys known paleontological resources; or
- Causes the loss of valuable scientific information by disturbing the geology in which fossils are found.

4.2.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA.

4.2.2.1 No Action

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on paleontological resources would occur.

4.2.2.2 Proposed Action - 96 WTG Layout Alternative

Under the Proposed Action, the BLM would authorize the Applicant to construct, operate and maintain, and decommission a 200-megawatt wind energy facility on BLM-administered lands. For the purposes of analyzing impacts on paleontological resources, the Area of Potential Effect for the Proposed Action encompasses approximately 249 acres of temporarily disturbed lands and approximately160 acres of permanently disturbed lands. In addition, a total of 37.6 miles of road construction and road improvements, two substations, one O&M building, and 8.7 miles of overhead transmission lines would be built.

The Proposed Action could result in destruction of or disturbance to buried or unknown paleontological resources. As discussed in Section 3.2.1, Paleontological Resources, the results of the paleontology literature and records review for the Proposed Action indicate that the majority of the project area has a low potential to affect significant nonrenewable fossil resources because the Quaternary alluvium and Tertiary volcanic rock formations in the project area fall into BLM Classes 1 and 2 (BLM 2007b: Attachment 1-1). Results of the data inventory and impact assessment confirm that no paleontological resources have been previously recorded in the project area, and that the sediments present within the boundaries of the project area have a very low to low potential to contain significant paleontological resources. The BLM has determined that in such geologic units, no additional paleontology assessment is necessary (BLM 2008c).

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. Effects of the switching station would be similar to those described above. Western would minimize effects to paleontological resources by implementing

Construction Standard 13, specifically section 13.4 Preservation of Cultural and Paleontological Resources.

4.2.2.3 87 WTG Layout Alternative

The 87 WTG Layout Alternative would be constructed, operated and maintained, and decommissioned similarly to the 87 WTG Layout Alternative except that 87 WTG Layout Alternative would consist of 9 less WTGs within the project site. Facilities associated with the 87 WTG Layout Alternative would be located over a total of approximately 230 acres of temporarily disturbed lands. Following the reclamation of temporary laydown areas, construction roadway widths, and WTG assembly areas, approximately 152 acres would be permanently disturbed. In addition, 35.9 miles of road construction and road improvements, two substations, one O&M building, and 8.7 miles of transmission lines would be built.

The type, intensity, and duration of effects on paleontological resources would be similar to that of the 96 WTG Layout Alternative, and the project design features and mitigation would be the same for both the Action Alternatives.

4.2.3 Mitigation

While results of the data inventory and impact assessment confirm that the sediments present within the boundaries of the Proposed Project area have a low potential to contain significant paleontological resources, if significant subsurface paleontological resources are identified during construction, the BLM requires the following mitigation:

MM PALEO-1: PALEONTOLOGICAL MITIGATION

The Applicant will immediately notify the BLM authorized officer of any paleontological resources discovered as a result of operations under this authorization. The Applicant will suspend all activities in the vicinity of such discovery until notified to proceed by the authorized officer, and will protect the locality from damage or looting. The authorized officer will evaluate, or will have evaluated, such discoveries as soon as possible, but not later than five working days after being notified. Appropriate measures to mitigate adverse effects on significant paleontological resources will be determined by the authorized officer after consulting with the Applicant. The Applicant is responsible for the cost of any investigation necessary for the evaluation and for any mitigation measures, including museum curation. The Applicant may not be required to suspend operations if activities can avoid further impacts on a discovered locality or be continued elsewhere (BLM 2008c: Attachment 1-4).

4.2.4 Residual Effects

No residual effects on paleontological resources would result from implementation of the No Action or action alternatives.

4.3 Water Resources Impacts

This section discusses impacts on water resources that may occur with implementation of the Proposed Action or alternatives. Information on existing water resource conditions from Section 3.3 of this DEIS was used as the baseline by which to measure and identify potential impacts by alternative.

4.3.1 Indicators

The Proposed Action would affect water resources if it:

- Decreases groundwater supply, interfere with groundwater recharge, or degrade the quality of groundwater such that it is no longer suitable for its intended use;
- Degrades water quality in down gradient washes and other surface waters beyond applicable surface water quality standards, such as through increased erosion and/or sedimentation;
- Alters projected frequency, extent, and duration of flooding from surface water runoff beyond applicable surface water quality standards;
- Degrades an existing surface water feature that meets the definition of a Water of the United States and not in compliance with a Section 404 permit issued by the USACE under the Clean Water Act;
- Increases the potential for flood hazards; or
- Changes existing water rights.

4.3.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.3.2.1 No Action Alternative

Under the No Action Alternative, the ROW applications would be denied and the Proposed Project and Western's proposed switching station would not be built; therefore, no project related effects on water resources would occur.

4.3.2.2 Proposed Action – 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Action and Western's proposed switching station would be carried forward. Effects that could result from the implementation of Proposed Action and Western's switching station during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the following measures (see Table 2.6-1) to avoid and minimize impacts on the water resources of the Proposed Project area:

- APM-1 Erosion Control
- APM-2 Excavation/Grading
- APM-3 Air/Dust Control
- APM-4 Stormwater Pollution Prevention Plant (SWPPP)
- APM-5 SPCCP
- APM-6 Health and Safety Program
- APM-7 Emergency Response Plan
- APM-8 Waste Management Plan

- APM-9 Weed Control Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-15 General Design and Construction Standards

For construction of the Westerns proposed switching station, Western will require the construction contractor to incorporate specific provisions of Western's Environmental Construction Standard 13 for mitigating impacts to water resources, specifically the following sections:

- 13.3 Landscape Preservation
- 13.5 Weed Control Plan
- 13.8 Disposal of Waste Material
- 13.10 Pollutant Spill Prevention, Notification, and Cleanup
- 13.16 Prevention of Water Pollution

Groundwater Usage

Minor impacts on groundwater would occur under the Proposed Action for construction, O&M, and decommissioning activities. Water for the Proposed Project and would be obtained from the existing SWS, which is supplied by two supply wells, or another existing water right in the Searchlight area. Applicants would coordinate with the Las Vegas Valley Water District to support the water needs for the proposed project. If sufficient resources are not available, the applicant will procure water from local sellers. Water would be transported to the Proposed Project site and stored in an approximately 4,000-gallon aboveground water storage tank. No wells would be drilled or springs developed for use by the Proposed Project.

<u>Construction.</u> The construction phase would account for the majority of water use under the Proposed Action including construction of Western's proposed switching station, with a water supply required for the concrete batch plant operations, road maintenance, dust suppression, and worker use. The concrete batch plant is expected to use approximately 1.5 acre-feet of water to make approximately 40,000 cubic yards of concrete for construction of WTG foundations, substations, and the O&M building. This is based on the estimated use of approximately 4,000 gallons of water per day over a period of about 5 months. Dust suppression and road maintenance activities would use approximately 30 acre-feet of water during the planned 8- to 12-month construction phase of the Proposed Action. Total water usage during construction would be approximately 27 million gallons (approximately 83 acre feet) In addition, temporary portable toilets would be provided during the construction phase. Due to the relatively small construction footprint of the Proposed Action in comparison to the area of the project watersheds, construction of the Proposed Project would not impact groundwater recharge in the Proposed Project area.

<u>O&M and Decommissioning.</u> During the O&M phase of the Proposed Project, approximately 15 full-time workers are expected to be onsite for day-to-day O&M activities. The ongoing water usage for drinking water and restroom facilities is estimated to be approximately 0.15 acre-feet per year. Drinking water would be supplied from the existing SWS. Water for toilets and drinking would be stored in a storage tank at the O&M facility. Due to the small permanent footprint of the Proposed Project in comparison to the area of the project watersheds, the O&M of the Proposed Project would not impact groundwater recharge in the project area.

Wastewater from toilet flushing at the O&M building would be treated on site with an onsite septic tank and absorption field. The Applicant would apply for a Small Commercial Septic System Permit from the Clark County Health District. The septic tank and absorption field would be located adjacent to the O&M building. Exact estimates for water usage during O&M were not available when the DEIS was prepared; however, these estimates for O&M water use are based on similar renewable energy projects in the western U.S.

Decommissioning of the Proposed Project would include the removal and disposal of WTG towers, aboveground electrical tower components, substation components, and O&M facilities, as well as the removal of below-ground infrastructure to 3 feet below the ground surface. No water requirements associated with decommissioning the Proposed Project have been identified at this time. However, based on the description of decommissioning activities provided in Section 2.3.7, Decommissioning, it is reasonably anticipated that approximately the same amount of water used for construction (approximately 30 acre feet) would be required for soil conditioning and dust control during decommissioning, which would involve some earth-disturbing activities. Decommissioning activities will include, but are not limited to, removal of concrete foundations, backfilling of foundation holes, and restoration of natural grade. A water source for decommissioning has not been identified; however, the same water source used during construction and O&M would likely be used to meet decommissioning requirements. The septic system would be abandoned in a manner consistent with state and local health regulations.

Groundwater Quality

Construction. Potentially, spills of chemicals and petroleum products can degrade groundwater quality such that it is no longer suitable for its intended use. The Proposed Project would use small amounts of hazardous materials during construction (see Section 3.14, Human Health and Safety). Petroleum spills would be possible while refueling equipment during construction and O&M of the Proposed Project.

As described in Section 3.3.4, Groundwater Resources, the static groundwater depths in those wells located in the project vicinity range from approximately 170 feet to over 270 feet below ground surface. The Applicant has also stated that an Emergency Response Plan (APM-7) would be developed to address emergencies, including leaks and spills during construction, and a Waste Management Plan (APM-8) to manage the storage, transportation, and handling of wastes. Successful implementation of the APMs listed above would minimize the potential for a spill and detail the measures to cleanup any spills that occur. In addition, groundwater is located over 100 feet below the ground surface; therefore, it is unlikely that any surface spill would infiltrate to groundwater. Potential impacts related to water impacts at Western's proposed switching station site, located on alluvial deposits, will be mitigated by Western requiring the construction contractor to comply with Western's Environmental Construction Standard 13.

O&M. Additionally, O&M of the Proposed Project would require the use of small amounts of hazardous materials; therefore, potential effects for O&M and mitigation would be the same as those described above. Additionally, the Applicant has stated that a SPCCP (APM-5) would be developed and implemented to protect the environment from petroleum product and hazardous material spills during operation.

Other sources of liquid waste with the potential for contamination would come from sanitary waste from the onsite septic tank and drainfield system that would be constructed near the O&M building to accommodate O&M-phase sanitary waste. The septic system would be constructed and maintained in accordance with state and local regulations.

Surface Water Quality

Surface water quality potentially can be degraded by increasing rates of erosion and sedimentation, introducing contaminants, violating water quality standards, or otherwise changing the character of surface waters. As described in Section 3.3, the Proposed Project area would be spread across portions of two Hydrographic Flow Regions; the Central Region and the Colorado River Basin Region, both of which are a part of the greater Colorado Regional Flow System (Harrill et al. 1988). The administrative hydrographic basins, or sub-basins, in which the Proposed Project area is located include the Central Flow System's Eldorado Valley to the north; Piute Valley to the west, and Colorado River Valley to the east, all part of the Colorado River Basin. There are no perennial water bodies within the Proposed Project area. Therefore, there are no surface water quality data available against which to measure potential impacts.

Construction. Under the Proposed Action, the total construction impact area for all project features would be 409 acres. Following the reclamation of 249 acres of construction impacts areas, the total acreage with permanently disturbed ground surfaces potentially opened to wind erosion as a result of this project would be approximately 160 acres under the Proposed Action.

Construction activities would result in the disturbance of soils, which could activate increased sediment transport in shallow unnamed ephemeral desert washes that pass through the site. Temporary impacts resulting from sediment uptake in stormwater would be mitigated using BMPs and APMs 1 and 4 for erosion containment to protect water quality. Permanent impacts from sediment uptake would be mitigated through facility design parameters, including stormwater-control and erosion-control structures in accordance with CCDAQEM and the State of Nevada's stormwater permits.

Changes to the site surface, including devegetation and gullying, would likely result in increased erosion and sedimentation both on and off site for the life of the project. The Applicant has proposed to incorporate the construction-phase erosion and sediment control measures listed in the Excavation/Grading Plan (APM-2), the Air/Dust Control Plan (APM-3), and the Applicant's SWPPP (APM-4). These measures are consistent with regional BMPs and federal, state, and local regulations. These measures would control erosion and sediment transport during construction. These plans must be approved by the BLM three months prior to the beginning of project. Potential impacts related to water impacts at Western's proposed switching station site will be mitigated by Western requiring the construction contractor to comply with Western's Environmental Construction Standard 13.

Using heavy equipment and trucks for construction activities carries some risk of an accidental fuel, chemical, or other hazardous material spill. Small amounts of general chemical solvents, herbicides, paints, and petroleum products would be used during construction of the Proposed Project. In addition, large quantities of mineral oils in transformers and hydraulic fluids and lubricating oils for WTG construction would be stored on site during the construction phase. The greatest potential for contamination of surface water from these materials would be from petroleum products, including diesel fuel stored on site for fueling equipment and in a 500-gallon aboveground storage tank for the concrete batch plant; petroleum products contained within transformer and other electrical equipment; and petroleum products contained within heavy equipment traversing the project area. The Applicant's Emergency Response Plan (APM-7) and SPCC Plan (APM-5) would provide for hazardous material spill prevention and clean-up measures, were a spill to occur. Potential impacts related to water at Western's proposed switching station site will be mitigated by Western requiring the construction contractor to comply with Western's Environmental Construction Standard 13.

O&M and Decommissioning. There would likely be effects that last beyond the construction period and terms of the General Permit and SWPPP. Although the Applicant and Western plan to maintain existing drainage patterns throughout the Proposed Project area, construction and O&M of the Proposed Project activities would likely change natural runoff patterns, thereby affecting erosion and deposition. O&M and decommissioning activities causing ground disturbance, such as grading and devegetation, and installation and operation of the Proposed Project components, could have long-term effects, increasing the amount of soil erosion in and downstream of the project area. These potential long-term effects are not completely understood at this time because the amount of revegetation that would occur is in a development phase. However, permanent impacts from sediment uptake would be mitigated through facility design parameters, including stormwater-control and erosion-control structures and incorporation of BMPs in accordance with the State of Nevada's stormwater permits, and the Applicant's Site Rehabilitation Plan (APM-10). Potential impacts related to water at Western's proposed switching station site will be mitigated by Western requiring the construction contractor to comply with Western's Environmental Construction Standard 13.

The Applicant has proposed to incorporate O&M-phase erosion and sediment control measures listed in the Air/Dust Control Plan (APM-3), SWPPP (APM-4), and Site Rehabilitation Plan (APM-10). These measures are consistent with regional BMPs and federal, state, and local regulations, and would control erosion and sediment transport during O&M activities.

The O&M of the Proposed Project would involve the periodic and routine transport, use, and disposal of small quantities of hazardous materials and equipment containing hazardous materials such as paint, lubricating oils, welding gases, hydraulic fluid, and cleaning solvents for WTG and substation maintenance. The greatest potential for contamination of surface water from these materials would be from petroleum products stored at the O&M building compound and mineral oils contained within electrical transformers across the project area. The Applicant's Emergency Response Plan (APM-7) and SPCCP (APM-5) would provide for hazardous material spill prevention and clean-up measures, were a spill to occur during O&M.

The O&M of the Proposed Action's 96 WTGs, two substations, O&M building, Western's proposed switching station, 8.7 miles of transmission interconnect lines, four MET towers, remaining laydown area, and 35.9 miles of access roads would result in low impacts on water quality. As described above, implementation of required BMPs and compliance with required water quality permits would occur for protecting water quality during the operational phase of the Proposed Project. Effects of the proposed switching station would be reduced through implementation of Western's Construction Standard 13.

A similar scale of effort and impact on water resources would occur with decommissioning as with the construction and O&M phases, therefore, there would not be a substantial impact on water resources.

Flooding

Development of the Proposed Action could result in an increase in flooding hazard if it were to:

- Impede or redirect flood flows;
- Cause inundation or additional risk associated with a debris flow; or
- Otherwise increase the rate or amount of surface water leaving the site.

Flood hazards can increase as a result of multiple factors, including altering the natural drainage of an area to prevent adequate water flow, reducing the area within which precipitation and runoff infiltrate, and increasing the impervious surface area in a region.

As noted in Section 3.3.3, Floodplains, a designated Zone A 100-year floodplain traverses the southwestern part of the Proposed Project area with approximately 0.32 square mile of a FEMA-designated 100-year floodplain within and along the southwestern boundary of the project area. Drainage within the project site occurs via sheet flow to migrating dry wash drainages, which is typical of an alluvial fan. Due to their loose nature, alluvial fans naturally change during a process known as hydrologic reworking. Extreme rain events can suspend sand, gravel, or even boulders and transport them downstream or downslope, resulting in damage to structures affected by flood waters (USGS 2001). If a flood event were to occur, it could result in flooding that could cause substantial damage across the project area as well as substantial localized destruction.

Potential impacts related to flooding issues at Western's proposed switching station site, located on alluvial deposits, will be mitigated by Western requiring the construction contractor to comply with Western's Environmental Construction Standard 13.

Jurisdictional Waters, Drainages, and Riparian Areas

As stated in Section 3.3.6, Jurisdictional Waters, Drainages, and Riparian Areas, based on an USACE delineation of the WOUS within the Proposed Project area, the Proposed Project could impact 0.174 acre of jurisdictional waters (Figure 4.3-1). The impacted acreage includes drainages to Piute Wash located approximately 3 miles south-southeast of the Proposed Project site, in an area that Proposed Project access roads would cross. The approved jurisdictional determination stated that the USACE would require a Section 404 Permit for the construction of an access road and drainage system crossing jurisdictional waters located within the boundaries of the Proposed Project.

Construction. Clearing and grubbing activities for project infrastructure (i.e., maintenance roads, tower foundations for the WTGs and transmission lines, collection lines, staging areas, substations, and switching station) could result in removal of desert wash vegetation and/or filling of jurisdictional areas. Additionally, the removal of vegetation could result in increased erosion and sedimentation, resulting in the degradation of water quality. During construction, the use of maintenance and access roads that cross desert washes could affect jurisdictional waters by crushing vegetation and increasing erosion. The use of vehicles and equipment to cross these washes could also result in degradation of water quality from the potential introduction of hazardous materials such as fuels and oils.

If WOUS within the Proposed Project area cannot be avoided, adverse impacts would be both short and long term. APM 1, which would reduce erosion and APMs 3-5 would help reduce impacts to WOUS by preventing and/or reducing the potential for contamination.

As no WOUS are located near the proposed switching station, no impacts to WOUS of the U.S. from construction of the switching station are anticipated. Potential impacts related environmental impacts at Western's proposed switching station site, located on alluvial deposits, will be mitigated by Western requiring the construction contractor to comply with Western's Environmental Construction Standard 13.

O&M. Most of the potential impacts to WOUS would occur during construction; however, use of the roads during O&M could affect jurisdictional waters as described above.

4.3.2.3 87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG Layout Alternative. The difference in the temporarily disturbed area (230 acres) and permanently disturbed area (152 acres) for construction would be less under this alternative, but the type, intensity, and duration of the effects would be similar to the 96 WTG Layout Alternative. Total water usage for the 87-WTG Layout Alternative during construction would be approximately 24 million gallons during the construction period (approximately 74 acre feet) Effects to Jurisdictional Waters would be the same under this alternative (Figure 4.3-2). The same mitigation used for the Proposed Action would be applicable for the 87 WTG Layout Alternative.

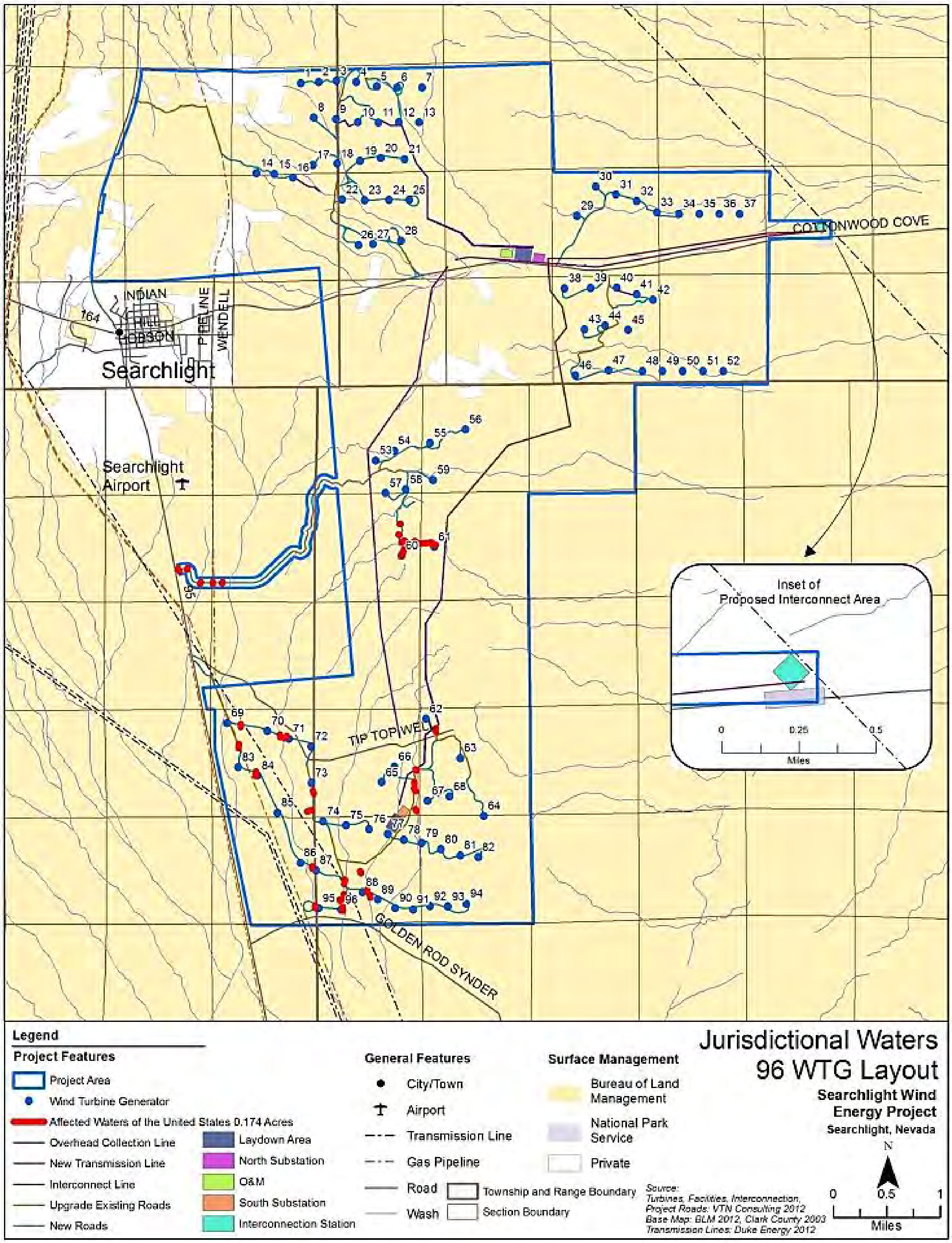


Figure 4.3-1. Jurisdictional Waters Potentially Affected by the 96 WTG Layout Alternative

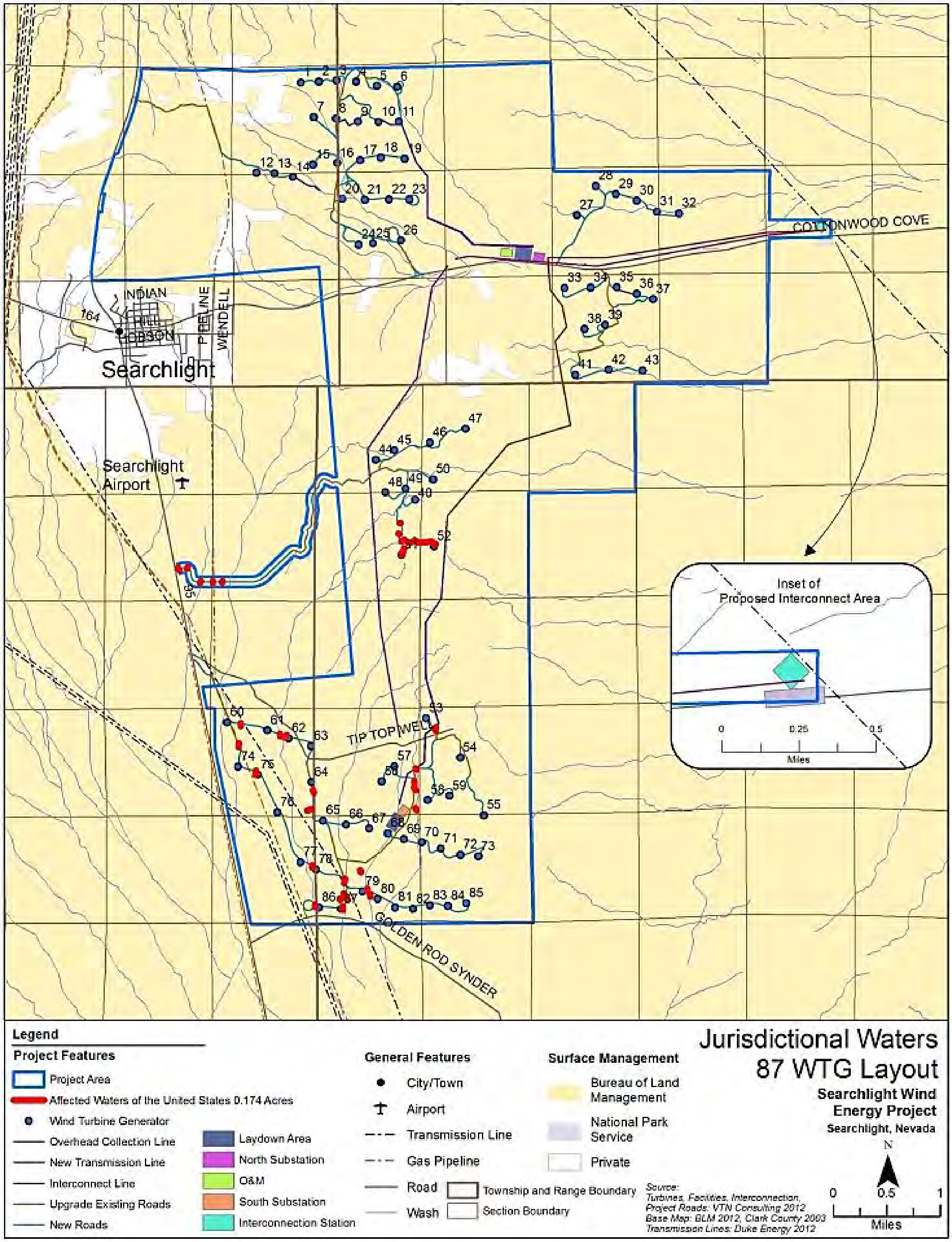


Figure 4.3-2. Jurisdictional Waters Affected by the 87 WTG Layout Alternative

4.3.3 Mitigation

To further reduce effects to water resources, the Applicant will adhere to the following mitigation measures:

MM WATER-1: WELLHEAD PROTECTION

Development of the O&M building and its associated septic system would require a wellhead protection plan. The State of Nevada's Wellhead Protection Ordinance encourages protection of public health and water supplies by ensuring there are appropriate distances between wells and potential sources of contamination (Clark County 2008a).

MM WATER-2: CONSTRUCTION PHASE EROSION AND SEDIMENTATION CONTROL MEASURES.

The Applicant will develop and implement erosion and sedimentation control measures to minimize impacts during the construction of the Project. At a minimum, this plan will include the following:

- Implement soil stabilization measures to offset loss in vegetation including the following
- BMPs:
  - Install silt fences
  - install temporary earthen berms,
  - install straw bale barriers to reduce water velocity and flows,
  - install temporary water bars,
  - install sediment traps,
  - install stabilized entrances from public roads to minimize track-out
  - stone check dams, or other equivalent measures (including installing erosion-control measures around the perimeter of stockpiled fill material) as necessary;
- Maintain or reduce salt yields originating from public lands to meet State-adopted and Environmental Protection Agency-approved water quality standards for the Colorado River (BLM 1998);
- Implement BMPs, as identified by the state of Nevada, to minimize contributions from both point and non-point sources of pollution (including salts) from public lands (BLM 1998);
- Ensure that any nonpoint source BMPs and rehabilitation techniques meet state and local water quality requirements (BLM 2005a);
- Implement BMPs such as locating waste and excess excavated materials outside drainages to avoid sedimentation;
- Conduct regular site inspections during the construction period to see that erosion-control measures were properly installed and are functioning effectively;
- Consider use of landscape for buffering, erosion control, and stormwater runoff control for maintaining acceptable water quality conditions (Clark County 2008a);
- Obtain and comply with necessary permits in accordance with the Clean Water Act Section 404 (dredge and fill) and Section 401 (water quality) from the USACE and NDEP (NDEP 2010; and
- Implement adaptive management of actions if erosion and sedimentation control measures are found to be insufficient to control surface water at the site (any changes must be approved by the BLM).

MM WATER-3: CONSTRUCTION PHASE PETROLEUM AND HAZARDOUS MATERIAL CONTAMINATED WATER PREVENTION AND CONTROL MEASURES.

The Applicant will develop and implement contaminant control measures to minimize impacts during the operation and maintenance of the Proposed Project. At a minimum, these measures will include the following:

- Prepare and comply with a SPCCP that outlines procedures to prevent the release of hazardous substances into the environment, thereby avoiding contaminating water resources (EPA 2010);
- Stage heavy maintenance equipment over impermeable surfaces and inspect regularly for petroleum releases;
- Conduct regular site inspections during operations and maintenance to see that petroleum and hazardous materials products are properly stored and inventoried in accordance with local, state, and federal regulations; and
- Implement BMPs, as identified by the state of Nevada, to minimize contributions from both point and nonpoint sources of pollution (including salts) from public lands (BLM 1998).

MM WATER-4: OPERATIONAL PHASE EROSION AND SEDIMENTATION CONTROL MEASURES.

The Applicant will develop and implement erosion and sedimentation control measures to minimize impacts during the operations and maintenance of the Proposed Project. At a minimum, this plan will include the following:

- Implement and maintain soil stabilization measures developed for MM WATER-2 to offset loss in vegetation;
- Conduct biannual and post-storm monitoring of erosion and sedimentation; and
- Conduct regular site inspections during operation and maintenance to see that erosion-control measures installed during the construction-phase (MM WATER-2) are properly installed and are functioning effectively.

MM WATER-5: OPERATIONAL PHASE PETROLEUM AND HAZARDOUS MATERIAL CONTAMINATED WATER PREVENTION AND CONTROL MEASURES

The Applicant will develop and implement contamination control measures to minimize impacts during the construction of the Proposed Project. At a minimum, these measures will include:

- Prepare and comply with a SPCCP that outlines procedures to prevent the release of hazardous substances into the environment, thereby avoiding contaminating water resources (EPA 2010);
- Stage heavy equipment and O&M vehicles over impermeable surfaces and inspect regularly for petroleum releases;
- Conduct regular site inspections during the O&M phase to see that petroleum and hazardous materials products are properly stored and inventoried in accordance with local, state, and federal regulations; and
- Implement BMPs, as identified by the State of Nevada, to minimize contributions from both point and nonpoint sources of pollution (including salts) from public lands (BLM 1998).

MM WATER-6: DRAINAGE CROSSING DESIGN

If drainages cannot be avoided by infrastructure placement, then the Applicant will design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon post-construction restoration. This measure is necessary to minimize the amount of erosion and degradation to which drainages are subject.

MM WATER-7: STORMWATER MONITORING AND RESPONSE PLAN

The Applicant will develop and implement a stormwater monitoring and response plan to minimize impacts from flood damage during the life of the Project. At a minimum, this plan will include:

- Visual surveys of all structures for scour following major storm events;
- Visual surveys of drainage crossings and fencing to check for damage;
- Cleanup of broken equipment if failures do occur;
- Inspection and cleanup of downstream areas if debris is transported off site; and

- Adaptive management of flood protection and erosion actions if the monitoring plan reveals routine damage to project components due to flooding (Any changes must be approved by the BLM).

4.3.4 Residual Effects

Residual effects on water resources or hydrology resulting from implementation of the Proposed Action or alternatives would include localized increases to sedimentation and scour in site drainages; a higher volume of concentrated stormwater due to drainage structures; a potentially higher flood hazard; and potentially altered drainage patterns due to the prevention of uninhibited channel migration within the Proposed Project site. Residual effects on water resources or hydrology resulting from construction of Western's proposed switching station would include localized increases to sedimentation and scour in drainages, potential concentration of stormwater due to drainage structures and potential higher flood hazard due to altered drainage patterns.

4.4 Biological Resources Impacts

This section discusses effects on biological resources that might occur with implementation of the Proposed Action or alternatives. This section is divided into several subsections by resource: vegetation, sensitive plant species, wildlife, and sensitive wildlife species resources. After the discussion of effects in each subsection, the mitigation measures are presented. These measures, which are designed to eliminate or reduce impacts to an acceptable level, are followed by a discussion of residual impacts.

4.4.1 Vegetation

4.4.1.1 Indicators

The Proposed Project would affect vegetation resources or special status plant species if:

- The structure, function, and persistence of sensitive upland vegetation communities were altered;
- Special status plant species, including cacti and yucca were adversely affected either directly or indirectly; or
- Invasive, non-native plants, or noxious weeds were introduced; or
- Invasive, non-native plants or noxious weeds already occurring in the area proliferated.

4.4.1.2 Direct and Indirect Effects by Alternative

Vegetation in the Proposed Project area is typical of the Mojave Desert. The implementation of the Proposed Project would affect all forms of vegetation on and surrounding the site. This section describes the effects on vegetation as a result of each alternative using the respective methodology under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. Additionally, effects during different phases of the Proposed Project (i.e., construction, O&M, and decommissioning) are addressed in this section. Direct and indirect effects, APMs and MMs, and residual effects on vegetation resources are discussed below.

No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on vegetation would occur.

Proposed Action – 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Project and Western's proposed switching station would proceed. Under this alternative, approximately 249 acres would be temporarily disturbed and 160 acres would be permanently disturbed. The Applicant has incorporated the following APMs to avoid and minimize impacts on vegetation resources of the Proposed Project area:

- APM-9 Weed Control Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-13 Environmental Clearance

Western will require the construction contractor to comply with Environmental Construction Standard 13 for construction of Western's proposed switching station, specifically the following sections:

- Section 13.2 Environmental Requirements
- Section 13.3 Landscape Preservation

- Section 13.5 Noxious Weed Control
- Section 13.16 Prevention of Water Pollution
- Section 13.19 Conservation of Natural Resources

Construction. During the 8 to 12 month construction phase, grading, excavation, trenching or other ground-disturbing activities required for installation of WTG and transmission line foundations and construction of substations, O&M building, ancillary facilities, and roads, might cause the direct mortality and loss of vegetation within the project area. The vegetation communities that would primarily be affected are Mojave Creosotebush-White Bursage Desert Scrub, Mojave Mid-Elevation Mixed Desert Scrub, Inter-Mountain Basins Semi-Desert Shrub Steppe, and North American Warm Desert Bedrock Cliff and Outcrop. Collectively these vegetation communities and land cover types cover approximately 97% of the Proposed Project area. Permanent removal and disturbance of vegetation communities associated with the 96 WTG Layout Alternative would encompass up to 160 acres.

Noxious weeds and invasive species can displace native vegetation, increase fire frequency, and reduce wildlife habitat quality. One direct effect of the Proposed Project is the potential for the introduction or proliferation of noxious weeds into the project area. The only noxious weed species found in the project area was Sahara mustard. In addition to noxious weeds, the project area may be more vulnerable to the proliferation of invasive species that already occur in the area, including red brome and red-stemmed filaree. Implementation of APM-9 would help to reduce the spread of weeds throughout the project area.

Temporary impacts are effects that result in short-term disturbance to natural vegetation communities from surface disturbances such as grading, blasting, excavation, or trenching and trampling. Short-term impacts include habitat disturbance, temporary change in plant composition, and mortality of individuals. Temporary impacts might persist for several years as vegetation reestablishes to preconstruction conditions. Temporary disturbance would occur at the two temporary laydown areas, turbine assembly areas, trenching areas, and temporary access roads. Vegetation might be crushed or temporarily removed. Areas where the vegetation is crushed would be allowed to revegetate after construction is finished. It is anticipated that approximately 249 acres of vegetation communities would be disturbed during construction.

Construction of Western's proposed switching station would result in the removal or disturbance of Mojave Creosotebush-White Bursage Desert Scrub. Effects to vegetation would be similar to those described above. It is anticipated that 7 acres would be disturbed during construction, but half of that area (2.5 acres) would be reclaimed post-construction. Western would minimize effects to vegetation by require its contractor to comply with Construction Standard 13.

O&M and Decommissioning. No additional effects on vegetation would occur during operation and maintenance and decommissioning of the facility or the switching station. Ongoing maintenance activities might increase the potential for introducing or spreading noxious or invasive weed species throughout the project area and possibly into adjacent areas.

87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG Layout Alternative. The temporarily disturbed area and permanently disturbed area would be decreased under this alternative because 9 less WTGs would be constructed. Approximately 152 acres of native vegetation would be permanently removed, approximately 8 acres less than under the 96 WTG Layout Alternative. Disturbance of a temporary nature would affect approximately 230 acres, which is approximately 19 acres less than under the 96 WTG Layout Alternative. The type, intensity, and duration of effects from construction, O&M, and decommissioning activities on vegetation communities, individual species, and habitat would be similar to the 96 WTG Layout Alternative.

4.4.1.3 Mitigation

The Applicant has proposed a Weed Control Plan and developed a Weed Management Plan (refer to APM-9 and Appendix B-1: Weed Management Plan), a Site Rehabilitation Plan and Facility Decommissioning Plan (AMP-10), and environmental clearance (APM-13). Western would minimize effects to vegetation by implementing Construction Standard 13 and reclaiming approximately half (2.5 acres) of the disturbed area. Additionally, the Applicant would implement the following mitigation measures will help reduce the effects to vegetation:

MM-BIO-1: INTERIM RECLAMATION

Interim reclamation actions are intended to reclaim areas of temporary use such as construction staging areas, and road widening areas. Interim reclamation actions will be initiated upon cessation of area use and no later than 12 months from commencement of operation, weather permitting. Interim reclamation will include the following:

- Areas that were cleared for staging or road widening and that are not needed for operation of the Proposed Project will be recontoured to the original contour, if feasible, or if not feasible, to an interim contour that bends with the surrounding topography.
- Wastewater, solids, and pond liners will be removed and disposed of at a proper facility. Areas that were occupied by evaporation ponds will be backfilled with native soil to match the existing surrounding grade and restore drainage function.
- Stockpiled topsoil will be spread evenly over the entire disturbed area to within a few feet of the production facilities. Salvaged cactus and yucca would be replanted in these disturbed areas.

4.4.1.4 Residual Effects

Despite the implementation of mitigation measures, it is possible that noxious or invasive plant species could be introduced or proliferate in the Proposed Project area. Artificial water sources used for construction activities (such as water for dust control or for the concrete batch plant operation) could encourage and support invasive and weed species propagation. A weed management plan (APM-9) has been developed that specifies that the Applicant will maintain and control weeds, within feasibly practicable means, within the Proposed Project site boundaries, construction areas, and areas influenced by project activities. Please refer to the *Searchlight Wind Farm Weed Management Plan* (AEC 2011) for more details on weed management (Appendix B-1: Weed Management Plan).

4.4.2 Special Status Plant Species

4.4.2.1 Direct and Indirect Effects by Alternative

According to the *Searchlight Botanical Survey Report* (AEC 2010), no special status plant species were found in the Proposed Project area; therefore, implementation of the 96 WTG Layout Alternative or the 87 WTG Layout Alternative would not have an effect on special status plant species.

4.4.2.2 Mitigation

No special status plant species were found in the Proposed Project area; therefore, no mitigation is proposed.

4.4.3 Cacti and Yucca

4.4.3.1 Direct and Indirect Effects by Alternative

No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on cacti and yucca would occur.

96 WTG Layout Alternative

Construction. Cacti and yucca would be removed to during construction of the Proposed Project facilities including construction of new roads and the upgrading of existing roads. The northern portion of the project area is characterized by Joshua trees and yucca species in higher abundance than in the central and southern portions of the project area. Individual trees could be removed during the upgrading of existing roads, overhead transmission lines, and laydown yards. Effects to cactus and yucca from construction of the proposed switching station would be similar.

O&M and Decommissioning. During O&M and decommissioning, there would be no activities which would have effects on cacti and yucca. Effects on cacti and yucca from construction activities under the action alternatives would be minimized with the implementation of the appropriate APMs and MMs.

87 Layout Alternative

Under the 96 WTG Layout Alternative, effects on cacti and yucca would be similar to those identified under the 87 WTG Layout Alternative; however, nine less turbines are associated with this alternative, thus causing less acres of permanent and temporary disturbance. Approximately 152 acres of native vegetation would be permanently removed, which is 8 acres less than under the 96 WTG Layout Alternative. Disturbance of a temporary nature would affect 230 acres, which is 19 acres less than under the 96 WTG Layout Alternative. However, the type, intensity, and duration of the effects would be similar to the 96 WTG Layout Alternative.

4.4.3.2 Mitigation

MM-BIO-2: Cactus and Yucca Salvage Plan

The Applicant will prepare and implement a cactus and yucca salvage plan. Removal of cacti and yucca in Nevada is governed by NRS 527.060 - .120 ("Protection of Christmas Trees, Cacti and Yucca") and the associated regulations (NAC Chapter 527). NAC 527.090 requires that all cacti and yucca removed or possessed for commercial purposes have a tag attached thereto. When a cacti or yucca is removed for commercial purposes from BLM-administered land, a tag for the plant is issued by the BLM. "Commercial purposes" is defined as the removal or possession of six or more cacti or yucca on any one calendar day or the removal or possession of less than six plants each for seven or more consecutive days, except when such removal or possession is for scientific or education purposes. *See* NRS 527.070. Accordingly, to the extent that cacti or yucca removed during the construction of the Proposed Project meet the definition of "commercial purposes," Nevada law requires that tags be obtained from the BLM for each such plant.

The Applicant will conduct the following plan for all cactus and yucca species that are salvaged within the Proposed Project area:

- The proponent will salvage sufficient cacti and yucca to restore all project temporary impacts to 1.5 times the density of cacti and yucca present in the adjacent native plant community. These cacti and yucca will be held in either an on-site temporary nursery or maintained in an off-site location. Once replanted in the temporary impact areas, the proponent will be responsible for maintaining them so that 80% survivorship is achieved. This activity will be conducted in conjunction with any other revegetation requirements.

- The proponent will transplant and maintain cacti and yucca at naturally occurring densities into approximately of 30 acres of BLM identified reclaimed mines, closed roads, and burn scars within 15 miles of the project site. Maintenance will include monitoring and watering for a period of one year.
- Any remaining cacti and yucca not salvaged from temporary and permanent impact areas will be purchased by the proponent using BLM Nevada forestry program pricing.
- The cactus and yucca salvage will follow SNDO cactus and yucca salvage best management practice guidelines and will be conducted by a qualified contractor with at least three years' experience performing this work in the Mojave Desert.

4.4.3.3 Residual Effects

Residual effects special status plant species would be the same as the residual effects described previously for vegetation.

4.4.4 Wildlife

Wildlife in the Proposed Project area is typical of the Mojave Desert. The implementation of the Proposed Project would affect non-listed wildlife species (wildlife) on and surrounding the site. This section describes the effects on wildlife as a result of each alternative using the respective methodology under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. Additionally, effects during different phases of the Proposed Project (i.e., construction, O&M, and decommissioning) are addressed in this section. Direct and indirect effects, APMs and MMs, and residual effects on wildlife are discussed below.

4.4.4.1 Indicators

The Proposed Project would affect wildlife if it altered the diversity or population of any wildlife species.

4.4.4.2 Direct and Indirect Impacts by Alternative

No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on wildlife resources would occur.

Proposed Action - 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Project and Western's proposed switching station would proceed. Under this alternative, approximately 249 acres would be temporarily disturbed and 160 acres would be permanently disturbed. The Applicant has incorporated the following APMs to avoid and minimize impacts on wildlife resources of the Proposed Project area:

- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-13 Environmental Clearance

Western will require the construction contractor to comply with Environmental Construction Standard 13 for construction of Western's proposed switching station, specifically the following sections:

- Section 13.2 Environmental Requirements

- Section 13.3 Landscape Preservation
- Section 13.5 Noxious Weed Control
- Section 13.16 Prevention of Water Pollution
- Section 13.19 Conservation of Natural Resources

Construction. Grading, excavation, trenching, or other ground-disturbing activities could directly result in mortality to various wildlife species. Some species that are particularly mobile might be able to avoid injury or mortality by leaving the area. However, some wildlife, such as nocturnal species or species that use burrows, might be more susceptible to injury or mortality during grading activities.

Although temporary in nature, noise and activity associated with construction could cause animals to avoid the area, thus altering their normal behavior patterns.

The Proposed Project would remove 160 acres of wildlife habitat. However, most of this habitat is Sonora-Mojave Creosote Bush -White Bursage Desert Scrub, which is the most common type of habitat throughout the project area, project vicinity, and southern Nevada.

Direct and indirect impacts from construction of the proposed switching station are similar to those identified above, although construction of the switching station would temporarily affect 7 acres of wildlife habitat of which 2.5 acres would be reclaimed post construction.

Wildlife may be attracted to temporary artificial ponds and may become entrapped and/or drown; however, as stated in Chapter 2, ponds would be fenced to discourage and/or prevent wildlife from entering. Some wildlife such as small mammals and reptiles may still access the ponds, so ponds will be equipped with textured materials or wildlife ladders in each corner that would provide trapped wildlife with sufficient traction to be able to exit the ponds.

O&M and Decommissioning. During project operation and maintenance, newly established roads and increased traffic could result in more vehicle/wildlife collisions, thereby resulting in injury or death to wildlife. This might be of particular concern for reptiles and species that use roads for heat sources or for other small wildlife.

During the public scoping and public comment period, concerns were expressed regarding potential noise and vibration impacts to nonhuman receivers (i.e., wildlife). However, there are no known laws, ordinances, regulations, or standards that address noise exposure to wildlife in the project vicinity. The peer reviewed literature widely documents that sound plays a critical role in intraspecies communication, courtship, predation and predator avoidance, and effective use of habitat. Additionally, similar studies have shown that wildlife can be adversely affected by sounds and sound characteristics that intrude on their habitats. While the severity of the impacts varies depending on the species being studied and other conditions, research strongly supports the fact that wildlife can suffer adverse behavioral and physiological changes from intrusive sounds (noise) and other human disturbances. Documented responses of wildlife to noise include increased heart rate, startle responses, flight, disruption of behavior, and separation of mothers and young (Selye 1956, Clough 1982, National Park Service 1994, US Department of Agriculture 1992, Anderssen et al. 1993).

When noise elevates ambient sound levels, signals that might otherwise have been detected and recognized are missed. The noise is said to mask these signals. Masking degrades an animal's auditory awareness of its environment, and fundamentally alters interactions among predators and prey. There are many animal species that rely almost exclusively on sounds to locate their prey (e.g., gleaning bats). Masking also affects acoustical communication. Animals have been shown to alter their calling behavior and shift their vocalizations in response to noise (Brumm and Slabbekoorn 2005; Patricelli and Blickley 2006; Slabbekoorn and Ripmeester 2008; Warren et al. 2006). These shifts have been documented in a variety of signal types: begging calls of bird chicks (Leonard and Horn 2007), alarm signals in ground squirrels (Rabin et al. 2006), echolocation cries of bats (Gilman and McCracken 2007) and sexual communication signals in birds and anurans (Brumm and Slabbekoorn 2005, Patricelli and Blickley 2006, Warren et al. 2006, Slabbekoorn and Ripmeester 2007, Parris et al. 2009). Although these results suggest an effect of noise, these studies did not control for other potentially confounding factors and the effect of noise could not be isolated. Vocal adjustment likely comes at a cost to both energy balance and information transfer; however, no study has addressed receivers (Barber et al. 2010). Some species are unable to adjust the structure of their sounds to cope with noise even within the same group of organisms (Lengagne 2008).

This summary of literature review presented above reveals there are few studies specifically focused on the noise effects of wind energy facilities on birds, bats and other wildlife while the effects of other noise sources is widely documented. The results suggest, as documented in various examples above, that varying sources and levels of noise can affect both the sending and receiving of acoustic signaling and sounds. Larkin (1996) reports that, "Animals can be extraordinarily sensitive to sounds in some circumstances and quite insensitive to sounds in other circumstances." Noise generated by wind turbines, has distinct characteristics, and although assumed to be comparable to other noise sources, notes it is not known with certainty that the effects would be similar to noise generated from other activities. According to USFWS, "As research specific to noise effects from wind turbines further evolves these findings should be utilized to develop technologies and measures to further minimize noise impacts to wildlife." http://www.fws.gov/windenergy/docs/Noise.pdf

87 WTG Layout Alternative

Under the 87 WTG Layout Alternative, effects on wildlife would be similar to those identified under the 96 WTG Layout Alternative, although nine less turbines are associated with this alternative reducing the acres of permanent (152 acres) and temporary disturbance (249 acres), thus slightly reducing the potential to affect wildlife. However, the type, intensity, and duration of the effects would be similar for both action alternatives.

4.4.4.3 Mitigation

Because the Applicant has proposed environmental clearance (APM-13) and Western implements Construction Standard 13; no further mitigation is proposed.

4.4.4.4 Residual Effects

Residual effects on wildlife diversity, populations, and habitat resulting from implementation of the Proposed Action or alternatives would be long-term. Effects include the permanent loss of 152-160 acres of wildlife habitat, resulting in the loss of shelter, breeding and foraging opportunities in the project area, and barriers and hazardous to wildlife behavior patterns with construction of new roads and transmission line towers.

4.4.5 Special Status Wildlife Species

This section describes the Proposed Project effects on special status wildlife species, which are species that are state or federally protected. Effects are described in relation to the area affected, the duration of the effects, and the intensity of the effect.

4.4.5.1 Indicators

The Proposed Project would affect special status wildlife species if:

- Substantially adverse effects, either directly or through habitat modification, on any special status wildlife species occurs;
- Direct or indirect impacts on candidate or special status species populations or habitat that would contribute to or result in the federal or state listing of the species (e.g., substantially reducing

species numbers, or resulting in the permanent loss of habitat essential for the species continued existence);

- Result in changes in the environment that would increase opportunities for predators of special status species; or
- Interfere substantially with the movement of any native resident or migratory wildlife species or with established native resident or migratory wildlife corridors.

4.4.5.2 Desert Tortoise – Direct and Indirect Impacts by Alternatives

No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on desert tortoise would occur.

Proposed Action - 96 WTG Layout Alternative

Construction. Permanent removal of desert tortoise habitat associated with the 87 WTG Layout Alternative would encompass up to 160 acres. Approximately 249 acres of desert tortoise habitat would be temporarily disturbed. Similar to the effects on other wildlife, tortoises might be killed or injured during construction activities. Tortoises or tortoise eggs in the area during initial ground grading activities could be crushed, killed, or trapped in natural burrows or man-made sheltering opportunities. Construction traffic on roads could increase the potential for tortoise/vehicle collisions. Construction noise and vibration, particularly from blasting activities, could affect tortoises and their normal activity patterns (Refer to Section 4.4.4-Wildlife for a discussion of noise impacts to wildlife). Tortoises might be attracted to the water used for dust control on the site or seek shade under construction equipment and be at risk of injury or death. Construction site litter and new perching opportunities might attract ravens and other raptors that prey on juvenile tortoises, thus potentially causing an increase in juvenile tortoise mortality. Tortoise may injest or become entangled with trash and litter left on the project site. Due to increased human presence in the area, tortoises may be killed or injured due to collection or vandalism associated with increased encounters with workers, visitors, and unauthorized pets.

The USFWS typically requires biological monitors to clear construction areas so that tortoises are not injured or killed during construction activities. Capturing, handling, and relocating tortoises away from construction activities would result in harassment and potentially injury or death. Injury or death can result from improper handling of tortoises, or as a result of a tortoise voiding its bladder during handling. Additionally, tortoises infected with upper respiratory tract disease (e.g., *Mycoplasma agassizii, M. testudium*), if relocated, could infect other tortoises in the area and result in the illness and mortality of infected individuals.

Direct and indirect impacts from construction of the proposed switching station are similar to those identified above, although construction of the switching station would temporarily affect 7 acres of desert tortoise habitat of which 2.5 acres would be reclaimed post construction.

O&M and Decommissioning. Continuous operation and maintenance of the wind turbines would result in increased traffic and thereby potentially increase vehicle/tortoise collisions. Additionally, new roads may also facilitate increased traffic from OHV recreationalists further increasing the potential for vehicle / tortoise collisions. Tortoise may avoid areas of high WTG density due to increased noise levels, vibration, and facility lighting. New roads and other project feature will contribute to habitat fragmentation possibly affecting tortoise distribution and use of the project area. This could potential affect gene flow patterns or local genetic structure; however, since the project is not proposing any major roads or fences, population connectivity should not be impeded (Appendix B-2: USFWS Biological Opinion). Additionally, traffic increase could introduce or spread nonnative invasive or noxious weed species, which would alter natural ecosystems and adversely affect desert tortoise habitat.

87 WTG Layout Alternative

Under the 87 WTG Layout Alternative, effects on desert tortoise would be similar to those identified under the 96 WTG Layout Alternative, although nine less turbines are associated with this alternative resulting in less acres of permanent and temporary disturbance and thus a slightly reduced potential to harm this species. Approximately 152 acres of desert tortoise habitat would be permanently removed, approximately 8 acres less than under the 87 WTG Layout Alternative. Disturbance of a temporary nature would affect approximately 230 acres, which is approximately 18 acres less than under the 87 WTG Layout Alternative. However, the type, intensity, and duration of the effects would be similar under either action alternative.

4.4.5.3 Mitigation

To further reduce impacts on desert tortoise, the Applicant and Western will adhere to the following mitigation measures:

MM-BIO-3: BIOLOGICAL OPINION

Formal consultation between BLM and USFWS under Section 7 was completed on September 15, 2012, resulting in the USFWS issuing the Biological Opinion for the proposed project (see Section 5.2.2-U.S. Fish and Wildlife Service Section 7 Consultation for details). The Biological Opinion includes the required mitigation measures (Appendix B-2: USFWS Biological Opinion)

The applicants would be required to adhere to all conservation measures and mitigation measures in the Biological Opinion. Implementation of these mitigation measures would reduce the likelihood of tortoise injury or death.

- Conservation Measures - proposed by the Applicant and BLM (and denoted in the BO) are as follows:
  1. *Waste Management Plan.* The Applicant will prepare a Waste Management Plan, in accordance with applicable laws and regulations, which will describe the storage, transportation, and handling of hazardous materials and wastes; will emphasize the recycling of wastes, where possible; and will identify the specific landfills that will receive wastes that cannot be recycled.
  2. *Weed Management Plan.* An Invasive Plant Management Plan will be developed for construction and O&M activities and include results of noxious weed inventories, identification of problem areas, preventative measures, treatment methods, agency specific requirements, monitoring requirements, and herbicide treatment protocol.
  3. *Site Rehabilitation and Facility Decommissioning Plan.* The applicant will develop a Reclamation, Restoration, and Revegetation Plan in consultation with appropriate agencies prior to adoption of the Final Environmental Impact Statement that will guide restoration and revegetation activities for all disturbed lands associated with construction of the project and the eventual termination and decommissioning of the project.
  4. *Water Usage*. If water is used for fugitive dust control, it will not be allowed to pool on access roads or other project areas, as this can attract desert tortoises. Similarly, leaks on water trucks and water tanks will be repaired to prevent pooling water.
  5. *Minimize Overhead Collection Line.* Collection lines will be buried to the greatest extent feasible to reduce the opportunity for perches for raptors and ravens.
  6. *Reduce Night Lighting.* Night lighting will be reduced in all natural areas to avoid unnecessary visual disturbance to wildlife using directed lighting, shielding methods, and/or reduced lumen intensity except as required by regulatory agencies such as the Federal Aviation Administration.

7 *Clean up.* SWEF will ensure that all unused material and equipment will be removed upon completion of construction activities or maintenance activities conducted. Upon completion, all construction equipment and refuse, including, but not limited to wrapping material, cables, cords, wire, boxes, rope, broken equipment parts, twine, strapping, buckets, metal or plastic containers will be removed from the site and disposed of properly. Any unused or leftover hazardous products will be properly disposed of offsite.

8 *Desert Tortoise Fencing.* Desert tortoise fencing will be installed around permanent facility structures including the O&M building and Western's proposed switching station.

9 *Desert Tortoise Measures.* The applicant or a qualified consultant will provide for the following to reduce impacts to desert tortoise:

a. A compliance manager will be designated and will oversee compliance monitoring activities and coordination with authorizing agency(s). Compliance activities will at a minimum include conducting preconstruction surveys, assuring proper handling of desert tortoise, adequate staffing of biological monitors during construction, and upholding all authorized conditions. The compliance manager will oversee all compliance documentation including daily observation reports, non-compliance and corrective action reports, and final reporting to any authorized agency upon project completion.

b. Construction monitoring will employ a designated compliance inspection contractor and authorized desert tortoise biologist(s) during the construction phase. A qualified biologist is defined as a person with appropriate education, training, and experience to conduct tortoise surveys, monitor project activities, provide worker education programs, and supervise or perform other implementing actions. An authorized desert tortoise biologist is defined as a wildlife biologist who has been approved to handle desert tortoises by the Service. A minimum of one monitor per crew is needed for construction crews using heavy equipment (e.g., backhoes, large trucks). One roving monitor will monitor multiple times per day in other active construction zones where heavy equipment is not in use.

c. All work area boundaries associated with temporary and permanent disturbances will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers will strictly limit activities and vehicles to the designated work areas.

d. Crushing or removal of perennial vegetation in work areas will be avoided to the maximum extent practicable.

e. Trash and food items will be contained in closed lid (raven- and coyote-proof) containers. Trash will be removed regularly (at least once a week) to reduce the attractiveness to the site to opportunistic tortoise predators such as common ravens and coyotes and to reduce the possibility of animals ingesting or becoming entangled in foreign matter.

f. Pets will not be allowed in working areas unless restrained in a kennel.

g. Where possible, motor vehicles will be limited to maintained roads and designated routes.

h. Desert tortoise caution signs will be installed on turbine access roads.

i. Desert tortoise clearance surveys at the project site must consist of at least two consecutive surveys of the site. Surveys shall involve walking transects less than or equal to 15-feet (5-meters) wide under typical conditions. In areas of sense vegetation or when conditions limit the ability of the surveyors to locate desert tortoise, transects should be reduced in width accordingly. Clearance surveys should be conducted when desert tortoises are most active (April-May or September-October). If desert tortoise are observed during the second pass, the USFWS and the appropriate State wildlife agency may require a third survey.

j. All methods used for handling desert tortoises during the clearance surveys must be in accordance with the Desert Tortoise Field Manual (USFWS 2009). Anyone that handles desert tortoises during clearance activities must have the appropriate authorizations from the Service and the State.

k. During the clearance surveys, desert tortoises in burrows may be removed through tapping or careful excavation. Multiple visits may be necessary if desert tortoises are inaccessible in deep caves or burrows. During all handling procedures, desert tortoises shall be treated in a manner to ensure that they do not overheat or exhibit signs of overheating (e.g., gaping, foaming at the mouth, etc.), or are placed in a situation where they cannot maintain surface and core temperatures necessary to their well-being. Desert tortoises shall be kept shaded at all times until it is safe to release them. Ambient air temperature shall be measured in the shade, protected from wind, at a height of2 inches (5 centimeters) above the ground surface. All clearance activities (capture, transport, release, etc.) shall occur when ambient temperatures are below 95°F {35°C) and not anticipated to rise above 95°F {35°C) before handling and processing desert tortoises are completed.

l. For desert tortoises that need to be relocated out of harm's way, the tortoise should be placed out of the path of project activity as per the instructions and guidance from the authorized desert tortoise biologist.

m. The area cleared and number of desert tortoises located within that area must be reported to the local Service and the appropriate State wildlife agency. The report should be made in writing, either by mail or email. Notification should be received within one week.

n. For activities conducted between March 15 and November 1 in desert tortoise habitat, all activities in which encounters with tortoises might occur will be monitored by an authorized desert tortoise biologist. The biologist will be informed of tortoises relocated during preconstruction surveys so that he or she could watch for the relocated tortoises in case they attempted to return to the construction site. The authorized desert tortoise biologist will watch for tortoises wandering into the construction areas, check under vehicles, examine excavations and other potential pitfalls for entrapped animals, examine exclusion fencing, and conduct other activities to ensure that death or injuries of tortoises were minimized.

o. For open trenches, earthen escape ramps will be maintained at intervals of no greater than 0.25 mile. A biological monitor will inspect all trenches, auger holes, or other excavations a minimum of twice per day, and also immediately prior to back-filling. Any wildlife species located will be safely removed and relocated out of harm's way, using a suitable tool such as a pool net when applicable. For safety reasons, biological monitors will under no circumstance enter open excavations.

p. No overnight hazards to desert tortoises (e.g., auger holes, pits, or other steep sided depressions) will be left unfenced or uncovered; such hazards will be eliminated each day prior to the work crew and biologist leaving the site. Plywood board will be used to cover open hazards. All excavations will be inspected for trapped desert tortoises at the beginning, middle, and end of the work day. Should a tortoise become entrapped, the authorized desert tortoise biologist will remove it immediately.

q. If blasting is required in desert tortoise habitat, a biological monitor will be assigned to each blasting crew or area in which blasting will occur. Prior to any blast, a 200-foot area around the blast site will be surveyed for desert tortoises. Aboveground tortoises will be relocated at least 500 feet from the blast site. Tortoises in burrows within 50 feet of the blast site will be relocated at least 75 feet away from the blast site to an unoccupied existing or artificial burrow. Burrows located between 50 and 150 feet away from the blast site will be flagged and stuffed with newspaper prior to the blast. The newspaper will be removed immediately after the blast and burrows assessed for damage.

r. Routine inspection and maintenance of transmission lines will be limited to the desert tortoise inactive periods of November through February and June through August. All access roads with re-established native vegetation that are used for scheduled, routine maintenance activities will be cleared by a tortoise monitor ahead of any vehicular movement. Should unscheduled, emergency maintenance become necessary, a tortoise monitor will clear the route ahead of vehicular movement.

s. Any incident occurring during project activities that was considered by the biological monitor to be in non-compliance with the mitigation plan will be documented immediately by the biological monitor. The compliance manager will ensure that appropriate corrective action was taken. Corrective actions will be documented by the monitor. The following incidents will require immediate cessation of the construction activities causing the incident, including 1) imminent threat of injury or death to a desert tortoise; 2) unauthorized handling of a desert tortoise, regardless of intent; 3) operation of construction equipment or vehicles outside a project area cleared of desert tortoise, except on designated roads; and 4) conducting any construction activity without a biological monitor where one is required. If the monitor and compliance inspection manager do not agree, the BLM's compliance officer will be contacted for resolution. All parties would refer the resolution to the BLM's authorized officer.

t. Worker Environmental Awareness Program. A Worker Environmental Awareness Program (WEAP) will be prepared. Construction crews and contractors associated with the SWEF or the W APA switching yard or power line will be required to participate in WEAP training prior to starting work on the project. This instruction will include specific desert tortoise training on distribution, general behavior and ecology, identification, protection measures, reporting requirements, and protections afforded by State and Federal endangered species acts.

u. Parked vehicles will be inspected prior to being moved. If a tortoise is observed beneath a vehicle, the authorized desert tortoise biologist will be contacted to move the animal from harm's way, or the vehicle will not be moved until the desert tortoise left of its own accord. The authorized desert tortoise biologist will be responsible for taking appropriate measures to ensure that any desert tortoise moved in this manner is not exposed to temperature extremes that could be harmful to the animal.

v. Should any desert tortoise be injured or killed, all activities will be halted, and the compliance inspection manager and/or authorized desert tortoise biologist immediately contacted. The compliance inspection manager and/or authorized desert tortoise biologist will be responsible for reporting the incident to the authorizing agencies.

w. A report to the Service will be produced reporting all tortoises seen, injured, killed, excavated, or handled. GPS locations of live tortoises will be reported.

x. The applicant will implement a Raven Management Program that will consist of: 1) an annual survey to identify raven nests on towers and any tortoise remains at tower locations; this information will be relayed to BLM so that the ravens and/or their nests in these towers would be targeted for removal, 2) SWEF making an annual or one time contribution to an overall raven reduction program in the Nevada desert, with an emphasis on raven removal in the vicinity of this project.

y. BLM will hold a preconstruction meeting with Duke Energy and the compliance inspection contractor (CIC) to discuss implementation of the terms and conditions of the biological opinion.

10 Transportation Plan. The transportation plan will be implemented during construction, O&M, and reclamation. The year will be divided into three periods based on Mojave desert tortoise activity levels as follows:

a. High activity period – April 1st to May 31st and September 1st to October 31st
b. Moderate activity period – March 1st to March 31st and June 1st to August 31st
c. Low activity period – November 1st to February 28th or 29th

During the high activity periods, a speed limit of 15 miles per hour will be maintained on all roads related to access for construction, post-construction (i.e., operation), and restoration. One biological monitor will travel in front of each piece of construction, post-construction, and restoration equipment and other construction-related vehicles entering and exiting the construction areas. If possible, construction, post-construction, and restoration equipment will be grouped while being escorted by a biological monitor entering and exiting the construction areas. Vans, busses, or carpooling will be employed to reduce the number of worker-related vehicles within the construction, post-construction, and restoration areas. These vehicles will be grouped and escorted by a biological monitor entering and exiting the construction, post-construction, and restoration area.

During the moderate activity period of March 1 to March 31, low activity measures (see below) will be in effect until the temperature exceeds 68°F for three consecutive days or a tortoise is observed. If a tortoise is observed or the temperature exceeds 68°F for three consecutive days, minimization measures for the high activity period will take effect unless the weather forecast for the next day is for the temperature to drop below 68°F.

During the moderate activity period of June 1 to August 31, high activity measures will be in effect until the temperature exceeds 95°F. After the temperature exceeds 95°F, minimization measures for the low activity period will take effect.

During the low activity periods, a speed limit of20 miles per hour will be maintained on all roads related to access for construction, post-construction, and restoration. Construction, post-construction, and restoration equipment entering and exiting a construction site will not need to be escorted by a biological monitor. Vans, busses, or carpooling will be optional to reduce the number of worker-related vehicles within the construction, post-construction, and restoration areas. Vans, busses, or carpooling will still be recommended to reduce the number of worker-related vehicles in construction areas.

11 Remuneration Fees. BLM will ensure payment by the project proponent of remuneration fees (see Tetra Tech 2012 for more details).

4.4.5.4 Desert Tortoise - Residual Effects

Residual effects on desert tortoise would be the same as the residual effects on wildlife species.

4.4.5.5 Chuckwalla and Gila Monster - Direct and Indirect Effects by Alternative

No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on chuckwalla and Gila monster would occur.

Proposed Action - 96 WTG Layout Alternative

Construction. Effects on chuckwalla and Gila monster would be similar to those discussed for desert tortoise. These protected reptiles could be crushed, injured, or killed during grading activities. However, chuckwallas prefer rocky cliff habitat, whereas turbine pads would be constructed on less rocky, level ground; therefore, while encounters with chuckwallas are possible, they are not likely. Gila monsters spend up to 95% of their lives below ground, and not much is known about their habitats (NDOW 2007b); however, it is possible that a Gila monster could be encountered and subsequently injured or killed during construction activities.

It is unlikely that construction of Western's proposed switching station would affect chuckwalla as there is no chuckwalla habitat in the vicinity. Effects of construction of the Switching Station on Gila monster would be similar to those associated with those described above.

O&M and Decommissioning. Similar to effects on other wildlife, increased traffic during operation and maintenance could increase the potential for reptile/vehicle collisions to cause Gila monster and chuckwalla injury or death.

87 WTG Layout Alternative

Under the 87 WTG Layout Alternative, effects on chuckwalla and Gila monster would be similar to those identified under the 96 WTG Layout Alternative; however, nine less turbines are associated with the project, thus causing less acres of permanent and temporary disturbance and thus a slightly greater potential to harm these species. Approximately 152 acres of native vegetation would be permanently removed, 8 acres more than under the 96 WTG Layout Alternative. Disturbance of a temporary nature would affect 230 acres, which is 18 acres less than under the 96 WTG Layout Alternative. However, the type, intensity, and duration of the effects would be similar.

4.4.5.6 Mitigation

To further reduce impacts on Chuckwalla and Gila monsters, both the Applicant and Western would implement the following measures:

MM-BIO-4: TERRESTRIAL WILDLIFE PLAN

A Terrestrial Wildlife Plan has been prepared for the proposed project and would be implemented to reduce impacts on chuckwalla and Gila monster (Appendix B-3: Terrestrial Wildlife Plan). Mitigation measures to reduce impacts on chuckwalla and Gila monster include the following:

- As part of the WEAP identified under the Biological Opinion *Desert Tortoise Measure t*, construction site personnel will be given a packet, which includes NDOW's Gila Monster Status, Identification and Reporting Protocol for Observations (NDOW 2007). The packet will also contain information describing the distinguishing features of a banded Gila monster and instructions on distinguishing a banded Gila monster from chuckwallas and banded geckos, as well as information on the protection status of the species and the consequences of a potential bite.
- All sightings of banded Gila monster and circumstances under which it was encountered, will be immediately reported to NDOW using the Gila Monster Reporting Form. Gila Monsters found dead will be preserved in a freezer-safe container or plastic bag and delivered to NDOW as soon as is feasible. When handling dead Gila monsters, hands shall be kept clear of the lizard's mouth to avoid a reflex-induced, painful and venomous bite.

- Upon finding a Gila monster, all construction activities will be halted in the immediate vicinity of the animal until the animal moves to safety of its own accord, undisturbed.
- During construction activities, qualified on-site biologists conducting desert tortoise monitoring will also monitor for chuckwalla and direct construction workers to allow the animal to move to safety of its own accord, undisturbed.
- If construction occurs during the nesting period, on-site desert tortoise monitors will investigate potential chuckwalla nesting habitat (sandy, well-drained soils) in July and August for signs of nests. These areas will be marked as sensitive areas and avoided to the extent practicable during construction to avoid disturbing eggs.

4.4.5.7 Residual Effects to Chuckwalla and Gila Monster

Residual effects on chuckwalla and Gila monster would be the same as the residual effects described previously for other wildlife species.

4.4.5.8 Bats - Direct and Indirect Effects by Alternative

No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on bats would occur.

Proposed Action - 96 WTG Layout Alternative

Construction. Although temporary in nature, project construction activities and increased vehicle traffic could result in injury or mortality to bats during early morning or early evening hours when construction activities overlap bat foraging activities or migration through the area. It is possible that bat/vehicle collisions could occur; however, bats are able to fly over roads to avoid vehicles, so that effect is expected to be minimal. Noise from construction activities might awaken day roosting or hibernating bats causing depletion of crucial energy reserves.

Approximately 160 acres of bat foraging habitat would be permanently removed and 249 acres would be temporarily affected during construction activities.

Effects to bats as a result of construction of Western’s proposed switching station are expected to be similar to those for the 87 WTG Layout Alternative; however, only 3.5 acres of bat foraging habitat would be permanently removed.

O&M and Decommissioning. During operation of the wind energy facility, bats might be attracted to or passively encounter the RSA (Horn et al. 2008). Bats might fly into or be hit by turbine rotors, which could cause injury or death, while they are congregating or foraging for food. Brazilian free-tailed bats (state sensitive species) and silver-haired bat (no status), both of which were found in the Proposed Project area, might be more susceptible to collisions with turbine blades due to migratory behavior based on previous studies (Arnett et al. 2008).

Bats could also suffer from barotrauma, which results when bats fly within a low-pressure area near the turbine rotors (Baerwald et al. 2008). When a bat flies into this low-pressure area, a rapid expansion of air in the lungs results in haemothorax (or a rupture of pulmonary tissue and bleeding), causing injury and eventually death. The number of bats that might suffer from baurotrauma as a result of the Proposed Project cannot be estimated because some bats could be injured at the facility and then die outside of the post-construction monitoring area (NWCC 2010).

No topographic or habitat features that are considered bat attractants (e.g., large summer day roost, open water surfaces, riparian corridor) exist within or immediately adjacent to the Proposed Project site, which may account for low bat use in the area when compared to bat activities at elevations elsewhere in

Nevada (O'Farrell Biological Consulting 2010). Even for the most heavily used sampling locations within the Proposed Project area, total activity was orders of magnitude less than activity recorded at other locations that did have attractant habitat features. Unfortunately, no correlation between preconstruction surveys and post-construction fatalities has been established (NWCC 2010). Therefore, even though bat activity in the area is lower than at other locations in Nevada, the proportional effects on the bat population cannot be predicted. Post-construction monitoring will be *essential to quantifying effects on bats.*

No effects to bats from O&M and decommissioning of Western's proposed switching station are anticipated.

87 WTG Layout Alternative

Under the 87 WTG Layout Alternative, effects on bats would be similar to those identified under the 96 WTG Layout Alternative; however, nine less turbines are associated with this alternative, slightly decreasing the potential for bat / rotor collisions. The type, intensity, and duration of the effects would be similar.

4.4.5.9 Mitigation

To further reduce impacts on bat, the following measures would be implemented:

MM BIO-5: BIRD AND BAT CONSERVATION STRATEGY

A Bird and Bat Conservation Strategy (formerly called an Avian and Bat Protection Plan [ABPP]) has been developed for the Proposed Project (Appendix B-4: Bird and Bat Conservation Strategy). The BBCS includes a risk assessment and provides for pre-construction surveys (immediately prior to construction as described in APM-13), post-construction monitoring, and adaptive management measures. The intention is not to predict the number of fatalities due to turbine collision as pre-construction data poorly predicts fatalities for birds (Ferrer et al. 2012), but to determine if any species is at high risk to inform post-construction fatality monitoring. The BBSC also includes monitoring requirements and provisions for adaptive management measures based on mortality rates. The final BBCS is included in Appendix B-4: Bird and Bat Conservation Strategy.

4.4.5.10 Residual Impacts on Bats

Residual effects on bats would be the same as the residual effects for other wildlife species.

4.4.5.11 Migratory Birds - Direct and Indirect Effects by Alternative

No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on migratory birds would occur.

Proposed Action - 96 WTG Layout Alternative

Construction. Raptors and non-raptors would be directly affected because the Proposed Project would remove approximately 160 acres of potential foraging habitat for raptors and nesting and foraging habitat for non-raptor species. An additional 249 acres may be temporarily affected during construction activities, but would be reclaimed. It is unlikely that construction grading and clearing activities would result in bird injury or death because most birds can flee the area; however, eggs, nests, and juveniles would be more susceptible to adverse effects. A few species such as burrowing owls might be more susceptible to injury or death during grading activities because they might not flee from their burrows and could become entombed.

Similar to effects on wildlife, increased vehicle traffic could result in injury or death to birds in the Proposed Project area. However, birds are highly mobile and routinely avoid vehicle traffic, so bird injury or mortality from vehicular collisions are expected to be minimal.

Increased noise during construction activities could result in birds, particularly non-raptors, avoiding the area and therefore result in a change of migration or breeding patterns.

Construction of Western's proposed switching station would have similar effects to migratory birds as those discussed above. The switching station would permanently remove 3.5 acres of foraging habitat for raptors and nesting and foraging habitat for non-raptor species.

O&M and Decommissioning. During operation of the facility, non-raptors and raptors might collide with wind turbine rotors or transmission lines, resulting in injury or death. The typical bird community in the Proposed Project area exhibited relatively little change over the 2 years of bird surveys and contains species typical of the Mojave Desert. Even though the proposed project area is within the Pacific Flyway, the project area does not receive a large influx of breeding birds in the spring, and migrants were detected during point counts infrequently and in low numbers (Tetra Tech 2012, Appendix B-4: Bird and Bat Conservation Strategy). The community is comprised of three primary species: the black-throated sparrow, Gambel's quail, and mourning dove. Species richness was higher in the spring compared to the fall, but many of these species were detected on fewer than 5% of the surveys. For example, in spring of 2009, a total of 55 species were observed, but 25 species were detected in less than 5% of the surveys. Thus, the Proposed Project area does not receive a large influx of breeding birds during spring, and migrants pass through infrequently and in low numbers. The overall low mean use and low encounter rates for all non-raptor species suggest that birds are not abundant and most fly below the RSA. These results suggest a low likelihood of interactions with turbines and a low overall risk to birds.

When compared to raptor use data at other wind energy facilities, raptor use at the Proposed Project site was relatively low. However, no installed wind projects in southern Nevada or similar nearby habitat exist so no direct comparisons can be made. Additionally, no golden eagle nests were located within 4 miles of the Proposed Project area. The level of raptor use in the Proposed Project area suggests that raptor mortality is anticipated to be low (Young et al. 2003). Turkey vultures, red-tailed hawks and American kestrels were the most common raptors observed in the Proposed Project area, and fatalities of each species have occurred at wind farms (Thelander et al. 2003, Kerns and Kerlinger 2004, Erickson et al 2004, Anderson et al. 2005, Kerlinger et al. 2006, Jain et al. 2007). However, the overall numbers of and encounter rates for turkey vultures, red-tailed hawks, and American kestrels detected in the Proposed Project Area were low, thereby minimizing the probability of negative interactions with turbines.

Birds, both raptors and non-raptors, would be susceptible to collisions with the Proposed Project's overhead transmission lines and collector lines, which could result in electrocution, injury, or death. However, transmission lines are designed with large separations between energized conductors; and therefore pose bird lower electrocution risks then the lower voltage collector lines that have closer spacing. (Avian Power Line Interaction Committee 2011). Larger raptors can be more susceptible to electrocutions because their large wing-span might contact two transmission wires. Red-tailed hawks were observed near the Proposed Project area roosting on transmission line towers. New transmission line towers associated with the Proposed Project might attract red-tailed hawks to the project area, thus making them more susceptible to collisions with turbines.

Bird-Switching Station interactions are possible and could result in electrocutions and injury or death. Similar to power lines, the higher transmission voltage sections of substations are typically spaced with adequate separation to protect large birds; however, lower voltage power lines within substations may pose electrocution risks (Avian Power Line Interaction Committee 2011).

87 WTG Layout Alternative

Under the 87 WTG Layout Alternative, effects on migratory birds would be similar to those identified under the 96 WTG Layout Alternative; however, nine less turbines are associated with this alternative presenting less potential for bird / rotor collisions. However, the type, intensity, and duration of the effects would be similar.

4.4.5.12 Mitigation

During construction, preconstruction surveys would be completed immediately prior to activities. If an active nest is located, no construction activities would occur within 100 feet of the nest (APM-13). To further reduce impacts on migratory birds, the following measures would be implemented:

MM BIO-5: BIRD AND BAT CONSERVATION STRATEGY.

A Bird and Bat Conservation Strategy (formerly called an Avian and Bat Protection Plan [ABPP]) has been developed for the Proposed Project (Appendix B-4: Bird and Bat Conservation Strategy). The BBCS includes a risk assessment and provides for pre-construction surveys (immediately prior to construction as described in APM-13), post-construction monitoring, and adaptive management measures. The intention is not to predict the number of fatalities due to turbine collision as pre-construction data poorly predicts fatalities for birds (Ferrer et al. 2012), but to determine if any species is at high risk to inform post-construction fatality monitoring. The BBSC also includes monitoring requirements and provisions for adaptive management measures based on mortality rates. The final BBCS is included in Appendix B-4: Bird and Bat Conservation Strategy.

MMBIO-6: BURROWING OWL PROTECTION DURING CONSTRUCTION:

For burrowing owls, biological monitors will use USFWS survey methods and mitigation measures presented in *Protecting Burrowing Owls at Construction Sites in Nevada's Mojave Desert Region* (USFWS no date specified).

MM BIO-7: TRANSMISSION LINE DESIGN

All overhead power lines will be designed using the *Suggested practices for Avian Protection on Power Lines: State of the Art in 2006 manual and Mitigating Bird Collisions with Power Lines: The State of the Art in 1994.*

4.4.5.13 Residual Effects – Migratory Birds

Residual effects on migratory birds would be the same as the residual effects for other wildlife species.

4.4.5.14 Game - Direct and Indirect Effects by Alternative

96 WTG Layout Alternative

Construction, O&M, and Decommissioning. Although temporary in nature, noise and activity associated with construction and decommissioning could cause game animals to avoid the area, thus altering their normal behavior patterns. New structures, roads and increased human presence may affectively serve as a barrier that suppresses or eliminates connectivity between populations of bighorn sheep in the Newberry and Eldorado Mountains (NDOW 2011). However, the project would only occupy a small portion of the available migratory corridor between these mountain ranges leaving some connectivity between the ranges; therefore, the project effects are anticipated to be minimal.

No effects to game animals are anticipated during the construction, or operation of Western's proposed switching station.

87 WTG Layout Alternative

Under the 87 WTG Layout Alternative, effects on game species would be similar to those identified under the 96 WTG Layout Alternative; however, nine less turbines are associated with this alternative reducing the potential impacts on game. However, the type, intensity, and duration of the effects would be similar.

4.4.5.15 Mitigation Measures

MM BIO-4: TERRESTRIAL MITIGATION PLAN

The Applicant has prepared a Terrestrial Wildlife Plan (Appendix B-3: Terrestrial Wildlife Plan). This Terrestrial Wildlife Plan includes a risk assessment and mitigation measures for the bighorn sheep, which include the following:

- Appropriate fencing will be installed around guy wire anchor points of existing met towers.
- Upon finding bighorn sheep in the area proposed for construction, all construction activities will be halted in the immediate vicinity of the animal until the animal moves to safety of its own accord, undisturbed. If sheep do not move within two hours from areas proposed for construction, Pat Cummings at NDOW (702-486-5127 x3212) will be contacted to determine the appropriate measures to encourage sheep to move from the construction area.

MM BIO-8: WILDLIFE WATER DEVELOPMENTS

If construction and operations effect the water developments directly, the applicant would compensate NDOW to relocate the water development inclusive of any administrative clearances (i.e. NEPA, Cultural) required by the BLM.

4.4.5.16 Residual Effects – Game

Residual effects on game would be the same as the residual effects for other wildlife species.

4.5 Cultural Impacts

The NHPA requires government agencies to take into account the effects of their actions on properties listed or eligible for listing on the NRHP. The process begins with the identification and evaluation of cultural resources for NRHP eligibility, followed by an assessment of effect on these eligible resources, and in consultation with the State Historic Preservation Office (SHPO), Native Americans, and other interested parties.

4.5.1 Indicators

Impacts to cultural resources were assessed in terms of the duration, intensity, and type as discussed below.

Duration. Any change to the physical attributes of historic property is considered long-term and of permanent duration.

Intensity. The description of the intensity of an impact to a cultural resource is limited to whether the impact is deemed an adverse effect or no adverse effect, as defined in the implementing regulations (36 CFR Part 800) for Section 106 of the NHPA. An adverse effect would be considered a major impact under NEPA. The NHPA guidelines for adverse/no adverse effect thresholds are shown in Table 4.5-1.

Table 4.5-1. Intensity of Environmental Consequences on Cultural Resources

Impact Intensity	Definition of Intensity
No Adverse Effect	There are no adverse effects if no historic property is present or the action will have no effect on historic properties. If an impact results in no alterations to the characteristics of a historic property, which qualify it for inclusion, or eligibility to the NRHP, the action is considered to have no adverse effect. For archeological investigations, measures approved by BLM, cooperating agencies, and the Nevada SHPO must be implemented to avoid or minimize effects to be considered no adverse effect. If no agreement among the above parties can be reached, the effect would remain adverse.
Adverse Effect	An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (NHPA 36 CFR 800.5(a)(1)).

Type. Under NHPA, unlike NEPA, only adverse impacts are taken into consideration. Adverse impacts to archeological resources include changes in visitor use patterns that increase access to sites, unauthorized artifact collection, vandalism, soil compaction, and ground disturbance within area site (e.g., earth-moving activities or increased erosion).

4.5.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative as prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.5.2.1 No Action Alternative

Under the No Action Alternative, the ROW applications would be denied and the Proposed Project would not be built; therefore, no project related effects on cultural resources would occur.

4.5.2.2 96 WTG Layout Alternative

Construction and use of the proposed WTGs, power transmission lines, and associated access roads will have direct and indirect adverse effects on historic properties that are eligible for NRHP listing. Direct impacts include those related to construction, road grading, and other actions that will occur as the facilities are built. Indirect impacts are those that result from increased visitation to the area, affecting sites both within the project area and nearby, as well as visual and audible impacts. Increased visitation impacts include more people walking over sites and either knowingly or unknowingly adversely affecting sites.

The Congressional route of the Mojave Road Variant of the Old Spanish Trail would not be directly or indirectly affected by the proposed project. The town of Searchlight, bladed roads and highways, and multiple utility and power transmission lines has impacted this route.

The indirect effects APE was extended to include the adjacent small historic mining town of Searchlight. An historic building and structure survey of Searchlight revealed that 34 parcels have buildings constructed between 1910 and 1965. More than half are residential and most were built after World War II. The majority of buildings have lost their historical integrity due to demolition or substantial alteration. Fifteen buildings may retain either historical and/or architectural integrity, but the town and its elements have not been fully recorded and formally evaluated and there would be no direct or visual effects to the original center of town. The commercial buildings are located along U.S. Highway 95 and the historic-aged residences are intermixed with newer homes, trailers, and empty lots. There would be no visual adverse effects to the town of Searchlight as all proposed tower locations are at least two miles away and would not be easily seen by a casual observer from any of the historic structures within the town.

One prehistoric and three historic NRHP-eligible sites could be impacted by the project activities. Different intensities of impacts were demonstrated in the four sites:

- Prehistoric site 26CK3635, a small rock shelter, is near existing dirt and paved roads. It is unlikely that public access would increase. There would be no direct impacts from Project activities.
- Historic JET Mine 26CK7718 is located on both private and BLM-managed land and has a primary community access road passing through it. It is proposed that this existing dirt road is to be widened up to ten additional feet on either side of the road and this would have a direct adverse effect. However, no NRHP-contributing features would be affected by this widening. The increased width of the road may contribute to an indirect effect from an increase in public use. Indirect effects to the setting of the site may also occur from being able to view the proposed turbines when looking east from the mining complex.
- Historic New Era Mine complex 26CK7654 has an existing dirt road passing through the complex and it is proposed to be widened an additional twenty feet and would be a direct adverse impact. However, no NRHP-contributing features would be affected by this widening. One turbine had been proposed to be situated on top of NRHP-contributing features within the site; however, this turbine has been relocated to another inventoried location. One other turbine is situated within the western edge of the site, but it is in a non-contributing area of the site. Indirect adverse effects would occur from having turbines easily visible from all directions from the site and would affect the setting.
- Historic Oakland Mine complex 26CK9294 was originally proposed to have the road passing through the site as a project access road, which would have needed to be widened. The Project Proponent concurred that an alternate inventoried access road could be used instead, thus no direct effects to the site would occur. Indirect visual effects would occur from being able to view the proposed turbines when looking northeast or possibly south from the site.

The duration of all of the unmitigated visual impacts is considered to be the lifetime of the proposed project.

4.5.2.3 87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be the same to those identified under the 96 WTG Layout Alternative.

4.5.3 Mitigation

As described above, various kinds and levels of adverse effects are expected. Table 4-2 describes the impacts and types of Section 106 mitigation recommended for the four sites recommended eligible for listing on the NRHP as well as impacts per NEPA from a Native American tribal perspective as presented in Section 5.2.4 of this document.

Table 4.5-2. Types of Impacts and Recommended Mitigation Measures

Site	Type of Impact	Intensity	Duration if Unmitigated	Mitigation Options
26CK3635	Indirect	Low	Length of Project	Avoid and Monitor during Construction
26CK7718 (JET)	Direct	Low	Length of Project	Monitor During Construction
	Indirect	Low	Length of Project	Avoid or Mitigate
26CK7654 (New Era)	Direct	Moderate	Length of Project	Monitor during construction
	Indirect	High	Length of Project	Avoid or Mitigate
26CK9294 (Oakland)	No Direct Indirect	High	Length of Project	Mitigate
Cultural Landscape	Direct	Moderate	Length of Project	Monitor during Construction
	Indirect	High	Length of Project	Ethnographic/Ethnohistoric study of the Project region
	Cumulative	High	Length of Project	Ethnographic/Ethnohistoric study of the Project region

MM CR-1: ARCHAEOLOGICAL MONITOR

An archaeological monitor will be required during access road construction, widening of existing roads, and any other ground-disturbing activities in order to protect known or unidentified cultural resources from project impacts.

MM CR-2: ETHNOGRAPHIC/ETHNOHISTORIC STUDY

An ethnographic/ethnohistoric study will be conducted to better understand the relationship of Native peoples to the cultural landscape in this region.

MM CR-3: DEVELOPMENT OF A MEMORANDUM OF AGREEMENT

Development of a Memorandum of Agreement would outline the roles and responsibilities of the affected parties. The Project Proponent would be required to fund an interpretive kiosk to be placed along Cottonwood Road (Highway 163) and an interpretive brochure on the history of the New Era Mine and its illustrious owner Sam Yet. The interpretive materials will be prepared by the BLM in partnership with the Lake Mead National Recreation Area. The MOA would also include an ethnographic/ethnohistoric study of the proposed project region.

The Memorandum of Agreement would need to be completed prior to the signing of the Record of Decision for this EIS. The mitigation measures would need to be completed prior to a BLM Notice to Proceed for project construction is authorized.

4.5.4 Residual Effects

The Proposed Project after construction would not have any residual impacts on cultural resources relative to the criterion outlined in this section.

4.6 Air Quality Impacts

This section discusses effects of the Proposed Project on existing air quality and climate that might occur with implementation of the Proposed Action, alternatives, or Western's proposed switching station.

The wind energy generation portion of the Proposed Project has an expected life of 30 years, with construction projected to occur over 8 to 12 months. It is anticipated that there would be long-term and short-term impacts on air quality due to emissions associated with project construction, O&M, and decommissioning. Air emissions associated with the Proposed Project including Western's proposed switching station would be primarily short term and chiefly associated with engine exhaust from the combustion of fossil fuels in construction equipment and fugitive dust during construction. Relatively less significant contributions to air emissions would be generated from on-road travel of vehicles for worker commutes and delivery of materials and equipment to the Proposed Project site. Estimates of vehicle types, vehicle numbers, and vehicle trips during construction, O&M, and decommissioning used to calculate emissions associated with the Proposed Project are based on industry standards established for the construction, O&M, and decommissioning of similar wind energy facilities.

Wind energy generation projects do not involve the combustion of fuels to generate electricity, so there would be no air quality impacts from the generation of power. In addition, there would be no large combustion sources on site. O&M emissions would be produced by the vehicles used by an estimated 15 workers commuting daily to the site, some onsite vehicles (such as pickup trucks and flatbed trucks), and small-scale comfort heating and cooling needs for the O&M building.

It is expected that a similar scale of air emissions for construction would occur during the Proposed Project's decommissioning. The activities involved in the facility closure would depend on the expected future use of the site. Therefore, the extent of site closure activities would be determined at the time of the closure. A conservative estimate of the air emissions associated with decommissioning would be similar to those present for the construction phase of the Proposed Project.

4.6.1 Indicators

The Proposed Project would affect air quality if it:

- Conflicts with or obstruct implementation of an applicable air quality plan;
- Violates any air quality standard or contribute substantially to an existing or projected air quality violation;
- Exposes sensitive receptors to substantial pollutant concentrations;
- Increases ambient pollutant concentrations from below to above any NAAQS;
- Contributes to an existing violation of any NAAQS;
- Impairs visibility within federally mandated PSD Class I areas, or
- Results in non-conformance with the CAA or any State Implementation Plan.

Clean Air Act Conformity

The CAA of 1990 requires federal agencies to ensure their actions conform to the CAA's requirements and federally enforceable plans, including state implementation plans. The conformity assessment process ensures that federal agency actions would not cause or significantly contribute to an exceedance of ambient air quality standards, and would not delay timely progress toward compliance with ambient air quality standards in areas where they are not currently being met.

Project construction impacts would be temporary in nature and minor to moderate in magnitude. Those emissions would not be sufficient to cause any new violations of ambient air quality standards, or to significantly contribute to CO levels.

Direct project operational impacts on air quality would be minimal and not adversely affect compliance with air quality standards in the Proposed Project area. Indirectly, the Proposed Project would enhance regional air quality by supporting practical delivery of renewable energy onto the local energy grid.

Climate Change/Greenhouse Gases

The environmental analysis and documents produced during the NEPA process should provide the decision maker with relevant and timely information about the environmental effects of the decision and reasonable alternatives to mitigate these impacts. In this context, climate change issues arise in relation to the consideration of (1) the effects of GHG emissions from a Proposed Action and alternative actions and (2) the relationship of climate change effects on a Proposed Action or alternatives, including the relationship to proposal design, environmental impacts, mitigation, and adaptation measures. Effects of GHG emissions and climate change from each alternative are presented in the analysis in Section 4.6.2. GHG impacts from the Proposed Project would affect the environment if they would:

- Help or hinder attainment of the state's goals of reducing GHG emissions (Nevada Climate Change Advisory Committee [NCCAC] 2008);
- Increase the consumption of energy resources, especially fossil fuels;
- Generate GHG emissions, either directly or indirectly, that might have a significant impact on the environment; or
- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

4.6.2 Direct and Indirect Effects to Air Quality by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.6.2.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on air quality would occur.

4.6.2.2 Proposed Action – 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Action would proceed. Effects that could result from the implementation of the Proposed Action during construction, O&M, or decommissioning activities are analyzed in this section. Under this alternative, 249 acres would be temporarily disturbed and 160 acres would be permanently disturbed in the Proposed Project area. The Applicant has incorporated the following measures to avoid and minimize impacts on air quality and climate within the project area:

- APM-1 Erosion Control
- APM-2 Excavation/Grading
- APM-3 Air/Dust Control
- APM-4 SWPP
- APM-5 SPCC Plan
- APM-6 Health and Safety Program

- APM-8 Waste Management Plan
- APM-9 Weed Control Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. For construction of Western's proposed switching station, Western requires the construction contractor to obtain the appropriate construction related permits. Additionally, Western will require the construction contractor to incorporate specific provisions addressing prevention of air pollution in Western's Construction Standard 13, specifically the following sections:

- 13.3 Landscape Preservation
- 13.5 Noxious Weed Control
- 13.13 Prevention of Air Pollution

Air Pollutant Emissions

Construction. Construction of the Proposed Project would take approximately 8 to 12 months and would generate emissions of CO, CO_2, NO_X, VOCs, SO_2, particulate matter with a mean aerodynamic diameter of 10 micrometers or less (PM_{10}), and particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$). Ozone (O_3) is not emitted directly from emission sources, but is created in the atmosphere via a chemical reaction between NO_X and VOCs in the presence of sunlight; these compounds are referred to as ozone precursors. Table 4.6-1 presents estimates of total emissions during construction, both as a yearly average as well as total emissions from all construction activities. Actual emissions can be reasonably expected to be lower than the emissions listed in this table.

Table 4.6-1. Criteria Air Pollution Emissions (Tons/Year) Over the 8 to 12 Month Proposed Project Construction Duration of the 96 WTG Alternative

Source	CO	CO_2	NO_X	VOC	SO_2	PM_{10}	$PM_{2.5}$
WTG and site construction	43	8,450	52	8	0.10	63.8	12
Transmission line construction	6.0	1,885	16	1.8	0.02	5.7	1.3
TOTAL	**49.3**	**10,335**	**68**	**9.8**	**0.12**	**69.5**	**13.3**
General Conformity *de minimis Thresholds*	**100**		**100**	**100**		**70**	

CO = carbon monoxide; CO_2 = carbon dioxide; NO_X = nitrogen oxides; PM_{10} = particulate matter with a mean aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less; SO_2 = sulfur dioxide; VOCs = volatile organic compounds

The construction activities would generate air pollutant emissions. The construction phase of the Proposed Project would temporarily cause fugitive dust related to grading and other construction activities. Sources of dust emissions would include the earth work for WTG foundations, substations, Western's proposed switching station, O&M building, laydown yards, communications and transmission line structures, and access roads; wind erosion from those areas where vegetation would be removed; active earth-moving or ground-breaking activities, including digging and ground contouring; activities associated with setting foundations for the WTGs, substation structures, switching station, O&M building, O&M building septic system, and transmission line structures; construction traffic on unpaved roads; and potentially tracked-out soil material resuspended by paved road traffic. A temporary cement batch plant, rock crusher, and construction operation trailer pad would also be located on site. In addition, heavy equipment and worker vehicles would be a source of exhaust emissions during the construction of the Proposed Project.

Exhaust and fugitive dust emissions generated from construction equipment and vehicles would increase ambient concentrations of air pollutants, but are not expected to contribute to regional exceedances of NAAQS criteria air pollutants, for which the area has been designated as nonattainment by the EPA for O_3. The temporary air quality impacts associated with construction would end immediately after construction.

Under the 96 WTG Alternative, the yearly construction emissions totals for NO_X, CO, and PM_{10} would be less than the *de minimis* thresholds as specified under the federal General Conformity Rule (40 CFR 93); thus, project-related emissions are assumed conform to state implementation plans (SIPs) and the regional air quality plans. In addition, any approved construction or new significant source of stationary (point) air pollution in Clark County would be required by the Clark County DAQ to adhere to the prescribed BMPs and control measures to minimize dust emissions and control engine exhaust emissions.

Estimated emissions of criteria air pollutants during the construction process are listed in Table 4.6-1. The estimate of dust from exposed ground calculations is very conservatively assumed that half of all project areas could be exposed at any one time. Implementation of APM-3 would minimize those emissions.

Reclamation or construction areas would reduce the acreage of exposed (i.e., not vegetated) ground in the Proposed Project area to access roads, plus two graveled acres at the two proposed substations. The total construction impact area for all project features would be approximately 409 acres. Following the reclamation of 249 acres of construction impacts areas, the total acreage with permanently disturbed ground surfaces potentially opened to wind erosion would be approximately 160 acres. Isolated impacts from dust could persist near the remaining areas where WTGs, access roads, and transmission lines would result in soil disturbances. Implementation of APM-3 would minimize those emissions.

At Western's proposed switching station about half of the 7 acre site will be graveled (3.5 acres) and the other half will be reclaimed (2.5 acres). For construction of the switching \station the Western will require the construction contractor to incorporate specific provisions addressing prevention of air pollution in Western's Construction Standard 13.

<u>*O&M and Decommissioning.*</u> Estimated annual operations emissions for criteria air pollutants and GHGs are listed in Table 4.6-2. These estimates are based upon the assumption of 75.2 miles of round trip gravel road travel for maintenance surveys and routine maintenance, and heavy equipment maintenance activity at up to one-tenth the activity level anticipated during construction.

Table 4.6-2. Criteria Air Pollutant Emissions (Tons/Year) During the Proposed Project O&M Duration of the 96 WTG Alternative

Source	CO	CO_2	NO_X	VOC	SO_2	PM_{10}	$PM_{2.5}$
Emissions generated by maintenance and operation site traffic	1.5	200	0.15	0.16	0.002	1.1	0.2
Windblown dust from exposed ground	--	--	--	--	--	15.1	2.2
TOTAL	**1.5**	**200**	**0.15**	**0.16**	**0.002**	**16.2**	**2.4**
General Conformity *de minimis* Thresholds	**100**		**100**	**100**		**70**	

CO = carbon monoxide; CO_2 = carbon dioxide ; NO_X = nitrogen oxides; PM_{10} = particulate matter with a mean aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less; SO_2 = sulfur dioxide; VOCs = volatile organic compounds

Ongoing emissions associated with O&M of the Proposed Project would be attributable to mobile combustion emissions from worker commutes and delivery trips, as well as limited fugitive dust from inspection, and O&M vehicles traveling on unpaved roads and from areas with disturbed soils, such as the laydown area and substations. Other sources of ongoing emissions would include corona activity on electrical elements in open air, which could produce limited amounts of gaseous O_3 or NO_x , and SF6 that would be used as a gaseous dielectric medium in the gas breakers proposed for the switching station and substations. SF6 releases would be limited based upon Western's handling and monitoring practices. Table 4.6-2 lists the maximum annual criteria air pollutant emissions anticipated during the O&M phase.

The Proposed Project would require an operational workforce of up to 15 full-time employees. This workforce would include administrative and management personnel, operators, and security and maintenance personnel. O&M would require the use of vehicles and equipment, including trucks for onsite WTG and substation maintenance, refueling, and lubricating, and crane trucks for WTG elevated equipment maintenance/replacement. Pickup trucks would be in daily use on the Proposed Project site, with occasional use of flatbed or other types of medium-duty trucks as needed.

Ground disturbance along the access roads would be subject to wind erosion. Maintenance surveys would be expected to result in dust and exhaust emissions from routine checks by vehicles along that linear access road and at the project substation components. Maintenance would be performed as necessary, resulting in emissions types like those described during the construction phase. Maintenance efforts would be intermittent, generally of short duration, and would not approach the level of activity described during the construction phase. As the access road to Western's proposed switching station would be graveled long term particulate and dust impacts from vehicle use during operations would be minimized.

It is anticipated that during decommissioning, a similar scale of effort and resultant emissions would occur as with the construction phase and, therefore, there would not be a significant impact on air quality during the decommissioning phase of the Proposed Action.

GHG Emissions

Construction. Climate change analyses are comprised of several factors, such as GHG emissions, land use management practices, and the Albedo effect (i.e., the reflecting power of a surface). The tools necessary to quantify specific climatic impacts of those factors are presently unavailable. As a consequence, impact assessment of specific effects of anthropogenic activities cannot be determined. Additionally, specific levels of significance have not yet been established. Therefore, climate change analysis for the purpose of this document is limited to accounting and disclosing of factors that have been identified to contribute to climate change. Qualitative evaluation of potential contributing factors is included where appropriate and practicable. GHG emissions are estimated with and without the Proposed Action and alternatives. An increase in unsequestered GHG emissions would lead to incrementally increased GHG concentrations in the atmosphere. This in turn would contribute to further manifestations of climate change.

The Proposed Project would emit GHGs during the construction phase, which could last 8 to 12 months, primarily from the exhaust of equipment and transportation of employees and materials to and from the site. Table 4.6-1 provides an estimate of cumulative CO_2 emissions associated with the construction phase. These would be one-time emissions, which would cease when the construction phase is completed.

O&M and Decommissioning. The O&M phase would include minimal SF6 loss from Western's circuit breakers, based on Western's handling and monitoring practices. O&M activities would include vehicular travel and maintenance activities that would release GHGs. Table 4.6-2 provides an estimate of annual CO_2 emissions estimated per year for the O&M phase of the project. The CO_2 emission calculations assume approximately 346,320 miles per year of paved road travel, approximately 17,550 miles per year of unpaved road travel, and O&M activity at one-tenth of the level during the project's construction phase. Decommissioning phase GHG emissions are expected to be on a similar scale as construction GHG emissions. GHG emissions during decommissioning could be reduced by implementation of MM AIR-2, 3, 4, 5 and 7. GHG emissions could be mitigated by removal and recycling of CF6 from Western's electrical equipment during decommissioning of Western's proposed switching station .

NewAlthough not quantified due to the speculative nature of GHG emissions impacts, long-term generation of renewable electricity could have ongoing, long-term air quality and climate benefits, including potential avoidance of GHG emissions associated with electricity production from traditional fossil fuel resources. The Proposed Action's potential to produce GHG emission-free renewable energy represents an air quality and climate mitigation measure.

GHG Emissions and Contribution to Global Warming

This section considers detailed information about the potential for construction, operation and maintenance, and decommissioning related activities to emit GHGs and contribute to global warming. GHG emissions are quantified in Table 4.6-3. Agencies under the U.S. Department of the Interior are required to consider potential impact areas associated with climate change, including potential changes in flood risk, water supply, sea level rise, wildlife habitat and migratory patterns, invasion of exotic species, and potential increases in wildfires.

Construction: Construction of the proposed project will involve coordination of numerous personnel and equipment. Construction activities would result in short-term, unavoidable increases in vehicle and equipment emissions, including GHGs. The GHG emissions estimate for construction is provided in

Table 4.6-3. Construction Related GHG Emissions (Tons) for 96 WTG Layout Alternative

Source	CO_2 - Equivalent
WTG and site construction	28,200
Transmission line construction	6,700
TOTAL	**34,900**

In addition to direct emissions of GHGs, construction of the 96 WGT layout would permanently disturb 159 acres of land and completely remove vegetation. This would reduce the ongoing natural carbon uptake by vegetation. A study of the Mojave Desert indicated that the desert may uptake carbon in amounts as high as 100 grams per square meter per year (Wohlfahrt et. al. 2008). This would equate to a maximum reduction in carbon uptake, calculated as CO_2 of 1.48 metric tons of CO_2 per acre per year for areas with complete vegetation removal. The equivalent loss in carbon uptake for the 96 WGT layout would be about 235 metric tons per year (258 tons/year).

Operations and Maintenance. Electricity generation GHG emissions are generally dominated by CO_2 emissions from carbon-based fuels. For this wind energy project the primary fuel is wind that is GHG-free. However, gasoline and diesel fuel would be used in maintenance vehicle, staff and employee vehicles. SF6 emissions from Western's circuit breakers would be minimal. The GHG emissions estimate for operations and maintenance is provided in Table 4.6-4.

Table 4.6-4. O & M Related GHG Emissions (Tons/Year)for the 96 WTG Layout Alternative

Source	CO_2 - Equivalent
Maintenance, staff and employee vehicles	273
TOTAL	**273**

Decommissioning. Decommissioning related activities would emit GHGs when the facility is dismantled and the site is reclaimed and revegetated. It is anticipated that such emissions would be caused by operation of construction equipment and motor vehicles; related impacts would be a one-time, limited duration event. Project specific contributions to global climate change during the decommissioning phase are evaluated using the same methods as initial construction emissions, and are anticipated to be comparable in type and magnitude, but likely to be lower than the construction emissions discussed above.

Hydrologic Resources: In Nevada and much of the western U.S., climate change is expected to result in several potential effects related to water resources. These include potential sea level rise, potential changes in the frequency of flooding and droughts, and potential reductions in surface water supply.

Sea Level Rise: Sea level rise is expected to occur as a result of increased global temperatures. Increased global temperatures include increases in ocean temperature, as well as air temperature. As water temperature increases, the water contained in the world's oceans would undergo thermal expansion. Increase temperatures could also result in a net melting and reduction in the polar ice sheets. These effects could result in an increase in the level of the world's oceans. However, these potential effects are not expected to affect the Proposed Project site, which is located approximately 200 miles from the Pacific Ocean, and at an elevation of at least 3,000 feet above mean sea level. The proposed project would not be affected by sea level rise.

Snowpack and Snowmelt Period: Changes in snowpack and snowmelt period are anticipated in Nevada and the Colorado River watershed as a result of climate change. Climate change is expected to result in generally warmer temperatures, which would result in a greater proportion of total annual precipitation falling as rain. Snowpack in the Colorado River watershed serves as a temporary means of water storage with water releases slowly during snowmelt. If a greater proportion of precipitation falls as rain, the snowpack would be lessened, and the potential for storage in the snowpack would be lessened. Warmer temperatures would cause earlier snowmelt events, potentially reducing the ability of water managers to capture snowmelt in reservoirs. However, there is no snowpack in the vicinity of the Proposed Project, and the SEEP is not dependent upon snowmelt water for water supply. Therefore, the proposed project would not be affected by potential changes in snowpack characteristics.

Dilution: Dilution refers to the amount of water that is available in a receiving body into which wastewater is discharged. Under some circumstances, climate change could result in a change in the volume or timing of water flows that are available in a stream for dilution of wastewater. The proposed project would not discharge wastewater into surface waters. Therefore, potential climate related changes in dilution capacity would not affect the Proposed Project.

Water Temperature: Water temperature can be critical to fisheries resources. The site and vicinity do not contain any perennial waterways that could support fisheries. The Proposed Project would rely on water supply from the local public water utility, which obtains its supply from public groundwater wells, and the temperature of the groundwater would not be critical to the project operation. The Proposed Project would not result in water discharge or other activity that would affect water temperature along the Colorado River. No component of the Proposed Project would alter reservoir flows or otherwise change water management operations such that water temperature would be altered. Potential changes in water temperature would not affect the project.

Flooding, Drainage, and Erosion: Climate change is anticipated to affect the frequency and intensity of extreme weather events, including large storm events and droughts, in the western U.S. watersheds including the Colorado River. The degree of change is uncertain, most likely the Colorado River watershed would experience an increase in the frequency and intensity of rainfall/flood events. This could result in an increase in potential stormwater runoff and flooding, an increase in erosion and sedimentation on site and downstream of the site. Increase in the frequency and intensity of droughts are discussed under water availability within this section. Impacts from erosion would be mitigated through the implementation of MMs 1-5 and APM-9. Erosion from flooding and drainage would be mitigated by implementing APM-10 and regarding roads and revegetation of disturbed areas following decommissioning of the facility.

Water Resources Availability: The site is located within the watershed to the lower Colorado River and some drainages on the site drain to the Colorado River. Surface waters at the subject site occur only during intense precipitation events, where surface water runoff occurs. There are no perennial streams or other waterways located on the site, and the Proposed Project would not rely on surface water for water supply during construction of operations. The Proposed Project would rely upon water from the public water utility, which obtains water from public water wells near Searchlight.

In the event that climate change results in reduced precipitation within the project area some degree of associated recharge reduction in groundwater recharge from rainfall would occur. This would not result in increased water requirements for the Proposed Project, and would not result in increased use of water from the public water utility for construction or operations or maintenance. No increase in groundwater pumping would be required as a result of the effects of climate change.

If climate change does result in reduced recharge to the groundwater basin that supplies the public water utility there could be effects on groundwater levels. The use of water from the public water utility for construction and operations and maintenance could have an effect on water levels, which could be further impacted by reduction in groundwater recharge due to climate change.

Wildfire Risks: Climate change would result in a small but general increase in temperature and could also increase the frequency of extreme weather events that could generate wildfires, such as increased frequency of drought and heat waves. Although the risk of wildfire that could affect the site could increase as a result of climate change, these potential increases in risk are expected to be offset by ongoing compliance with the worker safety and fire protection regulations including mitigation measure MM SAFE-4.

Heat Waves: The frequency and occurrence and severity of heat waves could increase as a result of climate change. Heat waves could result in increased potential risk to project employees. Such risks would be mitigated by implementation of MM SAFE-3 during construction, operations and maintenance and decommissioning. This measure would require implementation of a health and safety plan to protect workers against the effect of heat related hazards. Although the frequency and intensity of heat wave events could increase as a result of future climate change, the heat stress protection plan would provide for worker safety in accordance with state and federal requirements.

Soil Moisture: Climate change could result in increases in extreme weather events, including droughts and heat waves, and an overall reduction in precipitation. These conditions could result in a reduction in soil moisture content at the site and regionally. Reduction in soil moisture content would not affect the proposed project operations and would not require any change in water resource usage. The Proposed Project would not contribute to reductions in soil moisture.

Fugitive Dust: During construction, operations and maintenance, and decommissioning fugitive dust emissions would require mitigation to be compliant with federal, state and county regulations. Fugitive dust would be mitigated by implementation of the requirements of the Clark County DAQ for dust control and APM-3. The soils at the site have very low natural soil moisture content as a result of low rainfall and high evaporation rates of the desert environment of southern Nevada. Any potential further reductions in soil moisture associated with climate change are not anticipated to result in a substantial increase in fugitive dust emissions. The proposed mitigation measures would be sufficient to meet federal, state and county regulations regarding fugitive dust.

4.6.2.3 87 WTG Layout Alternative

Construction. For the 87 WTG Layout, effects to air quality would be similar to those associated with the 96 WTG Layout; however, the area of disturbance is slightly less therefore the impacts to air quality are slightly reduced under this alternative. Table 4.6-5 presents estimates of total emissions during construction, both as a yearly average as well as total emissions from all construction activities. Actual emissions can be reasonably expected to be lower than the emissions listed in this table.

Table 4.6-5. Criteria Air Pollution Emissions (Tons/Year) Over the 8 to 12 Month Proposed Project Construction Duration for the 87 WTG Layout Alternative

Source	CO	CO_2	NO_X	VOC	SO_2	PM_{10}	$PM_{2.5}$
WTG and site construction	41	8,042	50	7.78	0.09	59	11
Transmission line construction	6	1,885	15.7	1.8	0.02	5.7	1.3
TOTAL	**47**	**9,927**	**65.7**	**9.5**	**0.11**	**64.7**	**12.3**
General Conformity *de minimis* Thresholds	**100**		**100**	**100**		**70**	

CO = carbon monoxide; CO_2 = carbon dioxide; NO_X = nitrogen oxides; PM_{10} = particulate matter with a mean aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less; SO_2 = sulfur dioxide; VOCs = volatile organic compounds

O&M. Estimated annual operations emissions for criteria air pollutants and GHGs are listed in Table 4.6-6. These estimates are based upon the assumption of 71.8 miles of roundtrip gravel road travel for maintenance surveys and routine maintenance, and heavy equipment maintenance activity at up to one-tenth the activity level anticipated during construction.

Table 4.6-6. Criteria Air Pollutant Emissions (Tons/Year) During the Proposed Project O&M Duration for the 87 WTG Layout Alternative

Source	CO	CO_2	NO_X	VOC	SO_2	PM_{10}	$PM_{2.5}$
Emissions generated by maintenance and operation site traffic	1.7	222	0.16	0.18	0.002	1.2	0.19
Windblown dust from exposed ground	--	--	--	--	--	14.4	2.16
TOTAL	**1.7**	**222**	**0.16**	**0.18**	**0.002**	**15.6**	**2.35**

CO = carbon monoxide; CO_2 = carbon dioxide ; NO_X = nitrogen oxides; PM_{10} = particulate matter with a mean aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = particulate matter with a mean aerodynamic diameter of 2.5 micrometers or less; SO_2 = sulfur dioxide; VOCs = volatile organic compounds

For the 87 WTG Layout is that the yearly construction emissions totals for NO_X, CO, and PM_{10} would be less than the *de minimis* thresholds as specified under the federal General Conformity Rule (40 CFR 93); thus, project-related emissions are assumed to conform to SIPs and the regional air quality plans. In addition, any approved construction or new significant source of stationary (point) air pollution in Clark County would be required by the Clark County DAQ to adhere to the prescribed BMPs and control measures to minimize dust emissions and control engine exhaust emissions

4.6.3 Mitigation

In addition to the aforementioned APMs to reduce impacts to air quality, the Applicant would implement the following mitigation measures:

MM AIR-1: SECURE ALL VEHICLES HAULING LOOSE MATERIALS

The Applicant will cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard, which is the distance from the top of the truck bed in the material being hauled.

MM AIR-2: REDUCE VEHICLE EMISSIONS

The Applicant will turn off idling equipment when not in use.

MM AIR-3: PROHIBIT EQUIPMENT TAMPERING

The Applicant will prohibit any tampering with engines to increase horsepower, and require continuing adherence to manufacturer's recommendations.

MM AIR-4: LEASE NEW EQUIPMENT

If practicable, the Applicant will lease new, clean equipment that meet the most stringent of applicable federal or state standards.

MM AIR-5: USE LOW SULFUR FUELS.

The Applicant will use and require contractors to use low-sulfur diesel fuel (45 ppm) for vehicles and equipment, if available.

MM AIR-6: AVOID SENSITIVE AIR QUALITY RECEPTORS

The Applicant will locate diesel engines, motors, and equipment as far as possible from possible sensitive receptors.

MM AIR-7: MITIGATION OF GHG EMISSIONS

The Proposed Action would minimize GHG emissions through the long-term generation of renewable electricity, which would provide a potential net benefit to regional air quality.

4.6.4 Residual Effects

All air quality and climate impacts were assessed with consideration of all APMs, BMPs, MMs, Construction Standards and other design features of the alternatives have been applied. Therefore, there would be no difference between project impacts, as discussed above, and residual effects.

4.7 Transportation Impacts

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

4.7.1 Indicators

The Proposed Project would affect transportation levels if it:

- Causes an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system;
- Degrades existing road conditions as a result of construction;
- Prevents adequate emergency access;
- Causes loss of access to private land parcels; or
- Causes loss of access to historically important recreation access points or staging areas.

4.7.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects on transportation were identified and potential indirect effects on other resources resulting from increased ease of access are discussed in those sections (e.g., Biological Resources, Cultural Resources, Recreation, etc.).

Effects may arise from physical changes to roads, closures and reroutes, construction activity, introduction of construction- or O&M-related traffic on local roads, or changes in daily or peak-hour traffic volumes created by either direct or indirect workforce changes in the area.

4.7.2.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on transportation would occur.

4.7.2.2 Proposed Action – 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW application and the Proposed Action would be carried forward. Effects that could result from the implementation of the Proposed Action during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the following measures (see Table 2.6-1) to avoid and minimize impacts on transportation of the Proposed Project area:

- APM-3 Air/Dust Control
- APM-4 SWPP
- APM-6 Health and Safety Plan
- APM-7 Emergency Response Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-14 General Design and Construction Standards

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. Western will require the construction contractor to comply with Environmental Construction Standard 13 for construction of Western's proposed switching station.

Construction. Construction of the project roads, facilities, overhead transmission lines, and electrical/communication lines would occur at the same time. Regional and local access to the area would be by way of US-95 and Cottonwood Cove Road. Access to project facilities would be provided by newly constructed extensions of existing roads, and upgraded existing roads. These roads extend from portions of US-95 and Cottonwood Cove Road. The truck traffic and truck trips associated with the transport of equipment to the Proposed Project area would increase traffic on US-95 and Cottonwood Cove Road, which might result in temporary moderate impacts on motorized travel if traffic flow problems or traffic delays were to occur.

Construction of the Proposed Action would result in a short-term increase in traffic volume of a maximum of 9,931 trips over the 8- to 12-month construction period. Workers and construction equipment deliveries would use US-95 and Cottonwood Cove Road as the primary access route to the project site. Some short-term delays may occur as a result of over-dimension loads once off the main transport corridors.

Access and opportunities for motorized travel on local arterial roadways within the project area during the construction of roads, laydown areas, substations, MET towers, WTGs, facilities, O&M building, and Western's proposed switching station would likely be affected in the short term. When construction is completed, access for motorized travel might increase due to the construction of 29 miles of new roads.

Given the number of vehicle trips of heavy construction equipment during the construction period, it is reasonable to anticipate that the Proposed Project will damage public roads. Only minor vehicle use is anticipated during O&M and decommissioning. The Proposed Project site is in a relatively undeveloped area, and it is anticipated that construction traffic would result in short-term effects on access or road conditions.

Construction of the Proposed Action would have a temporary adverse effect on road conditions because any damage would be followed by restoration of a county road to its preconstruction conditions for both the base and surface.

Construction of Western's proposed switching station would not involve the construction of any new roads, only the upgrading of an existing access road for a short distance. Implementation of Western's Construction Standard 13 would minimize impacts to transportation.

O&M and Decommissioning. Short-term increases in the use of local roadways would occur during the decommissioning period from the transport of heavy equipment and labor force. Heavy equipment would remain at the site until reclamation was completed. With the implementation of the applicable APMs , impacts on transportation and motorized vehicle access from O&M and decommissioning of MET towers, WTGs, communications and transmission lines, roads, O&M building, and Western's proposed switching station would result in temporary and minimal impacts on transportation and access. Most roads to these facilities would be open to motorized travel, and impacts from O&M vehicles that access the project area for routine maintenance would be minimal. Barriers would be placed where the transmission line ROW intersects local roads to prevent unauthorized use. This would limit access for public motorized travel in localized areas in the long term.

Overweight and oversized loads could cause short-term disruptions to local traffic. Effects on transportation during decommissioning would be reduced with the implementation of the applicable APMs described above.

During O&M of the Proposed Action, there would be a long-term increase in traffic volume of up to 30 trips per day (for a staff of 15, including morning and evening trips). There would be additional irregular increases in traffic volume due to scheduled and unscheduled maintenance. Typical activities during decommissioning would include removing the facility features, including breaking concrete pads and foundations, removing facility access roads that are not maintained for other uses, and revegetating the site.

4.7.2.3 87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG Layout Alternative. The construction phase truck traffic and the number of truck trips would be slightly lower (9.025 truck trips) under the 87 WTG Layout Alternative. The construction of nine less WTGs would result in fewer truck trips to transport equipment. This would slightly decrease impacts on traffic flow and reduce the potential for traffic delays compared to the 96 WTG Layout Alternative. Access and opportunities for motorized travel on the existing and proposed new access roads during construction would likely remain unchanged.

The construction of approximately 27 miles of new roads could result in a smaller increase in access for motorized travel compared to the 96 WTG Layout Alternative (~29 miles Effects would be moderately decreased, but the type, intensity, and duration of effects would be similar to the Proposed Action with implementation of the recommended APMs and MMs.

4.7.3 Mitigation

In addition to the aforementioned APMs to reduce impacts to transportation, the following mitigation measures would be implemented:

MM TRAN-1: TRAFFIC MANAGEMENT PLAN

A Traffic Management Plan will be prepared that identifies BMPs to minimize construction-related traffic impacts. Specifically, the BMPs would ensure an adequate flow of traffic in both directions by providing sufficient signage to alert drivers of construction zones, notifying emergency responders prior to construction, conducting community outreach, and controlling traffic around affected intersections. The Plan will include the following:

- Consideration of the turbine manufacturer-provided dimensions and weight; maximum axle loads; and local regulations.
- Obtaining requisite transportation permits.
- Providing escort for components as required by the length, weight, or width.
- To further reduce effects to the US-95/Cottonwood Cove Road (SR 164) intersection, the Plan will identify an alternate access route to the Proposed Project site during peak construction if possible.
- Truck traffic will be phased throughout construction.
- Truck traffic will be restricted to the roadways developed or upgraded for the Proposed Project.
- Existing unimproved roads not associated with the Proposed Project would be used in emergency situations only.
- Deliveries of materials will be scheduled for off-peak hours to reduce effects during periods of peak traffic. Truck traffic will use designated truck routes when arriving to and departing from the proposed work sites.
- Providing alternate transportation routes should temporary road closures be required.
- The Applicant will encourage the construction workforce to carpool or vanpool.
- Signs and public notices regarding construction work will be distributed before disruptions occur and will identify detours to maintain access.
- To minimize the effects on local and Lake Mead traffic the Transportation Plan will mandate the use of flagmen or escort vehicles to control and direct traffic flow, and provide schedules that show roadway work will be done during periods of minimum traffic flow.
- Ongoing ground transportation planning will be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.

MM TRAN-2: REPAIR DAMAGED STREETS

Before construction, the Applicant, a BLM representative, and a local representative will document the condition of the access route, noting any preconstruction damage. After construction, any damage to public roads will be repaired to the road's preconstruction condition, as determined by the local representative and BLM.

4.7.4 Residual Effects

Under both action alternatives, there would be short-term and long-term increases in traffic volume and decreases in access to local roadways that could not be eliminated completely through implementation of APMs, Construction Standards, and MMs. Short-term increases in traffic volume would be considerable and would affect the LOS of roads in the Proposed Project area, particularly during construction and peak traffic times. These effects would be minimized by implementation of the recommended APMS and MMs. Long-term increases would be negligible and would not be likely to affect the LOS at any intersections in the project vicinity.

4.8 Land Use Impacts

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

4.8.1 Indicators

The Proposed Action would affect land use if it:

- Affects use of an existing ROW;
- Conflicts with existing federal, state, or local land use plans or policies;
- Conflicts with existing BLM land use authorizations;
- Changes public land disposition; or
- Restricts land tenure adjustments.

The BLM 1998 Las Vegas RMP management decisions and Clark County land use designations, as outlined in Section 3.8 in Chapter 3, were considered as the baseline of the following discussion.

4.8.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative as prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative.

4.8.2.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on land use would occur.

4.8.2.2 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Action would be carried forward. Effects that could result from the implementation of the Proposed Action during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant will implement the following mitigation measures to avoid and minimize impacts on existing and proposed land uses within the Proposed Project area:

- APM-1 Erosion Control
- APM-2 Excavation/Grading
- APM-3 Air/Dust Control
- APM-4 SWPP
- APM-5 SPCCP
- APM-6 Health and Safety Program
- APM-7 Emergency Response Plan
- APM-8 Waste Management Plan
- APM-9 Weed Control Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-11 Aeronautical Considerations
- APM-13 Environmental Clearance
- APM-14 General Design and Construction Standards

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. For construction of Western's proposed switching station, Western will require the construction contractor to incorporate specific provisions to mitigate impacts related land-use resources in Western's Environmental Construction Standard 13, specifically the following sections:

- 13.3 Landscape Preservation
- 13.5 Noxious Weed Control
- 13.8 Disposal of Waste Material
- 13.13 Prevention of Air Pollution
- 13.16 Prevention of Water Pollution
- 13.19 Conservation of Natural Resources

With implementation of the APMs and Western's Construction Standards, the Proposed Action would result in short-term and negligible effects on land use authorizations, and long-term, beneficial effects on public access and road conditions.

Land Ownership

Over 90% of the Proposed Project would be constructed on public lands administered by the BLM. The 5.5% of the project area that includes privately owned parcels would not be affected by the construction, O&M, or decommissioning of the Proposed Project, as it has been sited to specifically avoid privately owned parcels.

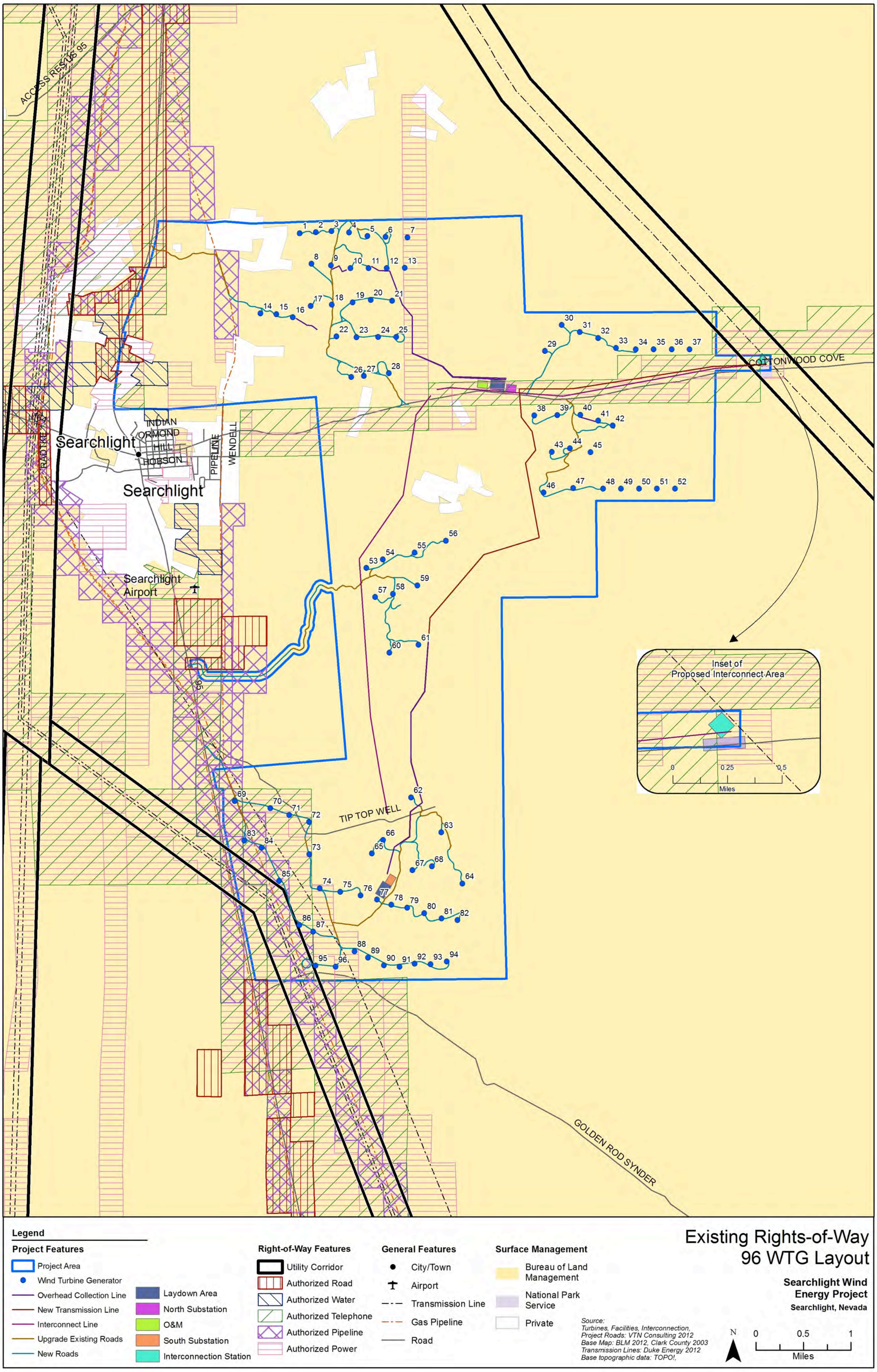
Governing Land Management Plans

With the implementation of the APMs and Construction Standards (listed above), the Proposed Project elements (including Western's proposed switching station) and activities would be consistent with current DOI directives and Instruction Memorandums as well as existing BLM and Clark County land use management plans. Therefore, no additional impacts on any federal, state, or local land use plans or policies, existing BLM land use authorizations, public land disposition, or land tenure adjustments would occur as a result of the Proposed Action.

Utility Corridors and Rights-of-Ways

Construction of a new road would impact two existing utility corridors (Figure 4.8-1). The two corridors include a gas pipeline to the north and south of Searchlight and a Nevada Power Company ROW along the southwest border of the Proposed Project area. Where existing access needs to be upgraded in any ROW, or where new access crosses an existing ROW, the Applicant would coordinate with the respective operators of each corridor. Implementation of APMs 1-4 and APM-9 would reduce impacts from the Proposed Project construction to negligible levels.

Existing roads would be upgraded and new roads would be constructed, which could temporarily affect local transportation and public access. During construction, O&M, and decommissioning, the Applicant and its contractors would have the right for ingress and egress necessary for these activities. Placement of WTGs and ancillary facilities and the development of access roads would preempt existing uses on a minor scale but would not affect overall pre-existing or future access and use practices. Upon decommissioning and the removal of structures and facilities, preconstruction vegetated areas would be restored (APM-10) and former land uses could resume. The anticipated impacts on land use resources within the project area during construction, O&M, and decommissioning would be similar in duration and intensity.



1
2 **Figure 4.8-1. WTG 96 Alternative and Existing ROWs.**

Per the objectives in the Las Vegas RMP the Applicant and Western would meet public demand and reduce impacts to sensitive resources by providing an orderly system of development for transportation, including legal access to private in holdings, communications, flood control, major utility transmission lines, and related facilities.

In addition, all public lands within the planning area are available at the discretion of the agency for right-of-way under the authority of the Federal Lands Policy Management Act.

Special Designations

The Piute-Eldorado Valley ACEC is adjacent to and surrounds the project area. A small portion of the project area extends into the ACEC on the eastern boundary encompassing Western's proposed switching station and tie line. Per the BLM RMP, the Switching Station would be located within one-half mile of a federally-designed highway that allows development of non-linear facilities (BLM 1998). With the exception of the Switching Station, no construction or O&M activities, laydown areas, WTGs, substations, or access areas are within the Piute-Eldorado Valley ACEC. Implementation of APMs 1-4 and APM-9 would reduce impacts from the Proposed Project construction, O&M, and decommissioning activities on soil erosion, air quality, and the inadvertent introduction of noxious or invasive weeds into the ACEC. The ACEC would remain a ROW avoidance area. The Proposed Action would not restrict access to NPS SMAs.

Disposal Lands

The southern segment of designated disposal land adjacent to Searchlight would be affected through construction of an access road that connects the project to Highway 95. Approximately .43 miles of road would be built. Construction of this road would be a moderate, beneficial impact to the people of Searchlight and to prospective purchasers of the disposal lands. It would provide additional access to the Disposal Lands without any cost to those who might wish to develop these properties in the future. Implementation of APMs 1-4 and APM-9 would reduce impacts from the Proposed Project construction, O&M, and decommissioning activities on soil erosion, air quality, and the inadvertent introduction of noxious or invasive weeds into the ACEC.

Airport

The Proposed Action would require a Determination of No Hazard to Air Navigation (NOHA) from the FAA for each WTG. Although coordination with the FAA has not yet been initiated, based on the lighting and marking requirements for similar projects and the FAA Obstruction Marking and Lighting Advisory Circular (AC70/7460-1K), determination of an adequate lighting setup for the Proposed Action is expected, as outlined in Section 2.3.3, Public Access and Safety. Implementation APM-11 would ensure that impacts associated WTGs would be identified prior to completion of final project design.

4.8.2.3 87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG Layout Alternative (Figure 4.8-2). The temporarily disturbed area and permanently disturbed area for construction would be decreased under this alternative compared to the 96 WTG Alternative, but the type, intensity, and duration of the effects would be similar. The construction of nine more WTGs would result in more truck trips to transport equipment, a slightly higher difference in construction phase truck traffic (9,931 truck trips). The construction of 27 miles of new roads could result in a slight decrease in access for public motorized travel compared to the 96 WTG Layout Alternative (29 miles). Future roadway improvements in and around Searchlight could reduce potential traffic delays, improve traffic flow, and increase access for motorized travel. The equivalent APMs, and Construction Standards used for the 96 WTG Layout Alternative to minimize impacts would be applicable for the 87 WTG Layout Alternative.

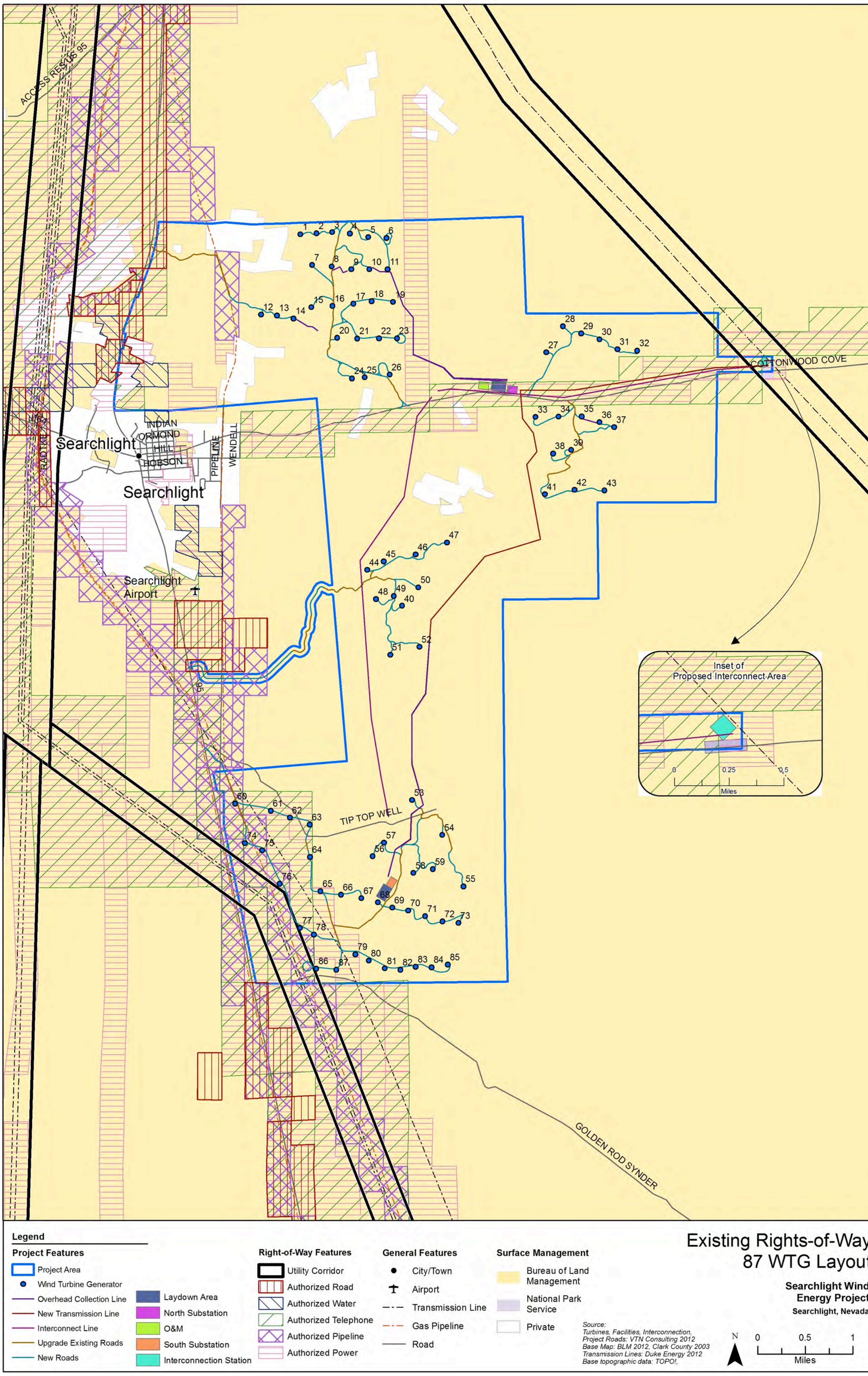


Figure 4.8-2. 87 WTG Layout and Existing ROWs

4.8.3 Mitigation

With implementation of the APMs listed above, the Proposed Action and Alternative would result in short-term and negligible effects on land use authorizations, and long-term, beneficial effects on public access and road conditions. Therefore, no mitigation measures beyond those listed above are necessary.

As described above, the southern segment of designated Disposal Land adjacent to Searchlight would be impacted through construction of an access road that connects the project to Highway 95. Approximately 0.43 miles of road would be built, yielding a total disturbance of 1.92 acres. Construction of this road would be a moderate, beneficial impact to the people of Searchlight and to prospective purchasers of the disposal lands. It would provide additional access to the Disposal Lands without any cost to those who might wish to develop these properties in the future. Beyond the APMs described previously, no mitigation measures are necessary to mitigate these impacts.

4.8.4 Residual Effects

The Proposed Project would not have any residual impacts on land use relative to the criteria outlined in this section.

4.9 Visual Resources Impacts

4.9.1 Indicators

Adverse effects on visual resources would occur if the Proposed Project:

- Creates visual contrasts that exceed the allowable levels associated with VRM Class III objectives denoted in the RMP; or
- Substantially interferes with the dark skies.

4.9.2 Methods

BLM VRM system methodology was used to evaluate the potential effects of the Proposed Project on the current viewing environment.

Visual Simulations and Visual Contrasts

In order to assess the visual contrast between the existing landscape and the Proposed Project, computer-aided simulations were prepared (For all simulations refer to Appendix E: Visual Simulations and Contrast Rating Forms).

Using the visual simulations, the contrast between the existing environment and the Proposed Project was evaluated. Contrast was evaluated for the following:

- **Structure contrast.** Structure contrast is determined by the degree to which the Proposed Project would contrast with the surrounding landscape character. The introduction of new/modified structures to the existing landscape creates impacts on scenic quality and sensitive viewers.
- **Vegetation contrast.** Vegetation contrast is determined by examining the diversity and complexity of existing vegetation. The degree of vegetation to be removed to construct roads and maintain ROWs and clearance zones determines the contrast level. Typically, the more diverse and dense the vegetation, the higher the contrast level. The removal of vegetation in an undeveloped or vacant area creates a distinct line, which draws the viewer's attention.
- **Landform/Water contrast.** Landform and water contrast is the change in landform patterns, water features and impoundments, exposure of soils, or scars that would result from erosion, landslides, slumping, or other disturbances noticeable as uncharacteristic in the natural landscape, such as roads.

After determining structural, vegetation, and landform/water contrast, overall visual contrast is determined by combining the contrast levels for an overall contrast rating. Structural contrast is typically the dominant factor in overall visual contrast. Therefore, structural contrast carries a slightly higher weight in determining visual contrast levels.

Visual Impact Evaluation

Visual simulations and visual contrast ratings helped to determine the level of impact. Additionally, other factors helped determine the level of impact for each proposed alternative, including the cultural significance and the local values. The degree of contrast is determined in accordance with the following definitions:

- Strong – The element contrast demands attention, will not be overlooked, and is dominant in the landscape.
- Moderate - The element contrast begins to attract attention and begins to dominate the characteristic landscape
- Weak – The element contrast can be seen but does not attract attention..

- None – The element contrast is not visible or perceived.

4.9.3 Direct and Indirect Effects by Alternative

4.9.3.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on visual resources would occur.

4.9.3.2 Proposed Action - 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Action would be carried forward. Effects that could result from the implementation of Proposed Action during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the following measures to avoid and minimize impacts on visual resources within the Proposed Project area:

- APM-3 Air/Dust Control
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-14 General Design and Construction Standards

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. For construction of Western's proposed switching station, Western will require the construction contractor to incorporate specific provisions to mitigate impacts related to visual resources in Western's Environmental Construction Standard 13, specifically the following sections:

- 13.3 Landscape Preservation
- 13.19 Conservation of Natural Resources

Visual Resources

Construction. Under the 96 WTG Layout Alternative, visual intrusions might result from the presence of construction vehicles, equipment and materials, and workforce in staging areas, along access roads, and along new overhead transmission line ROW. Effects from construction activities would be minimized in the short-term through implementation of APM-3.

Land scarring from the grading of staging areas and construction yards, construction of new access roads, and activities adjacent to construction sites and along ROWs would be long-lasting in semi-arid environments, where vegetation recruitment and growth are slow. Views along linear land scars or newly bladed roads would introduce potentially adverse visual change and contrast by causing unnatural vegetative lines and soil color contrast. Vegetation clearing would occur during construction and, in some instances, would remain substantially cleared for the life of the Proposed Project, while other areas would be restored with native plant materials.

Effects during construction of the switching station would be similar to those discussed above temporarily affecting 7 acres, half of which would be reclaimed post construction. Implementation of Western's Construction Standard 13 would help reduce the effects on visual resources.

O&M and Decommissioning. A moderate contrast would occur from the long-term presence and O&M of the WTGs (due to the large vertical structures and multiple rotating blades on the nacelles of each tower), ancillary facilities, and transmission lines.

Not all viewers at a given KOP may experience the same level of contrast. For example, foreground views of the Proposed Project facilities from a KOP that has an open, panoramic view might result in substantial contrast, while views from adjacent areas of the same distance might be screened by landforms or vegetation, resulting in weak or no contrast. Effects to visual resources would be minimized by the implementation of APM 3, APM 10, and APM 14.

After preparation and review of the visual simulations, it was determined that Proposed Action components would not be visible from KOP 1, which is approximately 37 miles from the Proposed Project area; therefore, this KOP has been eliminated from the visual impacts analysis. Additionally, the Proposed Project would not be seen or barely be distinguishable from the following KOPs:

- KOP 3 – US-93 Hillside Curve (view from US-93 approximately 30 miles from the project area)
- KOP 4 – Windy Point Campground (view from Windy Point Camping Area approximately 38 miles from the project area)
- KOP 5 – Palm Gardens Community (view from Palm Gardens approximately 13 miles from the project area)
- KOP 9 – View from Cottonwood Cove Marina Looking West (view from the new dock/pier facility on Lake Mohave, approximately 10.5 miles from the project area)

These KOPs represent barely seen views (i.e., the distance from the KOP to the Proposed Project site is 6 to 10 miles for a background view and greater than 10 miles for a barely seen view). Due to the distance and atmospheric conditions, only the motion of the blades may be discernible. Open panoramic views of the broad Piute Valley floor with rolling hills and distant mountain silhouettes offer a moderate level of visible manmade disturbance and landscape contrast within the view. No contrast would be discernible to motorists at KOP 3, recreationalists at KOP 4 and KOP 9, and residents at KOP 5. Visual simulations from these KOPs are included in Appendix E.

Additionally, several KOPs (KOPs 7, 13, 14, and 16) had similar views and visual contrast rating forms. In these cases, a representative KOP is included in this EIS instead of every similar KOP to reduce redundancy; however, all visual simulations and contrast rating forms are included in Appendix E for reference.

All WTGs would be constructed within designated VRM Class III areas. As stated in Chapter 3.9, the objective of this VRM class is to partially retain the exiting character of the landscape. Construction of the WTGs would be in conformance with VRM Class III objectives.

KOP 2 – View from US-95 Looking Southwest

Figure 4.9-1 represents the simulated view that motorist viewers would have traveling south on US-95 north of Searchlight. Viewers at this location would be approximately 3.5 miles north of the Proposed Project area, which represents a middleground view. The viewshed analysis demonstrates that the northernmost portion of the project area and portions of up to 15 WTGs would be visible from KOP 2. Views are considered to be of low to moderate scenic quality due to the presence of some distinct landscape features that are interrupted by, and contrast with, surrounding manmade alterations in the area such as roads, power lines, and radio or cell phone towers.

The WTGs would introduce white vertical and angular lines into the landscape and would be visible against the jagged mountain horizon, causing a moderate contrast in color and weak contrasts in line and form. The white WTGs would have a weak contrast with the existing various hues of green vegetation and tan soils. From this section U.S. 95, the project would be in view for approximately 5 miles. Motorists traveling at the average speed of 45 mph would view the project for no more than 7 minutes.

Existing

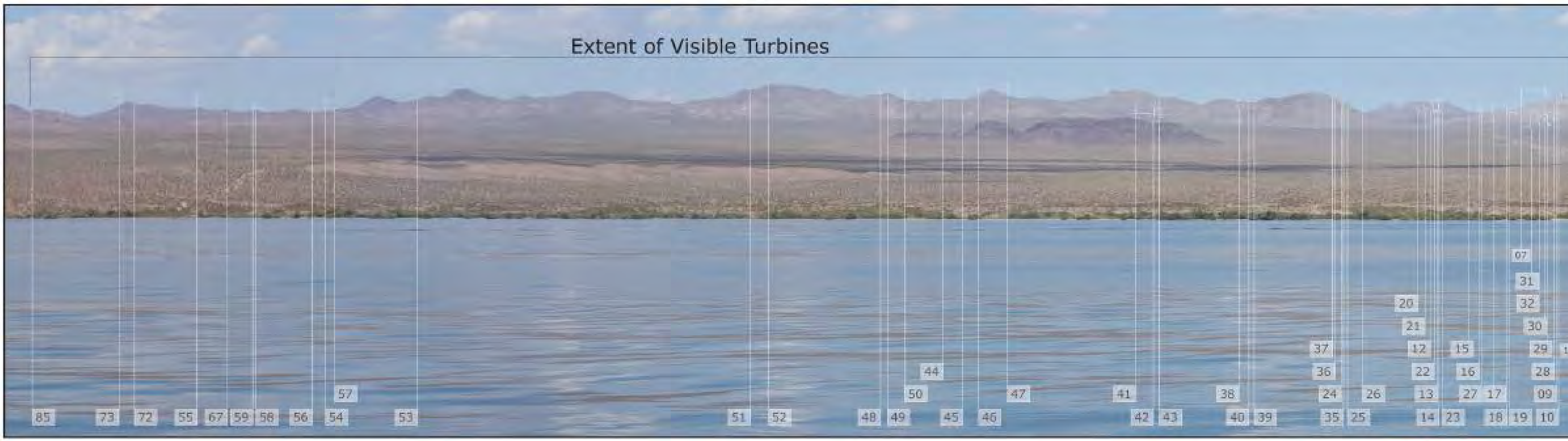
Simulation

Figure 4.9-1. KOP 2 – View from US-95 Looking Southwest

KOP 6 – View Across Lake Mohave

Figure 4.9-2 represents the view that recreational viewers who are boating/fishing on Lake Mohave would have looking west toward the Proposed Project. Viewers at this location would be approximately 10.3 miles east of the nearest visible turbine. This represents a background view. The viewshed analysis demonstrates that the easternmost portion of the project area maybe visible from KOP 6 and portions of up to 50 proposed WTGs could be seen. A viewer may be able to discern the smooth white cylindrical base of the WTG against the brown and green medium-textured background. However, due to the distance, terrain, and atmospheric conditions, contrasts in texture would be weak. The WTGs would introduce moving, vertical, angular structures against the rugged mountain background resulting in a moderate contrast in form, line, and color.

Existing



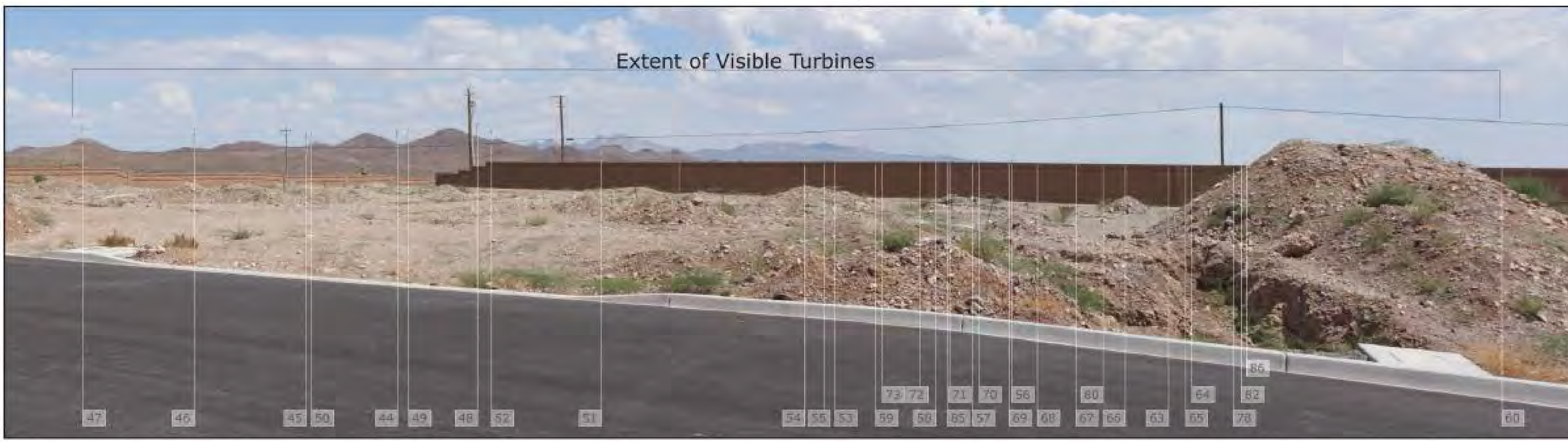
Simulation

Figure 4.9-2. KOP-6 – View Across Lake Mohave

KOP 8 – New Housing Development in Searchlight – Looking South to Southeast

Residential viewers from KOP 8 (Figure 4.9-3), a new residential development south of Cottonwood Cove Road, would have a substantial level of visibility to the Proposed Action. Viewers at this location would be approximately 0.3 mile west of the project area, which represents a foreground view. The viewshed analysis (i.e. DEM) demonstrates that almost all of the project area (a panoramic view) is visible from KOP 8 and portions of up to 96 WTGs could be seen; however, the visual simulation reveals that the number of viewable WTGs would be less than 96, with the most visible WTGs appearing in the skyline of the mountainous view. This residential community is still under construction, and when all the manmade structures are complete, they could partially screen views of the surrounding landscape and portions of many of the proposed WTGs. Partially screened views of the distant mountainous terrain offer a moderate level of visible contrast of form and color within the view.

Existing



Simulation

Figure 4.9-3. KOP 8 – View from New Housing Development in Searchlight-West End of Town.

KOP 10 – View of Travelers Exiting the Lake Mead NRA and Lake Mohave on Cottonwood Cove Access Road

The Proposed Action would have a higher level of visibility for recreational travelers exiting Lake Mead NRA and Lake Mohave on Cottonwood Cove Road, adjacent to the new entrance station at KOP 10 (Figure 4.9-4). Viewers at this location would be approximately 0.5 mile east of the project area, which would be a foreground view. The viewshed analysis demonstrates that almost half of the project area is visible from KOP 10 and a portion of approximately 49 proposed WTGs could be seen, some immediately adjacent to the view. The visual simulation reveals that a high number of WTGs are visible from this location; however, many of them are screened by the dramatic terrain of Fourth of July Mountain (the focal point of the view). Focal and panoramic views of the rolling hills and mountainous terrain would be interrupted by the vertical lines of the WTGs, which would create a moderate contrast in color and line. Visitors existing Lake Mead NRA would have a view of the project for 10 miles. Vehicles traveling an average of 45 mph would view the project for no more than 15 minutes.

Existing

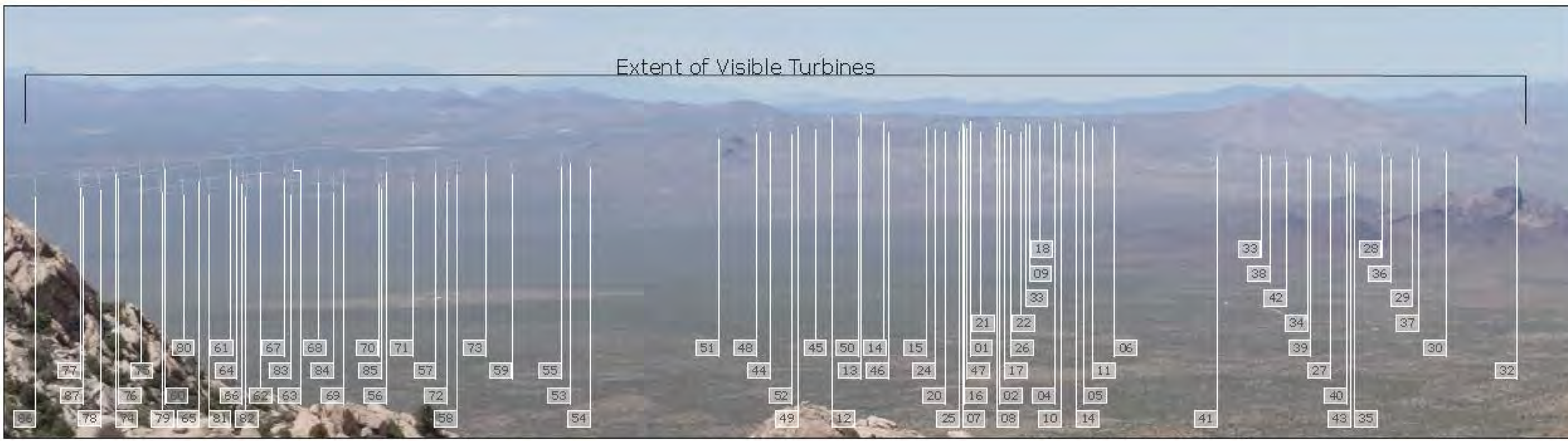
Simulation

Figure 4.9-4. KOP 10 – View exiting Lake Mead NRA.

KOP11 – View from Communication Towers near Spirit Mountain

Recreational viewers and Native Americans hiking up Spirit Mountain would have a low level of visibility to the Proposed Action (Figure 4.9-5). Viewers at this location would be approximately 12 miles southeast of the project area, representing a middleground-to-background view. The viewshed analysis demonstrates that the southwestern corner of the project area would visible from KOP 11 with portions of up to 80 WTGs visible at a great distance. It can be assumed that the WTGs, blade tips or motion of the blades could be discernible from this KOP resulting in a weak to moderate contrast in color, form, and line. Open panoramic and superior (high-elevation) views of rolling hills and dramatic, angular mountainous terrain offer low landscape contrast because of both the scarcity of such views in the region and a low level of visible manmade disturbance within the view.

Existing



Simulation

Figure 4.9-5. KOP 11 – Looking North from Communication Towers near Spirit Mountain.

KOP 12 – View from Cal-Nev-Ari North toward Searchlight

From KOP 12, the Proposed Action would have a minor-to-moderate level of visibility on residential viewers and moderately sensitive travelers along US-95 south of Searchlight (Figure 4.9-6 Viewers at this location would be approximately 5.1 miles south of the project area, which would be a middleground view. The viewshed analysis demonstrates that most of the project area is be visible from KOP 12 and portions of all the proposed WTGs could be seen. The WTGs would introduce multiple vertical, white, smooth structures into the viewshed resulting in a weak to moderate contrast in line, form and color.

Existing

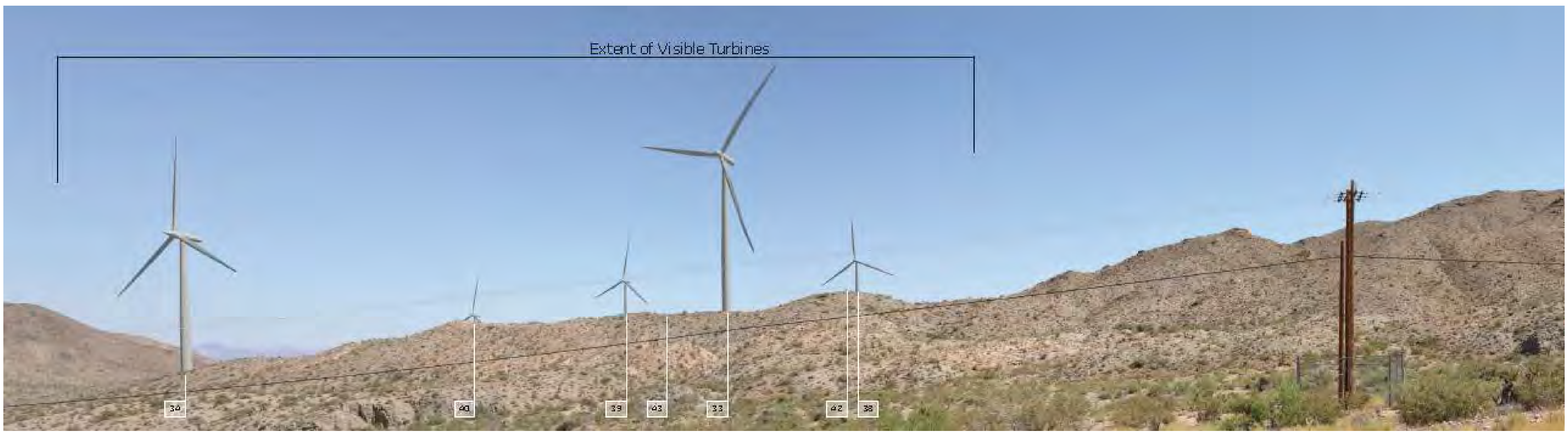
Simulation

Figure 4.9-6. KOP-12 – From a Residence Looking North to the Proposed Project Area

KOP 15 – View from Cottonwood Cove Entrance Station Looking South

Recreational viewers from KOP 15, Cottonwood Cove Access Road, would have a high level of visibility to the Proposed Action (Figure 4.9-7). Viewers at this location would be approximately 0.3 mile west of the project area. Although some natural screening exists, approximately 7 WTGs would be in the foreground. The WTGs would contribute to the vertical lines in relation to the rugged terrain. Visual contrast in line, color, and form are anticipated moderate with the 96 WTG Layout Alternative.

Existing



Simulation

Figure 4.9-7. KOP 15 – View from Cottonwood Cove Access Road Looking South

KOP 17 – View from Cottonwood Cove Access Road at MP 4 Looking North

Recreational viewers from KOP 17, Cottonwood Cove Access Road, would have a high level of visibility to Western's proposed switching station. Viewers at this location would be directly adjacent to the switching station, which represents a foreground view. The switching station would introduce another manmade structure into the foreground, although several structures, including a propane tank, parking area, overhead transmission lines, lights, and the park entrance station, already exist in the area. Because manmade structures exist in the area including the NPS Fee Station, Cottonwood Cove Road, and various radio and cell towers, the switching station would cause a moderate contrast in form, texture, and line.

Existing

Simulation

Figure 4.9-8. KOP-17 – View from Cottonwood Cove Access Road at MP 4 Looking North

Dark Skies

FAA regulations require that some WTGs be equipped with lights that intermittently flash red (2,000 candela). Typically, these lights are required on the "end" WTGs in a string and every 1,000 to 1,400 feet along a WTG string. These lights are not expected to contribute to sky glow or glare because of the intermittent nature and color of these lights. However, security or safety lighting that is typically associated with wind energy facilities could increase their visibility during dark hours and thus contribute to sky glow or glare. However, the dark-adapted human eye is more sensitive to flashing lights in peripheral vision than during the day so the flashing lights atop the WTG's may attract the viewers attention.

4.9.4 Mitigation Measures

Mitigation measures that would provide a reduction in the contrast of project facilities with the existing landscape and would reduce the effects of lighting include the following:

MM VIS-1: MINIMIZE SURFACE DISTURBANCE

Operators will reduce visual impacts during construction by clearly delineating construction boundaries and minimizing areas of surface disturbance; preserving vegetation to the greatest extent possible; using undulating surface disturbance edges; stripping, salvaging, and replacing topsoil; using contoured grading; controlling erosion; using dust suppression techniques; and restoring exposed soils as closely as possible to their original contour and vegetation.

MM VIS-2: CHOOSE BLM-APPROVED STANDARD ENVIRONMENTAL COLORS FOR STRUCTURES

All structures including Western's proposed switching station will be constructed of materials that restrict glare and will be finished with a BLM-approved Standard Environmental Color intended to blend with the surrounding environment. Due to the height of the WTGs and the oscillating motion of the blades, it is difficult to make the towers blend into the landscape; however, a flat gray paint color will tone down the usual white design and reduce glare. Any color other than white will need to be approved by the FAA. If a color is not easily distinguishable for pilots, daytime strobe lights will be needed, thus negating the mitigation (FAA 2007).

MM VIS-3: MINIMIZE PROFILES OF SITE DESIGN ELEMENTS

Site design elements will be integrated with the surrounding landscape, such as minimizing the profile of the ancillary structures, burial of cables, and use of timed, motion-sensor, and directional lighting.

MM VIS-4: MINIMIZE ROAD AND GRAVEL CONTRAST

The colors of the asphalt and gravel used for circulation and parking areas at the O&M building will be selected to minimize contrast with the site's soil colors. Roads will be contoured to blend into the existing topography.

MM VIS-5: MINIMIZE LIGHTING

Efforts will be made to minimize the need for and amount of lighting on ancillary structures. The applicant will submit a lighting plan to the BLM for review and approval, which will contain at a minimum the following elements:

- When possible, lighting will be associated with motion sensors to minimize constant lighting effects.
- The only exterior lighting on the WTGs will be the aviation warning lighting required by the FAA. The warning lighting will be the minimum required intensity to meet the current FAA standards.

- Outdoor night lighting at the O&M facility or other ancillary structures will be the minimum necessary for safety and security. All lights will be shielded to reduce offsite light pollution. Motion sensor lighter will be used when possible. Bluish lighting will be avoided and warm white or amber lighting will be used instead for general security and human vision needs. Facility lighting should be less than Kelvin color temperature (warm white or amber in color). Lighting will have screens that do not allow the bulb to shine up or out. All lighting fixtures shall be hooded and shielded, face downward, located within soffits, and directed on to the pertinent site only, and away from adjacent parcels or areas.

4.9.4.1 87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be similar to those identified under the Proposed Action. The temporarily disturbed area (230 acres) and permanently disturbed area (152 acres) for intensity, and duration of the effects would be similar. Both the construction of 29.2 miles of new roads (which could result in an decrease in access to the project area compared to the 96 WTG Layout Alternative ([27.5 miles]) and the construction of nine more WTGs could increase the level of visibility from some KOPs for residents and recreationists within the project area and vicinity. The equivalent APMs and MMs used for the Proposed Action to minimize visual impacts would be applicable for the 87 WTG Layout Alternative

4.9.5 Residual Effects

Long-term residual effects to visual resources would result from implementation of the 96 WTG Layout Alternative or the 87 WTG Layout Alternative. Although implementation of the APM or MMs would reduce the contrast of the WTGs in the project area, the WTGs would still be prominent features on the landscape. When moving under certain atmospheric conditions, the WTGs may attract the viewer's attention increasing the visual contrast with the surrounding landscape.

4.10 Noise Impacts

This section discusses the effects on the ambient noise and vibration levels that might occur with implementation of the Proposed Action or alternatives. Indicators used to identify and analyze effects are presented and potential effects are discussed. APMs, Western's Construction Standards, and agency-recommended mitigation measures are presented along with a discussion of residual impacts.

4.10.1 Indicators and Methodology

The Proposed Action would affect ambient noise and vibration levels if it:

- Results in the generation of noise levels or exposure of persons and sensitive species to noise levels in excess of standards established in applicable federal, state, and local general plans or noise ordinances at nearby noise-sensitive areas; or
- Results in generation of, or exposure of persons to, ground borne vibration or ground borne noise levels in excess of 75 vibration decibels (generally considered intrusive for residential uses) unless allowed by federal, state, or local codes or ordinances.

In order to compare effects associated with project elements inherent in the Proposed Action and alternatives, the indicators were considered both independently and in conjunction with one another using the following methodologies or assumptions.

Federal noise standards and guidelines, and Clark County noise standards were identified. Most of the federal standards would not appear to be directly applicable to the Proposed Project. In addition to the federal standards, the Lake Mead NRA has recommended that noise levels from operation of the Proposed Project do not exceed a Leq level of 35 dBA during nighttime hours on NPS lands. The Clark County noise ordinance limits noise levels. The identified noise standards and guidelines are discussed in detail in Section 3.10. The Clark County noise ordinance limits project operation noise levels at a residential property line. Since the thresholds are defined as the property line, an entire property parcel is effectively "covered" upon which recreational and other human activities may occur. Neither the BLM nor NEPA specify a threshold for "significant adverse effect" for noise. Reference noise levels used in this analysis were obtained from the Roadway Construction Noise Model User's Guide (FHWA 2006). There are no known laws, ordinances, regulations, or standards that address noise exposure to wildlife in the project, see Biological Resources, Section 4.4 for a discussion of noise effects on wildlife.

Noise impacts are assumed to occur when aggregate. The aggregate project operation vibration level at a property line is defined as "discernible to the human senses." This is a qualitative standard, which for purposes of a recommended impact assessment will be interpreted to mean a quantifiable value in accordance with applicable industry standards. Noise impacts are assumed to occur when aggregate nighttime project construction noise level at a property line exceeds decibel thresholds as established in subject Clark County regulations.

The Cadna/A® Noise Prediction Model (Version 3.72.131) was used to estimate project-generated operation sound levels at noise-sensitive receivers. Cadna/A® is a Windows®- based software program that predicts and assesses noise levels near industrial noise sources based on International Standards Organization 9613-2 standards for noise propagation calculations. The model uses these industry-accepted propagation algorithms and accepts sound power levels (PWL, in dB re: 1 picoWatt) provided by equipment manufacturers and other sources. The calculations account for classical sound wave divergence (the spreading of sound waves with distance), plus attenuation factors resulting from air absorption, basic ground effects, and barrier/shielding. For purposes of preparing an appropriate Cadna/A model, topographical data were imported to the model to represent terrain profiles (hills and valleys in the vicinity of the project site. Discussion and results of this analysis are found in Section 4.10.3.

The primary indicator of noise levels for this analysis is the A-weighted average noise level measured in decibels (L_{eq}). The one-hour average noise level (dBA L_{eq} [1-hour]) is often used to characterize ongoing operations or long-term effects. The maximum dBA level (dBA L_{max}) is used to document the highest intensity, short-term noise level. Another commonly used measure of noise effects is the daytime-nighttime noise level (L_{dn}). The L_{dn} value matches the L_{eq} value for noise generated from 7:00 a.m. to 10:00 p.m. but accounts for increased public sensitivity to noise at night by the A-weighted equivalent sound level for a 24-hour period with an additional 10 dB imposed on the equivalent sound levels for nighttime hours of 10:00 p.m. to 7:00 a.m.

4.10.2 Direct and Indirect Effects by Alternative

To compare effects of each alternative, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. Effects on the existing ambient noise and vibration levels might arise from construction, O&M, and decommissioning equipment and vehicles as well as from the introduction of construction or O&M-related traffic on local roads near the Proposed Project area. All effects discussed in this section are direct. No indirect effects were identified for this resource.

4.10.2.1 No Action Alternative

Under the No Action Alternative, the ROW applications would be denied and the Proposed Project would not be built; therefore, no project related effects on noise levels would occur.

4.10.2.2 Proposed Action – 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the Applicant would be authorized to construct, operate and maintain, and decommission a 200-MW wind energy facility on BLM-administered lands. Effects that could result from the implementation of the 96 WTG Layout Alternative during construction, O&M, or decommissioning activities are analyzed in the discussion below. The Applicant has incorporated the following APMs to avoid and minimize impacts of ambient noise and vibration levels on humans and wildlife in the project vicinity:

- APM-6 Health and Safety Program
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-14 General Design and Construction Standards

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. For construction of Western's proposed switching station, Western will require the construction contractor to incorporate specific provisions to mitigate impacts related to noise in Western's Environmental Construction Standard 13.

Construction. Construction would occur over approximately 8 to 12 months. During peak construction activity, the Proposed Project would require an estimated 250 to 300 full- and part-time employees. The Proposed Project would utilize conventional construction techniques and equipment, including excavators, bulldozers, heavy trucks (e.g., water truck, dump truck), cranes, and similar heavy construction equipment. The amount of construction equipment and the number of workers in any given location of the project area would vary, but activity would be concentrated in specific areas and then relocated as the WTGs are erected in an assembly-line fashion. These variations would result in varying levels of construction-related noise. Noise levels from common construction equipment at various distances can be estimated conservatively by assuming that the only sound-reducing mechanism is the divergence of the sound waves in open air. Propagation of groundborne vibration from equipment and vehicles is also assumed to be mitigated with greater distance. Thus, construction noise and vibration levels related to the Proposed Project would vary during the construction period, depending on the number and location of operating construction equipment relative to any specific receptor location.

To evaluate potential noise impacts resulting from project construction, reference noise levels were obtained from the Roadway Construction Noise Model User's Guide (FHWA 2006), which provides a comprehensive assessment of noise levels from construction equipment. Based on the reference values in the guide and the anticipated construction equipment to be used on the project, the loudest equipment would generally emit noise in the range of 80 to 90 dBA at 50 feet, with usage factors of 40 to 50% that account for the fraction of time that the equipment would be in use over the specified time period, or the duration of its operation on a typical day of construction. Conventional construction activities at the project site would result in a short-term, temporary increase in the ambient noise level resulting from the operation of construction equipment. Noise levels for typical construction equipment are presented in Table 4.10-1

Table 4.10-1. Noise Levels at Various Distances from Individual Typical Construction Equipment

Construction Equipment	Noise Level $L_{eq(1-h)}$[a] at Distances (dBA)					
	50 ft[b]	250 ft	500 ft	1,000 ft	2,500 ft	5,000 ft
Bulldozer/scraper	85	71	65	59	51	45
Concrete mixer	85	71	65	59	51	45
Concrete pump	82	68	62	56	48	42
Crane, derrick	88	74	68	62	54	48
Crane, mobile	83	69	63	57	49	43
Front-end loader	85	71	65	59	51	45
Generator	81	67	61	55	47	41
Grader	85	71	65	59	51	45
Shovel	82	68	62	56	48	42
Truck	88	74	68	62	54	48

Source: Final Programmatic EIS on Wind Energy Development on BLM-Administered Lands in Western U.S., Table 4.5-5.5.2-1 (BLM 2005b).
Note: An assumed propagation rate is 6 dBA per doubling of distance.
[a] $L_{eq(1-h)}$ is the equivalent steady-state sound level that contains the same varying sound level during a 1-hour period.
[b] To convert feet to meters, multiply by 0.3048.

According to Table 4.10-1, the loudest construction equipment would be a derrick crane and a truck. When a single sample of both of these two equipment categories are operated simultaneously, the noise level at 1,000 feet from the construction site would be estimated as 65 dBA (= 62 + 3 dB) L_{eq}.

Since the Clark County noise regulations allow construction-related noise during daytime hours, no adverse construction noise impacts during the day are anticipated.

With implementation of the 96 WTG Layout Alternative, 1,400 feet is the closest distance between a potential noise-sensitive receiver and the nearest WTG location. Table 4.10-1 indicates that noise from the crane-truck pair would fall between 71 dBA (= 68 + 3 db) and 65 dBA L_{eq} at this receiver location. As long as this kind of activity takes place during daytime hours, no construction noise impacts are anticipated.

The site preparation phase would involve noise-generating activities such as clearing and grubbing, earthwork, and rough site grading, while the installation of WTGs would involve the installation of steel beams using percussive or vibration equipment in a manner similar to installing freeway guardrails.

The estimated sound level from construction vehicles in staging and laydown areas would be an average level of 89 dBA at 50 feet, according to the US Environmental Protection Agency (EPA 1971). At a distance of 2 miles, the average noise level of 89 dBA at 50 feet would attenuate to less than 43 dBA and continue to diminish in magnitude with increasing distance. If the nearest noise-sensitive location is within 2 miles from the construction laydown and staging area, noise impacts from this source would be unlikely due to the 43 dBA limit calculated from the Clark County nighttime residential district thresholds.

Since the NDOT reports that AADT volume on US-95 for 2008 was 8,600 (NDOT 2009), the addition of 350 one-way trips per day (including travel by construction personnel and deliveries) associated with the Proposed Project would thus be expected to result in a minimal rise in transportation noise levels (i.e., less than 1 dBA increase) and a non-discernible change for receptors in the vicinity of the US-95 corridor.

Construction of the transmission lines would produce noise that could affect the closest resident properties from the operation of construction equipment. The FTA provides guidelines for reasonable criteria for assessment of construction noise (FTA 2006), indicating that construction noise that exceeds a 1-hour L_{eq} of 90 dBA or an 8-hour L_{eq} of 80 dBA during the day would provoke adverse community reaction. Noise levels discernible above background noise in the area would affect the resident properties located closest to the project area during construction. However, construction activities would be limited to daytime hours near residences and recreational areas, and Clark County regulations provide an exemption for noise generated during daytime construction activities.

Blasting might be necessary in order to construct access roads and set turbine foundations. The estimated noise level from blasting activity can be derived from the FHWA Roadway Construction Noise Model User’s Guide. It describes that the maximum noise level at 50 feet from blasting would be 94 dBA. At 2,500 feet, and assuming the aforementioned conservative attenuation rate of -6 dB per doubling of distance, the estimated noise level from this occasional blasting activity would be 60 dBA.

The only potential noise impact anticipated from the project substations and Western’s proposed switching station would occur during their construction. Noise levels associated with substation construction would be less than the construction noise associated with other elements of the Proposed Project; therefore, no adverse noise impacts are anticipated.

Other land uses and landscape designations that might be sensitive to noise impacts, such as recreation and SMAs, might be affected by short-term increase of noise levels. Effects on recreational users might be detectable along off-OHV routes but would be short-term and unlikely to impair the recreational resource. According to the December 2005 amendment to the BLM Las Vegas RMP (as part of the BLM Wind Energy Development Program), the project area, which is surrounded by and adjacent to the Piute-Eldorado Valley Area ACEC, does not include lands managed as exclusion or avoidance areas. The closest other SMA to the Proposed Project site is Lake Mead NRA, located 2 miles east of the site.

In order to determine construction noise levels at the NRA, computer noise modeling was conducted, utilizing the same methodology as will be discussed in subsequent sections for operational noise. It is anticipated that at most, three WTG sites may be in construction simultaneously. The noise modeling was performed assuming that the three turbine sites closest to the Lake Mead NRA boundary would be under construction simultaneously at the phase that produces the maximum amount of noise. This maximum noise level occurs during excavation of the foundations where up to three excavators are assumed to be operating simultaneously at their maximum noise level producing a combined noise level of about 90 dBA at 50 feet. This is a very conservative assumption because it is unlikely that three excavators would all be at full load simultaneously because construction equipment load varies up and down, and the sound level varies accordingly. Further, it is very unlikely that three sites would have excavation occurring simultaneously. For example, while one site is being excavated, a second may be having concrete placement, a third using cranes to erect the towers, etc. These other phases generate lower noise levels.

Based on the above assumptions, a maximum construction noise level of 28 dBA was calculated at the nearest Lake Mead NRA boundary. The maximum noise level is in reality expected to be lower for the reasons presented above, including the fact that it is extremely unlikely that three excavators will be in operation at full load at multiple WTG sites simultaneously. The 28-dBA level is well below the NRA recommended level of 35 dBA for nighttime hours. Most construction will occur during daytime hours. Notably, the maximum 28-dBA level is calculated for favorable noise propagation conditions (e.g., nighttime with calm or light winds. During sunny daytime hours, thermal heating of the ground will cause sound waves to bend upwards, greatly reducing the construction related sound at distances, such as those to the NRA boundary.

The maximum calculated construction noise level of 28 dBA is generally in the range of the measured ambient conditions within remote areas of the NRA as were provided and discussed in Sections 3.10. Ambient sound levels were generally 15 to 25 dBA, with some peaks to 35 dBA.

Impacts from construction-related noise on residential properties and SMAs would be negligible.

O&M and Decommissioning. During the O&M phase, the Proposed Project is expected to employ up to 15 permanent employees to operate and maintain the facility and provide facility security. Routine maintenance of the wind energy facility would primarily consist of daily visits by maintenance workers to WTG sites. O&M staff would travel in pickups or other light-duty trucks. Most servicing and repair would be performed within the nacelle, without using a crane to remove the turbine from the tower. Occasionally, the use of a crane or equipment transport vehicles might be necessary for cleaning, repairing, adjusting, or replacing the rotors or other components of the WTG. Monitoring the Proposed Project operations would be conducted from computers located in the base of each WTG tower and from the O&M building using telecommunication links and computer-based monitoring.

The potential sources of long-term operational noise would stem from the operation of electrical equipment, including the transformers for the WTGs, corona noise from the 230-kV transmission lines, the substations, Western' proposed switching station, and noise from vehicle operations during routine O&M.

Noise from electrical equipment, such as transformers, is characterized as a discrete low-frequency hum (Bell and Bell 1994). Among this type of equipment, transformers would be expected to contribute the most to the composite noise at the site. The noise from transformers is produced by alternating current flux in the core that causes it to vibrate (an effect also known as magnetostriction). In addition, transformer-cooling fans produce noise when they operate. This noise is produced at a frequency (Hz) of twice the reference line (i.e., 2 x 60 Hz = 120 Hz), which can propagate with favorable weather conditions over long distances with little potential for reduction and create disturbances for residential receptors located at distances of 3,000 to 10,000 feet (Elliot et al. 1998).

The relative loudness of transformers depends on the construction design and techniques, as well as the ambient noise levels at a site (Jefferson Electric 2010). The sound level at the closest receptor would dissipate over the long distance, and no measurable change would be detected from current conditions. Therefore, no substantive impacts from transformer-related noise are anticipated.

Transmission line corona noise is the noise generated from the strong electric field at the surface of a high-voltage power line conductor ionizing the nearby air, resulting in an audible, continuous, low-level noise or "buzz" during operation of transmission lines and substation equipment. The amount of corona produced by a transmission line is a function of the voltage of the line, the diameter of the conductor, the elevation of the line above sea level, the condition of the conductor and hardware, and the local weather conditions. Corona noise levels from 230 kV transmission lines, under conditions favorable to the development of corona noise (rain/high humidity) and with the line under maximum loading, are typically less than 40 dBA at a distance of 50 feet (refer to Table 3.10-1for dBA examples). The ROW of the existing line within the LMNRA is 200 feet wide, with edge of the ROW therefore 100 feet from the line. At this distance, maximum corona noise levels would be quite low (under 35 dBA). Increases over any existing corona noise levels would be negligible with the loading from the proposed Project, since the line is energized and at times generates corona noise under favorable conditions. The interconnection transmission line and Western's proposed switching station would not be audible at the closest sensitive receptor.

Potential effects from routine substation, O&M building, and security-related activities on the existing ambient noise levels might be detectable for a short duration at the site and on local roads (due to the minor increase in traffic), but given the relative location of the site with respect to sensitive receptors, any potential increases in the noise levels on the project site are unlikely to be detectable or of concern to the general public.

WTG O&M is expected to be the dominant operational noise source, with individual WTG sound power levels as outlined in Table 4.10-2. Sound power levels represent the amount of power, or energy, a source has. It differs from, and is a higher number, than the sound pressure level, which is the sound measured by sound level meters and perceived by the human ear.

Table 4.10-2. Operation Noise Model Parameters

Project Element	Type of Source	Sound Power Level at Octave Band Center Frequency (Hz)									A-Weighted	Acoustic Height (meter)
		31.5	63	125	250	500	1,000	2,000	4,000	8,000		
WTG	Point	n/a	83.5	94.4	98.1	102.1	102.1	98.4	91.2	87.2	107	80

Source: Wind Turbine data was provided to URS by Duke Energy Corporation

Note: Sound power level presented is valid for a wind speed of 8 meters per second (mps) referenced to a height of 10 meters above ground level. The A-weighted value is warranted by the manufacturer per Independent Electrical Contractors (IEC) 61400-11:2002 with amendment 1 dated 2006-05.

Hz = hertz; n/a = not applicable;

In order to assess impacts, total project O&M noise, predicted with the commercially available Cadna/A model, is compared with applicable Clark County thresholds. The software takes into account spreading losses, ground and atmospheric effects, shielding from terrain, barriers and buildings, and reflections from surfaces. These model capabilities are especially important in an area such as the Project site, as the effects of the complex terrain can be and were accounted for. By default, the model assumes that all receptors are downwind of the noise sources simultaneously - a physical impossibility but one that results in a conservative calculation of maximum expected sound levels. All WTGs operating simultaneously and operating at the warranted maximum sound output were included in the models, and all noise was assumed to emanate from turbine hub height (80 meters above the ground).

For reference purposes, the following input and calculation parameters were also used in the Cadna/A model:

- Maximum search radius = 10 kilometers (km).
- Ground absorption coefficient = 0.5 (on a scale ranging from 0 to 1).
- Temperature = 10 degrees Celsius (ºC).
- Relative humidity (RH) = 70%.
- A 107 dBA PWL per WTG as warranted by the vendor.
- The model does not include other sources or existing ambient noise because predictions are for proposed operating WTGs only.
- While WTG noise is based on wind speed as indicated, model wind speed and direction is currently neutral.

Noise prediction results can vary with changes to one or more of the above-listed parameters.

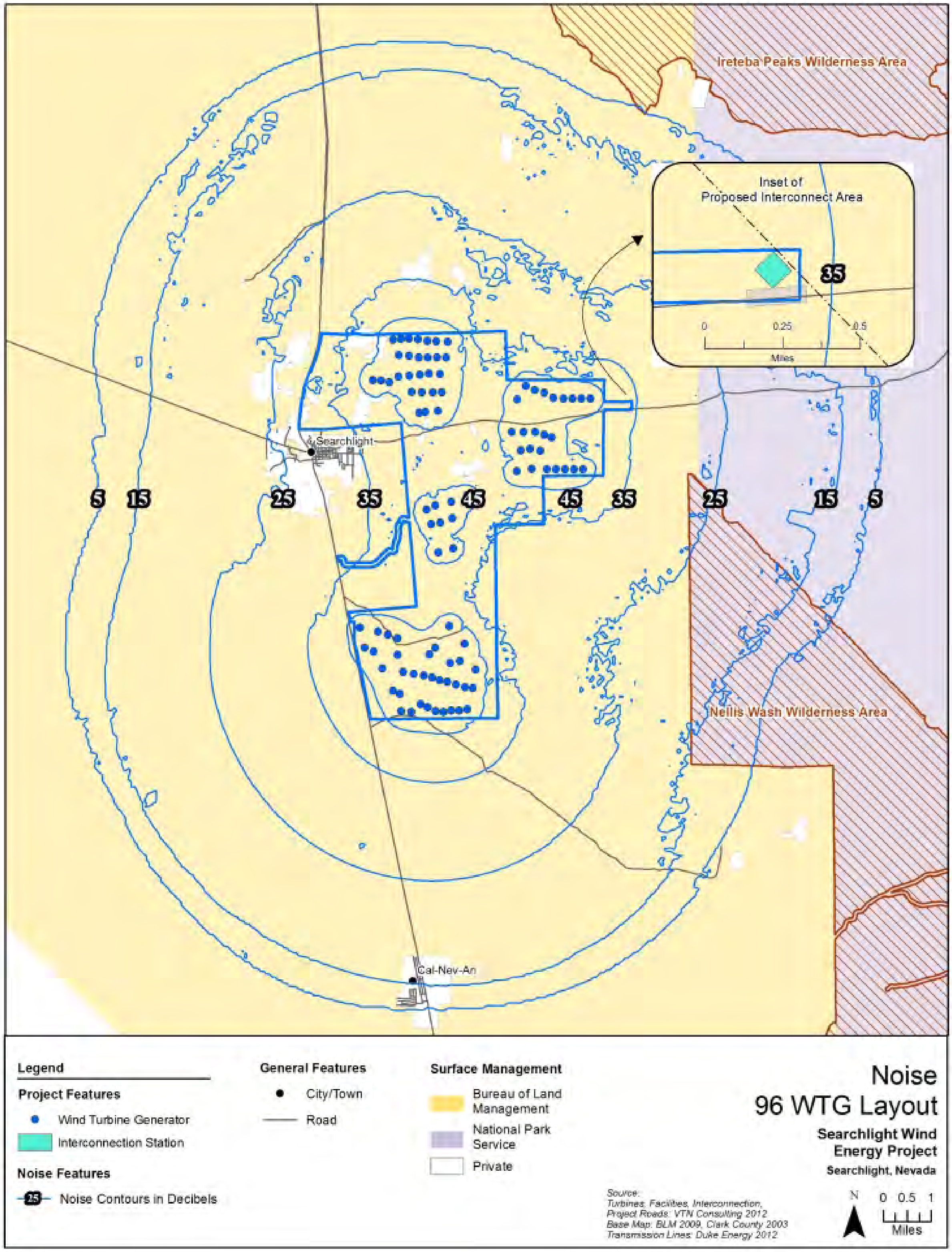
Using the values from Table 4.10-2 as inputs, and assuming the conditions on which they are based are valid for purposes of this analysis, a Cadna/A model generated estimates of predicted total sound pressure level (SPL) in unweighted dB from all 96 WTGs at each of 10 property line locations where the highest sound level was calculated for the property. The calculated Project sound levels, and comparison with the Clark County noise ordinance limit, are shown in Table 4.10-3. The output from the model, in the form of a noise contour map of the area, is presented as Figure 4.10-1.

Table 4.10-3. Predicted Operation Noise – 96 WTG Layout Alternative

Searchlight Wind Turbine Project Comparison of Project Sound Level to Clark Noise Standard at Property Line Receptor (dB unless noted)	Octave Band Center Frequency (Hz)									Total dBA *
	31.5	63	125	250	500	1000	2000	4000	8000	
Clark Noise Ordinance Limits	**65**	**58**	**50**	**44**	**40**	**37**	**33**	**30**	**27**	**46**
Property Line										
Parcel 24324000010		**57**	**55**	**50**	**50**	**46**	**39**	**26**	**4**	**51**
Exceeds Standard By			**5**	**6**	**10**	**9**	**6**			
Parcel 24324000021		**56**	**54**	**49**	**49**	**45**	**36**	**19**	**0**	**50**
Exceeds Standard By			**4**	**5**	**9**	**8**	**3**			
Parcel 24325000003		**52**	**49**	**44**	**44**	**39**	**30**	**10**	**0**	**44**
Exceeds Standard By				**0**	**4**	**2**				
Parcel 24400002013		**58**	**56**	**51**	**51**	**47**	**41**	**27**	**6**	**52**
Exceeds Standard By			**6**	**7**	**11**	**10**	**8**			
Parcel 24400002016		**51**	**47**	**42**	**41**	**34**	**19**	**0**	**0**	**41**
Exceeds Standard By					**1**					
Parcel 24400002023		**49**	**46**	**41**	**40**	**34**	**20**	**0**	**0**	**42**
Exceeds Standard By										
Parcel 24400002021		**50**	**47**	**42**	**41**	**36**	**24**	**0**	**0**	**40**
Exceeds Standard By					**1**					
Parcel 24400002032		**50**	**46**	**41**	**40**	**35**	**23**	**0**	**0**	**40**
Exceeds Standard By										
Parcel 24900001019		**51**	**48**	**43**	**43**	**39**	**30**	**12**	**0**	**44**
Exceeds Standard By					**3**	**2**				
Parcel 25002501001		**47**	**42**	**36**	**33**	**23**	**0**	**0**	**0**	**34**
Exceeds Standard By										

*** Presented for informational purposes only. The Clark County Ordinance is octave band based.**

Note: dB = decibel; Hz = hertz; SPL = sound pressure level; WTG = wind turbine generator



1
2 **Figure 4.10-1. Noise Contours for the 96 WTG Layout Alternative**

Under certain conditions, there is the potential for one or more of the following phenomena to occur that might temporarily cause a variance in the predicted operational sound levels shown in Table 4.10-3:

- In the Cadna/A prediction model, all studied WTGs were assumed to operate at the same speed. In reality, very slight differences in operating rotor speeds due to non-uniformities in the passing wind profile can result in intermittent constructive and destructive interference—or what one might call temporary "beats," that can have a perceptible frequency as current research suggests (van den Berg 2006).
- The atmosphere can either be "stable" or "unstable," which in summary are descriptors for how layers of air mass interact. The former of these two is usually associated with cold air near the ground that is not well coupled to higher air masses. This effect can explain why high wind speeds at WTG hub height can be substantially greater than those near ground level (BLM 2009).
- The RH and variations in ambient temperature have a substantial effect on the attenuation of outdoor sound at high frequencies and long distances through air absorption. Because sound tends to travel farther in colder and more humid conditions, the model uses 10º C and 70% RH in an attempt to make conservative sound level predictions. The variance caused by temperature and humidity tends to increase with increasing distance between a noise source and a receiver.

When considered relative to the Clark County Noise Ordinance, maximum sound level thresholds (nighttime, for residential or business/industrial districts as appropriate), the estimated SPLs in Table 4.10-3 are in excess by the dB quantities shown. In other words, the estimated WTG O&M noise would exceed the noise ordinance by the presented amounts. In 2011 Clark County approved a Special Use Permit application for the Proposed Project. They found that there were nighttime noise level exceedances at the property line, described above, but that at the actual residence locations the levels were all below the County's threshold. Therefore, the project was approved by Clark County.

Because the list of locations in Table 4.10-3represent those that are considered closest to the WTGs, it is expected that there would be other property line locations more distant from the WTGs (but on the same boundaries of the identified properties) that could experience impacts of less significance (i.e., excess in decibels lower than the quantities shown in Table 4.10-3).

As with construction noise, the Applicant would implement O&M-related noise reduction measures that are compatible with local plans and zoning to the extent practicable, including APMs listed above.

Operational sounds after construction would be 35 dBA at the eastern edge of the project footprint near the location of Western's proposed switching station. Noise at the boundary of the Lake Mead National Recreation Area would be less than the 35-dBA threshold suggested by NPS (Figure 4.10-1).

Due to similarities in equipment and activity, noise and vibration generated from project site decommissioning would be similar to but less than those associated with construction - largely due to shorter duration expected from the former. As planned for construction, most decommissioning activities would occur during the daytime, when noise is tolerated better and related activities would be categorized as a form of construction or demolition activity under Clark County's Noise Ordinance. Noise impacts from decommissioning activities are therefore not anticipated.

4.10.2.3 87 WTG Layout Alternative

Impacts under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG Layout Alternative. There would be fewer WTGs erected under this alternative, but the type, intensity, and duration of the effects would be similar to the 96 WTG Layout Alternative.

WTGs are expected to be the dominant operational noise source, with individual WTG sound power levels as outlined in Table 4.10-2. Using the values from Table 4.10-2 as inputs, and assuming the conditions on which they are based are valid for purposes of this analysis, a Cadna/A model generated estimates of predicted total SPL in unweighted dB from all 87 WTGs at each of 10 property line locations where the highest sound level was calculated for that property. The calculated Project sound levels, and a comparison to the Clark County ordinance limit, are shown in Table 4.10-4. The output from the model, in the form of a noise contour map of the area, is presented as Figure 4.10-2.

Table 4.10-4. Predicted Operation Noise – 87 WTG Layout Alternative

Searchlight Wind Turbine Project
Comparison of Project Sound Level to Clark Noise Standard at Property Line Receptor (dB unless noted)

	Octave Band Center Frequency (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	Total dBA*
Clark Noise Ordinance Limits	**65**	**58**	**50**	**44**	**40**	**37**	**33**	**30**	**27**	**46**
Property Line										
Parcel 24324000010		**57**	**55**	**50**	**50**	**46**	**39**	**26**	**4**	**51**
Exceeds Standard By			**5**	**6**	**10**	**9**	**6**			
Parcel 24324000021		**56**	**54**	**49**	**49**	**45**	**36**	**19**	**0**	**50**
Exceeds Standard By			**4**	**5**	**9**	**8**	**3**			
Parcel 24325000003		**52**	**49**	**44**	**44**	**39**	**30**	**10**	**0**	**44**
Exceeds Standard By				**0**	**4**	**2**				
Parcel 24400002013		**58**	**56**	**51**	**51**	**47**	**41**	**27**	**6**	**52**
Exceeds Standard By			**6**	**7**	**11**	**10**	**8**			
Parcel 24400002016		**51**	**47**	**42**	**41**	**34**	**19**	**0**	**0**	**41**
Exceeds Standard By					**1**					
Parcel 24400002023		**49**	**46**	**41**	**40**	**34**	**20**	**0**	**0**	**42**
Exceeds Standard By										
Parcel 24400002021		**50**	**47**	**42**	**41**	**36**	**24**	**0**	**0**	**40**
Exceeds Standard By					**1**					
Parcel 24400002032		**50**	**46**	**41**	**40**	**35**	**23**	**0**	**0**	**40**
Exceeds Standard By										
Parcel 24900001019		**51**	**48**	**43**	**43**	**39**	**30**	**12**	**0**	**44**
Exceeds Standard By					**3**	**2**				
Parcel 25002501001		**47**	**42**	**36**	**33**	**23**	**0**	**0**	**0**	**34**
Exceeds Standard By										

Note: Exceedances depicted by values in red text. Blank space indicates compliance.

*** Presented for informational purposes only. The Clark County Ordinance is octave band based.**

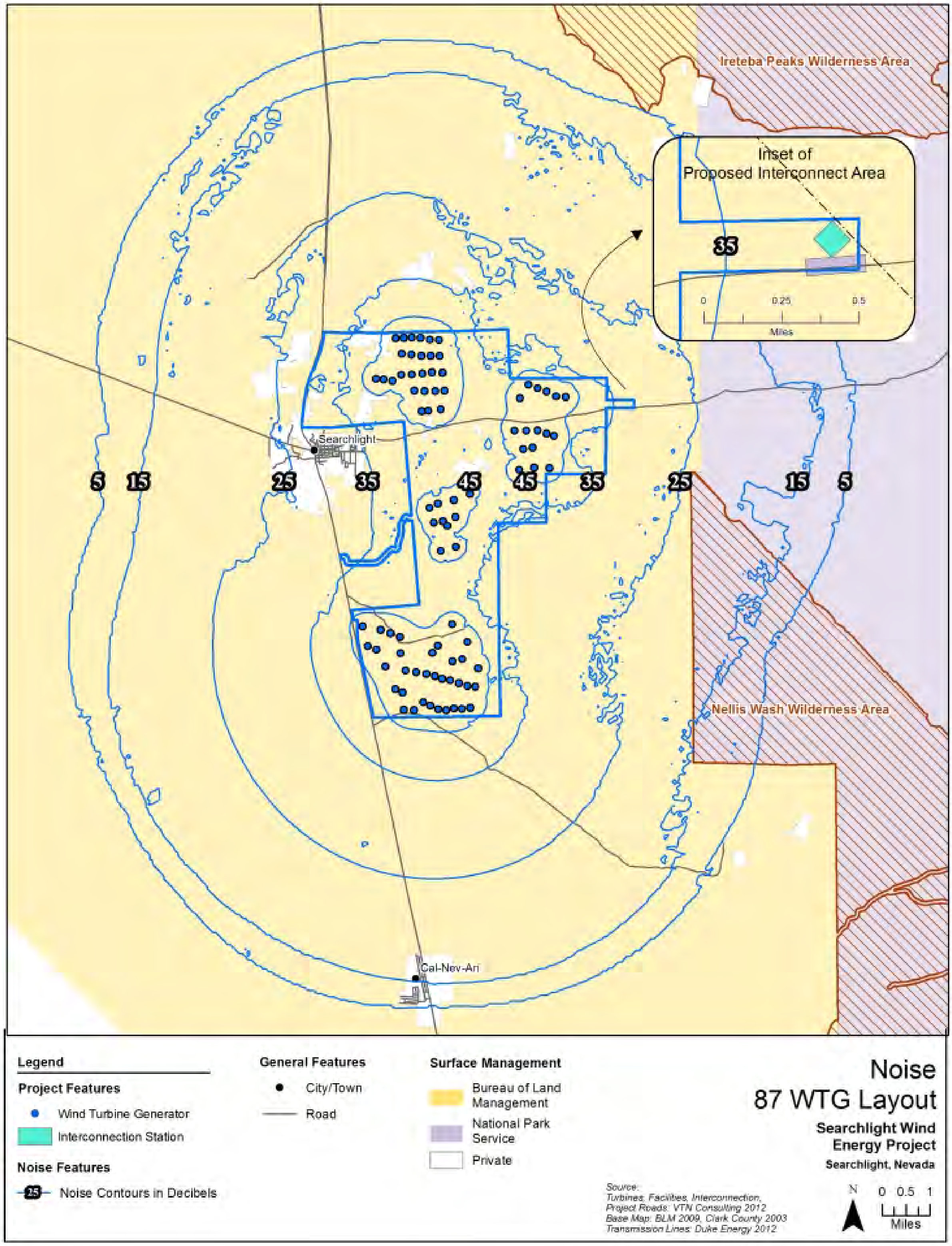


Figure 4.10-2. Noise Contours for the 87 WTG Layout Alternative

The predicted operational noise exceedances shown in Table 4.10-4 are at several of the closest property line locations. When considered relative to the Clark County Noise Ordinance maximum sound level thresholds (nighttime, for residential or business/industrial districts as appropriate), these estimated SPLs are in excess by the dB quantities shown. In other words, the estimated WTG O&M noise would exceed the noise ordinance by the presented amounts.

Because the list of locations in Table 4.10-4 represent those that are considered closest to the WTGs, it is expected that there will be other property line locations more distant from the WTGs (but on the same boundaries of the identified properties) that could experience less noise impacts (i.e., excess in decibels lower than the quantities shown in Table 4.10-4). As with construction noise, the Applicant would implement O&M- and decommissioning-related noise reducing measures that are compatible with local plans and zoning to the extent practicable, including APMs and MMs recommended for the 96 WTG Layout Alternative.

Operational sounds after construction would be less than 25 dBA at the boundary of the Lake Mead National Recreation Area - less than the 35 dBA threshold suggested by NPS (Figure 4.10-2).

4.10.3 Mitigation Measures

The Applicant would implement the following mitigation measures to further reduce noise increases:

MM NOI-1: CONDUCT CONSTRUCTION ACTIVITIES DURING DAYTIME HOURS

The Applicant will conduct construction activity only during daytime hours at the property boundary closest to the nearest residence(s). Construction activities (including truck deliveries, pile driving, and vibration equipment use) shall be restricted to the least noise-sensitive times of day-weekday daytime hours between 7:00 a.m. and 10:00 p.m., near residential or recreational areas. Blasting activities would be further limited to between the hours of 7:00 a.m. and 5:00 p.m. during weekdays only. Restrictions on air braking, down shift braking, stopping or staging in Searchlight will be enforced in compliance with the local traffic laws and the Traffic Control Plan that will be prepared by the construction contractor for review and approval by NDOT.

MM NOI-2: TURN OFF IDLING EQUIPMENT

The Applicant will turn off idling equipment when not in use.

MM NOI-3: NOTIFY ADJACENT RESIDENCES

The Applicant will notify adjacent residents in advance of construction work through public mailings and signs directed toward residents, landowners, and recreational users within 1 mile of the site prior to construction. The notice will state specifically where and when construction activities will occur in the area. The Applicant will also provide a communication line or procedures to enable individuals to contact the contractor in the event that construction noise levels affect them. The applicant will use an audible warning system will be used notifying public of pending blasting activities.

MM NOI-4: INSTALL ACOUSTIC BARRIERS

The Applicant will install acoustic barriers around stationary construction noise sources as necessary to maintain a noise level not to exceed 43 dBA at the property boundary closest to the nearest residence.

MM NOI-5: PROPER MAINTENANCE AND WORKING ORDER OF EQUIPMENT AND VEHICLES

Construction equipment will be maintained according to manufacturers' recommendations. The Applicant will ensure that all equipment is adequately muffled and maintained, to include:

- Use of noise controls on standard construction equipment and shielding on impact tools;
- Use of broadband noise backup alarms on mobile equipment; and

- Installation of mufflers on exhaust stacks of all diesel and gas-driven engines.

MM NOI-6: ENSURE PROPER INSTALLATION OF TRANSFORMER EQUIPMENT

The Applicant will ensure proper installation of transformer equipment by:

- Using sound-dampening pads between each transformer and mounting surface;
- Using flexible conduit couplings between each transformer and associated wiring system; and
- Mounting the transformers on surfaces with a large mass to avoid amplifying the sound.

4.10.4 Residual Effects

During construction phases of the Proposed Project, there would be short-term, negligible effects on the nearest human and nonhuman receptors. During O&M and decommissioning phases, there would be long-term effects on the closest receptors, which would be minimized through the implementation of applicable APMs, and MMS described above.

4.11 Recreation Impacts

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

4.11.1 Indicators

The Proposed Project would affect recreation if it:

- Conflicts with existing federal, state, and local recreation management plans and policies;
- Changes access to existing recreation areas or sites;
- Changes levels of use for existing recreational areas or sites; or
- Creates substantial overcrowding to other recreation areas caused by "spill over."

4.11.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. All effects discussed in this section are direct. No indirect effects were identified for this resource.

The extent and degree of surface disturbance resulting in changes to vegetation, topography, scenery, and the landscape was assessed. Effects on the recreation experience were assessed based on the extent and degree of surface disturbance, user conflicts, the presence of structures, and access for primitive and non-primitive recreation opportunities. The assessment takes into account existing recreation opportunities such as camping, hiking, wildlife viewing, rock climbing, OHV use, and hunting.

4.11.2.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built; therefore, no project related effects on recreation resources would occur.

4.11.2.2 Proposed Action – 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Action would be carried forward. Effects that could result from the implementation of the Proposed Action during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the following measures (see Table 2.6-1) to avoid and minimize effects on recreational resources in the Proposed Project area:

- APM-1 Erosion Control
- APM-2 Excavation/Grading
- APM-3 Air/Dust Control
- APM-5 SPCCP
- APM-7 Emergency Response Plan
- APM-8 Waste Management Plan
- APM-9 Noxious Weed Control Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-14 General Design and Construction Standards

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. Western will require the construction contractor to comply with Environmental Construction Standard 13 for construction of Western's proposed switching station.

Compliance with Management Goals

The Proposed Project site is within an area of Clark County administered by the BLM LVFO as the Southern Nevada Extensive Recreation Management Area (ERMA), which is managed to provide dispersed and diverse recreation opportunities. Within the project site, the current ROS classification is Roaded Natural, which offers roughly equal opportunities for organized, group recreational activities, or recreation in a natural setting, generally away from other human activities. There would be no change to the status of the ERMA or the existing ROS classification due to implementation of the Proposed Action.

Additionally, the Proposed Action and Western's proposed switching station would not have any effect on current management plans or policies within the Nelson Hills/Eldorado SRMA, located near the project vicinity.

The Proposed Action construction, O&M, and decommissioning activities are consistent with existing federal, state, and local recreation management plans and policies. Thus there would be no effect on recreation management directives resulting from implementation of the Proposed Action.

Recreation

Construction. During the 8 to 12 month construction phase, grading, excavation, trenching or other ground-disturbing activities, substantial short-term impacts to access to undeveloped recreational areas would occur. Regional and local access to the area would be by way of US-95 and Cottonwood Cove Roads. Access to project facilities would be provided by newly constructed extensions of existing roads, and upgraded existing roads. These roads extend from portions of US-95 and Cottonwood Cove Road. The truck traffic and truck trips associated with the transport of equipment to the Proposed Project area would increase traffic on US-95 and Cottonwood Cove Road, which might result in short-term substantial impacts on motorized travel if traffic flow problems or traffic delays were to occur. Construction of the Proposed Action would result in a short-term increase in traffic volume, which could change the level of access to recreational opportunities within and adjacent to the project site.

Access to public lands within the project area might also be temporarily restricted during construction for human and wildlife safety reasons. Construction activities might reduce access to current OHV riding, wildlife viewing, camping, hiking, rock climbing, and hunting opportunities. Temporary impacts may include road delays to nearby recreational activities such as LMNRA. However, when construction is complete, access roads would be available for public use and could enhance access to areas favorable for these recreational pursuits. Existing trails in the vicinity of proposed WTGs could be re-routed to accommodate the new turbines and construction (Kimley-Horn and Associates 2009). Existing access to multiple-use recreational trails and trailhead areas within the Piute-Eldorado ACEC would not be affected by the Proposed Project as no proposed project activities would be permitted in the ACEC. (Kimley-Horn and Associates 2009) with the exception of the proposed Western Switching Station which is allowable under the LV RMP because it is with a half mile of a federal highway.

Construction might result in a temporary decrease in the visual quality of the recreation setting in localized areas due to the presence of construction equipment, vehicles, and associated noise. Construction activities could reduce opportunities for solitude and naturalness and affect the primitive recreation experience in the short term. These activities could also force recreationists to pursue their activities in other areas. However, construction impacts would be short term with implementation of APM-1, APM-2, and APM-3. Requiring the construction contractor to comply with Western's Environmental Construction Standard 13 will mitigate impacts from construction of Western's proposed switching station site

Introduction or proliferation of noxious or invasive weeds resulting from earth-disturbing construction activities might affect the natural vegetation communities within the project area, detracting from the natural beauty of the landscape (See Section 4.4.2, Direct and Indirect Effects by Alternative – Non-listed Vegetation). All temporary construction sites, such as laydown areas, would be required to be reclaimed after construction, which would restore the recreation setting and experience in the long term. Effects to project area recreational resources and levels of use from construction would be minimized through the implementation of APM-3, APM-7, APM-8, APM-9, and Western's Construction Standard 13.

During construction of the Proposed Project, the BLM management of OHV activities within the Piute-Eldorado ACEC, which surrounds and is adjacent to the project area, would continue to be managed under the existing RMP and the terms and conditions of the Biological Opinion for the desert tortoise. These policies limit and restrict activities to designated areas to avoid interfering with MSHCP Covered Species. The range of management activities addressing OHVs that may be coordinated or funded over the life of the permit is listed in Sections 2.8.4 through 2.8.9 of the MSHCP (CCCPD 2000). Impacts on OHV use and experience during construction would be minimal in the short-term, including temporary restriction to limited locations within the project area, visual and noise intrusions, and potential alteration of drainages/dry washes used as OHV routes. These impacts would be minimized with implementation of the APMs and MMs listed above.

Approximately 1.5 miles of an existing road, which is an element of the Proposed Project and proposed for upgrading, may cross the northern portion of the Old Spanish National Historic Trail. However, no physical evidence of the trail exists on the ground (i.e. the exact location of the trail is unknown). Therefore, no impacts to the trail would occur.

Construction activities, laydown areas, or facilities would not affect recreational activities within the ACEC. Temporary decreases in camping, wildlife viewing, rock climbing and hiking opportunities within the project area due to construction activities and vehicle traffic would be minimal and short-term and limited to active construction sites and roads. Implementation of the applicable APMs and MMs listed above would minimize these impacts. Effects to recreation activities are expected to be similar to those discussed above. Impacts to recreation will be minimized through the implementation of Western's Construction Standard 13.

<u>O&M and Decommissioning.</u> Access to the project area during O&M would not be restricted and 29 miles of new and improved roads would allow for greater access to the area. Most access roads to O&M facilities would be open to motorized travel. O&M vehicles that access the project area for routine maintenance would have minimal impacts on public access to recreation activities in the area. Barriers would be placed where the transmission line ROW intersects local roads to prevent unauthorized use onto the transmission line ROW for human and wildlife safety reasons. This would limit access for public motorized travel in localized areas in the long-term. Impacts to access during decommissioning would be similar in type, intensity and duration as during construction. Effects on access to recreational opportunities during construction, O&M, and decommissioning would be minimized through the implementation of APM-10 and APM-14.

The physical presence of 96 WTGs and ancillary facilities including 2 substations, transmission lines, Western's proposed switching station, and access roads would change the character resulting in long-term impacts on the recreation setting and experience. The presence of these facilities and associated vehicle traffic would create visual contrasts across the landscape and degrade the quality of the recreation setting (See Section 4.10, Visual Resources Impacts). Opportunities for solitude and a primitive recreation experience would be reduced by O&M and decommissioning-related noise, and access could be temporarily limited for recreation activities in localized areas. The presence of WTGs and ancillary facilities, transmission lines, and roads, and the noise potentially created by them could impact big game and upland game wildlife habitat and reduce wildlife viewing and hunting opportunities. Implementation of the relevant APMs would minimize these impacts on wildlife habitat and populations.

Temporary impacts on the recreation setting and experience might occur from surface disturbing decommissioning activities, which could serve to increase the proliferation of noxious or invasive weeds. As with similar construction activities, implementation of applicable APMs and MMs listed above during decommissioning would serve to minimize these impacts.

Activities associated with O&M would not affect recreational activities that occur within the Piute-Eldorado ACEC. Approximately 159 acres of the total 18,949 acres proposed for the project would be unavailable for recreational pursuits after construction. Impacts to recreational activities such as camping, wildlife viewing, rock climbing and hiking within the Proposed Project area during O&M would be minimal and intermittent as described above. Impacts on recreational activities during decommissioning would be the same type, intensity, and duration as during construction. Implementation of the applicable APMs listed above would minimize these impacts.

It is possible that some existing recreation users in the project area will chose to recreate in other locations due to the presence of construction, O&M, and decommissioning activities and facilities. The permanent use of approximately 160 acres for project facilities would not substantially impact the project area's potential recreation opportunities or areas. Overcrowding of those pursuing recreational activities in other locations outside of the Proposed Project area is unlikely.

4.11.2.3 87 WTG Layout Alternative

Effects under the 87 WTG Layout Alternative would be similar to those identified under the 96 WTG Layout Alternative. The temporarily disturbed area (approximately 230 acres) and permanently disturbed area (approximately 152 acres) would be decreased under this alternative due to installation of 9 fewer WTGs. The presence of WTGs and ancillary facilities, and associated vehicle traffic, would create visual contrasts across the landscape and degrade the quality of the recreation setting. The type, intensity, and duration of effects from construction, O&M, and decommissioning activities on recreational activities would be similar to the 96 WTG Layout Alternative. Impacts on the recreation setting and experience would be slightly less than the Proposed Action due to the decrease in the number of proposed WTGs. The equivalent APMs and MMs implemented under the Proposed Action would be applicable under the 87 WTG Layout Alternative to minimize effects on recreation resources.

4.11.3 Mitigation

To further reduce impacts on recreation, the following measures would be implemented:

MM REC-1: RECREATION IMPACTS MINIMIZATION MEASURES

The Applicant and their contractor(s) shall reduce recreation impacts during construction by:

- Clearly delineating construction boundaries and minimizing areas of surface disturbance;
- Preserving vegetation to the greatest extent possible;
- Utilizing undulating surface disturbance edges;
- Stripping, salvaging and replacing topsoil;
- Employing contoured grading;
- Controlling erosion;
- Using dust suppression techniques;
- Restoring exposed soils as closely as possible to their original contour and vegetation; and
- Preserving access to roads and trails in the project area that are used for recreational purposes.

4.11.4 Residual Effects

There would be substantial residual impacts on the recreation setting and experience resulting from the long-term presence of WTGs, transmission lines, and access roads.

4.12 Socioeconomic Impacts

This section discusses effects on socioeconomic resources that may occur with implementation of the Proposed Action or alternatives. First, the indicators used to identify and analyze effects are presented, and second, potential effects are discussed. The discussion format is organized separately for both social and economic conditions.

4.12.1 Indicators

For the purposes of this analysis, the Proposed Action would affect social and economic conditions if it would:

- Result in a permanent or temporary population increase larger than local services, infrastructure, or population can accommodate; or
- Result in a tax burden to local residents not offset by the Proposed Action's generation of new public revenues.

NEPA provides no specific thresholds of significance for socioeconomic impact assessments. Significance varies based on the setting of the Proposed Action (40 CFR 1508.27[a]), but 40 CFR 1508.8 states that indirect effects may include those that are growth-inducing and others related to induced changes in the pattern of land use, population density, or growth rates. In addition, the regulations state, "Effects include….cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial" (40 CFR 1508.8).

A number of issues that were identified in the Public Scoping Summary Report relating to Socioeconomics form the basis for the assessment of potential effects. These include impacts on tourism in the area, property values, local jobs, and the economic quality of life for Searchlight residents and future economic growth.

The selection of an appropriate study area is important for regional economic analyses because the size of economic impacts is directly dependent on the size of the economy being analyzed. For purposes of economic impact modeling, the Searchlight Project Impact Region (SIR) has been defined as all of Clark and Mohave counties. While Boulder City and Laughlin/Bullhead City have relatively complete retail sectors, much of the impact would necessarily occur in the northern part of the region in and around Las Vegas, especially for purchases of larger and more technical construction services.

Direct economic impacts were estimated initially by developing detailed construction and operations budgets, with particular attention paid to the proportion of spending that might occur within the two-county region versus being imported into the region. These budgets, summarized in the analysis below, are the foundation for analyzing the region with and without the Proposed Project.

Total economic effects include direct effects attributed to the activity being analyzed, as well as the additional indirect and induced effects resulting from money circulating throughout the economy.[4] Because the businesses within a local economy are linked together through the purchase and sales patterns of goods and services produced in the local area, an action that has a direct impact on one or more of the local industries is likely to have an indirect impact on many other businesses in the region. For example, an increase in construction leads to increased spending in the adjacent area. These additional effects are known as the indirect economic impacts. As household income is affected by the changes in regional economic activity, additional impacts occur. The additional effects generated by changes in household spending are known as induced economic impacts.

The regional economic impacts of the Proposed Project were estimated using IMPLAN (Impact Analysis for Planning), an economic input-output (I-O) model[5]. This model is a standard in the industry and is commonly used in BLM planning. For this analysis, a 2008 economic model for Clark and Mohave counties was constructed by Dr. Tom Harris of the University of Nevada-Reno using IMPLAN software and data, and used to estimate economic impacts of the Proposed Project.

IMPLAN input-output models provide three economic measures that describe the economy: output, labor income, and employment. Output is the total value of the goods and services produced by businesses in the county. Labor income is the sum of employee compensation (including all payroll costs and benefits) and proprietor income. Employment represents the annual average number of employees, whether full-time or part-time, of the businesses producing output.

The costs of the Proposed Project and related assumptions, including spending estimates, locations of materials and services to be purchased, and use of local labor, were defined through communication with the Applicant and Western. It is important to remember that these cost estimates are snapshots that simplify dynamic market conditions that will be fluctuating up to the time of construction. The cost estimates are used as inputs to the IMPLAN model. All monetary values are reported in 2011 dollars, unless otherwise specified.

Assumptions used to analyze potential effects of the Proposed Project on socioeconomic conditions include the following:

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[4] Direct economic effects refer to changes in output, income, and employment attributed to the expenditures and/or production values specified as direct final demand changes. Effects are not the same as economic benefits, because effects are generated with inputs that would have an economic value in other uses. These opportunity costs must be deducted from effects to get the net economic benefits to society (or net changes in social welfare) that are used in benefit-cost analysis.

[5] The IMPLAN model consists of commercial software and region-specific economic data, which are maintained and distributed by the Minnesota IMPLAN Group, Inc., http://implan.com/v3/

1. A social discount rate of 3.0% is assumed for purposes of estimating the present value of various cost and revenue streams. Present value represents the current value of the future stream of output and income impacts. Future monetary values are discounted because society values money in the present more than the same amount of money at a future date. This social discount rate represents a long-term, inflation-free, and tax-free rate of return on investments.
2. Construction costs exclude debt financing costs. These are normally paid to financial institutions outside the region and do not affect local impacts.
3. Construction costs are based on 87 and 96 WTGs, each with a 2.3 MW capacity.
4. An 8- to 12-month construction period is assumed for the Proposed Project.
5. All costs and revenues are stated in 2011 constant dollars.
6. Project costs and revenues have been tailored to the project as specifically as possible, but many are representative costs or revenues taken from similar projects.
7. The economic life of the project is 25 years.
8. Royalty lease payments to BLM will occur at the rate of $4,155 per MW of installed capacity as set by the agency.
9. The project will qualify for Nevada property tax and sales tax abatement programs for renewable energy projects.
10. There is a 20% salvage value for the project after 25 years.

4.12.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA.

The economic impacts of one-time activities that happen during construction differ from the impacts of the activities that occur during project operation. Economic impacts are therefore reported separately for the construction and operation phases of each alternative. Economic impacts are further organized into direct and total effects. Direct effects refer to the impacts of economic activities generated directly by expenditures from the Proposed Project, while total effects also capture indirect effects and induced effects. The size of indirect and induced impacts depends on the proportion of goods, services, and labor that are provided from Clark and Mohave counties and not imported from outside the region. The higher the proportion of inputs provided locally, the larger the local economic impacts.

4.12.2.1 No Action Alternative

Under the No Action Alternative, the BLM would not grant the ROWs to the Applicant and Western, and thus there would be no change in existing socioeconomic conditions. The land would retain its rural desert qualities, and the habitats supporting ecosystems and species would not be altered from project-related encroachments. The purpose and need for the Proposed Project would be provided by other means. Under the No Action Alternative, the utility off-taker (the utility or bulk power purchaser and/or distributor) would not have access to the energy supply that would have been produced by the Proposed Project. Alternative renewable energy-generation projects developed elsewhere might not alleviate the Applicant’s concerns for reliability, cost, and the environmental sustainability of this resource.

4.12.2.2 Proposed Action — 96 WTG Layout Alternative

Social Impacts

This section discusses potential effects on the social well-being of area stakeholders. Effects on the social welfare of these groups might potentially occur during implementation of either action alternative. Potential social effects described in terms of effects on social well-being relate to the manner in which a particular social group, individual, or stakeholder interprets how the Proposed Action or alternatives might affect their environment and how such an effect relates to the integrity, quality, use, and enjoyment of socioeconomic resources.

Public comments received and evaluated during the public scoping process were reviewed to determine the values and quality of life concerns of stakeholder groups. These concerns form the backdrop against which project phases are evaluated for how each element could potentially influence the social well-being of the groups. Resources are broadly defined and can include, for example, historically used open spaces and quality habitat supporting recreation and wildlife appreciation and other resources necessary to maintain the historic quality of life that influences the social well-being of these stakeholders. Social well-being can potentially be affected by each phase of the Proposed Project (construction, O&M, and decommissioning). Social well-being can also be influenced by the level of participation and perceived degree of control that stakeholders have over their environment, its resources, and the government institutions that have stewardship obligations to manage these resources in a sustainable manner.

Demographics and Social Trends

Population

Construction. The construction phase of the 96 WTG Alternative is expected to have a short-term, beneficial impact on the Clark County population level. The impact would not cause a temporary population increase necessitating additional local public services or investment in infrastructure capacities that could not be provided from existing resources. During the peak of the construction period, the workforce could reach 250 to 300 workers. This would represent a negligible temporary increase in Clark County population where housing and infrastructure is designed for peak demands and fluctuations in global tourism.

O&M and Decommissioning. The operational phase of the 96 WTG Alternative is expected to have a long-term, beneficial impact on the area's population level. When constructed and operational, the Proposed Action would require up to 15 permanent staff to operate and maintain the facility.

Housing

Construction. The construction phase of the 96 WTG Alternative is expected to have a short-term, beneficial impact on the Clark County permanent and temporary housing stock. The impact would not cause a temporary strain and necessitate additional local public services or investment in public infrastructure capacities that could not be provided from existing resources. Sufficient temporary housing should be available within the Greater Las Vegas/Clark County area to accommodate nonlocal workers and their families/dependents during the length of their construction phase tenures. The small incremental demand from these workers would be beneficial to the housing and lodging sectors that have been negatively affected by the recession.

There is a possibility that some construction workers could choose to live in trailers or recreational vehicles (RVs). The nearest possibility would be some of the 149 sites available within the Cottonwood Cove Resort within the Lake Mead Recreation Area. However, the maximum stay within the recreation area is limited to 90 days within any consecutive 12-month period therefore it is more likely the workers with trailers or RVs would stay at an RV Park in Cal-Nev-Ari about 17 miles away or in Boulder City, the Las Vegas Valley, Laughlin, or Bullhead City, Arizona.

O&M and Decommissioning. The operational phase of the 96 WTG Alternative is anticipated to have a long-term, beneficial effect on the area's housing stock. The Proposed Action would permanently employ up to 15 full-time workers, which the Applicant anticipates would be local workers from the region and permanent residents. Therefore, the housing impact would be negligible; however, any incremental long-term stimulus provided from net migration to the housing sector would be beneficial for the economy. Some permanent workers could relocate to the Clark County area and would be expected to either purchase or lease homes during their long-term work tenures.

Affected Groups and Attitudes

Public Land Recreational Users / Off-Highway Vehicle Users / Organizations and Supporting Industries

Under the 96 WTG Alternative, recreational users would experience a limited impact on the open space currently available to them within the project vicinity to pursue activities such as horse and OHV riding, hiking, and flora and fauna viewing. The resources attracting these users would be affected by the Proposed Project site footprint, which would remove use of some public lands from recreational use and could change the historic relationship for recreational users. There is a possibility that some negative aspects of social well being associated with the use and enjoyment of select acreage of habitat or OHV and/or hiking range that is absorbed or altered by the project site could be compromised on both a short-term and long-term basis. This social unease could relate to feelings of insecurity about open lands shrinking, thereby removing them from the stock of lands that have historically been available to stakeholders. However, mitigation measures would reduce these potential negative social well-being effects (see Section 4.11, Recreation Impacts).

Environmental Groups and Stewards

Under the 96 WTG Alternative, the Proposed Project site could change the historic relationship that this stakeholder group has with public lands, as loss of desert open space areas would affect vegetation and wildlife communities and habitat. APMs and mitigation measures for vegetation and wildlife (see Section 4.4, Biological Resource Impacts) would reduce potential effects.

Project Construction Workers and Suppliers to the Renewable Energy Industry

Under the 96 WTG Alternative, construction workers and suppliers to the utility-scale wind energy facility installation industry have a vested interest in seeing the Proposed Action through to completion. The social well-being of this group would be enhanced because the construction phase mobilization of manpower, materials, equipment, and supplies would provide a much needed stimulus to this sector of the regional economy. Although the construction phase of the Proposed Action would be short term, the sense of positive social well-being would arise from the participation of this group in the industry's development and the experience of having worked on a utility-scale project. Positive social well-being also comes with developing experience and knowledge of utility-scale installation (and best construction practices) of wind energy assets that can potentially lead to future contracts in this growing industry. While the Proposed Action would require fewer workers during the O&M phase, it would continue to provide social well-being for these workers.

Utility Off-Taker and End-Use Energy Consumers

Under the 96 WTG Alternative, both the utility off-taker and end-use energy consumers would experience social well-being from the reliability, cost, and sustainability benefits generated by the Proposed Project's renewable energy production.

Local Private Land Owners/Residents/Large Lot Owners

The social attitudes within this stakeholder group are diverse, and the likely social welfare effects that arise under each alternative would be varied. Under the Proposed Action, members of this stakeholder group who support the full-scale development of renewable energy potential on public lands would feel validated and their sense of social well-being would be enhanced. Conversely, those who oppose renewable energy development at this location could experience the opposite feelings.

Economic Impacts

Construction. The economic impacts generated during construction of a wind energy project are related to the mix of inputs required to construct the Proposed Action. Capital equipment and construction-related materials are purchased both locally and outside the Proposed Project region. Construction labor generates jobs and associated labor income. Much of the labor is hired within the project region, but it is very common for a significant amount of specialized labor to be brought into the region from elsewhere (e.g., WTG erection crews). To quantify the effects of construction on the regional economy, it is necessary to identify and quantify the mix of inputs required to construct the Proposed Project. This was achieved through conversations with the Applicant, who relied on their experience constructing and operating other representative wind energy projects in the western United States to develop budgets specific to this project.[6] Construction impacts are temporary, lasting through a single construction season of 8 to 12 months.

For wind energy projects, typical construction inputs include major capital equipment (e.g., WTGs, towers, and transmission equipment), construction materials (e.g., concrete, rebar, and road aggregate), electrical equipment and supplies (e.g., transformers and wiring), soft costs (e.g., planning, permitting, and engineering), and construction labor. Table 4.12-1 presents a summary of the 96 WTG Layout Alternative construction expenditures.

Table 4.12-1. Summary of Project Construction Expenditures with the 96 WTG Layout Alternative

Construction Input	Total Cost	Local Expenditures	Local %
Nonlabor			
WTGs, including transportation	$216,070,000		0.0%
Roads and foundations	$19,510,000	$9,750,000	50.0%
Cables and electrical connections	$14,920,000	$520,000	3.5%
Interconnection switching station	$7,730,000	$390,000	0.0%
Balance of plant (construction, engineering, administration, etc.)	$26,100,000	$960,000	3.7%
Nonlocal labor living expenses		$3,240,000	100.0%
Nonlabor Subtotal	**$284,330,000**	**$14,860,000**	**5.2%**
Labor			
WTGs	$7,830,000	$2,120,000	27.0%
Roads and foundations	$3,990,000	$1,270,000	31.8%
Cables and electrical connections	$12,310,000	$3,090,000	25.1%
Interconnection switching station	$2,810,000	$480,000	17.1%
Balance of plant (construction, engineering, administration, etc.)	$10,870,000	$2,010,000	18.5%
Labor Subtotal	**$37,810,000**	**$8,970,000**	**23.7%**
Total Construction Costs	**$322,140,000**	**$23,830,000**	**7.4%**

[6] E-mails and phone conversations with Searchlight Wind Energy Project Manager Bob Charlebois and with Cost Engineer Dan Depperman on various dates in 2010 and 2011.

In sum, the total construction expenditures of the Proposed Action are estimated to be over $322 million, excluding debt financing and sales tax. The largest single expenditure is for the WTGs (including blades and towers), which cost about $216 million delivered onsite and account for 67% of total project costs. Direct labor costs are estimated to be nearly $38 million, with about $27 million in labor payments for installation of the roads, foundations, wind turbines, and electrical connections, including substations, and $10.9 million for other planning and construction activities. Of the total project costs, $274.5 million, or 92.6% of expenditures, would be for equipment and labor located outside the project region. Note that while the local living expenses of Applicant employees or contractors is included in local expenditures, there would be additional local spending for housing and meals by nonlocal construction personnel, which are estimated to be $3.1 million.

The total economic impacts of construction of the 96 WTG Layout Alternative are the sum of direct, indirect, and induced effects (Table 4.12-2). They reflect the specific construction costs as well as inter-industry linkages and representative household spending patterns that characterize the Clark and Mohave counties' economy. Although the total project cost is estimated at $322 million, the direct economic output in the SIR would be the $23.8 million of local expenditures. This direct impact would create indirect impacts of $7.1 million and induced impacts of $8.9 million, for a total temporary economic impact on output of $39.8 million during the year of construction. This would generate a total increase in labor income of $14.1 million. An estimated 300 full- and part-time jobs would be created directly by the project's construction. Note that a single construction worker or heavy equipment operator might hold multiple temporary jobs on the Proposed Project as it proceeds through various tasks for completion. The direct employment would generate an additional 47.9 jobs indirectly and induce another 67.3 jobs for a total of 415.2 temporary and full-time jobs during the construction period. To maximize the socioeconomic benefits of the Proposed Project on the local communities, to the extent possible, the Applicant, Western, and their contractors could hire qualified employees and qualified service vendors from the surrounding communities.

Table 4.12-2. Construction Impacts for the 96 WTG Layout Alternative

Economic Impact	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Output (millions 2011$)	$23.8	$7.1	$8.9	**$39.8**
Labor Income (millions 2011$)	$9.0	$2.5	$2.6	**$14.1**
Employment (full- and part-time temporary jobs)	300	47.9	67.3	**415.2**

Note: Totals may not add due to rounding.

<u>O&M and Decommissioning.</u> When operational, the Proposed Project would generate ongoing O&M activities that would result in long-term economic impacts on Clark and Mohave counties. Annual O&M are estimated to require $8.12 million (excluding taxes and debt service costs), of which $2.95 million would be expended locally (Table 4.12-3). These annual local expenditures would continue over the 25-year life of the Proposed Project. Over half of total expenditures would be for materials and services not produced locally (such as replacement parts for WTGs). However, $500,000 in annual purchases would be made locally for routine hardware and electrical supplies, lubricants, fuel and utility services, and nonlocal labor living expenses. Wiser and Bolinger (2011) note that project O&M costs tend to increase over time as WTGs age, component failures become more common, and warranties expire, so the O&M costs in this analysis may be conservative for the life of the project.

Table 4.12-3. Summary of Project Annual Operations Expenditures for 96 WTG Layout Alternative

Cost Category	Total Cost	Materials Expenditures	Labor Expenditures	Total Local Expenditures	Local %
Turbine warranty and O&M expenses	$3,680,000	$150,000	$590,000	$740,000	20.1%
Balance of plant O&M expenses	$2,090,000	$80,000	$1,530,000	$1,610,000	77.0%
Other O&M expenses	$600,000	$210,000	$340,000	$550,000	91.7%
BLM land lease payment	$920,000	$0	$0	$0	0.0%
Insurance	$850,000	$0	$0	$0	0.0%
Nonlocal labor living expenses		$50,000		$50,000	100.0%
Annual Total	**$8,150,000**	**$500,000**	**$2,460,000**	**$2,950,000**	**36.2%**

Notes:
1. Property tax of $1,279,000 in first year not included.
2. Totals may not add due to rounding.
3. Adjusted to 2011 dollars using forecasts of Gross Domestic Product (GDP) Implicit Price Deflator from Institute for Housing Studies (IHS) Global Insight's April 2011 baseline forecast
4. Nonlocal labor living expenses estimated to be 15% of wages.

Implementation of the 96 WTG Layout Alternative would support permanent, full-time employees, including management, administrative, and staff for security and O & M on project facilities. The majority of these positions would be with the WTG manufacturer in support of the WTG service and maintenance warranty. Many of these jobs would be local hires, particularly if a wind technician training program is offered at a nearby higher education institution. At the expiration of the warranty, these jobs would either be transferred to the owner for long-term maintenance of the WTGs, remain with the manufacturer in the form of a long-term maintenance contract, or be transferred to a third party maintenance firm. The total payroll for these positions, including benefits, is estimated to be approximately $2.5 million per year. It is assumed all project staff would reside permanently in Clark or Mohave counties when the facility is operational. To maximize the socioeconomic benefits of the Proposed Project on the local communities, the Applicant, Western and their contractors could hire qualified employees and qualified service vendors from the surrounding communities to the extent possible.

The Applicant would also make annual lease payments of $920,000 to the BLM for WTGs and other facilities. The BLM lease payments are specified at a rate of $4,155 per megawatt of installed nameplate capacity (BLM 2008b). Payments to the BLM for the WTGs on federal lands are not retained in the LVFO, and so are assumed to be expended outside the two-county region.

The direct expenditures described above were run through the two-county IMPLAN model to generate the estimated impacts in Table 4.12-4. The addition of indirect and induced impacts to the $2.95 million in local expenditures would create a total annual impact of $4.9 million in economic output for the two-county region. Labor income would increased by $3.1 million annually. An estimated 18.0 full-time and part-time jobs would be created directly by project O&M. Note that these are not all direct hires by the project operator, but may be employed by vendors serving the Proposed Project. Indirect impacts would add another 1.2 jobs and induced impacts another 13.4, for a total impact of 32.6 permanent full- and part-time jobs.

Table 4.12-4. Summary of Annual Operations Impacts for the 96 WTG Layout Alternative

Economic Impact	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Output (millions 2011 $)	$2.95	$0.19	$1.78	**$4.92**
Labor income (millions 2011 $)	$2.46	$0.07	$0.57	**$3.10**
Employment (full- and part-time jobs)	18.0	1.2	13.4	**32.6**

Notes:
1. Totals may not add due to rounding.
2. Does not include impacts of local expenditure of property tax revenue.

The impacts of project operations do not include the impacts created by local government spending the additional property tax revenues to provide local services to residents, or the impacts of sales tax distribution to local school districts. These expenditures would also ripple through the local economy.

Economic Impacts Summary

Total regional economic impacts of each phase of project construction and O&M with the 96 WTG Layout Alternative are presented in Table 4.12-5. Table 4.12-5 also presents the total economic impacts of the Proposed Action in present value terms. Present value represents the current value of the future stream of output and income benefits. By discounting future values, impacts can be analyzed in terms of current dollars. The discount rate used in this analysis is 3% (which means that $100 next year is equivalent to $97 this year).

Table 4.12-5. Summary of Estimated Impacts of 96 WTG Layout Alternative

Economic Impact	Construction (one-time)	Operations (Annual)	Present Value Project Total
Output (millions 2011$)			
Direct effects	$23.8	$3.0	$73.8
Indirect effects	$7.1	$0.2	$10.3
Induced effects	$8.9	$1.8	$39.0
Total Output Effects	**$39.8**	**$4.9**	**$123.1**
Labor Income (millions 2011$)			
Direct effects	$9.0	$2.5	$50.6
Indirect effects	$2.5	$0.1	$3.7
Induced effects	$2.6	$0.6	$12.3
Total Income Effects	**$14.1**	**$3.1**	**$73.3**
Employment (Jobs)			
Direct effects	300.0	18.0	
Indirect effects	47.9	1.2	
Induced effects	67.3	13.4	
Total Employment Effects	**415.2**	**32.6**	

Notes:
1. Totals may not add due to rounding.
2. Employment includes both full- and part-time jobs.

The present value of direct, indirect, and induced economic output generated in the two counties by the Proposed Action construction and O&M over the life of the project is estimated at $123.1 million. This economic activity generates labor income to the region’s residents of $73.3 million over the 25-year life of the Proposed Project, as well as employment of 415.2 full or part-time temporary jobs in the construction years and 32.6 full or part-time permanent jobs each year of full operation.

Economic Impacts after Expected Project Life

The Proposed Action would have an expected project life of 25 years. Given that the construction of the Proposed Project would take place over the first year, this means the useful life of the project ends after Year 26. Beginning Year 27, one of three scenarios could happen (as presented in the following subsections) that would carry positive economic impacts for the region. It is worth noting that economic impacts in Year 27 would still carry a present value of 45% at a 3% discount rate. This means that any of the three scenarios discussed below would have economic impacts with meaningful value today.

Useful Life Extends Beyond 25 Years

Perhaps the most likely scenario is that the WTGs could continue to function beyond 25 years. In fact, the term of the proposed ROW grant is for 30 years. At this point of the wind energy industry's rapid development, there is uncertainty about the length of useful life. Under this option, a few WTGs might fail but most would continue to generate electricity. The same O&M would be needed and might even increase with efforts to rehabilitate WTGs. The streams of economic value, spending, and tax revenues would continue. This option is a temporary condition, likely to last one to several years.

Project Repower, New Infrastructure

In a second possible scenario after Year 26, the existing WTG components and other infrastructure could be replaced. The cost would be significantly less than the cost of the original project, but would approach $200 million, based on the construction costs in Table 4.12-1. The technology that will exist in Year 27 is unknown, but it is likely that the new WTGs would generate more electricity and thus provide greater streams of continuing impacts from operation than the original Proposed Project.

Project Decommissioning

The third possible scenario is that the Proposed Project would be decommissioned sometime after Year 26. Significant local labor is likely to be used in the deconstruction and land restoration, providing large temporary economic impacts to the region's economy. Because of the relative youth of the wind energy industry, there are no data and considerable uncertainties around the cost of decommissioning, but decommissioning is a requirement of project construction permits.

Economic Impacts Outside the Searchlight Impact Region

The economic impacts of the Proposed Action would clearly extend beyond the project region. The expenditure of $275 million outside the region on large capital equipment like the WTGs and towers would generate hundreds of jobs for the U.S. and world economies (depending on where the materials are produced and how they are transported)[7]. In addition, many of the local purchases would be for goods

[7] Ayee et al. point out that the market share of domestically produced wind turbine components was approximately 50% in 2008. They cite a different study that estimates each 100MW of installed wind power capacity generates 310 person-years of manufacturing sector jobs, 67 contracting and installation jobs, and 9.5 O&M jobs.

imported into the region for resale. To the extent that local labor is not available and/or specialized labor is needed, workers would be drawn in from surrounding counties and/or states with larger and more diverse construction work forces. The payroll for labor purchased outside the region is nearly $30 million. This would result in employment benefits and generate wage earnings that are leaked outside the county, thereby benefiting other regional economies.

Project O&M would generate a number of positive economic impacts outside the region. There are over 8,000 precision parts in a single WTG, and approximately half of those components are manufactured in the U.S. (Ayee et al. 2009). Purchases of parts, equipment, and services for O&M outside the region would generate jobs and income in the areas where they are procured. The electricity produced by the Proposed Project would facilitate development in the areas where it is consumed, such as southern Nevada, to the extent that electricity supply is a limiting factor. Finally, there are positive environmental externalities generated to the extent that the power produced by the Proposed Project would replace more polluting thermal energy and thereby reduce U.S. carbon emissions (see Section 4.6, Air Quality and Climate Impacts).

Impacts on Property Values

The literature generally supports the hypothesis that wind energy developments do not adversely affect property values (Refer to Appendix F: Literature Review of Socioeconomic Effects of Wind Project and Transmission Lines). This is especially true for agricultural properties and for residential properties more than one mile from the project. The hedonic pricing study by Hoen, et al. (2009) appears to be the most comprehensive, statistically rigorous, and empirically defensible piece of the literature on this topic. They examined data on 7,459 actual home sales for 24 wind projects affecting ten communities across the country, comparing similar homes with and without a view of a wind project. The homes ranged from 800 feet to over five miles from projects. They examined three types of potential stigma: Area stigma from having a wind project in the general area, scenic view stigma of having a wind project within sight from the home, and nuisance stigma of perceived impacts on health and safety. Their data does not support the hypothesis that wind projects have a negative impact on property values.

The literature underscores an important point. Perceptions of a wind project on property value are very individual, with a wide range of responses. While some may have a strongly negative reaction to the presence of wind turbines, there are enough others with a neutral or even positive response who are willing to pay current market price for the home. The net result is to keep the market steady.

Note that the real estate market in and around the Town of Searchlight is very small. In 2007, ten residential houses were sold in Searchlight, and in 2008 there were four homes sold. There were slightly more sales of vacant lots and land. 2009-2011 has been even more difficult years for real estate transactions. People interested in moving to Searchlight must like the relative isolation and small town lifestyle, or they are attracted to the proximity to Lake Mohave coupled with the slightly cooler weather of high altitude Searchlight. The point is that the pool of potential homebuyers for Searchlight is much smaller than the pool of buyers for the Las Vegas area. Residents seeking to sell their property in Searchlight may be tempted to lay blame for slow sales or lower prices on a wind project, but the more likely reason is the very thin market of buyers for Searchlight property and the effects of the Great Recession. This may be especially true for higher valued properties.

Homes in the new development south of Cottonwood Cove road on the eastern edge of Searchlight lie roughly 0.3 miles from the Project boundary, but are about 1.5 miles from the nearest wind turbine. This development was constructed near the peak in residential homes values in 2007, and its property values have declined abruptly since. The literature does not support the hypothesis that this wind project will cause further declines in value.

There are perhaps a dozen residences east of Highway 95 and just north of the project boundary near Met Tower #8111. The closest of these structures is just over a quarter-mile from the nearest turbine and within view of several turbines. While it is not possible to rule out the possibility of some negative impact to the value of these scattered parcels, past studies do not support this hypothesis. The conclusion of Pitts and Jackson (2007) in their review of the literature on the impact of high voltage transmission lines seems useful here (Appendix F: Literature Review of Socioeconomic Effects of Wind Project and Transmission Lines).

Impacts on Recreation and Tourism

The wind farm literature as of 2009 shows no studies documenting any negative impacts on recreation or tourism. Two studies by Entrix acknowledge the possibility of small positive impacts associated with interest in the wind farms. An ex-post study of three existing wind farms in southeastern Washington state documented 600-800 visitors per year participating in group tours of the wind farms. (Entrix, 2009) Placing interpretive signage on Highways 95 and 164 would help address visitor curiosity and may cause passers-by to stop in the town of Searchlight.

Direct impacts to recreation and tourism values are expected to be negligible under both the 96 and 87 WTG Layout Alternatives. The direction of change in recreation values is indeterminate. There will be a diminishment in the quality of certain recreation uses that rely on wilderness or primitive conditions, which would reduce recreation values as a result of the project. Conversely, there may be an increase in OHV use of the area as a result of increased road access. Motorized recreation values are generally higher on a visitor-day basis than non-motorized uses (Stynes and White, 2005). The net change in recreation values flowing from the project area cannot be determined without estimates of the change in visitor use of each recreation type.

Similarly, in the short term there may be a small increase in both recreation and tourism visitors by those curious about large wind projects. However, there may also be a decrease in recreation use by individuals who have a negative reaction to the project's construction and presence. Both impacts may diminish over time as people become accustomed to the presence of the project.

The Town of Searchlight's location advantage as a gateway community and a provider of pass-through tourism services does not change as a result of this project. Impacts to these types of tourism activity expected to be minimal under either 96 or 87 WTG Layout alternatives.

Fiscal Impacts

An important part of project analysis is to look at the fiscal impacts to units of local government with and without the project. These impacts can either be increased revenue streams to local government from property taxes, sales taxes, and the like, or impacts can be costs incurred by government for the provision of public services needed by the project. Typical public services needed during construction and/or project operations are road maintenance, water, and fire and police protection. None of these are typically large for wind energy projects. The cost of such additional services is typically far less than the additional revenue provided to the relevant tax district, e.g. Clark County General Operating Fund.

Tax impacts vary by project year, so this analysis presents values in present values, in addition to first year values. Present value is the value in current, 2011dollars of the future stream of tax payments. As noted at the end of the previous section, to calculate the present value of the payments it is necessary to discount future values because a payment this year is more valuable than an equivalent payment next year (due to the use of the money this year). The discount rate used in this analysis is 3.0% (which means that $100 this year is equivalent to $97 next year).

The State of Nevada uses *ad valorem* taxes to generate revenue for local services. The roads and buildings in a wind energy project are taxed as real property, while the foundations, towers, WTGs, and other components are taxed as personal property, using a several depreciation rates of varying years of useful life. The assessed value is 35% of total project cost, less sales tax payments. Renewable energy projects qualify for an abatement of 45% of their property tax bill, provided they meet certain conditions regarding capital cost, job creation, and wage and benefit rates. Of the remaining tax, 45% is distributed to the Nevada Renewable Energy Fund and the rest is apportioned to the local taxing districts in proportion to their levies. Table 4.12-6 displays the distribution of the first full year tax bill and the present value of property taxes over the 30-year life of the Proposed Action. The property tax bill declines each year as the project assets are depreciated. The biggest beneficiary of these taxes is the State of Nevada, followed by Clark County schools, Clark County general fund, and the Las Vegas Metropolitan Police Department.

Table 4.12-6. Property Tax Revenues to Clark County with the 96 WTG Layout Alternative

Taxing District	FY11-12 Tax Rate	Share of Property Tax of $1,278,979	Present Value to 2011 at 3%
Clark County Capital	0.0500	$20,515	$171,875
Clark County Debt	0.0129	$5,293	$44,344
Clark County Family Court	0.0192	$7,878	$66,000
Clark County General Operating	0.4470	$166,993	$1,399,061
Clark County School Debt (Bonds)	0.5534	$227,061	$1,902,311
Clark County School O&M	0.7500	$307,727	$2,578,123
Indigent Accident Fund	0.0150	$6,155	$51,562
Las Vegas/Clark County Library District	0.0942	$33,193	$278,094
LVMPD Manpower Supplement - County	0.2800	$114,885	$962,499
Medical Assistance to Indigent Persons	0.1000	$41,030	$343,750
Town of Searchlight	0.0200	$24,618	$206,250
State Cooperative Extension	0.0100	$4,103	$34,375
State of Nevada	0.1700	$69,751	$584,375
	2.5217	$764,015	$6,379,533
Nevada Renewable Energy Fund (45%)		$625,103	$5,219,618
First Year Property Tax Bill with Abatement		$1,389,118	**$11,599,150**

Sales Tax

Nevada law also provides for a sales tax abatement to a reduced rate of 2.25% for qualifying renewable energy projects. Again, the Proponent anticipates meeting these requirements. Under the 96 WTG Layout Alternative, sales tax of $7.0 million will be paid to the State of Nevada for project construction. These revenues will return to local school districts under the normal distribution formula.

Additional Fiscal Impacts

There are several other factors that will increase fiscal impacts but cannot be quantified:

- Some purchases made by private contractors during construction may be subject to Nevada sales tax at the full rate.
- Some of the non-local labor will be spent locally for taxable food, lodging, and other personal expenditures.
- There will clearly be some taxable sales from indirect or induced spending and from operations spending that will generate revenue for the State of Nevada and relevant local jurisdictions.
- Similarly, there will be Nevada business taxes generated during project operations.

87 WTG Layout Alternative

Social Impacts

The 87 WTG Layout Alternative would have similar effects on social well-being of area stakeholders, population, demographics, and housing as those identified under the Proposed Action.

Economic Impacts

Expenditures, Earnings, and Employment

Construction. Under the 87 WTG Layout Alternative, the number of WTGs would be decreased to 87. The decreased number of WTGs would require a proportionate decrease in the number of road miles and electrical connections. The total construction expenditures of this alternative are estimated at nearly $300 million, excluding debt financing and sales tax (Table 4.12-7). The proportion of construction costs spent locally would increase slightly from 7.4% with the 96 WTG Alternative to 7.5% with the 87 WTG alternative. Table 4.12-7 presents a summary of the 87 WTG Layout Alternative construction expenditures.

Table 4.12-7. Summary of Project Construction Expenditures for the 87 WTG Layout Alternative

Construction Input	Total Cost	Local Expenditures	Local %
Nonlabor			
WTGs, including transportation	$195,820,000	$0	0.0%
Roads and foundations	$17,680,000	$8,840,000	50.0%
Cables and electrical connections	$14,150,000	$520,000	3.7%
Interconnection switching station	$7,730,000	$390,000	0.0%
Balance of plant (buildings, construction, engineering, administration, etc.)	$25,440,000	$960,000	3.8%
Nonlocal labor living expenses		$3,090,000	
Nonlabor Subtotal	**$260,820,000**	**$13,800,000**	**5.3%**
Labor			
WTGs	$7,100,000	$1,920,000	27.0%
Roads and foundations	$3,620,000	$1,150,000	31.8%
Cables and electrical connections	$11,580,000	$2,910,000	25.1%
Interconnection switching station	$2,810,000	$480,000	17.1%
Balance of plant (buildings, construction, engineering, administration, etc.)	$10,870,000	$2,010,000	18.5%
Labor Subtotal	**$35,970,000**	**$8,470,000**	**23.5%**
Total Construction Costs	**296,790,000**	**22,270,000**	**7.5**

The total economic impacts of project construction are the sum of direct, indirect, and induced effects (see Table 4.12-8). These impacts are slightly less than the impacts of the 96 WTG Layout Alternative.

Table 4.12-8. Construction Impacts for the 87 WTG Layout Alternative

Economic Impact	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Output (millions 2011$)	$22.3	$6.6	$8.4	**$37.2**
Labor Income (millions 2011$)	$8.5	$2.3	$2.4	**$13.2**
Employment (full and part-time temporary jobs)	275	44.7	63.2	**382.9**

Note: Totals may not add up due to rounding.

O&M and Decommissioning. Upon completion of construction, ongoing O&M activities would create long-term economic benefit to Clark and Mohave counties. Annual operations are estimated to require $7.4 million (excluding taxes and debt service costs), of which $2.7 million would be expended locally (Table 4.12-9). Annual O&M costs mirror those with the 96 WTG Layout Alternative, but would be slightly less due to the smaller number of WTGs.

Table 4.12-9. Summary of Project Annual Operations Expenditures for 87 WTG Layout Alternative

Cost Category	Total Cost	Materials Expenditures	Labor Expenditures	Total Local Expenditures	Local %
WTG warranty and O&M expenses	$3,340,000	$130,000	$530,000	$670,000	20.1%
Balance of plant O&M expenses	$1,900,000	$80,000	$1,390,000	$1,460,000	76.8%
Other O&M expenses	$600,000	$210,000	$340,000	$550,000	91.7%
BLM land lease payment	$830,000	$0	$0	$0	0.0%
Insurance	$770,000	$0	$0	$0	0.0%
Non-local labor living expenses		$50,000		$50,000	100.0%
Annual Total	$7,440,000	$470,000	$2,260,000	$2,680,000	36.0%

Notes:
1. Property tax of $1,279,000 in first year not included.
2. Totals may not add due to rounding.
3. Adjusted to 2011 dollars using forecasts of Gross Domestic Product (GDP) Implicit Price Deflator from IHS Global Insight's April 2011 baseline forecast
4. Nonlocal labor living expenses estimated to be 15% of wages.

The direct expenditures described above were run through the two-county IMPLAN model to generate the estimated impacts in Table 4.12-10. The addition of indirect and induced impacts to the $2.7 million in local expenditures creates a total annual impact of $4.5 million in economic output for the two-county region. Labor income is increased by $2.85 million annually. An estimated 15 full- and part-time jobs would be created directly by project operations. Note that these are not all direct hires by the project operator, but may be employed by vendors serving the Proposed Project. Indirect impacts would add another 1.1 jobs and induced impacts another 12.3, for a total impact of 28.4 permanent full- and part-time jobs.

Table 4.12-10. Summary of Annual Operations Impacts for the 87 WTG Layout Alternative

Economic Impact	Direct Impact	Indirect Impact	Induced Impact	Total Impact
Output (millions 2011 $)	$2.68	$0.17	$1.63	$4.49
Labor income (millions 2011 $)	$2.26	$0.06	$0.53	$2.85
Employment (full- and part time jobs)	15.0	1.1	12.3	28.4

Notes:
1. Totals may not add up due to rounding.
2. Does not include impacts of local expenditure of property tax revenue.

Economic Impacts Summary

Total regional economic impacts of each phase of construction and operations for the 87 WTG Layout Alternative are presented in Table 4.12-11. The impacts are similar to those of the 97 WTG Layout Alternative, but slightly lower in proportion to the decrease in WTGs.

Table 4.12-11. Summary of Estimated Impacts of 87 WTG Layout Alternative

Economic Impact	Construction (one-time)	Operations (Annual)	Present Value Project Total
Output (millions 2011 $)			
Direct effects	$22.3	$2.7	$67.6
Indirect effects	$6.6	$0.2	$9.5
Induced effects	$8.4	$1.6	$36.0
Total Output Effects	**$37.2**	**$4.5**	**$113.1**
Labor Income (millions 2011 $)			
Direct effects	$8.5	$2.3	$46.7
Indirect effects	$2.3	$0.1	$3.4
Induced effects	$2.4	$0.5	$11.3
Total Income Effects	**$13.2**	**$2.8**	**$61.4**
Employment (Jobs)			
Direct effects	275.0	15.0	
Indirect effects	44.7	1.1	
Induced effects	63.2	12.3	
Total Employment Effects	**382.9**	**28.4**	

Note:
1. Totals may not add due to rounding.
2. Employment includes both full and part-time jobs.

Impacts on Property Values

The impacts on property values in the 87 WTG Layout Alternative are the same as discussed in the 96 WTG Layout Alternative.

Impacts on Recreation and Tourism

The impacts on recreation and tourism values in the 87 WTG Layout Alternative are the same as discussed in the 96 WTG Layout Alternative.

Fiscal Impacts

Under the 87 WTG Layout Alternative, fiscal impacts would be the same as under the 96 WTG Layout Alternative, with small decreases in proportion because of the smaller number of WTGs. Table 4.12-12 displays the distribution of the first full year tax bill of $1.28 million and the present value of property taxes over the 25-year life of the project, $10.68 million.

Table 4.12-12. Property Tax Revenues to Clark County with the 87 WTG Layout Alternative

Taxing District	FY11-12 Tax Rate	Share of Property Tax of $1,278,979	Present Value to 2011 at 3%
Clark County Capital	0.0500	$19,155	$160,484
Clark County Debt	0.0129	$4,942	$41,405
Clark County Family Court	0.0192	$7,356	$61,626
Clark County General Operating	0.4470	$155,925	$1,306,338
Clark County School Debt (bonds)	0.5534	$212,013	$1,776,235
Clark County School O&M	0.7500	$287,332	$2,407,257
Indigent Accident Fund	0.0150	$5,747	$48,145
Las Vegas/Clark County Library District	0.0942	$30,994	$259,663
LVMPD Manpower Supplement County	0.2800	$107,271	$898,709
Medical Assistance to Indigent Persons	0.1000	$38,311	$320,968
Town of Searchlight	0.0200	$22,987	$192,581
State Cooperative Extension	0.0100	$3,831	$32,097
State of Nevada	0.1700	$65,129	$545,645
	2.5217	**$703,439**	**$5,873,720**
Nevada Renewable Energy Fund (45%)		$575,541	$4,805,771
First Year Property Tax Bill with abatement		$1,278,979	**$10,679,492**

Notes
1. Assumes assessed value to be 35% of $292.75 million total project cost (less sales tax) for 87 WTGs, with a 45% property tax abatement for renewable energy projects.
2. Rates for Clark County Tax Districts 700 and 701 for FY2011-12, with 45% to Nevada Renewable Energy Fund & remainder through normal proration to taxing districts.
3. Present values of future tax payments calculated using a 3% social discount rate.
FY = fiscal year; LVMPD = Las Vegas Metropolitan Police Department; O&M = operations and maintenance

Sales Tax

Under the 87 WTG Layout Alternative, sales tax would be the same as under the 96 WTG alternative, but slightly lower. Under this alternative, sales taxes of $6.35 million would be paid to the State of Nevada for project construction.

Additional Fiscal Impacts

Additional fiscal impacts will be the same in the 87 WTG Layout Alternative as in the 96 WTG Alternative.

4.12.3 Mitigation

No adverse impacts to socioeconomic conditions are anticipated; therefore, no mitigation is proposed.

4.12.4 Residual Impacts

During the construction phase of the Proposed Action, there would be short-term, beneficial residual effects on population and housing, the regional economy, and personal income and employment levels, public services, and tax revenues. During O&M phases, there would be long-term beneficial residual effects on population and housing, the regional economy, and personal income and employment levels, public services, and tax revenues. Effects on social and economic conditions from decommissioning are also expected to be beneficial.

4.13 Environmental Justice Impacts

This section discusses effects on environmental justice that may occur with implementation of the Proposed Action or alternatives. Data used for the environmental justice analysis was obtained from the 2000 Decennial Census and is presented in detail in Section 3.13, Environmental Justice. As discussed in Section 3.13, the Proposed Project area is not considered an environmental justice community, with respect to minority populations (including American Indian communities) or income. As such, any project-related impacts that would occur within the boundaries of the project area would not have any disproportionately adverse human health or environmental effect on minority, American Indians, or low-income populations.

4.13.1 Indicators

Consistent with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), this environmental justice analysis identifies and addresses any disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations. The CEQ (1997) has issued guidance to federal agencies on the definition of disproportionately high and adverse effects as used in EO 12898, as follows:

- **Disproportionately High and Adverse Human Health Effects.** When determining whether human health effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

  1. Whether the health effects, which may be measured in risks and rates, are significant (as employed by NEPA), or above generally accepted norms;

  2. Whether the risk or rate of hazard exposure to a minority population, low-income population, or Indian tribe to an environmental hazard is significant (as employed by NEPA) and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group; and

  3. Whether health effects occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposure to environmental hazards.

- **Disproportionately High and Adverse Environmental Effects.** When determining whether environmental effects are disproportionately high and adverse, agencies are to consider the following three factors to the extent practicable:

  1. Whether there is or will be an impact on the natural or physical environment that significantly (as employed by NEPA) and adversely affects a minority population, low-income population, or Indian tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Indian tribes when those impacts are interrelated to impacts on the natural or physical environment;

  2. Whether environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Indian tribes that appreciably exceed or are likely to appreciably exceed those on the general population or other appropriate comparison group; and

  3. Whether the environmental effects occur or would occur in a minority population, low-income population, or Indian tribe affected by cumulative or multiple adverse exposures from environmental hazards.

In addition, the BLM Land Use Planning Handbook defines BLM's environmental justice principles and considers "aggregate, cumulative, and synergistic effects, including results of actions taken by other parties" (BLM 2005a).

4.13.2 Direct and Indirect Effects by Alternative

This section discusses the potential direct and indirect effects on environmental justice under each alternative. Analysis for this section was completed by assessing potential temporary (i.e., construction) and permanent impacts resulting from the implementation of each alternative and comparing these impacts to the Census Tracts, Block Groups, and blocks within and in the vicinity of the Proposed Project area.

4.13.2.1 No Action Alternative

Under the No Action Alternative, the ROW application would be denied and the Proposed Project would not be built. There would be no change in current conditions for minority and low-income populations under this alternative. The opportunities for any minority and low-income persons to seek employment at higher wages would not occur.

4.13.2.2 Proposed Action - 96 WTG Layout Alternative

Under the 96 WTG Layout Alternative, the BLM would grant the Applicant ROW to construct, operate and maintain, and decommission a wind energy generation facility. Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. Section 3.13, Environmental Justice, presents a review of the estimated 2010 populations of the two-county (Clark and Mohave) SIR and the SIA. The SIR was observed to have similar but somewhat lower proportions of minority populations than the States of Nevada and Arizona overall. The SIA is markedly less diverse. Hispanic and American Indian populations have been growing in number faster than the overall population in the SIA. African Americans and Asians are few in number, but their populations are growing the most rapidly within the SIA. The conclusion is that minority populations are under-represented within the SIA.

In terms of low-income populations, estimated 2010 poverty levels for families in the SIR at 10.2% are between poverty levels for the State of Nevada at 8.6% and the State of Arizona at 10.9% (see Table 3.13-1 in Section 3.13-Environmental Justice). The SIA has 8.7% of families living in poverty, which is comparable to the State of Nevada. The conclusion is that Proposed Project area is not close to large numbers of low-income residents.

Under the 96 WYG Layout Alternatives, both construction and O&M activities would offer opportunities for minority and low-income persons to seek employment at higher wages. These opportunities are a tangible, if not measurable, positive impact.

Neither the temporary noise impacts during Proposed Action construction nor the viewshed effects during O&M would particularly affect low-income or minority neighborhoods. In fact, Cottonwood Cove Road passes by some of the newer homes in the Searchlight area. As described Section 4.12, Socio Impacts, no negative economic impacts on property values from construction and O&M of the 87 WTG Layout Alternative could be documented.

Because the nonwhite racial minority population in the SIA is less diverse than that of the SIR, Nevada and Arizona, and the U.S. overall, there are no minority populations that meet the environmental justice criteria. Though the SIA has a larger population of senior citizens than the U.S., their income levels appear to be higher and poverty levels lower than for the SIR or either state. For instance, within the Searchlight CDP, 41% of the 288 total population were seniors aged 65 or older, yet there were no people or households living below the poverty level in 2010. Given that poverty levels for the SIA are lower than the SIR, Arizona, and the United States, there are no low income populations that meet the environmental justice criteria. Mitigation would not be warranted because the only effects identified were the beneficial effects of additional employment opportunities.

4.13.2.3 87 WTG Layout Alternative

Because the Proposed Project area under the 87 WTG Layout Alternative would be located within the same Census Tracts, Block Groups, and blocks as the 96 WTG Layout Alternative, the environmental justice impacts on each of these demographics would be identical under the 87 WTG Layout Alternative. The 87 WTG Layout Alternative would not disproportionately affect minority and/or low-income populations who meet the environmental justice criteria.

4.13.3 Mitigation

No adverse effects to environmental justice populations are anticipated; therefore no mitigation is proposed.

4.13.4 Residual Effects

The Proposed Action and alternative would have no environmental justice impacts because there are no environmental justice communities within the Proposed Project area; therefore, the Proposed Project would have no residual effects under this criterion.

4.14 Health and Human Safety Impacts

This section discusses effects on human health and safety due to exposure to or creation of hazards that might occur with implementation of the Proposed Action, alternatives or Western's proposed switching station. Potential effects are discussed, agency-recommended mitigation measures are presented, and a discussion of residual effects is provided. It is the BLM's policy to reduce threats to public health, safety, and property. In addition, in accordance with the FLPMA, the BLM is required to comply with state standards for public health and safety. Written and verbal comments gathered during the EIS scoping period focused on concerns related to wildfire management, emergency response time, water resources impacts (e.g., chemical spills), and air traffic safety and future air travel facilities development.

4.14.1 Indicators

Under NEPA, significant effects on health and safety would occur if the Proposed Project:

- Uses, stores, or disposes of petroleum products and/or hazardous materials in a manner that results in a release to the aquatic or terrestrial environment in an amount equal to or greater than the reportable quantity for that material or creates a substantial risk to human health;
- Mobilizes contaminants currently existing in the soil or groundwater, creating potential pathways of exposure to humans or wildlife that would result in exposure to contaminants at levels that would be expected to be harmful;
- Exposes workers to contaminated or hazardous materials at levels in excess of those permitted by the Federal Operational Safety and Health Administration (OSHA) in 29 CFR §1910, or expose members of the public to direct or indirect contact with hazardous materials from the Proposed Action's construction or operations; or
- Exposes people residing or working in the Proposed Action vicinity or structures to safety hazards and/or a significant risk of loss, injury, or death.

In order to compare effects associated with the Proposed Action and alternative project elements, the indicators were considered both independently and in conjunction with one another using the following assumptions.

This analysis evaluates several aspects of the proposed use of hazardous materials at the proposed wind energy facility in order to assess the potential for released hazardous materials to affect the public. It is recognized that some hazardous substances must be used at the facility. Therefore, this analysis was conducted by examining the choice and amount of chemicals to be used, the manner in which the Applicant and Western would use the chemicals, the manner by which they would be transported to the facility, the way in which the Applicant and Western plan to store the materials on site, and engineering and administrative controls that the Applicant and Western will implement to mitigate the potential for hazardous substance releases, fire hazards, and exposure of the public and workers to hazards associated with the Proposed Project. In addition, the area within a 1-mile distance from the Proposed Project site boundary was researched and analyzed for potential hazardous materials facilities that could affect the Proposed Project, such as residential and commercial properties.

4.14.2 Direct and Indirect Effects by Alternative

This section describes the effects under each alternative using the respective methodology prescribed under NEPA. To compare effects, this analysis defines the temporal scale (time), spatial extent (area), and intensity of effects for each alternative. The analysis of direct and indirect effects focuses on the potential effects on public safety due to the exposure to hazards and hazardous materials on the general public, workers, and the environment.

The primary mechanisms for potential exposure to human health and safety hazards considered for this analysis include improper handling or transport of hazardous materials, reasonably foreseeable but inadvertent spills or releases of hazardous materials, soil disturbance on sites with known and unknown contamination, and electrical and fire hazard. Impacts would be considered significant if there were a violation of federal, state, or local regulations regarding proper hazardous material storage, use, and/or disposal.

4.14.2.1 No Action Alternative

Under the No Action Alternative, the ROW applications would be denied and the Proposed Project and would not be built; therefore, no project related effects on health and human safety would occur.

4.14.2.2 Proposed Action – 96 WTG Layout Alternative

Under the 87 WTG Layout Alternative, the BLM would approve the ROW applications and the Proposed Action would be carried forward. Effects that could result from the implementation of Proposed Action during construction, O&M, or decommissioning activities are analyzed in this section. The Applicant has incorporated the following measures to avoid and minimize impacts on human health and safety within the Proposed Project area:

- APM-1 Erosion Control
- APM-2 Excavation/Grading
- APM-3 Air/Dust Control
- APM-4 SWPP
- APM-5 SPCCP
- APM-6 Health and Safety Program
- APM-7 Emergency Response Plan
- APM-8 Waste Management Plan
- APM-9 Weed Control Plan
- APM-10 Site Rehabilitation Plan and Facility Decommissioning Plan
- APM-11 Aeronautical Considerations
- APM-13 Environmental Clearance
- APM-14 General Design and Construction Standards

Additionally under the Proposed Action, the BLM would authorize Western to construct, operate, and maintain the proposed switching station. For construction of the Western Switching Station, Western will require the construction contractor to incorporate specific provisions to mitigate impacts related to human health and safety in Western's Environmental Construction Standard 13, specifically the following sections:

- 13.1 Contractor Furnished Data
- 13.3 Landscape Preservation
- 13.5 Noxious Weed Control
- 13.7 Use of Recovered Material and Biobased Products
- 13.8 Disposal of Waste Material
- 13.9 Contractor's Liability for Regulated Material Incidents
- 13.10 Pollutant Spill Prevention, Notification, and Cleanup
- 13.12 Treated Wood Poles and Members Recycling or Disposal
- 13.13 Prevention of Air Pollution
- 13.14 Handling and Management of Asbestos Containing Material
- 13.16 Prevention of Water Pollution
- 13.17 Testing, Draining, Removal, and Disposal of Oil-Filled Electrical Equipment

- 13.18 Removal of Contaminated Material

Construction and O&M activities of the Proposed Action would take place on previously undeveloped BLM lands. Potential safety risks associated with the Proposed Action phases range from accidental spills or releases of hazardous substances; mobilization of existing contamination; handling and disposal of hazardous materials; and potential exposure to electrical, flood, fire, and aircraft operation hazards.

Hazardous Materials

Construction. Construction of Proposed Action including Western's proposed switching station would have potential human health and safety effects from the use, transport, and disposal of petroleum products and hazardous materials. During construction activities, localized spills and leaks of hazardous materials from equipment, storage sites, and/or vehicles could occur as a result of improper handling or inadvertent spills, which could result in exposure of the public or wildlife to contaminants. Potential sources of spills and leaks would be the operation of heavy equipment and filling of transformer and hydraulic equipment reservoirs. Hazardous materials that would be used and discarded during the construction activities include gasoline, diesel fuel, motor oil and oil filters, hydraulic fluids and lubricants, paints, solvents, cleaning fluids, adhesives, batteries, empty hazardous material containers (<1 ton), and spent welding materials.

Hazardous construction materials would be delivered to the site by truck and temporarily stored in designated staging areas. Additionally, some hazardous materials such as vehicle fuel, oils, and other fluids for vehicle maintenance would be used and stored in construction vehicles. Construction equipment would be well maintained at all times to minimize leaks of motor oils, hydraulic fluids, and fuels. All vehicle maintenance would be performed off site at an appropriate facility. An environmentally benign detergent would be used to remove wind-carried particulate matter from internal and external WTG mechanisms. Hydrocarbon or hazardous wastes may be generated from maintenance of heavy equipment in the field. These wastes would include used oil and grease, antifreeze, solvents, rags, and wipes. These wastes would be properly contained, labeled, and recycled or disposed of offsite in existing permitted facilities.

Construction activities could temporarily expose workers to direct or indirect contact with hazardous materials at levels in excess of those permitted by the OSHA (29 CFR, Part 1910). Workers who work with hazardous materials are required under OSHA regulations to have a certain level of training to properly handle hazardous materials. However, due to improper handling of hazardous materials, workers could be exposed in excess of permitted levels. To address workers potential exposure to contaminated or hazardous materials, the Applicant would develop and implement a Health and Safety Program (APM-6) that would require all employees and contractors to adhere to appropriate health and safety plans and emergency response plans that meet industry standards. However, detailed content of this plan is not currently available.

Solid waste streams generated during construction of the Proposed Action would include MSW, sewage, construction debris, nonhazardous regulated wastes, and small quantities of hazardous wastes. MSW from the workforce would be collected, contained, and trucked to an offsite permitted landfill or equivalent. Sewage would be collected in portable sanitary facilities and removed by a contractor for offsite treatment and disposal in an existing permitted treatment facility. A sanitary service contractor would remove sanitary waste. Solid waste generated during construction would be recycled or disposed of at either an industrial or municipal landfill.

In the event of any accidental spill, the Applicant would clean up and restore the spill site (see APM-5 and APM-7), and the resultant waste would be properly disposed in accordance with federal and state regulations. In addition, the Applicant would require all contractors and employees to comply with a Health and Safety Program (APM-6) during construction.

Because of the size of the Proposed Project, in addition to APM-7, the Applicant is required to prepare and implement a SPCC plan (APM-5) that would include BMPs for hazardous materials management. Additionally, a SWPPP (APM-4) will be prepared by the Applicant to prevent pollution from storm water runoff. To date, detailed information about the SPCC plan and SWPPP has not been available; the Applicant has committed to developing a SPCC plan and SWPPP prior to construction to protect the environment from spills of petroleum products.

With the proper implementation of the APMs, and adherence to regulations, any release that occurred would likely be below the reportable quantity for hazardous materials and would be cleaned up in a manner that complies with federal, state, and local regulations, thereby limiting or preventing any potential exposure to people or wildlife. Such measures would also reduce potential for wildfire. Therefore, the potential impact of an accidental release of hazardous materials during construction would be short term and localized.

Another potential effect to human health and safety during construction would be the disturbance of unearthing of hazardous waste-contaminated soils. Currently, there is no evidence to suggest that onsite soils are contaminated; however, soils in the project area have not been sampled and characterized, and mining activity has been reported within the project area and vicinity. Therefore, the possibility exists that small amounts of contaminated soils might be present on site. Construction activities could unearth this contamination, and construction workers or wildlife could be exposed.

Construction of the proposed switching station may have similar hazards as those discussed above. Implementation of relevant sections of Western's Construction Standard 13 would minimize these potential effects.

O&M. The O&M of the Proposed Project would involve the periodic and routine transport, use, and disposal of hazardous materials and equipment containing hazardous materials such as paint, lubricating oils, welding gases, hydraulic fluid, and cleaning solvents for WTG and substation maintenance. The hazardous substances to be used during O&M would have low and moderate (acetylene only) toxicity materials under the National Fire Protection Agency health rating. The Applicant and Western would have to comply with the standards of the required hazardous material permits to be issued by the Nevada State Fire Marshal and the Clark County Fire Department for the proper storage of these hazardous materials on site. In their permit application, the Applicant would be required to include a Hazardous Material Management Plan that includes a Facility Site Plan designating storage and use areas, maximum amount of materials to be stored, container sizes and types, location of emergency isolation and mitigation valves, and the proposed storage arrangement.

The WTGs would typically use lubricating oils and greases, none of which contain any compounds listed as hazardous by the EPA. These are used in moderate quantities and are contained entirely within the spill trap and nacelle, so the possibility for accidental leakage is minimal. Lubricating oils are checked quarterly and filled and changed as needed. Spent oils would be recycled with a certified waste contractor. Oil changes would be performed up-tower, where the nacelle would contain any accidental spills.

Solid waste streams generated during O&M of the Proposed Action would include MSW, sewage, nonhazardous regulated wastes, and small quantities of hazardous wastes. MSW from the O&M workforce would be collected, contained, and trucked to an offsite permitted landfill or equivalent. Sewage and wastewater from toilet flushing at the O&M building would be treated with an onsite septic tank and absorption field. The septic tank and absorption field would be located adjacent to the O&M building. The Applicant would apply for a Small Commercial Septic System Permit from the Clark County Health District (see Section 4.3.2, MM Water-1).

Transformers would contain cooling oil that is designated nonpolychlorinated biphenyl. Inspection of each transformer to detect and prevent leaks would be performed on a regular basis.

O&M of the transmission line and substation facilities would use little in the way of hazardous materials and would generate only minor amounts of MSW, which would be brought back to the O&M building for disposal. Transformer oils would be used in some of the transformers and certain other electrical devices. These are highly refined petroleum oils with low vapor pressure, high flash point, and low toxicity. In normal use, the oils are fully contained within the electrical apparatus, which themselves would be located within secure, fenced facilities. These management practices would therefore produce negligible environmental impacts.

Small quantities of oils and greases would be stored in the O&M building on site in properly suited containers. All special wastes, including waste oils and contaminated rags, would be removed from the site using a controlled waste manifest. All waste materials would be disposed of via a licensed waste carrier, who would deliver the material to a licensed waste disposal site. In addition, O&M vehicles and equipment would be well-maintained at all times to minimize leaks of motor oils, hydraulic fluids, and fuels. All vehicle maintenance would be performed off site at an appropriate facility.

The presence of potentially hazardous materials as well as high-voltage electrical equipment poses potential safety risks to local responders. Project components create the potential for a fire or medical emergency due to the storage and use of diesel fuels, lubricating oils, and hydraulic fluids. Storage and use of these substances may occur at the substations, in electrical transmission line structures, at staging area(s), and in the O&M building. However, due to the accessibility of these areas, response to an emergency should not be difficult for local fire and emergency personnel.

With the proper implementation of the APMs, MMs, and adherence to regulations, any release that occurred would likely be below the reportable quantity for hazardous materials and would be cleaned up in a manner that complies with federal, state, and local regulations, thereby limiting or preventing any potential exposure to any people or wildlife. Such measures would also reduce potential for wildfire. Therefore, the potential impact of an accidental release of hazardous materials during O&M would be short term and localized. Additional mitigation measures are not required for O&M activities.

Decommissioning. Decommissioning of the Proposed Action components would occur upon cessation of the ROW grant and/or the end of operation and removal of equipment (e.g., WTGs, substations, O&M building). The Proposed Action facilities have an expected life of approximately 30 years. The Applicant would develop a Site Rehabilitation Plan and Facility Decommissioning Plan for site closure activities (APM-10).

During decommissioning, the potential effects on human and ecological receptors would be similar to those described in the construction section. Additionally, decommissioning activities that would disturb soil include the removal of WTGs, support towers, and supporting foundations; demolition and removal of the O&M building, substations, and switchyards; removal of transmission poles and conductors; and closure and abandonment of the septic tank. If a spill of hazardous materials occurs, residual contamination could be unearthed.

In the Facility Decommission Plan, the Applicant would address the removal of equipment and hazardous material, impacts and mitigation associated with the decommissioning and closure of the site, the schedule of closure activities, a listing of equipment or disturbances to remain at the site, and the conformance of the plan with applicable federal, state, and local regulations.

Solid waste streams generated during decommissioning of the Proposed Action, including substations, would include MSW, sewage, non-salvageable equipment, nonhazardous regulated wastes, and small quantities of hazardous wastes. MSW from the workforce would be collected, contained, and trucked to an offsite permitted landfill or equivalent. The septic system would be abandoned in a manner consistent with state and local health regulations.

With the proper implementation of the APMs, MMs, and adherence to regulations, any release that occurred would likely be below the reportable quantity for hazardous materials and would be cleaned up in a manner that complies with federal, state, and local regulations, thereby limiting or preventing any potential exposure to any people or wildlife. Such measures would also reduce potential for wildfire. Therefore, the potential impact of an accidental release of hazardous materials during decommissioning would be short term and localized. Additional mitigation measures are not required for decommissioning activities.

Fire and Electrocution Hazards

Construction. During construction, the Proposed Project activities and related equipment could expose people or structures to an increased risk of loss, injury, or death as a result of electrocution or exposure to wildland fires, including wildlands adjacent to urbanized areas in the town of Searchlight (residential and commercial areas) and occasional recreational visitors within the project vicinity.

The risk of fire danger would be related to the combustion of native materials due to smoking, refueling, and operating vehicles and other equipment off roadways. Brushing activities for vegetation control and removal during construction could present a fire hazard if the vegetation debris were not removed from areas used for welding.

The Community Hazard Assessment conducted for the Clark County Multi-Jurisdictional Hazard Mitigation Plan (2005) classifies Searchlight as a “Moderate Hazard” due to its moderate wildfire risk potential, primarily due to steep topography and limited fire suppression resources. The Proposed Project would pose two major potential ignition sources during construction: brushing and welding. Organic matter removed during vegetation clearing and grubbing would be mulched on site and redistributed into the fill (except under equipment foundations, trenches, and roadways), thereby increasing the risk of wildland fires within the construction areas. In addition, WTG, collector, and transmission line construction would involve welding operations, which would increase the risk of wildland fire ignition within the construction areas.

Existing facilities located in proximity of the Proposed Project site are primarily dispersed residential properties, an elementary school, and commercial businesses within Searchlight. The Clark County Multi-Jurisdictional Hazard Mitigation Plan (Clark County 2005) has included a recommended measure for reducing the fire risk in Searchlight by removing abandoned structures and establishing defensible spaces around residential and commercial properties.

If the introduction of invasive, non-native plants is not controlled during construction, over time the project site could become dominated with non-native plants that tend to increase the frequency and severity of wildfires that might occur during the Proposed Project operational phase. The proposed Weed Control Plan (APM-9) would minimize the potential for weed colonization and dominance on site by requiring implementation of a risk assessment of the invasive weed species currently known within the project area, procedures to control their spread on site, and procedures to help minimize the introduction of new weed species. Implementation of this mitigation measure would not completely eliminate the introduction of noxious or invasive weeds into the study area, but it would minimize their introduction and control their spread on the project site.

Portions of the Project Action are located close to overhead transmission power lines. Construction of the Proposed Project could also expose workers to potential electrocution hazards. However, the Applicant has committed to designing the proposed electric systems and components in compliance with the National Electric Code (NEC) and National Electric Safety Code, as well as additional industrial safety standards and federal, state, and local codes (APM-14). Additionally, to ensure compliance with OSHA in 29 CFR, Part 1910, the Applicant would implement MM SAFE-3 during construction activities, including but not limited to Subpart S and Sections 1910.331-1910.335 related to protective measures and equipment for employees whose occupations require them to work directly with electricity.

Implementation of MM SAFE-4 along with the Applicant’s Emergency Response Plan (APM-7) and Weed Control Plan (APM-9) would reduce the risk of wildland fires by providing prevention and response measures to potential fire hazards. In addition, implementation of MM SAFE-3 would ensure that construction employees and those working with electrical equipment would be required to follow electrical safety-related work practices required by OSHA regulations.

O&M. The O&M of the Proposed Action could result in wildfire ignition if the WTG rotor blades were to spin out of control and cause a fire in the nacelle. In addition, during operation, lightning strikes on WTGs could create power surges that could result in a fire. WTGs can be the source of wildfire ignitions due to collection line failure, WTG malfunction or mechanical failure, and lightning- and bird-related incidents. When mechanical or electrical failures cause a WTG to catch fire, they might burn for many hours due to the limited ability of fire suppression crews to effectively fight fires hundreds of feet above the ground. High-wind conditions are risky for both WTG malfunction and the spread of wildfire. Wind-blown flaming debris from a WTG fire can ignite vegetation in the surrounding area. In addition, pad-mounted transformers can explode and result in a wildfire ignition, although this is expected to be a rare occurrence. However, vegetation clearance requirements (APM 9) and project design features (APM-14) would reduce the potential for wildfire ignition and the potential for a wildfire to spread out of control.

The height of the WTGs could interfere with aerial firefighting operations by obstructing low-level flight paths within the site boundaries. The presence of the existing transmission lines in the project vicinity causes aerial firefighters to avoid flying in the immediate project vicinity under existing conditions. Obstruction of aerial firefighting from the presence of WTGs and transmission lines would be moderate.

Additional O&M activities that would increase the potential for additional incidents related to fire and fire safety include the storage and use of hydraulic oil and other petroleum products, which combined with electrical arcing and sparking from exposed wiring between WTGs, collectors, transmission line, substations, and Western’s proposed switching station, would result in a fire hazard.

To reduce fire risk, the Applicant would construct a 20-foot-wide firebreak on the exterior of the perimeter fencing surrounding the O&M building and the proposed substations, in addition to a 20-foot wide firebreak surrounding individual WTG locations (APM-7). Shrubs and other large vegetation would be removed from the firebreak. Grading or discing would maintain the firebreak.

The electrical equipment enclosures that would house the transformers would be either metal or concrete structures. Any fire that could potentially occur would be contained within the structures, which would be designed to meet National Electrical Manufacturers Association standards for electrical enclosures (APM-14).

O&M activities could also expose workers to potential electrocution hazards from the electrically energized equipment. However, the Applicant has committed to designing the proposed electric systems and components in compliance with the NEC and other applicable federal and industrial standards (APM-14).

Decommissioning. Decommissioning of the Proposed Project would involve similar fire and electrocution risks as those described for the construction activities.

Turbine Hazards

O&M. Because of active, existing mineral claims within the project boundary, existing OHV trail use in the project area, and estimated use of the project access roads by OHV users, there is the possibility that the Proposed Project could create hazards or might adversely affect public safety due to potential blade throw or turbine collapse. The Applicant has proposed an estimated blade throw safety set-back for each turbine using a circle around each turbine with a radius of 886 feet (APM-14). This is a conservative safety set-back using an estimated maximum blade height of 295 feet multiplied by a factor of 3 (based on blade throw studies summarized in Larwood [2005]).

Trench Hazards

Construction. Because the Applicant will be excavating trenches to lay down communication and electrical lines between WTGs and collection points, there is the possibility that the Proposed Project could create open trench hazards during the construction phase that might adversely affect worker and/or public safety. The Applicant and Western will adhere to OSHA standards for trenching and excavation safety as outlined in 29 CFR 1926. To address workers potential exposure to contaminated or hazardous materials, the Applicant would develop and implement a Health and Safety Program (APM-6) that would require all employees and contractors to adhere to appropriate health and safety plans and emergency response plans that meet industry standards. However, detailed content of this plan is not currently available. The Applicant and Western will additionally ensure that all open trenches are property demarcated to ensure that both workers and the public are aware of the location of any open trenches when traveling in the project area.

4.14.3 Mitigation

To further reduce effects to Human Health and Safety, the following mitigation measures would be implemented:

MM SAFE-1: HAZARDOUS MATERIALS MANAGEMENT

The Applicant will implement a Hazardous Materials Handling Management Program or incorporate within their other program the item outlined below. Hazardous materials used and stored on site for the Proposed Action activities will be managed according to the specifications outlined below as follows:

- **Hazardous Materials Handling Program**. A project-specific hazardous materials management program will be developed prior to initiation of the Proposed Action construction. The program will outline proper hazardous materials use, storage, and disposal requirements. The program will identify types of hazardous materials to be used during construction activities. All personnel will be provided with project-specific training. This program will be developed to ensure that all hazardous materials are handled in a safe and environmentally sound manner. Employees will receive hazardous materials training and will be trained in hazardous waste procedures; spill contingencies; waste minimization procedures; and treatment, storage, and disposal facility training in accordance with OSHA Hazard Communication.
- **Transport of Hazardous Materials**. Hazardous materials that will be transported by truck include fuel (diesel fuel and gasoline) and oils and lubricants for equipment. Containers used to store hazardous materials will be properly labeled and kept in good condition. Written procedures for the transport of hazardous materials used will be established in accordance with U.S. Department of Transportation (USDOT) and NDOT regulations. A qualified transporter will be selected to comply with federal and state transportation regulations.
- **Fueling and Maintenance of Construction Equipment.** Written procedures for fueling and maintenance of construction equipment will be prepared prior to construction. Vehicles and equipment will be refueled on site or by tanker trucks. Procedures will include the use of drop cloths made of plastic, drip pans, and trays to be placed under refilling areas to ensure that chemicals do not come into contact with the ground. Refueling stations will be located in designated areas where absorbent pads and trays will be available. The fuel tanks will also contain a lined area to ensure that accidental spills do not occur. Drip pans or other collection devices will be placed under the equipment at night to capture drips or spills. Equipment will be inspected daily for potential leakage or failures. Hazardous materials such as paints, adhesives, and solvents, will be kept in an approved locker or storage cabinet.

MM SAFE-2: CHARACTERIZE POTENTIALLY CONTAMINATED SOIL

To ensure that workers, the public, and wildlife are not exposed to potential contaminants, if soil is unearthed that is discolored or has an odor, work will be stopped in that area. In this event, the Applicant will retain a Certified Environmental Manager approved by the State of Nevada to characterize the type and extent of potential contamination. The soil should then be sampled and characterized prior to further site excavation activities in the area with discolored or odorous soils. If the soil is found to be contaminated based on federal or state regulations, then the Applicant will implement the appropriate and relevant procedures to properly characterize, contain, and dispose of the contaminated material.

MM SAFE-3: ADHERENCE OF THE HEALTH AND SAFETY PROGRAM WITH 29 CFR, PART 1910

The Applicant and Western will ensure that all health and safety and emergency plans required for employees and contractors during construction, operations, and decommissioning of the Proposed Action will comply with the OSHA Standards provided in federal regulation 29 CFR, Part 1910, as well as with applicable state and local occupational health and safety regulations.

MM SAFE-4: CONSTRUCTION FIRE PREVENTION MEASURES

The Applicant, Western, or their contractor will implement the following fire prevention measures during Proposed Project construction:

- Maintain a list of all relevant firefighting authorities near the Proposed Project site. The closest resources to respond to a wildland fire threatening the town of Searchlight would come from Clark County Fire Department Rural Station 75 located in Searchlight. Volunteers staff this fire station. In the event of a fire on site, the Applicant and/or Western will contact both BLM Fire and the Clark County Fire Department;
- Have and maintain available fire suppression equipment in all construction areas, including but not limited to water trucks, potable water pumps, and chemical fire extinguishers. Ensure an adequate supply of fire extinguishers for welding and brushing crews;
- Include mechanisms for fire suppression in all heavy equipment, including fire extinguishers and spark arresters or turbo-charging (which eliminates sparks in exhaust);
- Vehicle catalytic converters, on vehicles that enter and leave the project site on a regular basis, will be inspected on a regular basis and cleared of all flammable debris;
- Remove any flammable wastes generated during construction on a regular basis;
- Accomplish vegetation clearing in a manner that reduces vegetation and does not create a fire hazard;
- Store all flammable materials used at the construction site;
- Allow smoking only in designated smoking areas;
- Require all work crews to park vehicles away from flammable vegetation, such as dry grass and brush. At the end of each workday, heavy equipment should be parked over mineral soil, asphalt, or concrete, where available, to reduce the chance of fire;
- All cutting/welding torch use, electric-arc welding, and grinding operations shall be conducted in an area free, or mostly free, from vegetation and an ample water supply and shovel shall be on hand to extinguish any fires created from sparks. At least one person, in addition to the cutter/welder/grinder, shall be at the work site to promptly detect fires created by sparks. In the O&M area, all hot work will require a special operator permit.

MM SAFE-5: AERONAUTICAL CONSIDERATIONS

The Applicant will notify FAA by filing FAA Form 7460 at least 30 days before construction is to begin or the date that an application for construction permit is to be filed.

MM SAFE-6: ADHERENCE OF THE HEALTH AND SAFETY PROGRAM WITH 29 CFR, PART 1926

The Applicant and Western will ensure that all health and safety and emergency plans required for employees and contractors during construction, operations, and decommissioning of the Proposed Action will comply with the OSHA Standards provided in federal regulation 29 CFR, Part 1926, as well as with applicable state and local occupational health and safety regulations

4.14.4 Residual Effects

With proper implementation of the APMs and MMs provided for additional prevention of, management of, and response to human health and safety hazards during construction, O&M, and decommissioning under the action alternatives, residual effects from exposure of human or ecological receptors to hazards and hazardous materials are not anticipated.

4.15 Unavoidable Adverse Impacts and Irreversible and Irretrievable

The CEQ regulations in 40 CFR 1502.16 and the BLM NEPA Handbook (H-1790-1, Sec. 9.2.9) require a discussion of unavoidable adverse impacts that would remain after all reasonable and effective mitigation is applied, as well as disclosure of irreversible and irretrievable commitments of resources if the Proposed Project is approved. A resource commitment is considered irreversible when direct and indirect impacts from its use limit future use options. Irreversible commitments apply primarily to nonrenewable resources, such as cultural resources, and also to those resources that are renewable only over long periods of time, such as soil productivity. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for future use. Irretrievable commitments apply to loss of production, harvest, or use of natural resources. The following section describes irreversible and irretrievable commitments that would occur in the Proposed Project area and may be affected by construction, O&M, and decommissioning activities.

4.15.1 Geology, Soils and Minerals

Soil lost to increased erosion and vegetation production lost to conversion of land uses would be irretrievable losses. There would be an irreversible commitment of resources on land assoc iated with the ROW and aboveground facilities.

Soil impacts could occur from spills of petroleum products or other construction equipment fluids. If a spill were to occur, the affected area would be cleaned according to the approved SPCCP. Affected soils would be irretrievably and irreversibly lost, which would be a negligible-to-minor unavoidable adverse impact.

4.15.2 Paleontological Resources

The geology of the Proposed Project site and the region is primarily relatively recent alluvial and volcanic and has low to very low potential for paleontological resources. The Proposed Project is not expected to have an irreversible and irretrievable commitment of the resource.

4.15.3 Water Resources

The Proposed Project would not use surface water or groundwater, and would instead use offsite and permitted municipal or industrial water sources for construction and decommissioning dust control and O&M activities. Therefore, the Proposed Action would not cause an irreversible or irretrievable commitment of water resources in the project area.

4.15.4 Biological Resources

Construction of the Proposed Project would result in long-term residual effects to wildlife. Approximately 229-248.5 acres of wildlife habitat would be removed resulting in the loss of shelter and foraging opportunities for wildlife in the Proposed Project area. Vegetation growth and recovery would take such a long time that, from a human viewpoint, this could be considered an irreversible or irretrievable commitment of the resource.

4.15.5 Cultural Resources

During construction of the Proposed Project, two NRHP-eligible historic mining complexes would have existing graded roads widened by approximately 20 feet. This would not affect features or characteristics of the site that contribute to considering it NRHP-eligible, however, it would be irretrievably committed by this modification. The width of the original access roads would not be restored for the lifespan of the project and beyond.

4.15.6 Air Quality and Climate

Project emissions would not exceed federal or state air quality standards. Air quality would return to existing conditions after completion of the project.

Desert soils have a carbon storage capacity that would be lost due to construction of the Proposed Project. Considering the relative proportions of ground disturbance associated with the Proposed Project area and the extent of the air basin, potential impacts on existing carbon storage capacity would is considered a negligible irreversible and irretrievable commitment.

4.15.7 Transportation

During construction, oversized loads could cause short-term, temporary transportation disruptions and may require wider turning clearance. Impacts on the transportation network and impacts on traffic would occur only during construction, and occasionally during maintenance activities. The Proposed Project would not cause a change in the LOS for the affected roads and would not cause a permanent irreversible and irretrievable commitment of the resource.

4.15.8 Land Use

The footprint of the Proposed Project would limit future use of between 229-248.5 acres of land for other uses for the life of the project and which would be restored at decommissioning. Therefore, there would not be any irreversible or irretrievable commit the resource.

4.15.9 Visual Resources

The WTGs and facilities structures would be removed from the project area during decommissioning and the visual impacts associated with the vericle white elements of the WTG'swould disappear; however, scaring of the land surface would be visible long after the structures were removed.

4.15.10 Noise

Construction, O&M, and decommissioning activities would cause increased noise levels. This would be a localized and temporary effect and would cease. Therefore, there would not be an irretrievable or irreversible commitment.

4.15.11 Recreation

Recreation can be affected by project activities. However, upon completion of decommissioning and restoration activities the effects would disappear. Therefore, there is not anticipated to be an irreversible or irretrievable commitment of recreational resources.

4.15.12 Social and Economic Conditions

The anticipated beneficial socioeconomic effects would cease following completion of decommissioning, therefore; there would be no irreversible and irretrievable commitments of economic resources.

4.15.13 Environmental Justice

The Proposed Project is not located within an environmental justice community and would, therefore, not disproportionately affect low income or minority populations. No unavoidable adverse impacts or irreversible and irretrievable commitments of resources are expected.

4.15.14 Human Health and Safety

The generation of solid wastes (that is, construction/demolition debris, plastics, papers, cartons, steel waste, pipes, cables, metal containers, and inorganic MSW) would occur during the construction phase. The Applicant and their contractors/workers would handle all wastes in accordance with applicable regulations, and would implement BMPs and pollution prevention and waste minimization programs. Measures have been identified and incorporated into the project or applied as mitigation to reduce potential impacts below federal and state safety limits. Therefore, the Proposed Action would not cause an irreversible and irretrievable commitment of the resource or unavoidable adverse public health and safety impacts.

There would be a potential for injuries or fatalities to workers during construction, O&M, and decommissioning of the Proposed Project the due to rare industrial hazards and accidents. Uncommon industrial accidents and their associated injuries would not be completely avoidable. Safety programs and BMPs would reduce, but not entirely eliminate, the potential for worker injuries or fatalities.

4.16 Relationship between Short-Term Uses and Long-Term Productivity of the Environment

The NEPA requires consideration of the relationship between short-term uses of the environment and long-term productivity associated with the Proposed Project. This involves the consideration of whether the Proposed Project would sacrifice a resource value that might benefit the environment in the long-term for some short-term value to the Applicant, Western, or the public. In reference to the Proposed Action, "short-term" refers to the temporary phase of construction of the proposed project, while "long-term" refers to the operational life of the proposed project and beyond. Chapter 4 of this document describes the evaluation of short-term and long-term effects that could result from the 96- and 87-WTG Layout Alternatives.

The short-term uses of the environment as a result of approving and implementing the 87- or 96-WTG Layout Alternatives include those typically found with wind energy development. Short-term impacts associated with construction activities and long-term effects were described previously in this chapter, and include effects to the natural environment, cultural resources, and recreation resources. Required decommissioning and habitat restoration activities, thereby rendering the land available for other uses, would mitigate the impacts of short-term use during construction. The effects to the environment during O&M and following decommissioning would constitute long-term uses of the environment that are consistent with the relevant land use plan(s) administered by the BLM.

The two action alternatives would result in favorable short-term and long-term effects for the local and regional economies. These benefits include the creation of new jobs and increased regional income; sales and income tax revenues; and ROW rental receipts to the federal government.

As discussed earlier in Irreversible and Irretrievable Commitment of Resources, the Proposed Action and alternative would result in a loss desert habitat, which in turn could adversely affect the long-term productivity of the area. However, the action alternatives would both also provide a long-term benefit by generating electric power without any increase in the use of non-renewable resources, such as fossil fuels, which would result in a benefit to air quality and a reduction in carbon-based emissions. There would also be long-term benefits from these alternatives, both of which would provide for the production of clean, renewable energy consistent with federal and state goals to increase production of renewable energy to help reduce dependence on fossil fuels.

4.17 Cumulative Impacts Analysis

4.17.1 Actions Considered for Cumulative Analysis

NEPA requires the consideration of cumulative impacts, which are the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7) regardless of what agency (Federal or non-Federal). This analysis of cumulative impacts was prepared in accordance with those regulations and with CEQ regulations for implementing NEPA.

4.17.2 Introduction and Methodology

The CEQ principles described in *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997) consider that resources, ecosystems, and the human community can each experience effects.

Where there are few existing projects or developments and where the environment has not been degraded, the impacts of past and present actions combine to form existing conditions. Existing conditions were considered during the evaluation of the baseline inventory as presented in the Affected Environment sections of this document.

Cumulative impacts result "from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal), individual, or industry undertakes such action. Cumulative impacts can result from individually minor but collectively significant actions occurring over a period of time (40 CFR 1508.7). These actions include any onsite or offsite projects identified within the spatial and temporal boundaries of the action considered in this DEIS.

The analysis of cumulative effects involved identifying the resources appropriate for inclusion in the cumulative effects analysis. After review of Chapter 4-Environmental Consequences, it was determined that all resources in the EIS should be included in the cumulative impacts analysis.

Next the spatial (i.e., geographic) boundaries were determined for each resource. In most cases, the geographic boundaries were based on the natural boundaries of the affected resource (e.g. watershed, airshed, etc.). The geographic boundaries were established to help set the limits of the cumulative effects analyses. Often, the geographic extent of cumulative effects is larger than the extent of the direct effects (i.e., project footprint); therefore, the cumulative impact area was extended to include the area where indirect effects could occur.

Additionally, temporal (i.e., timeframe) limits were determined for each resource. The timeframe encompasses the full duration of the anticipated effects. Timeframes, like geographic scope, could vary based on the duration of the direct and indirect effects and other proposed projects in the cumulative effects impact area. Timeframes are not strictly limited to the duration of the actions themselves.

Next, a range of past, present, and reasonably foreseeable actions were identified in the cumulative effects area. These include both federal actions and non-federal (i.e., private) actions.

The following sections describe reasonably foreseeable actions and the cumulative impacts of those actions considered in conjunction with the Proposed Action, the 96 WTG Alternative and the No-Action Alternative. Because of the similarity of the Proposed Action with the 96 WTG Alternative, the cumulative impacts are expected to be similar. Where differences were identified, they are described in the applicable resource discussion. Unless otherwise noted, this analysis considers impacts that could occur over the potential life of the ROW grant.

Reasonable foreseeable future actions are those for which there are existing decisions, funding, formal proposals, or which are highly probably based on known opportunities or trends (BLM 2008a).

4.17.3 Current Setting

Mining has been central to the history and development of Searchlight, Nevada and the surrounding vicinity. After gold was discovered in the late 1800's over 300 mines were operational and with approximately 1,500 residents Searchlight was larger than Las Vegas. Mining is ongoing on a smaller scale and the project is located in a Historic District. The project vicinity has several electric transmission lines, a nearby airport, mining, and signs of off-road vehicle activities. Development has affected the natural setting. US 95 and road development; increased access and, thus, recreational opportunities; and the development of retail, civic, aviation, and industrial facilities, such as transmission lines, pipelines, have resulted in some overall losses of wildlife habitat, decreased open space and visual character values, increased noise levels near active mines, and decreases in air quality attributable to increased emissions and fugitive dust.

4.17.4 Reasonable Foreseeble Actions

To determine the current and reasonably foreseeable projects a search was made for infrastructure projects, community development improvements, and private developments that were geographically related to the Proposed Project. Reliance was placed on interviews with agencies, planning officials, meeting reports, and Internet searches. A key factor influencing this cumulative effects analysis is the Eldorado-Paiute ACEC, which surrounds the town of Searchlight creating an "island" where the town and proposed project area are readily developable (Refer to Figure 3.8-2. Special Designations Areas within the Proposed Project Vicinity). No other potential projects were identified within the proposed project area; however, four projects were identified in the region, three on federal lands and one on private property. BLM has received ROW applications for two potential wind energy projects, and although there has been no action or limited activity on the applications for about 5 years, they were considered in this analysis.

- **Castle Mountain Searchlight Project** (N-082729) **- Oak Creek Energy Systems** filed a ROW application with the BLM on August 10 2006 to install MET towers to gather wind data for three years and reserve the land for possible future development. The ROW grant was issued on February 25, 2009. Currently the MET towers are installed. Recently, this applicant applied to the BLM to extend their wind-testing ROW grant for an additional 3 years. Depending upon the results of the wind data, this applicant may seek to develop a wind energy facility to be located within 34,456 acres, approximately 15 miles west of the Searchlight Wind Energy Project. No additional information about this project is available at this time.

- **South Paiute Valley Wind Project** (N-086300) **- Great Basin Wind Energy, LLC** filed a ROW application with the BLM in 2006 to install MET towers and reserve the land for possible future development. Currently, no MET towers have been installed and this project is currently on hold until BLM completes its revision to the Las Vegas RMP in 2014. No additional information about the facility is available at this time.

- **Searchlight Solar Project** – American Capital Energy (ACE) is planning to construct a 17.5 to 20 MW solar project near the northwestern border of the Searchlight Wind Energy Project. An NV Energy Solar Projects webpage reports the project is under development and does not have a scheduled completion date (https://www.nvenergy.com/renewablesenvironment/renewables/solar.cfm accessed 12/02/2012). The project would be constructed entirely on private property and includes the planned photovoltaic solar facility and ancillary structures as well as the transmission connect and public utility structures (electric switching/substation). It would be located on about 217 acres designated as Rural Open Land (R-U) Zone. It would be located about1.5 miles northwest of Searchlight, 4,000 feet north of State Route 164 and 2,000 feet west of US Highway 95 within Searchlight. In 2009 NV Energy, Inc. and ACE entered into a long-term PPA for the sale of energy produced from this solar photovoltaic power plant.

- **Mead – Searchlight 230 kV Transmission Line Project (N-089703) -** Western is proposing to build the Mead-Searchlight 230-kV Transmission Line, because it was determined to be a necessary element in a Systems Improvements Study completed by Western in 2011. This 800-MW capacity new transmission line would be located adjacent to Western's proposed switching station and the proposed Searchlight Wind Energy Project. The new transmission line would be approximately 36 miles in length connecting the proposed Searchlight switching station (to be constructed 6 miles east of the town of Searchlight, Nevada) to Mead Substation, both in Clark County, Nevada. The new transmission line would consist of single circuit overhead lines supported by approximately 140 direct-buried, galvanized steel monopoles, between 70 and 120 feet in height. The majority of the transmission line structures will be designed as a single-circuit; however, due to congestion around the Mead Substation, the four spans from the Mead Substation takeoff structure to the first turning structure would be double-circuit structures. The new transmission line alignment would run parallel and on the east side of an existing Davis-Mead transmission line. Both lines would share the existing access road. The new transmission line ROW would be 150 feet wide.

  Public lands managed by the BLM often have designated corridors specifically developed to concentrate the effects of utility lines in locations suitable for transmission lines. The Mead-Searchlight transmission line would be sited within such a 3,500-foot-wide corridor that BLM has designated for this specific use.

  In July 2011, Western presented the Mead-Searchlight 230-kV Transmission Line to a BLM interdisciplinary team to determine potential issues of concern and the NEPA documentation and compliance.

To establish the temporal boundary (i.e. timeframe) for the cumulative effects analyses, the reasonably foreseeable projects identified above were reviewed. It was determined that these projects would have a similar lifespan as the Proposed Project, namely; a 30-year term including project decommissioning. Effects on visual and biological resources are expected to persist after decommissioning because the desert habitat is slow to recover, meaning that the signs of disturbance would be visible for years (as discussed in Section 4.9.3).

4.17.5 Potential Cumulative Impacts

This section addresses the cumulative impacts that could result from the 87 WTG Alternative or the 96 WTG Alternative when considered with the three renewable energy projects: Castle Mountain Searchlight Project, South Paiute Valley Wind Project, Searchlight Solar Project, as well as the proposed Western 230-kV Mead-Searchlight transmission line. The two potential wind energy projects are considered to ensure a thorough evaluation, though the environmental effects of these potential projects are largely speculative at this point. While these project proponents have sought ROWs to install MET towers and collect wind data (and one proponent has installed MET towers and begun to collect wind data), these proponents have not applied to the BLM for wind energy development ROWs. The BLM does not have detailed information about these future project proposals, nor does it even know these project proponents will apply for wind energy development ROWs. Moreover, there is no evidence that any of the power generation projects, except the Searchlight Solar project, have associated power delivery agreements or power purchase agreements; therefore, there is little publicly available information about these projects. The proponent for the Searchlight Solar project entered into a power purchase agreement with NV Energy in 2009; however, the facility has not yet been built and little other information about the project is available. Additionally, there is little publicly available information developed at the time of preparation of this document regarding the Western Mead-Searchlight project because it is in early stages of development and NEPA permitting process with BLM and has not been developed yet.

CEQ regulations (40 CFR § 1502.22) addresses Federal responsibility in situations where relevant information is either incomplete or unavailable related to the preparation of environmental impact statements. It requires a statement that such information is incomplete or unavailable. Therefore; for the reasons described in the preceding paragraph, the analysis presented in this section is necessarily largely qualitative rather than quantitative because there is no specific nor detailed information available about these projects' timing, acres to be disturbed, construction schedules, construction work force numbers, or environmental effects.

After determining the potential cumulative projects, the next step is to consider the proper spatial scope of the analysis - the geographic extent for each resource of concern. A geographic scope for the analysis of each resource has been defined and is presented in Table 4.17-1.

The extent for cumulative effects varies by resource. For example, effects on soils would be largely limited to the area disturbed by construction (referred to as the project footprint) whereas emissions of dust generated by construction would be extend beyond the project footprint and therefore the airshed would be the more appropriate geographical extent. Importantly, the geographical boundaries should not be extended to the point that the analysis becomes unwieldy and useless for decision-making. In many cases, the analysis should use an ecological region boundary that focuses on the natural units that constitute the resources of concern. Consider the example of Biological Resources: a common vegetation assemblage within the area of the Proposed Project is Mojave Desert Scrub Habitat. This habitat type is diagnostic of the Mojave Desert, which encompasses some 32 million acres in California, Nevada, Arizona, and Utah. This scale is too large because if the anticipated project related disturbance were compared with this total then the amount would appear negligible to decision makers. If the area were limited to just Clark County then total acres converted on a percentage basis would similarly be minor and immaterial because there are about 3,467,118 acres of this habitat countywide (Clark County 2008). Scaling further down, the Proposed Project occurs in portions of 3 watersheds that encompass 875,840 acres (Eldorado Valley 339,200 acres, Colorado River 360,320 acres, and Piute Valley 216,320 acres). At this scale, the Proposed Project would still represent just a few hundredths of one percent of the watershed lands therefore the best available metric for assessing cumulative effects was determined to be the dominant habitat types within the project footprints of the Proposed Project and reasonably foreseeable actions.

Given the scarcity of information about the potential cumulative projects identified, it is anticipated the 87- and 96-WTG Alternatives would have similar contributing effects. A summary of the potential cumulative effects of the 87 WTG Alternative and the 96 WTG Alternative when considered with other reasonably foreseeable projects is presented in Table 4.17-1.

Table 4.17-1. Cumulative Effects Summary

Resource	Area of Effect	Other Actions within Area of Affect	Potential Cumulative Impacts Within Area of Affect
Air Quality and Climate	Affected Airsheds (Hydrographic Basins 167 Eldorado Valley, 213 Colorado River, and 214 Paiute Valley)	Western Transmission Line	Total construction emissions of PM_{10} for the Proposed Project was calculated to be 97 tons per year (86 tons for the project construction and 11 for the transmission element). It is anticipated the project would be complete or largely complete before Western initiated construction. Assuming Western's annual PM_{10} emissions were also 11 tons, the combined yearly construction emissions totals for criteria pollutants is predicted to be less than the *de minimis* thresholds as specified under the federal General Conformity Rule (40 CFR 93); thus, combined project-related emissions are assumed to conform to SIPs and the regional air quality plans. In addition, Western's transmission line, as with any approved construction or new significant source of stationary (point) air pollution in Clark County, would be required by the Clark County DAQ to adhere to prescribed BMPs and control measures to minimize dust emissions and control engine exhaust emissions.
Noise	Sensitive receptors (residences, public buildings within 2 miles of project facilities)	Western Transmission Line	Temporary construction noise would be increased in the immediate vicinity if both these projects were constructed simultaneously; however, the sensitive resident receptors would be out of range of the Western Transmission Line construction noise so no additive or cumulative effect to them is anticipated.
Geology and Minerals	Project footprint	None	The reasonably foreseeable projects would be expected to contribute only site-specific and localized individual ground-surface alterations. Collectively, the projects would not substantially alter prevailing topography and/or surface relief in the area. The cumulative change/alteration on surface contour features would therefore be minor. Cumulative effects on mining are not anticipated to occur.

Resource	Area of Effect	Other Actions within Area of Affect	Potential Cumulative Impacts Within Area of Affect
Soils	Project footprint	None	Cumulative effects on soils are not expected to occur. The effects of reasonably foreseeable projects within the region would be site-specific and localized and not be expected to contribute to ground-surface alterations beyond their boundaries.
Water Resources	Watersheds (Hydrographic Basins 167 Eldorado Valley, 213 Colorado River, and 214 Paiute Valley)	Western Transmission Line	The combined effects of both projects proposed are not likely to contribute to impacts on surface or groundwater resources. Groundwater: The Proposed Project would not result in an effect, contamination, or a reduction in volume of groundwater resources therefore there would be no cumulative contribution. Western's proposed project is limited to shallow excavation and similarly would not reasonably be expected to affect groundwater. Surface Water: The Proposed Project would affect up to 0.174 acres of waters of the United States under jurisdiction of the US Army Corps of Engineers. The amount of acres of jurisdictional waters affected by the Western line is expected to be less than one half acre because transmission lines have a large degree of flexibility in locating towers. It is expected Western would span jurisdictional waters to protect the towers from flood and to reduce environmental impacts. It is likely that Western's line would be eligible for permitting under a Nationwide Permit from the Corps of Engineers.

Resource	Area of Effect	Other Actions within Area of Affect	Potential Cumulative Impacts Within Area of Affect
Biological Resources	Sonora-Mojave Creosote Bush-White Bursage Desert and Mojave Mid-Elevation Mixed Desert Scrub within the project footprints	Western Transmission Line Castle Mountain Searchlight Project Pauite Valley Wind Project Searchlight Solar Project	Development of the reasonably foreseeable projects would remove this habitat type, increase habitat fragmentation, and directly displace individual animals. Collectively these projects may reduce the size of contiguous Sonora-Mojave Creosote Bush-White Bursage Desert Scrub and Mojave Mid-Elevation Mixed Desert Scrub. In combination these vegetation communities comprise the dominant habitat types in southern Nevada. The locations of the specific project components are not known at this time, but would likely pass through similar habitats that support the same wildlife species documented for the Searchlight Wind Energy Project. Additionally these projects may impact areas with different vegetation communities and species not found within Searchlight Wind Energy Project area. As discussed earlier in this section, effects would be minimal in the context of the available habitat in Clark County or in the Mojave Desert. The area of effect is dominated by two vegetation communities that comprise approximately 92 percent of the 18,949 acre project study area. The temporary and permanent disturbance for the Proposed Project Alternatives ranges from about 352 acres to 408 acres. The Western Transmission Line is likely to be constructed with 4-5 towers per mile and construction disturbance commonly is within a 100-foot diameter circle. This would result in up to 5 towers x 0.18 acres per tower x about 30 miles or 27 acres of disturbance. About 15 acres would be used for stringing the line using a about a half-acre cleared area every 2 miles. An estimated 5 acres would be used for pulling sites that would be located at angle points in the line. There would be spur roads to each tower off the existing access road. Without mitigation, new transmission lines could provide perching opportunities for raptors that prey on juvenile tortoises. In addition a new transmission line could represent a barrier/hazard to flying wildlife such as birds and bats. These species are susceptible to electrocutions and collision with power lines. It is likely that the Western Transmission Line would parallel an existing transmission line. This would represent a localized incremental contribution. To offset this potential effect, Western would construct the line in accordance with Avian Power Line Interaction Committee (APLIC) guidelines. In addition, BLM and USFWS would require implementation of mitigation measures similar to those presented in this document for Western's transmission
Cultural Resources	Project footpring and a 200-foot buffer (approximately 2,726 acres)	Western Transmission Line	The Western project would not geographically overlap with the Searchlight Wind Energy project and as the public already uses the existing roads along the transmission corridor, public access to the Searchlight Wind Energy Project should not cumulatively increase visitation to cultural resource sites thus protecting them from unauthorized artifact collection and adverse impacts.

Resource	Area of Effect	Other Actions within Area of Affect	Potential Cumulative Impacts Within Area of Affect
Paleontological Resources	Project Footprint	Western Transmission Line	Paleontological Resources were not found to occur and therefore the Proposed Project would not contribute cumulative effects.
Lands Use	Project Footprint	Western Transmission Line	The Western Transmission Line would be located in a designated BLM utility corridor therefore no changes to existing land uses would occur.
Recreation	Viewshed Project Vicinity	Western Transmission Line	Access to recreational opportunities may be temporarily restricted due to construction activities and increased vehicle traffic during construction. Temporary decrease in hiking opportunities due to construction activities and vehicle traffic would be cumulative if construction of both projects were to occur simultaneously. The Western project would use existing roads and therefore not change access for recreation.
Visual Resources	Viewshed	Western Transmission Line	The Western Transmission Project would be located in an approved utility corridor separated from the Proposed Project by an existing transmission line, and would therefore contribute an incremental localized effect within the Piute-Eldorado Valley.
Transportation	U.S. Highway 95 and State Route 164 (Cottonwood Cove Road)	Western Transmission Line, Searchlight Solar Project	If construction were to occur simultaneously, the collective effects of these projects would be temporary and short term during construction and include congestion and traffic delay. A Traffic Management Plan prepared by each project proponent and approved by NDOT is expected to reduce the impacts to an acceptable level.
Hazardous Materials	Project footprint	None	The anticipated projects do not overlap geographically and there would not be cumulative effects as onsite spill prevention and management plans would be required according to regulatory requirements standard protocol for BLM-approved projects.
Social and Economic Conditions	Local economy	Western Transmission Line	The combined effects of the proposed projects would likely result in beneficial impacts on socioeconomic conditions, both regionally and locally.

Resource	Area of Effect	Other Actions within Area of Affect	Potential Cumulative Impacts Within Area of Affect
Environmental Justice	Socially and/or economically disadvantaged populations in the Searchlight Area	Western Transmission Line	No Environmental Justice populations reside in the vicinity, and therefore there would be no effect or cumulative effect from either project.

5.0 Consultation and Coordination

This chapter summarizes the consultation and coordination activities conducted with agencies, organizations, tribes, and individuals for the proposed Searchlight Wind Energy Project. The primary goal of the NEPA public involvement process is to ensure that all interested and affected parties are aware of the Proposed Project.

For the purposes of public involvement, the NEPA process is divided into two phases: the scoping period and the DEIS review period. The scoping period includes the initial presentation of the Proposed Project to the public and opportunities for the public and agency representatives to provide comments on the Proposed Project. The Draft EIS review period presents the public with opportunities to comment on the document. More information on these phases is presented in the sections below.

5.1 Public Involvement Process

5.1.1 Scoping

The BLM published the Notice of Intent in the *Federal Register* on December 16, 2008, denoting the beginning of the scoping period for the project. The scoping period ended on February 17, 2009, totaling 60 days, which exceeds the BLM minimum requirement of a 30-day scoping period.

The public and many agencies were notified of the scoping period and comment opportunities through a newsletter distributed to approximately 814 people on January 16, 2009. The initial mailing list was provided by the BLM LVFO and included addresses of current local elected or municipal officials, federal and state agencies, potentially interested Native American tribes, and other interested parties. All post office box holders in zip codes 89046 (Searchlight, Nevada) and 89039 (Cal-Nev-Ari, Nevada) were sent a copy of the newsletter. The newsletter provided information for submitting comments via mail, fax, and e-mail, and included the direct contact information for the BLM Project Manager, Mark Chandler. The mailing list was supplemented throughout the NEPA process to include those who provided scoping comments, attended meetings, or expressed to the BLM their interest in the project through the project website or direct request.

Announcements for the public scoping meetings were published in a variety of local newspapers (Table 5.1-1). Meeting times and locations were also posted on the BLM website at http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy.html.

Table 5.1-1. Public Meeting Advertisements

Publication	Area of Coverage	Print Date
Las Vegas Review Journal	Las Vegas, Southern Nevada	January 12 and 18, 2009
Boulder City News	Boulder City, Nevada	January 15, 2009
Laughlin Time	Laughlin, Nevada	January 14, 2009
Desert Flyer (posted flyers)	Laughlin to Nelson, Nevada	January 12, 2009

Public meetings are required when there is a substantial "environmental controversy concerning the proposed action or substantial interest in holding the [meeting]" or when there is a "request for a hearing by another agency with jurisdiction over the action" (40 CFR 1506.6). Public scoping meetings locations, dates, and number of attendees are provided in Table 5.1-2. In accordance with BLM requirements, sign-in sheets were provided and attendees were encouraged to sign in. A total of 113 participants attended the scoping meetings

Table 5.1-2. Public Meeting Information

Meeting Location	Date*	Attendance
Searchlight Community Center 200 Michael Wendell Way Searchlight, Nevada 89046	Tuesday, January 27, 2009	73
William G. Bennett Elementary School 2750 South Needles Hwy Laughlin, Nevada 89029	Wednesday, January 28, 2009	4
Boulder City Library 701 Adams Blvd. Boulder City, Nevada 89005	Thursday, January 29, 2009	36

* Public meetings were held from 6-8 p.m.

Subsequently, another project presentation meeting was held at the Searchlight Town Hall on June 25, 2009, and 56 government officials and residents attended the meeting.

A total of 66 comment submissions were received. Individual issues within each comment were classified into 14 main categories. Table 5.1-3 summarizes the number of comments received on each of the 14 main issue categories.

Table 5.1-3. Summary of Public Scoping Comments

Main Issue	Total Comments
Air quality	19
Biological resources	82
Cultural/archaeology	16
Cumulative effects	8
Hazardous materials/safety	1
Land use/transportation	32
Noise vibrations	16
Process	12
Project alternatives	41
Project description	33
Project need	2
Socio	45
Visual resources	40
Water	7

Comments received during scoping assisted BLM in determining the issues and impacts to be analyzed in this EIS document. Please see the *Searchlight Wind Energy Project Scoping Summary Report* (URS 2009) for more detailed information on scoping activities and comments received during scoping (Appendix A-1: Scoping Report).

5.1.2 EIS Mailing List

After the scoping period and the subsequent project presentation meeting, an EIS mailing list was developed to include agencies, organizations, and other persons who expressed interest in being added to the mailing list. The mailing list was periodically updated throughout the NEPA process. The list was updated to include those who provided their address on comments, requested to be added to the mailing list, and those who registered at a public meeting.

5.1.3 Distribution on the Draft EIS

The *Federal Register* Notice of Availability of the Draft EIS was published on January 20, 2012, marking the beginning of the comment period for the project (Appendix A-2: Notice of Availability). The comment period ended on April 18, 2012, totaling 90 days, which exceeds the BLM minimum requirement of a 45-day comment period.

Announcements for the public comment meetings were published in local newspapers (Table 5.1-4). In order to assure that residents of Searchlight and Cal-Nev-Ari had ample notification of the locations, dates, and times of the public meetings on postcard announcements were distributed to all post office box holders in these towns (Appendix A-3: Public Hearing Materials). Additionally, meeting dates, times, and locations were posted on the BLM Las Vegas Field Office website at: http://www.blm.gov/nv/st/en/info/newsroom/2012/february/southern_nevada__blm.html.

Table 5.1-4. DEIS Public Comment Meeting Announcement Publications

Publication	Area of Coverage	Print Dates
Laughlin Times	Laughlin, NV	February 1, 2012
Boulder City Review	Boulder City, NV	February 2, 2012
Las Vegas Review Journal	Las Vegas	February 6, 2012
Desert Flyer (Monthly)	Nelson, NV Searchlight, NV Boulder City, NV Cal-Nev-Ari, NV	February 1, 2012

Copies of these announcements can be found in Appendix A-3: Public Hearing Materials.

5.1.4 Public Meetings

Public meetings are required where "there may be substantial environmental controversy concerning the environmental effects of the proposed action, a substantial interest in holding the meeting, or a request for a meeting by another agency with jurisdiction over the action" (40 CFR 1506.6). Public meeting locations, dates, and number of attendees are provided in Table 5.1-5. In accordance with BLM requirements, sign-in sheets were provided and attendees were encouraged to sign in. Copies of the sign-in sheets are provided in Appendix A-3: Public Hearing Materials.

Table 5.1-5. Public Meetings Locations, Dates, and Attendance

Meeting Location	Date*	Attendance
Clark County Regional Government Center 101 Civic Way Laughlin, NV	Tuesday, February 21, 2012	8
Searchlight Community Center 200 Michael Wendall Way Searchlight, NV	Wednesday, February 22, 2012	45
Boulder City Library 701 Adams Blvd. Boulder City, NV	Thursday, February 23, 2012	21

* Public meetings were held from 6-8 p.m.

Public meetings began with a brief presentation of the project area, alternatives, and an overview of the NEPA process. Additionally, posters summarizing the proposed project location, key environmental impacts, and an overview of the NEPA process were displayed for public review (Appendix A-3: Public Hearing Materials). BLM, Western, Searchlight Wind LLC and NewFields representatives were available to answer questions. Project fact sheets and comment cards were provided at each meeting.

Copies of the handouts are included in Appendix A-3: Public Hearing Materials. Comment cards were provided so members of the public could submit comments regarding issues or concerns of the proposed project. Comment cards could be submitted at the meeting, or mailed, emailed, or faxed to the BLM Las Vegas Field Office.

5.1.5 Addressing Public Comments on the DEIS

NEPA requires solicitation of public comments on draft plans for major federal actions. Specifically, the BLM and other federal agencies must consider public comments both individually and collectively (Title 40, Code of Federal Regulations Section 1503.4). Comments are viewed as critical to assisting the BLM in modifying and/or clarifying information in the document, the alternatives, and the preferred-alternative. As previously stated, the comment period exceeded the 45-day minimum requirement. Comments could be mailed, faxed, emailed to the BLM from January 20, 2012 to April 18, 2012 or submitted at the public meetings.

All comments received during the public comment period are included in this FEIS in their original form. Attachments submitted with comments are located on the BLM's Searchlight Wind Energy project website at http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html. Comments in Appendix A-4 are presented in the following order:

- Agency Comments (federal, state, and local)
- Tribal Comments
- Organization Comments
- Private Citizen/Individuals Written Comments
- Meeting Transcripts (in order: Laughlin, Searchlight, and Boulder City)

The following tables present the commenters and the location of their original comment in Appendix A-4: BLM Response to Comments on the DEIS.

Table 5.1-6. Agencies that Submitted Comments on the DEIS

Agency	Comment Type	Page Number in Appendix A-4 under Agency Comments
Environmental Protection Agency (EPA)	Letter	Federal Agency pages 1-13
National Park Service	Letter	Federal Agency pages 14-25
U.S. Fish and Wildlife Service	Letter	Federal Agency pages 26-28
Nevada State Clearinghouse	email	State Agency pages 29-37
Nevada Department of Transportation	Letter	State Agency page 1-9
Nevada Department of Wildlife	Letter	State Agency pages 10-12
Las Vegas Valley Water District	Letter	Local Agency page 1
Nevada Department of Air Quality	Letter	Local Agency pages 1-2

Table 5.1-7. Tribes that Submitted Comments on the DEIS

Tribe	Comment Type	Page Number in Appendix A-4 under Tribal Comments
Pahrump Paiute Tribe	Letter	Tribal Governments pages 1-2

Table 5.1-8. Organization that Submitted Comments on the DEIS

Organization	Comment Type	Page Number in Appendix A-4 under Organization Comments
Friends of Searchlight Desert and Mountain	Letter/ CD ROM	Organization Comments pages 1-116 – Attachments provided on BLM project website (see link above)
The Center for Biological Diversity	Letter	Organization Comments pages 117-127
Basin and Range Watch	Letter	Organization Comments pages 128- 130
Desert Tortoise Counsel	Letter	Organization Comments pages 131-134
Nevada Wilderness Project	Letter	Organization Comments pages 135-137
Sierra Club	Letter	Organization Comments pages 138-143
Red Rock Audubon Society	Letter	Organization Comments page 144

Table 5.1-9. Individual that Submitted Comments on the DEIS

Individual	Type of Comment	Page Number in Appendix A-4 under Written Public Comments or Transcripts (as noted)
Alper, Eliot	Letter	Mr. Alper submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Arroyo, Paul	Letter	Mr Arroyo submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Biro, Juliana	Letter	Private Citizen/Individuals Written Comments pages 61-62
Bundorf, Judy	Letter Oral	Organization Comments pages 1-116 Laughling Meeting Transcripts pages 24-25 Boulder City Meeting Transcript pages 24-26
Bundorf, Wayne	Oral	Laughlin Meeting Transcripts pages 22-24 Searchlight Meeting Transcripts pages 21-23
Burt, William	Email	Private Citizen/Individuals Written Comments pages 1-2
Carlson, Gary	Letter	Private Citizen/Individuals Written Comments pages 32-33
Casey, Thomas	Email Oral	Mr. Casey submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments Laughlin Meeting Transcripts pages 16-18 Searchlight Meeting Transcripts pages 7-9 Boulder City Meeting Transcripts pages 32-34
Charpied, Donna	Email	Ms. Charpied submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Coon, Leslie	Comment Card	Private Citizen/Individuals Written Comments pages 26-27
Coon, Russell	Comment Card, Oral	Private Citizen/Individuals Written Comments pages 7-8
Couture, Paul	Letter	Mr. Couture submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Cunningham, Laura	Oral	Searchlight Meeting Transcripts page 19
Curow, Jerry	Comment Card	Private Citizen/Individuals Written Comments page 19
Dobbie, Bruce	Comment Card Oral	Private Citizen/Individuals Written Comments pages 28 Searchlight Meeting Transcripts page 29-30
Doing, Riley	Email	Private Citizen/Individuals Written Comments pages 29
Doing, Reggie	Email	Private Citizen/Individuals Written Comments pages 29
Doing, Verlie	Email Oral	Mrs. Doing submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments. Her additional comments are addressed on page 14.

Individual	Type of Comment	Page Number in Appendix A-4 under Written Public Comments or Transcripts (as noted)
		Searchlight Meeting Transcripts pages 30-31
Eaton, James	Oral	Boulder City Meeting Transcripts pages 26-29
Emmerick, Kevin	Oral	Searchlight Private Comments pages 26-28
Ehli, Pat and Kim	Letter	Private Citizen/Individuals Written Comments pages 9-10
Esty, Raven	Letter	Private Citizen/Individuals Written Comments pages 50 and 63
Fisher, Duncan	Oral	Laughling Meeting Transcripts pages 3-4
Fuller, Jared	Email	Private Citizen/Individuals Written Comments pages 38-40
Fribeesh, Marvin	Email	Mr. Fribeesh submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Furtek, Robert C	Comment Card	Private Citizen/Individuals Written Comments pages 30-31
Gonzales, Shaun	Email	Private Citizen/Individuals Written Comments pages 20-23
Hiatt, John E	Oral	Boulder City Meeting Transcripts pages 29-32
Kendall, Diane	Email	Private Citizen/Individuals Written Comments pages 4
Klimitz, Lindsay	Letter	Private Citizen/Individuals Written Comments pages 50 and 59
Komers, Gary	Comment Card	Private Citizen/Individuals Written Comments pages 5-6
McColery, Kimberly	Oral	Searchlight Meeting Transcripts pages 32-33
McFarland, Arthur	Letter	Mr. McFarland submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Morins, Mathew	Letter	Mr Morins submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Mugge, Stephen	Letter	Mr. Mugge submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Neavell, Jack and Carol	Comment card	Private Citizen/Individuals Written Comments page 3
Overy, Carl and Jane	Comment card	Private Citizen/Individuals Written Comments pages 9-10
Palmer, Jon	Oral	Searchlight Meeting Transcripts pages 23-24
Poyo, Charmagne	Letter	Ms. Poyo submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Ross, Ashley	Letter	Ms. Ross submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Ross, Nathaniel	Letter	Mr. Ross submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Ross, Ellen	Letter Oral	Private Citizen/Individuals Written Comments pages 32-46 Searchlight Meeting Transcripts 19-21 Searchlight Private Transcripts pages 3-7 Boulder City Meeting Transcripts pages 21-24
Shook, Elenor	Oral	Searchlight Meeting Transcript, pages 24-26
Smith, Phillip	Oral	Laughlin Meeting Transcript, pages 20-22
Spencer, Heidi	Letter	Private Citizen/Individuals Written Comments pages 11-12
Stanko, Zachary	Letter	Private Citizen/Individuals Written Comments pages 54-60
Sterl, Paul	Letter	Mr. Sterl submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments
Stroehlein, Luke	Letter	Private Citizen/Individuals Written Comments pages 61-62
Thournton, Michael	Comment Card	Private Citizen/Individuals Written Comments pages 53

Individual	Type of Comment	Page Number in Appendix A-4 under Written Public Comments or Transcripts (as noted)
Trachtenberg, Sarah	Letter	Private Citizen/Individuals Written Comments pages 61-62
Van Fleet, Ronald Sr	Oral	Laughlin Meeting Transcript, pages 18-20
VanVranken, Tamara	Comment Card	Private Citizen/Individuals Written Comments pages 24-25
Vermillion-Mugge, Susan	Letter	Mrs. Vermillion-Mugge submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments. Her additional comments are addressed on page 16.
Weaver, John	Oral	Searchlight Meeting Transcript, page 18
Wood, Eileen F	Letter	Private Citizen/Individuals Written Comments pages 47-49
Wood, Thomas	Letter	Private Citizen/Individuals Written Comments pages 50-51
Wood, Timothy	Letter	Mr. Wood submitted the same comments that are addressed on pages 50-51 of Private Citizen/Individuals Written Comments.
Unidentified	Letter	This citizen submitted the same comments that are addressed on pages 11-12 of Private Citizen/Individuals Written Comments

The comments were sorted by resource into a comment matrix to facilitate review by the proper BLM resource technical staff. However, in this FEIS BLM comments are presented along side the original comment in Appendix B-4.

The CEQ recommends that responses to substantive comments result in changes in the text of the NEPA document. For comments that warranted a change in the EIS, the comment response refers the commentor to the section(s) of the document where the change was made (for the ease of the reader section numbers were referenced throughout the Appendix A-4: BLM's Response to Comments). In cases where a change was not required in the document, the BLM has directed the commentor to the answer contained within the document or explained why the comment does not warrant further agency response (by citing cases, authorities or the basis or rationale for BLM's position).

The comment matrix also includes comments that were not considered substantive. Comments that are considered non substantive include general comments in favor of, or against the proposed project; comments that agree or disagree with BLM policy or resources decisions with justification or supporting data; comments that don't pertain to the proposed project; and comments that take the form of vague, open-ended questions. BLM is not required to answer non substantive comments.

5.1.6 Final EIS Preparation and Distribution

The FEIS has been posted on the BLM website (click here) at http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html.

5.1.7 Record of Decision

Subsequent to the release of the FEIS, a Record of Decision (ROD) will be prepared demarcating the decision on the ROW applications. The availability of the ROD will be published in the Federal Register and posted on the BLM website (click here) at http://www.blm.gov/nv/st/en/fo/lvfo/blm_programs/energy/searchlight_wind_energy.html. Publication in the Federal Register marks the beginning of a 30-day appeal period.

5.2 Consultation with Interested Agencies and Tribal Government

5.2.1 Federal, State, and Local Agencies

The following federal, state, and local agencies were consulted during preparation of this DEIS:

- Advisory Council on Historic Preservation
- U.S. Fish and Wildlife Service
- National Park Service
- Western Area Power Administration
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- Nevada State Historic Preservation Office
- Nevada Department of Wildlife
- Nevada Department of Transportation
- Nevada State Division of Water
- Nevada Division of Minerals
- Nevada State Historic Society
- Nevada State Clearinghouse
- Clark Country Department of Air Quality
- Clark County Desert Conservation Program

5.2.2 Advisory Council on Historic Preservation

The Advisory Council on Historic Preservation (ACHP) was notified of and invited to participate in the Searchlight Wind Energy Project on August 1, 2012 as per the *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers regarding the Manner in which BLM will meet its Responsibilities under the National Historic Preservation Act* of 2012. On August 13, 2012, the ACHP responded and declined participation in the consultation to resolve adverse effects leaving it to the BLM and the Nevada State Historic Preservation Office. The filing of the final MOA with the ACHP completes the requirements of Section 106 of the National Historic Preservation Act.

5.2.3 U.S. Fish and Wildlife Service Section 7 Consultation

The ESA was passed by the U.S. Congress in 1973 and has since been amended several times. The ESA and 50 CFR 17.1-17.95(b) designates and provides for protection of threatened and endangered (T & E) plants and animals and their critical habitat. Procedures for addressing federally listed species require consultation with the USFWS, which administers the ESA for all federally protected species. In compliance with Section 7(c) of the ESA, the BLM, with the assistance of a third party contractor, has completed consultation with the USFWS including the following steps:

- Requesting information from the USFWS to establish a list of federally protected species that may be affected by the project (obtained on June 10, 2009;
- preparation of a Biological Assessment assessing the potential for the project to adversely affect listed species; and
- coordination between state and federal biological resource agencies to assess impacts and proposed mitigation.

Consultation concluded when the USFWS issued a final Biological Opinion on whether the project would affect federally listed species. The Biological Opinion included an incidental take statement that provides a statement of anticipated incidental take accompanied by the appropriate and reasonable mitigation measures to minimize such take. The Biological Opinion is included in Appendix B-2: USFWS

Biological Opinion. Text in the appropriate sections of this EIS has been amended to be consistent with the Biological Opinion.

5.2.4 Coordination on the BBCS

A Bird and Bat Conservation Strategy (formerly referred to as an Avian and Bat Protection Plan [ABPP]) has been developed in coordination with USFWS, BLM, and Tetra Tech (the Applicant's consultant). This strategy includes a "tiered" or stepwise process, as currently recommended in the USFWS Land-based Wind Energy Guidelines. It provides a qualitative risk assessment for the effect of a factor (e.g., collision, electrocution) on birds other than eagles. The intention is not to predict the number of fatalities due to turbine collision as pre-construction data poorly predicts fatalities for birds (Ferrer et al. 2012), but to determine if any species is at high risk to inform post-construction fatality monitoring. The BBSC also includes monitoring requirements and provisions for adaptive management measures based on mortality rates. The qualitative risk assessment (Section 5.3) of the Bird and Bat Conservation Strategy assumes all turbines would be operational during all daylight hours. This assumption does not reflect the Applicant's anticipated turbine operational hours; therefore the resulting risk assessment represents a "worst-case" scenario. The BBCS is considered to be a living document that will be updated periodically as new information becomes available and subsequent Tiers as outlined in the Wind Energy Guidelines are completed. This approach allows new information on risk, monitoring, or adaptive management to be incorporated so that the BBCS is accurate and uses the best information for decision-making.

5.2.5 Native American Consultation

Native American consultation is an ongoing process that is conducted by BLM management and staff in accordance with provisions of the National Historic Preservation Act of 1966, as amended [16 USC 470 et seq.], the American Indian Religious Freedom Act of 1978, as amended [42 USC 1996], and the Native American Graves Protection and Repatriation Act of 1990 [25 USC 300], the Executive Order on Indian Sacred Sites [EO 13007] and the Executive Order on Consultation and Coordination with Indian Tribal Governments [EO 13175]. Since Native Americans are concerned with the public distribution of information regarding the location and nature of traditional places, specific information provided to BLM is held as confidential.

The BLM coordinated with the following affiliated or interested tribes:

- Chemehuevi Indian Tribe
- Colorado River Indian Tribes
- Fort Mojave Indian Tribe
- Hualapai Indian Tribe
- Fort Yuma-Quechan Indian Tribe,
- Las Vegas Paiute Tribe
- Moapa Band of Paiutes
- Pahrump Paiute Tribe (non- federally recognized)
- Timbisha Shoshone Tribe

The BLM consultation for the Searchlight Wind Energy Project was formally initiated on December 17, 2009. Letters were sent to the Chemehuevi Indian Tribe, the Colorado River Indian Tribes, the Fort Mojave Indian Tribe, the Las Vegas Paiute Tribe, the Moapa Band of Paiutes, the Pahrump Paiute Tribe, the Hualapai Tribe, and the Fort Yuma-Quechan Tribe. The Quechan Tribe said they would defer their comments to the Mojave. On February 14, 2010, letters were again sent to these tribes, and to the Timbisha Shoshone Tribe, inviting them to participate on field trips to the project area planned for March 18 and 23, 2010. On March 18, 2010, representatives of the Chemehuevi Tribe, Las Vegas Paiute Tribe, and Hualapai Tribes participated in a field visit to the project area. On March 23, 2010, members of the Moapa Band of Paiutes, Chemehuevi Tribe, and Timbisha Shoshone Tribe attended a project field trip.

On April 9, 2010, another field trip was conducted to accommodate the Mojave Tribe. The Mojave, Chemehuevi and Pahrump Tribes were informed of a field trip on April 9, 2010 in which only the Mojave attended. The Mojave were also invited to attend a VRM photo simulation trip to the Christmas Tree Pass Communication Site in the Newberry Mountains to replicate the view of the project area from Spirit Mountain, a sacred peak and registered Traditional Cultural Property on May 1, 2010. However, they were unable to attend on the planned day. A simulation photo was taken of the Searchlight Wind Energy Project and represents a middle ground- to-background view. Due to the 12-mile distance, the southernmost WTGs would be faintly visible while motion of the blades would be discernible from this key observation point. There would be a weak to moderate contrast in color, form, and line. The BLM and Mojave discussed having a a tribal monitor present during the archaeological inventory, but neither of the pre-arranged monitors showed up for the inventory.

No consultation was held during 2011 as the Project Proponent was conducting a power transmission interconnect study and the project was put on hold. It was unclear whether potential changes in the Project area would require additional archaeological inventory. In January of 2012, a copy of the Searchlight Wind Energy Project Draft EIS was sent to each of the participating tribes for their review.

On May 3, 2012, the BLM met with the Mojave Ahamakav Cultural Society at their office to inform them of upcoming renewable energy projects, including the Searchlight Wind Energy Project. At that time, they expressed that the proposed project would have physical and spiritual affects to the land since it is in the cultural landscape of Spirit Mountain.

The Las Vegas and Moapa Paiute Tribes and the Chemehuevi Tribe were informed by telephone and e-mail of an informational meeting on July 10, 2012 at the BLM Southern Nevada District Office. The purpose of the meeting was to inform them of upcoming renewable energy projects in southern Nevada. Only representatives from the Las Vegas and Chemehuevi Tribes attended the meeting and they were informed that there would be a field trip to some of the accessible Searchlight Wind Energy Project area cultural resource sites. Both expressed an interest. On July 17, one representative of the Moapa Paiute Tribe came to the BLM office and all the renewable energy projects were discussed. The representative was interested in participating in a future cultural site field trip to the Searchlight Wind Energy Project.

The participating tribes were called and/or emailed to invite them to a cultural field trip on October 2, 2012. Consulting Tribes were sent a site information summary in advance of the field trip that presented potential project effects on sites. None of the tribes were able to attend that day. Another trip was set up on October 11, 2012 and representatives from the Chemehuevi, Hualapai, Moapa Paiute, and Mojave participated. At that time, only the Mojave provided their final cultural comment on the project, which is shown below. The other tribal representatives refrained from providing comments until they had a chance to review the site documentation and confirm comments with their tribes. The BLM made follow-up calls to the tribes from November 1 through November 29, 2012 to seek their comments on Project effects. The comments received to date are summarized below:

- Chemehuevi Indian Tribe: There are no cultural concerns for the Searchlight Wind Energy Project.
- Colorado River Indian Tribes: No comments have been received.
- Fort Mojave Indian Tribe: The Searchlight Wind Energy Project would have an Adverse Cumulative Effect to the area from more direct, visual, and spiritual impacts.
- Hualapai Tribe: The tribe expressed concerns about *Wikame* (Spirit Mountain) being fairly close to the Searchlihgt Wind Energy Project in regards to visual impacts as well as potentially more direct impacts to archaeological sites, trails, or other aspects of the cultural landscape. They request that an ethno-historic study be undertaken to investigate the cultural landscape from tribal perspectives as a mitigation measure.

- Fort Yuma-Quechan Tribe: They defer to the Fort Mojave Indian Tribe.
- Las Vegas Paiute Tribe: No comments have been received by the BLM.
- Moapa Band of Paiutes: The Searchlight Wind Energy Project would have an Adverse Cumulative Effect to the area from more direct, visual, and spiritual impacts.
- Pahrump Paiute Tribe (non- federally recognized): They are opposed to the Searchlight Wind Energy Project Action Alternatives.
- Timbisha Shoshone Tribe: No comments have been received.

The Fort Mojave, Moapa, and the Pahrump Tribes stated that the direct and cumulative effects of the Project couldn't be mitigated. These comments are applicable to the NEPA as effects to sites under Section 106 of the NHPA were not specifically addressed.

5.2.6 Nongovernmental Organizations

The following nongovernmental organizations provided comments during the public scoping period:

- Searchlight Airport
- Western Watersheds Project
- Western Lands Project

5.3 Preparers and Contributors

Table 5.3-1 lists individuals who participated in the preparation and review of this DEIS:

Table 5.3-1. List of Preparers and Contributors

Name	Responsibility
BLM - Las Vegas Field Office	
Bob Ross	Field Manager
Boris Poff	Water Resources
Marily Peterson	Recreation
John Evans	Social and Economic Conditions, Environmental Justice
Kathleen Sprowl	Paleontology, Cultural Resources, Native American Religious Concerns
George Varhalmi	Geology, Minerals, and Soils
Mike Moran	Human Health and Safety
Lisa Christensen	Air Quality
Mark Slaughter	Biological Resources
BLM – Pahrump Field Office	
Greg Helseth	Project Manager
Nancy Christ	Environmental Coordinator
Michele Bilodua	Environmental Coordinator
Mark Chandler	Land Use, Visual Resources, Noise
Jayson Barangan	Biological Resources
BLM Solicitors Office	
Janell Bogue	Legal and NEPA review
Greg Russell	Legal and NEPA review
BLM – Washington D.C. Office	
Shannon Stewart	NEPA review
Western Area Power Administration	
Todd Rhodes	Cooperating Agency review
Dave Swanson	
Jessica Herndon	
Bill Werner	
Matt Mueller	
Carla Cristelli	

Name	Responsibility
National Parks Service	
Jim Holland	Cooperating Agency review
NewFields Team	
Ken MacDonald	Project Manager, Biological Resources, Social and Economic Conditions
Albert Ridley[1]	Geology, Soils, and Minerals, Air Quality
Randy Keyes[1]	Geology, Soils, and Minerals, Water Resources, Air Quality
Anne DuBarton	Paleontology, Cultural Resources, Native American Religious Concerns, Land Use, Recreation
Courtney Brooks[1]	Water Resources
Stephanie Locke	Assistant Project Manager, Biological Resources, Visual Resources
Sean Milne	Biological Resources
Kim Hutson deBelle[2]	Transportation, Land Use, Noise, Recreation
Richard Gardner, Ph.D.[3]	Social and Economic Conditions, Environmental Justice
Randy Kyes[1]	Human Health and Safety
Jill Irwin[4]	Technical Editing
Tony Agresti[5]	Noise
Lionel Collins & Sawyer	
Linda Bullen, Esq.	Legal and NEPA review
URS Corporation	URS was involved in early stages through summer of 2010, including preparation of early draft sections of this document. However, URS has not been involved with changes to the document since that time.

[1]Ninyo and Moore, [2]CB4 Consulting, LLC [3]BootStrap Solutions [4]Irwin Writing/Editing [5]TRC

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