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.

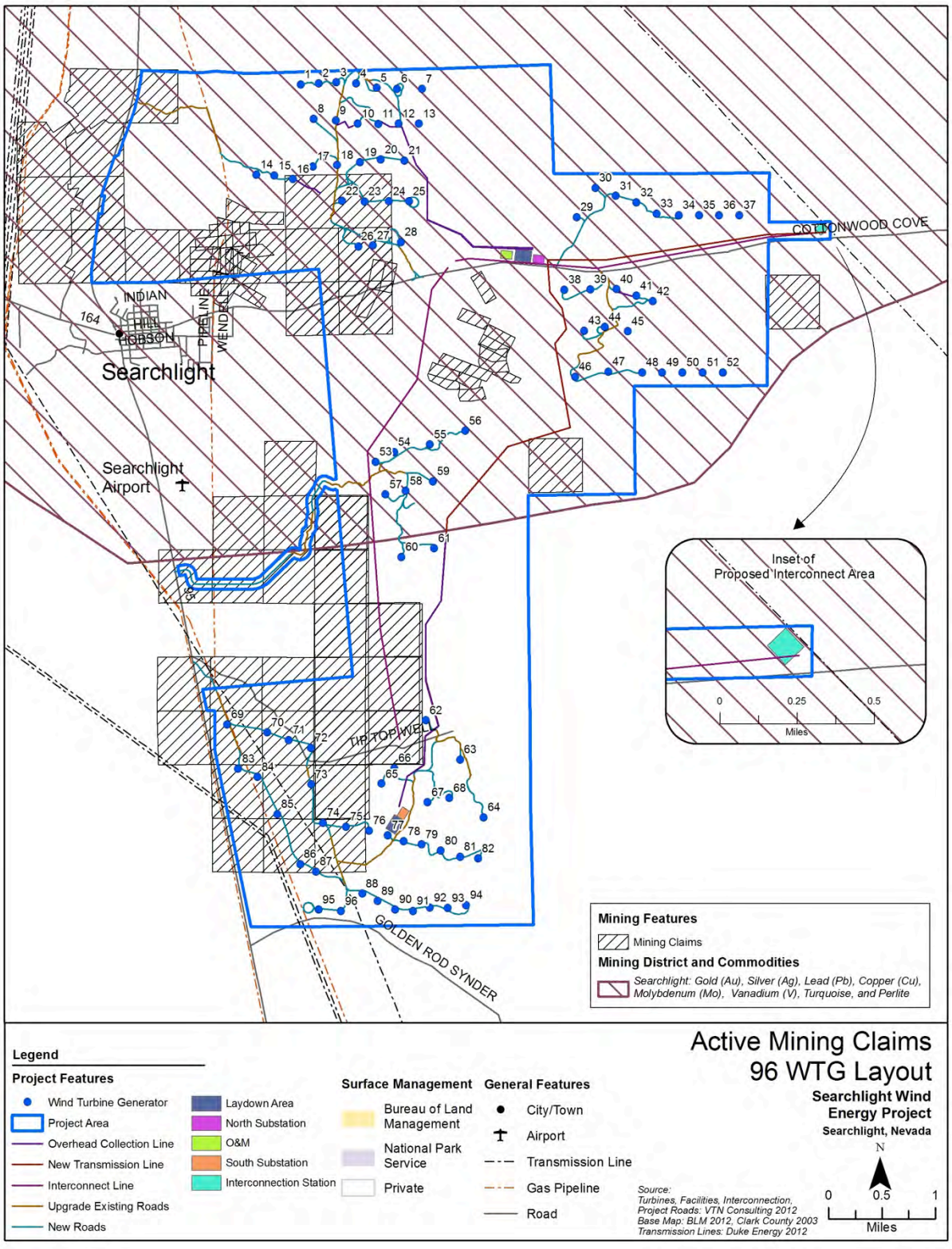


Figure 4.1-1. Mining Claims Potentially Affected by 96 WTG Layout Alternative

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.

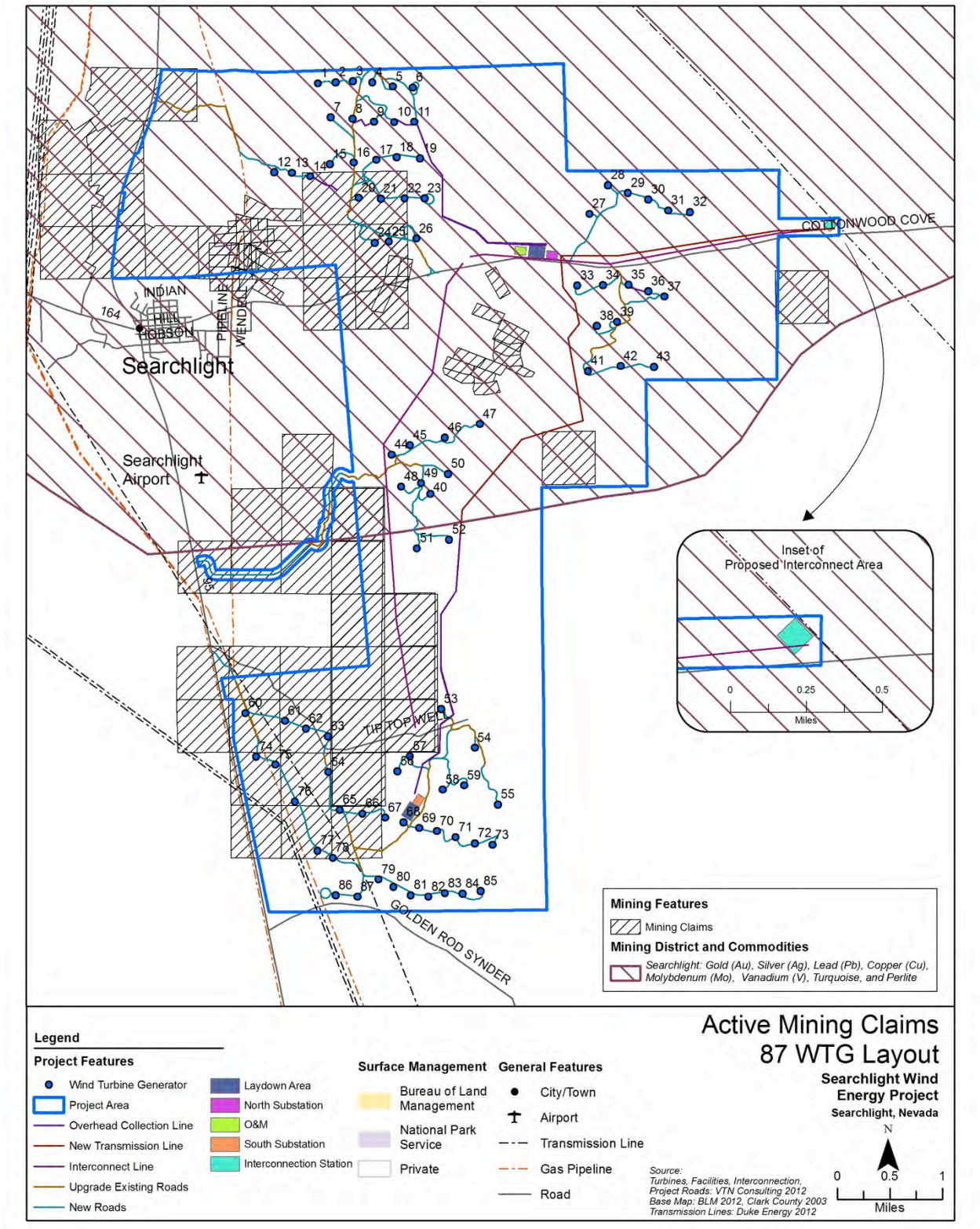


Figure 4.1-2. Mining Claims Potentially Affected by 87 WTG Layout Alternative

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.

Construction. 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.

O&M and Decommissioning. 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.

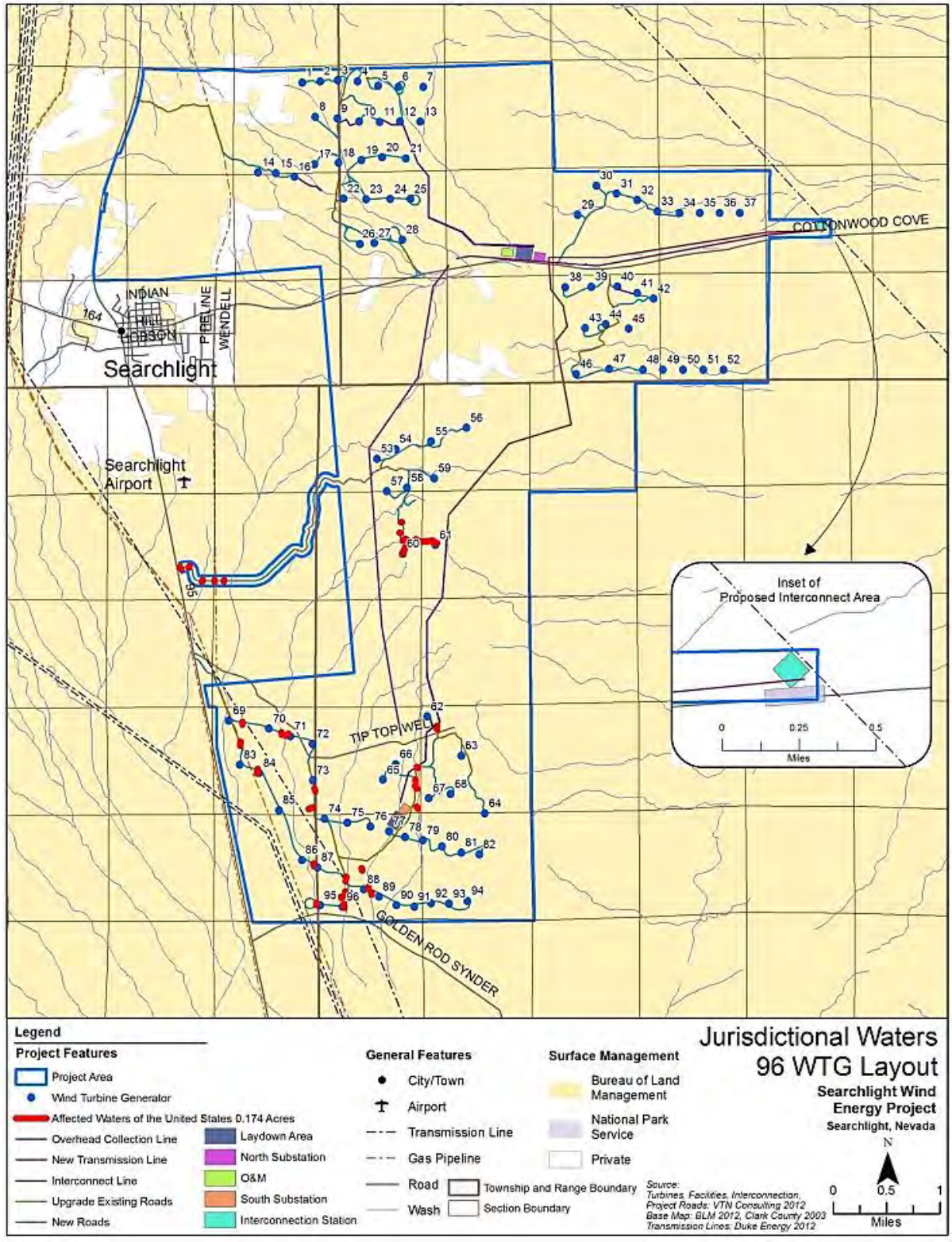


Figure 4.3-1. Jurisdictional Waters Potentially Affected by the 96 WTG Layout Alternative

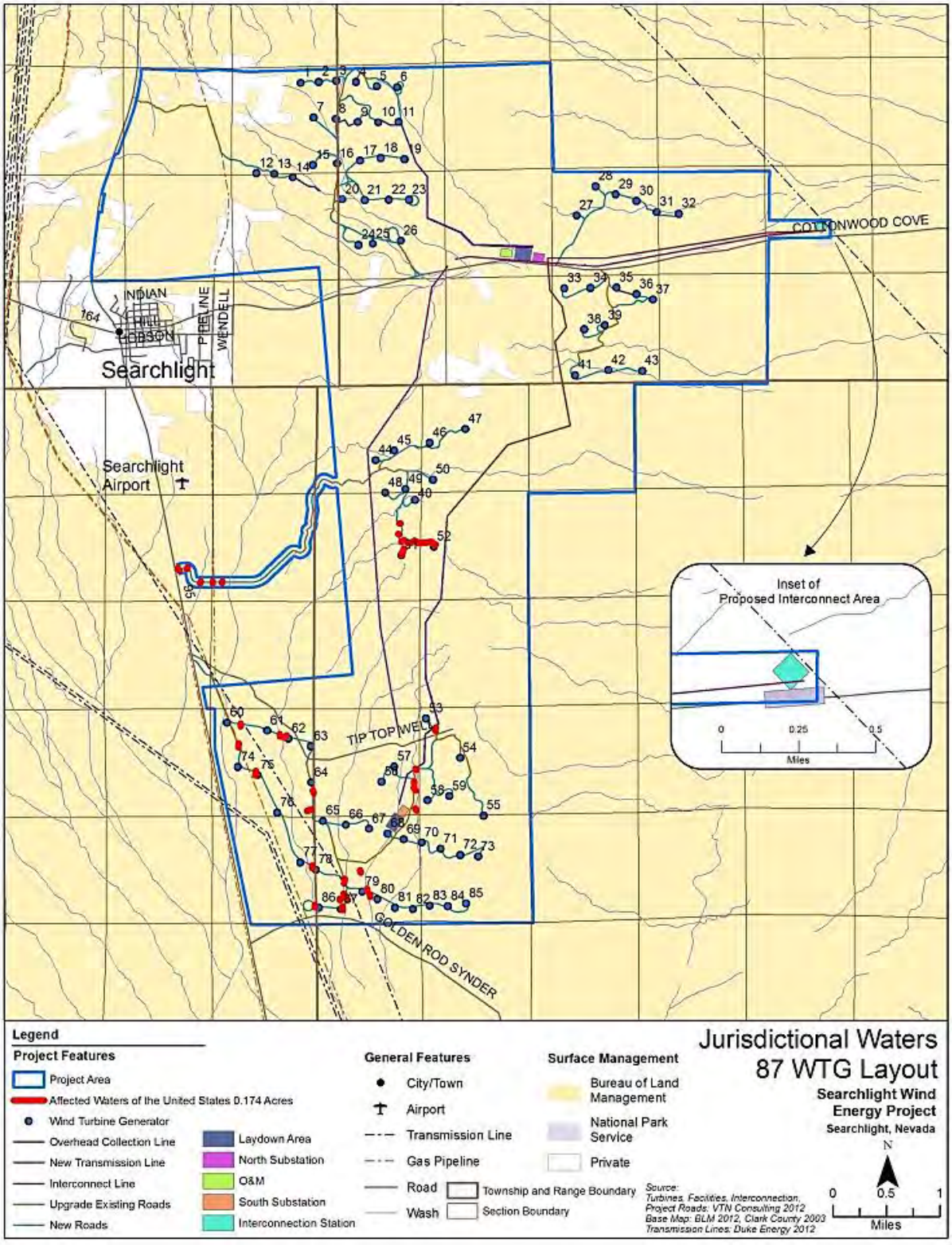


Figure 4.3-2. Jurisdictional Waters Affected by the 87 WTG Layout Alternative

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 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 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.

O&M and Decommissioning. 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.

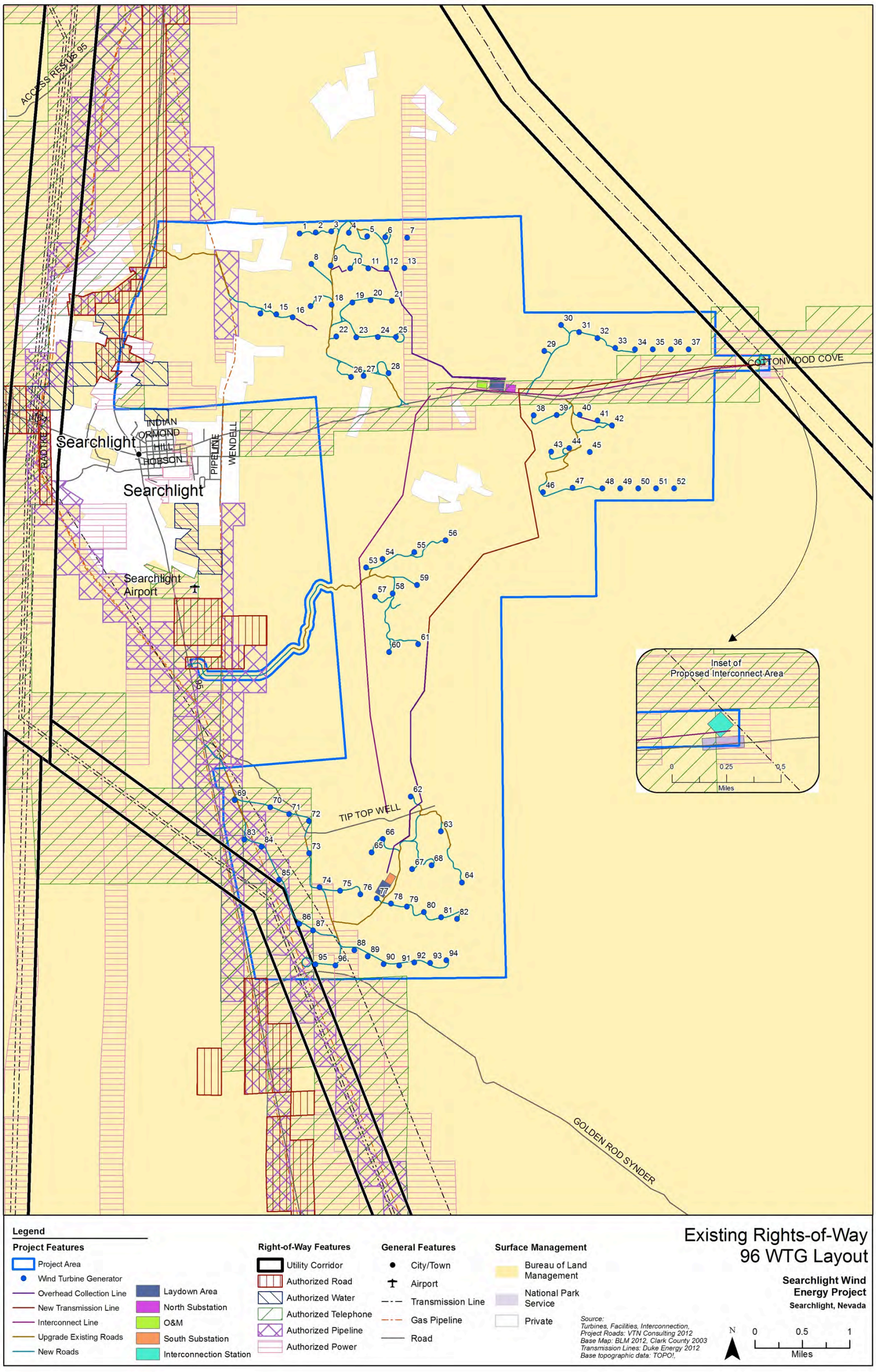


Figure 4.8-1. WTG 96 Alternative and Existing ROWs.

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.

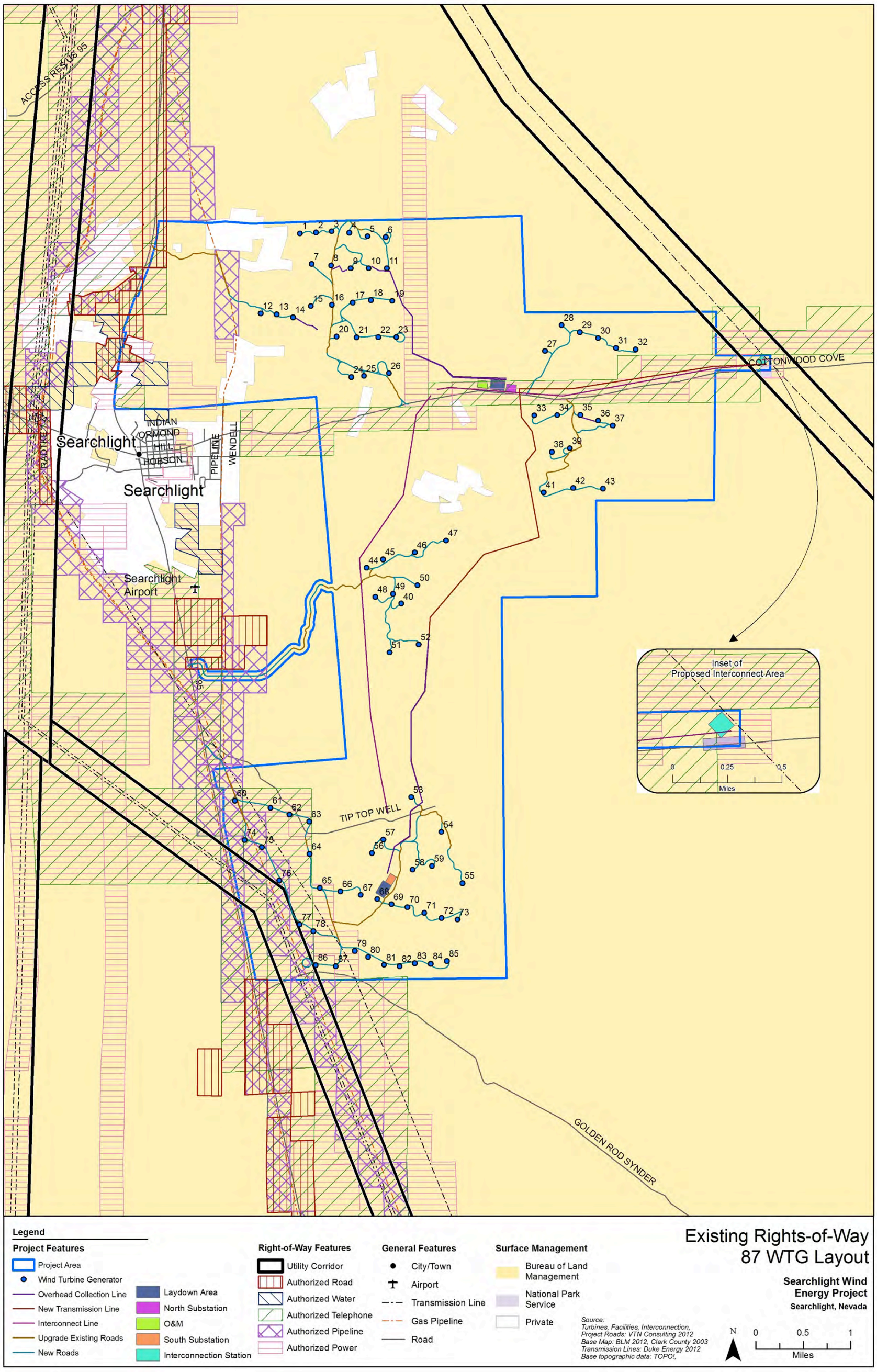


Figure 4.8-2. 87 WTG Layout and Existing ROWs

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.

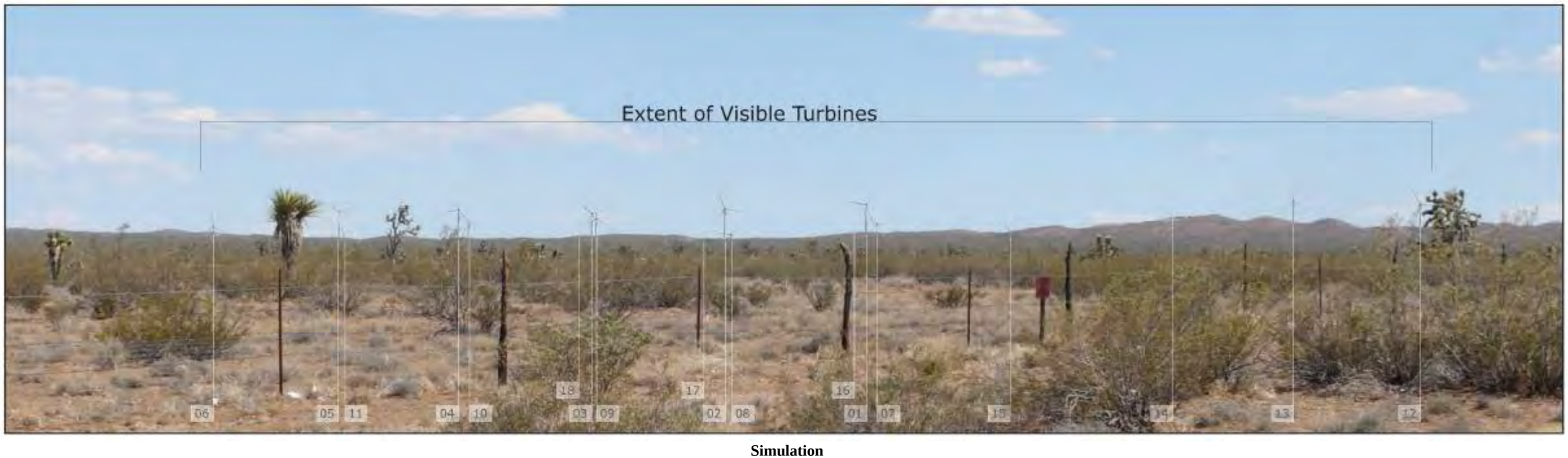
All WTGs would be constructed within designated VRM Class III areas. As stated in Chapter 3.9, the objective of this VRM class is to partially retain the exiting character of the landscape. Construction of the WTGs would be in conformance with VRM Class III objectives.

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



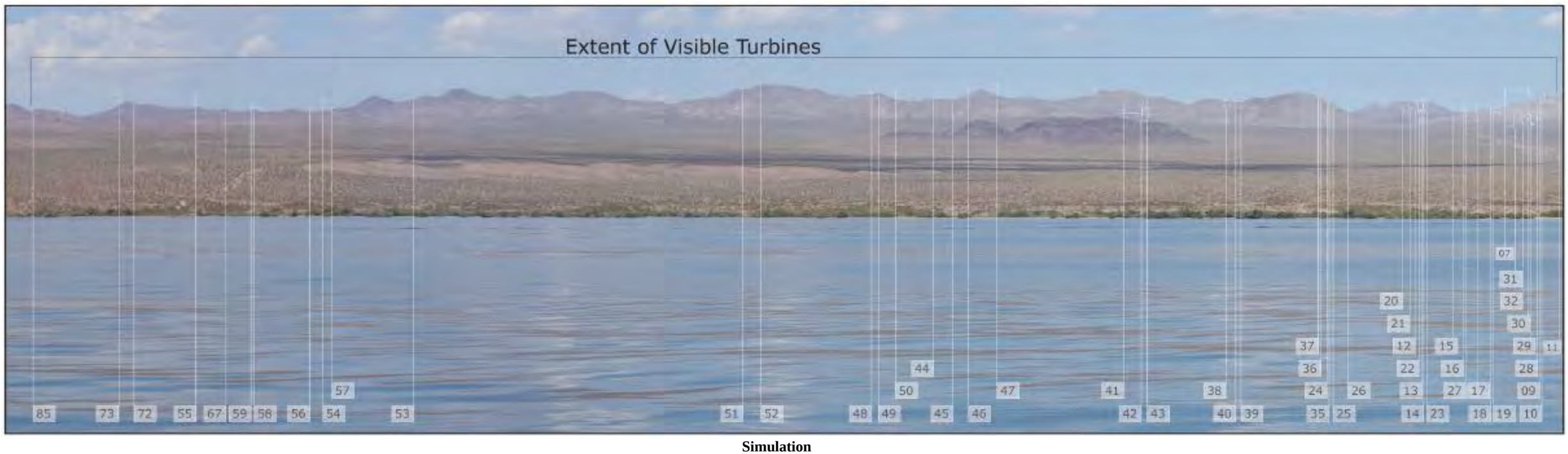
Simulation

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



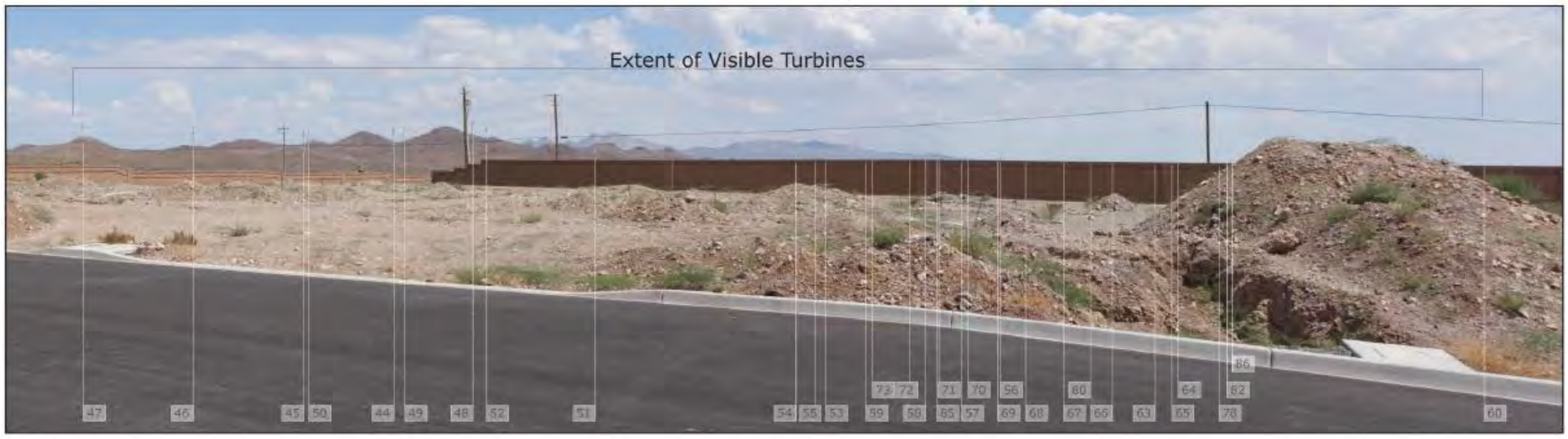
Simulation

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

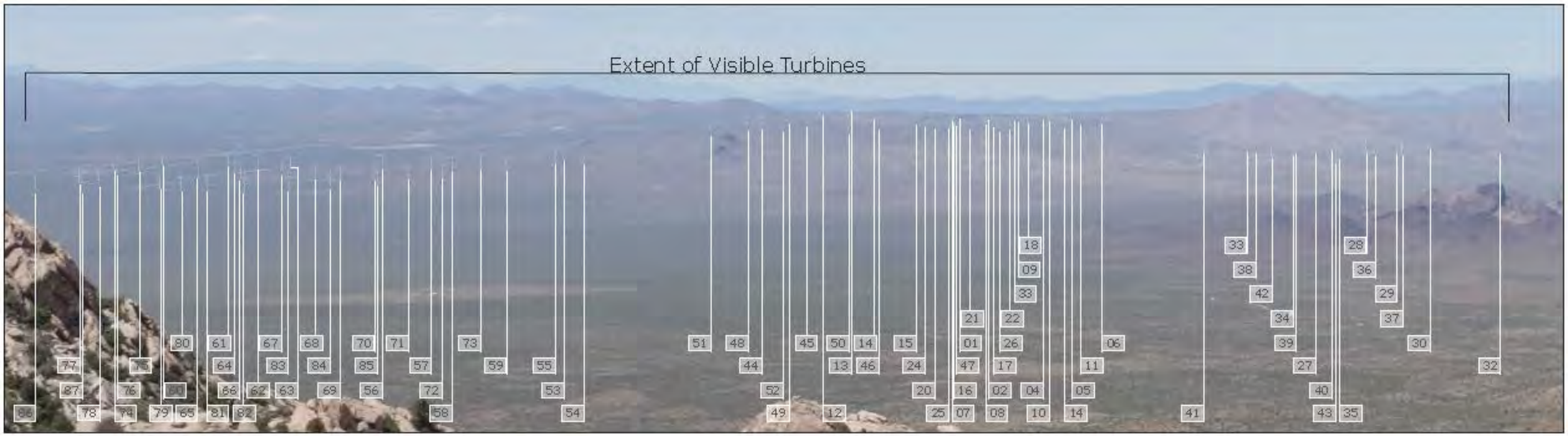
Simulation

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

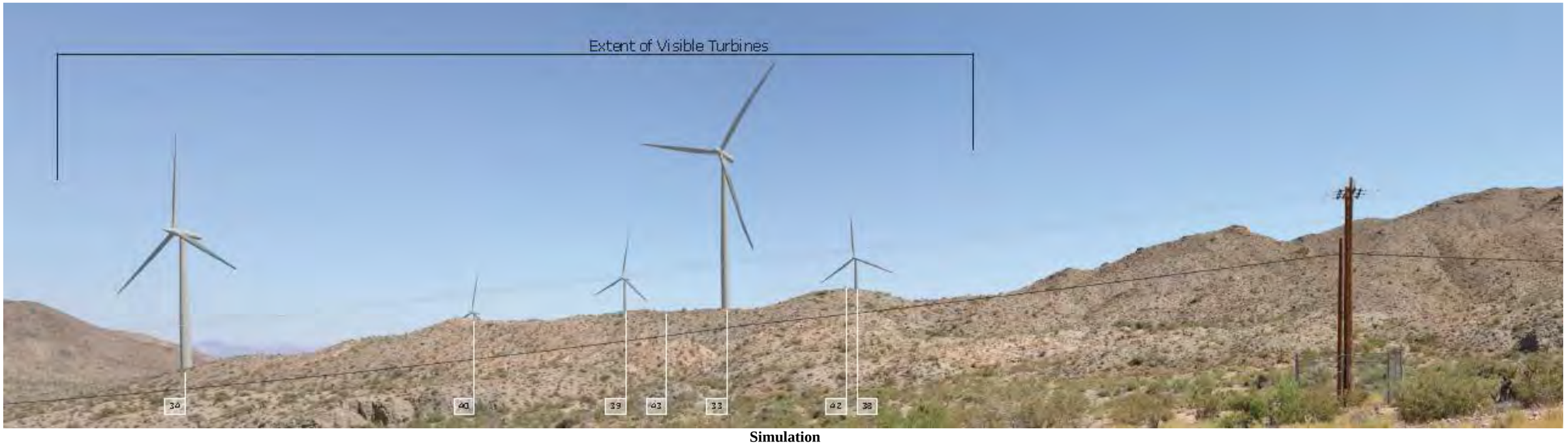
Simulation

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

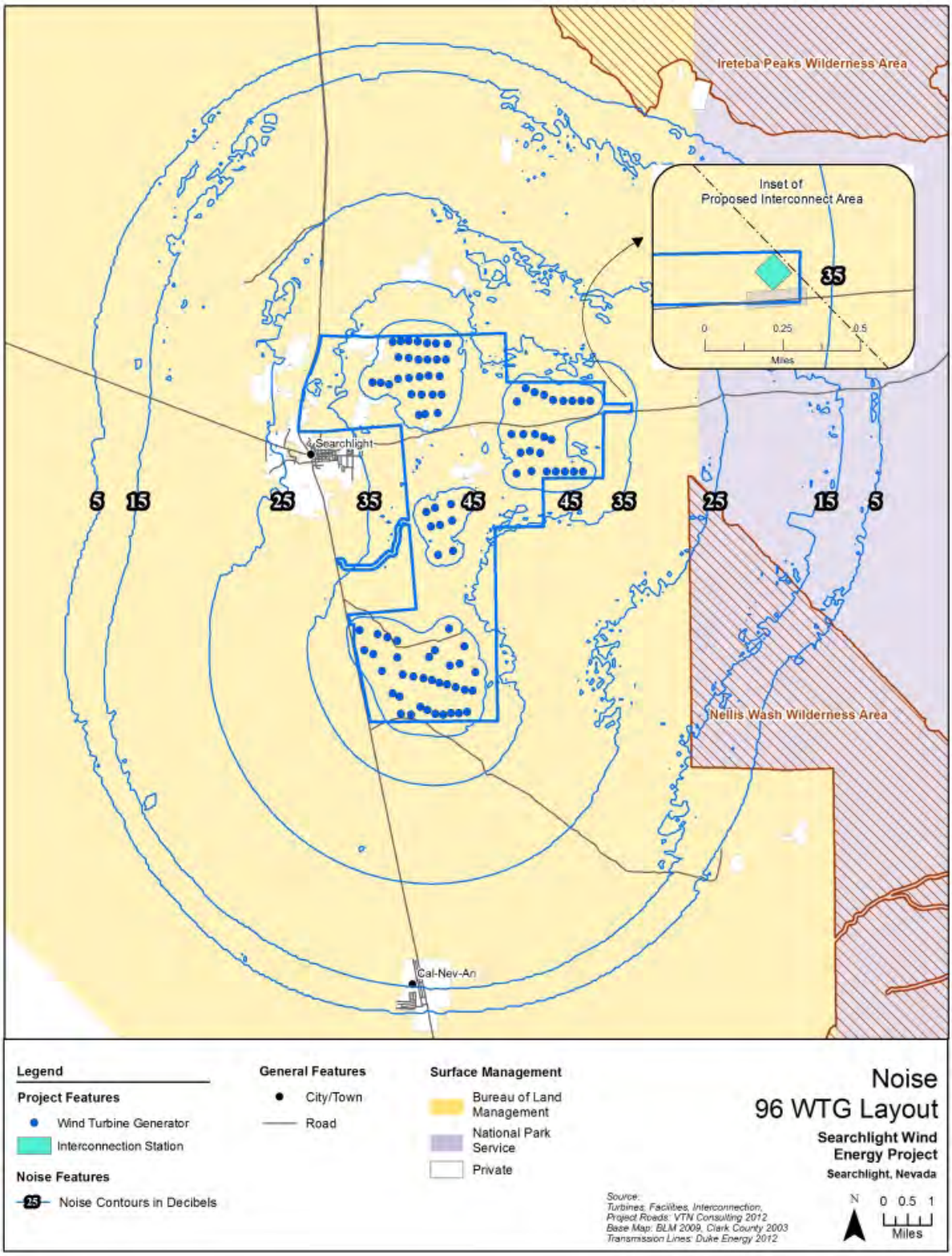


Figure 4.10-1. Noise Contours for the 96 WTG Layout Alternative

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.**

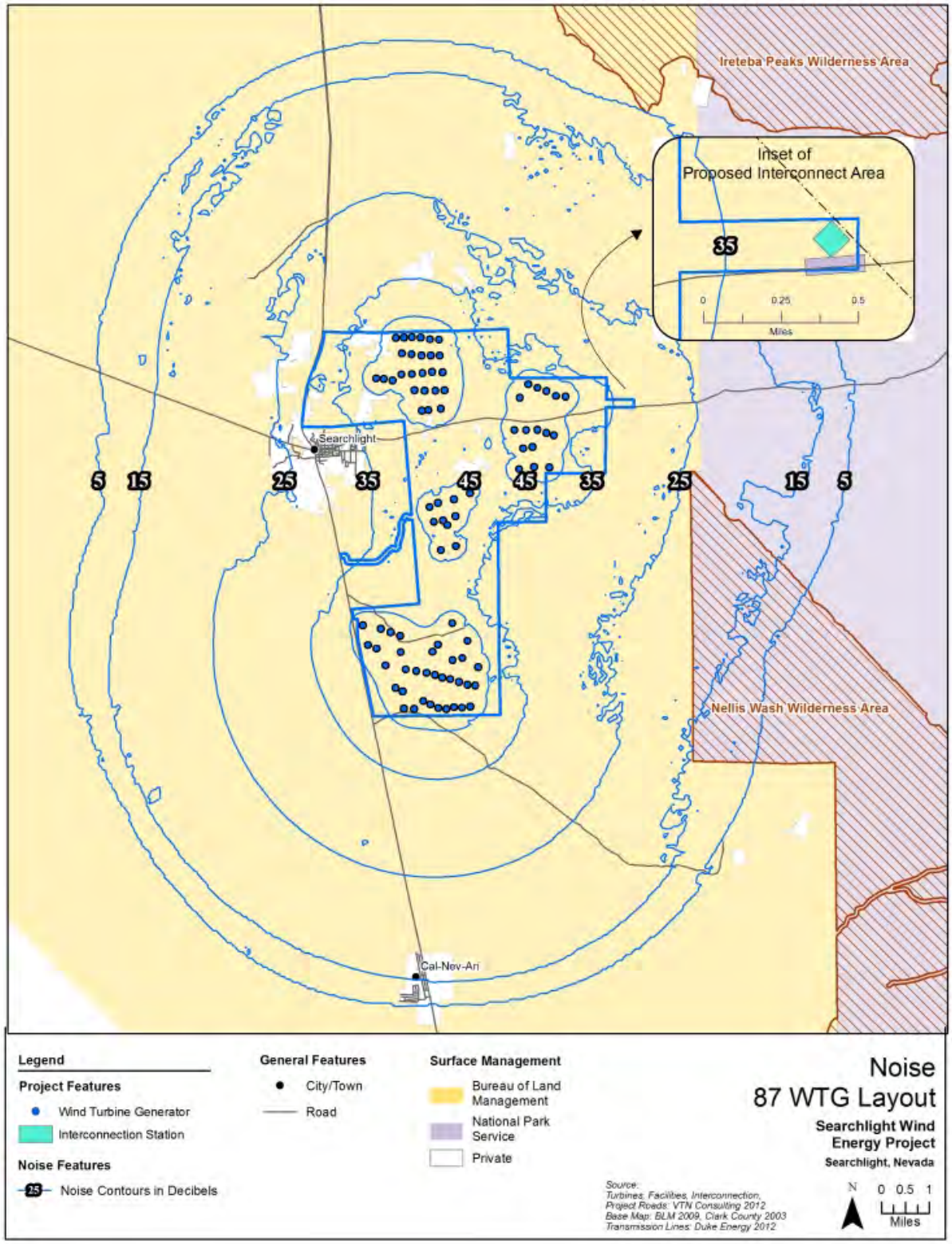


Figure 4.10-2. Noise Contours for the 87 WTG Layout Alternative

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.

O&M and Decommissioning. 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:

[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.

O&M and Decommissioning. 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.