

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

Borderlands Wind Project

**DRAFT ENVIRONMENTAL IMPACT STATEMENT AND
RESOURCE MANAGEMENT PLAN AMENDMENT**

DOI-BLM-NM-A020-2019-0002-RMP-EIS

Cooperating Agencies:

U.S. Fish and Wildlife Service; U.S. Air Force; Pueblo of Zuni;
New Mexico State Land Office; and Catron County, New Mexico

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Draft
Environmental Impact Statement and
Resource Management Plan Amendment

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Prepared by
U.S. Department of the Interior
Bureau of Land Management
Socorro Field Office
901 South Highway 85
Socorro, NM 87801-4168

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CHAPTER 1. INTRODUCTION

Borderlands Wind, LLC (a subsidiary of NextEra Energy Resources, LLC) is proposing development of an up to 100-megawatt (MW) wind-powered electrical generation facility in western Catron County, New Mexico (NM). The Borderlands Wind Project (BLWP) would be built near the Arizona (AZ)–NM border south of U.S. Highway 60 (U.S. 60) (Figure 1-1). Wind turbines and ancillary facilities, such as access roads, underground collection lines, and substation/switchyard areas, would be located on lands administered by the Bureau of Land Management (BLM) Socorro Field Office (SFO), New Mexico State Land Office (NMSLO)-owned lands, and privately owned lands. Borderlands Wind, LLC has filed an application with the BLM for a Federal Land Policy and Management Act of 1976 (FLPMA) Right-of-Way (ROW) authorization. The BLM must consider existing resource management plans (RMPs) in the decision to issue a ROW grant, in accordance with 43 Code of Federal Regulations (CFR) Part 1610.0-5(b). The proposed wind development alternatives are not in conformance with the SFO RMP (BLM 2010); therefore, an amendment to the RMP will be analyzed in this Environmental Impact Statement (EIS). An amendment to the SFO RMP would modify the visual resource management (VRM) classes and ROW avoidance area status.

The BLM's obligations for the proposed project are established by regulatory directives and current energy development trends. BLM's decision-making process will incorporate and consider the following Presidential Executive Orders (EOs): Promoting Energy Independence and Economic Growth (EO 13783), Promoting Agriculture and Rural Prosperity in America (EO 13790), and Establishing Discipline and Accountability in the Environmental Review and Permitting Process for Infrastructure Projects (EO 13807). Secretarial Order (SO) 3349 (American Energy Independence) provides guidance for the implementation of the Presidential EOs.

Borderlands Wind, LLC considered wind generating sites near existing Tucson Electric Power (TEP) transmission lines and avoided areas with existing congestion in the transmission network (such as sites surrounding Albuquerque, NM). Based on these site characteristics, two project areas were identified and initially evaluated for their feasibility for development as a wind energy facility. In addition to the BLWP area (Figure 1-1), an alternate project area was considered that was located approximately 40 miles northwest of the BLWP area in AZ. The AZ project area was not selected for development because the wind resources are of lower quality than at the BLWP area (SWCA Environmental Consultants 2018). Additionally, this alternative project area had substantially more environmental constraints. There were numerous eagle nests on and within 10 miles of the site, and it was also located near highly sensitive cultural resources for which the Tribes expressed substantial concerns. Borderlands Wind, LLC ultimately selected the proposed BLWP area due to the quality of wind resources, proximity to existing TEP transmission lines, relatively limited potential impacts to cultural resources as compared to the AZ project site, and compatibility of the BLWP with the existing land uses in the BLWP area, which is predominately cattle grazing (Borderlands Wind, LLC 2019).

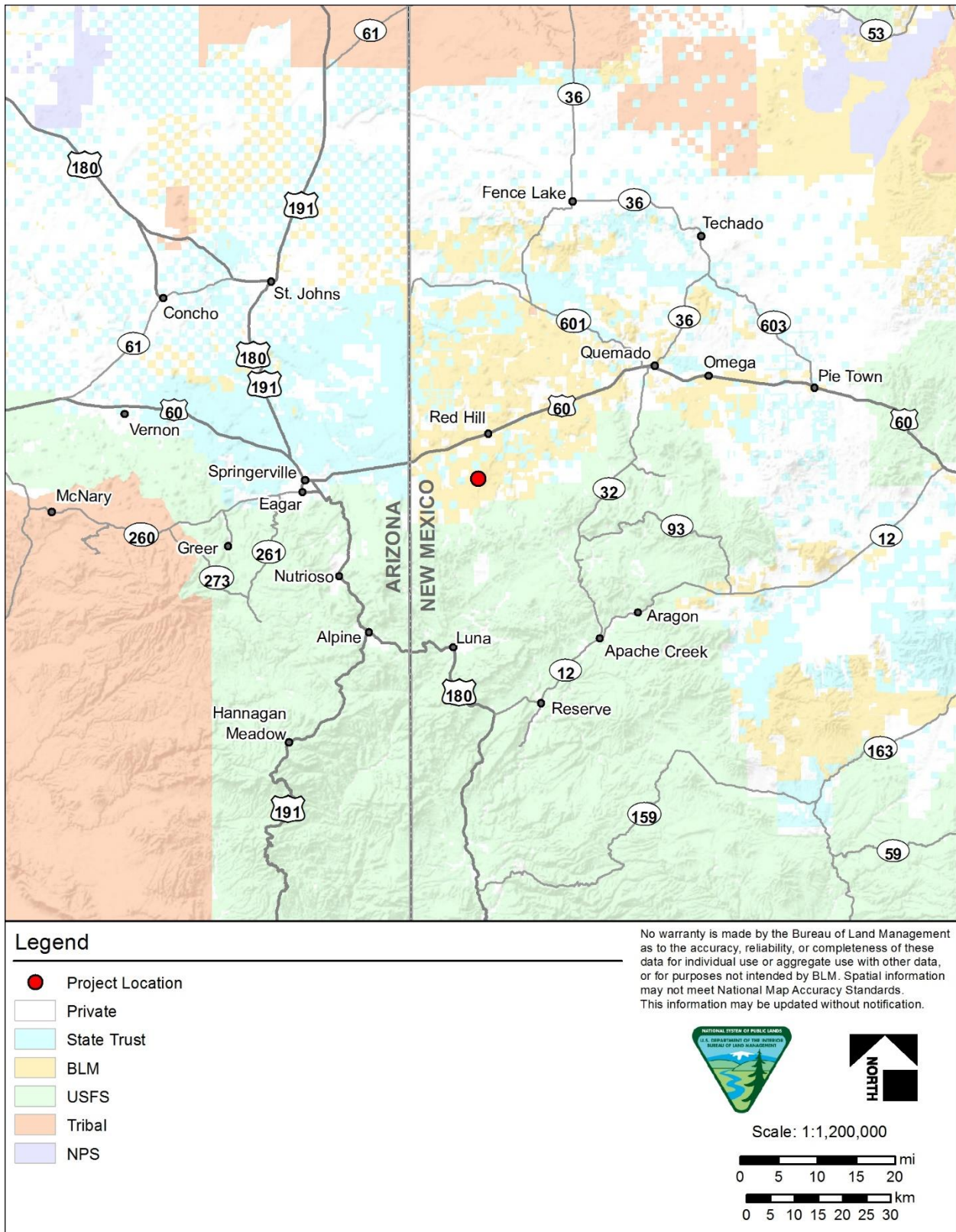


Figure 1-1. BLWP Area

1.1 Purpose and Need

The BLM's purpose and need for the proposed BLWP is established by regulatory obligations and directives and current energy development trends. The BLM's purpose is to respond to a ROW application submitted by Borderlands Wind, LLC to construct, operate, maintain, and decommission a wind energy facility and associated infrastructure in compliance with FLPMA, BLM ROW regulations, and other applicable Federal laws and policies. The need for the BLM's proposed action arises from FLPMA as amended October 1976 through December 2014, which established a multiple use mandate for management of Federal lands, including "systems for generation, transmission, and distribution of electric energy, except that the applicant shall also comply with all applicable requirements of the Federal Energy Regulatory Commission under the Federal Power Act, including part I thereof (41 Stat. 1063, 16 United States Code [U.S.C.] 791a-825r)" outlined in Title V of FLPMA. The BLM's action in considering Borderlands Wind, LLC's ROW application is provided under the authority of the Secretary of the Interior to "grant issue or renew rights of way ... for generation, transmission, and distribution of electric energy" (43 CFR 2800). The purpose and need is used to formulate a reasonable range of alternatives to be considered in the EIS.

1.2 Proponent's Project Objectives

Borderlands Wind, LLC's (the Proponent's) objective for the BLWP is to respond to a proposal from TEP for a wind project that is directly interconnected to their transmission system and can generate up to 100 MW of power for their customers. Tucson Electric Power (TEP), an AZ utility, is responding to market demands generated by the retirements of coal facilities along with transmission lines that deliver power to the Four Corners region (AZ-NM-Colorado-Utah) and to an increased interest in renewable energy to replace this power generation (Borderlands Wind, LLC 2019). Under the Renewable Energy Standard and Tariff that was approved by the AZ Corporation Commission in 2006, regulated utilities, such as TEP, must generate 15 percent of their energy from renewable resources by 2025.

1.3 Decisions to be Made

This EIS provides the information and environmental analysis necessary to inform the BLM's authorized officer and the public about the potential environmental consequences of the BLWP. It tiers to the BLM's *Final Programmatic Environmental Impact Statement for Wind Energy Development on BLM-Administered Lands in the Western United States and Record of Decision* (Final Wind Energy PEIS and ROD [BLM 2005]). The purpose of the BLM's action is to respond to the Borderlands Wind, LLC's application for use of BLM-administered lands for a ROW. Specifically, the BLM will decide whether to grant, grant with conditions, or deny the application for a ROW. Pursuant to 43 CFR § 2805.10, if the BLM issues a grant, the BLM decision maker may include terms, conditions, and stipulations determined to be in the public interest. If the decision is made to grant the ROW, the BLM also will decide which alternative to select; any mitigation requirements; and the terms, conditions, and stipulations of the grant.

The BLWP, as submitted, will require an SFO RMP amendment (BLM 2010) if the proposed project is approved or approved with modification, and the BLM NM State Director will make the decision as to whether or not to adopt the RMP amendment. In the ROD, the BLM will clearly distinguish the RMP amendment decision from the selected alternative.

1.4 Land Use Planning

Management direction of public land and resources is provided in land use plans or RMPs for each BLM field office or district office. The BLM must review relevant land use plans and RMPs to determine if a proposed project is in conformance with the management decisions and objectives of those plans. If a

proposed project is not in conformance, the BLM can choose to either deny the project, adjust the project to conform to the RMP, or amend the RMP to address the nonconformance. In this Draft EIS, the BLM identified a plan amendment needed for Visual Resource Management (VRM) allocations for any of the alternatives that are fully analyzed within the EIS. The development of a wind energy facility, such as the BLWP, must be consistent with the SFO RMP and applicable BLM policy (refer to Section 1.5 Authorizing Laws, Regulations, and Policies). The project, as proposed, does not currently conform to the SFO RMP for VRM objectives and ROW avoidance; therefore, this EIS will analyze an RMP amendment.

In addition, the 2007 Catron County Capital Improvement Plan (CIP)/Comprehensive Plan (Catron County 2007) was considered when evaluating potential impacts to land ownership and use patterns in the project vicinity (refer to Section 3.2 Lands and Realty). The land use designations in the 2007 Catron County CIP/Comprehensive Plan for the BLWP area are “Government Controlled” for the BLM-administered lands and NMSLO lands, and “Rural” for the private lands. The general land use goals identified in Catron County’s (County) plan include 1) encouraging local and sustainable growth in the County; 2) protecting existing land uses, natural resources, and related economic activities; and 3) protecting the County’s natural beauty.

1.5 Authorizing Laws, Regulations, and Policies

The FLPMA and its implementing regulations provide the legal framework that the BLM uses to manage public lands and assesses the effects of its management actions. The BLWP would be required to obtain the applicable authorizations established in the BLM’s Final Wind Energy PEIS and ROD (BLM 2005), as well as those from the SFO RMP. This EIS is being prepared by the BLM in compliance with NEPA; FLPMA; and U.S. Department of the Interior (DOI) and BLM policies and manuals, including the BLM NEPA Handbook (BLM 2008a). Table A-1 in Appendix A lists the relevant actions and authorities that must be obtained or considered for the BLWP. Table A-2 in Appendix A provides a partial list and summary of other Federal, State, and County authorities and actions that may be applicable to this EIS.

1.6 Lead Agency and Cooperating Agencies

The BLM through its New Mexico State Office, is the lead Federal agency responsible for preparing this EIS and associated analyses. The Council on Environmental Quality (CEQ) regulations addressing cooperating agencies statuses (40 CFR §§ 1501.6 & 1508.5) implement the NEPA requirement that Federal agencies responsible for preparing NEPA analyses and documentation do so in cooperation with State and local governments and other agencies with jurisdiction by law or special expertise.

The BLM invited various Federal, State, and County agencies and Tribal governments to participate as cooperating agencies in May 2018. Four agencies accepted: U.S. Air Force, U.S. Fish and Wildlife Service (USFWS), NMSLO, Catron County, and the Pueblo of Zuni.

1.7 Issues to Address in the EIS

Public scoping for the BLWP was initiated on November 9, 2018, when the BLM published a Notice of Intent (NOI) to prepare an EIS in the Federal Register. The NOI briefly described the purpose of and need for the BLWP, the proposed project location, and infrastructure associated with the BLWP; and initiated the scoping process and 30-day public comment period to solicit public comments and identify issues. It also served to segregate the public lands from appropriation in accordance with 43 CFR 2091.3-1(e) and 43 CFR 2804.25(f).

The BLM also identified issues through internal scoping among the BLM interdisciplinary staff. The scoping process is described in Chapter 4. The Scoping Report, as well as the BLM's consultation and coordination documentation are available on the [project's BLM website](#).

Of the 51 (47 public and 4 agency) comment submissions (comment letters and/or emails), five people sent in the same comments twice and one organization sent the same comments from two different individuals, which resulted in 45 unique letters and/or emails. A summary of issues that were raised most frequently during the public scoping period is provided below:

- *Socioeconomics* – Residents or private property owners in the adjacent Red Hill/Cimarron Ranch Subdivision noted issues related to property values, noise, and human health effects. Comments made noted the lack of local economic benefits, specifically loss of revenue from hunting and tourism; increased fire danger and added burden to local firefighters; and the change from a natural landscape to an industrial setting.
- *Biological Resources* – Numerous issues identified in public comments focused on impacts to biological resources, particularly eagles and other special status species, as well as bat and avian species. Other comments focused generally on the loss of vegetation, wildlife, and habitat; habitat disturbance and fragmentation; loss of elk habitat and migration path disruption; and ability for successful revegetation and restoration after project construction and decommissioning.
- *Visual Resources* – Comments on visual resources focused primarily on effects to views and the visibility of project facilities from nearby residences, places of traditional cultural importance, and recreational resources. Other comments were noted on the degradation of panoramic views, the night sky, and the landscape's natural character.
- *Cultural Resources* – Most of the comments on cultural resources indicated concern for impacts to archaeological resources and places of traditional cultural importance, such as Zuni Salt Lake.
- *Land Use, Recreation, and Transportation* – Some comments on land use identified effects to livestock grazing during the construction and revegetation process. Other comments questioned the impact to recreation and hunting use, and how the recreation experience would change in terms of the addition of a wind facility to the area. Comments were also received noting the potential degradation of U.S. 60 during construction by heavy equipment and increased volume of project-related vehicles. Additionally, driver distraction concerns were noted from the strobe effects of the wind turbine blade's movement during operation.
- *Military Training Routes* – Concerns were noted regarding the possible effects to military training flight paths, but with no distinct issue identified or responsive statement made.

Scoping comments raised that were not related to resources or uses included requests for information and to be added to the mailing list. Several comments asked for more advance notification for subsequent public meetings on the project and at a location closer to the Red Hill/Cimarron Ranch Subdivision. People would like to have a formal presentation and ability to make verbal comments at future BLWP public meetings.

CHAPTER 2. PROPOSED ACTION AND ALTERNATIVES

This chapter describes the BLWP's Proposed Action, Alternative 1, Alternative 2, and the No Action Alternative. A detailed description of the construction, operation and maintenance (O&M), and decommissioning of the proposed wind energy facility is provided in Section 2.2 and the BLWP Plan of Development (POD) (Borderlands Wind, LLC 2019; Appendix C).

2.1 Best Management Practices

All phases of the BLWP would be subject to the BLM's best management practices (BMPs), which are designed to guide project planning, construction activities, development of facilities, O&M, and decommissioning in order to minimize environmental and operational impacts. The BLWP would develop wind energy resources in compliance with the BMPs and other design features that were evaluated in the BLM's Final Wind Energy PEIS and ROD (BLM 2005). The applicable BMPs and other design features are included in Appendix B of this EIS.

2.2 Project Elements Common to All Build Alternatives

2.2.1. Right-of-Way Application

Under the Proposed Action and Alternatives 1 and 2 (build alternatives¹), the Applicant is seeking a ROW for development of the project.

2.2.2. Resource Management Plan Amendment

The build alternatives include amending the VRM Class II objective in the SFO RMP to VRM Class III objective and VRM Class III objective to Class IV objective (refer to Tables 3-24 and 3-25) for the proposed management activities. A ROW avoidance area was delineated along U.S. 60 to protect the VRM Class II allocation and would no longer be applicable if the VRM Class II allocation was removed.

2.2.3. Project Components

Details regarding the Proposed Action and Alternatives 1 and 2 are drawn from the BLWP POD (see Appendix C), clarification meetings between the BLM and Borderlands Wind, LLC (the Proponent), and other agencies, as appropriate. The Proponent has a Power Purchase Agreement with TEP. The Point of Interconnect for all build alternatives would tie into the existing TEP 345-kilovolt (kV) transmission line. Borderlands Wind, LLC selected the BLWP area based on the quality of available wind resources, proximity to existing transmission lines and compatibility with the current grazing use. Subject to the BLM's approval of the ROW application (with or without modification), the wind energy facility would operate year-round for up to 35 years. Analysis and surveys conducted within the BLWP area were applied to all alternatives.

Three models of wind turbine generators are proposed for the BLWP (Table 2-1). For all models, the turbine tower would be a tapered tubular steel structure manufactured in multiple sections depending on tower model height. The tower base would be approximately 15 feet in diameter, and the tower would be painted per Federal Aviation Administration (FAA) requirements (FAA 2018).

¹ The term "build alternatives" is interchangeable and used synonymously with "Proposed Action and Alternatives 1 and 2" throughout the document to encompass the alternatives that would require construction, O&M, and decommissioning of the BLWP. This is in contrast to the No Action Alternative which would not involve any development of a wind generation facility.

The nacelle sits on top of the tower and houses the main mechanical components of the wind turbine, drive train, gearbox, and generator. The nacelle would be equipped with an anemometer and a wind vane that signals wind speed and direction information to an electronic controller. The hub attaches the blades to the rotor shaft and is covered by a nose-cone structure to streamline the airflow and protect the equipment. The hub also contains the mechanisms that allow the blades to pitch in response to wind, temperature, and air density conditions. As noted in the descriptions of the alternatives below, the number and size of the turbines to be constructed would depend on the alternative. Based on the turbines considered, the blades would turn at no more than 18 revolutions per minute depending on wind conditions. Turbines would also have a braking system to allow the controller to stop the rotor. Each turbine would be equipped with a computer control system to monitor variables consisting of wind speed and direction, air and machine temperatures, electrical voltages, currents, vibrations, blade pitch, and yaw (side-to-side) movement (BLM 2013).

Table 2-1. Proposed Wind Turbine Generator Model Characteristics

Turbine Component	GE 2-MW Platform 2.3 MW (feet)	GE 2-MW Platform 2.5 MW (feet)	GE 2-MW Platform 3.03 MW (feet)
Hub height	262	289	361
Rotor/blade radius	190	209	230
Rotor/blade diameter	380	417	459
Ground clearance	72	84	131
Maximum overall height	453	499	591

Table Abbreviations: GE = General Electric; MW = megawatt

Note: Technical data represent the maximum worst-case design characteristics for each model, based on available manufacturer specifications (Borderlands Wind, LLC 2019)

Each turbine would have a pad-mounted transformer box at the base. Each wind turbine, through its associated transformer, would collect electricity and transfer it to a collector substation via the electrical collection system. The transformer at each wind turbine would increase the voltage for efficiency. The collection system would consist of underground cables connecting individual wind turbine generators together and then transporting the electrical power to the BLWP substation. Voltage at the substation would be increased from 34.5 kV to the interconnection voltage of 345 kV. In addition to wind turbines, numerous ancillary project components and activities would be associated with the construction, O&M, and decommissioning of the BLWP (Table 2-2; Appendix C). See Table 2-2 below for a detailed comparison of the components for the Proposed Action and Alternatives 1 and 2.

2.2.4. Project Construction

Site preparation would be the first phase of construction, including clearing and grading of the temporary laydown areas, turbine foundation, trenching for electrical cabling, and access roads. Any limitations of areas to be disturbed would be clearly defined prior to construction of roads, collection systems, and turbine locations. The Flagging, Fencing, and Signage Plan included in the BLWP POD further details site preparation, surveying, and staking. Site grading and clearing would be performed in accordance with BLM policies and the State-approved Stormwater Pollution Prevention Plan (Borderlands Wind, LLC 2019).

Delivery vehicles would be directed to a single point of access at the U.S. 60 and Bill Knight Gap Road intersection. During construction, the peak volume of trips generated along U.S. 60 is estimated at approximately 500 trips per day (based on 160 construction personnel and 50 delivery trucks leaving and entering the project site). A Road Design, Traffic, and Transportation Plan is included in BLWP POD (Borderlands Wind, LLC 2019).

Table 2-2. Comparison of Proposed Action, Alternative 1, and Alternative 2

Component	Description	Proposed Action	Alternative 1	Alternative 2
Wind Turbines and Pad-mounted Transformers ¹	Construction and installation of wind turbines to generate up to 100 MW of power. Each turbine would be mounted on a concrete pedestal, supported by a permanent underground concrete foundation with a tubular steel tower.	<ul style="list-style-type: none"> • 46 turbines permitted • 40 turbines constructed (36 GE 2.5 MW & 4 GE 2.3 MW) • 6 alternative locations • Temporary disturbance: <ul style="list-style-type: none"> – 1.6 acres/turbine – 74.5 acres total • Permanent disturbance: <ul style="list-style-type: none"> – 0.2 acre/turbine – 9.2 acres total 	<ul style="list-style-type: none"> • 45 turbines permitted • 40 turbines constructed (36 GE 2.5 MW & 4 GE 2.3 MW) • 5 alternative locations • Temporary disturbance: <ul style="list-style-type: none"> – 1.6 acres/turbine – 72.9 acres total • Permanent disturbance: <ul style="list-style-type: none"> – 0.2 acre/turbine – 9.0 acres total 	<ul style="list-style-type: none"> • 45 turbines permitted • 34 turbines constructed (30 GE 3.0 MW & 4 GE 2.5 MW) • 11 alternative locations • Temporary disturbance: <ul style="list-style-type: none"> – 2.9 acres/turbine – 129.2 acres total • Permanent disturbance: <ul style="list-style-type: none"> – 0.2 acre/turbine – 9.0 acres total
Electrical Interconnection Substation and Switchyard	The BLWP substation would be located where all underground electrical collection lines would terminate. The substation would step up the electricity generated by the BLWP to the voltage necessary to transmit it across the transmission system. The BLWP substation would include a power transformer, breakers, feeder breakers, switches, control house, and a substation superstructure. Exterior lighting at the substation would be down-shielded. The switchyard would be connected to, and in close proximity to, the BLWP substation. The switchyard would integrate the electricity generated by the BLWP onto the existing transmission system and may include circuit breakers, switches and controls, and a control building. Emergency backup power to the substation control house would be provided by connecting into Socorro Electric’s existing distribution line.	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 7 acres total • Permanent disturbance: <ul style="list-style-type: none"> – 7 acres total 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action
Underground Electric Collection System and Communication Lines	Each wind turbine would be connected to the substation by underground power and communication cables (i.e., the collection lines). Trenching for the underground collection lines would be approximately 4 feet wide and 3 feet deep. Where underground collection lines and access roads are co-located, trenching would occur adjacent to the roadbed, an average of 2 to 4 feet from the roadbed. It is anticipated that 60 feet of temporary workspace would be needed for trenching.	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 29.7 miles (213.7 acres) total • Permanent disturbance: <ul style="list-style-type: none"> – 0 acres; all temporary areas of disturbance would be reclaimed 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 39.5 miles (283.5 acres) total • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Alternative 1 • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action

Component	Description	Proposed Action	Alternative 1	Alternative 2
O&M Facility	<p>The 2,500-square-foot single-story O&M building would provide a home base for maintenance services and operational on-site monitoring. It would be a pre-manufactured building assembled on a concrete slab foundation. The O&M building would contain offices; restrooms; a kitchen/breakroom; a room to house the control system for the turbines; and a warehouse area that would store spare parts, tools, and maintenance equipment. Outside the O&M building would be a gravel parking area and outdoor storage area. Electricity to the O&M facility would be provided by connecting into Socorro Electric's existing distribution line.</p> <p>A 1,000-gallon septic tank would also be constructed as part of the O&M facilities, if feasible. If construction of a septic tank would not be possible, either a holding tank would be constructed that would be pumped periodically or porta-potties would be placed near the O&M building.</p>	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 5 acres total • Permanent disturbance: <ul style="list-style-type: none"> – 5 acres total 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action
Distribution Line	<p>An approximately 12-kV, single-phase line would be made of 45-foot-tall wooden poles. The poles would span approximately 250 feet. The distribution line would connect to an existing regional transmission line to deliver BLWP power to TEP.</p>	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 1.8 miles long; 100 feet wide (22.7 acres) • Permanent disturbance: <ul style="list-style-type: none"> – 1.8 miles long; 100 feet wide (22.7 acres) 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action
Borrow Pit	<p>A temporary borrow pit would be required during construction to supply the raw earthen materials needed for the on-site concrete batch plant and road construction. Activities associated with mining of the borrow pit would include the clearing of the borrow pit area, removal of topsoil to stockpile, construction of access roads/ramps, excavation of the borrow pit material to stockpile, and closure and rehabilitation of the borrow pit.</p> <p>If minerals are bought from a third-party source, no permit is required from the BLM as long as the land surface and subsurface is privately owned. A minerals material permit from the BLM is required where the BLM</p>	<ul style="list-style-type: none"> • Not applicable; raw earthen materials would be supplied through a New Mexico Department of Transportation (NMDOT)-approved existing borrow pit, on lands with federally owned subsurface minerals, after applying for a BLM mineral material permit 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 35 acres • Permanent disturbance: <ul style="list-style-type: none"> – 0 acres; all temporary areas of disturbance would be reclaimed – Borrow pit may be on lands with federally owned subsurface minerals, after applying for a BLM mineral material permit 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Alternative 1 • Permanent disturbance: <ul style="list-style-type: none"> – Same as Alternative 1

Component	Description	Proposed Action	Alternative 1	Alternative 2
	owns the subsurface material even if the surface use is issued to a private party. If the private landowner issues a surface use permit to Borderlands Wind, LLC, it should be provided to the BLM with an extraction and reclamation plan for the BLM to issue a permit to Borderlands Wind, LLC.			
Access Roads	<p>Existing roads would be used to the extent feasible and would be improved by regrading and filling the surface to allow for all-weather access. Roads would be graded, include sufficient drainage, and be surfaced with an aggregate surface material. During construction, roads would be contained within the 150-foot-wide temporary disturbance corridor to accommodate construction activities. In the event that the access road would intersect with grazing fences, gates or cattle guards would be constructed and any damaged fencing would be repaired/replaced.</p> <p>Bill Knight Gap Road, from the intersection of U.S. 60, would be the primary access road to the BLWP. Improvements would be needed at the intersection of U.S. 60 and Bill Knight Gap Road. Permanent improvements to this intersection would include the widening of U.S. 60 to the north to construct: 1) an approximate 1,225-foot-long westbound deceleration lane, left-turn lane with storage, and associated taper, 2) an approximate 1,000-foot-long eastbound deceleration lane with storage and associated taper, and 3) apron improvements for turning movement.</p> <p>Hooper Ranch Road, from the intersection of U.S. 60 south to the O&M building, would be a secondary access used only if the primary access is not available. A portion of Hooper Ranch Road (approximately 0.3 mile) would need to be improved between the interconnection and substation to allow for construction of the distribution line.</p>	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 48.0 miles total, including 41.3 miles of new roads – 872.7 acres • Permanent disturbance: <ul style="list-style-type: none"> – 48.0 miles total, including 40.3 miles of new roads and 1 mile of Bill Knight Gap Road reroute – 16 feet wide for all except Bill Knight Gap Road, which would be 24 feet wide (6.8 miles) – 101 acres 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 46.6 miles total, including 39.8 miles of new roads – 847.3 acres • Permanent disturbance: <ul style="list-style-type: none"> – 46.6 miles total including 38.8 miles of new roads; and 1 mile of Bill Knight Gap Road reroute – 16 feet wide for all except Bill Knight Gap Road, which would be 24 feet wide (6.8 miles) – 97 acres 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Alternative 1 • Permanent disturbance: <ul style="list-style-type: none"> – Same as Alternative 1

Component	Description	Proposed Action	Alternative 1	Alternative 2
Fencing	<p>The substation/switchyard and the O&M facility are the only areas that would be permanently fenced. The substation/switchyard fence would consist of an 8-foot-tall chain-link structure with 1 foot of three-strand barbed wire on top, resulting in a total height of 9 feet. The O&M facility would be fenced with a 6-foot-tall chain-link fence with 1 foot of three-strand barbed wire on top, for a total height of 7 feet. The maximum depth of the fencing would be 4 inches. Facility fence gates would be locked when the facility is unattended.</p> <p>Temporary fencing would be used around areas of vegetation restoration. This fencing would be on previously disturbed lands and no additional ground disturbance is anticipated.</p>	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Within the footprint of the substation/switchyard and the O&M facility, no additional disturbance • Permanent disturbance: <ul style="list-style-type: none"> – Within the footprint of the substation/switchyard and the O&M facility, no additional disturbance 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action
Construction Laydown/ Staging Areas	<p>Three secure areas for temporary construction offices, construction vehicle parking, equipment and construction materials storage, and stockpiled soil storage would be developed. The laydown areas would be cleared and graded by bulldozers, road graders, or other standard earth moving equipment. At the end of construction, these areas would be reclaimed and revegetated. Electricity to the construction laydown/staging areas would be provided by on-site generators.</p>	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 60.8 acres total • Permanent disturbance: <ul style="list-style-type: none"> – 0 acres; all temporary areas would be reclaimed 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action
Construction Concrete Batch Plant	<p>The temporary concrete batch plant would be co-located within one of the construction laydown/staging areas. The plant would supply the concrete needed for project components (e.g., turbine foundations). The batch plant and associated facilities would include silos to contain fly ash, lime, and cement; aboveground storage tanks for water storage; and outside storage areas for sand- and gravel-mixing equipment. The heights of these facilities generally range from 30 to 50 feet. A washout area would be located within the laydown/staging area, with the concrete removed and reclaimed when the washout area is no longer needed. Electricity to the batch plant would be provided by on-site generators; one 500-kilowatt generator for the batch plant and two 60-kilowatt generators for the other facilities.</p>	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 2 acres within the footprint of the laydown/staging area, no additional disturbance • Permanent disturbance: <ul style="list-style-type: none"> – 0 acres; all temporary areas would be reclaimed 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action

Component	Description	Proposed Action	Alternative 1	Alternative 2
Water	<p>Construction activities would require approximately 26 million gallons of water and would be pumped from an existing private well and conveyed through aboveground piping. Water rights would remain with the private well owner.</p> <p>A new 5- to 6-gallon per minute well would be drilled for O&M water use; estimated withdrawal at 140,800 gallons per year. The new well would be located next to the O&M building. Until the new well adjacent to the O&M is fully functional, water may either be pumped from an existing domestic well and conveyed through aboveground piping to storage tanks, or trucked in and held in the storage tanks. O&M water use would be limited to restroom and kitchen use for staff. A domestic water use permit would be acquired for the O&M building well with water rights appropriated to Borderlands Wind, LLC for the life of the BLM ROW grant. Water rights would be conveyed to the BLM once the BLWP is decommissioned.</p>	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 1.5 miles of water line would follow access road disturbance; no new disturbance – 0.23 acres for new well construction within the footprint of the O&M building; no new disturbance • Permanent disturbance: <ul style="list-style-type: none"> – 0 acres; all temporary areas would be reclaimed – 0 acres for new well; within the footprint of the O&M building; no additional disturbance 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as Proposed Action
Aviation Lighting	<p>The turbines and meteorological (MET) towers would have medium-intensity, red strobe warning lights attached to the nacelles of the turbines. The FAA would make the final determination as to which turbines would require nighttime lights. If approved by FAA, the turbines and MET towers would have the Aircraft Detection Lighting System (ADLS), which would automatically be illuminated when aircraft are detected. Lighting would also be compatible with night vision goggles, as necessary for military training exercises.</p>	No temporary or permanent ground disturbance	No temporary or permanent ground disturbance	No temporary or permanent ground disturbance
Meteorological (MET) Tower	<p>Four MET tower locations would be considered, only two MET towers would be needed during operations. The MET tower would be no more than 361 feet tall and lighted with the ADLS if approved by the FAA. Data collected from the MET tower would be transmitted wirelessly to an off-site location; frequent access to the tower would not be needed. It is anticipated that personnel would visit the MET tower one or two times a year to perform routine maintenance.</p>	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – 10.5 acres total • Permanent disturbance: <ul style="list-style-type: none"> – 0.1 acre total 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as the Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as the Proposed Action 	<ul style="list-style-type: none"> • Temporary disturbance: <ul style="list-style-type: none"> – Same as the Proposed Action • Permanent disturbance: <ul style="list-style-type: none"> – Same as the Proposed Action

Component	Description	Proposed Action	Alternative 1	Alternative 2
Waste/ Hazardous Materials	Minimal hazardous materials are expected to be used, stored, transported, or disposed of as a result of the project. The Waste and Hazardous Materials Management and a Spill Prevention, Control, and Countermeasure plans in the BLWP POD address non-hazardous waste-stream composition, lubricant spills and cleanup procedures, and protocols for identifying hazardous waste.	No temporary or permanent ground disturbance	No temporary or permanent ground disturbance	No temporary or permanent ground disturbance
Fire Protection	The Emergency Preparedness and Response Plan and Fire Protection and Prevention Plan are included in the BLWP POD to prevent and manage fire during construction and operation of the proposed wind facility.	No temporary or permanent disturbance	No temporary or permanent disturbance	No temporary or permanent disturbance

Table Abbreviations: ADLS = Aircraft Detection Lighting System; BLWP = Borderlands Wind Project; FAA = Federal Aviation Administration; GE = General Electric; kV = kilovolt; MW = megawatt; NMDOT = New Mexico Department of Transportation; O&M = operation and maintenance; POD = Plan of Development; TEP = Tucson Electric Power
Source: Borderlands Wind, LLC 2019

Note: The numerical values in this EIS including those provided in tables, are shown to one decimal place. The data used to generate the values was maintained to 10 decimal places in order to capture small values in the analysis. In the EIS tables, the resultant outputs are rounded to one decimal place to make the values readable; therefore, totals and subtotals found in the tables may not appear to sum precisely.

¹ Acreages of temporary and permanent disturbance and miles/number of components provided in the table represent the construction of the total number of permitted turbines. The actual amount of disturbance and miles/number of components would be less because the number of turbines constructed would be less than the number of turbines permitted. The final turbine array layout would not be determined until final design, which means the associated components such as the alignment of the collection system would also not be decided until final design.

The next phase of construction would include construction of the switchyard, O&M building, and substations; installation of the electrical hardware; and construction of the turbines. A bulldozer or road grader would clear the area for excavation in order to prepare for each concrete foundation. If the subsurface is too hard to excavate, blasting would be conducted. Blasting may also be required for some select areas of the roads and collection line cable trenches. The BLM would require a Blasting Plan, Hazard Communication Plan, and Safety Plan to be in place before any blasting occurs. Blasting is anticipated to occur for about 1.5 seconds, 2 to 4 times per day, over a 40- to 50-day period. The project would require 18,000 cubic yards of concrete for construction, which would be supplied by the on-site concrete batch plant. The processing area and materials stockpiling area would be located at the batch plant. The batch plant and any excess concrete elements would be removed after the concrete placing phase and could be recycled or reused on other projects. Stockpiles for aggregate and sand would be constructed near the batch plant in a manner that would minimize wind exposure.

After project construction is completed, the site would be cleaned up and restored to facilitate O&M activities. Waste, debris, and equipment used during construction would be removed from the site. Revegetation would occur on all major staging and laydown areas. The BLWP’s roadway footprint would be reduced by decreasing the width of the majority of construction roadways, and revegetating any areas disturbed during construction that would not be retained for operations. The BLWP would be commissioned once the construction of the wind energy facility is done. Detailed inspection and testing procedures would be provided after final turbine commissioning.

2.2.5. Construction Workforce Numbers, Vehicles, Equipment, and Time Frames

Project construction would require at least 50 to 70 workers at any given time, and a maximum of 250 workers would be required during peak construction. Construction is anticipated to be completed in 5 to 6 months. Depending on the weather, construction crews would work 8- to 12-hour work days, 6 days per week. Construction-phase vehicles and heavy equipment would be required for construction of the project (Table 2-3). The equipment would be delivered to the site by flatbed combination truck, and most equipment would remain on site until construction is finalized. Construction materials that would be transported to the BLWP site include gravel, rock, and sand, all of which should be locally available.

Table 2-3. Construction Use Areas and Activities

Vehicles	Use Areas	Activities
Bulldozers and excavators	Turbine locations and major earthwork locations	Clearing, grading, excavating, and moving large quantities of soil
Crane and forklifts	Turbine locations, O&M, and substation/switchyard	Lifting and erecting turbine components and unloading and placement of equipment and materials
Graders	Access roads, O&M, turbine locations, and substation/switchyard	Clearing, finish grading, and moving small amounts of soil
Trenchers and backhoes	Turbine locations and collection system	Small area and trench excavation and backfill
Delivery trucks and semi-trucks	Access roads and all major construction areas and the concrete batch plant	Delivery of finished concrete, aggregate, cement, water, steel, cable, and other bulk construction items
Pick-up trucks and sport-utility vehicles	Access roads and all construction areas	Worker and small equipment transport

Table Abbreviations: O&M = operation and maintenance

Source: Borderlands Wind, LLC 2019

2.2.6. Operation and Maintenance

Once construction is finalized, on-site personnel would operate and maintain the wind energy facility. Personnel from the wind turbine supplier would also be on-site as needed to perform warranty maintenance and operations servicing. System operations, routine performance checks, troubleshooting malfunctions, turbine system checks, shut down and restart of facilities, and security would be the responsibility of O&M staff. Up to five full-time wind turbine technicians, administrative personnel, operations personnel, and managers would be employed to operate and manage the BLWP. Staff would be working at various times and days for the life of the project. Staff might not be present 24 hours per day, but operations would be monitored continually through the Supervisory Control and Data Acquisition (SCADA) system from a Borderlands Wind, LLC-operated remote location. Staff would be headquartered at the on-site O&M facility and travel around the site when necessary. During site operations, two to three service vehicles may be used, as crews would work and travel in pairs.

Training would be provided to each staff regularly regarding best practices of health, safety, and environmental protection services. Additionally, any equipment used during the BLWP's operations would be maintained and regularly inspected by authorized and trained personnel. A complete maintenance schedule would be developed prior to starting operations.

When the initial startup period has concluded, the wind turbines would be serviced at regular intervals. Overhaul maintenance service would also need to be performed annually; servicing would be on site. Occasional blade cleaning may be necessary if debris reduces the turbine's aerodynamic performance. Water would be used to spray wash the blades using a high-pressure sprayer. Access roads for the BLWP would be graded periodically and compacted to maintain integrity, safety, and environmental requirements for the life of the project. New gravel may periodically be needed to maintain the integrity of the access roads. Maintenance of cut-and-fill slopes, culverts, grade separations, and drainage areas would be performed as needed to control and correct erosion issues and manage functionality of drainage structures.

2.2.7. Decommissioning

The BLWP would have a life expectancy of up to 35 years, based on electrical demand, maintenance, and the expected life of the project facilities and major components. At some period in the future, the BLWP may no longer be cost-effective to continue operation. At that time, the BLWP would be decommissioned and all project facilities would be dismantled and removed in accordance with applicable County, State, and Federal laws. BLM would require receipt of a performance bond to ensure the costs of decommissioning are available. However, underground distribution cables, foundations, and structures would remain in place except as noted in the Decommissioning Plan in the BLWP POD (Borderlands Wind, LLC 2019). To minimize impacts during the decommissioning phase of the project, BMPs and other design features would be implemented (Appendix B).

2.3 Proposed Action

The Proposed Action would be built on 43,528 acres in western Catron County, NM. The Proposed Action area (Figure 2-1) consists of approximately 30,338 acres of public lands administered by the BLM SFO, 5,693 acres of public lands managed by the NMSLO, and 7,497 acres of privately owned lands (Table 2-4). Forty wind turbine generators and associated facilities would deliver up to 100 MW of electricity to the electrical transmission grid in the southwestern United States.

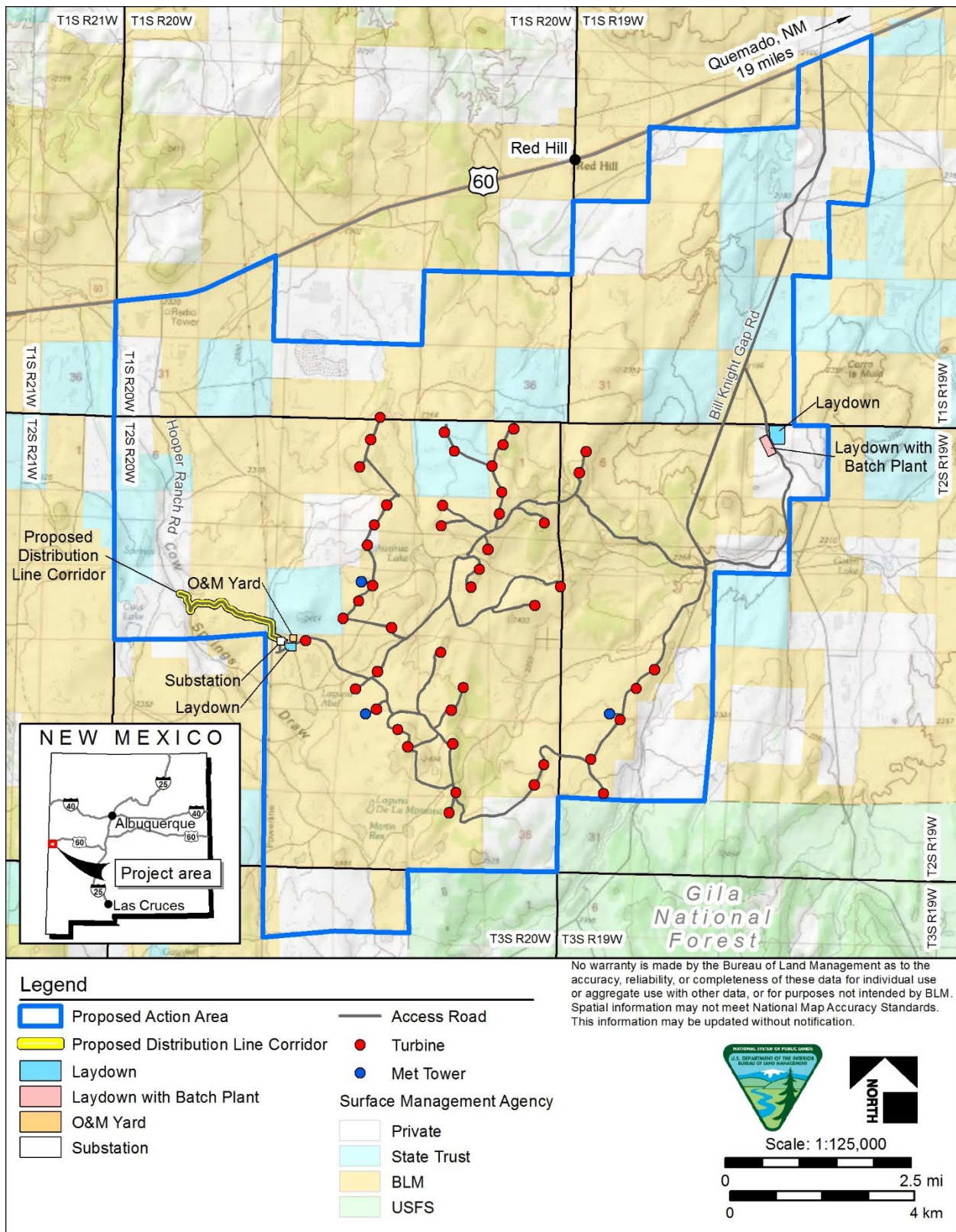


Figure 2-1. Proposed Action

Table 2-4. Proposed Action Area Location: Township, Range, Section

Township/ Range	Sections
T1S, R19W	SE1/4 SE1/4 of Sec. 3, Sec. 10, 15, 16, 17, 19, 20, 21, W1/2 of Sec. 22, 28, 29, 30, 31, 32, 33
T1S, R20W	Sec. 25, 26, S1/2 NW1/4, NE1/4 NW1/4, E1/2, SW1/4 of Sec. 29, S1/2 NE1/4, S1/2 of Sec. 30, 31, 32, 33, 34, 35, 36
T2S, R19W	Sec. 4, 5, 6, 7, 8, 9, 17, 18, 19, 20, 29, 30
T2S, R20W	Sec. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 33, 34, 35, 36
T3S, R20W	Sec. 3, 4

Table Abbreviations: NE = northeast; NW = northwest; R = range; S = south; SE = southeast; Sec. = section; SW = southwest; T = township; W = west

Note: Cadastral locations are relative to the New Mexico Principal Meridian, NM

The Proposed Action would consist of 40 constructed turbines, including 36 General Electric (GE) 2.5 MW and 4 GE 2.3 MW turbines (Figure 2-1). The GE 2.5 MW turbines have a maximum overall height of 499 feet, and the GE 2.3 MW turbines have a maximum overall height of 453 feet. Borderlands Wind, LLC has identified 46 turbine locations in the Proposed Action area in case turbine locations are determined not suitable during construction. This EIS evaluates all 46 turbine locations for the Proposed Action because the final turbine array layout would not be determined until construction. As a result, the potential disturbance and associated impacts on resources/uses within the Proposed Action area are greater than what the total impacts would be as constructed. In addition to the turbines, project components and ancillary facilities for the Proposed Action are discussed in Section 2.6.

2.4 Alternative 1

Under Alternative 1, the wind energy generating facility would encompass 18,907 acres of lands, with 15,837 acres being public lands administered by the BLM SFO (Figure 2-2 and Table 2-5). The remaining lands in the Alternatives 1 and 2 area are managed by NMSLO (1,168 acres) or by private landowners (1,902 acres). This alternative would reduce the total project boundary acreage by 24,621 acres, including 14,501 acres of BLM-administered public lands, 4,525 acres of NMSLO-managed lands, and 5,595 acres of privately owned lands.

Table 2-5. Alternatives 1 and 2 Area Location: Township, Range, Section

Township/ Range	Sections
T1S, R19W	W1/2 of Sec. 10, W1/2 Sec. 15, E1/2 NE1/4, E1/2 SE1/4, SW1/4 SE1/4 of Sec. 21, W1/2 NW1/4, NE1/4 NW1/4, NW1/4 SW1/4 of Sec. 22, NE1/4, W1/2 SE1/4, E1/2 SW1/4 of Sec. 28, S1/2, S1/2 NW1/4, NE1/4 NW1/4, W1/2 NE1/4 of Sec. 33
T1S, R20W	SE1/4 SW1/4, SW1/4 SE1/4 of Sec. 34
T2S, R19W	SW1/4 NW1/4, SW1/4 of Sec. 3, Sec. 4, E1/2, S1/2 SW1/4 of Sec. 5, W1/2, S1/2 SE1/4 of Sec. 6, Sec. 7, 8, 9, 17, 18, 19, NW1/4, NW1/4 SW1/4 of Sec. 20, W1/2, NE1/4, W1/2 SE1/4 of Sec. 30
T2S, R20W	Sec. 1, 2, 3, 10, 11, 12, 13, 14, 15, E1/2 SE1/4, SW1/4 SE1/4, S1/2 SW1/4 of Sec. 16, SE1/4, S1/2 NW1/4, E1/2 SW1/4, NW1/4 SW1/4 of Sec. 17, SE1/4 NE1/4, NE1/4 SE1/4 of Sec. 18, NE1/4 NE1/4 of Sec. 20, N1/2, NE1/4 SE1/4 of Sec. 21, Sec. 22, 23, 24, 25, 26, NE1/4, N1/2 SE1/4, NE1/4 NW1/4 of Sec. 27, NE1/4, E1/2 NW1/4 of Sec. 35, NW1/4, NW1/4 NE1/4 of Sec. 36

Table Abbreviations: E = east; N = north; NE = northeast; NW = northwest; R = range; S = south; SE = southeast; Sec. = section; SW = southwest; T = township; W = west

Note: Cadastral locations are relative to the New Mexico Principal Meridian, NM

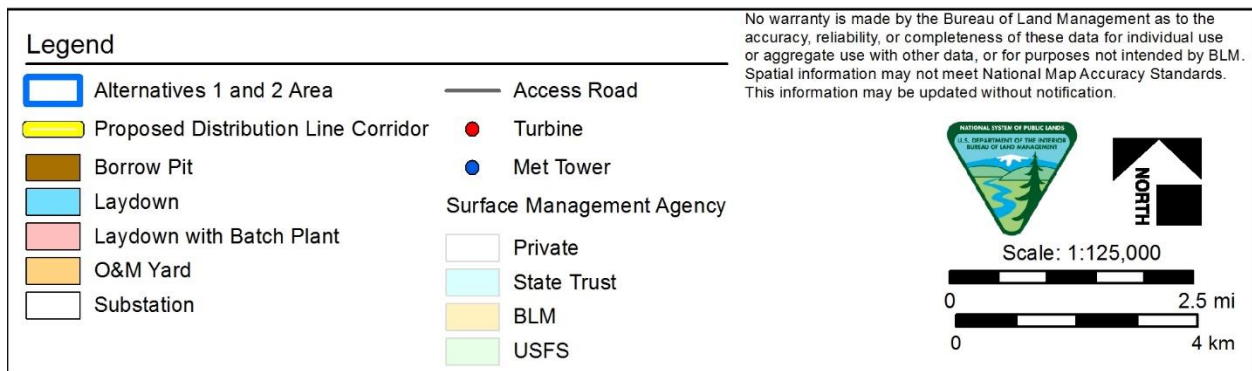
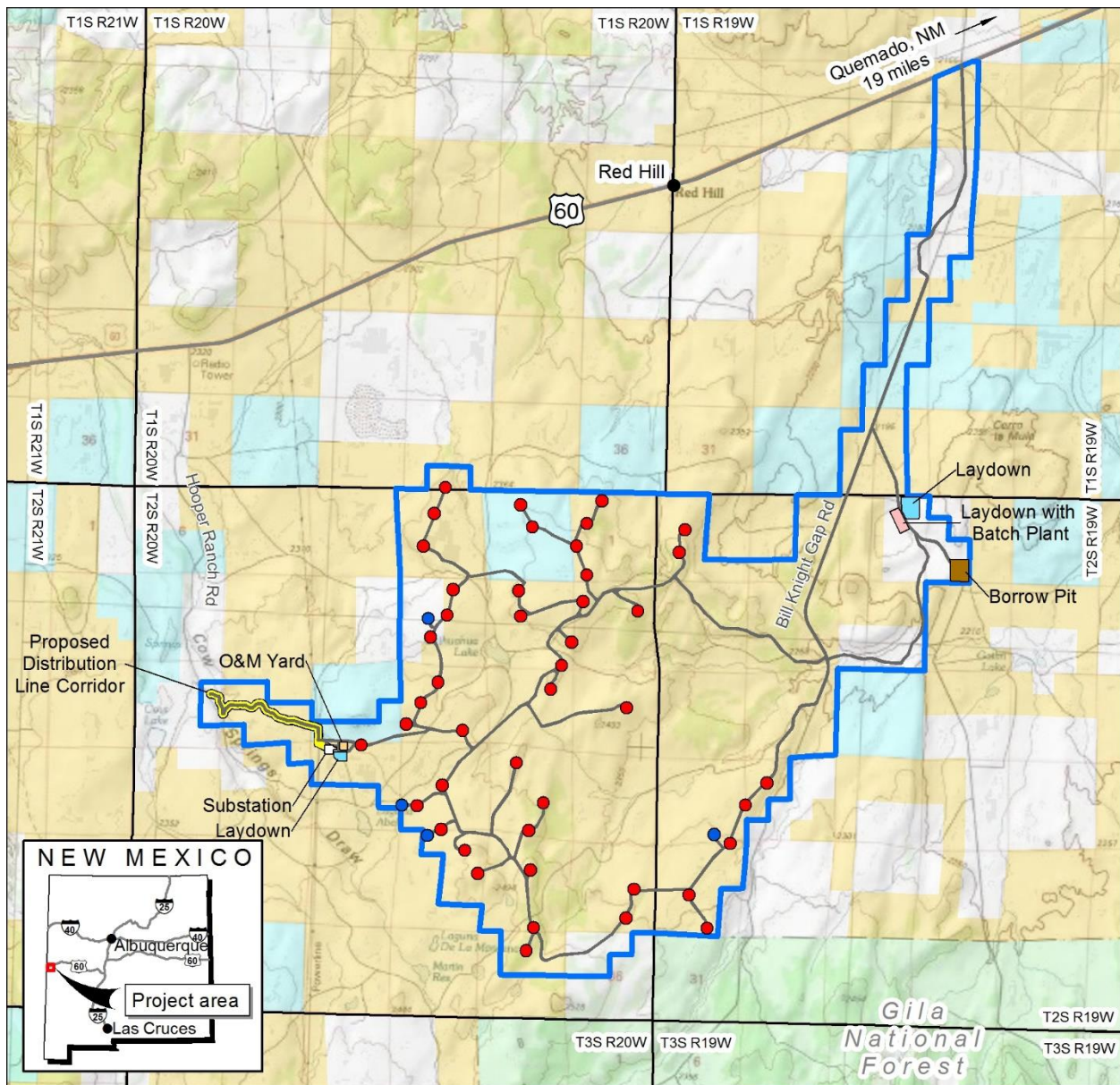


Figure 2-2. Alternatives 1 and 2

Alternative 1 would consist of 40 constructed turbines, including 36 GE 2.5 MW and 4 GE 2.3 MW turbines (Figure 2-2). This alternative would consist of the same number and type of turbines as the Proposed Action. Borderlands Wind, LLC has identified 45 turbine locations in the Alternative 1 area in case turbine locations are determined not suitable during construction. This EIS evaluates all 45 turbine locations for Alternative 1 because the final turbine array layout would not be determined until construction. As a result, the potential disturbance and associated impacts on resources/uses within the Alternative 1 area are greater than what the total impacts would be as constructed.

This alternative would slightly shift the locations of some of the project infrastructure (turbines, roads, collection lines) as compared to the Proposed Action to minimize impacts to sensitive environmental resources where feasible. In addition to the turbines, project components and ancillary facilities for Alternative 1 are discussed in Section 2.6.

2.5 Alternative 2

Alternative 2 has the same 45 turbine locations, ancillary facilities, and project boundary/legal description as Alternative 1 (Figure 2-2; Table 2-2). Alternative 2 would consist of 34 constructed turbines, including 30 GE 3.03 MW and 4 GE 2.5 MW turbines (Figure 2-2). The GE 3.03 MW turbines have a maximum overall height of 591 feet and the GE 2.5 MW turbines have a maximum overall height of 499 feet. This EIS evaluates all 45 turbine locations for Alternative 2 because the final turbine array layout would not be determined until construction. As a result, the potential disturbance and associated impacts on resources/uses within the Alternative 2 area are greater than what the total impacts would be as constructed. In addition to the turbines, project components and ancillary facilities for Alternative 2 are discussed in Section 2.6.

2.6 No Action Alternative

Under the No Action Alternative, the BLM would not grant ROW for construction and operation of the proposed project, and it would not amend the SFO RMP. The project facilities would not be built and existing land uses and present activities in the BLWP area would continue. The land on which the proposed project is located would be available to other uses that are consistent with the SFO's land use plan (BLM 2010). The State's renewable energy goals and the Federal mandates would have to be met using other alternative energy projects at other locations.

2.7 Alternatives Considered but Eliminated from Detailed Analysis

The following alternatives were considered by Borderlands Wind, LLC but not analyzed in detail in this EIS.

2.7.1. Visual Resource Management IV Turbine Array Layout Alternative

Under this alternative, all turbines would be located within the allocated VRM Class IV area in the southern end of the BLWP area near the Gila National Forest. The VRM Class IV area management objectives would allow for a high level of change to the characteristic landscape, which would be in compliance with the SFO RMP. Additionally, this alternative would minimize potential impacts to an eagle nest located in the northeast corner of the BLWP area. The VRM IV Turbine Array Layout Alternative would not provide the standard amount of land and spacing required for commercial energy projects of this size. Fewer wind turbines would be used for the project and the project would not be able to meet the 100 MW required to satisfy the Power Purchase Agreement between TEP and NextEra Energy Resources, LLC. This alternative was eliminated from further analysis in the EIS because it would be economically infeasible.

2.8 Federal Lead Agency Preferred Alternative

Under NEPA, the “preferred alternative” is a preliminary indication of the lead agency’s preference of action among the Proposed Action and alternatives. The lead agency may select a preferred alternative for a variety of reasons, including the agency’s priorities, in addition to the environmental considerations discussed in the EIS. In accordance with NEPA (40 CFR 1502.14[e] and 43 CFR 1610.4-7), the BLM has preliminarily identified Alternative 1 as the preferred alternative.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

The information in this chapter describes the affected (existing) environment in the BLWP area and presents the potential effects of the Proposed Action, Alternatives 1 and 2, and the No Action Alternative. Measures to avoid or minimize impacts have also been identified and are listed at the end of each resource discussion. The terms “impacts” and “effects” are used interchangeably, and the terms “increase” and “decrease” are used for comparison purposes. Direct, indirect, and cumulative impacts are described in this chapter. Potential impacts are described in terms of duration, intensity, and context. Definitions of impact terms are provided below.

- **Direct:** caused by the action, same time and place.
- **Indirect:** caused by the action, but later in time or further in distance, but still reasonably foreseeable.
- **Cumulative:** caused by the incremental impact of the action, decision, or project when added to other past, present, and reasonably foreseeable future actions.

For the purposes of this analysis, duration (temporal scale) of the direct or indirect effects of the analysis is defined as follows. These durations would apply to each of the resources/uses that are analyzed in this EIS but may vary slightly depending on the resource/use. Forty years would include the expected duration of the life of the wind energy facility (35 years) and an additional five years would allow for site restoration after decommissioning.

- **Short-term/Temporary:** impacts that would be less than 5 years in duration.
- **Long-term:** impacts that would be between 5 to 40 years.
- **Permanent:** impacts that would be longer than 40 years.

For the purposes of this analysis, intensity or severity of the impact is defined as follows:

- **Negligible:** changes would not be detectable and/or measurable. The resource/use would be essentially unchanged or unaltered.
- **Minor:** changes would be detectable and/or measurable and would have a slight change or alteration to the resource/use.
- **Moderate:** changes would be clearly detectable, measurable, and/or have an appreciable effect on the resource/use. The resource/use would be notably changed or altered and the effect is apparent. Project activities could change the indicator over a small area or to a lesser degree.
- **Major:** changes would be readily detectable, and/or have a severe effect on the resource. The resource/use would be substantially changed or altered over a large area or to a large degree.

Context is the setting within which an impact is analyzed. For the purposes of this analysis, the contexts are defined as follows:

- **Local:** within and immediately adjacent to the BLWP area.
- **Regional:** remaining area outside of but within 30 miles of the BLWP area.

Appendix 1 of BLM’s National Environmental Policy Act (NEPA) Handbook (H-1790-1) identifies supplemental authorities that contain requirements specified by statute or EO and must be considered in all BLM environmental documents (BLM 2008). The supplemental authorities and other resources and uses that are not present within the BLWP area or would not be impacted by the Proposed Action and alternatives include farm lands, lands with wilderness characteristics, wild and scenic rivers, wild horses and burros, wilderness, and wilderness study areas (WSAs). These authorities and resources/uses are not further evaluated in the EIS in accordance with the BLM NEPA Handbook Section 6.4.1 (BLM 2008).

Table 3-1 identifies the supplemental authorities and resources or uses in the BLWP area and states the rationale for the exclusion of a detailed analysis in the EIS per Section 6.4.2 of the BLM NEPA Handbook (BLM 2008). The supplemental authorities and other resources or uses that may be affected by the Proposed Action and/or alternatives are further described in the EIS as noted in Table 3-1.

Several geographic areas are discussed in this chapter, including the BLWP, Proposed Action, and Alternatives 1 and 2 areas. The BLWP area refers to the general location that is proposed for the BLWP (refer to Chapter 1, Figure 1-1). The Proposed Action area refers to the 43,528-acre area that would encompass the BLWP components associated with the Proposed Action (refer to Chapter 2, Figure 2-1). The Alternatives 1 and 2 area refers to the 18,907-acre area that would encompass the BLWP components of both Alternatives 1 and 2 (refer to Chapter 2, Figure 2-2). All three alternative areas are in the same general location (BLWP area) but include varying acreages of land.

Table 3-1. Determination and Rationale for Detailed Analysis by Resource/Use

Resource/Use	Additional Analysis Determination and Rationale
Air Quality	<p>The proposed BLWP area lies within the Southwestern Mountains-Augustine Plains Intrastate Air Quality Control Region 156 (New Mexico Environment Department [NMED] 2018).</p> <p>The Final Wind Energy PEIS (BLM 2005: pp. 5-13 through 5-20) provides a detailed analysis of potential air quality impacts associated with the construction, O&M, and decommissioning of a wind facility. According to this analysis, the potential impacts from a wind facility on local and regional air quality would be minor with the implementation of BMPs and would not require additional measures to avoid and/or minimize impacts (BLM 2005). Since 1992, Catron County has been below (attained) the U.S. Environmental Protection Agency (U.S. EPA) air pollutant standards for criteria pollutants (U.S. EPA 2019). Any additional emissions associated with the alternatives would be associated with construction and decommissioning activities.</p> <p>The main source of fugitive dust (particulates) in the vicinity of the BLWP area would include vehicular traffic on unpaved roads and windblown dust. Fugitive dust on unpaved roads would be reduced through watering the roads or other dust control measures. The operation of the concrete batch plant would require an air quality permit from the NM Air Quality Bureau. During the construction and decommissioning activities of the BLWP, there would be short-term, localized minor increases in vehicle emissions and fugitive dust. Once these activities are completed (construction activities are estimated to take up to six months), there would be long-term negligible increases in emissions from a limited amount of vehicle traffic into and out of the BLWP area.</p> <p>The build alternatives would not result in greater impacts than previously disclosed in the Final Wind Energy PEIS (BLM 2005). Borderlands Wind, LLC is not proposing activities different from those analyzed in the Final Wind Energy PEIS, and all BMPs are included as part of the Proposed Action and Alternatives 1 and 2 design features (Appendix B). The build alternatives are not expected to contribute to measurable or detectable impacts to air quality. There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation, so this issue is not discussed further in this EIS.</p>
Areas of Critical Environmental Concern (ACECs)	<p>There are two ACECs in the vicinity of the BLWP area: Cerro Pomo and Zuni Salt Lake; both are located north of U.S. 60 and would not be physically disturbed by the build alternatives. Impacts to existing ACECs is discussed in Section 3.5 Cultural Resources and in Section 3.9 Visual Resources.</p>

Resource/Use	Additional Analysis Determination and Rationale
Climate Change/ Greenhouse Emissions	<p>The proposed BLWP area (Southwestern Mountains-Augustine Plains Intrastate Air Quality Control Region 156) where the wind turbines would be located is in attainment for all regulated criteria pollutants. The NMED has prepared an Inventory of Greenhouse Gas Emissions: 2000-2013, updated in 2016 (NMED 2016), for the State of NM. This inventory is a statewide compilation and analysis of greenhouse gas (GHG) emissions data and provides information for decision makers about the relative contribution of each sector as it relates to the State's GHGs. The evaluation of GHG emissions on a production basis considers the total direct emissions from the activities of all sources in the State. New Mexico production-based analysis does not take into consideration the GHG emissions produced during the manufacture and transportation of products to the State, or adjust for the GHG emissions associated with electricity imported or exported across State lines (NMED 2016).</p> <p>The BLWP GHG emissions in of itself would not be a major contribution to climate change as a result of using greenhouse gases as a proxy in determining climate change impacts. The life cycle emissions of the material used in this project includes raw mineral extraction, steel production, manufacturing, transportation and use phases and then end of life,-which includes potential re-use and/or recycling. At each stage there are regulatory mechanisms and thresholds in place that permit, report and mitigate emissions from the various activities related these upstream and midstream sources.</p> <p>The BLWP would generate direct GHG emissions during construction, O&M, and decommissioning. Direct GHG emissions during construction would be generated from use of off-road equipment (such as graders, cranes, and excavators) and from on-road construction vehicle trips. Additionally, emissions would be generated from heavy haul trips and other construction materials like water, aggregate and cement for concrete production, and commute driving by construction employees. Direct emissions would be generated onsite during concrete production. The New Mexico Air Quality Bureau typically requires an air quality permit for concrete batch operations. The NMED regulates and issues general construction permits based on certain conditions such as; site setbacks from occupied structures and recreational areas, production limits, operating hours and emissions limits. Borderlands Wind, LLC would need to meet any state permitting requirements.</p> <p>As a wind energy project, the BLWP would have no primary direct carbon dioxide emissions from electricity production during operation; however, there are other minor sources of GHG emissions that would result from site O&M activities, including the use of off-road equipment; on-road vehicles used for inspection, maintenance, and personnel commuting; and minor leakage from electrical equipment (insulation materials, circuit breakers, etc.) to manage high voltages. During operation, BLWP is expected to result in an indirect reduction in GHG emissions due to the displacement of electricity generated by fossil fuel-fired power plants, which contributes to GHG emissions at much higher levels; this would be partially offset by a small indirect increase in GHG emissions due to the loss of carbon uptake from the removal of vegetation for the BLWP.</p> <p>The BLWP GHG emissions would result in minuscule short term incremental additions to the existing air quality as well as the future state and is limited to the construction phase. More information on criteria and hazardous pollutants as well as climate change and greenhouse gases can be found in latest version of the BLM's Air Resources Technical Report document and is herein incorporated by reference (BLM 2018a). No additional analysis in this EIS is warranted.</p>
Cultural Resources	See detailed analysis in Section 3.5 Cultural Resources.
Environmental Justice	There are no minority or low-income populations identified within or adjacent to the BLWP area. Consequently, there are no disproportionate impacts to environmental justice populations.

Resource/Use	Additional Analysis Determination and Rationale
Fire Management	<p>Development of the BLWP would slightly reduce the long-term potential for wildland fires in the area by temporarily removing the fuel source (vegetation) on approximately 140 acres for the Proposed Action, 137 acres for Alternative 1, and 134 acres for Alternative 2. The alternatives would slightly increase the likelihood for ignitions (such as from vehicles parked over dry vegetation) that could increase the frequency of fire. Wildland fire management would not change with implementation of the Proposed Action. The implementation of the Fire Protection and Prevention Plan included in the BLWP POD (Borderlands Wind, LLC 2019) would minimize the potential for the spread of fire. New access roads in the BLWP area could aid suppression efforts of wildland fires.</p> <p>Potential fire ignition from turbine lubricants would be negligible since limited quantities would be stored or maintained on site during the construction, O&M, and decommissioning phases. Fire-resistant hydraulic fluids and lubricant oils would be used to reduce the likelihood of a fire (Jennifer Field, personal communication, 2019). Therefore, the build alternatives would have negligible impacts to wildland fire and fire management. No detailed analysis in this EIS is warranted.</p>
Floodplains	<p>Executive Order 11988, Floodplain Management, requires an evaluation of impacts to floodplains for all Federal actions and directs Federal entities to reduce impacts to floodplains and minimize flood risks to human safety. The Proposed Action and Alternatives 1 and 2 would not involve any modification of a floodplain that would impede or redirect flood flows that would result in property damage or risk to human safety on- or off-site. The existing flood-carrying capacity of the floodplain, pattern, or magnitude of the flood flow would not be affected. No additional analysis in this EIS is warranted.</p>
Forest Resources	<p>The BLWP area does contain some woodland areas. Some clearing of pinyon-juniper woodlands may be required for the construction of new roads, turbine foundations, substations, and utility lines. This would result in an approximately 0.1 percent long-term reduction of woodlands within the Proposed Action area and an approximately 0.3 percent long-term reduction of woodlands within the Alternatives 1 and 2 area. This equates to a 0.001 percent reduction of woodlands within a 30-mile radius of the BLWP in NM for all alternatives. The build alternatives would result in negligible impacts to forest resources from the reduction of woodland areas. No additional analysis is warranted in this EIS.</p>
General Wildlife	<p>The BLWP area is a relatively undisturbed and unaltered landscape that provides diverse habitat conditions for wide variety of wildlife, which includes big game, small game, furbearers, and non-game wildlife species. Game species known to occur in the BLWP area include mule deer, elk, pronghorn, wild turkey, black bear, mountain lion, Mearns's quail, Gambel's quail, mourning dove, and various waterfowl. Furbearers that occur in this area include gray fox, kit fox, bobcat, badger, coyote, and skunk. A variety of other non-game species that are present include reptiles, amphibians, and rodents.</p> <p>The Final Wind Energy PEIS (BLM 2005) evaluates potential impacts to wildlife from construction activities (pp. 5-41 through 5-45), O&M (pp. 5-53 through 5-75), and decommissioning (p. 5-77) of a wind facility (e.g., injury or mortality; habitat loss, degradation, and fragmentation; disturbance/displacement; collision with turbines, towers, and transmission lines). The implementation of BMPs and other design features would minimize the direct and indirect impacts that may occur during construction, O&M, and decommissioning; however, some of these impacts (e.g., habitat loss and fragmentation) would be unavoidable even with the application of the project BMPs and design features.</p> <p>Wildlife species that rely on shrubland and grassland habitats (the most prevalent habitats within the Proposed Action and Alternatives 1 and 2 areas), especially during critical times of the year such as birthing/calving or overwintering, would be impacted the most. The SFO RMP includes a BMP to avoid surface-disturbing activities during these critical time periods, which would minimize impacts of the Proposed Action and Alternatives 1 and 2 on big game. Big game species associated with the Proposed Action and Alternatives 1 and 2 areas are highly mobile and would be expected to move</p>

Resource/Use	Additional Analysis Determination and Rationale
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out of the BLWP area during construction when outside of these critical time periods and would be expected to continue use of the available habitat in the BLWP area once construction activities have ceased and the BLWP is operational. In addition to the direct impacts to wildlife from habitat loss, there would be indirect impacts from habitat fragmentation and degradation resulting from the construction of access roads, and disturbance/displacement associated with an increase in human presence. These indirect impacts would extend across an area larger than the actual project footprint, and wildlife species that are more sensitive to fragmentation and disturbance may shift their habitat use to other areas.

The impacts of habitat loss and fragmentation are greatest when the affected habitats are in short supply. The habitat types and general wildlife that are present within the BLWP area are relatively common within the region. The estimated long-term loss of habitat is approximately 140 acres for the Proposed Action and 137 acres for Alternatives 1 and 2, both of which represent less than 0.01 percent of similar habitat within the NM region (within 30 miles from the BLWP area within NM). While some smaller or less mobile species or individuals may be displaced by the BLWP, the majority of the wildlife that would be impacted by construction, O&M, and decommissioning of the BLWP would continue to use the area, and there are no known wildlife movement or migration corridors present in the BLWP area that would be impacted by the proposed project. Therefore, the Proposed Action and Alternatives 1 and 2 would result in short- and long-term, minor impacts to general wildlife. No additional analysis in this EIS is warranted.

Invasive Plant Species and Noxious Weeds	Surface disturbing activities that would be created by the build alternatives would provide an opportunity to introduce noxious weeds. The SFO RMP (BLM 2010) outlines the processes and procedures for the management and prevention of noxious and invasive weeds. Any invasive plant and noxious weed populations would be managed in compliance with the SFO RMP. The BLWP POD would include BMPs to reduce the potential spread and/or introduction of noxious and invasive weed populations (Appendix C). Standard operating procedures from the recent BLM vegetation for noxious weed control would be followed to minimize the spread of invasive plant species and noxious weeds (BLM 2007 and 2016; BLM Integrated Vegetation Management Handbook 1740-2). Herbicides would be used where needed after approval from the BLM. Therefore, the build alternatives are anticipated to have negligible impact to the spread or introduction of invasive plant species and noxious weeds from the alternatives. No additional detailed analysis in this EIS is warranted.
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Land Use	See detailed analysis in Section 3.2 Land Use.
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Livestock Grazing	<p>There are six authorized grazing allotments within the BLWP area. Five of the allotments—including Vevarosa (#10011), Red Hill South (#10038), Red Hill North (#10062), Florenio Orona (#00099), and Cow Springs (#01126)—would incur temporary or permanent impacts. Any existing range improvements would be rehabilitated if disturbed by the BLWP. The existing grazing lease authorizations would remain the same as the current use. There would be temporary access restrictions during the five- to six-month construction period. There would be no permanent access limitations or grazing rotation restrictions anticipated with the alternatives.</p> <p>Portions of the BLWP area, including the O&M facility and the substation, would be fenced to keep livestock out. These areas, as well as the direct impact acreage for the turbines, would reduce the amount of available forage. Forage availability and production would be permanently reduced by 0.4 percent and temporarily reduced by 3.1 percent of the total allotted acreage within the Proposed Action area (permanent disturbance of 116.8 acres and temporary disturbance of 892.0 acres of grazing allotments). For Alternative 1, forage availability and production would be permanently reduced by 0.7 percent and temporarily reduced by 5.2 percent of the total allotted acreage (permanent disturbance of 110.7 acres and temporary disturbance of 830.6 acres of grazing allotment). For Alternative 2, forage availability and production would be permanently reduced by the same amount as Alternative 1 and temporarily reduced by 5.5 percent of the total allotted acreage (temporary disturbance of 866.2 acres of grazing allotment).</p>
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Resource/Use	Additional Analysis Determination and Rationale
	<p>Eliminating forage needed to feed grazing livestock (i.e., AUMs) would be required; however, it is not anticipated to be substantial enough to affect this use of the land. The loss of forage acres can be translated to a decrease in AUMs on the permit. A 116.8- or 110.7-acre loss of foraging within alternatives is potentially 17.5 to 16.6 AUMs total reduction. The build alternatives would result in short- and long-term, negligible impacts to livestock grazing because of the limited reduction in available forage and temporary access restrictions during construction. No further analysis on impacts to grazing resources in this EIS is warranted.</p>
Migratory Birds	<p>See detailed analysis in Section 3.7 Special Status Plant and Wildlife Species.</p>
Minerals	<p>Borderlands Wind, LLC may apply for a surface use permit from a private landowner and a mineral material permit from the BLM including a surface use agreement and exploration and reclamation plan. The mineral material permit would allow Borderlands Wind, LLC to extract and use subsurface material for construction activities. Separate environmental documentation would be completed and submitted with the permit. The BLM would issue a permit with any appropriate terms and conditions. Borderlands Wind, LLC may choose to obtain borrow material from a private landowner where the subsurface material is not managed by the BLM; in that case, no mineral material permit would be needed. No detailed analysis of minerals in this EIS is warranted.</p>
Native American Religious Concerns	<p>There are known Native American Religious Concerns associated with the Zuni Salt Lake Proprietary ACEC and specifically the Zuni Salt Lake. Identification of other Native American religious concerns associated with the BLWP area is pending results of the Tribal consultation. The potential for additional concerns to be present would be identified through consultation. Once consultation is complete, text will be revised to reflect findings.</p>
Noise	<p>The Final Wind Energy PEIS (BLM 2005:pp. 5-20 through 5-27) provides a detailed analysis of potential noise impacts associated with the construction, O&M, and decommissioning of a wind facility.</p> <p>The primary noise source around the BLWP area includes noise caused by vehicle traffic along U.S. 60 and high wind speeds. The Final Wind Energy PEIS (BLM 2005) evaluates the impacts from construction and O&M, including the use of heavy equipment, vehicular traffic, blasting, and substation activities. Noise from the turbines themselves is dependent on the type of turbine, array, site conditions, weather, and temperature. Above wind speeds of 17.7 mph, noise level generated from the turbine itself is difficult to determine because the background wind-generated noise masks the wind turbine noise. As a result, noise issues are more commonly a concern at lower wind speeds. Borderlands Wind, LLC would implement applicable BMPs and other design features associated with construction and operational noise to reduce potential noise-related impacts (Appendix B).</p> <p>For a typical rural environment, background noise is expected to be approximately 40 dB(A) during the day and 30dB(A) at night (BLM 2005). There are no Catron County policies/statutes that regulate noise in the BLWP area. However, the U.S. EPA has published a guideline that specifically addresses issues of community noise (U.S. EPA 1974). This guideline suggests goals for noise levels affecting residential land use for the Day-Night Average Sound Level (L_{dn}) <55dB(A) for exterior levels and L_{dn} <45dB(A) for interior levels. The U.S. Department of Housing and Urban Development Noise Guidebook also recommends following the U.S. EPA guideline of 55 dB(A) L_{dn} but indicates that a noise level of up to 65 dB(A) L_{dn} could be considered acceptable (24 CFR Section 51.101(a)(8)).</p> <p>The nearest sensitive receptor (seasonal recreation use) would be approximately 0.8 mile away from the nearest turbine in the BLWP area. At this distance, noise impacts generated from construction and decommissioning (e.g., heavy equipment use), would be negligible to minor and short-term depending on the activities. Noise impacts during O&M would be below the noise thresholds recommended in the U.S. EPA guidelines and below the level of the background noise because of the distance to the nearest receptor (BLM 2005; Kellner 2014). In addition, the build alternatives would</p>

Resource/Use	Additional Analysis Determination and Rationale
	<p>not result in greater noise impacts than previously disclosed in the Final Wind Energy PEIS (BLM 2005). Because noise levels would be below U.S. EPA guidelines and there is no potential for new or modified impacts that have not been disclosed in prior environmental documentation; noise is not further discussed in this EIS.</p>
Paleontological	<p>A paleontological assessment of the BLWP area was conducted to meet requirements under NEPA and FLPMA. The BLM statewide paleontological locality database was used to determine if known localities were present in the BLWP area, and none were identified. The BLM's Potential Fossil Yield Classification (PFYC) database was also examined to determine if geologic units present in the BLWP area have a higher potential to contain fossils of scientific interest. The PFYC system is ranked from Class 1 (Very Low Potential) to a Class 5 (Very High Potential). The geologic units exposed in the BLWP area are volcanic and igneous rock units that have a low to very low potential to contain paleontological resources. The northern section of the BLWP area consists of a basalt and andesite flows dating to the Miocene and is ranked as PFYC 1, which does not require mitigation. The southern section of the BLWP area consists of basaltic and andesitic volcanics interbedded with Pleistocene and Pliocene sedimentary units and is ranked as PFYC 2. Based on the lack of known paleontological localities in the area and the low PFYC values assigned to the affected geologic units, no additional analysis in the EIS is warranted for the build alternatives.</p>
Recreation	<p>There are no designated recreation facilities, such as trails, known to occur on the BLWP area. However, there are opportunities for dispersed recreation activities, such as motorized and non-motorized activities, wildlife viewing, hunting, camping, hiking, and OHV use. During construction and decommissioning, construction activities and traffic may reduce the appeal for dispersed recreational activities, resulting in a direct and indirect, short-term, negligible effect. During O&M, the BLWP would not prohibit hunting or other dispersed recreation activities. There may be the potential for unauthorized OHV use and illegal dumping with the construction of new roads. New roads would provide access for dispersed recreation, hunting, and additional recreational opportunities, resulting in long-term direct and indirect, negligible effects to recreation resources associated with the Proposed Action and Alternatives 1 and 2. No analysis in this EIS is warranted.</p>
Social and Economic Conditions	<p>See detailed analysis in Section 3.3 Social and Economic Conditions.</p>
Soils	<p>Soils in the BLWP area fall within the Mollisols soil classification by the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS). Mollisols are the soils of grassland ecosystems and are characterized by a thick, dark surface horizon. The majority of the BLWP area contains Cabezon-Thunderbird-Celsosprings, Rudd-Modyon, Datil-Dioxice and Smilo-Adman complex soil series; 87 percent of the Proposed Action area and 90 percent of Alternatives 1 and 2 area. These soils are one of the most productive soils and support a variety of plant communities, including grasslands, chaparral-mountain shrub, and forests. The Cabezon-Thunderbird-Celsosprings is the most prevalent soil within the BLWP area and is considered to have a low susceptibility to wind erosion and high susceptibility of the soil to rill and sheet erosion by rainfall (University of California, Davis 2019).</p> <p>The Final Wind Energy PEIS (BLM 2005:p. 6-3) states that the impacts to soil from wind facilities would be minimal to negligible because BMPs and other design features would be followed to prevent or address potential increases in soil erosion. Implementation of the BMPs and other design features for the build alternatives would reduce the potential impacts to soils including around the playas to minimize erosion and sedimentation (refer to Appendix B). The build alternatives would result in short-term, minor impacts and long-term negligible impacts to soils. No additional analysis in this EIS is warranted.</p>
Special Status Plant and Wildlife Species	<p>See detailed analysis in Section 3.7 Special Status Plant and Wildlife Species.</p>

Resource/Use	Additional Analysis Determination and Rationale
Threatened or Endangered Species	See detailed analysis in Section 3.6 Federally Listed Species.
Transportation and Travel Management	See detailed analysis in Section 3.4 Transportation and Travel Management.
Vegetation	<p>Vegetation in the Proposed Action area consists of 26 percent sparse short-grass grassland interspersed with less than one percent of rock outcrops and playas, 65 percent shrubland, and 8 percent dense patches of pinyon-juniper. For the Alternatives 1 and 2 area, vegetation consists of 22 percent sparse short-grass grassland interspersed with less than one percent of rock outcrops and playas, 64 percent shrubland, and 14 percent dense patches of pinyon-juniper woodland. These general vegetation communities occur throughout the region and are well represented in the surrounding area. The cliff/rock outcrop areas are much less common in the region and the playas within the build alternatives do not contain riparian or emergent wetland habitat.</p> <p>The estimated long-term loss of vegetation is approximately 140 acres for the Proposed Action and 137 acres for Alternatives 1 and 2, each of which represents less than 0.01 percent of similar vegetation communities within the NM region (i.e., 30miles from the BLWP area within NM). Shrublands would be affected the most, with a permanent loss of approximately 85 acres and 83 acres for the Proposed Action and Alternatives 1 and 2, respectively, each of which represents a 0.02 percent reduction of shrublands within the NM region. The implementation of BMPs and other design features would prevent or minimize impacts that may occur during construction, O&M, and decommissioning, such as the removal of vegetation, introduction of invasive vegetation, and potential for wildland fire (Appendix B). The BMPs and other design features include revegetation, soil stabilization, and erosion reduction measures that would be implemented to ensure that all temporary use areas are restored. Therefore, the Proposed Action and Alternatives 1 and 2 would result in localized and regional negligible impacts to general vegetation. No additional analysis in this EIS is warranted.</p>
Visual Resource	See detailed analysis in Section 3.9 Visual Resources.
Wastes, Hazardous or Solid	<p>The Final Wind Energy PEIS (BLM 2005:pp. 5-30 through 5-32) provides a detailed analysis of potential hazardous materials impacts associated with the construction, O&M, and decommissioning of a wind facility.</p> <p>Potential impacts would be associated with the release of hazardous materials to the environment from the improper use, storage, or disposal of hazardous materials such as fuels (e.g., gasoline, diesel fuel), lubricants, cleaning solvents, paints, herbicides, and explosives. As outlined in the BLWP POD, applicable BMPs associated with hazardous materials and wastes to reduce or prevent environmental impacts would be implemented. Prior to the installation of a septic/waste water system, all State and County permits would be acquired.</p> <p>The Proposed Action and Alternatives 1 and 2 would not result in greater impacts than previously disclosed in the Final Wind Energy PEIS. Borderlands Wind, LLC is not proposing activities different from those analyzed in the Final Wind Energy PEIS, and all BMPs are included as part of the Proposed Action and Alternatives 1 and 2 design features (Appendix B). There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation, so this issue is not discussed further in this EIS.</p>

Resource/Use	Additional Analysis Determination and Rationale
Water Quality (Surface/Ground)	<p>There are no perennial surface water features within the BLWP area. During the winter or episodes of monsoonal rains, there may be intermittent or ephemeral flows within streams or standing pools of water. During construction of wind turbines and associated facilities, BMPs and other design features would be followed in order to ensure that any surface water is not affected (Appendix B). Well water would be used during construction and O&M. Construction activities would require approximately 26 million gallons of water and would be pumped from an existing private well and conveyed through aboveground piping. Based on 2015 Catron County water use data, the amount of water anticipated for use during construction represents 0.09 percent of the water the County uses in a year (USGS 2015). A new 5- to 6-gallon per minute well would be drilled for the O&M water use; estimated withdrawal at 140,800 gallons per year, which would be less than a 4-person household annual water use. Borderlands Wind, LLC would apply for a domestic water use permit for use during O&M in compliance with the NM State Engineer requirements. Once the BLWP is decommissioned, BLM would assume authority over the well, including the water rights for the well. Documentation that a permit to drill has been issued would be provided to the BLM.</p> <p>The amount of groundwater used would be negligible to minor, specifically over the long term. Therefore, the Proposed Action and Alternatives 1 and 2 would have both short- and long-term, direct, negligible impacts to surface water quality. No additional analysis for surface water or groundwater is warranted in this EIS.</p>
Wetlands/Riparian Zones	<p>There is a small area of emergent herbaceous wetlands mapped in the western portion of the Proposed Action area along Cow Springs Draw that would not be impacted during construction, O&M, or decommissioning.</p> <p>There are a number of playas present within the Proposed Action area and the surrounding area; these seasonally inundated depressions are considered riparian habitats by the BLM, though they are generally vegetated with the same species as the surrounding areas. There are no components of the project infrastructure that would be placed within the mapped boundaries of these playas; however, some of the turbines, collector lines, and access roads would be constructed within 0.25 mile of four of the mapped playas. The Proposed Action would have both short- and long-term, direct and indirect, negligible impacts to these playas and their associated riparian vegetation due to the potential for alterations to the natural hydrology of the ephemeral drainages that feed into the playas, which could result in erosion or sedimentation. No additional analysis is warranted in this EIS.</p>

Table Abbreviations: ACEC = Area of Critical Environmental Concern; AUM = animal unit month; BLWP = Borderlands Wind Project; BLM = Bureau of Land Management; BMP = best management practice; CFR = Code of Federal Regulations; CT = Census Tract; dB(A) A-weighted decibel; EIS = Environmental Impact Statement; FLPMA = Federal Land Policy and Management Act; GHG = greenhouse gas; L_{dn} = Day-Night Average Sound Level; mph = miles per hour; NEPA = National Environmental Policy Act; NMED = New Mexico Environment Department; O&M = operation and maintenance; PEIS = Programmatic Environmental Impact Statement; PFYC = Potential Fossil Yield Classification; POD = Plan of Development; RMP = Resource Management Plan; SFO = Socorro Field Office; TCP = Traditional Cultural Property; USACE = U.S. Army Corps of Engineers; U.S. EPA = U.S. Environmental Protection Agency.

3.2 Land Use

This section describes existing land use conditions in the BLWP area and surrounding region (30-mile radius from the BLWP area), and the effects that may occur with the implementation of the Proposed Action, Alternatives 1 and 2, and the No Action Alternative. Land use is assessed here by analyzing current land activities, land ownership, and land use designations in adopted plans and policies. An assessment of land use must also consider legal guarantees or limitations, such as those provided by easements, deeds, ROWs, claims, leases, licenses, and permits. Lands administered by BLM are not zoned, but they may be encumbered by easements, ROWs, mining claims, and permits.

3.2.1. Affected Environment

3.2.1.1 Regional Land Use Conditions

Located in western NM, Catron County is the largest county in the State. Land within the County is owned, managed, and/or administered by the BLM, U.S. Forest Service (USFS), National Park Service (NPS), State of NM, Native American Tribes, and private landowners. Catron County encompasses 6,898 square miles with approximately 25.6 percent under private ownership. Federal agencies administer 61.6 percent of the land within the County, Indian Tribes 0.3 percent, and the State of NM 11.5 percent (Catron County 2006 and 2007). Approximately 3,725 people make up the County population (U.S. Census Bureau 2018). In the 2007 Catron County CIP/Comprehensive Plan (Catron County 2007), the County identified three land uses, categorized as government controlled (lands managed by State or Federal agencies), rural areas (private lands), and community nodes. A community node is a concentration of commercial, governmental services, and/or residential uses. Reserve, the Catron County seat, is the largest town and only incorporated community in the County; the town has a population of about 289. The adjacent Apache County in eastern AZ is 11,174 square miles; the County seat is St. Johns with a population of 71,518. Only 13 percent of Apache County is privately owned, more than 65 percent is covered by American Indian Reservations, and 21 percent is in public ownership (i.e., USFS, BLM, and AZ State Land Department) (USFS 2017). Major communities within the vicinity of the BLWP area are described in Table 3-2.

The NMSLO has not established a specific land use management plan for State Trust land in the vicinity of the BLWP area, but they do have goals, policies, and programs in place to manage and provide support for resource conservation programs for the well-being of the public and the State's natural environment, including recreation and livestock grazing.

Table 3-2. Communities within the BLWP Region

Communities	Description
Red Hill/Cimarron Ranch Subdivision, NM	The 2,431-acre Cimarron Ranch Subdivision is located in Red Hill, a dispersed, unincorporated community that consists entirely of private owners, just north of the BLWP area on the north side of U.S. 60 and includes the Quemado Volunteer Fire Station No. 2. The subdivision was platted in 1992 and contains 228 parcels ranging in size from approximately 5 to 26 acres. The population of the subdivision is estimated at approximately 50 individuals, based on verbal information from Catron County (Keith Riddle, personal communication, 2019).
Quemado, NM	Located approximately 18.8 miles east of BLWP area, Quemado had a population of 228 with a total of 135 housing units in 2010. Quemado supports the surrounding area with both an elementary and a high school.
Escudilla Bonita, NM	Between the BLWP area and the AZ–NM state line, and south of U.S. 60, is the community of Escudilla Bonita. The community has a population of 119 with a total of 152 housing units in 2010. No commercial services are provided in Escudilla Bonita.
Springerville, AZ	Located approximately 17.5 miles west, the Town of Springerville is in Apache County, AZ, and had a population of 1,961 with a total of 954 housing units in 2010. The town provides community services, K-12 school, and a community college.
Eagar, AZ	Located directly adjacent to the south of Springerville in Apache County, AZ, Eagar had a population of 4,885 with a total of 2,045 housing units in 2010. The town provides a library, fire and police departments, and a full service hospital.
Coyote Creek Development, AZ	This planned development is adjacent to the AZ–NM state line, approximately six miles west of the BLWP area. It contains 316 acres and has not yet been platted. There are no residences within the Coyote Creek Development as of this time.

Table Abbreviations: AZ = Arizona; BLWP = Borderlands Wind Project; NM = New Mexico
Source: Census Viewer 2018; Arizona Commerce Authority 2017; Riddle 2019

Two national forests are located with the region: Gila National Forest in NM and the Apache-Sitgreaves National Forests in AZ. The Gila National Forest consists of 3.3 million acres in western NM and is known for the Gila Wilderness, which was the first wilderness designated in the United States. It is considered one of the more remote and least developed national forests. Recreation facilities in the Gila National Forest include the Quemado Lake Recreation Area, Armijo Springs Campground, and the Head of the Ditch Campground (USFS 2018a). The Apache-Sitgreaves National Forests in east-central AZ cover over 2 million acres. These national forests have over 200,000 acres of wilderness and primitive areas, including the Escudilla Wilderness that encompasses the notable landmark Escudilla Mountain and the Escudilla National Recreation Trail. Other recreation facilities in the region include the Nelson Reservoir Campground, Alpine Divide Campground, and the Coronado Trail National Scenic Byway (USFS 2018b).

3.2.1.2 Regional Aviation Uses

There are five regional airport facilities within approximately 30 miles of the BLWP area: Quemado Airport, Springerville Municipal Airport, St. Johns Industrial Airpark, Jewett Mesa, and Reserve Airport. Quemado Airport is an unattended airport located one mile west of Quemado, NM approximately 18 miles from the BLWP area (Catron County 2007). It has one dirt runway and is available for private use only (AirNav 2019a). Springerville Municipal Airport is a town-owned public-use airport located 1.15 miles west of Springerville, AZ, and 19 miles west of the BLWP area. The airport has two paved runways and provides services including aircraft parking and hangar leasing. In addition to its use by the public for general purposes, the Springerville Municipal Airport also serves as an emergency transportation hub for the local area residents, providing air ambulance service, and as a seasonal base for fire services for the Apache-Sitgreaves National Forests (Springerville Municipal Airport 2018). St. Johns Industrial Airpark is a city-owned, public-use airport located 1 mile north of St. Johns, AZ and 32 miles northwest of the BLWP area. The airport has two paved runways and provides services including aircraft parking and fuel (AirNav 2019b).

There are two airports in the area owned by USFS. Jewett Mesa is a USFS-owned, public-use airport located 26 miles southwest of Quemado, NM and 8 miles southeast of the BLWP area. The airport has one unpaved (dirt) runway and is only open May through September. The Jewett Mesa Airport has no additional services (AirNav 2019c). The Reserve Airport is also a USFS-owned, public-use airport; it is located 5 miles southwest of Reserve, NM and 25 miles south of the BLWP area. This airport has one paved runway in fair condition and offers tie downs for parking (AirNav 2019d).

Three military installations have military training routes (MTRs) over the BLWP area: Holloman, Kirtland, and Cannon Air Force Bases (AFBs). Holloman AFB, located in Otero County, NM, southeast of Catron County, is an Air Combat Command base that supports national security objectives with its rapid mobility capability (Military.com 2018a, 2018b). The 49th Wing (host wing at Holloman Air Force Base) supports national security objectives by deploying worldwide to support peacetime and wartime contingencies. The 49th Wing is the Air Force's premier MQ-9 Reaper and F-16 Fighting Falcon training wing for pilots and sensor operators. Additionally, the wing delivers Air Transportable Clinics and Basic Expeditionary Airfield Resources while providing support to more than 10,000 military and civilian personnel (Jay Nash, personal communication, 2019). Kirtland AFB, located near Albuquerque, NM, is the center for research, development, and testing of non-conventional weapon, space, and missile technology and hosts a special operations wing (U.S. Air Force 2018), and Cannon AFB in eastern NM, is an Air Force Special Operations Command base. According to information provided by Holloman AFB, MTRs are flight corridors used to practice high-speed, low-altitude training that generally occurs below 10,000 feet above mean sea level at speeds in excess of 250 nautical miles per hour. The MTRs are described by a centerline, with defined horizontal limits on either side of the centerline and vertical

limits expressed as minimum and maximum altitudes along the flight track. Visual Routes (VR) are MTRs flown under FAA visual flight rules, where the military conducts operational and training flights.

3.2.1.3 Regional Special Management Designations

Special management designations provide additional protection for areas with unique natural, historic, scenic, or recreational resources. Special designations include Areas of Critical Environmental Concern (ACECs), National Historic or Scenic Trails (NHTs/NSTs), National Recreation Trails, Scenic Byways, WSAs, and wilderness areas. The special management designations within 30 miles of the BLWP area are described in Table 3-3 and illustrated in Figure 3-1.

Table 3-3. Special Management Designations in the Region

Special Management Designations	Description
Cerro Pomo ACEC	This ACEC is located north of the BLWP, entirely within the Eagle Peak WSA and includes 28,248 acres. It contains scenic and significant cultural values, as well as diverse wildlife, vegetation, and landforms; it encompasses the former Mogollon Pueblo Special Management Area (BLM 2010).
Continental Divide NST	This NST climbs and descends the peaks of the Rocky Mountains from Canada to Mexico. Two segments of this trail are located within Catron County, but only one is located on BLM-administered land. The Continental Divide NST is managed for recreational use and to protect scenic values on the 34 miles of its length within the BLM's SFO planning area (BLM 2010).
Coronado Trail National Scenic Byway	Designated in 2005, the Coronado Trail stretches from Morenci, AZ to Springerville, AZ in Greenlee and Apache counties and lies almost entirely within the Apache-Sitgreaves National Forests in AZ. Routed along U.S. 191 and U.S. 180, the 123-mile-long byway travels through a region characterized by rolling foothills, high rugged mountain peaks, and steep narrow canyons (Federal Highway Administration 2018).
Eagle Peak WSA	This 43,960-acre WSA has diverse landforms ranging from sandstone mesas and volcanic cinder cones to gently rolling hills and lava flows. It has numerous topographic features and contains significant archaeological values (from circa 6000 BC) (BLM 1985).
Escudilla National Recreation Trail	Located in Apache County, AZ within the Apache-Sitgreaves National Forests and Escudilla Wilderness Area, the trail is 5.9 miles in length with a total elevation gain of 1,499 feet (BLM 2010).
Escudilla Wilderness Area	Located within the Apache-Sitgreaves National Forests in AZ, the Escudilla Wilderness was designated in 1984 and has a total of 5,158 acres. The wilderness area encompasses the upper reaches of Escudilla Mountain, which is visible from just about anywhere in eastern AZ and western NM (Wilderness Connect 2018).
Mesita Blanca WSA	Located north of the BLWP area, Mesita Blanca WSA contains 19,414 acres. This WSA includes a high density of archaeological sites and the notable natural landmark of the 500-foot-high Red Hill Cinder Cone. This classic volcanic cinder cone and lava flow covers approximately 2,000 acres within the WSA (BLM 1985).
White Mountain Scenic Road	Designated in 1993, the scenic road follows State Routes 260, 262, and 273 between Alpine and Hon Dah on the White Mountain Apache Indian Reservation in AZ. It winds through AZ's largest mountain range, the White Mountains, for a distance of 55 miles in Greenlee and Apache counties (Arizona Department of Transportation 1993).
Zuni Salt Lake Proprietary ACEC	This ACEC is located northwest of the BLWP area and includes 46,746 acres. It holds traditional religious significance to the Zuni Tribe and to other Native American groups in the Southwest. The lake itself lies in a volcanic crater and contains highly saline water (BLM 2010).

Table Abbreviations: ACEC = Area of Critical Environmental Concern; AZ = Arizona; BLM = Bureau of Land Management; BLWP = Borderlands Wind Project; NM = New Mexico; NST = National Scenic Trail; SFO = Socorro Field Office; WSA = Wilderness Study Area

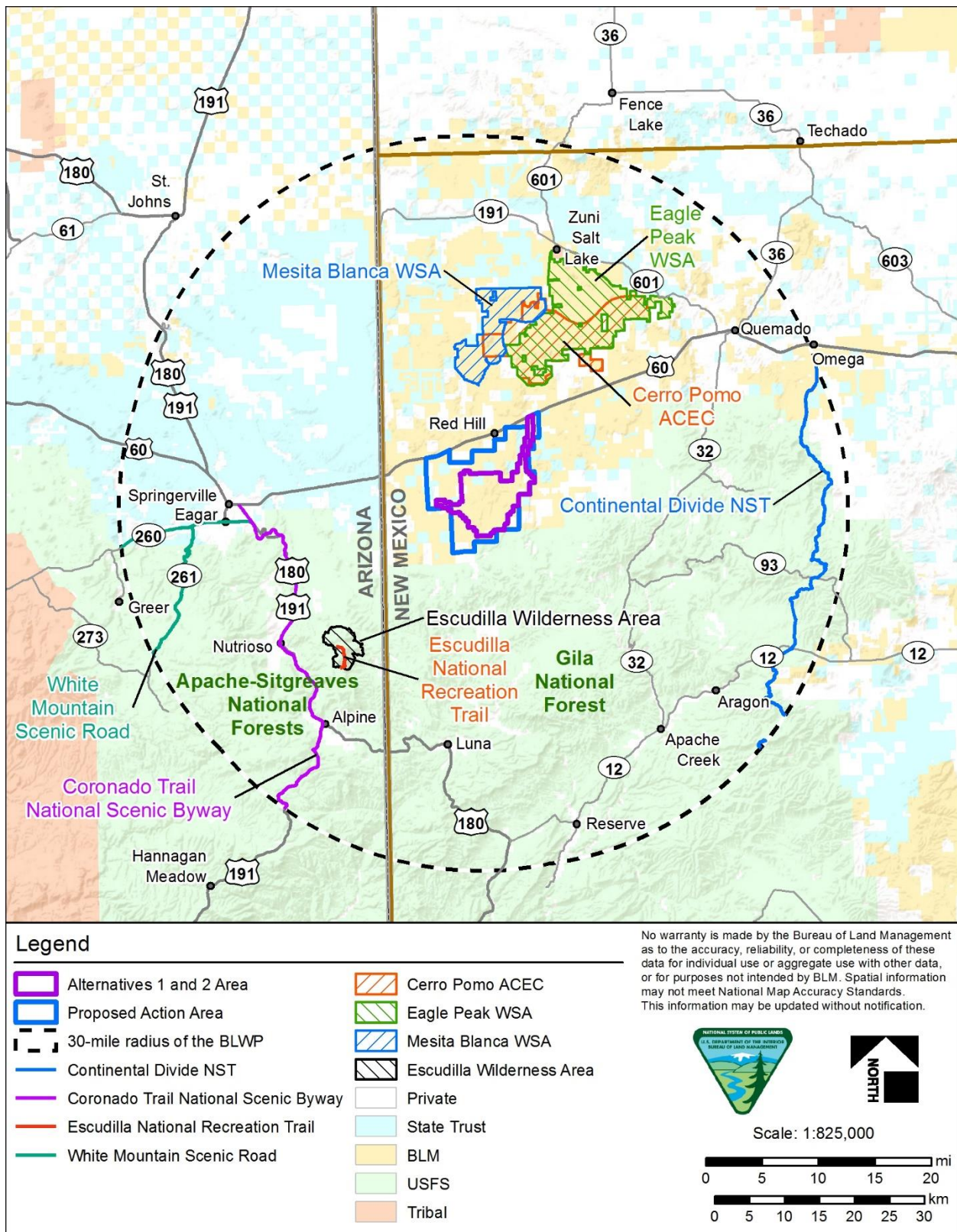


Figure 3-1. Special Management Designations in the Region

3.2.1.4 Regional Recreation

The SFO RMP provides opportunities for dispersed recreation including motorized and non-motorized activities for people from nearby communities. Recreation opportunities in the region include photography, backpacking, wildlife viewing, picnicking, hunting, camping, hiking, scenic driving, and off-highway vehicle (OHV) use. According to the 2010 BLM SFO RMP, all motorized vehicle use is limited to designated routes. Special Recreation Permits (SRPs) are BLM-granted land use authorizations that allow specified recreational uses of public lands. The SFO BLM currently has 49 SRPs issued to hunters and hunting guide outfitters (BLM 2010). Recreation facilities in the region include 10 campgrounds, such as the Quemado Lake Campground in NM and the Nelson Reservoir Campground in AZ. Lyman Lake State Park is located just north of Springerville in AZ. There are numerous designated trails located within the Gila and Apache-Sitgreaves National Forests in addition to the Continental Divide NST and the Escudilla National Recreation Trail. Scenic driving occurs on the designated Coronado Trail National Scenic Byway and White Mountain Scenic Road.

The NM Department of Game and Fish and the AZ Game and Fish Department manage hunting and trapping throughout their respective States including areas in and around the BLWP area. The NM Game Management Units 12 and 15, and AZ Game Management Units 1, 27, 2CD, and 2E are located in the BLWP region. Wildlife species hunted within these units include pronghorn antelope, elk, mountain lion, mule deer, javelina, and upland game bird species such as dove and quail. In Catron County in 2013, there were 12,406 hunting licenses issued with elk, deer, and turkey as the most targeted species (Southwick Associates 2014).

3.2.1.5 Regional Livestock Grazing

Enactment of the Taylor Grazing Act of 1934 provided parameters for livestock grazing in the form of grazing allotments, regulation of number and type of livestock (e.g., cattle, sheep, horses), and season of use. Grazing permits are required for livestock use on public lands. Grazing allotments on public lands in the region are classified according to the type of forage available for livestock. Rangeland improvements such as springs, wells, storage tanks, and dirt tanks have been developed in the region to provide water for livestock and wildlife. Within the SFO, there are 263 grazing permits on BLM-administered lands encompassing 1,492,301 acres (BLM 2018b).

3.2.1.6 BLWP Area Land Use Conditions

The proposed BLWP would be located on BLM-, State-, and County-administered lands in western Catron County. Figures 3-2 and 3-3 show the current land ownership within the boundaries of the Proposed Action and Alternatives 1 and 2 areas, respectively; Table 3-4 provides the acres in both areas. Land uses in the BLWP area consist of ranching, livestock grazing, and utility corridors. The BLWP area is not in a mining district and there are no active or pending mining claims within the BLWP area. Hunting, OHV use, and hiking recreation uses are known to occur on BLM-administered lands; however, there are no designated recreation facilities such as trails within the BLWP area.

Table 3-4. Proposed Action and Alternatives Land Ownership

Land Ownership	Proposed Action Area (acres)	Alternatives 1 and 2 Area (acres)
BLM	30,338	15,837
State	5,693	1,168
Private	7,497	1,902
Total	43,528	18,907

Source: BLM 2018b

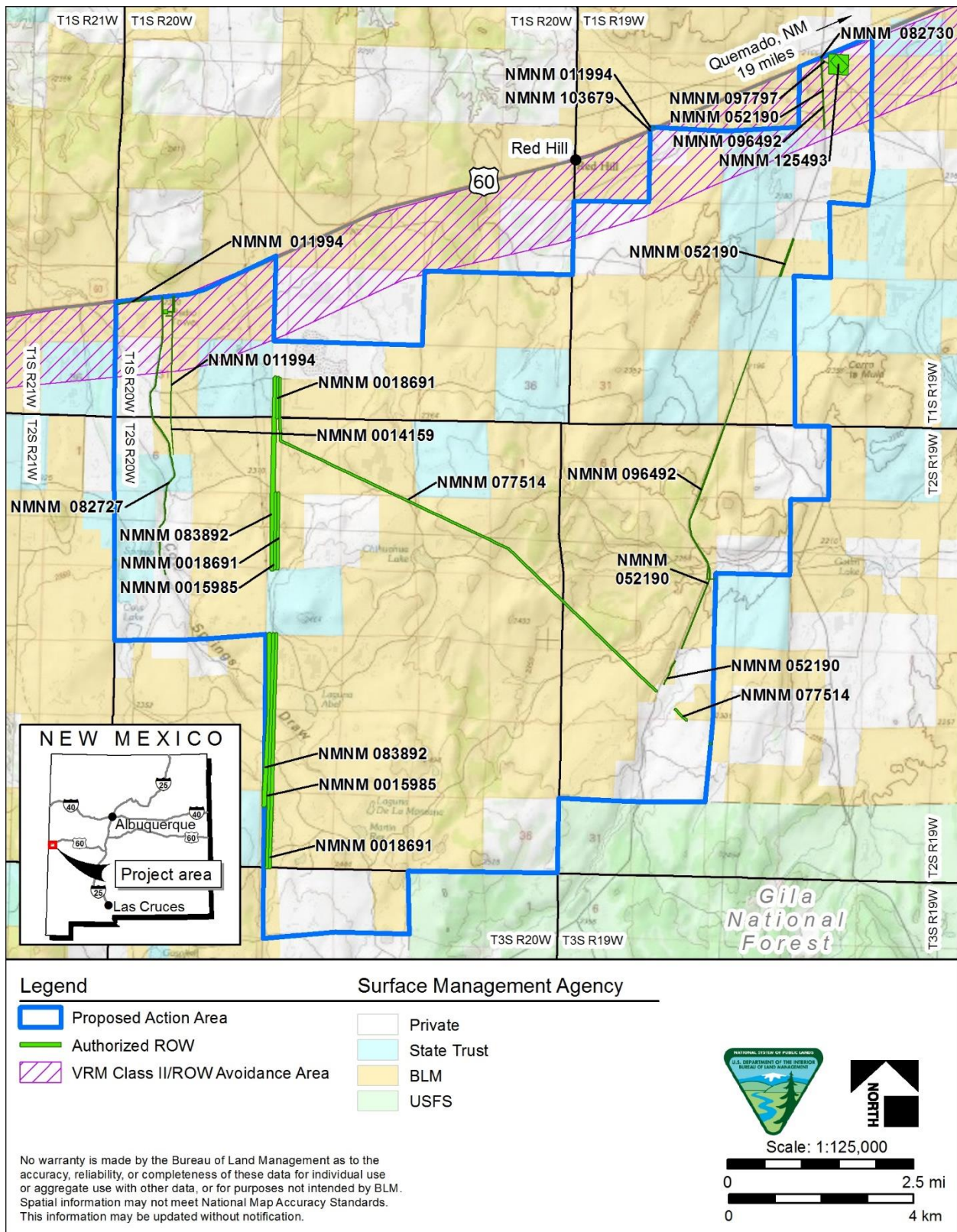


Figure 3-2. Avoidance Area and Authorized ROWs within the Proposed Action Area

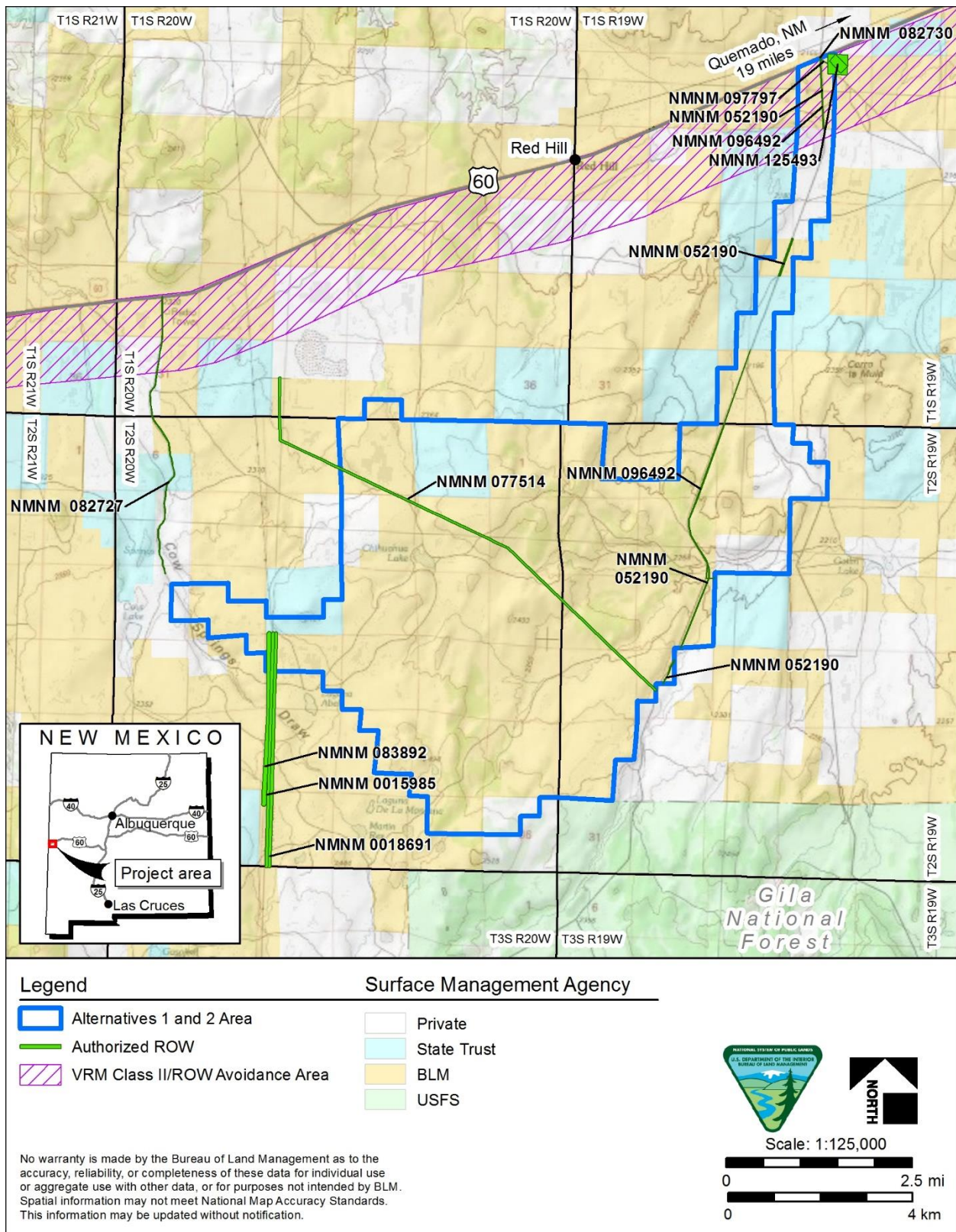


Figure 3-3. Avoidance Area and Authorized ROWs within the Alternatives 1 and 2 Area

Socorro Field Office Resource Management Plan. The SFO RMP, approved by the ROD dated August 20, 2010, provides management guidance for the public land and resources under the BLM’s jurisdiction in Socorro and Catron Counties, NM. The SFO oversees approximately 1.5 million surface acres of public land, and the RMP guides the management of diverse multiple uses over these lands for a 20-year time period. The RMP does not include any specific management plans or special land use designations such as an ACEC or WSA in the BLWP area. A ROW avoidance area has been designated along the south side of U.S. 60 from just west of Quemado, NM to the AZ–NM border because of the VRM Class II allocation (Figures 3-2 and 3-3).

New Mexico State Land Office. The NMSLO’s mission is to optimize revenues generated from State Trust lands to support the beneficiaries of the State Land Trust while ensuring proper land management and restoration to continue the legacy for future generations (NMSLO 2016). The NMSLO has not established a specific land use management plan for State Trust land in the vicinity of the BLWP. The NMSLO has about nine million acres of land available for lease to renewable energy companies. Renewable energy leasing is expected to be the largest growth area for commercial leasing (NMSLO 2018).

Catron County Comprehensive Land Use Plan. Private lands in the vicinity of the BLWP area are under the jurisdiction of Catron County and are subject to the policies set forth in the Catron County CIP/Comprehensive Plan (Catron County 2007). The County’s Plan includes existing and anticipated conditions affecting the County; establishes goals, policies, and implementation measures that guide the County’s future actions; and describes actions to take to achieve the County’s desired future. Lands within the BLWP area are designated as government-controlled for the Federal- and State-managed lands and as rural for the private lands according to the County’s Plan. Catron County has no zoning ordinances in place.

3.2.1.7 BLWP Area Grazing Allotments

Portions of six grazing allotments are located on BLM lands within the BLWP area (Table 3-5 and Figures 3-4 and 3-5). The majority of the BLM lands in the BLWP area are within the Red Hill North grazing allotment (BLM 2018b).

Table 3-5. Grazing Allotments within BLM Lands in the BLWP Area

Allotment Name	Total Allotment Acreage	Allotment Acreage within Proposed Action Area	Allotment Percentage (%) within Proposed Action Area¹	Allotment Acreage within Alternatives 1 and 2 Area	Allotment Percentage (%) within Alternatives 1 and 2 Area²
Vevarosa	16,463.39	6,060.45	36.82	3,149.76	19.13
Red Hill South	17,085.95	4,632.80	26.21	451.13	2.64
Florenio Orona	4,013.99	2,805.60	69.91	2,689.85	67.01
Red Hill North	21,300.07	12,917.47	57.79	9,512.68	44.66
Cow Springs	10,219.93	3,639.71	29.24	29.02	0.28
Heavenly Acres	2,412.54	264.03	10.95	0	0
Total	189,056.47	30,320.06	16.04	15,832.72	8.37

Source: BLM 2018b

¹Percent references the portion of the total allotment that is located on BLM lands within the Proposed Action Area.

²Percent references the portion of the total allotment that is located on BLM lands within the Alternatives 1 and 2 Area.

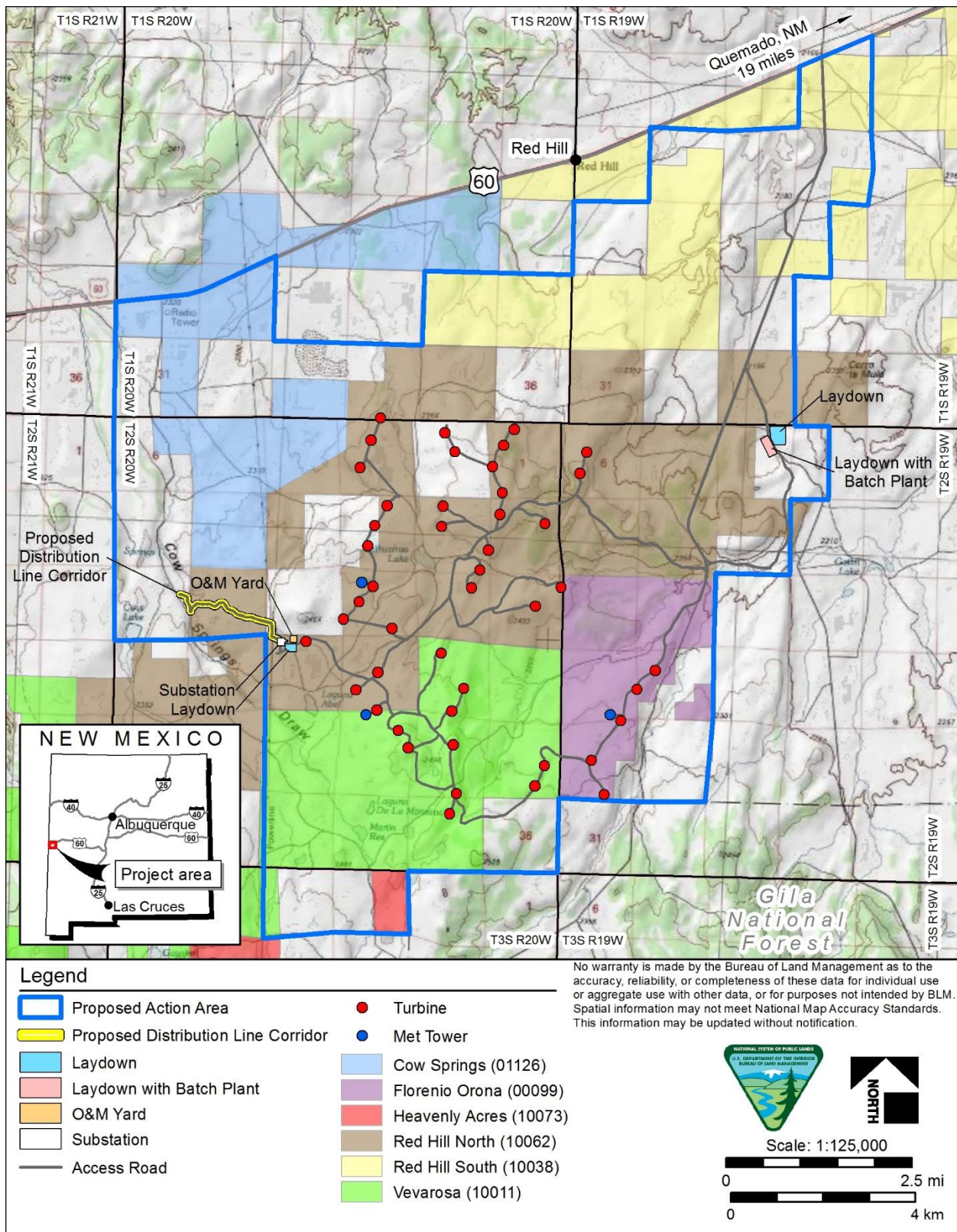


Figure 3-4. Grazing Allotments within the Proposed Action Area

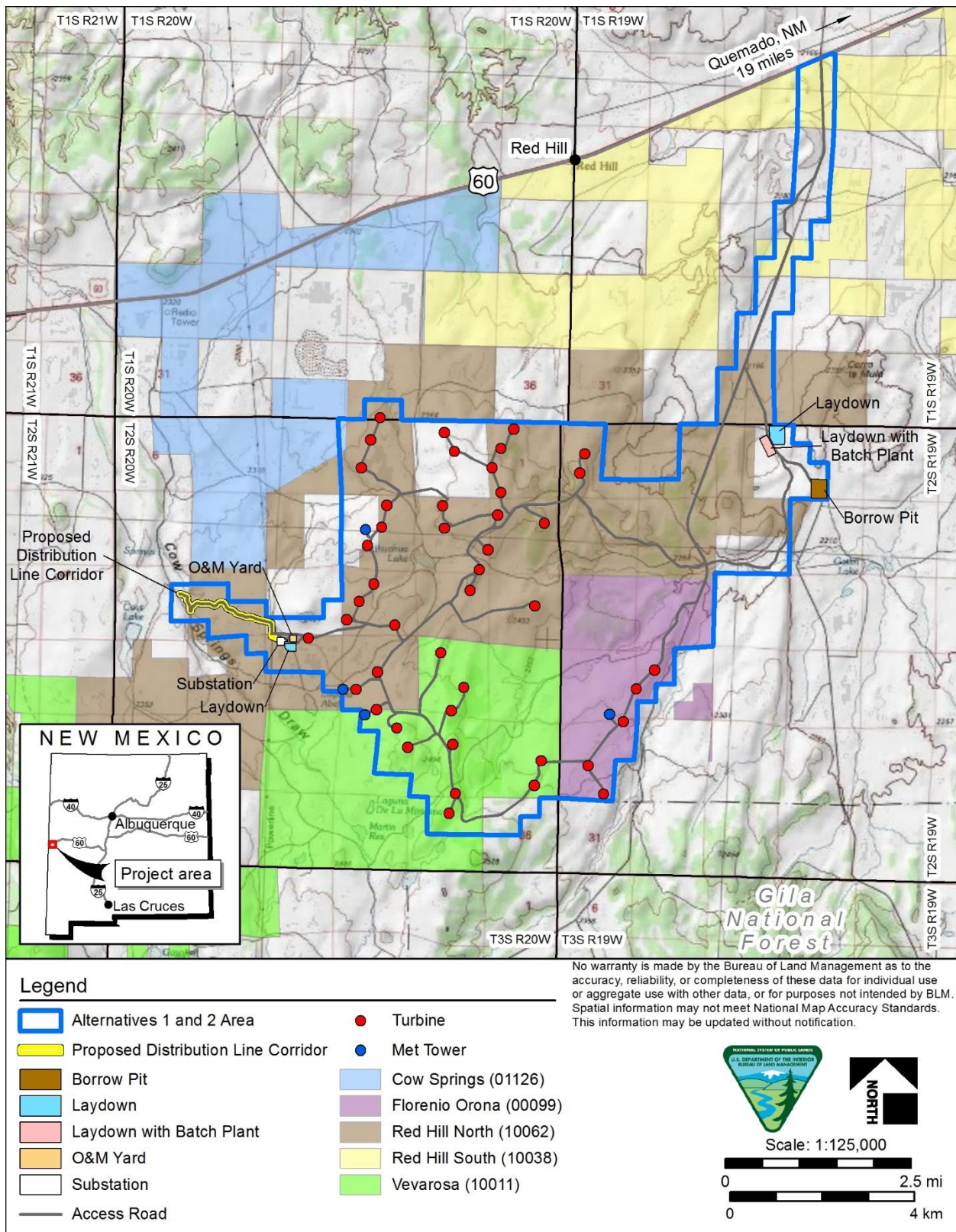


Figure 3-5. Grazing Allotments within the Alternatives 1 and 2 Area

3.2.1.8 BLWP Area Authorized ROWs

Existing ROW authorizations within the BLWP area include overhead electrical transmission and distribution lines, a sand and gravel pit, fiber optic and telephone facilities, and roads (Figures 3-2 and 3-3; Table 3-6). There are two parallel TEP 345-kV transmission lines, the Springerville-Luna lines, on metal frame structures within the BLWP area. The El Paso Electric Company's Harlosa-Springerville 345 kV overhead lines are on wooden "H-frame" poles. The Socorro Electrical Cooperative has a single wood pole 14.4/24.9-kV distribution line, where the main distribution line is 24.9 kV and the lines to the residences are 14.4 kV. Qwest Corporation and Western New Mexico Telephone Company also have authorized ROW within the BLWP area. In the northeast portion of the BLWP area, a small sand and gravel pit is operated by the NMDOT. There is also a Federal-Aid Highway Program authorization for the portion of U.S. 60 that passes over BLM-administered lands.

3.2.1.9 BLWP Area Aviation Use

Two military low-level flightpaths (i.e., MTRs), slow route (SR)-201 and visual route (VR)-176, currently cross the BLWP area (Figure 3-6). The width of the two flightpaths vary from 10 to 45 miles and penetrate the military airspace with the planned turbines encumbering approximately 20 percent of the military training route width. Holloman AFB Flightpath VR-176 encompasses all alternatives. Kirtland AFB Flightpath SR-201 covers the northern portion including roughly 17,120 acres or 39 percent of the Proposed Action area and 5,037 acres or 27 percent of the Alternatives 1 and 2 areas. Slow routes flown by C130s airplanes directly go over the BLWP area and airplanes can fly below 500 feet, but no lower than 250 feet above ground level. Additionally, both TEP and El Paso Electric Company conduct routine flights for inspection and maintenance of their overhead power lines.

3.2.2. Environmental Consequences

This section discusses the lands and realty impacts that would occur with implementation of the Proposed Action, Alternatives 1 and 2, and the No Action Alternative. The Proposed Action and Alternatives 1 and 2 would affect land use within the BLWP area and vicinity if they: 1) conflict with existing Federal, State, or local land use plans or policies; 2) conflict with existing BLM land use authorizations; or 3) change public land disposition. Surface or mineral ownership would not be impacted under any alternatives because surface jurisdiction and mineral ownership would not change.

3.2.2.1 Direct and Indirect Impacts of the Proposed Action

The Proposed Action would be constructed on public lands administered by the BLM or NMSLO. No privately owned land would be acquired for the construction, O&M, or decommissioning of the Proposed Action.

Electrical generation facilities are an allowable land use under FLPMA, and with issuance of the ROW grant, the Proposed Action would be in compliance with FLPMA and would not conflict with the 2007 Catron County CIP/Comprehensive Plan. The construction and O&M of the wind turbines and ancillary facilities would require a plan amendment for the Proposed Action to be in conformance with the existing SFO RMP (BLM 2010). The Proposed Action is located in an area segregated from mining claim entries. Development of a wind farm would not prohibit other permitted uses such as grazing, use of existing ROWs, and dispersed recreation. Indirect land use impacts would not be expected because it is anticipated that a wind energy development project would not substantially induce or reduce regional growth to the extent that it would change off-site land uses (BLM 2005).

Table 3-6. Authorized ROW within the Proposed Action Area and Alternatives 1 and 2 Area¹

Serial Number	Holder Name	ROW Width (feet)	Acres within Proposed Action Area	Length within Proposed Action Area (miles)	Acres within Alternatives 1 and 2 Area	Length within Alternatives 1 and 2 Area (miles)
NMNM 125493	Red Hill Community Pit	NA	10.00	NA	10.00	NA
NMNM 082730	Catron County	60	0.09	0.01	0.01	0
NMNM 082727	Catron County	60	28.51	3.92	0	0
NMNM 077514	El Paso Electric Company	135–150	132.03	7.21	95.65	5.26
NMNM 097797	NMDOT (access road to the Red Hills Community Pit)	14	0.29	0.17	0.29	0.17
NMNM 011994	Qwest Corporation	40	12.13	2.51	0	0
NMNM 0014159	Socorro Electric Cooperative	30	1.95	0.53	0	0
NMNM 018691	TEP	220	127.27	4.67	13.90	0.5
NMNM 015985	TEP	220	112.35	4.15	13.90	0.5
NMNM 083892	TEP	330	190.27	4.86	21.18	0.50
NMNM 103679	Western New Mexico Telephone Company	30	0.03	0.01	0	0
NMNM 096492	Western New Mexico Telephone Company	30	17.85	4.90	17.81	4.89
NMNM 052190	Western New Mexico Telephone Company	30	18.65	5.11	18.51	5.08
NMNM 002666	NMDOT	Varies	0 (adjacent)	0 (adjacent)	0 (not adjacent)	0 (not adjacent)
NMNM 0558313	NMDOT	Varies	0 (adjacent)	0 (adjacent)	0 (not adjacent)	0 (not adjacent)
NMNM 0057985	NMDOT	Varies	0 (adjacent)	0 (adjacent)	0 (adjacent)	0 (adjacent)
NMNM 109246	Western New Mexico Telephone Company	Varies	0 (adjacent)	0 (adjacent)	0 (adjacent)	0 (adjacent)
Total Area	-	-	651.39	38.03	191.24	16.92

Source: BLM 2018b and 2018c

¹ Analysis area includes the U.S. 60 ROW where construction-related activities would be necessary.

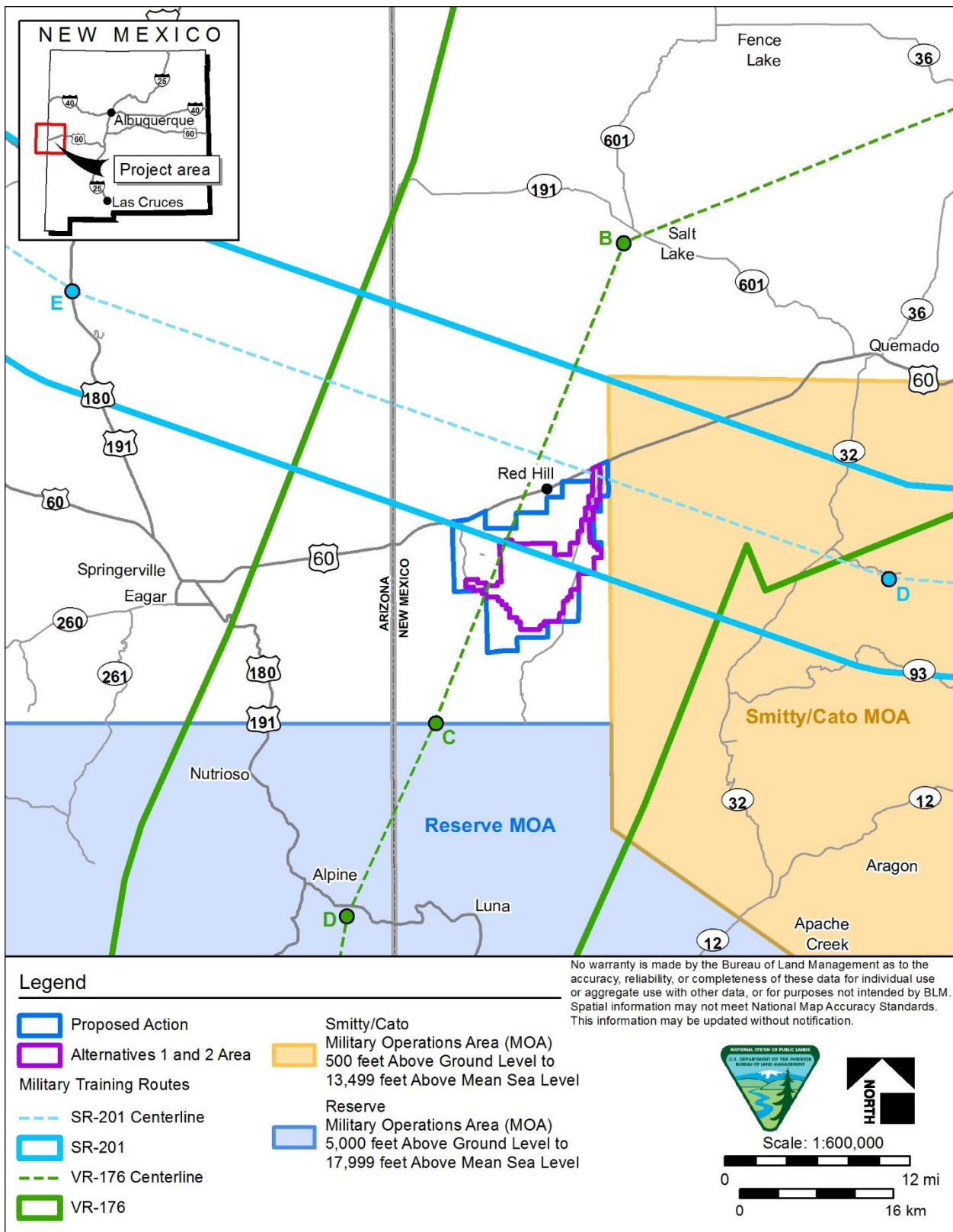


Figure 3-6. Military Low-Level Flightpaths (MTRs)

Construction

In the Proposed Action, the approximately 1.8-mile distribution line would be run from the electrical interconnection switchyard and substation to the Socorro Electrical Cooperative 14.4/24.9-kV distribution line near Cow Springs and west of the Proposed Action area. Using the existing designated utility corridor and transmission lines in the vicinity of the Proposed Action area would not result in a change in land use. Construction of turbines and other related facilities (including switchyards, MET towers, staging areas, O&M facilities, and access roads) would not impact existing transmission lines or utility corridors.

There are six authorized grazing allotments within the BLWP area. Five of the allotments—including Vevarosa (#10011), Red Hill South (#10038), Red Hill North (#10062), Florenio Orona (#00099), and Cow Springs (#01126)—would have temporary impacts. Any existing range improvements would be rehabilitated if disturbed by the BLWP during construction. The existing grazing lease authorizations would remain the same as the current use. There would be temporary access restrictions during the five- to six-month construction period. Livestock may get out of the pasture or allotment and produce additional workload and/or cost of retrieving and sorting animals. Construction activities could also create stress on the livestock. Depending on the options available to the grazing permittee, they may be able to shift livestock to pastures outside of the construction area.

The BLWP design features (Appendix B) would include notifying the permit holders of all major construction milestones so that they are informed as to the time and location of potential disturbances. Construction activities would result in the loss of or damage to vegetation, which could impact livestock forage availability in localized areas in the Proposed Action area. Construction vehicle traffic could result in minor short-term livestock displacement in localized areas. Construction activities and equipment could also increase the potential for the establishment of invasive and noxious weeds that could indirectly affect forage quality. Dust created by vehicle traffic and construction activities could indirectly result in a temporary reduction of forage quality in localized areas. BMPs would be implemented to control dust and reduce the establishment of invasive species and noxious weeds.

Access to the ranching areas could be temporarily restricted during construction in site-specific areas. The oversized loads and slow-moving equipment on public roads and highways could result in temporary delays for local users. Dust and additional vehicle traffic could impact traffic movement adjacent to the Proposed Action area over the short-term; these impacts would be minimized through design features such as the application of water or other dust suppressants. Any residual impacts would be temporary, occurring for a few months during construction, in specific areas such as the proposed access road corridors.

Existing roads would be upgraded and new roads would be constructed, which could temporarily affect local transportation and public access. The main access point for the Proposed Action would be at the intersection of U.S. 60 and Bill Knight Gap Road. Improvements at the intersection would include permanent deceleration and acceleration lanes for both directions at the intersection to accommodate turning radius needs for turbine delivery. The SFO RMP would need to be amended in order to construct the intersection improvements in the designated ROW avoidance area along the south side of U.S. 60.

Operations and Maintenance

Facility O&M, including the repair of wind turbines, ancillary facilities, and transmission line facilities, would not result in impacts to utility corridors or ROWs, although the transmission line interconnection would reduce the capacity to add more power to the selected transmission line from other energy generation projects. Currently, there are no planned future residential developments in the BLWP area, but the presence of turbines and O&M activities could indirectly result in a shift in the location or siting of future residential developments on private land. ROWs are non-exclusive and any new applications

for ROWs in the project area would be analyzed on a case-by-case basis for compatibility with the existing wind facilities.

The Proposed Action would require a Determination of No Hazard to Air Navigation (NOHA) from the FAA for each turbine. The presence of turbines, permanent MET towers, and overhead transmission lines associated with the Proposed Action, as well as the use of drones during O&M activities, could add constraints to military testing and training operations that may occur at low altitudes. Aircraft would no longer be able to operate at the current levels within the airspace over the BLWP area because of the wind turbine obstructions although according to Holloman AFB, the turbines that create vertical obstructions for aircrafts between segments B and C (Figure 3-6) would be able to fly around the obstructions and still accomplish their training requirements. The turbines' height would require markings or lights per FAA Guidelines (FAA 2007) to provide visible warning to pilots. The planned turbines will encumber approximately 20 percent of the route width. Impacts to flying operations are mitigatable by flying in the remaining 80 percent of the route width.

The addition of approximately 40 miles of new access roads would provide access for dispersed recreation, hunting, and grazing and livestock management because motorized (and non-motorized) vehicle access would be allowed on new roads established in the Proposed Action area, except those within restricted facility areas.

There would be no grazing rotation restrictions anticipated with the Proposed Action. Portions of the BLWP area, including the O&M facility and the substation, would be fenced to keep livestock out. These areas, as well as the direct impact acreage for the turbines, would reduce the amount of available forage. Forage availability and production would be permanently reduced by 0.4 percent and temporarily reduced by 3.1 percent of the total allotted acreage within the Proposed Action area (permanent disturbance of 116.8 acres and temporary disturbance of 892.0 acres of grazing allotments).

Revegetation with native species in areas disturbed by construction could restore and improve forage resources for livestock grazing. Eliminating forage needed to feed grazing livestock would be required; however, it is not anticipated to be substantial enough to affect this use of the land. The loss of forage acres can be translated to a decrease in animal unit months (AUMs) on the permit. A minor reduction of 17.5 AUMs from the total of 4,336 AUMs would occur from the loss of 116.8 acres of permanent foraging; this represents less than 0.4 percent of the total allotment acreage within the Proposed Action area. The volume of vehicle traffic associated with O&M activities on new access roads would be substantially less than traffic associated with construction but could result in localized impacts to livestock and livestock management.

Decommissioning

Decommissioning activities would cause temporary, localized disturbances to land use similar to those described under the Construction section above. Decommissioning would require coordination similar to that performed during construction where the activities under the Proposed Action would overlap existing uses (including roads and transmission lines). Land use plans, policies, or regulations may have changed by the time the Proposed Action would be decommissioned. As such, the decommissioning plan would ensure that decommissioning is conducted in accordance with then-current land use plans, policies, laws, or regulations. Project features such as turbines, substations, the switchyard, O&M building, and related facilities would be removed at the end of the operational life of the Proposed Action. If access roads are left in place, they would continue to provide access to some recreational users (e.g., hunters). Decommissioning the Proposed Action would have similar impacts to livestock grazing as described for construction. Additionally, previously restored areas could be re-disturbed resulting in short-term loss of available forage and a decrease in forage quality. Decommissioning and restoring disturbed areas with native soils and plants would improve forage availability.

Additional Measures to Avoid and/or Minimize Impacts

Along with the implementation of the BMPs and other design features in Appendix B, the BLM recommends the additional measures below to avoid and/or minimize impacts to land use from the Proposed Action:

- Turbines along this route would use lighting compatible with night vision goggles (NVGs) for safe operations and identification of the turbines when aircrews are conducting NVG training.
- Borderlands Wind, LLC would be required to coordinate with the U.S. Air Force if drones would be used.
- No existing authorized BLM range improvement should be removed, altered, or left inoperable without prior consultation and written agreement with the grazing allottee and the BLM SFO.

3.2.2.2 *Direct and Indirect Impacts of Alternatives 1 and 2*

Like the Proposed Action, Alternatives 1 and 2 would be constructed on public lands administered by the BLM or NMSLO. No privately owned land would be acquired for the construction, O&M, or decommissioning of either of these two alternatives. With the issuance of the ROW grant, these alternatives would also be in compliance with FLPMA and would not conflict with the 2007 Catron County CIP/Comprehensive Plan. A plan amendment would be required for the alternatives to be in conformance with the 2010 SFO RMP. Alternatives 1 and 2 would reduce the total project boundary acreage by 24,621 acres (56.6 percent) as compared to the Proposed Action, with 14,501 acres (47.8 percent) being reduced from public lands administered by the BLM, 4,525 acres (79.5 percent) being reduced from the NMSLO-managed lands, and 5,595 acres (74.6 percent) being reduced from private landowners.

Construction

The construction effects associated with Alternative 1 would be essentially the same as for the Proposed Action because the same number of turbines would be built under the Proposed Action and Alternative 1. Under Alternative 2, there would be six less turbines (34 instead of 40 turbines) built with similar but slightly less impacts from the fewer number of turbines, access roads, and underground electric collection system and communication lines built. Because of the smaller construction footprint associated with Alternative 2, livestock grazing allotments within and adjacent to the BLWP area would be less affected by the construction activities as compared to the Proposed Action and Alternative 1.

The temporary traffic delays from oversized loads and slow-moving equipment on public roads and highways from the construction of Alternatives 1 or 2 would be equal or similar to the Proposed Action. The main access point for either of the alternatives would be the same as the Proposed Action: at the intersection of U.S. 60 and Bill Knight Gap Road. The SFO RMP would also need to be amended for Alternatives 1 and 2 in order to construct the intersection improvements in the designated avoidance area.

Operations and Maintenance

Potential direct and indirect impacts from O&M activities under Alternatives 1 and 2 would result in the same or similar impacts to the utility corridors and ROWs as the Proposed Action. Both Alternatives 1 and 2 would have the same FAA requirements as the Proposed Action. The presence of either alternative could add constraints similar to the Proposed Action to military testing and training operations that may occur at low altitudes.

New access roads would provide access for dispersed recreation, hunting, and grazing and livestock management because motorized (and non-motorized) vehicle access would be allowed on new roads established in either alternative, except those within restricted facility areas. The amount of new roads associated with Alternatives 1 and 2 would be approximately 15 percent less than the Proposed Action.

For Alternative 1, forage availability and production would be permanently reduced by 0.7 percent and temporarily reduced by 5.2 percent of the total allotted acreage (permanent disturbance of 110.7 acres and temporary disturbance of 830.6 acres of grazing allotment). For Alternative 2, forage availability and production would be permanently reduced by the same amount as Alternative 1 and temporarily reduced by 5.5 percent of the total allotted acreage (temporary disturbance of 866.2 acres of grazing allotment). The volume of vehicle traffic associated with O&M activities under Alternatives 1 and 2 could result in less localized impacts to livestock and livestock management than the Proposed Action.

Decommissioning

Decommissioning activities from Alternatives 1 and 2 would cause temporary, localized disturbances to land use and livestock grazing similar to those described under the Proposed Action. If access roads are left in place, they would continue to provide access for some recreational users (e.g., hunters). Additionally like the Proposed Action, previously restored areas could be re-disturbed resulting in short-term loss of available forage and a decrease in forage quality in Alternatives 1 and 2. Decommissioning and restoring disturbed areas with native soils and plants would improve forage availability.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, the BLM recommends the additional measures below to avoid and/or minimize impacts to land use from Alternatives 1 and 2.

- Turbines along this route would use lighting compatible with night vision goggles (NVGs) for safe operations and identification of the turbines when aircrews are conducting NVG training.
- Borderlands Wind, LLC would be required to coordinate with the U.S. Air Force if drones would be used.
- No existing authorized BLM range improvement should be removed, altered, or left inoperable without prior consultation and written agreement with the grazing allottee and the BLM SFO.

3.2.2.3 Direct and Indirect Impacts of the No Action Alternative

Under the No Action Alternative, the BLWP would not be constructed and there would be no impacts to land use within the BLWP area.

3.3 Social and Economic Conditions

3.3.1. Affected Environment and Socioeconomic Study Area

The nearest named communities to the BLWP area include Red Hill, NM located immediately north of the BLWP area; Quemado, NM approximately 19 miles east and slightly north of the BLWP area; Escudilla Bonita, NM approximately 2.5 miles west of the BLWP area; and the towns of Springerville and Eagar, AZ approximately 17.5 miles west of the BLWP area (for additional information refer to Table 3-2). Catron County is the largest county in NM in geographic area (6929 square miles), but is one of the least populated in the State (Southwest New Mexico Council of Governments 2015) with a total County population under 4,000 individuals. Given the low population density of Catron County, the socioeconomic study area (SESA) for the BLWP encompasses the entire County, and also includes Springerville and Eagar in Apache County, AZ as these towns are the nearest population centers able to provide additional housing and services.

This section addresses population, housing, income, employment, and relevant industry in the BLWP SESA. In addition to traditional market values for goods, housing, and services, this section will also analyze nonmarket values and ecosystem services that may be impacted by the BLWP. Natural resource development, ranching, and recreational uses are the primary economic activities that have shaped the social and economic landscape of the BLWP's SESA.

3.3.1.1 Demographics, Income, Industry, and Employment

The total population of the County was 3,725 as of the 2010 decennial census, but recently declined to 3,547 as of 2017 based on the annual American Community Survey (ACS) estimated data (U.S. Census Bureau 2010 and 2017). The U.S. Census Bureau designated one census tract (9674) that encompasses the entire County and identified Quemado and Escudilla Bonita as Census Designated Places (CDPs) (Figure 3-7). Quemado CDP is the second largest populated area in the County (after Reserve, NM) with a population of 228 people. Escudilla Bonita CDP had a population of 118 in 2010. The Red Hill/Cimarron Ranch Subdivision population is estimated to be around 50 based on verbal information from Catron County (Keith Riddle, personal communication, 2019). In Catron County in 2010, 92.7 percent of the population identified as white and similarly, the majority of the population in Quemado and Escudilla Bonita CDPs were also white (76.3 percent and 95.8 percent, respectively; Table 3-7). The 2010 Native American population consisted of 5.0 percent of the population in Catron County, 21.1 percent in Quemado CDP, and 7.6 percent in Escudilla Bonita CDP. Hispanics/Latinos made up 19.0 percent of the total population in Catron County, 23.7 percent in Quemado CDP, and 7.6 percent in Escudilla Bonita in 2010.

In AZ, the towns of Springville and Eagar consist of three census tracts (9703, 9705.1, and 9705.2) and five block groups. Eagar has a higher population (4,885), but the towns account for a combined population of 6,132 individuals as of the 2010 census. As of 2017, ACS estimates the population slightly increased in Eagar (4,894) and decreased in Springerville (1,751). In both Eagar and Springerville, the majority of the population identified as white (90.5 percent and 87.3 percent, respectively). The 2010 Native American population consisted of 7.3 percent of the population of Springerville and 4.9 percent of the population in Eagar. Hispanics/Latinos made up 24.6 percent of Springerville's population and 18.8 percent of Eagar's population in 2010.

Major employment sectors in Catron County include 39.2 percent in management, business, science, and arts; 29.6 percent in sales and office jobs; and 17.4 percent in natural resources, construction, and maintenance. The per capita income for Catron County in 2017 was \$22,487, with a median household income of \$42,047 (Table 3-8). Approximately 21.5 percent of the people in Catron County were below the poverty level in 2017 (U.S. Census Bureau 2017). According to the New Mexico Department of Workforce Solutions, Catron County had an unemployment rate of 7.4 percent in February of 2019.

In Quemado CDP, major employment sectors include 43.6 percent in natural resources, construction, and maintenance; 36.6 percent in sales and office jobs, and 19.8 percent in service jobs (U.S. Census Bureau 2017). Recent unemployment estimates are not available for this community. Sales and office jobs accounted for the entire workforce of Escudilla Bonita CDP, by 2015 ACS estimates. No industry or employment data is available for the Red Hill/Cimarron Ranch subdivisions.

Major employment sectors in Springerville include 24.3 percent in management, business, science, and arts; 24.8 percent in sales and office jobs; 17.6 percent in production, transportation, and material moving jobs; 24.5 percent in service jobs; and 8.7 percent in natural resources, construction, and maintenance. The per capita income for Springerville in 2017 was \$18,996 with a median household income of \$38,333. Approximately 36.6 percent of the people in Springerville were below the poverty level in 2017 (U.S. Census Bureau 2017). The unemployment rate reported through ACS 5-year estimates was 10.3 percent. Major employment sectors in Eagar included 34.5 percent in management, business, science, and arts; 14.8 percent in sales and office jobs; 14.1 percent in production, transportation, and material moving jobs; 27.4 percent in service jobs; and 9.2 percent in natural resources, construction, and maintenance. The per capita income for Eagar in 2017 was \$20,982 with a median household income of \$57,931. Approximately 11.9 percent of the people in Eagar were below the poverty level in 2017 (U.S. Census Bureau 2017). The unemployment rate reported through ACS 5-year estimates was 8.8 percent.

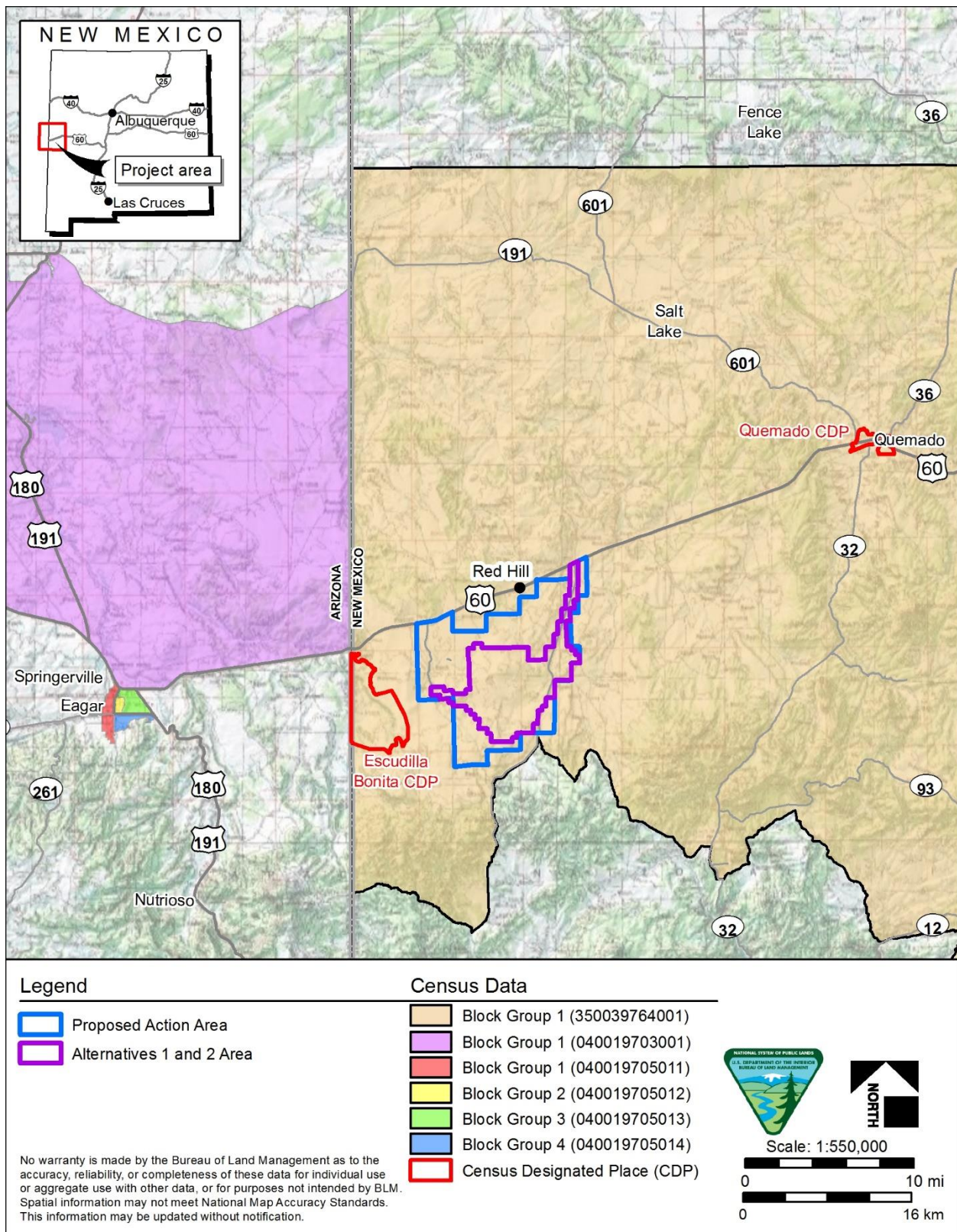


Figure 3-7. Census Block Groups and CDPs for the BLWP SESA

Table 3-7. BLWP SESA's Population by Ethnic and Racial Groups

Location	Population (number of individuals)	Black/		American	Asian	Native	Other	Hispanic/
		African	American	Indian and		Hawaiian		Latino
		White	American	Alaska		Pacific		Ethnicity
				Native		Islander		
Quemado CDP, NM	228	174 (76.3%)	5 (2.2%)	48 (21.1%)	0 (0.0%)	0 (0.0%)	9 (3.9%)	54 (23.7%)
Escudilla Bonita CDP, NM	119	114 (95.8%)	0 (0.0%)	9 (7.6%)	1 (0.8%)	0 (0.0%)	3 (2.5%)	9 (7.6%)
Springerville, AZ	1,961	1,712 (87.3%)	13 (0.7%)	143 (7.3%)	24 (1.2%)	1 (0.1%)	143 (7.3%)	482 (24.6%)
Eagar, AZ	4,885	4,420 (90.5%)	63 (1.3%)	241 (4.9%)	26 (0.5%)	7 (0.1%)	284 (5.8%)	916 (18.8%)
Catron County, NM	3,725	3,454 (92.7%)	22 (0.6%)	185 (5.0%)	12 (0.3%)	1 (<0.1%)	172 (4.6%)	709 (19.0%)
Apache County, AZ	71,518	17,674 (24.7%)	476 (0.7%)	53,273 (73.5%)	315 (0.4%)	72 (0.1%)	1,178 (1.6%)	4,113 (5.8%)
NM	2,059,179	1,473,005 (71.5%)	57,040 (2.8%)	219,512 (10.7%)	40,456 (2.0%)	4,698 (0.2%)	346,627 (16.8%)	953,403 (46.3%)
AZ	6,392,017	4,852,961 (75.9%)	318,665 (5.0%)	353,386 (5.5%)	230,907 (3.6%)	25,106 (0.4%)	846,031 (13.2%)	1,895,149 (29.6%)

Table Abbreviations: AZ = Arizona; BLWP = Borderlands Wind Project; CDP = Census Designated Place; NM = New Mexico; SESA = socioeconomic study area
Source: U.S. Census Bureau 2010
Note: Individuals may identify with multiple racial groups.

Table 3-8. Income and Poverty Rates based on 2013-2017 ACS 5-year Estimates within the BLWP SESA

Location	Per Capita Income	Median House hold Income	Poverty Rate ¹
Quemado CDP, NM	\$21,275	NA	31.4%
Escudilla Bonita CDP, NM	\$23,232	NA	NA
Springerville, AZ	\$18,996	\$38,333	36.6%
Eagar, AZ	\$20,982	\$57,931	11.9%
Catron County, NM	\$22,487	\$42,047	21.5%
Apache County, AZ	\$13,865	\$32,360	35.9%
NM	\$25,257	\$46,718	20.6%
AZ	\$27,964	\$53,510	17.0%

Table Abbreviations: ACS = American Community Survey; AZ = Arizona; BLWP = Borderlands Wind Project; CDP = Census Designated Place; NA = not applicable; NM = New Mexico; SESA = socioeconomic study area
Source: U.S. Census Bureau 2017

Note: Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. In addition to sampling variability, the ACS estimates are subject to nonsampling error.

¹ Poverty Rate reflects "All people whose income in the past 12 months is below the poverty level.

3.3.1.2 Housing Characteristics and Property Values

Housing characteristics were obtained using the 2010 census data and median property value using the 2017 ACS 5-year estimates. In NM, an estimated 901,390 housing units existed as of 2010, including a reported 87.8 percent occupied units and 12.2 percent vacant units (Table 3-9). The median value of owner-occupied homes in NM was not reported in the 2010 census, but in the 2017 ACS, the median value was estimated to be \$163,900. An estimated 3,289 housing units existed in Catron County as of 2010, including a reported 54.3 percent occupied units and 45.7 percent vacant units. More than a third of vacant units were described as vacant due to seasonal, recreational, or other use (34.1 percent). The median value of owner-occupied homes in Catron County was not reported in the 2010 census, but in the 2017 ACS, the median value was estimated to be \$164,600. The number of housing units reported for Quemado CDP in 2010 was 135 units, with 63.7 percent of units occupied and 36.3 percent vacant. A smaller portion of housing units (13.3 percent) were described as vacant due to seasonal, recreational, or other use. The number of housing units reported for Escudilla Bonita CDP in 2010 was 125 units, including 44.0 percent occupied units and 56.0 percent vacant units. Similar to Catron County, more than a third (40.8 percent) of units were described as vacant due to seasonal, recreational, or other use. No housing units, occupancy data, or median house values are available for the Red Hill/Cimarron Ranch subdivision.

In Springerville, AZ a reported 954 units housing units existed in 2010, including 81.2 percent occupied units and 18.8 percent vacant units. Only 4.2 percent of housing units were reported to be vacant due to seasonal, recreational, or other use. The median value of owner-occupied homes in Springerville was not reported in the 2010 census, but in the 2017 ACS, the median value was estimated to be \$105,600. The number of housing units reported in Eagar, AZ in 2010 was 2,045, with 84.8 percent of units occupied and 15.2 percent vacant. The median value of homes in Eagar was not reported in the 2010 census, but in the 2017 ACS, the median value was \$165,400.

Table 3-9. BLWP SESA’s Housing Characteristics

Location	Total Housing Units (number)	Occupied Housing Units (number/percent)	Unoccupied Housing Units (number/percent)	Median Home Value ¹
Quemado CDP, NM	135	86 /63.7%	49/36.3%	NA
Escudilla Bonita CDP, NM	125	55/44%	70/56%	NA
Springerville, AZ	954	775/81.2%	179 /18.8%	\$105,600
Eagar, AZ	2,045	1,734/84.8%	311/15.2%	\$165,400
Catron County, NM	3,289	1,787/54.3%	1,502 /45.7%	\$164,600
Apache County, AZ	32,514	22,771/70%	9,743/30%	\$72,800
NM	901,388	791,395/87.8%	109,993/12.2%	\$163,900
AZ	2,884,526	2,380,990/83.7%	463,536/16.3%	\$193,200

Table Abbreviations: AZ = Arizona, CDP = Census Designated Place, NA= data not available, NM = New Mexico,

Source: 2010 Census,

Note: Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. In addition to sampling variability, the ACS estimates are subject to nonsampling error.

¹ Data only available in 2013-2017 ACS 5-Year Estimates.

3.3.1.3 Agriculture, Ranching, and Recreation

The industries that are the largest contributors to income in Catron County include agriculture, ranching, and recreation (e.g., fishing and hunting). Agriculture and ranching activities account for a market value

of \$12.74 million for products sold. The majority (99.0 percent) of products sold are attributed to livestock sales (U.S. Department of Agriculture 2012). Cattle and calves are the primary commodity, accounting for \$11.6 million. The 2012 Census of Agriculture reported 351 farms/ranches in Catron County with an average size of 3,070 acres. Overall, 1,077,534 acres of land are attributed to farms/ranches within the County. For a related discussion of land use for livestock grazing on public lands, see Section 3.2 Lands and Realty.

Recreation activities in the County make a substantial economic contribution and include common outdoor activities, such as hiking, fishing, trapping, and hunting. Among NM residents, walking/hiking, and running; hunting, fishing, shooting, and wildlife watching; and camping are the most common outdoor activities (New Mexico State Parks Division 2015). Catron County is ranked among the top three hunting destination counties in NM with a reported 9,648 residents and 2,758 non-residents participating annually. Table 3-10 shows the annual economic contributions of fishing, hunting, and trapping for the County as reported for 2013. The majority of economic contributions from hunting are associated with hunting for elk, deer, and small game (i.e., quail, duck, and squirrel).

Table 3-10. Economic Contributions of Fishing, Hunting and Trapping in Catron County and NM

Activity	Jobs (Catron County)	Labor Income	Contribution to NM Gross	
			Domestic Product	State and County Tax Revenues
Fishing	21	\$368,329	\$1,000,258	\$165,450
Hunting	237	\$3,318,008	\$9,468,383	\$1,405,967
Trapping	1	\$17,469	\$41,759	\$8,116

Table Abbreviations: NM = New Mexico
Source: Southwick Associates 2014.

Catron County contains 12 Game Management Units (GMUs), which are geographic subdivisions used by the NM Department of Game and Fish for the management of big game species. The Proposed Action and Alternatives 1 and 2 areas are located within GMU 15, but also include a small portion of GMU 12 (approximately 10.6 acres). Of the deer licenses sold in Catron County, 381 licenses (5.2 percent) were sold for GMU 15 in 2017–2018. There were 2,464 elk licenses (25.6 percent) sold for GMU 15 in 2017–2018 (NM Department of Game and Fish 2018). The Proposed Action area would include 43,517.0 acres of GMU 15 (4.2 percent of the total unit area). The Alternatives 1 and 2 area would account for 18,907.3 acres of GMU 15 (1.8 percent of the total unit area).

3.3.1.4 Rural Prosperity and Nonmarket Values

Based on its land use planning authority provided in Section 202 of FLPMA, the BLM manages public lands for both the preservation and use of natural resources to serve both local communities and the broader public. *Executive Order 13790, Promoting Agriculture and Rural Prosperity in America* (April 25, 2017), directs agencies of the Federal government to (among other things):

- Further the Nation’s energy security by advancing traditional and renewable energy production in the rural landscape; and
- Address hurdles associated with access to resources on public lands for the rural communities that rely on cattle grazing, timber harvests, mining, recreation, and other multiple uses.

The BLM must consider these directives during planning. The BLWP advances the development of renewable energy production on the rural landscape, and does not substantially impede public access to economically important natural resources, such as grazing lands, and recreational opportunities. To reach this conclusion, BLM analyzed impacts to both market and non-market values.

One of the ways that people evaluate the importance of natural resources is through perceived non-market values. Nonmarket values are assigned to natural resources by people. These non-market values may not be quantifiable, such as certain communities placing a high value on perceptions of landscapes and rural lifestyles. Different communities and individuals may assign different values to a natural resource, dependent on their specific circumstances. For example, the ranching community in the area of the Proposed Action would place a different value on open, grassy rangelands, than would people who value the views and wildlife associated with woodlands.

Many residents in the SESA place a high value on rural landscapes and rural lifestyles. As noted during the public scoping period, local residents value open space and rural views, as well as the lifestyles associated with ranch operations, livestock grazing, and recreational (hunting) opportunities. They tend to prefer land uses that conserve or enhance these values. Ranchland in NM is part of a broader cultural landscape that encompasses many of the nonmarket values that ranchers hold in high regard, such as sense of place and purpose. As a result, ranchers in NM can develop a sense of attachment to the landscapes that visitors, recreationists, and others may not. The value of these ranchlands are generally not reflected in market prices.

Recreation is an important resource use in the SESA by both local residents and nonlocal visitors. The benefits people obtain from recreating are personal, with different people obtaining different benefits from the same piece of land. Scenery is an important component of non-market valuation associated with landscapes. Sometimes referred to as scenic quality or landscape character, visual appreciation of the environment is a well-recognized and accepted dimension of aesthetic appreciation. The scenery associated with a landscape contributes to community identity and sense of place. Additionally, wildlife provides a variety of benefits to the public. When consumed as food, certain species may be considered important for reasons of traditional use and recreation, and when hunted for sport or viewed by recreationists, the same species are considered important contributors to local economies. Some wildlife also hold non-use values; for example, when people do not use wildlife but recognize that future generations may value specific wildlife species or the fact that wildlife exists (USFS 2014). Within the BLWP area, deer, elk, and other game species would be considered to be important for both economic and non-market reasons, while eagles, prairie dogs, wolves, and other sensitive species also contribute to the non-market perceptions of the area by both local and non-local users.

3.3.2. Environmental Consequences

3.3.2.1 *Direct and Indirect Impacts of the Proposed Action and Alternatives 1 and 2 – Market Values*

Construction

The project construction phase is estimated to take five to six months, with approximately 200 to 250 workers onsite during peak construction and an average of 50 to 70 workers onsite daily. Total income for all construction workers is estimated to range from \$1.5 to \$3.0 million (R. Stephens, personal communication, 2019).

Construction of the BLWP would result in hiring local and non-local construction workers, as well as expenditures for local goods and services. Some of the labor to construct the BLWP would be specialized and would be sourced from outside the SESA. These workers are anticipated to be temporary residents that would only reside in Catron County during construction of the BLWP. The projected local workforce used during construction would be approximately 10 to 25 workers. Borderlands Wind, LLC would hire as many local workers as possible; however, due to the remote project location, qualified workers may come from areas within a two-hour driving distance from the BLWP area.

While housing choice by construction workers depends on the type and quality, as well as the quantity of available housing, it is expected that project-related housing demand would be met by the existing housing and hotel supply based on the diversity of choices available between Quemado and Springerville/Eagar, AZ and the BLWP area. Therefore, no new housing is expected to be built for workers during the construction of the BLWP. The increased demand for short-term housing from BLWP construction workers would have no effect on housing market prices because of the availability of nearby hotels and short construction timeframe (six months or less).

Indirect effects would result from additional local jobs that would be supported by BLWP-related expenditures on goods and materials, such as construction materials and supplies. During construction, these related expenditures would come from non-local workers staying in local motels/hotels/campgrounds, buying gas and food locally, and frequenting local restaurants. Meals, food, and lodging could contribute an estimated \$750,000 to the local economy during construction (Jennifer Field, personal communication, 2019).

Short-term employment opportunities may be generated in other sectors of the Catron County economy through spending by workers that are supported directly or indirectly by the BLWP construction. Increased spending by local construction worker households may also generate additional employment in the County. The majority of this employment and income is anticipated to be in service sectors and would be a negligible to minor contribution to the County economy during the five- to six-month period of construction.

Major economic drivers in the BLWP area are primarily related to recreation/hunting and ranching and the livestock industry. These activities may be displaced during construction of the BLWP. The Proposed Action area and Alternatives 1 and 2 area would include approximately 4.2 percent and 1.8 percent of GMU 15, respectively. Based on the number of elk and deer licenses issued for the BLWP area during the 2017–2018 season, the number of affected hunters is expected to be limited to less than 200, primarily during the project construction phase (NM Department of Game and Fish 2018). Because of the relatively short construction schedule, any loss of hunting opportunities would also depend on what time of year the proposed BLWP is actually under construction. Since approximately two-thirds of the hunters in NM are local residents rather than non-residents, there would be negligible, if any, reduction in related expenditures, such as for lodging from non-resident hunters in the BLWP area, under any of the alternatives. Construction of the BLWP would result in the temporary reduction of forage availability in six grazing allotments under the Proposed Action and three grazing allotments under Alternatives 1 and 2.

In 2017, the total revenue for Catron County was \$5.4 million. Borderlands Wind, LLC estimates that they would pay approximately \$1.1 million of sales tax to the State and \$115,000 to Catron County during the construction phase of the project. If the County's revenue remained the same as it was in 2017, this would be an increase of approximately 2.0 percent of revenue for the County (Stone, McGee and Co. 2017).

The BLWP may impact adjacent property values. Numerous conflicting economic studies have analyzed the effect of wind farm development on private property values. One recent review of research findings on the impact of wind power projects on residential property values in the United States stated that there is no consistent, statistically significant effect on home sale prices with a view of wind facilities or those in close proximity to wind facilities (Thayer 2017). Other research done in 2014 by the London School of Economics cites that properties located within approximately 9 miles of a wind farm can have a 12 percent reduced value. The various studies suggest there are several qualitative and quantitative factors that influence property values adjacent to announced or operating wind generating facilities other than the presence of the facility. These factors include the sale price of nearby comparable

properties; the property's square footage, age, and number of bedrooms/bathrooms; and the quality metrics of the property such as the condition of the home and location specific variables.

The BLWP may impact private property values of residences and/or vacant parcels within the Red Hills/Cimarron Ranch Subdivision and on other adjacent private properties. However, the magnitude and duration of such impacts on property values solely attributed to the presence of the BLWP would be specific to the individual property at the time of the sale and would not be consistent across the entire Red Hills/Cimarron Ranch Subdivision or across other adjacent private residential and non-residential properties. This lack of consistency makes it difficult to provide an accurate estimate of impacts to property values.

Operations and Maintenance

Operation of the BLWP would result in the long-term reduction of approximately 116.8 acres of forage production under the Proposed Action and approximately 107.8 acres of forage production under Alternatives 1 and 2 through the life of the project. Table 3-11 identifies the percent reduction within each of the allotment carrying capacity within the Proposed Action area and Alternatives 1 and 2 area, and the reduction in each permittee's entire allotment.

Table 3-11. Reduction in Grazing Allotments within the Proposed Action and Alternatives 1 and 2 Areas

Allotment Name	Proposed Action Allotment Acreage Reduction	Proposed Action Allotment % Reduction¹	Alternatives 1 & 2 Allotment Acreage Reduction	Alternatives 1 & 2 Allotment % Reduction²
Vevarosa	16.69	0.10	13.86	0.08
Red Hill South	4.31	0.03	4.34	0.03
Florenio Orona	9.36	0.23	9.21	0.23
Red Hill North	86.42	0.34	83.21	0.39
Cow Springs	0.0	0.00	0.00	0.00
Heavenly Acres	0.0	0.00	0.00	0.00
Total	116.79	0.35	110.63	0.69

Table Abbreviations: BLM = Bureau of Land Management; BLWP = Borderlands Wind Project

Source: BLM 2018b

¹ Percent references the reduction in the portion of the total allotment acreage that is located on BLM lands within the Proposed Action area (30,320.06 total acres; see Table 3-5).

² Percent references the reduction in the portion of the total allotment acreage that is located on BLM lands within the Alternatives 1 and 2 area (15,832.72 total acres; see Table 3-5).

The BLM indicated that there is an average of 0.15 AUMs² per acre of SFO grazing land (Matt Atencio, personal communication, 2019). If the total grazing area is reduced by 116.79 acres in the Proposed Action and 110.63 acres in Alternatives 1 and 2, the rancher would potentially lose income from the reduction in the number of cattle that could be raised, resulting in an economic impact, if other grazing lands cannot be secured. There would be a reduction of approximately 17.5 AUMs (116.79 acres x 0.15 AUMs) every year for the life of the Proposed Action, and 16.6 AUMs (110.63 acres x 0.15 AUMs) with Alternatives 1 and 2, which would be a 0.4 percent and 0.7 percent decrease in the AUMs for the grazing allotments within the BLWP area, respectively. The economic impacts on livestock grazing during the life of the BLWP for any of the alternatives would result in a less than one percent reduction in AUMs, and is therefore anticipated to be a negligible impact.

² There are 1,492,301 BLM acres of public lands open to grazing with 226,818 active AUMs or 0.15 AUM per grazing acre in the SFO (Matt Atencio, personal communication, 2019).

During the 35-year operational period, approximately 5 jobs would support an additional \$7.9 to \$8.8 million in household income. It is assumed that O&M would be conducted by employees hired locally, or employees that would relocate and settle locally in Catron County. Expenditures of wages by BLWP employees and supporting industry employees in the local economy would also support local employment.

Long-term population impacts on Catron County would be less than 5 people, for which there are adequate available, vacant housing units and/or property for sale. Therefore, no new housing is expected to be constructed as a result of the BLWP and no effect on housing prices is expected because of the small number of permanent jobs associated with the BLWP's O&M.

Other economic benefits to the local government would be annual payments as part of the Industrial Revenue Bond structure. Borderlands Wind, LLC would make annual payments in lieu of tax to Catron County in the amount \$397,800 per year for 30 years. Over 30 years, those payments would total \$11,934,000. If the County's revenue remained the same as it was in 2017, this would be an increase of approximately 7.0 percent of revenue to the County annually over the 30-year payment structure.

Decommissioning

Decommissioning would require labor to remove the wind turbines, electrical system, structural foundations, and roads. In addition, labor would be required to regrade, recontour, and revegetate areas to be restored. It is not known how many employees the BLWP would directly or indirectly support during decommissioning. It is anticipated that the local labor and income effects would be relatively minor as the decommissioning period is temporary. No new housing is expected to be constructed as a result of BLWP decommissioning, and no effect on housing prices is expected.

3.3.2.2 *Direct and Indirect Impacts of the Proposed Action and Alternatives 1 and 2 – Nonmarket Values*

Construction

During the construction of the BLWP, some short-term impacts on quality of life for local residents may result due to increased BLWP-related traffic, potential impacts on air quality and habitat, and potential increased prevalence of invasive species. Increased traffic on existing roads, including U.S. 60 and Bill Knight Gap Road, may result in increases to travel time and travel hazards for local residents.

Construction-related emissions and dust may reduce air quality in the Proposed Action and Alternatives 1 and 2 areas due to increases in PM10 (particulate matter that is 10 micrometers or less in size). PM10 can reduce visibility and negatively affect health. The potential consequences of these impacts vary by location and would be relatively low in the area due to the existing good air quality and low population density. Total groundwater pumping withdrawals for dust control and concrete production represent a small percentage of depletion and is unlikely to affect the overall groundwater supply. Habitat areas disturbed by the BLWP construction may be more susceptible to invasive species, the treatment of which may have potential costs to landowners or public agencies. The seasonal recreation use (closest sensitive noise receptor) in proximity to the Proposed Action and Alternatives 1 and 2 areas would not be expected to experience construction or operation noise impacts based on the distance from the nearest turbine.

Local residents and visitors that recreate in the Proposed Action and Alternatives 1 and 2 areas may be affected by construction activities. Construction of the BLWP may potentially impact the value of the recreation experience for visitors and residents; hunters would be deterred from the Proposed Action and Alternatives 1 and 2 areas during the five- to six-month construction period. Short-term impacts would include the loss of access to wildlife for hunting and/or viewing opportunities, as well potential dispersal of wildlife (including sensitive species) from the area during construction of the BLWP. The

effect on recreationists, specifically hunters, is expected to be limited, as recreation use in the BLWP area is estimated to be relatively low (NM Department of Game and Fish 2018).

As described in the visual resources section (refer to Section 3.9 Visual Resources), some of the residents in the Red Hill/Cimarron Ranch Subdivision would have unobstructed views of all of the BLWP turbines.

Operations and Maintenance

The type of expected impacts on quality of life for local residents during O&M would be similar to impacts in the construction period, but effects to some nonmarket values would be smaller in magnitude due to reduced activity in the Proposed Action and Alternatives 1 and 2 areas (and associated lower emissions and traffic). Impacts on habitat and recreation would likewise be less, as less area would be disturbed by BLWP-related O&M activities compared to construction activities. The potential increase in the number and quality of public routes constructed by the BLWP could be perceived as a positive impact for recreationists and hunters. Sensitive wildlife species that were dispersed during construction may return to the area as the restoration of disturbed areas is completed. However, the presence of the wind turbines and associated increase in sustained human activity over the life of the project would negatively impact the public's opportunity for watching wildlife and harvesting game species.

The visibility of wind turbines to residents and recreationists in and near the BLWP area would impact the scenic values and recreation experience as compared to existing conditions. As noted in the visual resource analysis (refer to Section 3.9 Visual Resources), the presence of the wind turbines would alter the existing character of the landscape, lower the scenic quality, and create strong visual contrast in the setting. For these reasons, the impact to nonmarket values associated with scenic values from the O&M of the BLWP would be a long-term major negative impact.

Decommissioning

Decommissioning activities would cause temporary, localized disturbances similar to those described under the Construction section above. It is anticipated that impacts to nonmarket values would be relatively minor as the decommissioning period is temporary.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, the BLM recommends one additional measure to avoid and/or minimize negative impacts to social and economic conditions from the Proposed Action or Alternatives 1 and 2:

- Thirty days prior to commencing construction, the contractor would post a construction schedule along Bill Knight Gap Road and where dictated by the BLM SFO to alert hunters of upcoming construction vehicle traffic and activities.

3.4 Transportation and Travel Management

This section discusses effects to transportation and travel management that may occur with the implementation of the Proposed Action, Alternatives 1 and 2, and the No Action Alternative.

3.4.1. Affected Environment

Access to the BLWP area is from U.S. 60, a two-lane paved highway. U.S. 60 is classified as a principal arterial; it serves statewide travel, links urban areas, and provides mobility through rural areas (Federal Highway Administration 2017, NMDOT 2015). Approximately 187.7 miles of unimproved and improved unpaved routes within the BLWP area provide access for the public and private landowner vehicles

(BLM 2018b). Bill Knight Gap Road is an improved, unpaved route that runs along the eastern portion of the BLWP area and provides access to the Gila National Forest and to the community of Luna, NM from U.S. 60. In addition, there are several utility lines in the BLWP area that have unimproved access roads to provide access for periodic routine inspections, maintenance, and repairs. Other known users of these unimproved routes are hunters and local landowners. Overall, vehicle volume is relatively low due to the rural nature of the area.

The BLM designates the public lands it administers as open, limited, or closed to OHVs. Additionally, the SFO RMP identifies that land classified as 'limited' can either be limited to existing or designated routes. The BLM objectives for OHV management are to protect the resources of public lands, promote the safety of all users of those lands, and minimize conflicts among the various uses of those lands (BLM 2010). All BLM land in the BLWP area is classified for OHV use as limited to designated routes. During the planning process for the SFO RMP, a definitive route inventory and route designation could not be completed except for in the WSA. Until the final travel management network is established, motorized travel is limited to designated routes within the BLM's Planning Area, unless specifically identified otherwise.

3.4.2. Environmental Consequences

Any roads constructed by the alternatives would be built to the BLM Gold Book Standards, minimally, and in compliance with the BLM Roads Design Handbook 9113-1 (DOI and U.S. Department of Agriculture 2007, BLM 2011).

3.4.2.1 Direct and Indirect Impacts of the Proposed Action

Construction

The Proposed Action is estimated to generate a peak of approximately 500 trips per day on U.S. 60 (based on 160 construction personnel and 50 delivery trucks leaving and entering the BLWP site). During construction, 48.0 miles of roadway would be necessary, including 6.8 miles of existing road and 41.2 miles of new road. A Road Design, Traffic, And Transportation Plan would be prepared by Borderlands Wind, LLC and included in the BLWP POD. Temporary traffic delays would occur during the construction of improvements to U.S. 60. An increase in travel time for U.S. 60 motorists would also occur because of the presence of slower moving construction vehicles and an increase in the number of delivery trucks and workers' vehicles. Construction of the Proposed Action is estimated to take up to 6 months with construction crews working 8- to 12-hour work days, 6 days per week (Borderlands Wind, LLC 2019). These traffic delays would result in minor impacts to local traffic during construction activities.

The Proposed Action area currently contains approximately 24.0 miles of BLM-designated open routes that would be closed intermittently during construction. Any of the new access roads constructed for the Proposed Action would be open to public use after construction. It is not known if there would be an increase in vehicle traffic from the public interested in viewing the wind farm construction, but all vehicle traffic would be limited in the same manner during construction (Borderlands Wind, LLC 2019).

Operation and Maintenance

The total length of access roads for O&M of the 40 proposed turbines would be less than 48.0 miles (6.8 miles of existing road and 41.2 miles of new road), which would be the total mileage needed to support all 46 permitted turbine locations. Following construction, the addition of new access roads would provide access for dispersed recreation, hunting, and livestock management because motorized (and non-motorized) vehicle access would be allowed on new roads established in the BLWP area, except within the fenced areas for the switchyard, substations, and O&M building. Improved access within the Proposed Action area could create opportunities for unauthorized OHV use on previously

inaccessible areas of BLM lands. While new access roads could provide a local impact from the increase in available travel routes, additional unauthorized OHV use could indirectly affect travel and transportation in these areas.

Decommissioning

Decommissioning activities would cause temporary disturbances similar to those described under the Construction section above. These activities would require coordination similar to that performed during construction where the activities under the Proposed Action would overlap existing road uses. Decommissioning the facility would require removing all unnecessary roads built to serve the facility and removing the aggregates, re-contouring the surface, and seeding until native species become re-established. Oversized loads and slow-moving equipment on roads within the Proposed Action area and along U.S. 60 could result in temporary delays for local motorists. If access roads are left in place, they would continue to provide access for recreational users (e.g., hunters), as well as for livestock management.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to minimize impacts to transportation and travel management from the Proposed Action are recommended.

3.4.2.2 Direct and Indirect Impacts of the Alternatives 1 and 2

Construction

During the construction of Alternatives 1 and 2, 46.6 miles of roadway would be necessary including 6.8 miles of existing road and 39.8 miles of new road. The Alternative 1 and 2 area currently contains approximately 24.9 miles of BLM-designated open routes that would be closed intermittently during construction. Alternative 1 is expected to generate the same peak number of construction vehicle trips per day on U.S. 60 and create the same level of impact from construction traffic delays for motorists as the Proposed Action since the same number of turbines would be constructed in both alternatives and the construction period would be the same as well. With six less turbines being constructed for Alternative 2 as compared to the Proposed Action and Alternative 1, Alternative 2 would generate a slightly lower number of construction vehicle trips per day on U.S. 60 and a shorter construction timeframe by up to two weeks. Alternative 2 would also slightly decrease the temporary traffic delays as compared to the Proposed Action and Alternative 1 because there would be fewer construction vehicles, delivery trucks, and workers' vehicles. Potential traffic delays along U.S. 60 from the construction of the acceleration and deceleration lanes on the highway would be the same for all alternatives. These traffic delays along U.S. 60 for all alternatives would result in minor impacts to local traffic during construction activities.

As stated in the Proposed Action, it is not known if there would be an increase in vehicle traffic from the public interested in viewing the wind farm construction, but all vehicle traffic would be limited in the same manner during construction for all alternatives (Borderlands Wind, LLC 2019).

Operation and Maintenance

The exact number of miles of access roads (new or existing that would be used for O&M of the facility) for each of the alternatives is not known since the selection of the final turbine locations would be made during construction to account for specific site conditions. In general, Alternative 1 would provide the same amount of access for dispersed recreation, hunting, and livestock management as the Proposed Action because motorized (and non-motorized) vehicle access would be allowed on new roads established in the BLWP area, except within the fenced areas for the switchyard, substations, and O&M building. Comparatively, the level of access for recreation, hunting, and livestock management would be

less in Alternative 2. For all alternatives, the new access roads would provide a local impact from the increase in available travel routes.

Decommissioning

The impacts from decommissioning activities as described for the Proposed Action would be the same or similar for Alternatives 1 and 2. Alternative 2 would have six fewer turbines, so the timeframe to complete the decommissioning would be slightly less compared to the Proposed Action and Alternative 1.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to minimize impacts to transportation and travel management from Alternatives 1 and 2 are recommended.

3.4.2.3 Direct and Indirect Impacts of the No Action Alternative

The No Action Alternative would result in no change to the existing transportation and travel network; therefore, no impacts would occur to those resources.

3.5 Cultural Resources

The classification of a “cultural resource” for purposes of the BLWP EIS includes all districts, sites, buildings, structures, objects, and landscapes that have been created by or are associated with humans and are considered to have historical or cultural value. This section of the EIS discusses the presence of cultural resources within the BLWP area and the impacts that the Proposed Action, Alternatives 1 and 2, and the No Action Alternative would have on those resources. The analysis area consists of the area of potential effects (APE), which is a geographic area or areas in which cultural resources may be directly or indirectly affected by the BLWP. The APE for the BLWP was defined by the BLM in consultation with the NM State Historic Preservation Office (SHPO) and other consulting parties, including Native American Tribes.

3.5.1. Affected Environment

3.5.1.1 Cultural Setting

Paleoindian Tradition (ca. 10,000–5500 BC)

The Paleoindian tradition dates from roughly 12,200 BC to approximately 5500 BC. In the Southwest, Paleoindian sites are identified by distinctive projectile points that have been recovered in association with the remains of large Pleistocene mammals. Paleoindians were highly mobile and low population densities prevailed. As a result, Paleoindian sites are rare and have low archaeological visibility. Evidence for Paleoindian use in west-central NM near the BLWP area is also rare, although a small number of Paleoindian points have been documented at sites in the Quemado area (Gerow 1994) and a number of Paleoindian sites have been found on the Plains of San Augustin east of the BLWP area (Jenks and Leckman 2009).

Archaic Tradition (ca. 5500 BC–AD 200)

Spanning roughly 6,000 years, the Archaic tradition is generally divided into three distinct periods: the Early (5500–3200 BC), Middle (3200–1800 BC), and Late Archaic (1800 BC–AD 200). Overall, the Archaic period is characterized by three broad demographic and settlement trends: population growth, decreases in residential mobility, and economic intensification. Archaeologically, these trends are evidenced by an increase in the frequency and density of sites, the appearance of structures and storage pits, the increasing regionalization of artifact styles, and the appearance and spread of ground-

stone implements and domesticated maize. Artifacts and features associated with subsistence intensification also appear and include pit ovens, knives, scrapers, drills, perforators, and stemmed and notched projectile points.

Archaic populations exhibited a fair amount of diversity across western NM, as local populations adapted to a wide variety of terrain, climates, and resources. A number of Archaic sites have been recorded in the general area between and around Reserve and Quemado, including more than 50 from the Salt River Project (Hogan 1985) north of Quemado, a number from the Largo and Agua Fria drainages (Kayser 1972, 1973), almost a dozen from the Chihuahua Lake and Tularosa Canyon areas (Fowler 1990), and 21 sites in the White Snake Burn Project immediately to the south of the BLWP area (Jenks and Leckman 2009). Many of the known Archaic-period sites in the vicinity of the BLWP area are located on low ridges and date to the Early and Middle Archaic periods.

Formative Period (ca. AD 200–1600)

The Formative period in the Southwest is characterized by an increased reliance on agricultural subsistence, increasing populations, decreasing mobility, and the introduction and adoption of ceramic technology. The BLWP area lies along the intersection of two major Formative-period Southwestern cultural traditions: the Ancestral Puebloan to the north and the Mogollon to the south. In the area near Quemado and surrounding the BLWP area, both Mogollon and Ancestral Puebloan sites have been identified. Mogollon and Ancestral Puebloan sites in this region are typically distinguished primarily by their differences in pottery technology (brown ware ceramics and white or grey ware ceramics, respectively) and architectural features, although other attributes such as site layout, burial practices, and cradleboard technology have also been used to differentiate the two traditions (Jenks and Leckman 2009). Within west-central NM, the Formative period is divided into several periods: Basketmaker II (AD 1–500), Basketmaker III–Pueblo I (AD 500–900), Pueblo II (AD 900–1100), Pueblo III (AD 1100–1300), and Pueblo IV (AD 1300–1600).

Generally speaking, the Basketmaker II period is characterized by pre-ceramic communities of atlatl-using, basket-making horticulturalists (Kidder 1927; Matson 1991). Few sites in the west-central NM have been dated to the Basketmaker II period. A handful of pre-ceramic agricultural sites have been excavated in the region (ZCRE 2000), as well as a few Archaic sites that may include early Basketmaker components (Jenks and Leckman 2009).

The Basketmaker III and Pueblo I periods are distinguished from the Late Archaic and Basketmaker II periods by the rapid proliferation of ceramics and the appearance of black-on-white painted pottery. A small number of Basketmaker III period sites have been investigated in the area around the BLWP and near Quemado (Danson 1957), which lies approximately 25 miles northeast of the BLWP area. Some of these sites contain attributes of both Mogollon and Ancestral Puebloan traditions (Bullard 1962). Pueblo I-period Ancestral Puebloan sites were recorded on Mariana Mesa north of Quemado and Mogollon sites were recorded just to the south of Quemado.

The Pueblo II period saw a shift from pit structures to aboveground habitations and an increased quantity of decorated pottery and corrugated vessels (Jenks and Leckman 2009). Over one hundred Pueblo II-period Ancestral Puebloan/Mogollon sites have been recorded on Mariana Mesa (Danson 1957). Ancestral Puebloan sites have been recorded in large numbers around Quemado (Gerow 1994; Hogan 1985). Several large sites have been identified to the north of the BLWP area, including Cox Ranch Pueblo and Cerro Pomo (Duff 2003; Duff and Robinson 2004). Pueblo II-period Mogollon sites have also been identified east of the BLWP area near Largo Creek (Kayser 1973) and Tularosa Canyon (Fowler 1990), as well as further south near Reserve (Bluhm 1957; Martin and Rinaldo 1950; Martin et al. 1949).

The Pueblo III period is characterized by distinctive, regional ceramic types, increased site size (most having at least 20 masonry rooms), and larger and more elaborate public architecture (Danson 1957; Hogan 1985; Jenks and Leckman 2009). To the north of the BLWP area, large sites such as Goesling Ranch Pueblo are known (Duff 2002). Although several large villages were occupied at the end of Pueblo III in the Quemado area, all were abandoned by about AD 1350 (Lekson 1996). In the Reserve area to the south, prehistoric populations had entirely abandoned the area by AD 1300. It is likely that the inhabitants of the lands around the BLWP area relocated north to the Zuni and El Morro areas (Gerow 1994).

Historic Tradition

After AD 1350, west-central NM was not used for permanent habitation until AD 1850. Archaeological remains from this 500-year-long period are rare, although oral traditions and a few artifacts tell of the use of the region for resource procurement by several Native American groups (Van West and Greenwald 2005). Historical-period use of the BLWP area and its surrounding vicinity was by Western Pueblo, Navajo, and Apache groups, as well as Hispanic and Anglo ranchers (Jenks and Leckman 2009). Sites associated with Pueblo, Navajo, and Apache groups have been identified in the Quemado area. Such sites often consist of historical-period pottery, petroglyphs, temporary camp sites, hogans, and historic trails associated with travel to the Salt Lake (Van West and Greenwald 2005). Euro-American settlement in the Quemado area did not occur until the late 1800s and the initial settlement was largely by Hispanic shepherders, which was soon followed by Anglo ranchers (Gerow 2003). By the late 19th century, Hispanic shepherders and Anglo cattle ranchers began to file for homesteads in the Quemado area (Merlan 2010). Homesteading increased after the passage of the Stock-Raising and Homestead Entry Act of 1916 (Gerow 2003) and more settlers came in the later 1920s and 1930s, many of them farmers escaping the “Dust Bowl” (Vogt 1955). Detailed discussions pertaining to the Hispanic settlement of west-central NM can be found in Wozniak (1985), Kelley (1988), and Gerow (2003).

3.5.1.2 Area of Potential Effects

The APE for direct and indirect physical effects applies to all land ownership types within the BLWP area. The APE for visual effects is defined as areas visible within 5 miles of any project component or to the visual horizon, whichever is closer. The APE for visual effects is based upon the BLM’s method of subdividing landscapes for visual resource inventories into three distance zones based upon relative visibility of project components: foreground-middleground, background, and seldom seen. The foreground-middleground extends between 3 and 5 miles from the project area and is where project components might be seen in detail. Outside of 5 miles, the details, texture, and form are no longer as apparent and in some cases, atmospheric conditions can reduce visibility (BLM 1984).

The APE for direct and indirect physical effects consists of the following areas.

- **Turbines:** a minimum 500-foot radius from the center of the turbine footprint, plus areas of disturbance or surface modification (such as erosion control features or fill slopes) extending beyond 500 feet of the turbine footprint.
- **Access roads; new or improved:** a minimum of 300 feet from either side of the centerline of the roadway, plus areas of disturbance or surface modification (such as erosion control features or fill slopes) extending beyond 300 feet of the centerline of the roadway.
- **Access roads; existing, no modification:** a minimum of 100 feet from either side of the centerline of the roadway, plus areas of ground disturbance or surface modification (such as erosion control features or fill slopes) extending beyond 100 feet of the centerline of the roadway.
- **Electrical collection lines:** 200 feet from each side of the centerline of the collector trench unless placed within an area previously surveyed for access roads. Collector trenches placed on

the perimeter of the area surveyed for the access road have an additional 100-foot APE extending beyond the perimeter.

- **Associated facilities (including laydown yards, substations, the O&M facility, the batch plant, etc.):** 200 feet beyond the perimeter of the footprint of all proposed ground disturbance or surface modifications.

The incorporated buffers account for areas where potential impacts due to increased erosion and unauthorized artifact collection and vandalism might occur.

Within the APE for visual effects, archaeological sites that are significant only for their potential to yield important information generally would not be affected by changes to their visual setting, but setting might be an important element of the historical values of other types of resources, such as historic trails and roads, historic buildings and structures, and traditional cultural properties (TCPs).

3.5.1.3 Identification of Cultural Resources

A Class III systematic pedestrian survey was completed in the BLWP area and covered approximately 9 square miles (5,889.8 acres). Shovel tests were conducted on a site-only basis, as needed to determine the presence or absence of buried cultural deposits or to support or negate recommendations of its eligibility to be listed in the National Register of Historic Places (NRHP). The Pueblo of Zuni is conducting an ethnographic and ethnohistoric study to further investigate traditional Tribal cultural use of the APE and to inventory and evaluate TCPs.³ This investigation is currently in process and is anticipated to be completed by the end of 2019. The BLM will identify TCPs in the BLWP area through consultation with the Pueblo of Zuni and other tribes.

Archaeological and Historical Resources

The Class III cultural-resources inventory and a pre-field records search resulted in the identification of numerous archaeological and historical sites within the physical-effects APE and within the immediate vicinity of the physical-effects APE. Cultural resources date to the Archaic, Formative, and Historic periods. Resource types include mainly prehistoric artifact scatters, artifact scatters with associated features, and historic roads. Lithic scatters are the most abundant resources and are believed to be associated with lithic procurement, tool production, and subsistence-processing activities of mobile hunter-gatherers during the Archaic period and of agricultural groups in the Formative period. Formative-period resources include sites affiliated with both the Ancestral Puebloan and Mogollon archaeological cultures. Historic sites are rare and reflect sheep-herding and cattle-ranching activities, and roads (including a segment of U.S. 60). Out of the 128 sites in the Class III survey area, the BLM has determined that there are 40 sites eligible for inclusion in the NRHP, 52 have been determined not eligible for inclusion in the NRHP, and the NRHP-eligibility statuses of 36 sites have not been evaluated.

Cultural resources that might be subject to visual impacts to the visual setting were also identified by reviewing records available on the New Mexico Cultural Resources Information System (NMCRIS). These efforts identified 265 cultural resources within the visual-effects APE, and the majority (87 percent) are archaeological prehistoric sites such as artifact scatters and artifact scatters with features that are not sensitive to visual impacts. A review of NMCRIS data indicated that there are 28 sites with historic-age components or of unknown age with structural components; however, in all cases, these structural features consist of remains of log cabins, barns, etc. As such, their NRHP-eligibility or potential NRHP-eligibility lies in their information potential, and they are not sensitive to visual impacts to setting. Six historic-age linear structures were also identified within the visual-effects APE, including segments of historical roads. With the exception of U.S. 60, these resources are dirt

³ Ethnography is a branch of anthropology that investigates specific human cultures, and ethnohistory combines ethnography and history.

roads depicted on historical maps; some are currently abandoned while others remain in-use. The dirt roads are not sensitive to visual impacts to setting, and they have been determined to be not eligible for inclusion in the NRHP. The segment of U.S. 60 identified within the visual-effects APE has been determined to be non-contributing to the road's NRHP-eligibility, and as such, is not sensitive to visual impacts. In addition to these sites, one TCP is known in the vicinity of the BLWP area, but outside of the visual-effects APE (see discussion below).

An NHPA Section 106 Programmatic Agreement (PA) (Appendix G) is being developed by the BLM in consultation with NM SHPO, Tribes, Borderlands Wind, LLC, and other consulting parties. The PA will provide guidance on how adverse impacts to NRHP-eligible cultural resources resulting from project construction activities would be avoided, minimized, or mitigated. In order to avoid any direct or indirect impacts on NRHP-eligible cultural resources from project construction, monitoring is recommended if construction activities occur within 100 feet of these sites. The PA stipulates that a Historic Properties Treatment Plan (HPTP) that would include procedures for data recovery, site-avoidance marking, and monitoring would be prepared and implemented prior to construction. The HPTP may also include measures to minimize or mitigate visual impacts, if feasible. Additional supplemental surveys may be required as more detailed construction plans are developed and would be conducted in accordance with the PA.

Traditional Cultural Properties

The BLM is consulting with nine Tribes regarding the identification of cultural resources including TCPs. The Pueblo of Zuni conducted ethnographic research to identify cultural resources that could be impacted by the Proposed Action and Alternatives 1 and 2. The Hopi Tribe has deferred to the Pueblo of Zuni, but requested that the BLM continue to consult and provide them copies of cultural resources reports. The BLM received no other responses from the other Tribes. The BLM will continue to consult with Tribes pursuant to the PA in order to identify TCPs.

3.5.2. Environmental Consequences

This section assesses the impacts on cultural resources that would result from the construction, O&M, and decommissioning of the Proposed Action and Alternatives 1 and 2. Impacts on cultural resources are considered for those resources that are listed in the NRHP, NRHP-eligible, or potentially NRHP-eligible (i.e., those sites for which NRHP-eligibility recommendations or determinations have not been made). For the purpose of this analysis, cultural resources of indeterminate NRHP-eligibility were treated as if they were eligible for inclusion in the NRHP.

The analysis of potential impacts to cultural resources utilized the criteria defined by the regulations for Protection of Historic Properties (36 CFR Part 800), which implement Section 106 of the NHPA. An effect is defined as a direct or indirect alteration to the characteristic(s) of a cultural resource that qualify it for inclusion in the NRHP. Effects are adverse when the alterations diminish the integrity of a cultural resource's location, design, setting, materials, workmanship, feeling, or association. For cultural resources, effects could be the result of ground disturbances; visual or audible disturbances; increased erosion; or changes in public access, traffic patterns, or land use. For this EIS, there would be effects on cultural resources when a site 1) falls within the temporary disturbance footprint⁴ of the Proposed Action and Alternatives 1 and 2 and/or 2) lies outside but within a 100-foot buffer of the temporary disturbance footprint of the Proposed Action and Alternatives 1 and 2. There will be effects to cultural resources that are sensitive to visual impacts when the turbines can be seen from a site and the turbines dominate the landscape.

⁴ The temporary disturbance footprint would include the permanent disturbance footprint in the Proposed Action and Alternatives 1 and 2 (Table 2-2).

3.5.2.1 Direct and Indirect Impacts of the Proposed Action

Construction

Construction activities that disturb or excavate soils may impact cultural resources by destroying intact archaeological features of deposits. Construction activities that modify the slope of the natural terrain or compact soils have potential to increase erosion, which might affect the integrity of cultural resources. Because construction activities would comply with regulations regarding the control of stormwater discharges, there is only minor potential for increased soil erosion to damage cultural resources. Such secondary impacts would likely be confined to the immediate vicinity of construction zones.

The Proposed Action would involve the construction of new roads and improvements to existing roads. Studies have demonstrated that, in rural settings, the integrity of archaeological and historical sites near roads is much more likely to have been diminished by unauthorized artifact collection and vandalism than sites in more remote settings (Ahlstrom et al. 1992; Nickens et al. 1981; Simms 1986; Spangler 2006; Spangler et al. 2006). The impacts of unauthorized collection and vandalism vary with distances from roads, but the types and visibility of sites also are important factors. For example, historic structures are more vulnerable than artifact scatters.

The cultural resource sites that would fall within the temporary disturbance footprint (see Table 2-4) and/or the 100-foot-wide buffer of the temporary disturbance footprint of the Proposed Action are listed in Table 3-12. Assuming that all construction activities would be confined to the surveyed portion of the temporary disturbance footprint, construction of the Proposed Action would have direct impacts on a total of 29 cultural resource sites based upon available information. Some of the sites listed in Table 3-12 may be avoided through the implementation of the PA and HPTP; furthermore, additional sites may be identified that could be impacted by construction resulting from any supplemental cultural resources inventories stipulated by the PA.

Table 3-12. Cultural Resource Sites within Proposed Action Permanent and Temporary Disturbance Areas and 100-foot Temporary Disturbance Buffer

Site	Period	Site Type	NRHP-Eligibility Status	Permanent Disturbance Footprint	Temporary Disturbance Footprint	100-Foot-Wide Buffer of Temporary Disturbance Footprint
LA 130639	Prehistoric	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 179855	Historic	Road	Eligible	-	-	Yes
LA 192148	Prehistoric	Artifact Scatter	Eligible	-	Yes	Yes
LA 192151	Prehistoric	Artifact Scatter	Eligible	-	Yes	Yes
LA 192160	Unknown	Artifact Scatter	Eligible	-	-	Yes
LA 192161	Unknown	Artifact Scatter	Unevaluated	Yes	Yes	-
LA 192164	Unknown	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 192167	Prehistoric	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 192168	Unknown	Artifact Scatter	Eligible	-	Yes	Yes
LA 192173	Prehistoric	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 192176	Prehistoric	Artifact Scatter	Unevaluated	-	Yes	Yes

Site	Period	Site Type	NRHP-Eligibility Status	Permanent Disturbance Footprint	Temporary Disturbance Footprint	100-Foot-Wide Buffer of Temporary Disturbance Footprint
LA 192178	Unknown	Artifact Scatter	Eligible	-	Yes	Yes
LA 192181	Prehistoric	Artifact Scatter	Eligible	-	-	Yes
LA 192187	Unknown	Artifact Scatter	Unevaluated	-	-	Yes
LA 192193	Prehistoric	Artifact Scatter	Unevaluated	Yes	Yes	Yes
LA 192196	Prehistoric	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 192200	Prehistoric	Artifact Scatter	Eligible	-	-	Yes
LA 192201	Unknown	Artifact Scatter	Unevaluated	-	-	Yes
LA 192205	Unknown	Artifact Scatter	Eligible	-	-	Yes
LA 192206	Prehistoric	Artifact Scatter	Eligible	-	-	Yes
LA 192209	Prehistoric and Historic	Artifact Scatter and Feature	Unevaluated	Yes	Yes	Yes
LA 192211	Prehistoric	Artifact Scatter	Unevaluated	Yes	Yes	Yes
LA 192214	Unknown	Artifact Scatter	Unevaluated	-	Yes	Yes
LA 192218	Prehistoric	Artifact Scatter and Feature	Unevaluated	-	Yes	Yes
LA 192222	Unknown	Artifact Scatter	Unevaluated	Yes	Yes	Yes
LA 192223	Prehistoric	Artifact Scatter	Eligible	-	-	Yes
LA 192226	Unknown	Artifact Scatter	Eligible	Yes	Yes	-
LA 192228	Prehistoric	Artifact Scatter and Features	Eligible	-	Yes	Yes
LA 192234	Prehistoric	Artifact Scatter	Unevaluated	Yes	Yes	Yes
LA 192235	Prehistoric and Historic	Artifact Scatter	Eligible	-	-	Yes
LA 192236	Prehistoric	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 192238	Prehistoric	Artifact Scatter	Unevaluated	Yes	Yes	Yes
LA 192244	Unknown	Artifact Scatter	Unevaluated	-	Yes	Yes
LA 192246	Unknown	Artifact Scatter	Unevaluated	Yes	Yes	Yes
LA 192314	Unknown	Artifact Scatter	Unevaluated	-	-	Yes
LA 192315	Prehistoric	Artifact Scatter	Unevaluated	Yes	Yes	Yes
LA 55990	Prehistoric	Artifact Scatter	Eligible	-	-	Yes
LA 66745	Prehistoric	Artifact Scatter	Eligible	-	-	Yes

Site	Period	Site Type	NRHP-Eligibility Status	Permanent Disturbance Footprint	Temporary Disturbance Footprint	100-Foot-Wide Buffer of Temporary Disturbance Footprint
LA 66750	Unknown	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 66751	Prehistoric	Artifact Scatter	Eligible	-	Yes	Yes
LA 66752	Prehistoric	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 71685	Prehistoric	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 89082	Prehistoric	Artifact Scatter	Eligible	-	-	Yes

Table Abbreviations: NRHP = National Register of Historic Places

In addition to the 29 cultural resource sites that lie within the temporary disturbance footprint, 17 cultural resource sites are located outside but within 100 feet of the temporary disturbance footprint of the Proposed Action, and these sites could potentially be subject to indirect impacts (Table 3-12). Indirect impacts from project construction could include increased alluvial erosion at NRHP-eligible sites. These effects would be minor and short-term. Once collector-line areas have been reseeded and vegetation re-established, alluvial erosion would be considerably less; therefore, no further management is recommended. In addition, increased unauthorized visitation could indirectly affect NRHP-eligible sites as a result of the increased access to the area. Most of the NRHP-eligible sites known in the area are artifact scatters, which are less visible and less likely to attract the attention of unauthorized collectors or vandals.

The Zuni Salt Lake is not within the APE for visual effects; however, given its status as a TCP, and based upon concerns raised by the Pueblo of Zuni, potential visual effects to this important cultural resource were evaluated (see Section 3.9, Visual Resources). It was determined that the Proposed Action would not be visible from the Zuni Salt Lake. However, a portion of the blades from approximately 26 turbines would be visible from the top of the landform surrounding the Zuni Salt Lake. Due to distance (approximately 21 miles) and atmospheric conditions, the portion of the turbines visible would be visually subordinate in the landscape and would create low contrast with elements and features in the landscape. The Pueblo of Zuni has also provided two locations along a pilgrimage trail to the Zuni Salt Lake that are significant to the overall eligibility of the TCP. The first location along the pilgrimage trail is 30.3 miles from the nearest proposed turbine location in the Proposed Action. A portion of the blades of the turbines would be visible. A casual observer at this location would not likely notice the turbines because of the expansive views, variable atmospheric conditions, time of day, and variety of the landforms in the landscape. The second location along the pilgrimage trail is 20.6 miles from the nearest turbine location in the Proposed Action. No turbines would be visible from this location, because existing landforms would block any view of the turbines. No other NRHP-eligible cultural resources that are sensitive to potential visual impacts were identified within the APE for visual effects.

Operation and Maintenance and Decommissioning

Ground disturbing activities associated with O&M and decommissioning of the Proposed Action would be confined to areas in the temporary disturbance footprint created during construction of the BLWP. No additional impacts on cultural resources are expected from O&M or decommissioning activities.

Additional Measures to Avoid and/or Minimize Impacts

Adverse impacts to NRHP-eligible cultural resources resulting from construction of the Proposed Action would be mitigated in accordance with the project NHPA Section 106 PA (see Appendix G). To avoid any direct or indirect impacts on these sites from project construction, monitoring is recommended if construction activities occur within 100 feet of these sites. The PA stipulates that an HPTP, which

would include procedures for data recovery, site avoidance marking, and monitoring, would be prepared and implemented prior to construction. The HPTP may also include measures to minimize or mitigate visual impacts, if feasible. Additional supplemental surveys may be required as more detailed construction plans are developed and would be conducted in accordance with the PA.

3.5.2.2 *Direct and Indirect Impacts of Alternatives 1 and 2*

Construction

Alternatives 1 and 2 were developed, in part, to minimize impacts to cultural resources. The types of direct and indirect impacts on cultural resource sites associated with Alternatives 1 and 2 would be similar to the impacts from the Proposed Action although the number of potential sites affected would be different for each alternative. The cultural resource sites listed in Table 3-13 are those that may be impacted by Alternatives 1 and 2 based upon current information. Some of the sites listed in Table 3-13 may be avoided through the implementation of the PA and HPTP; furthermore, additional sites may be identified that could be impacted by construction resulting from any supplemental cultural resources inventories stipulated by the PA. Based upon current information, a total of eight cultural resource sites lie within the temporary disturbance footprint of Alternative 1 and nine in Alternative 2. In addition, 13 cultural resource sites are located outside but within 100 feet of the temporary disturbance footprints of Alternatives 1 and 2 (Table 3-13). Indirect effects from construction of Alternatives 1 and 2 would be the same as those indirect effects resulting from the Proposed Action. Visual impacts to the Zuni Salt Lake and the two locations on the pilgrimage trail would be the same as the impacts associated with the Proposed Action.

Table 3-13. Cultural Resource Sites within Alternatives 1 and 2 Permanent and Temporary Disturbance Areas and 100-foot Temporary Disturbance Buffer

Site	Period	Site Type	NRHP-Eligibility Status	Permanent Disturbance Footprint	Temporary Disturbance Footprint	100-Foot-Wide Buffer of Temporary Disturbance Footprint
LA 130639	Prehistoric	Artifact Scatter	Eligible	-	Yes	Yes
LA 179855	Historic	Road	Eligible	Yes	Yes	Yes
LA 192151	Prehistoric	Artifact Scatter	Eligible	-	Yes	Yes
LA 192161	Unknown	Artifact Scatter	Unevaluated	-	-	Yes
LA 192167	Prehistoric	Artifact Scatter	Eligible	-	-	Yes
LA 192176	Prehistoric	Artifact Scatter	Unevaluated	-	-	Yes
LA 192203	Prehistoric	Artifact Scatter	Eligible	-	-	Yes
LA 192206	Prehistoric	Artifact Scatter	Eligible	-	Yes	Yes
LA 192209	Prehistoric and Historic	Artifact Scatter and Feature	Unevaluated	Yes	Yes	-
LA 192218	Prehistoric	Artifact Scatter and Feature	Unevaluated	-	-	Yes
LA 192222	Unknown	Artifact Scatter	Unevaluated	Yes	Yes	Yes
LA 192223	Prehistoric	Artifact Scatter	Eligible	-	-	Yes

Site	Period	Site Type	NRHP-Eligibility Status	Permanent Disturbance Footprint	Temporary Disturbance Footprint	100-Foot-Wide Buffer of Temporary Disturbance Footprint
LA 192228	Prehistoric	Artifact Scatter and Features	Eligible	-	-	Yes
LA 192234	Prehistoric	Artifact Scatter	Unevaluated	-	-	Yes
LA 192235	Prehistoric and Historic	Artifact Scatter	Eligible	-	-	Yes
LA 192236	Prehistoric	Artifact Scatter	Eligible	Yes	Yes	Yes
LA 192238	Prehistoric	Artifact Scatter	Unevaluated	Yes	Yes	-
LA 192246	Unknown	Artifact Scatter	Unevaluated	-	-	Yes
LA 192314	Unknown	Artifact Scatter	Unevaluated	-	Yes (Alternative 2 only)	Yes
LA 55990	Prehistoric	Artifact Scatter	Eligible	-	-	Yes
LA 66746	Unknown	Artifact Scatter	Eligible	-	-	Yes
LA 89082	Prehistoric	Artifact Scatter	Eligible	-	-	Yes

Table Abbreviations: NRHP = National Register of Historic Places

Operation and Maintenance and Decommissioning

Ground disturbing activities associated with O&M and decommissioning activities associated with Alternatives 1 or 2 would be confined to areas in the temporary disturbance footprint created during construction. No additional impacts on NRHP-eligible cultural resources are expected from O&M or decommissioning activities.

Additional Measures to Avoid and/or Minimize Impacts

Adverse impacts to NRHP-eligible cultural resources resulting from construction of Alternatives 1 and 2 would be mitigated in accordance with the project NHPA Section 106 PA (see Appendix G). To avoid any direct or indirect impacts on these sites from project construction, monitoring is recommended if construction activities occur within 100 feet of these sites. The PA stipulates that an HPTP, which would include procedures for data recovery, site avoidance marking, and monitoring, be prepared and implemented prior to construction. The HPTP may also include measures to minimize or mitigate visual impacts, if feasible. Additional supplemental surveys may be required as more detailed construction plans are developed and would be conducted in accordance with the PA.

3.5.2.3 *Direct and Indirect Impacts of the No Action Alternative*

Under the No Action Alternative, the BLWP would not be constructed, and no impacts on cultural resources within the BLWP APE would occur.

3.6 Federally Listed Species

This section identifies federally listed species that have the potential to occur within the BLWP area and assesses the potential impacts on them from the Proposed Action, Alternatives 1 and 2, and the No Action Alternative. The Endangered Species Act of 1973 (ESA), as amended, protects listed species and their habitat by prohibiting a “take.” Section 7 of the ESA requires Federal agencies to ensure that

actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of their critical habitats.

3.6.1. Affected Environment

An official list of threatened, endangered, and proposed species and critical habitats that may occur within the Proposed Action area was obtained from the USFWS. A total of 13 species were included on the list. Table D-1 in Appendix D provides information on the 13 species' habitat associations and their potential to occur within the BLWP area. There is no critical habitat that has been designated or proposed for any federally listed species within the Proposed Action or Alternatives 1 and 2 areas.

The potential occurrence of federally listed species in the BLWP area was discussed during a meeting with the USFWS on March 7, 2018, and it was determined that the Mexican spotted owl and Mexican wolf could potentially occur within the BLWP area and be affected by the BLWP. There is no suitable habitat present in the BLWP area for the remaining 11 species that were included on the USFWS list, so these species were not carried forward for further analysis. A detailed description of both species and their habitat requirements is provided in the Biological Assessment for this project (BLM 2018d).

3.6.1.1 Mexican Spotted Owl (*Strix occidentalis lucida*)

The Mexican spotted owl was listed as endangered in 1995 and critical habitat was designated in 2004; a revised recovery plan was finalized in 2012 (USFWS 2012). In total, 2,089,523 acres of critical habitat were designated in 20 critical habitat units throughout NM (USFWS 2004). The nearest critical habitat unit is approximately 3.5 miles southwest of the Proposed Action area and 5.9 miles southwest of the Alternatives 1 and 2 area.

Mexican spotted owls are characterized by patchy distribution in isolated mountain ranges and canyon systems across southern Utah, Colorado, AZ, NM, western Texas, and northern Mexico. The forested mountains and canyonlands they inhabit throughout their range are broken into ten Ecological Management Units (EMUs) in the United States and Mexico (USFWS 2012). The BLWP area is located within the Upper Gila Mountains EMU. The Mexican spotted owl is highly selective in its nesting and roosting habitats, which are comprised primarily of mixed conifer forests. Migrating/wintering and dispersing Mexican spotted owls have been documented in other habitats, including sparse ponderosa pine and pinyon-juniper woodlands (USFWS 1995); topography may be an important additional component of the habitats that are used by Mexican spotted owls during dispersal.

The Proposed Action and Alternatives 1 and 2 areas do not contain closed-canopy forests with a high percentage of ground litter and woody debris, which are characteristic of preferred Mexican spotted owl foraging, roosting, and nesting habitat (USFWS 1995). Data provided by Natural Heritage New Mexico (NHNM) indicates that there are documented occurrences of Mexican spotted owl on Gila National Forest lands to the south of the BLWP area (NHNM 2017), which corresponds with the nearest suitable habitat for the species. There are Mexican spotted owl Protected Activity Centers (PACs) and designated critical habitat on the Gila National Forest; however, there are no PACs or areas of designated critical habitat within the Proposed Action or Alternatives 1 and 2 areas.

The Proposed Action and Alternatives 1 and 2 areas do not overlap with any known Mexican spotted owl home ranges or any hypothetical home range centered on the nearest sight records. Mexican spotted owls are not expected to occur within the Proposed Action or Alternatives 1 and 2 areas due to the lack of their preferred foraging, roosting, and nesting habitat. While migrating/wintering or dispersing, Mexican spotted owls are occasionally found in pinyon-juniper habitats and could occur as vagrants within the Proposed Action or Alternatives 1 and 2 areas at some point, the abundant and widespread

pinyon-juniper woodlands in the region are not limiting habitats for migrating/wintering or dispersing Mexican spotted owls. Any Mexican spotted owl occurrence in the Proposed Action or Alternatives 1 and 2 areas would be rare and sporadic at most.

3.6.1.2 Mexican Wolf (*Canis lupus baileyi*)

The Mexican wolf was listed as endangered in 1976 and the USFWS has recently revised the recovery plan for the species (USFWS 2017); no critical habitat has been proposed or designated. The Mexican wolf is the rarest, smallest, southernmost, and most genetically distinct of the five subspecies of gray wolves that once inhabited most of North America. The subspecies was reintroduced into AZ and NM under a special designation that established a “nonessential experimental population” in this area. The special designation gives agencies more flexibility in managing wolf populations and allows them to take action when there are conflicts with human activities such as ranching.

Under the reintroduction program, captive-bred Mexican wolves have been released within the Mexican Wolf Experimental Population Area (MWEPA). The BLWP area is located within the MWEPA. As of February 2019, the current documented wild population of Mexican wolves in the United States includes 64 individuals in eastern AZ and 67 in western NM based on ground and aerial surveys (USFWS 2019a). The Proposed Action area would comprise 0.39 percent of the current occupied range of the Mexican wolf; the Alternatives 1 and 2 area would comprise 0.17 percent of the species’ current occupied range (USFWS 2019b).

Suitable habitat for the Mexican wolf has few roads and minimal human development or sources of anthropogenic disturbance given the species’ tendency to avoid these elements. Mexican wolves are associated with montane woodlands characterized by sparsely to densely forested mountainous terrain consisting of evergreen oak and juniper woodlands to higher elevation pine forests, mixed conifer forests, and adjacent grasslands at mid- to high elevations where ungulate prey are abundant. The species reportedly avoids desert scrub and semi-desert grasslands that provide little cover, food, or water. The primary large prey within the BLWP area are elk and deer. Cattle, which occur throughout the BLWP area, are also targeted as prey on occasion.

The USFWS, working jointly with other State and Federal agencies, as well as the White Mountain Apache Tribe, has been collecting data, monitoring, and managing the free-ranging Mexican wolf population in AZ and NM. The Mangas wolf pack is known to occupy Gila National Forest lands south of the Proposed Action and Alternatives 1 and 2 areas based on telemetry data. Consistent with the wide-ranging movements of this species, there are a number of other packs that have been recently documented within 30 miles of the Proposed Action and Alternatives 1 and 2 areas (e.g., San Mateo, Leon, Iron Creek, Elkhorn, Hoodoo, Saffel, Single, Sierra Blanca, Frieborn, Prime Canyon, Squirrel Springs, and Copper Creek). Mexican wolves typically prefer to locate their home ranges in forested areas, near water, and far away from sources of human disturbance such as roads and farms. Passoni (2015) also found that most wolf denning and rendezvous sites were very close to or inside forested areas. Several observations of wolves in the Proposed Action and Alternatives 1 and 2 areas have been reported by a biologist conducting wildlife surveys, hunters, and a local rancher (SWCA Environmental Consultants 2018). The USFWS considers the Proposed Action and Alternatives 1 and 2 areas to be within occupied habitat for the Mexican wolf, though wolves are not known to concentrate their activities in this area and there are no known den sites in the area (Susan Pruitt, personal communication, 2018). Currently, there are high levels of wolf use and livestock depredation in the neighboring grazing allotments to the south of the Proposed Action and Alternatives 1 and 2 areas (Carlos Madril, personal communication, 2019).

3.6.2. Environmental Consequences

3.6.2.1 Direct and Indirect Impacts of the Proposed Action

Mexican Spotted Owl (*Strix occidentalis lucida*)

Construction

The Proposed Action would not impact Mexican spotted owl PACs or areas of designated critical habitat, directly or indirectly, during construction or any other phase of the project. The incidental occurrence of Mexican spotted owls in the Proposed Action area cannot be ruled out; however, the overall risk of direct impacts on the Mexican spotted owl from wind energy developments is low (USFWS 2005). Noise and visual disturbance from heavy equipment use and surface disturbance during construction of the BLWP would have a negligible impact on Mexican spotted owls due to the availability of extensive pinyon-juniper habitats in the surrounding area.

Operation and Maintenance

As noted in the USFWS's *Biological Opinion for Likely Effects of BLM's Proposed Wind Energy Development Program* (USFWS 2005), the risk of Mexican spotted owls colliding with wind turbines is extremely low because turbines are typically located outside of suitable nesting and roosting habitat. Direct effects on Mexican spotted owls from the Proposed Action are not anticipated during O&M of the proposed wind facility due to the lack of suitable Mexican spotted owl habitat in the Proposed Action area. Indirect effects on Mexican spotted owls from noise, human activity, and traffic are also not expected due to the distance to areas of suitable habitat. Although wildland fire has been identified as one of the primary threats to the species, the BLWP is not anticipated to contribute to the threat of large-scale wildfires because implementation of the *Emergency Preparedness and Response Plan* and *Fire Protection and Prevention Plan* in the BLWP POD provides fire prevention and control measures during construction, O&M, and decommissioning of the BLWP (Borderlands Wind, LLC 2019).

Decommissioning

Potential impacts during decommissioning would be similar to those described for the construction phase, though to a lesser extent. After reclamation of disturbed areas, vegetation would be restored to pre-construction conditions over the long-term. Human activity in the Proposed Action area would decrease after decommissioning and the removal of wind energy generating facilities, although activities such as hunting and ranching would continue.

Effects Determination for the Mexican Spotted Owl

The Proposed Action would not impact any Mexican spotted owl PACs or result in any loss of suitable nesting or foraging habitat. Additionally, the Proposed Action would not affect the ability of Mexican spotted owls to move through the Proposed Action area (unlikely as it may be to occur), or result in reduced prey availability. The Proposed Action could result in localized negligible impacts on Mexican spotted owls and would not have regional impacts on the Mexican spotted owl. The more detailed analysis presented in the Biological Assessment has led to the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Mexican spotted owl.

Mexican Wolf (*Canis lupus baileyi*)

Construction

Construction of the Proposed Action would result in minor habitat loss, degradation, and fragmentation for the Mexican wolf because wolves are not known to concentrate their activities in this area and there are no known den sites in the area. Construction activities would result in increased noise, human disturbance, and vehicle traffic, which could discourage adult or dispersing juvenile wolves from traveling through or foraging within the Proposed Action area. There would be localized short-term, minor impacts on Mexican wolves during the construction of the Proposed Action and no regional

impacts because of the absence of breeding habitat, the relatively short construction time frame (less than one year), and the infrequent presence of the species.

Operation and Maintenance

Similar to construction impacts, noise and disturbance associated with human activities and vehicle traffic would occur during O&M of the proposed wind facility, but to a lesser extent. The approximately 41.2 miles of new access roads within the Proposed Action area would give the public more access to the area, which would increase the potential for disturbance to Mexican wolves that may travel in the vicinity of the Proposed Action area. The Proposed Action would have minor localized impacts and no regional impacts on the Mexican wolf during the O&M phase due to the minimal use of the area by this species.

Decommissioning

Short-term localized impacts during decommissioning would be similar to those from construction because of the increase in human presence, elevated noise levels, and additional vehicles. Human activity in the Proposed Action area would decrease after decommissioning with the removal of wind energy generating facilities, although activities such as hunting and ranching would continue. Reclamation of access roads would decrease the potential for disturbance to the Mexican wolf after decommissioning of the wind facility.

Effects Determination for the Mexican Wolf

The Proposed Action would result in localized minor impacts on the Mexican wolf and would not have regional impacts on this federally listed species. The more detailed analysis presented in the Biological Assessment has led to the determination that the Proposed Action “may affect, but is not likely to adversely affect” the Mexican wolf. Mexican wolves that may occur in the Proposed Action area are part of a nonessential experimental population as characterized under Section 10(j) of the ESA, and in this context the Mexican wolf is considered a proposed threatened species for the purposes of ESA consultation. Therefore, the determination with regard to the 10(j) population is that the Proposed Action is not likely to jeopardize the continued existence of the Mexican wolf.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to avoid and/or minimize impacts on Mexican wolves from the Proposed Action are recommended.

3.6.2.2 Direct and Indirect Impacts of Alternatives 1 and 2

Mexican Spotted Owl (*Strix occidentalis lucida*)

The potential impacts of Alternatives 1 and 2 on Mexican spotted owls would be similar to the Proposed Action. Shifting the number/locations of wind turbines or other project infrastructure within the Alternatives 1 and 2 area, as proposed under Alternatives 1 and 2, would not substantially add to or reduce the potential impacts on Mexican spotted owls from construction, O&M, or decommissioning of the BLWP as compared to the Proposed Action.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to avoid and/or minimize impacts on Mexican spotted owls are recommended for Alternatives 1 or 2.

Mexican Wolf (*Canis lupus baileyi*)

The potential impacts of Alternatives 1 and 2 on the Mexican wolf would be similar to the Proposed Action. Shifting the number/locations of wind turbines or other project infrastructure within the Alternatives 1 and 2 area would not substantially add to or reduce the potential impacts on the Mexican wolf from construction, O&M, or decommissioning of the BLWP as compared to the Proposed Action.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to avoid and/or minimize impacts on Mexican wolves are recommended for Alternatives 1 or 2.

3.6.2.3 Direct and Indirect Impacts of the No Action Alternative

Under the No Action Alternative, no new impacts on the Mexican spotted owl or Mexican wolf would occur within the BLWP area. Existing impacts on federally listed species within the BLWP area are primarily associated with relatively low levels of human disturbance (e.g., ranching, hunting, and vehicle/OHV use) that could result in localized negligible impacts related to the noise and visual disturbance to Mexican spotted owls and Mexican wolves that may move through the area on occasion. The No Action Alternative would not result in regional impacts on either federally listed species because of the relatively low levels of human disturbance in the BLWP area.

3.7 Special Status Plant and Wildlife Species

This section discusses effects on special status species (excluding federally listed threatened and endangered species, which are addressed in Section 3.6 Federally Listed Species) that may occur with the implementation of the Proposed Action, Alternatives 1 and 2, and the No Action Alternative. The term special status species as used in this EIS includes BLM sensitive species along with other species of concern such as State-listed species and USFWS's Birds of Conservation Concern. Special status species that are known to occur or could potentially occur in the BLWP area include:

- BLM sensitive species
- USFS sensitive species
- Birds of Conservation Concern (BCCs)
- NM State-listed threatened and endangered species
- NM rare plants
- Species of Greatest Conservation Need (SGCN) in NM
- Species of Economic and Recreational Importance (SERI) in NM

Potential impacts on migratory birds also are discussed in detail in this section; however, impacts specifically on bald and golden eagles are discussed in Section 3.8 Bald and Golden Eagles. In addition to the consideration of impacts on migratory birds in general, the USFWS recommends that agencies evaluate the effects of their actions on BCCs (USFWS 2008). The USFWS's designation of BCCs is specific to each Bird Conservation Region (BCR); the BLWP area is located in two BCRs (BCR 16: Southern Rockies and Colorado Plateau, and BCR 34: Sierra Madre Occidental). The information presented in this section was compiled from a literature review, agency coordination, and resource reports provided by Borderlands Wind, LLC.

3.7.1. Affected Environment

There are 59 special status species (8 plant, 11 terrestrial wildlife, and 40 bat and bird species) that are known to occur or could potentially occur within the BLWP area (Table 3-14 through Table 3-16). For additional information on each of the species listed below, as well as other special status species that were initially considered but determined unlikely to occur in the BLWP area, see Table E-1 in Appendix E.

Table 3-14. BLM Sensitive Species and Other Species of Concern—Plants

Common Name	Habitat	
Scientific Name	Association	Status
Apache milkvetch <i>Astragalus nutriosensis</i>	Volcanic silty clay soils in grasslands and pinyon-juniper woodlands	NMRP SS

Common Name	Habitat	Status
Scientific Name	Association	
Bog alkaligrass <i>Puccinellia parishii</i>	Alkaline springs, seeps, and seasonally wet areas such as playas	BLM S, NM-E, NMRP E
Goodding's bladderpod <i>Lesquerella gooddingii</i>	Open pinyon-juniper woodlands and ponderosa pine forests	NMRP SS
Groundcover milkvetch <i>Astragalus humistratus</i> var. <i>crispulus</i>	Sandy, volcanic soils in pinyon juniper woodlands and ponderosa pine forest	USFS SS, NMRP SS
Mogollon Mountain draba <i>Draba mogollonica</i>	Volcanic soils on moist mountain slopes in oak-pine woodlands and mixed conifer forests	NMRP SS
White Mountain clover <i>Trifolium neurophyllum</i>	Wet meadows, springs, and riparian corridors in conifer forests	NMRP SS
Wright's catchfly <i>Silene wrightii</i>	Cliffs and rocky outcrops in ponderosa pine forests	NMRP SS
Zuni milkvetch <i>Astragalus accumbens</i> ; syn: <i>Astragalus missouriensis</i> var. <i>accumbens</i>	Alkaline soils in pinyon-juniper woodlands	NMRP SS

Table Abbreviations: BLM S = BLM sensitive species; E= Endangered; NM-E = New Mexico Endangered - Endangered species are those in jeopardy of extinction or extirpation from the state; NMRP E = New Mexico Rare Plant Endangered; NMRP SS = New Mexico Rare Plant Strategy Species; USFS SS = USFS sensitive species.

Table 3-15. BLM Sensitive Species and Other Species of Concern—Terrestrial Wildlife Species

Common Name	Species	Habitat Association	Status
Scientific Name	Type		
Arizona montane vole <i>Microtus montanus arizonensis</i>	Mammal	Wet meadows, playas, seeps, springs, and drainages with tall grass, sedges, or cattails	USFS SS, NM-E, SGCN
Black bear <i>Ursus americanus</i>	Mammal	Forests and woodlands	SERI
Cougar <i>Puma concolor</i>	Mammal	Mountainous areas with broken terrain and steep slopes in deserts, woodlands, and forests	SERI
Elk <i>Cervus canadaensis</i>	Mammal	Forests, woodlands, and grasslands	SERI
Gunnison's prairie dog <i>Cynomys gunnisoni</i>	Mammal	Grasslands and shrublands	BLM S, USFS SS, SGCN
Mule deer <i>Odocoileus hemionus</i>	Mammal	Wide range of habitats from desert scrub up to montane forests	SERI
Arizona tree frog <i>Hyla wrightorum</i>	Amphibian	Near pools and streams in ponderosa pine and mixed conifer forests	SGCN
Arizona black rattlesnake <i>Crotalus cerberus</i>	Reptile	Open, rocky slopes and rocky drainages with water in a wide range of habitats including pinyon-juniper woodlands and ponderosa pine forests	SGCN
Sonora mud turtle <i>Kinosternon sonoriense</i>	Reptile	Aquatic habitats including streams, rivers, ponds, stock tanks, and ditches in a range of habitats including desert scrub, grasslands, and pinyon-juniper woodlands	SGCN

Common Name	Species		Status
Scientific Name	Type	Habitat Association	
Monarch butterfly <i>Danaus plexippus plexippus</i>	Insect	Wide range of habitats; presence of suitable host plants (milkweeds) required for breeding.	BLM S
Clam shrimp <i>Elumnadia follisimilis</i>	Crustacean	Potentially in a wide range of aquatic habitats, has been documented in stock tanks and ponds in NM.	BLM S, SGCN

Table Abbreviations: NM-E = New Mexico Endangered - Endangered species are those in jeopardy of extinction or extirpation from the state; SERI=Species of Economic and Recreational Importance; SGCN = Species of Greatest Conservation Need - species that are indicative of the diversity and health of the state's wildlife; USFS SS = USFS sensitive species.

Table 3-16. BLM Sensitive Species and Other Species of Concern—Bird and Bat Species

Common Name	Species		Status
Scientific Name	Type	Habitat Association	
Allen's big-eared (lappet-browed) bat <i>Idionycteris phyllotis</i>	Bat	Oak woodlands, pinyon-juniper woodlands, and ponderosa pine forests; roosts in rock crevices, caves, and abandoned mines	USFS SS
Spotted bat <i>Euderma maculatum</i>	Bat	Desert scrub up to ponderosa pine and mixed conifer forests; roosts in rock crevices, cliff faces, caves, and buildings	BLM S, NM-T, SGCN
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	Bat	Desert scrub up to ponderosa pine and mixed conifer forests; roosts in caves, mines, buildings, and tree cavities	BLM S, USFS SS, SGCN
Bendire's thrasher <i>Toxostoma bendirei</i>	Bird	Desert scrub, shrubland, grassland, and pinyon-juniper woodland	BLM S, BCC (BCR 16, 34), SGCN
Black-chinned sparrow <i>Spizella atrogularis</i>	Bird	Shrublands and chaparral	BCC (BCR 34), SGCN
Black-throated gray warbler <i>Setophaga nigrescens</i>	Bird	Pine-oak woodlands, pinyon-juniper woodlands, and ponderosa pine forests	BCC (BCR 34), SGCN
Brewer's sparrow <i>Spizella breweri</i>	Bird	Desert scrub, shrublands, pinyon-juniper woodlands, and ponderosa pine forest	BCC (BCR 16)
Canyon towhee <i>Melospiza fusca</i>	Bird	Desert grasslands, pinyon-juniper woodlands, and pine-oak forests	BCC (BCR 34)
Cassin's finch <i>Haemorhous cassinii</i>	Bird	Pinyon-juniper woodlands, ponderosa pine forests, and mixed conifer forests	BCC (BCR 16), SGCN
Cassin's sparrow <i>Peucaea cassinii</i>	Bird	Grasslands	SGCN
Chestnut-collared longspur <i>Calcarius ornatus</i>	Bird	Grasslands	BLM S, BCC (BCR 16, 34), SGCN
Clark's nutcracker <i>Nucifraga columbiana</i>	Bird	Pinyon-juniper woodlands, ponderosa pine forests, and mixed conifer forests	SGCN
Common nighthawk <i>Chordeiles minor</i>	Bird	Grasslands, shrublands, and open woodlands	SGCN
Eared grebe <i>Podiceps nigricollis</i>	Bird	Shallow lakes and ponds	SGCN
Elf owl <i>Micrathene whitneyi</i>	Bird	Desert woodlands, oak woodlands, pinyon-juniper woodlands, and riparian forest	BCC (BCR 34), SGCN

Common Name	Species		Status
Scientific Name	Type	Habitat Association	
Evening grosbeak <i>Coccothraustes vespertinus</i>	Bird	Pine-oak woodlands, pinyon-juniper woodlands, ponderosa pine forests, and mixed conifer forests	SGCN
Ferruginous hawk <i>Buteo regalis</i>	Bird	Grasslands, shrublands, pinyon-juniper woodlands, and sparse riparian forests	BCC (BCR 16)
Flammulated owl <i>Psiloscops flammeolus</i>	Bird	Ponderosa pine forests	BCC (BCR 16, 34), SGCN
Grace's warbler <i>Setophaga graciae</i>	Bird	Pine-oak, ponderosa pine, and mixed conifer forests	BCC (BCR 16, 34), SGCN
Gray vireo <i>Vireo vicinior</i>	Bird	Chaparral and pinyon-juniper woodlands	BCC (BCR 16, 34), USFS SS, NM-T, SGCN
Juniper titmouse <i>Baeolophus ridgwayi</i>	Bird	Pinyon-juniper woodlands	BCC (BCR 16), SGCN
Lark bunting <i>Calamospiza melanocorys</i>	Bird	Grasslands and shrublands	BCC (BCR 34)
Lewis's woodpecker <i>Melanerpes lewis</i>	Bird	Pinyon-juniper woodlands, ponderosa pine forests, and riparian forests	BCC (BCR 16, 34), SGCN
Loggerhead shrike <i>Lanius ludovicianus</i>	Bird	Desert scrub, shrubland, woodlands and riparian areas	SGCN
Long-billed curlew <i>Numenius americanus</i>	Bird	Short-grass prairie and wetlands	BCC (BCR 16), SGCN
McCown's longspur <i>Calcarius mccownii</i>	Bird	Short-grass plains and prairies, agricultural fields, and desert scrub	BLM S, SGCN
Mexican whip-poor-will <i>Antrostomus arizonae</i>	Bird	Pine-oak, pine-juniper-oak, and ponderosa pine woodlands	BLM S, SGCN
Mountain bluebird <i>Sialia currucoides</i>	Bird	Grasslands, shrublands, and pinyon-juniper woodlands	SGCN
Mountain plover <i>Charadrius montanus</i>	Bird	Shortgrass prairie and fallow or recently tilled agricultural fields	BCC (BCR 16, 34), SGCN
Northern goshawk <i>Accipiter gentilis</i>	Bird	Ponderosa pine forests	USFS SS
Olive-sided flycatcher <i>Contopus cooperi</i>	Bird	Open conifer forests	SGCN
Peregrine falcon <i>Falco peregrinus</i>	Bird	Cliffs and open landscapes	BCC (BCR 16, 34), USFS SS, NM-T, SGCN
Pinyon jay <i>Gymnorhinus cyanocephalus</i>	Bird	Pinyon-juniper woodlands	BLM S, BCC (BCR 16, 34), SGCN
Pygmy nuthatch <i>Sitta pygmaea</i>	Bird	Ponderosa pine and mixed conifer forests	SGCN
Red-faced warbler <i>Cardellina rubrifrons</i>	Bird	Pine-oak, ponderosa pine, and mixed conifer forests	BCC (BCR 34), SGCN

Common Name	Species		
Scientific Name	Type	Habitat Association	Status
Vesper sparrow <i>Pooecetes gramineus</i>	Bird	Grasslands, shrublands, and woodlands	SGCN
Virginia's warbler <i>Oreothlypis virginiae</i>	Bird	Pinyon-juniper and oak woodlands	BLM S, SGCN
Western bluebird <i>Sialia mexicana</i>	Bird	Grasslands, pinyon-juniper woodlands, ponderosa pine forests, and mixed conifer forests	SGCN
Western burrowing owl <i>Athene cunicularia</i>	Bird	Sparsely vegetated grassland, steppe, and desert biomes	BLM S, BCC (BCR 16), USFS SS, SGCN
Williamson's sapsucker <i>Sphyrapicus thyroideus</i>	Bird	Pine-oak woodlands, pinyon-juniper woodlands, ponderosa pine forests, mixed conifer forests, and riparian forests	SGCN

Table Abbreviations: BCC = Birds of Conservation Concern; BCR 16 = Bird Conservation Region 16 Southern Rockies/Colorado Plateau; BCR 34 = Bird Conservation Region 34 Sierra Madre Occidental; BLM S = BLM sensitive species; NM-T = New Mexico Threatened - Threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of their range in the state; SERI = Species of Economic and Recreational Importance; SGCN = Species of Greatest Conservation Need - species that are indicative of the diversity and health of the state's wildlife; USFS SS = USFS sensitive species.

3.7.1.1 Ecological setting

The BLWP area is located within the AZ–NM Mountains Ecoregion, which is a rugged landscape that is dominated by forested mountains and plateaus, but also includes grasslands, shrublands, and riparian forests (Bell et al. 1999). The topography in the BLWP area is primarily characterized by hills and rolling plains; however, a narrow, linear escarpment, rocky outcrops, and a depression/crater are located in the northeastern portion of the site.

Vegetation in the BLWP area consists of sparsely vegetated short-grass grassland interspersed with rock outcrops in the northeastern portion, which transitions to semi-desert grassland/shrub steppe/juniper savanna with scattered and locally dense patches of pinyon-juniper woodland in the central and southern portions. Ponderosa pine trees are intermixed with the pinyon-juniper and grassland habitat in the southern portion of the BLWP area. Ponderosa pine forest occurs on the mountainous terrain to the south of the BLWP area within the Gila National Forest. Dominant plant species within the BLWP area include blue grama, broom snakeweed, rubber rabbitbrush, one-seed juniper, and two-needle pinyon pine.

General land cover types that have been identified in the Proposed Action and Alternatives 1 and 2 areas for the purpose of evaluating potential impacts on special status wildlife habitat include shrubland, grassland, pinyon-juniper woodland, cliff/rock outcrop, playa, and emergent herbaceous wetland (Table 3-17; Figure 3-8 and Figure 3-9). The shrubland, grassland, and pinyon-juniper woodland in the Proposed Action and Alternatives 1 and 2 areas occur throughout the region and are well represented in the surrounding area. The cliff/rock outcrop areas are much less common in the region; these areas are used as nesting substrates for raptors and also provide roosting habitat for many bat species. There are many Gunnison's prairie dog colonies that provide an abundant food source for raptors in the Proposed Action and Alternatives 1 and 2 areas.

Table 3-17. Land Cover Types within the Proposed Action and Alternatives 1 and 2 Areas

Land Cover Type	Proposed Action Area (acres/percent)	Alternatives 1 and 2 Area (acres/percent)
Shrubland	28,448/65%	12,121/64%
Grassland	11,255/26%	4,144/22%
Pinyon-Juniper Woodland	3,577/8%	2,612/14%
Playa	125/<1%	20/<1%
Bare Ground/Cliff/Rock Outcrop	119/<1%	9/<1%
Emergent Herbaceous Wetland	4/<1%	0/0
Total	43,528	18,907

Note: Based on the National Land Cover Database (Homer et al. 2011)

There are 20 “playas of wildlife value” within the Proposed Action area, along with a number of stock tanks; there are 2 “playas of wildlife value” within the Alternatives 1 and 2 area along with six or more stock tanks in each of the alternative areas. Most of these playas are seasonally wet areas and less than 3 acres in size when full. Four playas are larger—up to 220 acres in size when full—and provide water sources for wildlife, as well as temporary habitats for waterfowl and shorebirds. The playas are considered riparian habitats by the BLM, though they are generally vegetated with the same species as the surrounding areas.

3.7.1.2 Results of Site Investigations

Various site investigations have been conducted to characterize plant and animal populations and patterns of use in the Proposed Action and Alternatives 1 and 2 areas. The results of these site investigations have been used to help inform siting decisions and various plans, including a project-specific Bird and Bat Conservation Strategy that would be implemented as part of the selected alternative (Borderlands Wind, LLC 2019).

Special Status Plants

A 100 percent survey for special status plant species was conducted within the disturbance footprint for the Proposed Action and Alternatives 1 and 2 in July and August 2018. Although there are previously documented occurrences of Apache milkvetch within the Proposed Action and Alternatives 1 and 2 areas, and in the surrounding area, none of the eight special status plants that could potentially occur within the Proposed Action area were observed within the project footprint during the 2018 survey. It is possible that one or more special status plant species could be found within the project footprint at a later date given that environmental conditions such as drought can affect germination and growth in any particular year, and there was little precipitation in the region leading up to the 2018 survey.

Gunnison’s Prairie Dog Colonies

Gunnison’s prairie dogs form loosely organized colonies and restrict most of their interactions to family groups, with minimal spatial overlap or interaction with members of different family groups.

A Gunnison’s prairie dog colony may contain 15–26 family groups. The Gunnison’s prairie dog colonies within the Proposed Action area, along with other prairie dog colonies that may exist in the surrounding area, comprise the local population for the purposes of analysis in this EIS.

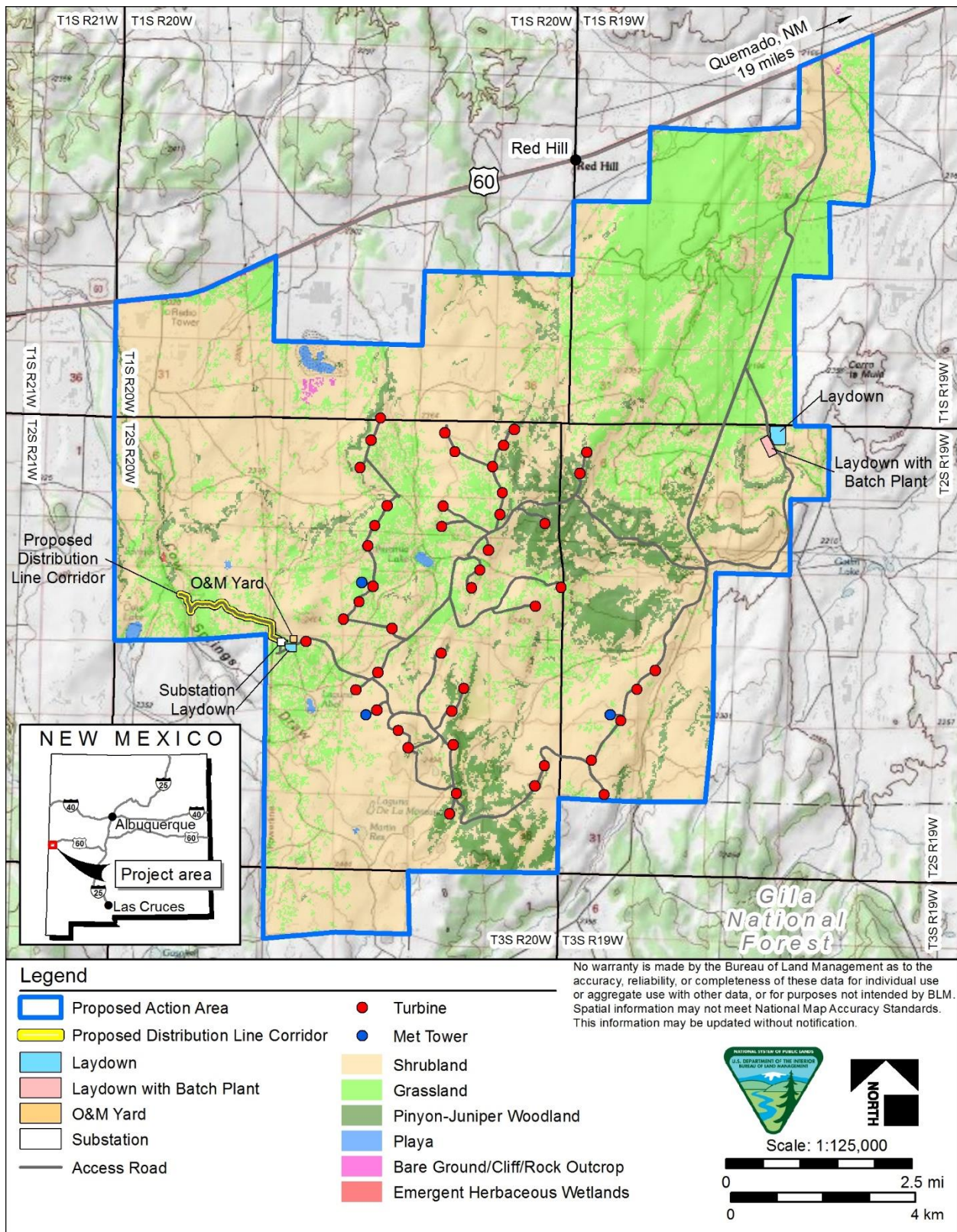


Figure 3-8. Land Cover Types within the Proposed Action Area

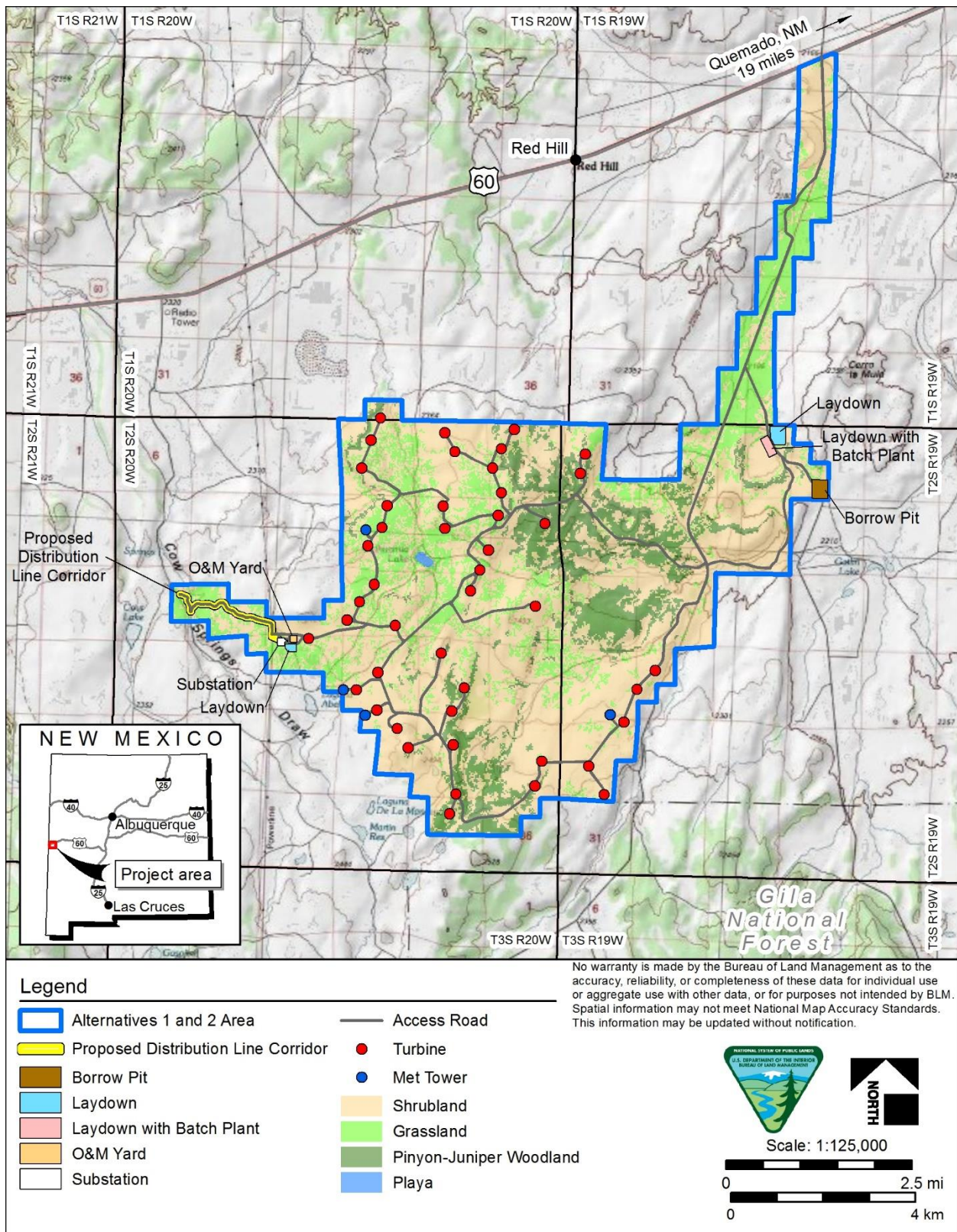


Figure 3-9. Land Cover Types within the Alternatives 1 and 2 Area

Surveys were conducted to locate and delineate Gunnison's prairie dog colonies within 0.5 mile of project facilities (i.e., wind turbines, access roads, collection lines, and substation) in July 2018. Thirty-one distinct, occupied prairie dog colonies containing up to 192 individuals in each colony were documented within the Proposed Action area (Figure 3-10). The total acreage of mapped prairie dog colonies at the time of the survey was 2,284 acres; however, surveys were only conducted in proximity to areas that would be disturbed by project infrastructure, so this total does not account for the total number of colonies present within the Proposed Action or Alternatives 1 and 2 areas. The largest colonies, by size and number of detected individuals, are situated in the northeastern, southwestern, and western portions of the Proposed Action and Alternatives 1 and 2 areas. Seventeen of the 31 prairie dog colonies are located (entirely or partially) within the Alternatives 1 and 2 area (Figure 3-11).

Special Status Bats

Bat activity at the BLWP area was monitored at two monitoring stations from September 2017 through November 2018 (SWCA Environmental Consultants 2018). Special status bat species that are known to occur in the BLWP area based on this monitoring are noted in Table E-1 in Appendix E.

Special Status Birds

Avian surveys were conducted to characterize bird populations and patterns of use in the BLWP area in accordance with the USFWS's *Land-Based Wind Energy Guidelines* (USFWS 2012). The resulting information has been used to inform siting decisions such as the ultimate placement of wind turbines and other infrastructure. Avian use surveys were conducted on-site, twice per month, starting in March 2017 and continued through March 2019. Eagle-focused nest surveys were conducted within 10 miles and a raptor nest survey was conducted within 1 mile of the Proposed Action and Alternatives 1 and 2 areas. Special status bird species that are known to occur in the BLWP area based on the avian surveys and incidental observations are noted in Table E-1 in Appendix E.

A total of 108 nests associated with non-eagle species (e.g., common raven, great horned owl, red-tailed hawk) were recorded during aerial nest surveys and ground-based surveys (point counts) in 2017 and 2018. One ferruginous hawk nest was recorded within the Proposed Action area, just outside the Alternatives 1 and 2 area; the ferruginous hawk is a BCC that receives special protection in the SFO RMP.

3.7.2. Environmental Consequences

3.7.2.1 Direct and Indirect Impacts of the Proposed Action

The Final Wind Energy PEIS (BLM 2005) identifies and discusses potential impacts on vegetation and wildlife during construction activities (pp. 5-38 through 5-45), O&M (pp. 5-50 through 5-75), and decommissioning (p. 5-77) of a wind facility (e.g., habitat loss, degradation, and fragmentation; disturbance/displacement; collision with turbines, towers, and transmission lines). These impacts would generally also apply for special status plant, terrestrial wildlife, and bird and bat species that occur within the Proposed Action area and, with regard to some indirect impacts, species that may be present in the adjacent lands surrounding the Proposed Action area. Construction, O&M, and decommissioning of the BLWP would result in short-term ground disturbance of approximately 2.6 percent (1,131 acres) and long-term vegetation loss (until decommissioning) of approximately 0.3 percent (140 acres) of the 43,528-acre Proposed Action area based on the total number of proposed turbine locations. The various plans that would be implemented to address impacts on resources such as vegetation (e.g., Weed Management Plan) and wildlife (e.g., Bird and Bat Conservation Strategy) would help to reduce the potential localized impacts on special status species.

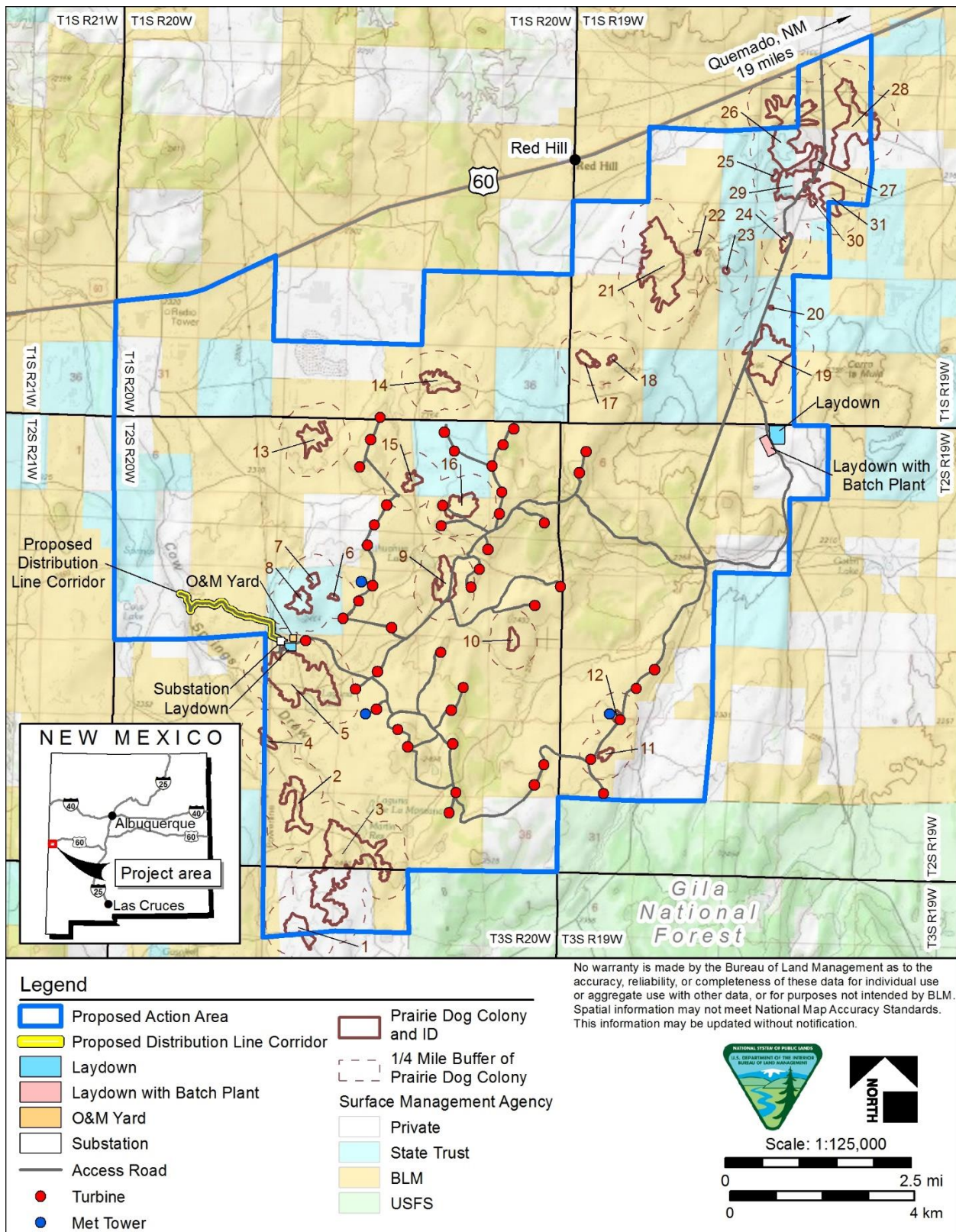


Figure 3-10. Gunnison's Prairie Dog Colonies within the Proposed Action Area

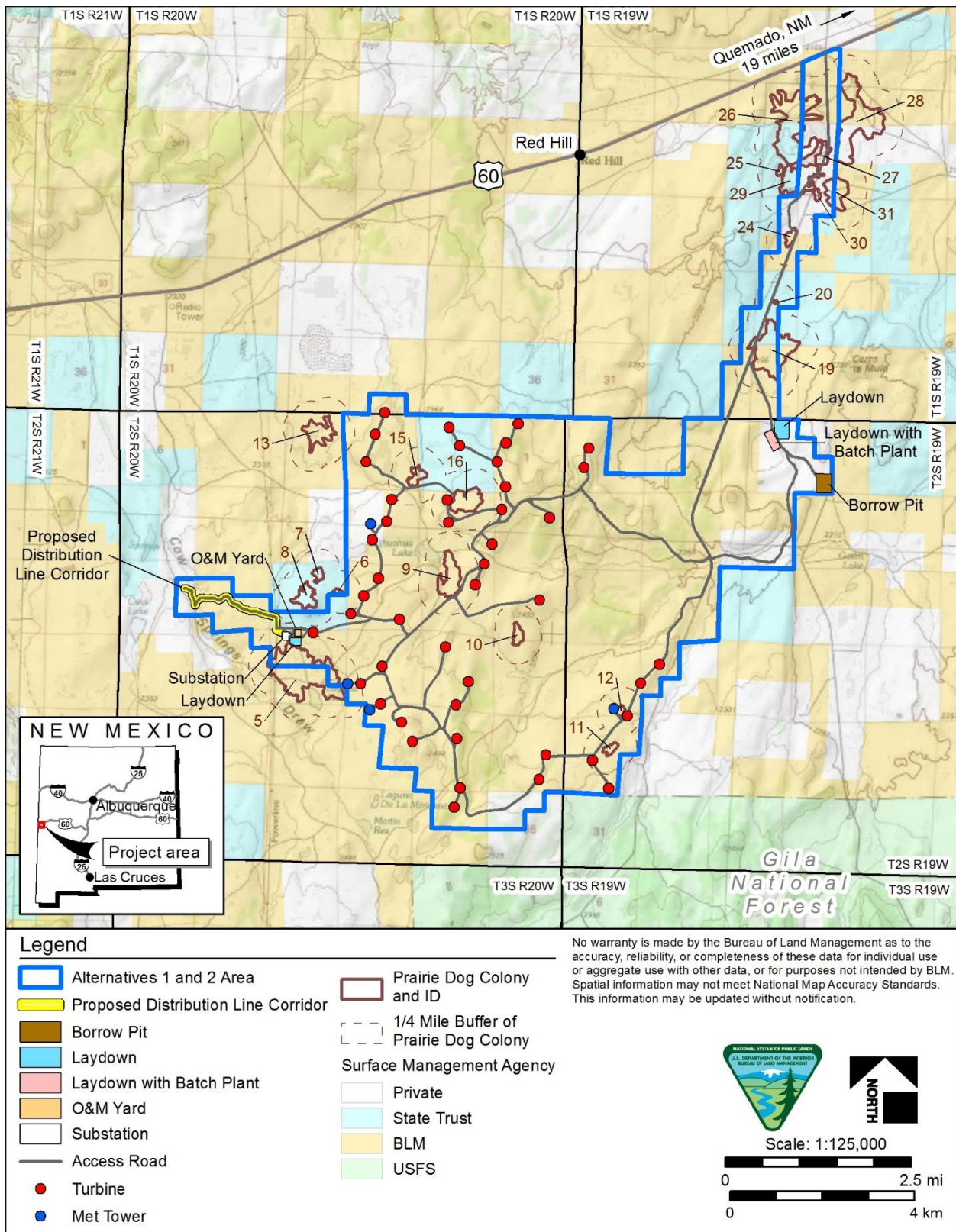


Figure 3-11. Gunnison's Prairie Dog Colonies within the Alternatives 1 and 2 Area

Special Status Plant Species

Construction

No special status plant species were observed during the 2018 survey of the disturbance footprint of the Proposed Action; however, pre-construction surveys would be conducted to identify the presence of any special status plants and verify the results of the 2018 survey. Prior to the start of construction, the boundaries of any special status plant populations that are found would be delineated with flagging or fencing. Flagged and fenced areas would be avoided to the extent practicable during construction activities. There would be negligible direct impacts from construction of the BLWP because construction activities would only disturb a relatively small portion of the Proposed Action area and special status plant species that may be found within the limits of the Proposed Action disturbance footprint during the pre-construction survey would be protected in place to the extent practicable.

Potential indirect impacts on individual sensitive plant species such as the Apache milkvetch may occur from the introduction or spread of noxious or invasive weeds in the newly disturbed areas, as well as potentially outside of the BLWP's disturbance footprint. No noxious weed species were documented within the disturbance footprint during the July and August 2018 survey by Borderlands Wind, LLC. BMPs that are implemented during the construction phase and implementation of a Weed Management Plan would minimize the potential for introduction or spread of noxious or invasive weeds within the BLWP disturbance footprint and adjacent areas. Restoration in accordance with the BLWP's Reclamation Plan would reduce the amount of disturbed habitat at any one time, which would reduce the potential for the introduction of noxious or invasive weeds. As a result, there would be negligible indirect effects on special status plant species during construction.

Operation and Maintenance

Direct impacts on special status plant species are not likely to occur during the O&M phase of the Proposed Action due to the lack of any observed species within the project disturbance footprint. Activities such as the maintenance or repair of project infrastructure (e.g., wind turbines, access roads) would result in limited ground disturbance that could impact special status plants, if present (i.e., if they establish or are later found to occur). Ground-disturbing activities during the O&M phase would generally occur in areas that were previously disturbed during construction.

During the O&M phase, the potential for introducing or spreading noxious or invasive weeds within the Proposed Action area would decrease since fewer vehicles and people would be present onsite as compared to the amount during construction. Previous areas of temporary disturbance would be revegetated. Continued implementation of BLWP's Weed Management Plan during O&M would minimize the potential for noxious or invasive species to establish within the Proposed Action area.

Decommissioning

Decommissioning would result in potential impacts on sensitive plant species similar to those described for the construction phase in that there would be some re-disturbance (e.g., vegetation removal, soil compaction, fugitive dust) of previously reclaimed and revegetated areas during the process of removing the turbines and other aboveground project components. Ground disturbance during decommissioning would again increase the potential for introduction and spread of noxious and invasive weeds that could degrade special status plant habitats. Weed management activities would continue throughout the decommissioning phase, which would minimize the potential for noxious or invasive species to establish within the Proposed Action area.

Special Status Terrestrial Wildlife Species

Construction

The Gunnison's prairie dog is known to occur throughout the Proposed Action area and surrounding lands. The SFO RMP includes a BMP that calls for restricting land use activities within active/occupied

prairie dog colonies, as well as a 0.25-mile buffer zone surrounding occupied prairie dog colonies. The locations of the various Proposed Action facilities have been sited to mostly avoid occupied prairie dog colonies; however, the primary access road (Bill Knight Gap Road) passes through four prairie dog colonies, and various project components (e.g., access roads, collector lines, turbines, laydown yard, substation, O&M yard, MET towers) would be constructed within prairie dog colonies or within the 0.25 mile buffer zone (Table 3-18). The direct impacts to individual prairie dog colonies are noted in Table 3-19.

Table 3-18. Proposed Action and Alternatives 1 and 2 Project Components within Gunnison’s Prairie Dog Colonies and Buffer Zones

Project Component	Proposed Action	Alternative 1	Alternative 2
Turbines within occupied prairie dog colonies	0 turbines	Same as Proposed Action	Same as Proposed Action
Turbines within 0.25-mile buffer zone	7 turbines	5 turbines	Same as Alternative 1
Length of road within occupied prairie dog colonies	1.60 miles	0.72 mile	Same as Alternative 1
Length of road within 0.25-mile buffer zone	11.25 miles	11.10 miles	Same as Alternative 1
Length of collection lines within occupied prairie dog colonies	0.97 mile	0 miles	Same as Alternative 1
Length of collection lines within 0.25-mile buffer zone	7.85 miles	8.37 miles	Same as Alternative 1
Temporary disturbance within occupied prairie dog colonies	34.77 acres	13.38 acres	Same as Alternative 1
Temporary disturbance within 0.25-mile buffer zone	268.03 acres	259.19 acres	264.38 acres
Permanent disturbance within occupied prairie dog colonies	3.75 acres	2.12 acres	Same as Alternative 1
Permanent disturbance within 0.25-mile buffer zone	40.44 acres	40.19 acres	Same as Alternative 1

Note: Assumes all turbine locations would be constructed. Actual impacts would be less due to fewer turbines actually being constructed.

Table 3-19. Proposed Action and Alternatives 1 and 2 Impacts to Individual Gunnison’s Prairie Dog Colonies

Prairie Dog Colony ID ¹	Total Colony Area (acres)	Temporary Disturbance	Permanent Disturbance	Temporary Disturbance	Permanent Disturbance
		Proposed Action (acres/percent)	Proposed Action (acres/percent)	Alternatives 1 and 2 (acres/percent)	Alternatives 1 and 2 (acres/percent)
5	278.58	5.04/1.81	0.13/0.05	0/0.00	0/0.00
9	72.85	9.58/13.15	0.9/1.24	0.03/0.04	0/0.00
12	7.07	1.9/26.83	0.21/2.91	0.19/2.66	0/0.00
15	23.64	0.86/3.66	0/0.00	0.03/0.14	0/0.00
16	65.3	4.57/6.99	0.49/0.75	0/0.00	0/0.00
19	166.52	2.14/1.29	0.34/0.21	2.24/1.34	0.36/0.21

Prairie Dog Colony ID ¹	Total Colony Area (acres)	Temporary Disturbance Proposed Action (acres/percent)	Permanent Disturbance Proposed Action (acres/percent)	Temporary Disturbance Alternatives 1 and 2 (acres/percent)	Permanent Disturbance Alternatives 1 and 2 (acres/percent)
24	14.23	2.07/14.57	0.3/2.10	2.31/16.20	0.38/2.70
27	24.25	4.34/17.91	0.7/2.87	4.33/17.84	0.69/2.85
29	94.39	4.27/4.52	0.68/0.72	4.26/4.52	0.68/0.72
Total ²	746.83	34.77/1.52	3.75/0.16	13.38/0.59	2.12/0.09

Note: Assumes all turbine locations would be constructed. Actual impacts would be less due to fewer turbines actually being constructed.

¹ Refer to Figure 3-10 and Figure 3-11.

² Total for all of the affected prairie dog colonies.

Construction activities that occur within prairie dog colonies or in their vicinity could result in direct impacts (such as injury or mortality) or indirect impacts (such as habitat loss and fragmentation), although these effects would be minimized through the implementation of species-specific BMPs for the Gunnison's prairie dog (see Appendix B). Disturbance from human activities and construction noise could alter the patterns of Gunnison's prairie dog use across the site, though other factors such as soil conditions and vegetation would also influence habitat selection and use by this species. Construction of the overhead distribution line may also alter patterns of prairie dog use in the immediate area as raptors are likely to utilize the new infrastructure for perching and hunting.

The project infrastructure has been sited to avoid the seasonally wet playa areas where the Arizona montane vole and Arizona tree frog could occur, which reduces the potential for direct or indirect impacts. The stock tanks within the Proposed Action area that provide potential habitat for Sonora mud turtles would be avoided during construction where feasible. The Arizona black rattlesnake prefers rocky habitats but could be encountered anywhere within the Proposed Action area, resulting in potential direct impacts during construction. Short-term impacts on special status terrestrial wildlife species would include potential injury or death from interactions with the increased number of vehicles traveling on access roads and/or ground disturbance and underground burrow destruction by heavy equipment during construction activities. There would be no direct or indirect regional impacts on special status terrestrial wildlife species because of the presence of similar habitat within the region of the Proposed Action and the limited area within the Proposed Action area that would be affected (1,131 acres or approximately 2.6 percent of the 43,528-acre Proposed Action area) during construction.

The four SERI identified in the New Mexico Crucial Habitat Assessment Tool for this area (i.e., black bear, cougar, elk, and mule deer) are relatively common species that could incidentally occur within the Proposed Action area, such as while foraging, but would not be expected to occupy the Proposed Action area for long periods of time due to the lack of cover. There are no known wildlife movement or migration corridors present in the BLWP area that would be impacted by the Proposed Action. Increased noise and visual disturbance from human activity during construction would likely cause these species to avoid foraging within the Proposed Action area and the area immediately surrounding the BLWP. None of these species are likely to be injured or killed as a result of the Proposed Action and no population-level effects would occur.

Provisions of the Integrated Reclamation Plan would minimize the potential for introduction or spread of noxious or invasive weeds within the Proposed Action area and adjacent lands, which would minimize habitat degradation. The Proposed Action would have minor short-term direct impacts on local special status terrestrial wildlife species with the exception of the Gunnison's prairie dog. Even with the

implementation of BMPs and species-specific mitigation measures/design features, the Proposed Action would result in localized short- and long-term, moderate impacts on prairie dogs.

Operation and Maintenance

Potential impacts on special status terrestrial wildlife species during the O&M phase of the Proposed Action would include various types of disturbance associated with human activities (e.g., vehicle use, maintenance activities) and wind turbine operation (e.g., noise, vibration, flicker/shadows cause by moving blades). Over time, individual animals may become acclimated to the disturbance or shift their habitat use to avoid areas with undesirable levels of disturbance. The reclamation and revegetation of disturbed areas during the O&M phase would allow for previously displaced individuals to potentially reestablish use of the habitat.

Potential impacts would be reduced compared to the construction phase because of the lower volume of vehicles traveling on access roads and fewer people needed to operate and maintain the BLWP. Special status terrestrial wildlife species would still be able to move through the Proposed Action area following construction of the wind facility, and the open landscape in the surrounding area allows for relatively unrestricted wildlife movement, so there would be negligible localized impacts on wildlife movement. Construction of new project access roads would fragment prairie dog habitats and could also lead to an increase in recreational shooting, which may impact the local Gunnison's prairie dog population. The Proposed Action could result in a downward trend and/or contribute to the loss of viability of the local Gunnison's prairie dog population. There would be no regional impacts on special status terrestrial wildlife species during the O&M phase of the Proposed Action due to the general availability of similar habitats within the region and the limited area within the Proposed Action area that would be affected in the long term (140 acres or approximately 0.3 percent of the 43,528-acre Proposed Action area).

Decommissioning

Potential impacts during the decommissioning phase would be similar to those described for the construction phase, though to a lesser extent. Direct impacts on special status terrestrial wildlife species, including injury or mortality of individual animals, may occur during decommissioning. Much of the potential habitat for special status reptiles and amphibians (i.e., playas and stock tanks) would be avoided. Ground-disturbing activities associated with the removal of turbines and other infrastructure would create areas of degraded habitat, which may be of marginal value until these areas are reclaimed and vegetation communities restored. A Reclamation Plan would be implemented as part of the decommissioning effort to direct and aid in the revegetation efforts. Although revegetation may take several decades for the structure and composition to resemble current conditions, a limited area of the Proposed Action area (140 acres or approximately 0.3 percent of the 43,528-acre Proposed Action area) would be disturbed. The Proposed Action's decommissioning activities would result in localized long-term, direct, minor impacts on special status terrestrial wildlife species.

Special Status Bird and Bat Species

Construction

Potential impacts associated with the construction of project infrastructure (e.g., turbines, collection lines, access roads) would include habitat loss, degradation, and fragmentation, as well as noise and visual disturbances. Vegetation clearing would remove foraging habitat for special status birds and bats and could result in direct impacts on nesting birds and tree-roosting bats. Impacts on bird species that are less tolerant of the disturbance associated with noise and human activity would extend further than the actual disturbance footprint and may extend to lands outside of the Proposed Action area. The one ferruginous hawk nest that was documented within the Proposed Action area would be avoided and any construction activities would occur outside of a 0.5-mile buffer of the nest to minimize disturbance at the nest site.

There are no known features, such as caves or mines that would provide communal roost or maternity sites for large numbers of bats within the Proposed Action area. Bat use of this area would consist of opportunistic foraging (including drinking at available water sources) and roosting by individual bats or small groups of bats in cliffs/rock outcrops, buildings, and trees. The foraging and roosting habitats for bats within the Proposed Action area are fairly widespread in the region. Construction-related activities would have negligible impacts on bats that may fly through or forage within the Proposed Action area or surrounding area at night.

Operation and Maintenance

Birds and bats are vulnerable to injury and mortality from collisions with wind turbine blades. Wind turbines mainly pose a threat to these species when the rotor is spinning; the area where the individuals can be struck by the rotor/blades is termed the rotor-swept area. The wind turbines that are proposed for the BLWP have rotor diameters from 380 to 417 feet. At this size, the revolutions-per-minute are lower than with smaller turbines, but the speed of the rotor tips is still very high. The numerous Gunnison's prairie dog colonies and seasonally-inundated playas in the Proposed Action area are hunting grounds for various predators, and the availability of prey in this area is associated with increased use of the area by raptors. Larger soaring birds, such as ferruginous hawks and other raptors, are more prone to being hit in the rotor-swept area than smaller birds that fly closer to the ground. For birds, adjusted fatality rates from most studies range from three to six birds per turbine-generated MW per year for all species combined, and no publicly available study has reported more than 15 bird fatalities per turbine-generated MW per year (American Wind Wildlife Institute [AWWI] 2018).

Bat fatalities associated with wind turbines can be higher than the bird fatalities on the same wind farm, and it is difficult to predict the level of impact on bats even with acoustic monitoring data from preconstruction surveys. Bats fly around to forage at night and mainly during low wind speeds; raising cut-in speeds (i.e., the lowest wind speeds at which turbine rotors begin rotating) at night can be an effective way of minimizing bat mortality. Reductions in local bat populations can be magnified at the regional scale because bats are wide-ranging and have a low reproductive rate. On average, reported bat fatality rates are substantially lower at facilities in the western United States compared to those in the eastern part of the country (AWWI 2018). The potential threat to special status birds and bats from wind turbines at the BLWP would exist during the anticipated 35-year life of the project and the Proposed Action could have a long-term, minor to moderate effect on these species.

Distribution lines and other project facilities would be designed to discourage their use as perching or nesting substrates by birds, and to minimize collisions and electrocutions (e.g., by constructing power lines to Avian Power Line Interaction Committee standards). Two permanent MET towers would be needed during operations. The MET towers would be no more than 361 feet high with side guy wires extending from each tower on two sides. Bird flight diverters or high visibility marking devices would be used to reduce the potential for collision with the guy wires, though they would not entirely eliminate the potential impacts on birds. Impacts on special status bird and bat species, including fatalities resulting from the operation of wind turbines, would not be avoidable under the Proposed Action.

Decommissioning

Potential impacts on special status birds during decommissioning would be similar to construction, though to a lesser extent assuming some degree of acclimation to disturbance by resident birds during the O&M phase. Impacts on special status bird and bat species from collisions with wind turbines would cease when operation of the BLWP is discontinued and the turbines, overhead distribution lines, and MET towers are removed. Long-term, localized effects on foraging and nesting habitat for some special status species would occur because it may take years or decades for the vegetative structure and composition of disturbed areas to be restored to current conditions. However, the areas requiring

revegetation would only be 0.3 percent of the Proposed Action area (140 acres) and a Reclamation Plan would be implemented during decommissioning to guide the revegetation efforts.

Migratory Birds

Potential impacts on migratory birds during construction, O&M, and decommissioning activities would be the same as noted above for other special status birds. There are no Important Bird Areas designated within the BLWP area and, with the exception of seasonal playas, the BLWP area does not contain habitats that would concentrate migrating birds, such as large bodies of water, wetlands or riparian areas, or mountain ridges that would provide updrafts for migrating raptors. However, there are many Gunnison's prairie dog colonies that provide an abundant food source for raptors in the Proposed Action area.

The nearest major waterways likely to be used by migratory birds include the Little Colorado River (approximately 15 miles to the west), the San Francisco River (approximately 20 miles to the south), and the Rio Grande (approximately 110 miles to the east). Migrating birds may pass over or stop to forage or rest in the BLWP area as they travel between these major corridors. While there would be short- and long-term, minor impacts on the existing habitats within the Proposed Action area, the grassland, shrubland, and pinyon-juniper cover types that would be affected by the project are abundant habitats in the lands surrounding the Proposed Action area and within BCRs 16 and 34. The Proposed Action would result in short- and long-term, direct and indirect, moderate, local and regional impacts to migratory birds. A Bird and Bat Conservation Strategy would be implemented along with BMPs and other design features as part of the Proposed Action to minimize potential impacts on migratory birds and provide for adaptive management during the O&M phase.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to avoid and/or minimize impacts on special status plant and wildlife species are recommended for the Proposed Action.

3.7.2.2 Direct and Indirect Impacts of Alternatives 1 and 2

The potential impacts of Alternatives 1 and 2 on special status plant, terrestrial wildlife, and bird and bat species would be similar to the Proposed Action, with minor differences in the overall acreages that would be disturbed during construction and decommissioning of the BLWP. Construction, O&M, and decommissioning of the BLWP under Alternatives 1 and 2 would result in short-term ground disturbance of approximately 6 percent (1,134 acres) and long-term vegetation loss (until decommissioning) of approximately 0.7 percent (137 acres) of the 18,907-acre Alternatives 1 and 2 area.

Special Status Plant Species

The impacts of Alternatives 1 and 2 on special status plant species would be similar to those under the Proposed Action. The effects associated with Alternative 1 would be essentially the same as for the Proposed Action because the same number of turbines would be built under both alternatives. Under Alternative 2, there would be six fewer turbines (34 instead of 40 turbines) built with similar but slightly less impacts since there would be fewer turbines, access roads, and underground electric collection system and communication lines built. Because of the smaller construction footprint associated with Alternative 2, impacts to special status plant species would be slightly reduced compared to the Proposed Action and Alternative 1. Shifting the number/locations of wind turbines or other project infrastructure within the Alternatives 1 and 2 area would not substantially add to or reduce the potential impacts on special status plant species from construction, O&M, or decommissioning of the BLWP as compared to the Proposed Action.

Special Status Terrestrial Wildlife Species

The impacts of Alternatives 1 and 2 on special status terrestrial wildlife species would be similar to the Proposed Action Alternative. The locations of various project components that are within occupied prairie dog colonies or within the 0.25-mile buffer zone surrounding occupied prairie dog colonies under Alternatives 1 and 2 are noted in Table 3-18. Shifting the number/locations of wind turbines or other project infrastructure as proposed under Alternative 1 or Alternative 2 would not substantially add to or reduce the potential impacts on special status terrestrial wildlife species from construction, O&M, or decommissioning of the BLWP as compared to the Proposed Action.

Special Status Bird and Bat Species

The impacts of Alternatives 1 and 2 on special status bird and bat species would be similar to those under the Proposed Action. The wind turbines that are proposed for the BLWP under Alternative 2 would have larger rotor diameters (417 to 459 feet) compared to the Proposed Action and Alternative 1 (380 to 417 feet), resulting in a larger rotor swept area for each turbine; however, there would be fewer turbines constructed under Alternative 2 (34 turbines) compared to the Proposed Action and Alternative 1 (40 turbines). Shifting the number/locations of wind turbines or other project infrastructure as proposed under Alternative 1 or Alternative 2 would not substantially add to or reduce the potential impacts on special status bird and bat species from construction, O&M, or decommissioning of the BLWP as compared to the Proposed Action.

Migratory Birds

The impacts of Alternatives 1 and 2 on migratory birds would be similar to those under the Proposed Action. Shifting the number/locations of wind turbines or other project infrastructure as proposed under Alternatives 1 and 2 would not substantially add to or reduce the potential impacts on migratory birds from construction, O&M, or decommissioning of the BLWP as compared to the Proposed Action.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to avoid and/or minimize impacts on special status plant and wildlife species are recommended for Alternatives 1 and 2.

3.7.2.3 *Direct and Indirect Impacts of the No Action Alternative*

Under the No Action Alternative, the BLWP would not be constructed, and no additional impacts on special status species within the BLWP area would occur. Existing impacts on special status species within the BLWP area are primarily associated with recreational shooting of prairie dogs, vehicle (including OHV) use that results in minor noise and visual disturbance, and occasional injury or mortality to wildlife from collisions with vehicles or, for special status birds and bats, the existing transmission lines and structures that cross the area.

3.8 Bald and Golden Eagles

The Bald and Golden Eagle Protection Act (Eagle Act) is the overarching law that protects bald and golden eagles; it prohibits anyone without a permit from “taking” eagles, their parts, eggs, or nests⁵. The Eagle Act’s definition of “take” does not include habitat destruction or alteration, unless such damage

⁵ The Bald and Golden Eagle Protection Act, originally passed in 1940, provides for the protection of the bald eagle and the golden eagle (as amended in 1962) by prohibiting the take, possession, sale, purchase, barter, offer to sell, purchase or barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C. 668(a); 50 CFR 22). “Take” includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb (16 U.S.C. 668c; 50 CFR 22.3).

disturbs an eagle. Disturb is defined as “to agitate or bother to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”

In 2009, the USFWS promulgated regulations (i.e., the Eagle Rule) that established two new permit types authorizing: 1) purposeful take (removal, relocation, or destruction) of eagle nests under limited circumstances, and 2) incidental take that results from, but is not the purpose of, an otherwise lawful activity. In 2016, the USFWS revised the regulations for eagle incidental take permits, allowing developers to obtain a 30-year permit subject to mitigation and monitoring, among other requirements. The 2016 Eagle Rule Revision also removed the distinction between standard permits (that address one-time effects from a project) and programmatic permits (that authorize recurring take from a project), and modified their definition of the “preservation standard” so that any authorized take must be consistent with the goals of maintaining stable or increasing breeding populations in all eagle management units, and the persistence of local populations throughout the geographic range of each species.

In 2017, the BLM issued IM 2017-040 Bald and Golden Eagle Protection Act–Eagle Incidental Take Permit Guidance for Renewable Energy Development on the processing of ROW applications for wind and solar development projects on BLM-managed lands that have the potential to result in take of eagles. The BLM’s IM 2017-040 identifies the coordination and surveys that are required in order to determine whether take of eagles is likely, as well as stipulations that would be included with ROW grants.

This section assesses the potential impacts on bald and golden eagles from the Proposed Action, Alternatives 1 and 2, and the No Action Alternative.

3.8.1. Affected Environment

The USFWS’s *Eagle Conservation Plan Guidance* (USFWS 2013a) and *Programmatic EIS for the Eagle Rule Revision* (USFWS 2016a) recommend that siting decisions for project infrastructure, such as wind turbines, be informed first by eagle exposure (related to eagle sightings during avian surveys) and then by the presence of important eagle use areas such as occupied nests or foraging areas. Avian use surveys have been conducted twice per month within the Proposed Action area (which encompasses the Alternatives 1 and 2 area) from March 2017 through March 2019. Eagle-focused nest surveys were also conducted within 10 miles of the area and a raptor species nest survey was also conducted within 1 mile of the Proposed Action area. The USFWS has determined that there are important eagle-use areas within the Proposed Action area based on food resources such as the prairie dog colonies and golden eagle telemetry data. Information on bald and golden eagles and their occurrence in the Proposed Action area is provided below.

3.8.1.1 Golden eagle

Golden eagles occur across most of the northern hemisphere and throughout the Southwest where there are suitable nest sites and available prey. Year-round residents occur throughout NM and migrants from northern latitudes are also present during the winter months. Golden eagles typically select nest sites on tall cliffs or large trees near the open areas where they hunt for small to mid-sized mammals such as ground squirrels, jackrabbits, and prairie dogs. They can also prey upon some larger waterfowl species and opportunistically feed upon carrion, including ungulate carcasses. Additional information on the life history and status of the golden eagle, as well as known threats to the species, is included in the USFWS’s *Programmatic EIS for the Eagle Rule Revision* (USFWS 2016a) and *Bald and*

Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update (USFWS 2016b).

There is telemetry data supporting the occurrence of golden eagles in the project vicinity; an immature golden eagle that was tagged in the northeastern portion of the Proposed Action area in 2015 has continued to occupy the BLWP area year-round, though a single eagle's use patterns should not be extrapolated to describe overall eagle use of an area. Eagle use surveys conducted for the BLWP have documented golden eagles flying through the Proposed Action area (which encompasses the Alternatives 1 and 2 area) on five occasions during the period from March 2017 through March 2019. A total of 16 "eagle minutes" were documented at survey points during that period. Eagle minutes are only recorded during the eagle use surveys and are specifically used to assess potential impacts to eagles; there were also incidental observations of golden eagles on 19 occasions from March 2017 through March 2019.

Multiple golden eagle breeding attempts were documented during nest surveys conducted within a 10-mile buffer of the Proposed Action area in 2017 and 2018. Golden eagle nesting substrate in the Proposed Action area is limited to a narrow, linear escarpment and small rock outcrops located in the northeastern portion, and transmission towers along a north-south utility corridor located on the western edge of the Proposed Action area. Golden eagles use an average of two to three alternate nests, with some territories containing only one nest. The 47 nest structures identified as golden eagle nests (28 nests) or possible golden eagle nests (19 nests) during surveys were assigned to nine golden eagle and seven potential golden eagle territories/breeding areas. In 2017, four of the breeding areas had nests where eggs, nestlings, or an adult in an incubation posture were observed, and five contained nests where eagles were present but were not observed engaging in breeding activities. In 2018, two of the territories had active breeding attempts and six contained occupied nests only (e.g., adults perched on or near the nest, recent greenery, sticks, whitewash, or feathers). One potential golden eagle breeding area (i.e., Luna Tank) and its associated nest are located within the northeastern portion of the Proposed Action area; all of the other territories/breeding areas are located within a 10-mile buffer surrounding the Proposed Action area. The Luna Tank nest has not been observed to be active during project surveys (i.e., no eggs or young were observed in the nest); however, a golden eagle was observed in the vicinity of the nest in March 2017.

Surveys were also conducted to locate and delineate Gunnison's prairie dog colonies within 0.5 mile of proposed project facilities (e.g., turbines, access roads, collection lines, the substation), as golden eagles are attracted to these colonies for prey. Thirty-one distinct, occupied prairie dog colonies containing up to 192 individuals in each colony were documented within the Proposed Action area. The total acreage of mapped prairie dog colonies at the time of the survey was 2,284 acres; however, surveys were only conducted in proximity to areas that would be disturbed by project infrastructure, so this total does not account for the total number of colonies present within the Proposed Action or Alternatives 1 and 2 areas. The largest colonies, by size and number of detected individuals, were situated in the northeastern, southwestern, and western portions of the Proposed Action and Alternatives 1 and 2 areas (refer to Figure 3-10 and Figure 3-11 in Section 3.7 Special Status Species). In addition to open habitats throughout the BLWP area and Gunnison's prairie dog colonies that provide foraging opportunities for golden eagles, eagles may also feed upon animal carcasses that they find within the Proposed Action and Alternatives 1 and 2 areas.

3.8.1.2 Bald eagle

Bald eagles occur throughout North America and typically build stick nests in large trees or on cliffs near open water (lakes and rivers) to be close to their preferred food sources (fish and waterfowl). With the exception of the desert nesting population occurring in AZ, bald eagles are migratory and many

individuals in northern latitudes fly south to overwinter. Juvenile bald eagles may also range widely during dispersal, though both wintering and juvenile bald eagles are still typically associated with breeding habitats (i.e., lakes and rivers). Additional information on the life history and status of the bald eagle, as well as known threats to the species, is included in the USFWS's *Programmatic EIS for the Eagle Rule Revision* (USFWS 2016a) and *Bald and Golden Eagles: Population demographics and estimation of sustainable take in the United States, 2016 update* (USFWS 2016b).

Bald eagles have been observed in the Proposed Action area on three separate occasions during avian point count surveys: in January 2018, December 2018, and February 2019. Bald eagle use of the Proposed Action area is expected to be infrequent and sporadic, and more likely to occur outside of the breeding season (i.e., late August–February) when wintering birds from colder northern climates and dispersing juveniles are present in the region.

There is a general lack of bald eagle nesting habitat and limited foraging habitat for bald eagles in the area. Animal carcasses provide an intermittent source of carrion that could be utilized by bald eagles. The seasonally inundated playas that are present may, particularly in wet years, also provide temporary habitats where waterfowl or shorebirds could congregate and provide hunting opportunities for bald eagles. The nearest preferred foraging areas for bald eagles are Becker Lake (21 miles to the west), Quemado Lake (21 miles to the east), and Lyman Lake (28 miles to the northwest). There is marginal roosting habitat for bald eagles within the Proposed Action area due to the general lack of tall trees; there are young ponderosa pine trees interspersed with the pinyon-juniper and grassland habitat in the southern portions of the area, with larger trees found further to the south on the Gila National Forest.

3.8.2. Environmental Consequences

3.8.2.1 Direct and Indirect Impacts of the Proposed Action

The Final Wind Energy PEIS (BLM 2005) identifies and discusses potential impacts on wildlife including eagles during construction activities (pp. 5-41 through 5-45), O&M (pp. 5-53 through 5-75), and decommissioning (p. 5-77) of a wind facility (e.g., habitat loss, degradation, and fragmentation; disturbance/displacement; collision with turbines, towers, and transmission lines). Potential impacts on bald and golden eagles from the Proposed Action including “take” are likely to occur from the construction, O&M, and decommissioning of the BLWP. Measures that have been developed to avoid and/or minimize adverse impacts on eagles are identified in Appendix B; additional measures would be identified in an Eagle Management Plan (which is not the same as an Eagle Conservation Plan that would be required by the USFWS as part of an application for a take permit) that will be included in the Final POD prior to publication of the Final EIS. These measures would include the ongoing removal of large mammal carcasses (e.g., dead cattle) and roadkills within the Proposed Action area to avoid attracting eagles. The BLWP-specific design features and BMPs would be incorporated into each phase of the project to minimize these potential impacts to the extent practicable. The various plans that would be implemented to address impacts on resources such as vegetation (e.g., Weed Management Plan, Reclamation Plan) and wildlife (e.g., Bird and Bat Conservation Strategy) would also help to reduce the potential impacts on eagles.

Construction

Construction of the BLWP would result in the loss, degradation, and fragmentation of golden eagle foraging habitat. Approximately 2.6 percent (1,131 acres) of the 43,528-acre Proposed Action area would be impacted by construction activities, which represents a localized, minor impact on golden eagle habitat. The disturbance footprint and location of various infrastructure (e.g., wind turbines, access roads, and collection lines) have been sited to minimize impacts on eagle use areas including the Luna Tank breeding area and within a 0.25-mile buffer around active Gunnison's prairie dog colonies that are hunting grounds for golden eagles. Construction activities that occur in the vicinity of prairie

dog colonies may prevent golden eagles from foraging in these areas. Given the number of prairie dog colonies in the Proposed Action area and the surrounding area, there would be a moderate direct impact on golden eagles from construction-related disturbance near foraging habitats.

Bald eagles are expected to occur infrequently and sporadically in the Proposed Action area given the lack of nesting and roosting habitat, and the limited foraging habitat that is present (i.e., seasonally inundated playas and incidental occurrence of carrion). While wintering and dispersing bald eagles can range widely, they generally focus their activities at lakes and along rivers where there is suitable prey. There would be a negligible loss of foraging habitat for bald eagles given that the BLWP area does not contain this species' preferred foraging habitat.

Disturbance from human activities and noise during construction could alter the patterns of eagle use across the site, including the areas used for foraging, roosting, and nesting. The primary access road (Bill Knight Gap Road) would be located approximately 3,500 feet from the Luna Tank nest. While this is greater than the 0.5-mile buffer distance that is typically recommended by the USFWS, disturbance to nesting golden eagles during construction activities or vehicle/equipment access along Bill Knight Gap Road could potentially occur. Disturbance from human activities and noise during construction would have a localized, short-term, minor to moderate impact on any bald eagles that may be present in the BLWP area during the construction phase, depending on the timing and season of construction.

Roadwork and vehicle use on the primary access road during construction could result in disturbance to nesting golden eagles and a decrease in productivity (i.e., the number of eagles that are fledged from the nest) or nest abandonment. Any reduction in golden eagle nest success resulting from the Proposed Action would be a localized and regional, short- and long-term, major impact on golden eagle populations.

Operations and Maintenance

There would be less on-site activity during the O&M phase of the BLWP than during construction. As a result, there would be less noise and visual disturbance to eagles from human activities (e.g., road maintenance), though potential impacts such as those identified for the construction phase could similarly occur during the O&M phase. Wind turbines have been sited outside of a 3.9-mile buffer around the Luna Tank nest to minimize impacts on nesting golden eagles.

Distribution lines and other project facilities would be designed to discourage their use as perching or nesting substrates. Overhead power lines would be constructed to Avian Power Line Interaction Committee standards to reduce the risk of electrocution and collisions. Bird flight diverters or high visibility marking devices would be installed on MET tower guy wires to reduce the potential for collisions with guy wires. These measures would reduce the potential risks to eagles, though the proposed project infrastructure would still pose an ongoing threat to eagles from collisions with distribution lines or MET tower guy wires over the life of the project.

The USFWS evaluated the risk of golden eagles colliding with rotors during operation of the BLWP based on two years of pre-construction data collected in the Proposed Action area. The results of the USFWS's analysis indicate that a golden eagle fatality is predicted to occur at an annual rate of 0.307 eagles per year (with an 80 percent confidence level based on statistical analysis). The USFWS predicted there would be a cumulative take of two golden eagles over a five-year period. The potential threat to eagles from collisions with wind turbines at the BLWP would exist during the anticipated 35-year life of the project. The USFWS typically re-evaluates the potential for take every 5 years based on post-construction monitoring data and documented fatalities, so an assessment of eagle take for the 35-year life of the project is not currently available. Mortality of golden eagles that may result from the

Proposed Action would constitute localized and regional, short- and long-term, major impacts on golden eagle populations.

As previously mentioned, bald eagles are expected to occur infrequently and sporadically in the BLWP area, and noise and visual disturbance resulting from human activities and turbine operation during the O&M phase may cause bald eagles to avoid the Proposed Action area. Animal carcasses that could potentially attract bald eagles would be subject to ongoing removal under the Proposed Action, per the Eagle Management Plan (Borderlands Wind, LLC 2019), which would reduce the likelihood of bald eagles foraging in the Proposed Action area. For these reasons, take of bald eagles at the BLWP is considered less likely to occur than take of golden eagles. However, the USFWS does not have sufficient data in the form of onsite bald eagle observations for the Proposed Action area, and as a result, it is currently not possible to generate a fatality estimate for bald eagles. Mortality of bald eagles that may result from the Proposed Action would constitute localized and regional, short- and long-term, major impacts on bald eagle populations.

Decommissioning

The extent of noise and visual disturbance to eagles during decommissioning of the BLWP would be similar to the construction phase and there would likely be impacts on patterns of eagle use established during the O&M phase, such as the areas used for foraging, roosting, or nesting. As the various aboveground infrastructure across the site is removed and disturbed areas are rehabilitated and restored over time, there would likely be an increase in prey species (e.g., prairie dogs) that is commensurate to the loss experienced during construction of the BLWP.

The project BMPs and other design features, and the stipulations that would be included in the BLM ROW authorization would minimize the potential short- and long-term impacts on eagles. However, the Proposed Action is still anticipated to result in both short- and long-term, direct and indirect, major local and regional impacts on bald and golden eagles.

Bald and Golden Eagle Protection Act (Eagle Act)

The USFWS has determined that the take of eagles is likely to occur under the Proposed Action. The annual golden eagle fatality estimate (0.307 eagles per year) is equivalent to 0.78 percent of the estimated local area population of 396 golden eagles. A fatality estimate for bald eagles is not possible at this time due to the lack of sufficient data; however, take of bald eagles under the Proposed Action is considered less likely to occur than take of golden eagles. Based on the USFWS determination, the Proposed Action is considered a Category 2 project under the USFWS's *Eagle Conservation Plan Guidance*, indicating that there is a high or moderate risk to eagles with the opportunity to avoid or mitigate impacts. This is due to: 1) the presence of important eagle use areas, and 2) an annual fatality estimate between 0.03 percent and 5 percent of the estimated local area population size.

Based on Borderlands Wind, LLC's decision not to seek an incidental take permit, the BLM would follow "Option 2" as identified in BLM's IM 2017-040. According to the general ROW stipulations identified in BLM's IM 2017-040, after the USFWS has determined that take of eagles at a project is likely to occur (according to the methodology outlined in the *Eagle Conservation Plan Guidance* [USFWS 2013a] and the Final Eagle Rule [USFWS 2016c]), the BLM would include stipulations in the ROW grant requiring the grant holder to monitor its project regularly for eagle fatalities using USFWS-approved standards throughout the life of the grant. The USFWS has recommended post-construction mortality monitoring during the first two years of operation and, depending on the results from the first two years of monitoring, one year of monitoring at least every five years. Operational eagle mortality monitoring (i.e., monitoring that is conducted by project personnel) would be required for the duration of the project. These stipulations would be incorporated in the ROW grant, regardless of whether the ROW

applicant elects to apply for a take permit (see Appendix B for more details on monitoring requirements).

According to the ROW stipulation under Option 2, the ROW grant would also specify that, if an eagle is taken without a take permit, Borderlands Wind, LLC would be required to immediately notify the BLM and the USFWS. After consultation with the BLM and the USFWS, Borderlands Wind, LLC would implement reasonable specific actions to avoid further unpermitted take of eagles. Any take of bald or golden eagles resulting from the Proposed Action may result in enforcement actions by the USFWS.

Additional Measures to Avoid and/or Minimize Impacts

Borderlands Wind, LLC has included a commitment in their draft Eagle Management Plan to provide voluntary compensatory mitigation to offset the anticipated impacts on eagles. The voluntary compensatory mitigation that is currently proposed by Borderlands Wind, LLC would take the form of \$165,000 in funding that would be contributed to the National Fish and Wildlife Foundation's Eagle Mitigation Account or to a mitigation banking or in-lieu fee credit program.

The BLWP would not be permitted for the take of eagles under an incidental take permit, so the process⁶ for ongoing re-evaluation of eagle take and adjustment of the compensatory mitigation that is needed to achieve no net loss of eagles would not be available to the BLM. It is therefore uncertain whether the amount of funding that is provided for voluntary compensatory mitigation by Borderlands Wind, LLC would be sufficient to result in no net loss of eagles.

3.8.2.2 *Direct and Indirect Impacts of Alternatives 1 and 2*

The impacts of Alternatives 1 and 2 on bald and golden eagles would be similar to the Proposed Action. The wind turbines that are proposed for the BLWP under Alternative 2 would have larger rotor diameters (417 to 459 feet) compared to the Proposed Action and Alternative 1 (380 to 417 feet), resulting in a larger rotor swept area for each turbine; however, there would be fewer turbines constructed under Alternative 2 (34 turbines) compared to the Proposed Action and Alternative 1 (40 turbines). Shifting the number/locations of wind turbines or other project infrastructure within the Alternatives 1 and 2 area as proposed would not substantially add to or reduce the potential impacts on bald or golden eagles from construction, O&M, or decommissioning of the BLWP as compared to the Proposed Action. For example, the results of the USFWS's analysis of Alternative 2 indicate that a golden eagle fatality is predicted to occur at an annual rate of 0.315 eagles per year and a predicted cumulative "take" of two golden eagles over a five year period, compared to an annual fatality rate of 0.307 eagles per year and cumulative take of two golden eagles over five years under the Proposed Action and Alternative 1.

Additional Measures to Avoid and/or Minimize Impacts

The measures that would be implemented to avoid and/or minimize impacts on eagles under Alternatives 1 and 2 would be the same as those under the Proposed Action.

⁶ For wind energy projects that are permitted for the take of eagles under an incidental take permit that is issued by the USFWS, the USFWS ensures that authorized activities ultimately result in "no net loss" of eagles by requiring compensatory mitigation that either reduces another form of mortality to a level equal to or greater than the unavoidable mortality, or leads to an increase in carrying capacity and/or productivity that allows the eagle population to grow by an equal or greater amount. For permitted projects with 30-year incidental take permits, the USFWS re-evaluates take at the project every five years over the course of a 30-year permit, and authorization may be amended based on the five-year reviews. Compensatory mitigation is not calculated over 30 years from the initial pre-construction fatality estimate as post-construction monitoring data and documented fatalities are used to inform the fatality estimate. A permit review is conducted every five years and, based on estimated actual take during the preceding five years, the USFWS may adjust predicted take for the next five-year period. Once the five-year review is complete, the USFWS may also adjust compensatory mitigation requirements.

3.8.2.3 Direct and Indirect Impacts of the No Action Alternative

Under the No Action Alternative, the BLWP would not be constructed, and there would be no additional impacts on bald and golden eagles beyond those associated with the current uses of the BLWP area. Existing impacts on bald and golden eagles within the BLWP area are primarily associated with transmission lines and structures that pose risks to eagles (i.e., potential for collisions or electrocution) and low levels of human activity (e.g., ranching, hunting, vehicle/OHV use) that may result in minor noise and visual disturbance to eagles.

3.9 Visual Resources

The term “visual resources” refers to the composite of basic terrain, geologic, and hydrologic features; vegetative patterns; and built features that influence the visual appeal of a landscape. Visual impacts are defined as the change to the visual environment resulting from the introduction of modifications to the landscape. This section describes the existing context of the visual environment and assesses the potential impacts from the Proposed Action, Alternatives 1 and 2, and the No Action Alternative within the visual resource impact analysis area, which includes the area within 30 miles of the Proposed Action area, including Alternatives 1 and 2 area, but excluding the National Forest system lands.

3.9.1. Affected Environment

The visual resource impact analysis area lies within the southeastern portion of the Colorado Plateau physiographic province (U.S. EPA 2010). The Colorado Plateau consists of an uplifted, eroded, and deeply dissected tableland. Its benches, mesas, buttes, salt valleys, cliffs, and canyons are formed in and underlain by thick layers of sedimentary rock. Precipitous sidewalls mark abrupt changes in local relief, often of 1,000 to 2,000 feet or more. The region is dominated by a mix of pinyon-juniper and grasslands.

The BLM uses the Visual Resource Management (VRM) System to classify and manage visual resources on lands under its jurisdiction. The VRM System involves inventorying scenic values, establishing management objectives for those values through the resource management planning process, and then evaluating proposed activities to determine whether they conform to the management objectives (BLM 1984). The BLM’s VRM System incorporates scenic quality, viewer sensitivity, and visual distance zones to identify overall visual resource inventory (VRI) classes. These classes (I, II, III, and IV) represent the relative value of the existing visual landscape, as well as the visual resource baseline from which to measure impacts that a proposed project may have on these values. A VRI is not currently available for the SFO. To effectively evaluate impacts to scenic values within the area, a project-level VRI was conducted in June 2018 within a 30-mile distance of the BLWP within the SFO covering approximately 656,731 acres. The VRI area was defined as the area of visibility up to 30 miles from the location of BLWP wind turbines. This area was determined following research conducted by Argonne National Laboratory and the results found within *Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes* (Sullivan, R., et al. 2012).

The scenic quality⁷ of the VRI area regardless of jurisdiction/ownership was inventoried as part of the VRI. Each scenic quality rating unit received a rating that relates to its inherent aesthetic value based on the key factors of landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications, which are used to evaluate the scenic quality of a landscape. Within the VRI area, 212,558 acres were evaluated as Scenic Quality B and 444,172 acres as Scenic Quality C. Mapping related to scenic quality is located in Appendix F.

Visual sensitivity reflects attitudes and perceptions held by people regarding the landscape and, in general, reflect the public's level of sensitivity for noticeable change to the landscape. Visual sensitivity levels for the VRI area ranged from high to low. High levels of sensitivity, located within approximately 225,027 acres, are located along major roadways such as U.S. 60 and the co-aligned Magdalena Stock Driveway, as well as populated areas such as Quemado where the public views the landscape consistently and has concern for the preservation of the existing scenic quality. Moderate areas of sensitivity to change in scenic quality, located within approximately 361,034 acres, occur north of U.S. 60 in more remote and less populated areas where modifications to the landscape occur and changes in scenic quality are not as high of concern. Low areas of sensitivity, located within approximately 70,670 acres, are located south of U.S. 60 adjacent to Gila National Forest in remote areas where changes in scenic quality are not perceived by the public due to limited access. Mapping related to visual sensitivity is located in Appendix F.

The analysis of distance zones as part of the VRI considers the distance from which areas are commonly viewed (viewing platforms). The VRI area is subdivided into three distance zones: foreground-midground (FM), background (BG), and seldom seen (SS) per BLM M-8400, based on viewing platform selections and Geographic Information System (GIS) modeling. Within the VRI area, approximately 314,673 acres occur within the FM distance zone, primarily along major roadways and communities, 71,470 acres occur in the BG distance zone, and 270,588 acres occur in the SS zone. Mapping related to visual distance zones is located in Appendix F.

Within the VRI area, 63,378 acres are classified as VRI Class I (10 percent of the VRI area), 34,762 acres (5 percent of the VRI area) as VRI Class II; 189,084 acres (29 percent of the VRI area) as Class III; and 369,987 acres (56 percent of the VRI area) as VRI Class IV. Approximately 19,868 acres/49 percent occurs on VRI Class III and 20,474 acres/51 percent occurs on VRI Class IV within the 40,342-acre BLWP area. Mapping related to VRI Classes is located in Appendix F.

In its planning process, the BLM weighs visual and competing resource values to allocate the VRM classes with associated management class objectives for a given area's visual setting. The SFO RMP identifies approximately 28,533 acres (2 percent of the total SFO acreage) to be managed as VRM Class I and 520,024 acres (36 percent of the total SFO acreage) to be managed as VRM Class II. The remainder of the SFO is to be managed as VRM Class III (448,910 acres/28 percent) and Class IV (509,432 acres/34 percent) (BLM 2010).

There are 40,342 acres within the BLWP area within the SFO. Approximately 3,242 acres (8 percent) occur on lands managed as VRM Class II; 20,842 acres (52 percent) occur on VRM Class III; and 16,257 acres (40 percent) occur on VRM Class IV within the BLWP area. Figure 3-12 and Figure 3-13

⁷Scenic or visual quality is the visual appeal of a landscape. The landscape is measured in terms of its distinctiveness (or memorability), scarcity, and variety of the landform, vegetation, water, color, adjacent scenery, and man-made features and how well these features fit together. The relative scenic quality (A, B, or C) is assigned to a landscape by rating the scenic quality evaluation key factors of landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications on a numerical scale. Landscapes considered to have the highest scenic value have a scenic quality rating of A; those with a rating of C are considered to be more common, less distinct landscape (BLM 1986b).

show the VRM classes allocated by the SFO within the Proposed Action and Alternatives 1 and 2 areas, respectively.

The existing landscape character and condition of the visual resource impact analysis area are identified in terms of general landforms, vegetation, built features, and land use by visual analysis units (VAUs). The VAU delineations, similar to Scenic Quality Rating Units, are based on areas with common landform patterns and features, vegetation communities and patterns, built features, land use patterns, scarcity, and/or surface water resources in relation to the Colorado Plateau Ecoregion. Two VAUs were delineated within the Proposed Action and Alternatives 1 and 2 areas (Figure 3-14 and Figure 3-15, respectively). Detailed description of the VAUs are provided in Appendix F.

Key sensitive viewing platforms or key observation points (KOPs) were selected within and adjacent to the Proposed Action and Alternatives 1 and 2 areas (Figure 3-16 and Figure 3-17, respectively) that represent viewing locations where the public would view the proposed BLWP both from a stationary (e.g., scenic overlook or residential area) or a linear (e.g., highway or trail) location. The KOPs that were selected include the Cimarron Ranch Subdivision, U.S. 60, Bill Knight Gap Road, Coronado Trail National Scenic Byway, and Zuni Salt Lake Proprietary ACEC. Table 3-20 provides the rationale and type of each viewing platform. For linear platforms such as U.S. 60, the entire length of the route within the visual resource impact analysis area was evaluated, not just from a single viewing location. In addition, the Pueblo of Zuni have provided the BLM with two stationary locations that are used on their pilgrimage route to the Zuni Salt Lake. These locations are considered sensitive and are not shown on the figures in this EIS.

Table 3-20. Sensitive Viewing Platform Selection Rationale

Sensitive Viewing Platform	Platform Type	Rationale for Platform Selection
Cimarron Ranch Subdivision	Stationary	The Cimarron Ranch Subdivision sensitive viewing platform was selected due do the number of residences and potential views from residences. The platform is located approximately 4.5 miles north of the nearest visible turbine.
Zuni Salt Lake Proprietary ACEC	Stationary	The Zuni Salt Lake Proprietary ACEC sensitive viewing platform was selected due do the cultural importance of this location to Native American Tribes in the area. The stationary platform is located approximately 21 miles north of the nearest visible turbine at the top of the landform surrounding the Zuni Salt Lake; the BLWP would not be visible from the water body itself.
U.S. 60	Linear	The U.S. 60 sensitive viewing platform was selected due do the large amount of vehicular traffic associated with this highway. This platform also has some historical significance and is identified as the Ocean to Ocean Highway as well as an alignment associated with the Magdalena Stock Driveway ¹ . The platform is located approximately 2.5 miles north of the nearest visible turbines and intersects project infrastructure (transmission lines).
Bill Knight Gap Road	Linear	Bill Knight Gap Road is a north-south connector route between U.S. 60 and Luna, NM. This linear platform parallels and is adjacent to the turbines proposed along the east side of the alternatives.
Coronado Trail National Scenic Byway/U.S. 191	Linear	The Coronado Trail National Scenic Byway (U.S. 191) is located approximately 16 miles from the nearest visible wind turbines. The angle of observation from this platform would be predominately head-on views and viewer position would be predominately neutral.

Table Abbreviations: ACEC = Area of Critical Environmental Concern; NM = New Mexico

¹ The Magdalena Stock Driveway was a 125-mile long corridor that was used for movement of cattle and sheep to Magdalena, New Mexico for shipping in the late 1800's until the 1970's and is of historical importance in the region.

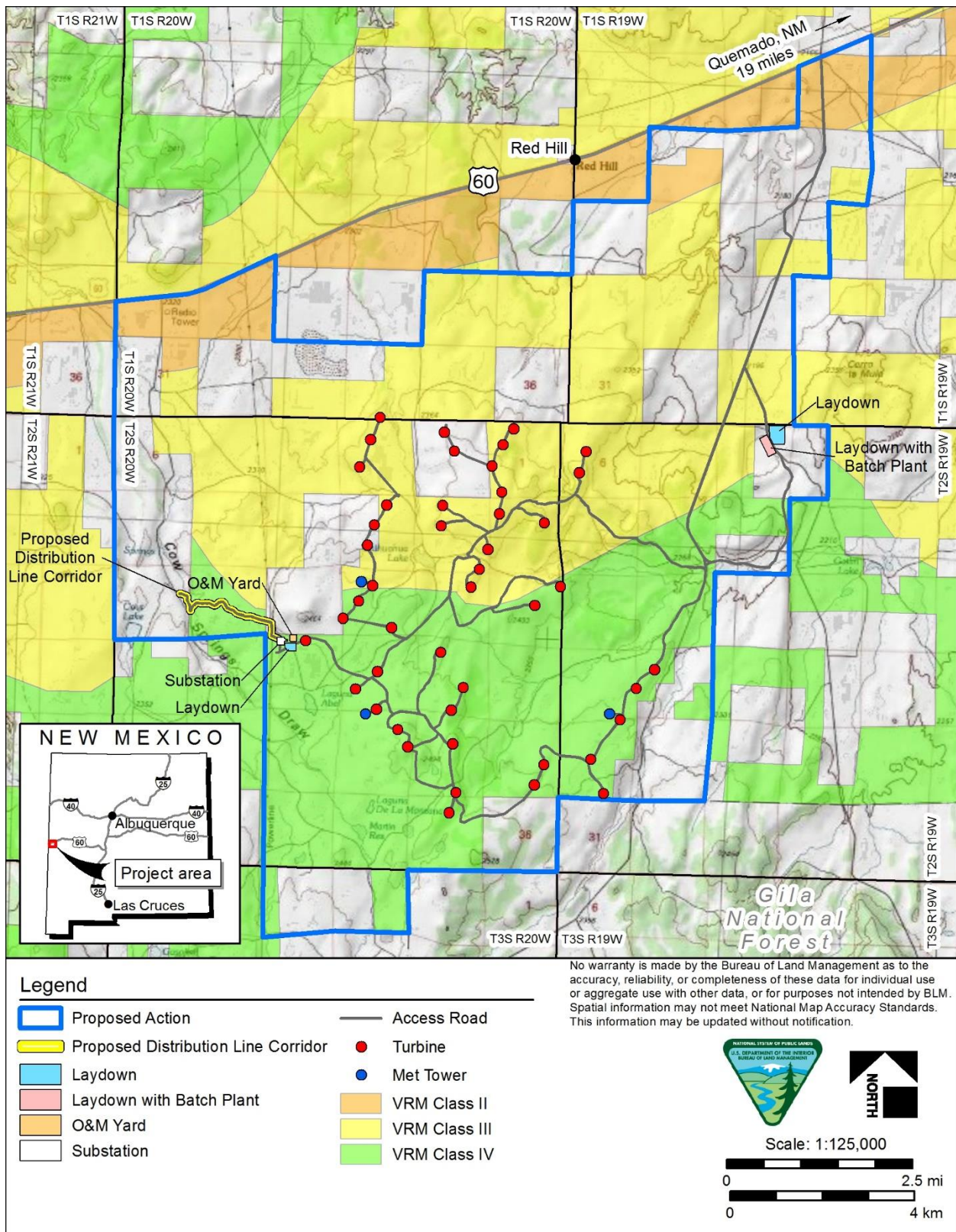


Figure 3-12. VRM Classes within the Proposed Action Area

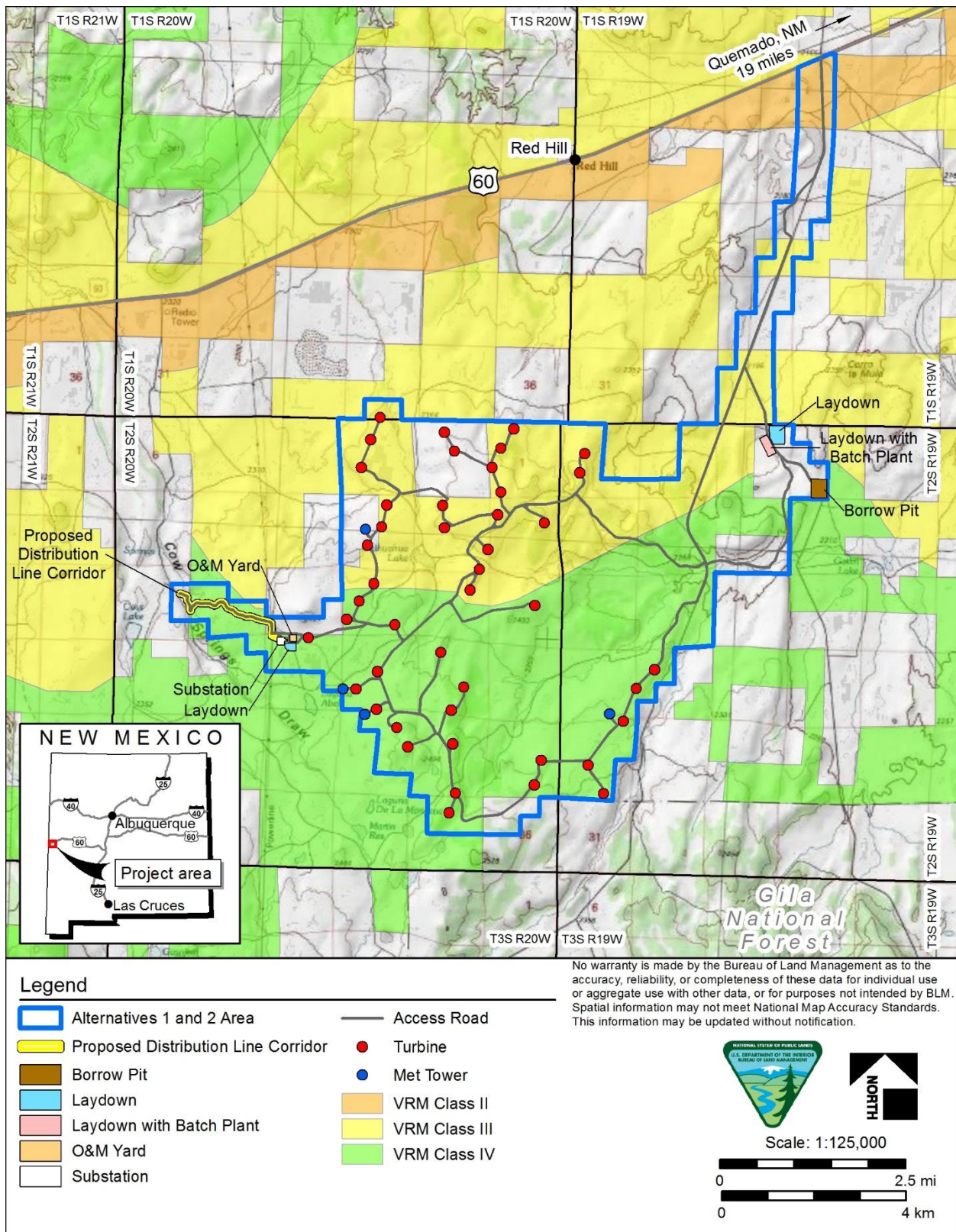


Figure 3-13. VRM Classes within Alternatives 1 and 2 Area

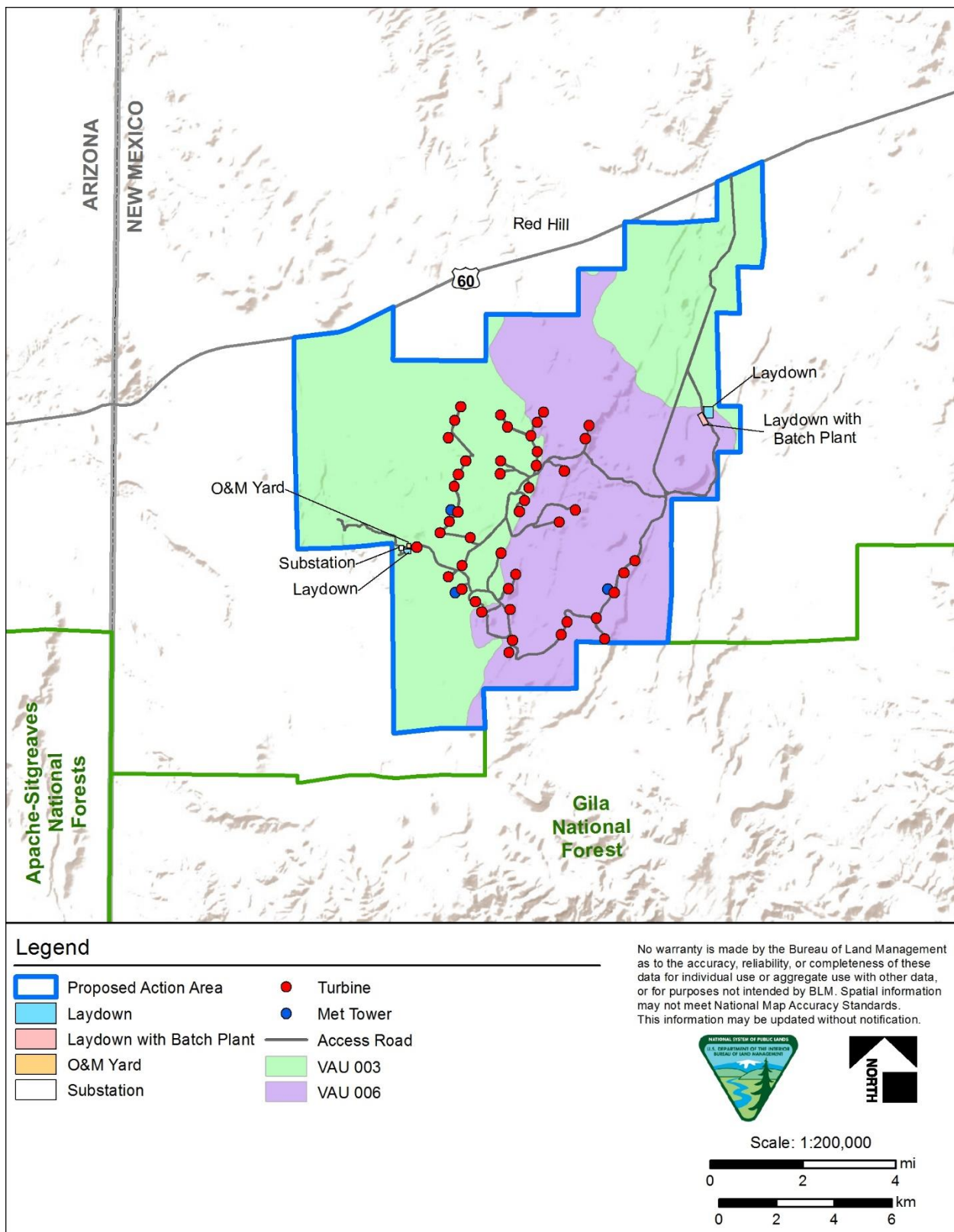


Figure 3-14. Visual Analysis Units within the Proposed Action Area

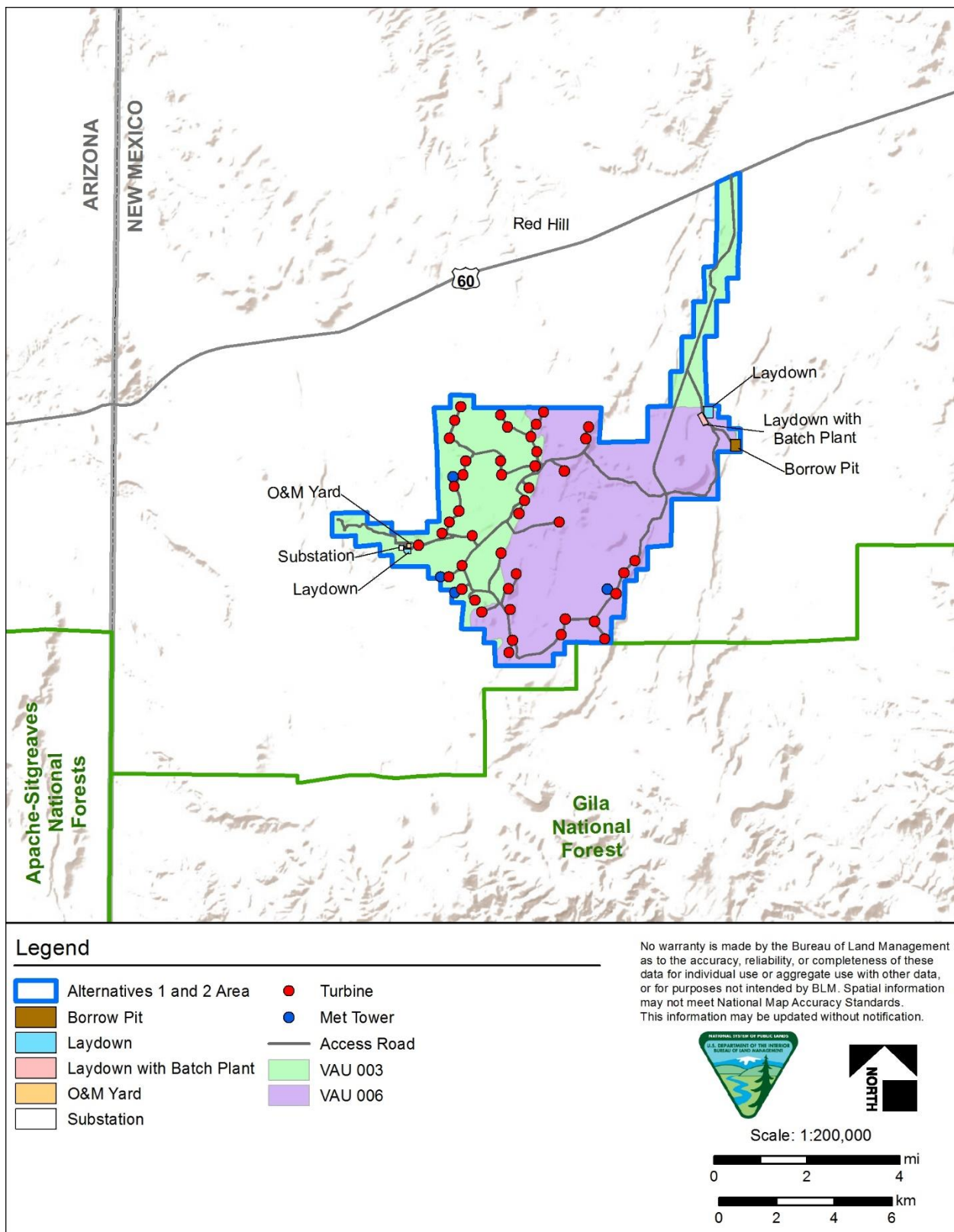


Figure 3-15. Visual Analysis Units within Alternatives 1 and 2 Area

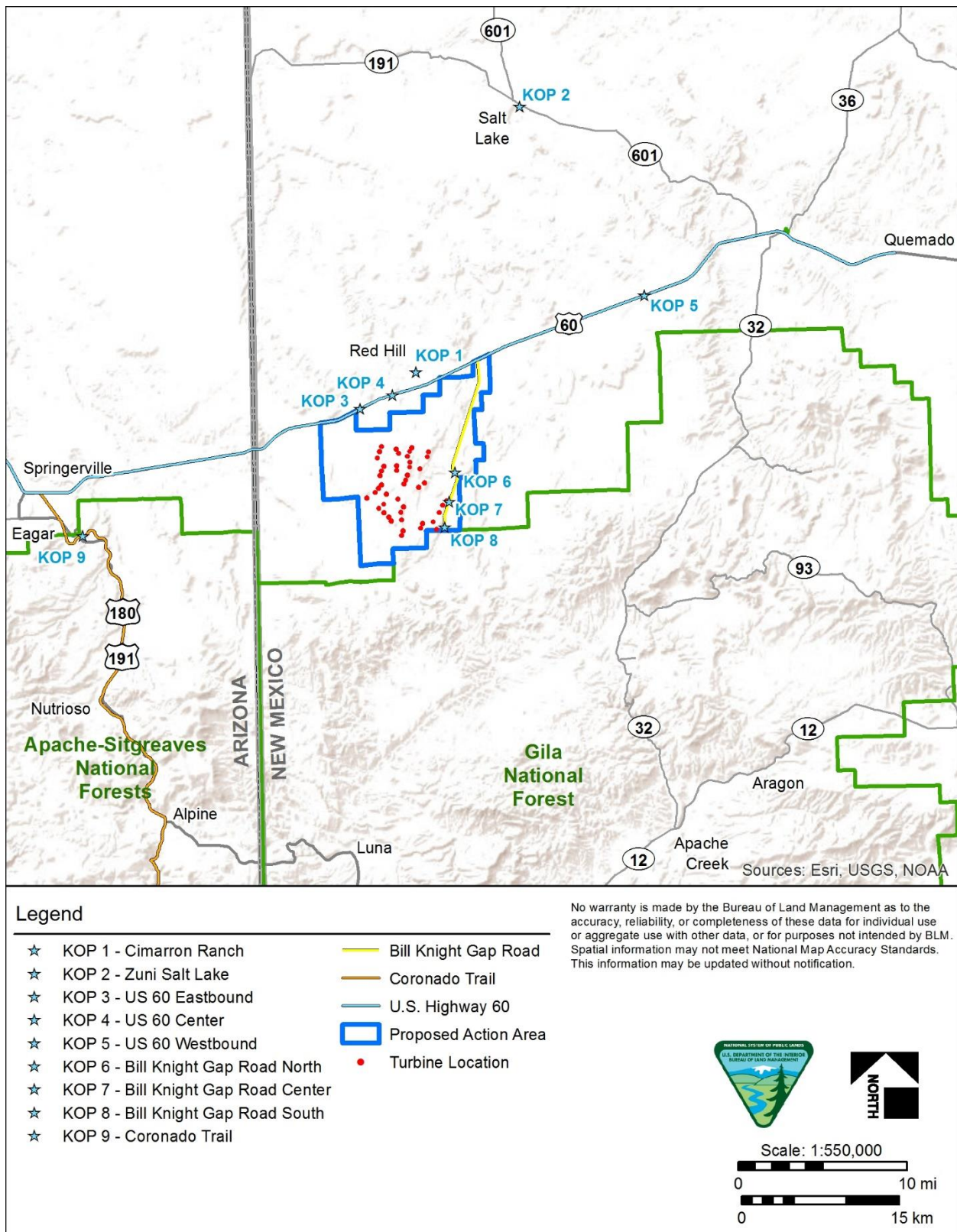


Figure 3-16. Key Observation Point Locations for the Proposed Action

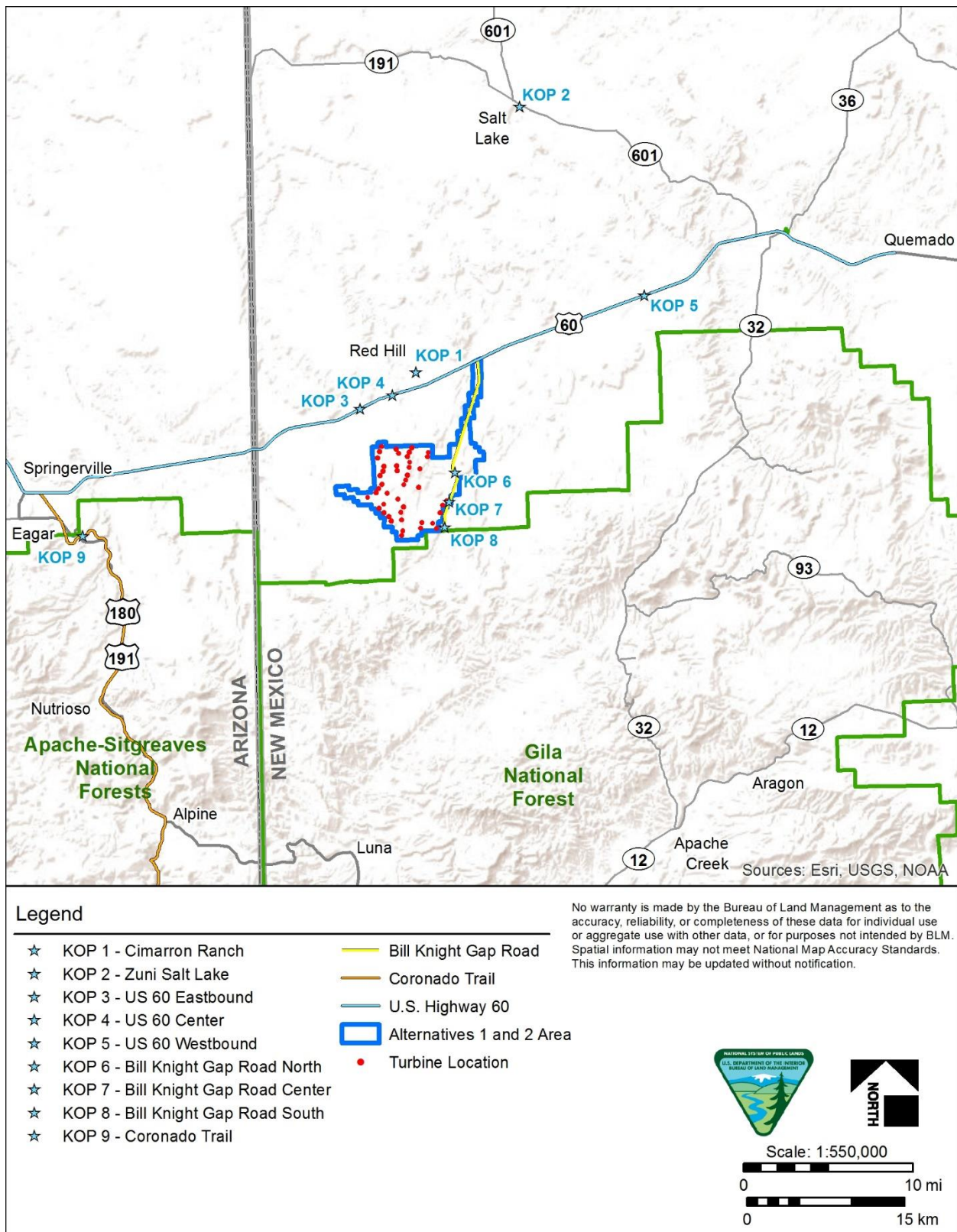


Figure 3-17. Key Observation Point Locations for Alternatives 1 and 2

3.9.2. Environmental Consequences

An analysis of visual dominance, scale, and contrast was used to determine the degree that the Proposed Action and Alternatives 1 and 2 would attract attention and to assess the relative change in character as compared to the existing characteristic landscape and its inherent scenic quality. The amount of visual contrast created is directly related to the amount of attention that is drawn to a feature in the landscape. Changes in the viewsheds from sensitive viewing locations were also evaluated and characterized. In addition, the analysis of visual impacts was used in the determination of compliance with the BLM's VRM objectives where the Proposed Action and Alternatives 1 and 2 would be located within BLM-administered lands. The potential impact to the Coronado Trail National Scenic Byway, Zuni Salt Lake Proprietary ACEC (including the two pilgrimage route locations), and the Cerro Pomo ACEC are also addressed in this section.

3.9.2.1 *Direct and Indirect Impacts from the Proposed Action*

Construction

Under the Proposed Action, the existing visual character and scenic quality would be affected during construction by the generation of fugitive dust; movement of equipment and vehicles in and out of the Proposed Action area; and the presence of construction cranes, transmission line stringing, and material stockpiles. The construction activities would introduce forms, lines, colors, and textures that would temporarily attract attention and create strong contrast⁸ with the existing setting. Removal of vegetation would expose lighter-color soils in the cleared areas for laydown/staging, underground electrical collection system trenches, distribution poles, new access roads, and turbine towers.

The construction-related impacts would range from a minor to moderate degree of change in the characteristic landscape in the foreground area⁹ of three of the KOPs (U.S. 60, Bill Knight Gap Road, and Cimarron Ranch Subdivision) depending on the viewing distance, type of construction activity taking place, and time of day. There would be no apparent change in the middleground from these viewing platforms or from the Coronado Trail National Scenic Byway KOP because of the open and irregular vegetation pattern in the landscape and because much of the ground disturbance from the construction of the BLWP would not be readily apparent at that distance. The construction activities would also be less noticeable in the middleground because of the presence of other cultural modifications and areas of disturbance such as the Red Hill Community sand and gravel pit and existing network of unpaved roads. Therefore, there would be short-term, moderate impacts on visual resources resulting from construction activities.

Operation and Maintenance

The magnitude of change to the landscape character and scenic quality within the foreground of the Proposed Action area would introduce numerous elements not currently common in the Proposed Action area. The proposed substation, security fencing, and O&M building would appear to substantially alter the landscape and be visually prominent. The large stature of the 499-foot-tall wind turbines, the

⁸ To analyze and mitigate potential visual impacts associated with proposed activities, the BLM uses guidelines described in BLM Handbook H-8431-1, Visual Resource Contrast Rating (BLM 1986). The degrees of contrast determined from selected KOPs or places where users tend to congregate, are categorized in a range including none, weak, moderate, or strong—where strong indicates a proposed activity will create contrast that demands attention, will not be overlooked, and is dominant in the landscape. Factors to be considered when applying the contrast criteria include distance, angle of observation, length of time the proposed project is in view, relative size or scale, season of use, light conditions, recovery time, spatial relationships, atmospheric conditions, and motion.

⁹ The foreground distance zone is defined as the area up to 10 miles from the BLWP wind turbines or the KOPs, the middleground distance zone is the area from 10 miles to 20 miles away, and the background is considered to be from 20 to 30 miles away.

white color of the towers, and the movement of the blades would attract attention, create a severe change in the landscape character, and result in a strong visual contrast within the foreground of the Proposed Action area. The overhead transmission and collection lines and access roads would be similar to existing features already present within the foreground area and would most likely not attract attention. Within the middleground and background of the Proposed Action area, the magnitude of change to the existing landscape character and scenic quality would vary depending on the distance, scale, and distinctiveness of landforms, which would affect the prominence of the Proposed Action components not common within the landscape.

Effects on Existing Scenic Quality and Landscape Character

Within the Proposed Action area, there are no lands that are considered as scenic quality A or B landscapes. There would be approximately 41,997 acres of scenic quality C landscapes within the Proposed Action area that would be impacted by the Proposed Action due to the influence of project components within the landscape that would reduce the overall scenic quality rating associated with cultural modification for the two VAUs located within the Proposed Action area. The magnitude of change in landscape character associated with the Proposed Action would be major due to the dominant scale and form of the wind turbines in comparison to the undulating and sloping landforms, low stature vegetation, and minimal built features found in the existing landscape.

The improvements to existing access roads and the construction of new access roads within the Proposed Action area could create opportunities for people to access previously inaccessible areas of BLM lands. This could result in trampling vegetation and additional resource damage (such as increased erosion), which may indirectly, affect scenic quality in these areas. New access roads could also potentially provide scenic viewing opportunities not currently available to the public. Therefore, there would be long-term, major impacts on the existing scenic quality and landscape character resulting from operation and maintenance activities.

Effects on Cimarron Ranch Subdivision KOP

All 46 of the potential wind turbine locations would be visible from the Cimarron Ranch Subdivision KOP, which is approximately 4.5 miles from the nearest turbine location. The potential magnitude of impacts to the views from the KOP would vary depending primarily on the distance from the Proposed Action and the visibility conditions. The wind turbines associated with the Proposed Action would demand attention and dominate the landscape in the foreground of the Cimarron Ranch Subdivision KOP. The landscape from this viewpoint would appear to be severely altered because of the dominance of the wind turbine structures in scale, color, line, texture, and form, as well as the motion of the turbine blades, which would create strong contrast in the setting. Therefore, there would be long-term, major impacts on the views from the Cimarron Ranch Subdivision KOP resulting operation and maintenance activities.

Effects on U.S. 60, Bill Knight Gap Road, and Coronado Trail National Scenic Byway

Of the three linear viewing platforms, only U.S. 60 and Bill Knight Gap Road would have foreground views of the Proposed Action. Views of project components from these platforms would predominately be skylined and occasionally backdropped based on viewer perspective.

Within the foreground and middleground distance zones of U.S. 60, all 46 potential Proposed Action wind turbine locations would be visible from the highway. Eastbound motorists on U.S. 60 would have views of the turbines in the foreground of the Proposed Action area for approximately 15 miles of the 67 miles (22 percent of the time) within the visual resource impact analysis area. Westbound motorists on U.S. 60 would see the wind turbines in the foreground of the highway for approximately 16 miles of the 67 miles (24 percent of the time) within the Proposed Action area. Within the middleground views from U.S. 60, the proposed turbines would be equally skylined and seen with a backdrop against mountainous terrain. From this distance, the components of the Proposed Action would be visible by

motorists when traveling in either the eastbound or westbound direction for less than 4 miles of the 67 miles (6 percent of the time) within the visual resource impacts analysis area. Within the background distance zone, 14 of the Proposed Action wind turbine locations would be visible. The Proposed Action would be visible to motorists for 2 miles out of a total of 67.0 miles (3 percent of the time) within the analysis area in the eastbound direction. The components of the Proposed Action would not be visible within the background distance zone traveling in the westbound direction. Therefore, there would be long-term, major impacts on views from U.S. 60 resulting from operation and maintenance activities.

Along Bill Knight Gap Road within the foreground distance zone, 42 of the possible 46 Proposed Action wind turbine locations would be visible in either direction for the entire approximately 10.6 miles (100 percent) within the analysis area. Along one portion of Bill Knight Gap Road, the proposed turbines would be within approximately 850 feet of the road. The Bill Knight Gap Road viewing platform does not occur within the middleground or background area. Therefore, there would be long-term, major impacts on views from Bill Knight Gap Road KOP resulting from operation and maintenance activities.

From the U.S. 191 segment of the Coronado Trail National Scenic Byway, motorists would have middleground views of the Proposed Action; there would be no foreground or background views. Of the possible 46 Proposed Action wind turbine locations, 43 turbine locations would be visible from the scenic byway only in the southbound travel direction. Views of the proposed wind turbines from the scenic byway would be equally skylined and seen with a backdrop against mountainous terrain. The duration of view of the Proposed Action from the middleground of the scenic byway would be approximately 0.4 mile of the 36.6 miles of roadway (less than 1 percent of the time) within the visual resource impact analysis area. The Proposed Action as viewed from the middleground of the Coronado Trail National Scenic Byway would create weak contrast in form, color, line, and texture in the characteristic landscape and may attract attention depending on the time of day and atmospheric conditions. Therefore, there would be long-term, minor impacts on views from the Coronado Trail National Scenic Byway KOP resulting from operation and maintenance activities.

Effects on Zuni Salt Lake and Cerro Pomo ACECs

The Proposed Action would be visible in the background (approximately 21 miles away) of the Zuni Salt Lake Proprietary ACEC KOP. Twenty-six of the Proposed Action wind turbine locations would be visible from the Zuni Salt Lake Proprietary ACEC KOP. Views of the Proposed Action from this stationary KOP would be predominantly of the blades of the wind turbines; the remainder of the turbine structure would be obstructed from view by landforms. The proposed wind turbines would be visually subordinate and overall the project components would create low contrast due to the distance and variable atmospheric conditions. The casual observer would not likely notice the turbines on the horizon from this viewing platform because of the expansive views and variety of the landforms in the landscape. The amount of exposure of the Proposed Action from this KOP would be span approximately 15 degrees along the horizon. Visual magnification such as binoculars at this distance may be needed to pick out the turbines against the sky. Therefore, there would be long-term, negligible impacts on views from the Zuni Salt Lake Proprietary ACEC KOP resulting from operation and maintenance activities.

One of the two locations on the pilgrimage route is approximately 9 miles north of the Zuni Salt Lake Proprietary ACEC KOP and 30 miles from the closest wind turbine in the Proposed Action. At this location, the view would be approximately 800 feet higher in elevation than the Zuni Salt Lake Proprietary ACEC KOP and all 46 wind turbine locations would be visible. Only a portion of the blades of the turbines would be visible; the rest of the turbine would be obstructed from view by landforms. The wind turbines would be visually subordinate, and overall, the project components would create low contrast due to distance from the Proposed Action and variable atmospheric conditions. A person at this distance from the Proposed Action would not likely notice the turbines because of the expansive views and variety of the landforms in the landscape. The casual observer may need the aid of binoculars

or some other magnification at this distance to pick out the turbines against the sky. The second location along the pilgrimage route is approximately 1 mile south of the Zuni Salt Lake Proprietary ACEC KOP. The Proposed Action would not be visible from this location because of intervening landforms and an inferior viewer position. Therefore, there would be long-term, negligible impacts on views from the pilgrimage route resulting from operation and maintenance activities.

Visitors at the Cerro Pomo ACEC would have foreground and middleground views of the Proposed Action that would be intermittent and predominately seen with a backdrop against mountainous terrain. Views of the Proposed Action in the foreground would attract attention and create moderate contrast within the viewshed due to the form, line, color, texture, and scale of the turbines that are not characteristic of the landscape. Similar to other middleground views, the Proposed Action would create weak contrast in form, color, line, and texture in the characteristic landscape and may attract attention depending on the time of day and atmospheric conditions. Approximately 21 percent of the ACEC would have views of the Proposed Action in the foreground area and 4 percent would have views in the middleground area. Therefore, there would be long-term, minor impacts on views from within the Cerro Pomo ACEC resulting from operation and maintenance activities.

Effect on Night Skies

To avoid collisions with aircraft, the proposed turbines must be lighted at night. Night-sky contrasts can be substantial in rural, undeveloped areas such as the BLWP area because there are few other light sources and there is uniform and generally featureless dark background. The lights may be visible for more than 20 miles depending on atmospheric conditions (Sullivan, et.al. 2012, NPS 2014). The synchronized flashing of the Aircraft Detection Lighting Systems (ADLS) as proposed in the BLWP POD (Borderlands Wind, LLC 2019) when activated would result in strong, short-duration contrast on the surrounding landscape from aircraft leaves the airspace.

Military aircraft conducting training missions within designated flight corridors in the vicinity of the wind turbines may activate the ADLS. Specific Military Training Routes known as Visual Routes are conducted between 100 feet and 1500 feet above ground level with flight corridors in this area which falls within the 1,000-foot ADLS trigger area. The number of Commercial air traffic passing over the BLWP area (not landing at local airports) would not activate the ADLS because they travel at elevations greater than 1,000 feet. There are four regional airports within approximately 30 miles of the BLWP area. Based on flight statistics obtained from those four regional airports, it is estimated there may be 55 flights that would occur in the BLWP area within a 24-hour period. It is unknown how many of the estimated 55 flights would occur during nighttime hours or fly at altitudes at or below 1,500 feet (height of the turbine and 1,000-foot trigger area). An airplane could trigger the ADLS on for approximately 4.5 minutes based on a speed of 180 miles per hour (single engine, general aviation aircraft) (Davisson 2016). Single engine aircrafts would typically cruise above 1,000 feet and would only enter into the 1,000-foot ADLS trigger area when they are landing or taking off. The closest regional airport is approximately 12 miles away with an average of two flights a month. A single engine, general aviation plane would approach or depart from an airport at a 10:1 glide slope gradient and would fly at an elevation between 1,000 and 1,500 feet approximately 2.5 miles away from the airport (Schiff 2011). At this distance from the BLWP area, it is unlikely that planes using the regional airport would trigger the ADLS.

The short duration synchronized flashing of the ADLS when activated by aircraft entering the airspace and approximately 30 seconds after leaving the airspace would have substantially less visual impacts at night than the standard continuous, medium-intensity red strobe light aircraft warning systems due to the short duration of activation. Therefore, there would be long-term, negligible to minor impacts on night skies resulting from operation and maintenance activities associated with the ADLS.

Decommissioning

The potential impacts associated with the decommissioning process would be similar to the construction-related effects for the Proposed Action. The Proposed Action area's scenic quality and landscape character would be affected by the generation of fugitive dust, movement of equipment and vehicles in and out of the BLWP area, and presence of construction cranes removing the turbine towers. The decommissioning activities would introduce forms, lines, colors, and textures that would temporarily attract attention and strongly contrast with the existing setting. In addition, the decommissioning activities would create a subtle degree of change in the characteristic landscape in the foreground area of the U.S. 60, Bill Knight Gap Road, and Cimarron Ranch Subdivision KOPs. There would be no apparent change in the middleground view of the KOPs because of the partial obstruction of the proposed project components by landforms, as well as much of the decommissioning activities, such as removal of the substation and O&M building, would not be readily apparent at that distance. Therefore, there would be short-term, moderate to strong impacts to scenic quality and landscape character resulting from decommissioning activities.

3.9.2.2 Proposed Action Conformance with BLM VRM Objectives

The BLM has developed measurable standards for managing the visual resources of its administered lands. As previously noted, VRM classes with established objectives have been identified for the BLWP area's visual resources as part of the RMP process. Based on the contrast rating evaluation (BLM 1986b) conducted for this analysis, the magnitude of impact determined whether or not the Proposed Action would be in conformance with the established objectives (Table 3-21). The contrast rating and environmental factors worksheets for each KOP assessing BLM-administered lands are included in Appendix F, along with photorealistic simulations.

Table 3-21. BLM Visual Resource Management Class Objectives

VRM Class	Management Objective
I	The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
III	The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be no more than moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
IV	The objective of this class is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Table Abbreviations: BLM = Bureau of Land Management; VRM = Visual Resource Management

The Proposed Action would create weak contrast in VRM Class II areas when viewed from U.S. 60 and Bill Knight Gap Road KOPs and would meet VRM Class II objectives from those locations. There would be no perceived contrast associated with the Proposed Action from the Cimarron Ranch and Coronado Trail Scenic Byway KOPs.

As noted above, the Proposed Action would attract attention, create a severe change in the landscape character, and result in a strong visual contrast within the foreground area of the U.S. 60, Cimarron Ranch Subdivision, and the Bill Knight Gap Road KOPs. Therefore, the Proposed Action would not be in conformance with the VRM Class III management objectives (Table 3-22). Because the Proposed Action would not meet the VRM Class III objective as allocated in the SFO RMP, a land use plan amendment would be required. The Proposed Action would create weak contrast when viewed from the Coronado Trail Scenic Byway and would meet VRM Class III objectives from this KOP.

The Proposed Action would create strong contrast in VRM Class IV areas when viewed from the Cimarron Ranch, U.S. 60, and Bill Knight Gap Road KOPs and would meet VRM Class IV objectives from those locations. There would be weak contrast associated with the Proposed Action from the Coronado Trail Scenic Byway KOP.

The landscape of the Proposed Action area would not be visible from the Zuni Salt Lake Proprietary ACEC KOP; only a portion of the blade of the turbines would be visible, and as such, compliance with VRM is not applicable for that KOP.

Table 3-22. BLM Conformance by KOP for the Proposed Action

KOP	VRM Class	BLM Acres		Contrast Rating	Compliance
		Visible			
Cimarron Ranch Subdivision	II	16		None	Meets
	III	2,363		Strong	Does Not Meet
	IV	23		Strong	Meets
U.S. 60	II	2,908		Weak	Meets
	III	13,876		Strong	Does Not Meet
	IV	6,257		Strong	Meets
Bill Knight Gap Road	II	525		Weak	Meets
	III	4,484		Strong	Does Not Meet
	IV	4,508		Strong	Meets
Coronado Trail Scenic Byway	II	7		None	Meets
	III	317		Weak	Meets
	IV	952		Weak	Meets
Total Acres of Noncompliance	II	0		NA	NA
	III	20,723		NA	NA
	IV	0		NA	NA

Table Abbreviations: BLM = Bureau of Land Management; KOP = key observation point; NA = not applicable; VRM = Visual Resource Management.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to avoid and/or minimize impacts to visual resources from the Proposed Action are recommended.

3.9.2.3 Direct and Indirect Impacts of Alternative 1 and Alternative 2

Alternatives 1 and 2 would have similar effects as the Proposed Action. With Alternative 2, the casual observer at the Zuni Salt Lake Proprietary ACEC KOP would see 7 more turbines than the Proposed

Action and Alternative 1 because of the difference in turbine height. The reduction of one turbine location for both Alternatives 1 and 2 as compared to the Proposed Action and the increase in turbine height associated with Alternative 2 would not be perceived by the casual observer and impacts on visual resources would be consistent with those impacts associated with construction, O&M, and decommissioning of the Proposed Action.

Conformance with BLM VRM Objectives:

Alternatives 1 and 2 would have similar effects on VRM objectives and KOPs as the Proposed Action (Table 3-23). Overall BLM acres visible from KOPs would be reduced as a result of the smaller footprint of Alternative 1 and 2 area as compared to the Proposed Action area. Similar to the Proposed Action, Alternatives 1 and 2 would not meet VRM Class III objectives as allocated in the SFO RMP; a land use plan amendment would be required.

Table 3-23. BLM Conformance by KOP for Alternatives 1 and 2

KOP	VRM Class	BLM Acres		Contrast Rating	Compliance
		Visible			
Cimarron Ranch Subdivision	II	0		None	Meets
	III	387		Strong	Does Not Meet
	IV	23		Strong	Meets
U.S. 60	II	312		Weak	Meets
	III	3,816		Strong	Does Not Meet
	IV	4,204		Strong	Meets
Bill Knight Gap Road	II	269		Weak	Meets
	III	2,704		Strong	Does Not Meet
	IV	3,401		Strong	Meets
Coronado Trail Scenic Byway	II	0		None	Meets
	III	254		Weak	Meets
	IV	969		Weak	Meets
Total Acres of Noncompliance	II	0		NA	NA
	III	6,907		NA	NA
	IV	0		NA	NA

Table Abbreviations: BLM Bureau of Land Management; KOP = key observation point; NA = not applicable; VRM = Visual Resource Management.

Additional Measures to Avoid and/or Minimize Impacts

With the implementation of the BMPs and other design features in Appendix B, no additional measures to avoid and/or minimize impacts to visual resources from Alternatives 1 and 2 are recommended.

3.9.2.4 *Direct and Indirect Impacts from the No Action Alternative*

Under the No Action Alternative, the BLM would not authorize the new grant application to construct, operate, maintain, and decommission the Proposed Action or Alternatives 1 or 2. No new disturbance to the characteristic landscape would occur, and no new elements or patterns would be introduced to the BLWP area. Therefore, there would be no impact on the casual viewer from stationary or linear KOPs or Special Management Areas.

3.10 Cumulative Impacts

The determination of what past, present, and reasonably foreseeable future actions to consider in the impact analysis is based on the resources being affected by the proposed BLWP. Past, present, and reasonably foreseeable future actions that incrementally add to the potential cumulative impacts of the Proposed Action, Alternatives 1 and 2, and No Action Alternative are considered in this EIS. The intent of this analysis is to capture the total effects of multiple actions over time that would be missed by evaluating each action individually.

3.10.1. Cumulative Effects Analysis Area and Timeframe of Effects

Each resource being analyzed has a defined cumulative effects analysis area (CEAA) for the Proposed Action, Alternatives 1 and 2, and No Action Alternative. Table 3-24 provides the geographic area of the CEAs by resource.

Table 3-24. Cumulative Effects Analysis Areas (CEAs)

Resource	CEAA ¹ and Rationale for CEAA	Acres of Proposed Action CEAA	Proposed Area Percent of Total CEAA	Acres of Alternatives 1 and 2 CEAA	Alternatives 1 and 2 Percent of Total CEAA
Cultural Resources	5 miles. Applies to all land ownership types and areas visible within 5 miles of any project component or to the visual horizon, whichever is closer.	220,587	19.73	18,907	10.74
Mexican Wolf	Species' current occupied range (not including Tribal lands).	11,155,987	0.39	11,155,987	0.17
Special Status Species	10 miles. Anticipated area of effect for local area populations.	490,188	8.88	424,656	4.45
Bald Eagle	86 miles. Area of potential impacts to bald eagles related to the regional breeding population and the usual dispersal distance for eagle fledglings.	16,951,207	0.26	16,556,068	0.11
Golden Eagle	109 miles. Area of potential impacts to golden eagles related to the regional breeding population and the usual dispersal distance for eagle fledglings.	26,510,746	0.16	26,015,700	0.07
Visual Resources	30 miles. Due to the scale and visibility of wind turbines, facilities beyond this distance might sometimes be noticed by casual observers, but would appear to be so small as to have negligible impacts.	2,570,753	1.69	2,418,739	0.78

¹ Where miles are used, miles refers to the distance from the Proposed Action or Alternatives 1 and 2 area boundaries.

In terms of timeframe, the cumulative effects analysis is considered over a 35-year period. The proposed BLWP has a life expectancy of 35 years based on electrical demand, maintenance, and the expected life of the project facilities and major components.

3.10.2. Past and Present Actions

The cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. Existing conditions reflect the aggregate impact of prior human actions and natural events that have affected the environment and could contribute to cumulative effects. By looking at current conditions, the residual effects of past human actions and natural events are captured, regardless of which particular action or event contributed those effects. The Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.”

3.10.3. Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions are actions that have existing decisions, funding, or formal proposals or that are highly probable. These actions are not connected to the Proposed Action, Alternatives 1 and 2, and No Action Alternative. They are projections being made so that future effects, cumulative and otherwise, can be estimated, as required by NEPA. Specific projects within the resource CEAs have been reviewed by land managers, including the USFS Schedule of Proposed Actions (SOPA), NMDOT, Arizona Department of Transportation, NMSLO, and Catron, Apache, and Greenlee counties. Table 3-25 identifies the name and provides a brief description of each project within the CEAs.

Table 3-25. Projects in the Cumulative Effects Analysis Areas

Project Name	Owner/Proponent	Project Summary	Relevant Resource
4FRI Rim Country Project EIS	Apache-Sitgreaves National Forests	Landscape-scale restoration on the Coconino, Apache-Sitgreaves, and Tonto National Forests of ponderosa pine ecosystems; designed to maintain, improve, and restore ecosystem structure, pattern, function, and resiliency.	Mexican Wolf, Special Status Species, Bald and Golden Eagles
Luna Restoration Project EIS	Gila National Forest Quemado Ranger District	Ecological restoration treatments to minimize impacts of high severity fire across the landscape and provide community protection, provide vegetation and forest health management, improve watershed conditions, and protect and conserve wildlife habitat.	Mexican Wolf, Special Status Species, Bald and Golden Eagles, and Cultural Resources
Sheep Cabin Water System CE	Gila National Forest Quemado Ranger District	Improve existing water sources on the El Caso Allotment near Poison Canyon. These water improvement structures will benefit wildlife, including bats, and livestock. Action will install approximately 2.3 miles of pipeline, 4 storage tanks, 3 troughs, and 1 well.	Mexican Wolf, Special Status Species, Visual and Cultural Resources
Quemado RD Willie Steele and Escondido Trail Re-Routes CE	Gila National Forest Quemado Ranger District	Decommission approximately 0.75 mile of trail segments on Willie Steele and Escondido trails that dead end on private land, and construct 1.6- and 1.0-mile segments of Willie Steele and Escondido trails, respectively, around private land to provide access entirely on USFS lands.	Mexican Wolf, Special Status Species, Visual and Cultural Resources

Project Name	Owner/Proponent	Project Summary	Relevant Resource
Agua Fria Water System CE	Gila National Forest Quemado Ranger District	Improve existing water sources on the Agua Fria Allotment to benefit wildlife and livestock. Proposed to install approximately 2.7 miles of pipeline, 1 or 2 storage tanks, and 2 troughs.	Mexican Wolf, Special Status Species, Visual and Cultural Resources

Table Abbreviations: 4FRI = Four Forest Restoration Initiative, CE = Categorical Exclusion, EIS = Environmental Impact Statement, RD = Ranger District

Other reasonably foreseeable future actions and management activities occurring in the CEAs that are highly probable include livestock grazing, range improvements, vegetation management, recreation (e.g., hunting, OHV use), road improvements, special designation areas, temporary MET towers, transmission lines, telephone lines, communication towers, and community development. Other disturbances that are ongoing include wildland fire and spread and establishment of noxious weeds and invasive plant species.

3.10.4. Cumulative Impacts to Resources

For this analysis, cumulative resource impacts for the CEAs are the combined direct and indirect effects of the present and reasonably foreseeable future actions, in addition to the direct and indirect impacts of the Proposed Action, Alternatives 1 and 2, and No Action Alternative. The levels of cumulative impacts are categorized as major, moderate, or minor based on the same thresholds defined in Section 3.1. If the results of the analysis of direct or indirect impacts were considered to be none or negligible as a result of the build alternatives and No Action Alternative, there would be no measurable contribution to a cumulative effect; therefore, no cumulative effects analysis for the respective resource/use has been done.

Based on the analysis of direct and indirect impacts, only short-term impacts would occur from the construction or decommissioning of the Proposed Action or Alternatives 1 and 2 for a resource/use. It is unlikely that all of the reasonably foreseeable future actions and management activities occurring in the CEAs would be built at the same time as the Proposed Action or Alternatives 1 and 2. Therefore, there would be no measurable contribution of the alternatives' short-term impacts to a given resource's/use's cumulative impacts, and no cumulative short-term effects analysis for the respective resource/use has been done.

Based on the analysis of direct and indirect impacts provided in Chapter 3, neither the Proposed Action, nor Alternatives 1 and 2, nor No Action Alternative would have long-term, minor, moderate, or major direct or indirect effects to lands and reality; transportation and travel management; general vegetation; special status plant, reptile, and amphibian species; or federally listed species within the BLWP area. There would be no measurable contribution to the resource's/use's respective cumulative impacts; therefore, there is no cumulative effects analysis for these resources/uses. Refer to the specific resource subsection in Chapter 3 for detailed information.

At the end of the description of the cumulative impacts for each resource below, concluding statements of impacts are provided. The alternative's magnitude, duration, and intensity of direct and indirect impacts are restated, followed by a similar summary of total cumulative impacts that includes consideration of the direct and indirect alternative's effects. A statement on the contribution of the alternatives' impacts to the cumulative impacts is made as well.

3.10.4.1 Cultural Resources

Only a portion of the approximately 345 square miles within the Proposed Action CEAA and 275 square miles within the Alternatives 1 and 2 CEAA has been surveyed for cultural resources. The region

surrounding the Proposed Action and Alternatives 1 and 2 areas is one with a rich history and prehistory.

The identified past, present, and reasonably foreseeable projects that could contribute impacts to cultural resources include community development, transmission line development, roads, and forest health management. Although the extent of these disturbances is not readily quantifiable, much of the CEAA remains undeveloped, and thousands of cultural resources probably remain intact but have yet to be discovered and recorded. Potential impacts to public land managed by BLM and NMSLO would be considered for projects proposed in the future, and measures to avoid, reduce, or mitigate impacts on important cultural resources are likely to be implemented.

Proposed Action and Alternatives 1 and 2 Contribution to Cumulative Impacts

The cultural resources that would be directly affected by Alternatives 1 and 2 are a small fraction of a percent of the cultural resources within the CEAA, and impacts on those resources would be avoided or mitigated to the maximum extent practicable. If disturbance is unavoidable, recovery and preservation of artifacts and information and other potential mitigation measures would be implemented in accordance with Section 106 consultation. Direct visual impacts of the wind farm on the setting of cultural resource sites could be largely reversible with decommissioning of the BLWP at the end of its use life and the restoration of the landscape.

Any residual direct impacts would not represent a major cumulative impact to those of other past, present, and reasonably foreseeable future actions.

The BLWP, in combination with other highly probable reasonably foreseeable projects, including other planned renewable energy and residential development projects, could result in cumulative indirect impacts to cultural resources. Cumulative impacts resulting from most types of development projects are likely to be long-term because those facilities probably would be present for decades.

No Action Alternative Contribution to Cumulative Impacts

There would be no contribution to cumulative impacts to cultural resources because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts to cultural resources.

3.10.4.2 Mexican Wolf

The types of projects or actions that could contribute to impacts to Mexican wolves include livestock grazing, community development, OHV use, transmission line development, roads, vegetation management, and forest health management (including prescribed burning). Livestock grazing, as well as wildlife movement, may spread invasive plants and alter the cover and composition of plant communities used by wildlife. Community development, roads, and infrastructure development would potentially consume useable habitat and fragment large blocks of habitats into smaller isolated ones. Future Federal planning efforts such as the 4FRI Rim Country and the Luna Restoration projects would help to implement measures to reduce impacts since their purpose is to protect and conserve wildlife habitat. Some of the foreseeable future actions, such as fuels and vegetation management found within the Mexican Wolf CEAA would have beneficial impacts to Mexican wolves and their suitable habitats on federally managed lands. Approximately 64 percent of the lands within the Proposed Action and Alternatives 1 and 2 CEAA for Mexican wolves are federally managed. In combination, past, present, and reasonably foreseeable future actions would result in long-term, direct and indirect, minor impacts to Mexican wolves because the majority of the CEAA would have measures implemented by the BLM and/or Forest Service to minimize potential effects to Mexican wolves and their respective habitats.

Proposed Action and Alternatives 1 and 2 Contribution to Cumulative Impacts

In the long-term, the Proposed Action would have direct and indirect, minor effects to Mexican wolves and their habitats. These long-term effects would be reduced gradually over time as natural reclamation

of plant composition and cover occurs following construction and decommissioning activities. Cumulatively, the effects of the Proposed Action or Alternatives 1 and 2, when combined with past, present, and reasonably foreseeable future actions, would result in minor cumulative impacts to Mexican wolves within the Mexican Wolf CEAA due to the potential for further habitat loss, degradation, and fragmentation. The Proposed Action and Alternatives 1 and 2 would have a minor contribution to the cumulative effect on Mexican wolves.

No Action Alternative Contribution to Cumulative Impacts

There would be no contribution to cumulative impacts to Mexican wolves because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts to Mexican wolves.

3.10.4.3 Special Status Species

The types of projects or actions that could contribute to impacts to special status species include livestock grazing, community development, OHV use, transmission line development, roads, vegetation management, and forest health management (including prescribed burning). Livestock grazing, as well as wildlife movement, may spread invasive plants and alter the cover and composition of plant communities used by wildlife. Community development, roads, and infrastructure development would potentially consume useable habitat and fragment large blocks of habitats into smaller isolated ones. Future Federal planning efforts such as the 4FRI Rim Country and the Luna Restoration projects would help to implement measures to reduce impacts since their purpose is to protect and conserve wildlife habitat. Some of the foreseeable future actions, such as fuels and vegetation management found within the Special Status Species CEAA would have beneficial impacts to special status species and suitable habitats on federally managed lands. Approximately 69 percent of the lands within the Proposed Action CEAA and approximately 71 percent of the lands within the Alternatives 1 and 2 CEAA for these special status species are federally managed. In combination, past, present, and reasonably foreseeable future actions would result in long-term, direct and indirect, minor, impacts to special status species because the majority of the CEAA would have measures implemented by the BLM and/or USFS to minimize potential effects to these special status species and their respective habitats.

Proposed Action and Alternatives 1 and 2 Contribution to Cumulative Impacts

In the long-term, the Proposed Action would have direct and indirect, minor effects to special status species and their habitats. These long-term effects would be reduced gradually over time as natural reclamation of plant composition and cover occurs following construction and decommissioning activities. Cumulatively, the effects of the Proposed Action or Alternatives 1 and 2, when combined with past, present, and reasonably foreseeable future actions, would result in moderate cumulative impacts to special status species within the Special Status Species CEAA due to the potential for further habitat loss, degradation, and fragmentation. The Proposed Action and Alternatives 1 and 2 would have a minor to moderate contribution to the cumulative effect on special status species.

No Action Alternative Contribution to Cumulative Impacts

There would be no contribution to cumulative impacts to special status species because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts to special status species.

3.10.4.4 Bald and Golden Eagles

The types of projects or actions that could contribute to impacts to bald and golden eagles include livestock grazing, community development, OHV use, transmission line development, roads, vegetation management, and forest health management (including prescribed burning). Livestock grazing, as well as wildlife, may spread invasive plants and alter the cover and composition of plant communities used

by prey species. Community development, roads, and infrastructure development would potentially consume useable habitat and fragment large blocks of habitats into smaller isolated ones. Future Federal planning efforts such as the 4FRI Rim Country and the Luna Restoration projects would help to implement measures to reduce impacts since their purpose is to protect and conserve wildlife habitat. Some of the foreseeable future actions, such as fuels and vegetation management found within the Bald and Golden Eagles CEAs would have beneficial impacts to bald and golden eagles and their suitable habitats on federally managed lands. Approximately 40 percent of the lands within the Proposed Action and Alternatives 1 and 2 CEAs for bald eagles and 37 percent of the lands within the Proposed Action and Alternatives 1 and 2 CEAs for golden eagles are federally managed. In combination, past, present, and reasonably foreseeable future actions would result in long-term, direct and indirect, minor, impacts to bald and golden eagles because a large percentage of the CEAs would have measures implemented by the BLM and/or USFS to minimize potential effects to these species and their respective habitats.

Proposed Action Contribution to Cumulative Impacts

The USFWS's Programmatic EIS for the Eagle Rule Revision (USFWS 2016a) concluded that an annual take rate of 5 percent of the local area eagle population was the upper threshold of what would be appropriate to authorize (i.e., permit), whether or not the take is offset by compensatory mitigation. The USFWS has not issued any permits for authorized take of golden eagles that overlap with the project's local area population.

In the long-term, the Proposed Action and Alternatives 1 and 2 may have direct and indirect, major effects to eagles and their suitable habitat. These long-term effects would be reduced gradually over time as natural reclamation of plant composition and cover occurs following construction and decommissioning activities. Cumulatively, the effects of the Proposed Action and Alternatives 1 and 2, when combined with past, present, and reasonably foreseeable future actions, may result in major cumulative impacts to eagles within CEAA due to the potential for take of eagles as well as habitat loss, degradation, and fragmentation. The Proposed Action and Alternatives 1 and 2 may have a major contribution to the cumulative effect on eagles, though the cumulative effect to eagles would be offset to some degree through voluntary compensatory mitigation.

No Action Alternative Contribution to Cumulative Impacts

There would be no contribution to cumulative impacts to bald and golden eagles because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts to bald and golden eagles.

3.10.4.5 Visual Resources

The types of projects or actions that could contribute to impacts to visual resources include overhead transmission lines, MET towers, pipelines, communication towers, and community development. These actions generally result in a transformation of the natural landscape to a more developed setting when viewed during both day and night conditions over the long-term. Currently there are no projects or actions identified within the cumulative effects analysis area on BLM administered lands. Four reasonably foreseeable future actions have been identified which occur on USFS managed lands within the Quemado Ranger District. The Luna Restoration Project, Sheep Cabin Water System, Quemado Road Willie Steele and Escondido Trail Re-Routes and the Agua Fria Water System may contribute to overall cumulative impacts to visual resources, though at this time there is not sufficient documentation to evaluate the level of impact associated with these identified projects. In addition, wildland fire would also create a substantial change in the characteristic landscape for decades depending on the scale and intensity of the wildfire. The expansion of residential areas would expand the footprint of developed areas through the addition of structures, roads, and electrical distribution lines. The expanded

developed area would be particularly evident during nighttime conditions, when lighting would extend for a substantial distance from the developed area. Impacts of the combined actions would be perceived as strongest where viewed from sensitive viewing platforms, traditional areas identified by Native American Tribes, and from wilderness areas and WSAs. The implementation of the respective VRM objectives for BLM and USFS lands within the Visual Resources CEAA would help to implement measures to reduce impacts. In combination, past, present, and reasonably foreseeable future actions would result in long-term, direct and indirect, minor to moderate, e impacts to visual resources that overall would reduce scenic quality and notably transform the characteristic landscape.

Proposed Action and Alternatives 1 and 2 Contribution to Cumulative Impacts

The large stature of the proposed wind turbines with the white color of the towers, the movement of the blades and the synchronized flashing of the ADLS at night when activated would attract attention, create a substantial change in the landscape character, and result in a strong visual contrast within the foreground area of both linear and stationary sensitive viewing platforms (i.e., KOPs). The view of the casual observer from the foreground of these sensitive viewing platforms would be visually dominated by the Proposed Action and Alternatives 1 and 2. Based on the analysis of potential effects in this EIS, the Proposed Action and Alternatives 1 and 2 would have long-term, direct and indirect, minor to major, impacts to visual resources depending on the distance from the proposed project components. Cumulatively, effects of the Proposed Action and Alternatives 1 and 2, when combined with past, present, and reasonably foreseeable future actions, would result in long-term, direct and indirect, minor to moderate, cumulative impacts to the visual resources within the Visual Resources CEAA. The Proposed Action and Alternatives 1 and 2 would have a moderate contribution to the cumulative effects to visual resources because of the scale, strong contrast, and industrial characteristic of the wind facility in a sparsely populated and relatively undeveloped area. Visual resource impacts created by the wind farm would be largely reversible with decommissioning of the BLWP at the end of its use life and restoration of the landscape.

No Action Alternative Contribution to Cumulative Impacts

There would be no contribution to cumulative impacts to visual resource because the No Action Alternative would not result in any impacts. As such, the No Action Alternative is not analyzed for cumulative impacts to visual resources.

3.11 Land Use Plan Amendment

Actions approved or authorized by Federal land management agencies must conform to the approved land use plans for the lands they administer (43 CFR 1610.5-3). The BLWP area includes VRM Class II, III, and IV allocations (Figure 3-18 and Figure 3-19). The BLM's VRM Class III allocation allows for management/project activities that may attract attention, but should not dominate the view of the casual observer. However, the construction and operation of the BLWP wind turbines over the 35-year life of the proposed project would create strong visual contrast in terms of scale, line, form, color, and texture in the characteristic landscape. None of the alternatives would be in conformance with VRM Class III objectives established in the SFO RMP for the management of the visual resource values associated with this landscape. The VRM Class III allocations in the Proposed Action and Alternatives 1 and 2 areas would have to be re-classified as VRM Class IV for the BLWP to meet the objectives of the VRM class. Therefore, a plan amendment would be required for the BLWP to be in conformance with the RMP.

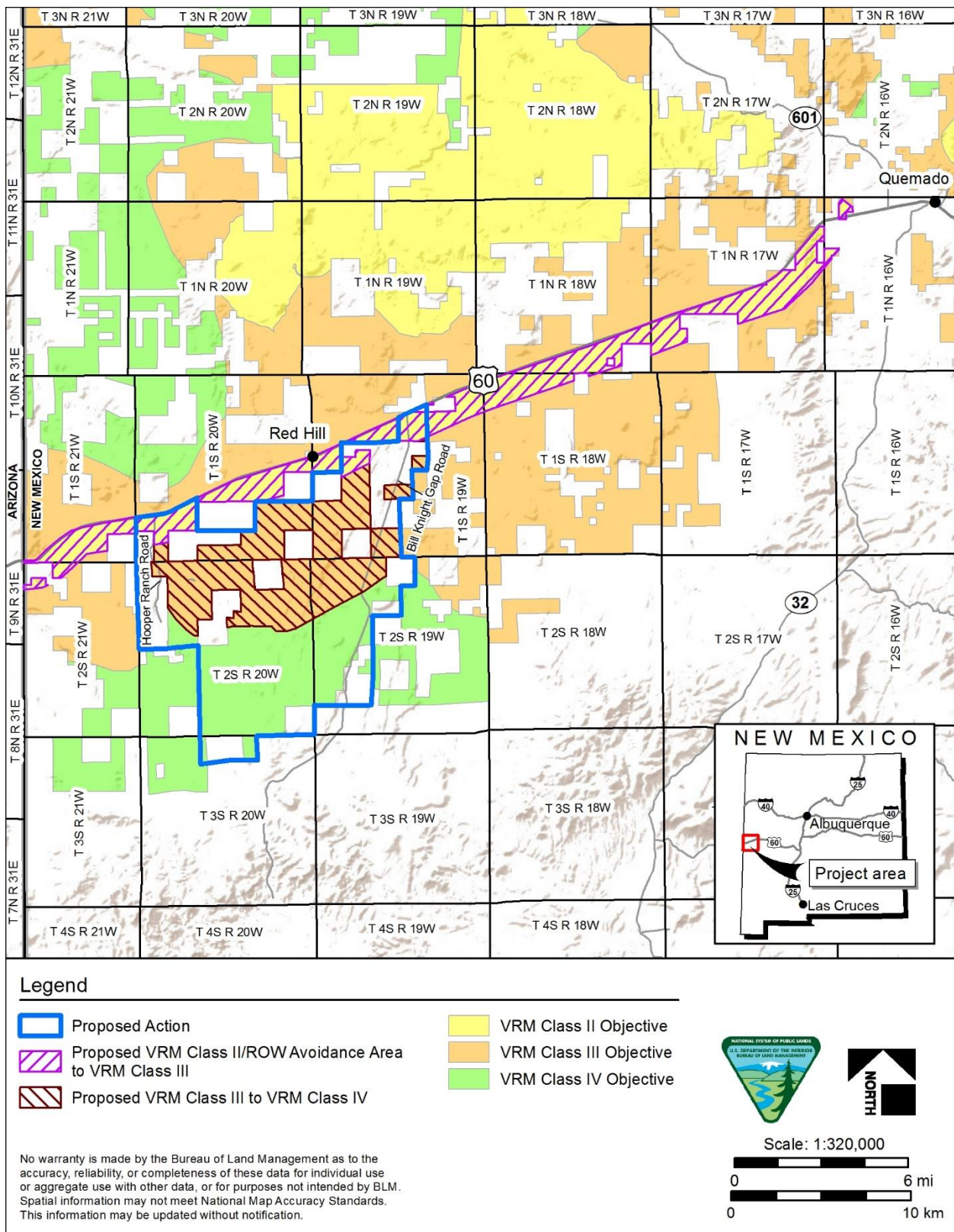


Figure 3-18. VRM RMP Amendment within the Proposed Action

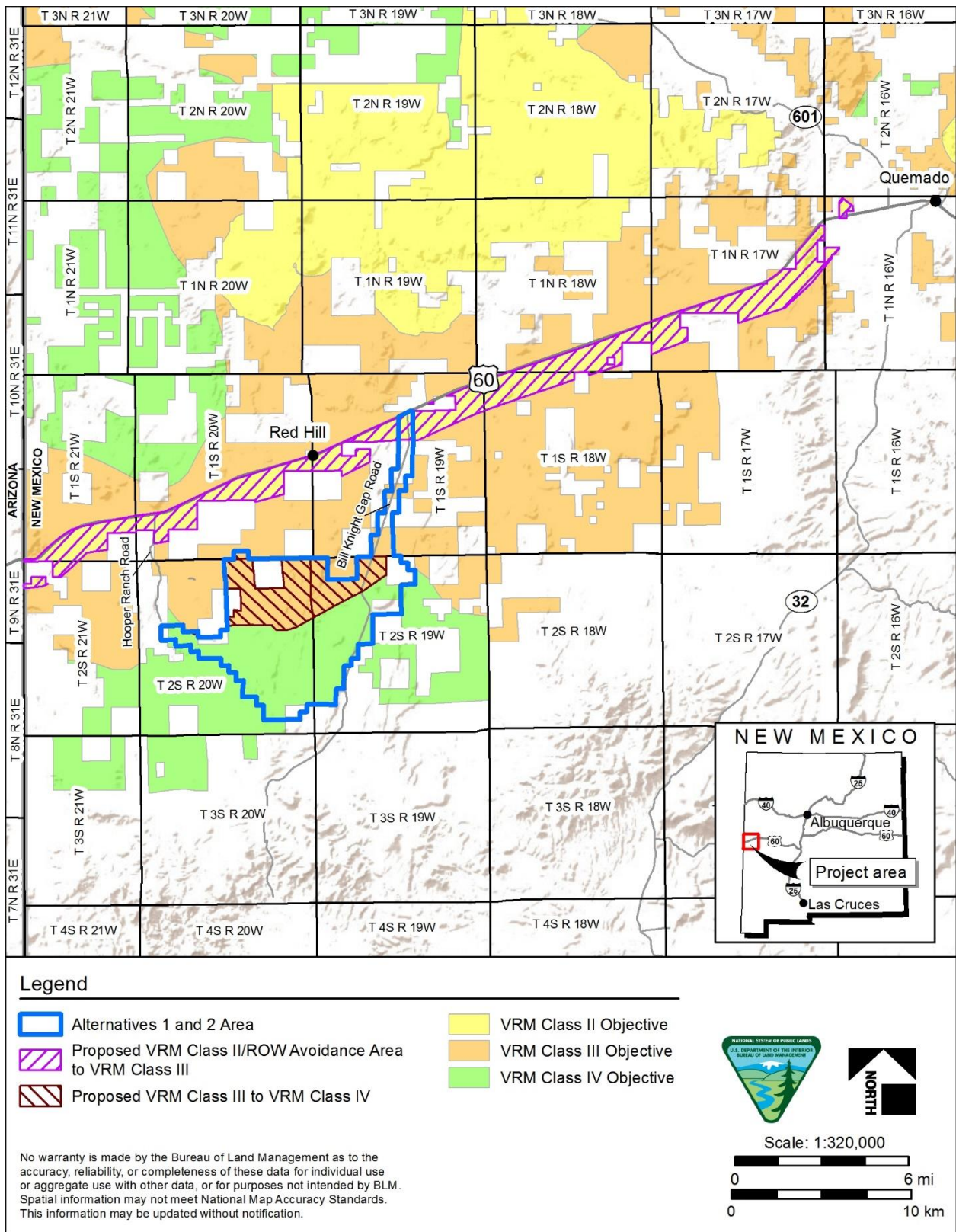


Figure 3-19. VRM RMP Amendment within Alternatives 1 and 2

The SFO RMP has allocated a VRM Class II and ROW avoidance area within a 37-mile-long by approximately 1.0-mile-wide segment (15,084 acres of BLM-managed lands) along the south side of U.S. 60 from just west of Quemado to the AZ–NM State line. The BLWP access roads proposed within this VRM Class II allocation and ROW avoidance area¹⁰ designation would not be compatible with the SFO RMP avoidance area allocation. The ROW avoidance area was delineated to protect the VRM Class II allocation and would no longer be applicable if the VRM Class II allocation was removed. As part of the proposed RMP amendment, the VRM Class II allocation would be removed and therefore the ROW avoidance designation would no longer be applicable. The removal of the VRM Class II and ROW avoidance would be completed within the Proposed Action and Alternatives 1 and 2 areas, as well as the entire 37-mile segment. The original allocation of VRM Class II in the RMP is not supported by the RMP record and no rationale exists for retaining the VRM Class II and ROW avoidance areas. This is beyond the scope of what is immediately necessary for the project but is being considered because of the lack of any rationale supporting the original allocation. The proposed plan amendment would re-classify the VRM II to a VRM III classification and remove the ROW avoidance area allocation.

Table 3-26. SFO RMP Proposed Amendment and Table 3-27 provide the acres of the proposed VRM changes, and Figure 3-18 and Figure 3-19 show the location of these modifications to the VRM class allocations for the Proposed Action and Alternatives 1 and 2, respectively. The acres of the various VRM classes in the SFO RMP (BLM 2010:pp. 42–43) and Map 6 Visual Resources Management Designations in the SFO RMP (BLM 2010:p. 44) would require revisions to show the change in VRM classes and the removal of the ROW avoidance area.

Table 3-26. SFO RMP Proposed Amendment for the Proposed Action

VRM Class	Existing VRM (acres)	Proposed VRM Change (acres)	Current RMP VRM (acres)	Proposed RMP VRM (acres)	Difference from Existing VRM RMP (percent)
Class II	2,044*	-2,044	520,024	517,980	-0.39
Class III	15,026	-12,982	448,910	435,928	-2.89
Class IV	13,268	+15,026	509,432	524,458	+2.95

Table Abbreviations: RMP = Resource Management Plan; SFO = Socorro Field Office; VRM = Visual Resource Management
 * All VRM Class II allocated areas within the Proposed Action area are located within the U.S. 60 ROW avoidance area.

Table 3-27. SFO RMP Proposed Amendment for Alternatives 1 and 2

VRM Class	Existing VRM (acres)	Proposed VRM Change (acres)	Current RMP VRM (acres)	Proposed RMP VRM (acres)	Difference from Existing VRM RMP (percent)
Class II	286*	-286	520,024	516,738	-0.05
Class III	5,381	-5,095	448,910	443,815	-1.13
Class IV	9,558	+5,381	509,432	514,813	+1.06

Table Abbreviations: RMP = Resource Management Plan; SFO = Socorro Field Office; VRM = Visual Resource Management
 * All VRM Class II designated areas within Alternatives 1 and 2 areas are located within the U.S. 60 ROW avoidance area.

¹⁰ A ROW Avoidance area is an environmentally sensitive area where ROWs may be granted only when no feasible alternative route is available (BLM 2010).

Amending the land use plan for the Proposed Action area would result in 12,982 fewer acres in VRM Class III and 15,026 more acres in VRM Class IV. For Alternatives 1 and 2, there would be 5,095 fewer acres in VRM Class III and 5,381 more acres in VRM Class IV.

There would be 15,084 fewer acres in VRM Class II in the SFO from the 37-mile-long segment (including the Proposed Action and Alternatives 1 and 2 areas). The total area removed from the ROW avoidance area in the SFO RMP (342,363 acres) would be a 15,084-acre, or 4.4 percent, reduction.

3.11.1. Environmental Effects of RMP Amendment

Direct and indirect effects of the BLWP Proposed Action and Alternatives 1 and 2 have been described in the preceding resource sections. This section includes descriptions of the potential impacts resulting from the proposed RMP amendment. With the No Action Alternative, no plan amendment would be implemented; it would not result in any additional environmental impacts other than those identified in the 2008 SFO RMP EIS (BLM 2008a) and ROD signed on August 20, 2010 (BLM 2010a). The following discussion addresses impacts from the change in allocation of VRM Class III to Class IV and the change from VRM Class II to Class III along with the removal of the ROW avoidance designation along U.S. 60 within the Proposed Action and Alternatives 1 and 2 areas.

The change in VRM objectives within the BLWP area to Class IV would allow for management/project activities to visually dominate the landscape and may be the major focus of viewer attention. The amendment to the SFO RMP to remove the ROW avoidance area would allow for ROW applications that did not meet prior ROW avoidance perimeters to be considered on a case-by-case basis. The amendment to the SFO RMP could have direct impacts to lands, realty, and mineral resources depending on the type and scale of management/project activities that may be allowed to occur on lands affected by these changes. As noted in the RMP EIS, on page 4-23, removal of the ROW avoidance area could open the area to exploration and development. These types of activities would remove vegetation, modify landforms, and may add structural elements to the landscape. Any ground-disturbing activities associated with construction and operation of facilities would generate fugitive dust, increase traffic on access roads, and potentially use nighttime lighting.

The VRI for the BLWP area identified the area as having class C scenic quality, with a mix of high and low sensitivity levels and visual distance zones identified within the foreground/midground as well as areas of seldom seen (see mapping in Appendix F). Future facilities and/or project activities would need to comply with the amended VRM Class III and Class IV objectives, which could have observable changes to the characteristic landscape by casual observers.

Removing the ROW avoidance designation, and changing the VRM from Class II to Class III, would allow for applications of land uses that could result in broader impacts to soil resources, such as roads wider than 14 feet. The change would reduce the BLM's level of management protection of soil and water resources on lands in the ROW avoidance area, because the management emphasis on maintaining existing vegetation and terrain features would not apply as noted in the 2008 RMP EIS on pages 4-38 and 4-39. Because the lands would still be managed by the BLM, measures to minimize impacts to soils would be implemented as part of the authorization process.

Biological resources may be affected by the SFO RMP amendment through a potential increase in habitat fragmentation and edge effects in a variety of wildlife habitats. Special status species that use these habitats may be effected by surface-disturbing activities (BLM 2008a:pp. 4-44 through 4-46). The magnitude of the potential effects to sensitive species are uncertain, but would be dependent on the type of construction and management activities for any project activities approved in the future that would take place within the BLWP area or the U.S. 60 corridor. Any direct or indirect impacts to federally

listed species or species proposed for listing would be evaluated under Section 7 of the ESA at the time that a new activity or development is proposed.

Vegetation in the BLWP area consists of sparsely vegetated short-grass grassland that transitions to shrubland and dense patches of pinyon-juniper woodland. These general vegetation communities occur throughout the region and are well represented in the surrounding area, including the U.S. 60 ROW avoidance area. Following the removal of the avoidance designation, vegetation in the ROW avoidance area would not be protected from surface-disturbing activities, which may result in loss of vegetation, reduction in soil stability, increase in erosion, and/or reduction in watershed health. The intensity of these effects would vary by the actual use allowed. The VRM Class II would be reduced to Class III, which would decrease the area where the maintenance or enhancement of existing vegetation communities is supported in accordance with VRM objectives through mitigation measures when a surface-disturbing action is proposed. Effects related to soil erosion, water quality, and invasive species could result from future surface-disturbing activities such as construction in ROWs, although it is expected that mitigation would be identified as part of the future site-specific NEPA analyses on a project-by-project basis (BLM 2008a:p. 4-40). Any invasive plant and noxious weed populations would be managed in compliance with the SFO RMP, the Final Vegetation Treatments Using Herbicides PEIS (BLM 2007), and the Vegetation Treatments Using Aminopyralid Fluroxypyr and Rimsulfuron on BLM Lands in 17 Western States PEIS (BLM 2016).

The SFO RMP amendment may include the introduction of new access into areas that were previously unavailable to the public. Any new access could allow for inadvertent damage from erosion brought about from vehicles and OHV use. ROWs are non-exclusive and any new applications for ROWs in the project area would be analyzed on a case-by-case basis for compatibility with the existing wind facilities. Direct effects to cultural resources would be assessed, and if adverse effects are identified, they would be resolved as part of the NHPA Section 106 process for any future management/project activities.

Direct and indirect socioeconomic impacts to BLM lands are expected to be minimal as a result of the amendment to the SFO RMP. If major utility-, energy-, or transportation-related projects were to be constructed in the U.S. 60 ROW avoidance area, Catron County and surrounding communities could experience job creation and tax revenues during construction. Impacts to population, housing, and community services would be greatest during construction of future projects because new populations would temporarily relocate for work. Mitigation or BMPs would minimize impacts from noise and other potential hazards to public safety.

3.12 Comparison of Impacts by Alternative

Table 3-28 displays the major characteristics and substantive environmental effects of each alternative, including the Proposed Action, considered in detail in this EIS.

Table 3-28. Comparison of Alternatives

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Bald and Golden Eagles	<p>Construction and decommissioning of the BLWP would result in the loss, degradation, and fragmentation of eagle foraging habitat. Disturbance from human activities and noise during construction and decommissioning could alter eagle use patterns, including the areas used for foraging, roosting, and nesting. Eagles that fly within the Proposed Action area could be injured or killed from collisions with rotating blades of wind turbines.</p> <p>The USFWS predicted there would be an annual take of 0.307 golden eagles per year and a cumulative take of two golden eagles over a five-year period during the O&M phase; the take of bald eagles at the BLWP is considered less likely to occur than take of golden eagles, but could not be quantified due to a lack of data resulting from few sightings within the Proposed Action area. The potential threat to eagles from collisions with wind turbines at the BLWP would exist during the anticipated 35-year life of the project.</p> <p>The project BMPs and other design features, and the stipulations that would be included in the BLM ROW authorization would minimize the potential short- and long-term impacts on eagles. However, the Proposed Action would still result in both short- and long-term, direct and indirect, major local and regional impacts on bald and golden eagles.</p> <p>Borderlands Wind, LLC has included a commitment in their draft Eagle Management Plan to provide voluntary compensatory mitigation to offset the anticipated impacts on eagles. The voluntary compensatory mitigation that is currently proposed by Borderlands Wind, LLC would take the form of \$165,000 in funding that would be contributed to the National Fish and Wildlife Foundation’s Eagle Mitigation Account or to a mitigation banking or in-lieu fee credit program.</p>	Same as Proposed Action.	Same as the Proposed Action except that the results of the USFWS’s analysis of Alternative 2 indicate that a golden eagle fatality is predicted to occur at an annual rate of 0.315 eagles per year and a predicted cumulative take of two golden eagles over a five-year period during the O&M phase.

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Cultural Resources	<p>The Proposed Action would introduce direct and indirect impacts on NRHP-eligible and unevaluated cultural resources that would not occur under the No Action Alternative. All direct impacts on cultural resources would occur during the construction phase of the project. It is expected that the 29 cultural resource sites that lie within the temporary disturbance footprint of the Proposed Action would be impacted by construction activities.</p> <p>The 17 cultural resource sites located outside but within 100 feet of the temporary disturbance footprint of the Proposed Action may also be indirectly impacted by construction activities.</p> <p>The O&M and decommissioning of the BLWP would likely not result in additional direct or indirect impacts to cultural resources beyond those resulting from the construction phase of the project.</p> <p>No cultural resources that are sensitive to potential visual impacts to setting were identified within the APE for indirect effects.</p> <p>The PA stipulates that an HPTP, which would include procedures for data recovery, site avoidance marking, and monitoring, would be prepared and implemented prior to construction. Additional supplemental surveys may be required as more detailed construction plans are developed; if needed, they would be conducted in accordance with the PA.</p>	<p>There would be 8 cultural resource sites considered eligible, potentially eligible, or unevaluated for the NRHP within the temporary disturbance footprint of Alternative 1 that would be impacted adversely by construction activities.</p> <p>The 13 cultural resource sites located outside but within 100 feet of the temporary disturbance footprint of Alternative 1 may also be indirectly impacted by construction activities.</p> <p>The O&M and decommissioning of the BLWP would likely not result in additional direct or indirect impacts to cultural resources beyond those resulting from the construction phase of the project.</p> <p>No cultural resources that are sensitive to potential visual impacts to setting were identified within the APE for indirect effects.</p> <p>The PA stipulates that an HPTP, which would include procedures for data recovery, site avoidance marking, and monitoring, would be prepared and implemented prior to construction. Additional supplemental surveys may be required as more detailed construction plans are developed; if needed, they would be conducted in accordance with the PA.</p>	<p>There would be 9 cultural resource sites considered eligible, potentially eligible, or unevaluated for the NRHP within the temporary disturbance footprint of Alternative 2 that would be impacted adversely by construction activities.</p> <p>The 13 cultural resource sites located outside but within 100 feet of the temporary disturbance footprint of Alternative 2 may also be indirectly impacted by construction activities.</p> <p>The O&M and decommissioning of the BLWP would likely not result in additional direct or indirect impacts to cultural resources beyond those resulting from the construction phase of the project.</p> <p>No cultural resources that are sensitive to potential visual impacts to setting were identified within the APE for indirect effects.</p> <p>The PA stipulates that an HPTP, which would include procedures for data recovery, site avoidance marking, and monitoring, would be prepared and implemented prior to construction. Additional supplemental surveys may be required as more detailed construction plans are developed; if needed, they would be conducted in accordance with the PA.</p>

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Land Use	<p>With the exception of the SFO RMP, the Proposed Action would be in conformance with existing State and local land use plans, and would not prohibit other permitted uses to occur over the long-term. An amendment to the SFO RMP would be needed to grant the ROW for the Proposed Action in order to construct the intersection improvements on U.S. 60 within the designated ROW avoidance area.</p> <p>Localized, short-term, minor impacts would occur during construction and decommissioning when ground disturbance and the presence of construction equipment would disrupt livestock grazing and create delays for local vehicular traffic. Long-term impacts to land use would include a reduction in AUMs from the negligible loss of permanent foraging acres (0.4 percent).</p> <p>There would be no regional impacts to land use from the Proposed Action.</p> <p>An amendment to the SFO RMP would be needed to grant the ROW for the Proposed Action in order to construct the intersection improvements on U.S. 60 within the designated ROW avoidance area. With an RMP amendment, the Proposed Action would be in conformance with existing State and local land use plans, and would not prohibit other permitted uses to occur over the long-term.</p>	<p>Alternative 1 would reduce the total project boundary acreage by 24,621 acres, including 14,501 acres of BLM-administered public lands, 4,525 acres of NMSLO-managed lands, and 5,595 acres of privately owned lands as compared to the Proposed Action.</p> <p>With the exception of the SFO RMP, Alternative 1 would be in conformance with existing State and local land use plans, and would not prohibit other permitted uses to occur over the long-term.</p> <p>Similar localized, short-term, minor impacts as the Proposed Action would occur during construction and decommissioning when ground disturbance and the presence of construction equipment would disrupt livestock grazing and create delays for local vehicular traffic by Alternative 1. Long-term impacts to land use would include a reduction in AUMs from the negligible loss of permanent foraging acres (0.7 percent).</p> <p>There would be no regional impacts to land use from Alternative 1.</p>	Same as Alternative 1.

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Migratory Birds	<p>There are no Important Bird Areas designated within the BLWP area. With the exception of seasonal playas, the BLWP area does not contain habitats that would concentrate migrating birds, such as large bodies of water, wetlands or riparian areas, or mountain ridges that would provide updrafts for migrating raptors. However, there are many Gunnison's prairie dog colonies that provide an abundant food source for raptors in the Proposed Action area.</p> <p>Potential impacts to migratory birds during construction and decommissioning may include injury or mortality; loss of nests; habitat loss, degradation, and fragmentation; and disturbance/displacement.</p> <p>During O&M, impacts to migratory birds would include injury or mortality from collision with turbines, towers, or transmission lines; electrocution from power lines; habitat loss, degradation, and fragmentation; and disturbance from human activities.</p> <p>A Bird and Bat Conservation Strategy would be implemented along with BMPs and other design features as part of the Proposed Action to minimize potential impacts on migratory birds and provide for adaptive management during O&M. The Proposed Action would result in short- and long-term, direct and indirect, moderate local and regional impacts to migratory birds.</p>	<p>An amendment to the SFO RMP would be needed to grant the ROW for Alternative 1 in order to construct the intersection improvements on U.S. 60 within the designated ROW avoidance area. With an RMP amendment, Alternative 1 would be in conformance with existing State and local land use plans and would not prohibit other permitted uses to occur over the long-term.</p>	<p>Same as Proposed Action.</p>

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Social and Economics Conditions	<p>The primary economic impacts of the Proposed Action would be relatively short-term potential increases in income and employment in the Social and Economic Study Area (SESA, see Section 3.3 for a detailed discussion), and longer term increases in tax revenue in Catron County. These potential increases in income, employment, and tax revenue would range from negligible to minor and would include direct and indirect impacts.</p> <p>Potential project-related impacts to employment and income are anticipated to be highest during the five- to six-month construction period, with smaller income and employment impacts during O&M and decommissioning. There would be short-term, minor impacts from the displacement of recreation and livestock grazing uses during construction and decommissioning. Potential impacts to population density in the area, water quantity, or housing availability due to the Proposed Action are projected to be minor and short-term.</p> <p>Short-term minor to negligible impacts to quality of life, particularly during the construction and decommissioning phases, may result from impacts related to frequency and quantity of vehicle traffic in the area, noise, air quality, water quality, scenic quality, and recreation. Long-term minor to major impacts to scenic values would be created by the Proposed Action.</p> <p>Current economic activities in the BLWP area are limited to some recreational use and livestock grazing. There would be short-term, minor impacts from the displacement of both uses during construction and decommissioning. Minor to no impacts are expected on population, water quantity, or housing availability due to the build alternatives. Short-term minor to negligible impacts to nonmarket values, particularly during the temporary construction and decommissioning periods, may result from effects on traffic, air quality, and access to recreation, hunting, and wildlife viewing opportunities. Long-term minor to major impacts to nonmarket scenic values would be created by the Proposed Action.</p>	Same as Proposed Action.	Same as Proposed Action.

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Special Status Plant and Wildlife Species	<p>There are eight special status plant species that are known to occur or could potentially occur within the Proposed Action area. None of these species have been found in the disturbance footprint. Indirect impacts on special status plant species may occur from the introduction or spread of noxious or invasive weeds in disturbed areas, as well as potentially outside of the Proposed Action footprint. The Proposed Action would result in localized, negligible impacts on special status plants.</p> <p>Localized, short-term impacts on special status terrestrial wildlife species during construction and decommissioning would include potential injury or death from interactions with the increased number of vehicles traveling on access roads and/or ground disturbance and underground burrow destruction by heavy equipment during construction activities.</p> <p>Potential impacts on special status terrestrial wildlife species during the O&M phase of the Proposed Action would include injury or mortality of individuals and various types of disturbance associated with human activities (e.g., vehicle use, maintenance activities) and wind turbine operation (e.g., noise, vibration, flicker/shadows cause by moving blades). The Proposed Action would result in localized short- and long-term, minor impacts on special status terrestrial wildlife species, with the exception of the Gunnison's prairie dog.</p> <p>The siting of turbines and other infrastructure in proximity to Gunnison's prairie dog colonies and the construction of access roads and collection lines within occupied prairie dog colonies would result in ongoing injury or mortality of prairie dogs and fragmentation of prairie dog colonies; increased access could also lead to an increase in recreational shooting of prairie dogs. Even with the implementation of BMPs and species-specific mitigation measures/design features, the Proposed Action would result in localized short- and long-term, moderate impacts on prairie dogs.</p>	Same as Proposed Action.	Same as Proposed Action.

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Federally Listed Species	<p>Potential impacts on special status birds and bats during construction and decommissioning include injury or mortality; loss of nests; habitat loss, degradation, and fragmentation; and disturbance/displacement. Special status birds and bats may be injured or killed as a result of collisions with turbines, towers, or transmission lines during the O&M phase, with an increased risk for raptor and bat species that forage in the Proposed Action area. The Proposed Action would result in short- and long-term, direct and indirect, moderate, local and regional impacts on special status birds and bat species.</p> <p>The Mexican spotted owl and Mexican wolf are the two federally listed species that could potentially occur within the BLWP area. There are no critical habitats for federally listed species in the BLWP area.</p> <p>There is a lack of preferred foraging, roosting, and nesting habitat for Mexican spotted owls in the BLWP area; however, wintering/migrating or dispersing Mexican spotted owls could potentially occur in the BLWP area. The Proposed Action would not impact Mexican spotted owl PACs or areas of designated critical habitat, directly or indirectly, during construction or any other phase of the project. The incidental occurrence of Mexican spotted owls in the Proposed Action area cannot be ruled out; however, the overall risk of direct or indirect impacts on the Mexican spotted owl is low. The Proposed Action could result in localized negligible impacts on Mexican spotted owls but would not have regional impacts on Mexican spotted owl populations.</p>	Same as Proposed Action.	Same as Proposed Action.

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Transportation and Travel Management	<p>Mexican wolves may occasionally travel through the BLWP area, but are not known to concentrate their activities in this area. Construction of the Proposed Action would result in minor habitat loss, degradation, and fragmentation for the Mexican wolf because wolves are not known to concentrate their activities in this area and there are no known den sites in the area. Construction and decommissioning of the Proposed Action would result in increased noise, human disturbance, and vehicle traffic, which could discourage adult or dispersing juvenile wolves from traveling through or foraging within the Proposed Action area.</p> <p>The construction of new access roads within the Proposed Action area would give the public more access to the area during O&M, which would increase the potential for disturbance to Mexican wolves that may travel in the vicinity of the Proposed Action area. The Proposed Action would have minor localized impacts on the Mexican wolf during the O&M phase due to the minimal use of the area by this species. The Proposed Action would result in localized minor impacts on the Mexican wolf but would not have regional impacts on Mexican wolf populations.</p>	Same as Proposed Action.	Same as Proposed Action.

Resource/Use	Proposed Action	Alternative 1	Alternative 2
Visual Resource	<p>The landscape character and scenic quality within the foreground areas from the Proposed Action area would appear to be severely altered as a result of the introduction of elements of form, line, color, texture, and scale, as well as motion not common within the existing landscape. During construction, O&M, and decommissioning, the Proposed Action would create major changes to the existing landscape character and the landscape would appear visually altered.</p> <p>The short duration synchronized flashing of the ADLS when activated by aircraft entering the airspace and approximately 30 seconds after leaving the airspace would have substantially less visual impacts at night than the standard continuous, medium-intensity red strobe light aircraft warning systems due to the short duration of activation.</p> <p>The Proposed Action would result in short- and long -term, direct, major impacts on visual resources within the characteristic landscape and from sensitive viewing platforms depending on the viewing distance and visibility conditions.</p> <p>An RMP amendment would be required since the Proposed Action would result in a strong visual contrast within the foreground area of the U.S. 60, Cimarron Ranch Subdivision, and the Bill Knight Gap Road KOPs and would not meet the VRM Class III objective as designated in the SFO RMP. Amending the SFO RMP for the Proposed Action area would result in 12,982 fewer acres in VRM Class III and an additional 15,026 acres in VRM Class IV. For Alternatives 1 and 2, there would be 5,095 fewer acres in VRM Class III and 5,381 more acres in VRM Class IV.</p> <p>There would be 15,084 fewer acres in VRM Class II in the SFO from the 37-mile-long segment (including the Proposed Action and Alternatives 1 and 2 areas). The total area removed from the ROW avoidance area in the SFO RMP (342,363 acres) would be a 15,084-acre, or 4.4 percent, reduction.</p>	<p>Same as Proposed Action.</p> <p>An RMP amendment would be required since Alternative 1 would result in a strong visual contrast within the foreground area of the U.S. 60, Cimarron Ranch Subdivision, and the Bill Knight Gap Road KOPs and would not meet the VRM Class III objective as designated in the SFO RMP similar to the Proposed Action. Amending the SFO RMP for Alternative 1 area would result in 5,095 fewer acres in VRM Class III and 5,381 more acres in VRM Class IV.</p> <p>The reduction in VRM Class II and the total area removed from the ROW avoidance area would be the same as the Proposed Action.</p>	<p>With Alternative 2, the casual observer at the Zuni Salt Lake Proprietary ACEC KOP would see 7 more turbines than the Proposed Action and Alternative 1 because of the difference in turbine height. The reduction of one turbine location for Alternative 2 as compared to the Proposed Action and the increase in turbine height would not be perceived by the casual observer and impacts on visual resources would be consistent with those impacts associated with</p> <p>Alternative 2 would result in short- and long -term, direct, major impacts on visual resources within the characteristic landscape and from sensitive viewing platforms depending on the viewing distance and visibility conditions.</p> <p>An RMP amendment would be required since Alternative 2 would result in a strong visual contrast within the foreground area of the U.S. 60, Cimarron Ranch Subdivision, and the Bill Knight Gap Road KOPs and would not meet the VRM Class III objective as allocated in the SFO RMP. Amending the RMP for Alternative 2, there would be 5,095 fewer acres in VRM Class III and 5,381 more acres in VRM Class IV.</p>

Resource/Use	Proposed Action	Alternative 1	Alternative 2
			The reduction in VRM Class II and the total area removed from the ROW avoidance area would be the same as under the Proposed Action and Alternative 1.

Table Abbreviations: ACEC = Area of Critical Environmental Concern; APE = area of potential effects; AUM = animal unit month; BLWP = Borderlands Wind Project; BLM = Bureau of Land Management; BMP = best management practice; GHG = greenhouse gas; HPTP = Historic Properties Treatment Plan; KOP = key observation point; NM = New Mexico; NMSLO = New Mexico State Land Office; NRHP = National Register of Historic Places; O&M = operation and maintenance; PAC = Protected Activity Center; RMP = Resource Management Plan; ROW = right-of-way; SFO = Socorro Field Office; VRM = Visual Resource Management

3.13 Irreversible and Irrecoverable Commitments of Resources

A commitment of resources is irreversible when its primary or secondary impacts limit the future option for a resource. An irretrievable commitment refers to the use or consumption of resources neither renewable nor recoverable for later use by future generations, and represents a permanent effect. Implementation of any of the build alternatives involving construction would require a commitment of natural, physical, human, and fiscal resources. Construction and operation of any of the build alternatives would require similar commitment of these resources.

Of all the build alternatives, the Proposed Action and Alternative 1 would represent the greatest impact to irreversible and irretrievable commitments of resources, as well as unavoidable impacts because these alternatives would have the larger footprint as compared to Alternative 2. Alternative 2 would have smaller construction and operation impacts because the footprint of this alternative, and the associated resources used to construct the BLWP would be less than the Proposed Action and Alternative 1. It should be noted however, that the construction of fewer turbines would mean constructing turbines with higher generation capacity to satisfy the interconnection agreement with TEP.

The No Action Alternative would represent no irreversible and irretrievable commitment of resources or unavoidable impacts in relation to the proposed BLWP. However, the No Action Alternative may represent possible impacts to resources on a regional basis because the amount of energy required for the demand would need to be produced from other sources. It would be speculation to say that the demand and subsequent supply would be from other renewable energy sources.

Construction of the BLPW would require the use of fossil fuels for construction vehicles, equipment, and construction-worker vehicles. Electricity would also be used at construction trailers or by portable generators during BLPW construction. Wind is a renewable resource that would not be depleted or altered by the build alternatives and could offset the need to consume fossil fuels.

Construction of the BLPW would require the use of various types of raw building materials, including cement, aggregate, steel, electrical supplies, piping, and other building materials such as metal, stone, sand, and fill material. Additionally, the fabrication and preparation of these construction materials would require labor and natural resources. Utilization of these resources would be irretrievable. However, these resources are readily available at this time and effects on their continued availability would not be expected.

Construction and operation of the proposed facilities would require labor, which would be otherwise unavailable for other projects. The commitment of labor is considered irretrievable. This commitment of labor, while irretrievable, would not be considered an effect, because the BLWP would be supplying employment opportunities. Furthermore, fiscal resources would be irretrievably committed to construction and operation of the BLWP. These funds would then not be available for other projects and activities.

In addition to the resources used in construction and operation of the proposed Project, there would be some irreversible and irretrievable loss of existing resources in the impact areas. The loss of productivity (i.e., forage, wildlife habitat) from lands devoted to Project facilities would be an irreversible and irretrievable commitment during the time that those lands are out of production and until they are successfully revegetated. Impacts on geological resources could result from surface and subsurface disturbing activities. Both surface and subsurface geology could be damaged (fractured) or destroyed during construction activities that disturb bedrock such as coring, trenching, blasting, clearing, and grading. Blasting, coring, and trenching would fracture and permanently alter bedrock resulting in

irreversible and irretrievable impacts on geology. The permanent loss of soil and vegetation within small and highly localized areas that would not be reclaimed would result in irreversible and irretrievable impacts on soils and vegetation.

The use of groundwater from wells for the construction, O&M, and decommission activities would be irretrievable since they would either be used for consumptive purposes, such as mixing cement, or would be applied for dust control and lost to evapotranspiration. Groundwater losses associated with the BLWP would, over time, replenish the aquifer through natural processes.

Archaeological sites are by their nature finite, and once damaged or destroyed they cannot be replaced. Any loss of such sites is therefore irreversible and irretrievable. Recovering artifacts and information from archaeological sites before they are damaged or destroyed and preserving the recovered artifacts and information commonly is considered acceptable mitigation for the loss of such sites.

CHAPTER 4. CONSULTATION AND COORDINATION

In addition to the planning, analysis, and review activities performed in preparation for this EIS, the BLM is conducting consultation, coordination, and public participation efforts. These efforts started with public scoping and will continue throughout the EIS process. The purpose of the consultation and coordination program is to encourage interaction between the BLM and other Federal, State, and local agencies; Native American Tribes; and the public. The BLM's initiative is to inform the public about the project and solicit input to assist in analysis and decision-making. The BLM has made formal and informal efforts to involve, consult with, and coordinate with these entities to ensure that the most appropriate data have been gathered and analyzed, and that agency policy and public sentiment and values are considered and incorporated.

4.1 Consultation and Coordination

Agencies and organizations that have jurisdiction and/or special expertise in the BLWP were contacted at the beginning of scoping, during resource inventory, and before the publication of the Draft EIS. This section describes the consultation and coordination activities with agencies, Tribes, and stakeholders that occurred throughout the EIS process, including the scoping process and public review of the Draft EIS.

4.1.1 Cooperating Agencies

The BLM SFO is the lead Federal agency responsible for the preparation of the EIS under NEPA. The BLM has decision-making authority to permit construction on affected Federal lands. The Federal, State, and local cooperating agencies are identified in Chapter 1.

4.1.2 Cultural Resources Formal Consultation

The BLM is required to prepare the EIS in coordination with studies or analyses required by the NHPA, as amended (54 U.S.C. 300101 et seq.). In accordance with Section 106 (54 U.S.C. 306108) of the NHPA, the lead Federal agency and cooperating Federal agencies are required to consider the effects of the agencies' undertakings on historic properties listed in, or eligible for listing in, the National Register of Historic Places (NRHP). The regulations also specify the need for meaningful consultation with SHPOs, Tribal Historic Preservation Offices, Native American Tribes, and other interested parties during all phases of Section 106 compliance. Pursuant to Title 36 CFR Part 800, and as lead Federal agency for the undertaking, the BLM has initiated Section 106 consultation. Consultation must be completed before a ROD can be issued.

4.1.2.1 *Government-to-Government and Section 106 Tribal Consultation*

The United States has a unique legal relationship with Native American Tribes, as established by the U.S. Constitution, treaties, EOs, Federal statutes, and Federal and Tribal policies. As sovereign nations, Native American Tribes are conferred with legal rights and benefits with respect to their relationship with the U.S. Government. This relationship is founded on the U.S. Government's trust responsibilities to safeguard Tribal sovereignty and self-determination, as well as Tribal lands, assets, and resources reserved by treaty and other federally recognized rights. Federal agencies are required by both statute and regulation to consult with Native American Tribes on a government-to-government basis on Federal actions or undertakings that may affect "trust assets," including cultural and natural resources of concern to Tribes. Government-to-government consultation involves the process of seeking, discussing, and considering Tribes' views on policies, undertakings, and decisions such as environmental review of the proposed BLWP. The venue for government-to-government consultation for the BLWP has followed the established form of contact preferred by each Tribe. Consultation has generally involved formal

letters and submission of material via U.S. Postal Service Certified Mail, with follow-up telephone contact.

In May and September of 2018, the BLM formally initiated consultation with nine Native American Tribes that have previously expressed claims to cultural affiliation with the BLWP area to inform them of the project and to inquire about their interest in continuing government-to-government consultation. The contacted tribes are as follows:

- Fort Sill Apache Tribe
- Hopi Tribe
- Mescalero Apache Tribe
- Navajo Nation
- Pueblo of Acoma
- Pueblo of Isleta
- Pueblo of Laguna
- Pueblo of Zuni
- White Mountain Apache Tribe

The Pueblo of Zuni was the only Native American Tribe to request consultation on the EIS process. All other Tribes deferred to the Pueblo of Zuni or declined consultation. Additionally, on July 10, 2018, an informal meeting was held between BLM and the Zuni Tribe. The Zuni Governor and two Zuni Council members were present, along with the BLM SFO Manager and the BLM National Project Manager. The BLM representatives briefly described the BLWP and associated components and explained that specific consultation with the Tribe regarding the BLWP would occur as the project moves toward the Draft EIS publication. Zuni representatives confirmed their status as a cooperating agency and stated that they would be reviewing the Draft EIS.

4.2 Scoping Process

Borderlands Wind, LLC submitted its initial ROW application to the BLM in May 2017. On November 2, 2018, the BLM published an NOI to prepare the BLWP EIS in the Federal Register. The public scoping process began with the publication of the NOI to prepare the BLWP EIS. Scoping notifications were sent to 106 individuals and organizations, posted on the BLM's BLWP site on ePlanning, and placed in the *Catron County Courier*. In addition, scoping flyers were placed in public location in Magdalena, Datil, Pie Town, Quemado, Red Hill, Socorro, Springerville, AZ, and at the ranger stations for the Cibola, Gila, and Apache National Forests. The scoping comment period was held from November 2 through December 3, 2018. A public scoping meeting was held in Quemado, NM on November 14, 2018. A total of 40 people attended the 2018 scoping meeting. The BLM consulted with SHPO regarding the BLWP in June 2018 as part of the NHPA Section 106 review process.

4.3 Public Review of the Draft EIS

This Draft EIS is posted to the [project ePlanning website](#) and has been made available to agencies, interested organizations, and individuals for review and comment. During the 90-day comment period for the Draft EIS, the BLM will hold a public meeting to receive comments on the Draft EIS. Comments received on the Draft EIS and from the public meetings will be compiled, analyzed, summarized, and substantive comments will be addressed in the Final EIS. The public release of the Final EIS will be followed by a 30-day public protest period and 60-day Governor's Consistency Review before the BLM may issue the ROD.

4.4 Preparers and Contributors

The following individuals from the BLM and the third-party contractor team were responsible for preparing the Draft EIS.

4.4.1. Bureau of Land Management

Washington Office

James Stobaugh, National Project Manager

National Project Support Team

Christine Fletcher, Wildlife Biologist

New Mexico State Office

Cynthia Herhahn, Deputy Preservation Officer/Heritage Program Lead

Dave Alderman, Planning and Environmental Coordinator

Debby Lucero, Lands & Realty State Lead

Marikay Ramsey, Threatened and Endangered Species Program Lead

McKinney Briske, National Conservation Lands and Wilderness Program Lead

Michael Johnson, Zone Social Scientist

Nathan Combs, Rangeland Management Specialist

Sharay Dixon, Air Resources Lead

Albuquerque District Office

Danita Burns, District Manager

Socorro Field Office

Bethany Rosales, Natural Resources

Carlos Madril, Wildlife Biologist

Jeremy Zimmerman, GIS Specialist

Jonathan Smith, Assistant Field Manager

Kristen Long, Planning and Environmental Coordinator

Mark Matthews, Field Manager

Matt Atencio, Assistant Field Manager

Michael Papirtis, Archaeologist/Paleo Coordinator

Virginia Alguire, Realty Specialist

4.4.2. Office of the Solicitor

Southwest Region

Benjamin S. Vacarro, Attorney-Advisor

4.4.3. Logan Simpson

EIS Management, Coordination, Resource Analysis, and Production

Chris Bockey, Visual Resource Specialist

Diane Simpson-Colebank, Project Manager, Environmental Planner

Dylan George-Sills, EIS Coordination, Environmental Planner/GIS Analyst

Erick Laurila, Cultural Resources, Tribal Coordination
Ian Tackett, Wildlife Biologist
Julie Capp, Wildlife Biologist
Patricia McCabe, Deputy Project Manager, Environmental Planner
Roy Baker, GIS Analyst
Samantha Vaughn, Wildlife Biologist
Sara Wheatcroft, Graphics Specialist
Vicki Casteel, Technical Editor
William Graves, Cultural Resources

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**APPENDIX A: SUMMARY TABLES OF POTENTIAL MAJOR AGENCY
AUTHORITIES AND ACTIONS AND
OTHER APPLICABLE FEDERAL LAWS, REGULATIONS, AND
POLICIES**

Table A-1 lists the relevant actions and authorities that must be obtained or considered for the BLWP. Table A-2 provides a partial list and summary of other Federal, State, and Catron County authorities and actions that may be applicable to this EIS. The lists provided in each table are not meant to be comprehensive or all-inclusive.

Table A-1. Summary of Potential Major Agency Authorities and Actions

Agency	Proposal Requiring Action	Permit, License, Approval, Compliance, or Review	Relevant Law and/or Regulation
Bureau of Land Management (BLM)	Right-of-way grant for the Borderlands Wind Project (BLWP), primary access road, transmission line, and other associated facilities on BLM-administered land. The BLM is the lead agency for National Environmental Policy Act (NEPA) purposes.	Environmental Impact Statement (EIS) and Record of Decision	NEPA (42 U.S.C. 4321); Council Environmental Quality NEPA Regulations (40 CFR 1500-1508) Department of the Interior implementing regulations (43 CFR 46)
BLM	Prevent the establishment and spread of noxious and invasive weeds	Compliance	Federal Noxious Weed Act of 1974, as amended, Public Law 93-629 (7 U.S.C. § 2801 et seq.; 88 Stat. 2148); and Executive Order 13112, Invasive Species
BLM	Protection of segments, sites, and features related to national trails	Compliance	National Trails System Act (Public Law 90-543) (16 U.S.C. 1241 to 1249)
BLM	Potential disturbance of graves, associated funerary objects, sacred objects, and items of cultural patrimony	Consultation with affected groups regarding a Plan of Action for treatment of protected remains and objects	Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001-3002)
BLM	Effects on BLM sensitive species	Compliance	BLM Manual H-6840 (Special Status Species)
BLM (lead) in consultation with New Mexico State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation	Proposed undertaking that may adversely affect properties eligible for, or on the National Register of Historic Places	Section 106 reviews and provides consultations to identify and resolve any adverse effects to historic properties	National Historic Preservation Act (16 U.S.C. 470; 36 CFR 800)
BLM in consultation with U.S. Fish and Wildlife Service (USFWS)	Effects on species listed or critical habitat designated under the Endangered Species Act	Compliance	Endangered Species Act of 1973, as amended (16 U.S.C. §1531) Section 7(a)(2)

Agency	Proposal Requiring Action	Permit, License, Approval, Compliance, or Review	Relevant Law and/or Regulation
BLM in consultation with USFWS	Protection of migratory birds	Compliance	The Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712; Ch. 128); and Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds
BLM in consultation with USFWS	Protection of Bald and Golden Eagles	Compliance	The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), 1940 et seq., and BLM Instruction Memorandum 2010-156.
U.S. Environmental Protection Agency	Potential pollutant discharge during construction, operation, maintenance, and decommissioning	Spill Prevention Control, Countermeasure Plan, and Stormwater Pollution Prevention Plan	Oil Pollution Act of 1990 (33 U.S.C. 2701 et seq.; 40 CFR Part 112); Section 402 of the Clean Water Act
U.S. Army Corps of Engineers	Potential discharge of dredged or fill material into waters of the United States (including wetlands and washes)	Section 404 Permit (individual or nationwide)	Clean Water Act (33 U.S.C. 1344)
Federal Aviation Administration (FAA)	Structures exceeding 200 feet	Determination of No Hazard To Air Navigation and Confirmation of achieved height	14 CFR Part 77, Objects Affecting Navigable Air Space (49 U.S.C. 44718)
FAA	Required lighting on turbines	Review and approval of selective lighting	FAA Advisory Circular 70/7460-1K, change 2
New Mexico Department of Transportation (NMDOT)	Project activities that require oversized commercial delivery and construction of project access on public right-of-way	Commercial Driveway Permit, Approval to construct access on public right-of-way, Traffic Control / Roadway Work Permit	23 CFR 710.201 49 CFR Part 24
New Mexico State Land Office (NMSLO)	The proposed project and associated facilities (access road, transmission line, and other associated facilities) located on NMSLO-administered lands	Right-of-Way grant authorization	Title 19 Chapter 2, Part 10

Table Abbreviations: BLM = Bureau of Land Management; BLWP = Borderlands Wind Project; CFR = Code of Federal Regulations; EIS = Environmental Impact Statement; FAA = Federal Aviation Administration; NEPA = National Environmental Policy Act; NMSLO = New Mexico State Land Office; U.S.C. = U.S. Code; USFWS = U.S. Fish and Wildlife Service

Table A-2. Summary of Other Applicable Federal Laws, Regulations, and Policies

Relevant Authority
American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
Antiquities Act of 1906 (16 U.S.C. 431–433)
Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa to 470ee)
Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668–668d)
Clean Air Act (42 U.S.C. 7401 et seq., as amended)
Clean Water Act (33 U.S.C. 1251 et seq.)
Clean Water Act - Section 404(b)(1) Guidelines (40 CFR 230)
Endangered Species Act of 1973 (16 U.S.C. 1513 et seq.)
Energy Policy Act of 2005 (Public Law 109-58; 42 U.S.C. 13201 et seq.)
Executive Order 11593, Protection and Enhancement of the Cultural Environment (May 6, 1971)
Executive Order 11990, Protection of Wetlands (May 24, 1977)
Executive Order 13007, Indian Sacred Sites (May 24, 1996)
Executive Order 13112, Invasive Species (February 3, 1999)
Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 9, 2000)
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (January 10, 2001)
Executive Order 13212, Actions to Expedite Energy-Related Projects (May 18, 2010)
Federal Noxious Weed Act of 1974, as amended
Manual 6100– National Landscape Conservation System (July 13, 2012)
Manual 6220– National Monuments, National Conservation Areas, and Similar Designations (July 13, 2012)
Manual 6280– Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation (September 14, 2012)
Migratory Bird Treaty Act of 1918 (16 U.S.C. 703–711)
National Historic Preservation Act of 1966 (54 U.S.C. 300101 et seq.)
Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001–3002)
Secretarial Order 3355: Streamlining NEPA Section 4.a.(2)

Table Abbreviations: CFR = Code of Federal Regulations; NEPA = National Environmental Policy Act; U.S.C. = U.S. Code

APPENDIX B: BEST MANAGEMENT PRACTICES AND DESIGN FEATURES

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Table B-1. Proponent-Provided Best Management Practices (BMPs) and Design Features

BMP	Source
The area disturbed by installation of meteorological towers (i.e., footprint) shall be kept to a minimum.	BLWP POD
Existing roads shall be used to the maximum extent feasible. If new roads are necessary, they shall be designed and constructed to the appropriate standard.	BLWP POD
Meteorological towers shall not be located in sensitive habitats or in areas where ecological resources known to be sensitive to human activities (e.g., prairie grouse) are present. Installation of towers shall be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors.	BLWP POD
Meteorological towers installed for site monitoring and testing shall be inspected periodically for structural integrity.	BLWP POD
Borderlands Wind, LLC will plan for efficient use of the land. Any necessary infrastructure requirements will be consolidated wherever possible, and current transmission and market access will be evaluated carefully.	BLWP POD
Borderlands Wind, LLC will utilize existing roads and utility corridors to the maximum extent feasible, and to minimize the number and length/size of new roads, lay-down areas, and borrow areas.	BLWP POD
Borderlands Wind, LLC will develop “good housekeeping” procedures to ensure that during operation the site will be kept clean of debris, garbage, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards.	BLWP POD
Borderlands Wind, LLC will design the project to avoid (if possible), minimize, or mitigate impacts to important, sensitive, or unique habitats in the project vicinity (e.g., locate the turbines, roads, and ancillary facilities in the least environmentally sensitive areas; i.e., away from riparian habitats, streams, wetlands, drainages, or critical wildlife habitats).	BLWP POD
Borderlands Wind, LLC will design the project to minimize or mitigate the potential for bird and bat strikes.	BLWP POD
Borderlands Wind, LLC will site turbines to avoid landscape features known to attract raptors (to the extent practical) if site studies show that placing turbines there would pose a significant risk to raptors.	BLWP POD
Borderlands Wind, LLC will avoid placing turbines near known bat hibernation, breeding, and maternity/nursery colonies; in known migration corridors; or in known flight paths between colonies and feeding areas (to the extent practicable).	BLWP POD
Borderlands Wind, LLC will consider measures to reduce raptor use at a project site.	BLWP POD

BMP	Source
Borderlands Wind, LLC will design facilities to discourage facility structure's use as perching or nesting substrates by birds (to the extent practicable).	BLWP POD
Design the project to avoid (if possible), minimize, or mitigate impacts to these resources. Mitigation may include seasonal use restrictions, if other mitigation is not possible, during construction and operation.	BLWP POD
Borderlands Wind, LLC will integrate the turbine array with the surrounding landscape to the extent practicable. Design elements to be addressed include visual uniformity, use of tubular towers, proportion and color of turbines, nonreflective paints, and prohibition of commercial messages on turbines.	BLWP POD
Borderlands Wind, LLC will integrate other site design elements with the surrounding landscape to the extent practicable including minimizing the profile of the ancillary structures, burial of cables, prohibition of commercial symbols, and lighting. Borderlands will minimize the need for and amount of lighting on ancillary structures.	BLWP POD
Borderlands Wind, LLC will prepare an access road siting and management plan incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual (BLM 1985).	BLWP POD
Design the project to avoid (if possible), minimize, or mitigate impacts to these resources.	BLWP POD
Borderlands Wind, LLC will use certified weed-free mulching. Trucks and construction equipment are arriving from locations with known invasive vegetation problems, will undergo a controlled inspection and a cleaning area will be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.	BLWP POD
Borderlands Wind, LLC may use herbicides on the site, and an integrated weed management plan will be developed to ensure that applications would be conducted within the framework of BLM and DOI policies and entail only the use of EPA-registered herbicides. Borderlands will only apply herbicides in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.	BLWP POD
Design the project to avoid (if possible), minimize, or mitigate impacts to these resources.	BLWP POD
Borderlands Wind, LLC will avoid cultural resources to the extent practicable and coordinate with BLM and/or tribes on other mitigation measures.	BLWP POD
Borderlands Wind, LLC will include in their construction worker training and operations staff training, the protocols for unanticipated discoveries and the consequences of unauthorized collection and destruction of artifacts on public land.	BLWP POD

BMP	Source
Design the project to avoid (if possible), minimize, or mitigate impacts to these resources.	BLWP POD
Borderlands Wind, LLC will develop a discovery plan for construction activities in case of inadvertent cultural resource discoveries.	BLWP POD
Borderlands Wind, LLC will avoid paleontological resources to the extent practicable	BLWP POD
Borderlands Wind, LLC will include in their construction worker training and operations staff training, the protocols for unanticipated discoveries and the consequences of unauthorized collection and destruction of fossils on public land	BLWP POD
Design the project to avoid (if possible), minimize, or mitigate impacts to these resources.	BLWP POD
Borderlands Wind, LLC will minimize the area disturbed by construction and operation of the project (i.e., footprint).	BLWP POD
Borderlands Wind, LLC will minimize the number and size/length of roads, temporary fences, lay-down areas and borrow areas.	BLWP POD
Borderlands Wind, LLC will salvage and reapply during reclamation, the topsoil from all excavations and construction activities.	BLWP POD
Borderlands Wind, LLC will reclaim all areas of disturbed soil using weed-free native grasses, forbs, and shrubs. Reclamation activities will be undertaken as early as possible on disturbed areas.	BLWP POD
Borderlands Wind, LLC will bury all electrical collector lines in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance).	BLWP POD
Borderlands Wind, LLC will avoid creating excessive slopes during excavation and blasting operations. Special construction techniques will be used, where applicable, in areas of steep slopes, erodible soil, and stream channel crossings	BLWP POD
Borderlands Wind, LLC will utilize erosion controls that comply with county, state, and federal standards Practices such as jute netting, silt fences, and check dams will be applied near disturbed areas.	BLWP POD
Borderlands Wind, LLC will undertake restoration in accordance with the habitat restoration plan as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.	BLWP POD
Borderlands Wind, LLC will implement a worker environmental awareness training to educate/instruct all construction employees to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. Borderlands will not allow employees' pets on site during construction.	BLWP POD

BMP	Source
Borderlands Wind, LLC will reduce visual impacts during construction by minimizing areas of surface disturbance, controlling erosion, using dust suppression techniques, and restoring exposed soils as closely as possible to their original contour and vegetation.	BLWP POD
Borderlands Wind, LLC will use existing roads but only if in safe and environmentally sound locations. If new roads are necessary, roads will be designed and constructed to the appropriate standard and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Excessive grades on roads, road embankments, ditches, and drainages will be avoided, especially in areas with erodible soils. Special construction techniques will be used, where applicable. Abandoned roads and roads that are no longer needed will be recontoured and revegetated	BLWP POD
Where appropriate, Borderlands Wind, LLC will use aggregate materials on road surfaces.	BLWP POD
Borderlands Wind, LLC will design any new roads to follow natural contours and minimize side hill cuts.	BLWP POD
Borderlands Wind, LLC will locate roads away from drainage bottoms and avoid wetlands, if practicable.	BLWP POD
Borderlands Wind, LLC will design roads so that changes to surface water runoff are avoided and erosion is not initiated.	BLWP POD
Borderlands Wind, LLC will locate roads to minimize stream crossings. All structures crossing streams will be located and constructed so that they do not decrease channel stability or increase water velocity. All applicable federal and state permits will be obtained.	BLWP POD
Borderlands Wind, LLC will not alter existing drainage systems, especially in sensitive areas such as erodible soils or steep slopes. Potential soil erosion will be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts will be cleaned and maintained regularly.	BLWP POD
Borderlands Wind, LLC will construct gates along access roads that intersect allotment pasture fences as necessary.	BLWP POD
Borderlands Wind, LLC construction personnel and contractors will be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions, to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and airborne dust.	BLWP POD
Borderlands Wind, LLC will restrict traffic to the roads developed for the project. Use of other unimproved roads shall be restricted to emergency situations.	BLWP POD
Borderlands Wind, LLC will place signs along construction roads to identify speed limits, travel restrictions, and other standard traffic control information.	BLWP POD

BMP	Source
Borderlands Wind, LLC will use dust abatement techniques on unpaved, unvegetated surfaces to minimize airborne dust.	BLWP POD
Borderlands Wind, LLC will post and enforce speed limits (e.g., 25 mph [40 km/h]) to reduce airborne fugitive dust.	BLWP POD
Borderlands Wind, LLC will cover construction materials and stockpiled soils if they are a source of fugitive dust.	BLWP POD
Borderlands Wind, LLC will implement dust abatement techniques before and during surface clearing, excavation, or blasting activities.	BLWP POD
Borderlands Wind, LLC will avoid creating hydrologic conduits between two aquifers during foundation excavation and other activities.	BLWP POD
Borderlands Wind, LLC will backfill foundations and trenches with originally excavated material as much as possible. Excess excavation materials will be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities	BLWP POD
Borderlands Wind, LLC will obtain borrow material only from authorized and permitted sites and existing sites may be used instead of new sites	BLWP POD
Borderlands Wind, LLC will coordinate with BLM and other federal and state agencies to establish the parameters for use of explosives with respect to timing, specified distances from sensitive wildlife or streams and lakes.	BLWP POD
Borderlands Wind, LLC will limit noisy construction activities (including blasting) to the least noise-sensitive times of day (i.e., daytime only between 6 a.m. and 10 p.m.) and weekdays.	BLWP POD
Borderlands Wind, LLC will ensure that all construction equipment will have sound-control devices no less effective than those provided on the original equipment. All construction equipment used will be adequately muffled and maintained.	BLWP POD
Borderlands Wind, LLC will ensure that all stationary construction equipment (i.e., compressors and generators) will be located as far as practicable from nearby residences.	BLWP POD
Borderlands Wind, LLC will notify nearby residents in advance if blasting or other noisy activities are required during the construction period.	BLWP POD
Borderlands Wind, LLC will bring to the attention of the BLM authorized officer any unexpected discovery of cultural or paleontological resources during construction. Work will be halted in the vicinity of the find to avoid further disturbance to the resources while the resource(s) is being evaluated and appropriate mitigation measures are being developed.	BLWP POD

BMP	Source
Borderlands Wind, LLC will ensure that secondary containment is provided for all on-site hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) will be a temporary activity occurring only for as long as is needed to support construction activities.	BLWP POD
Borderlands Wind, LLC will ensure wastes are properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.	BLWP POD
In the event of an accidental release to the environment, Borderlands Wind, LLC will document the event, including a root cause analysis, appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event will be provided to the BLM authorized officer and other federal and state agencies, as required.	BLWP POD
Borderlands Wind, LLC will ensure that any wastewater generated in association with temporary, portable sanitary facilities will be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility. Temporary, portable sanitary facilities provided for construction crews will be adequate to support expected on-site personnel and will be removed at completion of construction activities.	BLWP POD
Borderlands Wind, LLC will install temporary fencing around staging areas, storage yards, and excavations during construction to limit public access.	BLWP POD
Borderlands Wind, LLC will ensure that inoperative turbines will be repaired, replaced, or removed in a timely manner. Borderlands understands that requirements to do so will be incorporated into the due diligence provisions of the ROW authorization. Borderlands will be required to demonstrate due diligence in the repair, replacement, or removal of turbines; failure to do so could result in termination of the ROW authorization.	BLWP POD
Borderlands Wind, LLC will ensure that employees, contractors, and site visitors will be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. Borderlands will also ensure that no pets will be allowed on site to avoid harassment and disturbance of wildlife.	BLWP POD
Borderlands Wind, LLC will ensure that observations of potential wildlife problems, including wildlife mortality, will be reported to the BLM authorized officer. Threatened and endangered species fatalities, as well as eagle fatalities, will be reported within 24 to 48 hours to the BLM authorized officer. All other fatality events will be reported in a year-end report. This includes following the methodology outlined in the Bird and Bat Conservation Strategy (Appendix M), which will include specifics for a downed wildlife observation program and reporting, as well as a post-construction fatality monitoring and searcher efficiency program for general avian species, eagles, and bats.	BLWP POD
Borderlands Wind, LLC will ensure that 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.	BLWP POD

BMP	Source
Borderlands Wind, LLC will ensure that any site monitoring protocols defined in this POD and plans associated with this POD will be implemented. These will incorporate monitoring program observations and additional mitigation measures into standard operating procedures and BMPs to minimize future environmental impacts.	BLWP POD
Borderlands will provide the results of monitoring program efforts to the BLM authorized officer.	BLWP POD
Borderlands Wind, LLC will install and maintain permanent fencing around the electrical substation/switchyard. Turbine tower access doors will be locked to limit public access.	BLWP POD
In the event the project results in EMI, Borderlands Wind, LLC will work with the owner of the impacted communications system to resolve the problem. Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.	BLWP POD
Borderlands Wind, LLC will remove all turbines and ancillary structures.	BLWP POD
Borderlands Wind, LLC will salvage and reapply topsoil from all decommissioning activities during final reclamation.	BLWP POD
Borderlands Wind, LLC will reclaim (using weed-free native shrubs, grasses and forbs) all areas of disturbed soil.	BLWP POD
Borderlands Wind, LLC will ensure that the vegetation cover, composition, and diversity is restored to values commensurate with the ecological setting.	BLWP POD

Table B-2. BMPs and Design Features from BLM

Category	BMP	Source
Air		
	The contractor shall use a Bureau of Land Management (BLM)-approved dust palliative on roads and disturbed surfaces to reduce the potential for fugitive dust during construction.	Ocotillo Wind Energy Facility, CA El Centro FO; 2012
	<p>In accordance with Section 12 of the Air Quality Regulations, the applicant would obtain an air quality permit for any emission units or stationary sources (e.g., concrete plants, rock crushers, boilers, emergency generators) on the project capable of emitting regulated pollutants. The applicant would use water to control dust to comply with New Mexico dust control requirements. Where water is insufficient to control dust, soil stabilizers approved by the BLM would be used within the project area to control dust to New Mexico standards. The project would implement the following practices for fugitive dust and wind erosion control:</p> <ul style="list-style-type: none"> • Minimize grading and vegetation removal, and limit surface disturbance during construction. • Limit vehicular speeds (post and enforce) on non-paved roads to 25 mph to reduce airborne fugitive dust. • Apply water to disturbed soil areas of the project site to control dust and maintain optimum moisture levels for compaction, as needed. Apply the water using water trucks. • Minimize water application rates as necessary to prevent runoff and ponding. • Apply dust control suppressants approved by the BLM. • During windy conditions (forecast or actual wind conditions of approximately 25 miles per hour or greater), apply dust control to haul roads to adequately control wind erosion. • Cover exposed stockpiled material areas. • Suspend excavation and grading during periods of high winds. • Cover all trucks hauling soil and other loose material or maintain at least 2 feet of freeboard 	Searchlight Wind Energy Project; NV Las Vegas FO; 2012
	The applicant would turn off idling equipment when not in use.	Searchlight Wind Energy Project; NV Las Vegas FO; 2012
	Dust abatement techniques shall be used before and during surface clearing, excavation, or blasting activities.	BLM Wind PEIS; 2005
Construction		
	At locations where collection lines would cross features like surface water drainages, horizontal directional drilling below the features would be used to minimize impacts.	BLM Wind PEIS; 2005

Category	BMP	Source
	All control and mitigation measures established for the project in the POD and the resource-specific management plans that are part of the POD shall be maintained and implemented throughout the construction phase, as appropriate.	BLM Wind PEIS; 2005
	The area disturbed by construction and operation of a wind energy development project (i.e., footprint) shall be kept to a minimum.	BLM Wind PEIS; 2005
	The number and size/length of roads, temporary fences, lay-down areas, and borrow areas shall be minimized.	BLM Wind PEIS; 2005
	Topsoil from all excavations and construction activities shall be salvaged and reapplied during reclamation.	BLM Wind PEIS; 2005
	New Mexico-certified noxious weed-free seed shall be used and tested prior to purchase and planting in the rehabilitation process, all BLM SFO RMP Noxious weeds stipulations shall be followed.	BLM Wind PEIS; 2005
	All electrical collector lines shall be buried in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance). Overhead lines may be used in cases where burial of lines would result in further habitat disturbance.	BLM Wind PEIS; 2005
	Operators shall identify unstable slopes and local factors that can induce slope instability (such as groundwater conditions, precipitation, earthquake activities, slope angles, and the dip angles of geologic strata). Operators also shall avoid creating excessive slopes during excavation and blasting operations. Special construction techniques shall be used where applicable in areas of steep slopes, erodible soil, and stream channel crossings.	BLM Wind PEIS; 2005
	A project-specific Erosion Control Plan that complies with county, State, and Federal standards shall be developed, approved by the BLM, and applied. Practices such as jute netting, silt fences, and check dams shall be applied near disturbed areas, as necessary.	BLM Wind PEIS; 2005
	The project shall be planned and designed to comply with FAA regulations and in coordination with the Department of the Air Force, including lighting regulations, and to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips. (Air Force compliance is needed)	BLM Wind PEIS; 2005
	Above ground facilities requiring painting should be designed to blend in with the surrounding environment.	Socorro Field Office RMP; 2010
	Surface disturbance would be restricted in areas that have special topographic (steep or broken terrain and/or benches) and soil concerns in order to reduce impacts caused by soil erosion and habitat disturbance.	Socorro Field Office RMP; 2010

Category	BMP	Source
	In areas that BLM has permitted the contractor to travel off-road, minimize the off-road impact of large vehicles. Use wide, flat-tread, balloon tires (especially on seismic thumper trucks) where possible. Use all-terrain vehicles rather than large vehicles where possible.	Socorro Field Office RMP; 2010
	Only excavate topsoil and subsoil where it is absolutely necessary. Consider brush-beating, mowing, and/or parking on vegetation for surface disturbing activities.	Socorro Field Office RMP; 2010
	Disturbed areas should be contoured to blend with the natural topography. Blending is defined as reducing form, line, and color contrast associated with the surface disturbance. Disturbance should be contoured to match the original topography, where matching is defined as reproducing the original topography and eliminating form, line, and color caused by the disturbance, as much as possible.	Socorro Field Office RMP; 2010
	Interim reclamation should be implemented concurrent with construction and site operations to the fullest extent possible. Final reclamation actions shall be initiated within 6 months of the termination of operations unless otherwise approved in writing by the authorized officer.	Socorro Field Office RMP; 2010
	Fill material should be pushed into cut areas and up over back slopes. Depressions should not be left that would trap water or form ponds unless the authorized officer has determined that dips or depressions may be used to assist reclamation efforts and seed propagation.	Socorro Field Office RMP; 2010
	Reclaimed soil would be free of contaminants and would have adequate depth, texture, and structure to provide for successful vegetation reclamation. Vegetation reclamation would be considered successful when healthy, mature perennials are established with a composition and density that closely approximates the surrounding vegetation as prescribed by the BLM, and the reclamation area is free of noxious weeds.	Socorro Field Office RMP; 2010
	If necessary after reclamation, a BLM-standard barbed wire fence would be constructed to exclude livestock for a minimum of at least two successful growing seasons. Do not disturb, or leave inoperable at any time, livestock improvements including but not limited to pipeline systems, fences, or water catchments. If they must be disturbed, consult with the grazing allottee and come to a favorable resolution immediately.	Socorro Field Office RMP; 2010
	Additional reclamation measures may be required based on the conditions existing at the time of abandonment.	Socorro Field Office RMP; 2010
	Oil and fuel for equipment and vehicles must be carefully handled and disposed of to prevent soil or water contamination.	Socorro Field Office RMP; 2010

Category	BMP	Source
	Develop a Spill Contingency Plan that identifies all actions to be taken in the event of a chemical spill, including phone numbers for Federal, State, and local agencies that must be notified.	Socorro Field Office RMP; 2010
	Time activities to avoid wet periods.	Socorro Field Office RMP; 2010
Biology		
<i>General Biology Measures</i>		
	Comply with all applicable federal, state, and local laws.	Bat Conservation International, 2017
	Establish non-disturbance buffer zones to protect sensitive habitats or areas of high risk for species of concern identified in pre-construction studies. Determine the extent of the buffer zone in consultation with the USFWS and state, local and tribal wildlife biologists, or other credible experts as appropriate.	Bat Conservation International, 2017
	Use construction and management practices to minimize activities that may attract prey and predators to the wind energy facility.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010
	All vehicles and heavy equipment used for the completion, maintenance, inspection, or monitoring of ground disturbing activities; or for authorized off-road driving would confirmed to be clean and free of soil and debris capable of transporting weed propagules. Vehicles and equipment would be cleaned with power or high pressure equipment prior to entering or leaving the project area. Cleaning efforts would concentrate on tracks, feet or tires, and on the undercarriage. Special emphasis would be applied to axles, frames, cross members, motor mounts, on and underneath steps, running boards, and front bumper/brush guard assemblies. Vehicle cabs would be swept out and refuse would be disposed of in waste receptacles. Cleaning sites would be recorded using global positioning systems or other mutually acceptable equipment and provided to the Albuquerque District Office Weed Coordinator or designated contact person.	Ocotillo Wind Energy Facility, CA El Centro FO; 2012

Category	BMP	Source
	<p>Borderlands Wind, LLC would implement appropriate waste management practices during on site concrete operations. Waste management practices would be applied to the stockpiling of concrete, curing and finishing of concrete as well as to concrete wash-out operations. Waste management practices would be adequate to ensure that fluids associated with the curing, finishing and wash- out of concrete would not be discharged to any stream or basin. Concrete wastes would be stockpiled separately from sediment and protected by erosion control measures so that concrete dust and debris are not discharged to any stream or basin. The appropriate waste management practices based on considerations of flow velocities, site conditions, availability of erosion control materials and construction costs would be used. Decommissioning methods should minimize new site disturbance and removal of native vegetation, to the greatest extent practicable</p>	<p>Tule Wind Energy Project ; CA El Centro FO; 2012</p>
	<p>Trenches will not be left open overnight and will be covered with suitable material that would not cave in with weight. Escape ramps (i.e. dirt berms) would be installed to allow for wildlife to exit the trench. Trenches will be inspected by a biological monitor each morning before construction activities resume. If wildlife are in the trench, biological monitors will safely remove wildlife. Ensure that all fences are constructed to BLM Socorro Field Office Fence Specifications to mitigate impacts to wildlife. No harm, harassment, or collection of plant and wildlife species would be allowed. Feeding of wildlife would be prohibited.</p>	<p>Socorro Field Office RMP; 2010</p>
	<p>Project personnel would not be allowed to bring firearms or pets to any Project area to minimize harassment or killing of wildlife and to prevent the introduction of destructive animal diseases to native wildlife populations.</p>	<p>Tule Wind Energy Project ; CA El Centro FO; 2012</p>
	<p>All earthwork/disruptive heavy equipment would cease during heavy rains, and would not resume until conditions are suitable for the movement of equipment and materials. However, work inside towers, nacelles, etc., would continue.</p>	<p>Tule Wind Energy Project ; CA El Centro FO; 2012</p>
	<p>Littering would not be allowed. Garbage and waste disposal on project sites would be properly managed using wildlife proof containers to avoid creating attractive nuisances for wildlife by providing them with supplemental food. Food-related garbage and trash would be removed from the Project area daily.</p>	<p>Tule Wind Energy Project ; CA El Centro FO; 2012</p>
	<p>If pesticides are used on the site, an integrated pest management plan shall be developed to ensure that applications would be conducted within the framework of BLM and DOI policies and entail only the use of EPA-registered pesticides approved for use in BLM's Record of Decisions related to herbicide/pesticide use (BLM 2007, BLM 2016). Pesticide use shall be limited to non-persistent, immobile pesticides and shall only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Herbicides may be used for vegetation removal around the base of the turbines during construction and to reduce the spread of noxious weeds.</p>	<p>Ocotillo Wind Energy Facility, CA El Centro FO; 2012</p>
	<p>Observations of potential wildlife issues, including wildlife mortality, shall be reported to the BLM authorized officer immediately.</p>	<p>BLM Wind PEIS; 2005</p>

Category	BMP	Source
	Provide the results of all monitoring program efforts, including post-construction mortality information, to the appropriate state and federal wildlife offices. Consider contributing the data (confidentially) to the American Wind and Wildlife Institute's (AWWI) Wind/Wildlife database.	Bat Conservation International, 2017
	At the completion of the Project, all construction materials would be removed from the site.	Tule Wind Energy Project ; CA El Centro FO; 2012
	Foundations should be removed to a minimum of three feet below surrounding grade, and covered with soil to allow adequate root penetration for native plants, and so that subsurface structures do not substantially disrupt ground water movements. Three feet is typically adequate for agricultural lands. Wind turbines that are no longer in operation and overhead distribution lines that are no longer needed should be removed.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010
	Restrict construction vehicle speeds to 25 mph on unpaved roads. Nighttime vehicle traffic volume associated with Project activities would be kept to a minimum and speeds would be limited to 10 miles per hour to prevent mortality of nocturnal wildlife species. Instruct project personnel to drive at appropriate speeds, be alert for wildlife, and use additional caution in low visibility conditions.	Tule Wind Energy Project ; CA El Centro FO; 2012
	All construction employees shall be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons.	BLM Wind PEIS; 2005
	Explosives will be used only within specified times and at specified distances from sensitive wildlife or surface waters as established by BLM.	Alta East Wind BBCS; CA,
	In all crucial calving, lambing, kidding, and fawning areas and wintering ranges, all surface-disturbing activities, permanent or temporary, will be avoided during the appropriate time periods.	BLM Socorro Field Office
<i>Bald and Golden Eagle Measures</i>		
	Pre-construction nesting eagle surveys would be completed during the year(s) of construction to document the status of all existing and any newly identified eagle nests within the project area during the breeding/nesting season. Disruptive construction and maintenance activities would be avoided within 0.5 mile of active nests from January 1 - August 31.	BLM Socorro Field Office
	Borderlands Wind, LLC would hold an annual meeting with federal and state agencies including but not limited to BLM, USFWS, and NMGFD. The annual meeting would discuss monitoring, quarterly and annual reports, observations and issues, maintenance needs, and other conservation practices.	BLM Socorro Field Office

Category	BMP	Source
	Borderlands Wind, LLC would be required to develop a mitigation plan for eagles that demonstrates operational measures that avoid and minimize eagle mortality at the facility.	BLM Socorro Field Office
	Borderlands Wind, LLC would develop as part of their monitoring plan an Adaptive Management process, which would be used to identify additional conservation practices, BMPs, avoidance and minimization measures, and conservation measures to reduce risk to eagles based on monitoring. It is expected over the life of the project that advances in industry standards would identify additional BMPs and conservation practices that may be appropriate for this project area.	BLM Socorro Field Office
	If an eagle is taken at any point during the life of the ROW grant, the Borderlands Wind, LLC shall immediately notify the BLM authorized officer and the USFWS (Division of Migratory Birds, Southwest Region and Office of Law Enforcement, Southwest Region). After consultation with the BLM and the USFWS, Borderlands Wind, LLC shall implement reasonable specific actions (i.e. conservation actions, BMPs) to avoid further unpermitted take of eagles. Borderlands Wind, LLC shall work closely with the USFWS to identify appropriate risk reduction and offsetting measures, consistent with the applicable USFWS permitting policies including development of an Eagle Conservation Plan as appropriate. All such measures shall be identified and, after appropriate environmental review, incorporated into an amended ROW grant. It is important to note that this does not alleviate any enforcement actions that may be taken by UFSWS's Office of Law Enforcement since Borderlands Wind, LLC is not permitted to take eagles.	BLM Socorro Field Office
	Borderlands Wind, LLC shall notify USFWS Office of Law Enforcement and the BLM Authorized Officer within 24 hours of the discovery of any dead or injured eagle in the Borderlands Wind, LLC Project area. The USFWS Office of Law Enforcement would provide further direction. No remains, parts, feathers shall be disturbed by Borderlands Wind, LLC. If an injured eagle is encountered, the USFWS Office of Law Enforcement and BLM Authorized Officer shall be notified immediately. The USFWS Office of Law Enforcement would direct a qualified biologist, such as a state game biologist, or other certified wildlife handler to handle the eagle and transfer it to an approved rehabilitation center as appropriate.	BLM Socorro Field Office
	The BLM would require Borderlands Wind, LLC to monitor eagle fatalities following the Eagle Conservation Plan Guidance (USFWS 2013a) and implement adaptive management that would reduce mortalities further if take rates are higher than expected. During the first two years of operation, carcass searches would be conducted to document eagle fatalities potentially attributable to project operation. Post-construction mortality monitoring would be comprised of three components: standardized carcass searches, searcher efficiency trials, and carcass removal trials. This monitoring would be conducted to estimate total eagle mortality accounting for biases from imperfect searcher efficiency, unsearched areas, and carcass removal rates. Results from post-construction mortality monitoring can be entered into the USFWS's Collision Risk Model to update the collision probability prior with the monitoring data collected from the wind facility to obtain a posterior distribution that provides project specific estimates of collision probability. Depending on results from the first two years of monitoring, at least one additional year of standardized eagle mortality monitoring every five years would be conducted to supplement operational eagle mortality monitoring to assess impacts to eagles. Operational eagle	USFWS

Category	BMP	Source
	<p>mortality monitoring would be required for the duration of the project. Annual monitoring reports and raw survey data would be submitted to the BLM and the Service. The monitoring would be conducted by qualified, independent third parties that report directly to the BLM. The monitoring protocols that would be implemented would include:</p> <ul style="list-style-type: none"> • <u>Standardized eagle mortality monitoring</u>: first two years of operation, performed by biological consultant <ol style="list-style-type: none"> 1. <u>Carcass searches</u> <ul style="list-style-type: none"> • All dead or injured eagles found in proximity to hazardous project features will be attributed to facility operations and maintenance unless the USFWS determines otherwise • Year-round surveys to systematically search for eagle remains, once per month • Conducted at 50% of the turbines: 20 turbines for Proposed Action and Alternative 1 or 17 turbines for Alternative 2 • Turbines to be searched randomly selected for first survey, and alternated with unsearched turbines for second survey so that all turbines are searched every other month • Sampling 260 m square search plot centered on the turbine (240 m square plots cover all of the distribution of the fall zone for large birds for turbines with 55 m rotor radius (using average of Table 5 and Table 9 in Hull and Muir 2010), so for larger radius turbines proposed for the project, 260 m sampled to cover this larger distribution) • 12 m distance between parallel survey transects • While intent is to monitor eagle carcasses, also record all bird and bat fatalities • For all fatalities, record discovery date; collection date; species; sex and age; carcass condition and description; GPS coordinates; turbine number; type and configuration of structure or features found near eagle remains and potentially responsible for injury/mortality; ground distance remains found from nearest pole, line, turbine, or other structure; suspected cause of mortality/injury; any Federal band number, color markers, or transmitter descriptions; and any special notes or additional information • Photograph all fatalities • Record data and photograph any carcasses discovered incidentally by searchers or operations staff and code these carcasses as incidental discoveries 2. <u>Searcher efficiency (i.e., observer) bias correction trials</u> <ul style="list-style-type: none"> • To estimate proportion of carcasses detected by observers, to adjust carcass counts for detection bias • Year-round surveys, 20 carcasses per season • Large bird trial carcasses may include raptors, turkeys, geese, ducks, or pheasants; decoys should not be used as there is no evidence that they are an adequate surrogate • Trial carcasses randomly placed within plots before carcass searches 3. <u>Carcass persistence (i.e., scavenger-removal) bias correction trials</u> 	

Category	BMP	Source
	<ul style="list-style-type: none"> • To estimate length of time carcasses remain in the search area, to adjust carcass counts for removal by scavengers or other factors • Year-round trials, 20 carcasses per season • Carcasses used for searcher efficiency testing can also be used to test carcass persistence • Removal trial carcasses may include raptors, turkeys, geese, ducks, or pheasants • Carcasses monitored over 40-day period, checked every day on days 1-4 and then on days 7, 10, 14, 20, 30, and 40 • <u>Operational eagle mortality monitoring</u>: all years of operation, performed by trained operations staff trained by biological consultant <ul style="list-style-type: none"> ▪ All dead or injured eagles found in proximity to hazardous project features will be attributed to facility operations and maintenance unless the USFWS determines otherwise ▪ Year-round surveys, once per month ▪ Conducted at all turbines ▪ Walking search of road and turbine pad ▪ Binocular search of areas out to maximum blade-tip height from turbine ▪ Standardized documentation for all fatalities, including discovery date; collection date; species; sex and age; carcass condition and description; GPS coordinates; turbine number; type and configuration of structure or features found near eagle remains and potentially responsible for injury/mortality; ground distance remains found from nearest pole, line, turbine, or other structure; suspected cause of mortality/injury; any Federal band number, color markers, or transmitter descriptions; and any special notes or additional information ▪ Photograph all fatalities ▪ Record data and photograph any carcasses discovered outside search area and code these carcasses as incidental discoveries 	
	<p>Minimize the area and intensity of disturbances:</p> <ul style="list-style-type: none"> • Minimize roads, power lines, and other Project infrastructure to the maximum extent practicable; use existing transmission corridors and roads to the extent practicable. • Avoid or minimize the use of structures that are attractive to eagles for perching. • Use the minimum number of permanent meteorological (MET) towers. 	SWCA EMP 2019
	<p>Informed by eagle use of the site, site turbines back from ridge edges and drainages, as warranted; in the final proposed design, all proposed turbines have been sited at least 100 m from steep slopes and drainages.</p>	SWCA EMP 2019
	<p>Site turbines away from any additional important eagle use areas and the flight paths between them if identified during the Stage 2 Year 2 surveys.</p>	SWCA EMP 2019

Category	BMP	Source
	From February 15–June 15, avoid short-duration surface-disturbing activities within 0.25 mile of occupied prairie dog colonies (BLM 2010) to the extent practicable.	SWCA EMP 2019
	Consider eagle attractant removal (e.g., relocating prairie dogs) as warranted to adhere to avoidance prescriptions (Allison et al. 2017).	SWCA EMP 2019
	Dismantle non-permanent/non-operational MET towers.	SWCA EMP 2019
	Minimize storage, equipment, or debris/rock piles near turbines that may attract prey.	SWCA EMP 2019
	Discourage eagles from nesting or perching on newly installed power poles, MET towers, and other facility structures to the extent practicable (BLM 2009, 2010).	SWCA EMP 2019
	Bury power lines to reduce avian collision and electrocution to the extent practicable.	SWCA EMP 2019
	<p>If overhead lines are necessary, follow the Avian Power Line Interaction Committee (APLIC) guidance (APLIC 2006, 2012) on power line construction and design to limit collision and electrocutions:</p> <ul style="list-style-type: none"> • To reduce collision risk, avoid siting powerlines within collision risk areas (i.e., important eagle use areas and the flight zones between them). If powerlines are placed within collision risk areas, install line marking devices (also known as diverters), and design lines without ground wires (APLIC 2018; Loss et al. 2014). • To reduce electrocution risk, cap energized parts and ensure 60 inches of horizontal separation and 40 inches of vertical separation between phases and grounds (APLIC 2006, 2018). 	SWCA EMP 2019

Category	BMP	Source
	<p>The use of self-supported MET towers are preferred if feasible. The structure should be painted so that it stands out from the surrounding environment to provide optimum visibility for birds. If guy wires are necessary, bird flight diverters will be used following BLM's (2012) protocols:</p> <ul style="list-style-type: none"> • Each and every guy wire (not just external wires) should be clearly marked for the length of the wire. Starting at the top of the guy wire, the first marker must be placed within the first 15 feet of length. The last marker can be no more than 15 feet from the ground at the end of the guy wire. Markers should be of a color that does not blend with the wire. Choice of marker and spacing of the markers along the guy wire must use one of the following options. <ul style="list-style-type: none"> ▪ Spiral flight diverters (i.e., open-ended BIRD FLIGHT™ diverter or closed SWAN FLIGHT™ diverter or equivalent technology) spaced at intervals no greater than 15 feet apart. ▪ FireFly™ “flapper” secured with a dropped forged galvanized cable (u-bolt) clamp or equivalent technology, spaced at intervals no greater than 30 feet apart. ▪ In an alternating pattern, FireFly™ (or equivalent technology), and spiral flight diverters (e.g., open-ended BIRD FLIGHT™ diverter or closed SWAN FLIGHT™ diverter or equivalent technology) at spacing intervals of 15 feet apart. • Avoid placing lines within wetlands, over canyons, or within important avian movement corridors (i.e., between foraging and nesting sites) to the extent practicable. • Lights are sometimes used to mark guy wires and power lines. Because lights can both attract and confuse migrating birds, use lights only if lighting is needed for aviation safety. Unless otherwise requested by the Federal Aviation Administration, use only the minimum number of strobed, strobe-like, or blinking incandescent lights with a minimum intensity, maximum “off-phased” dual strobe lights. No steady-burning lights (e.g., L-810) should be used. All lights should illuminate simultaneously. 	SWCA EMP 2019
	Dismantle non-permanent/non-operational MET towers.	SWCA EMP 2019
	Minimize storage, equipment, or debris/rock piles near turbines that may attract prey.	SWCA EMP 2019
	Maintain facilities and grounds in a manner that minimizes any potential impacts to eagles (e.g., minimize storage, equipment, or debris/rock piles near turbines that may attract prey).	SWCA EMP 2019
	Instruct Project personnel, including contractors, to drive at low speeds (<25 mph) and be alert for wildlife, especially in low-visibility conditions.	SWCA EMP 2019

Category	BMP	Source
	<p>Implement a carcass removal plan to promptly remove large mammal (e.g., cows, elk) carrion from the Project footprint and vicinity when observed (Allison et al. 2017):</p> <ul style="list-style-type: none"> Plan will include lessee/landownership agreement involving regular communication regarding known carcasses and relocation/removal of the known cow dump site to an appropriate area outside of the Project footprint; siting of the new area will consider potential flight path connections between eagle use areas and eagle risk. Instruct Project personnel to identify and investigate corvid (e.g., crow, raven) and turkey vulture (<i>Cathartes aura</i>) concentration areas to inform presence of relevant carcasses. 	SWCA EMP 2019
	Implement training to educate workers on eagle identification and ecology, BMPs, avoiding eagle use areas, and eagle fatality/injury reporting and disposition procedures	SWCA EMP 2019
	Implement effectiveness monitoring, including development of additional BMPs as warranted, through the adaptive management process (see Section 6.6).	SWCA EMP 2019
	Follow decommissioning BMPs aimed at stabilizing soils and restoring native vegetation identified in the Project's POD.	SWCA EMP 2019
	Minimize new site disturbance and removal of native vegetation to the extent practicable.	SWCA EMP 2019
	Overhead power lines that are no longer needed should be removed.	SWCA EMP 2019
<i>Bird and Bat Measures</i>		
	A Bird and Bat Conservation Strategy (BBCS) would be developed by Borderlands Wind, LLC for the Proposed Project. The BBCS would contain detailed mitigation requirements and adaptive management techniques to avoid and minimize impacts to birds and bats. The BBCS would include a risk assessment and provide for rigorous pre- construction surveys, post construction monitoring, and adaptive management measures consistent with the USFWS Land-Based Wind Energy Guidelines. Pre-construction surveys are intended to determine if any species is at high risk to inform post-construction fatality monitoring. The BBCS would also include monitoring requirements and provisions for adaptive management measures based on mortality rates.	Searchlight Wind Energy Project; NV Las Vegas FO; 2012
	To avoid avian electrocution and collisions, place low and medium voltage electric power lines underground (see NMDGF Trenching Guideline) or on the surface as insulated, shielded wire where feasible unless greater adverse impacts to sensitive resources would result. To avoid and minimize bird electrocution or collisions associated with on- or off-site above-ground lines, transformers or conductors, refer to the NMDGF Powerline Guideline, and design and construct structures following the published recommendations of the Avian Power Line Interaction Committee (APLIC 1994, 2006, 2012).	NMDGF Wind Energy Guidelines, 2012

Category	BMP	Source
	Operators shall determine the presence of active raptor nests (i.e., raptor nests used during the breeding season). Measures to reduce raptor use at a project site (e.g., minimize road cuts, maintain either no vegetation or nonattractive plant species around the turbines) should be implemented.	BLM Wind PEIS; 2005
	Prior to initiating geophysical or other preliminary surveys during the raptor breeding season, the area would be surveyed for the presence of raptor nests.	Socorro Field Office RMP; 2010
	Encourage landowners/lessees to reduce availability of carrion by practicing responsible animal husbandry (removing carcasses, fencing out cattle, etc.) to avoid attracting Golden Eagles and other raptors.	NMDGF Wind Energy Guidelines, 2012
	Examine the impact of wind turbines on bats. Methods for post-construction monitoring may include fatality searches, acoustic detectors, radar, and thermal imaging.	Bat Conservation International, 2017
	Based on the results of post-construction monitoring, scientifically-proven avoidance, mitigation, and minimization strategies such as operational minimization and curtailment should be used during periods of high risk to reduce bat fatalities and the potential take of sensitive species at wind turbines.	Bat Conservation International, 2017
	Use data collected by the wind turbines or meteorological towers to relate bat and or bird fatality to weather and operational variables.	Bat Conservation International, 2017
	Participate in on-going and new research to better understand bat behaviors near wind turbines and effective strategies to minimize bat fatalities, such as ultrasonic acoustic deterrents, or operational minimization.	Bat Conservation International, 2017
	During construction and operation, measures would be taken to avoid/minimize the impact of light intrusion into adjacent native/undisturbed/sensitive habitats. Night lighting during construction would not occur to the maximum extent practicable. Any night lighting used during construction and operation would be the lowest illumination allowed for human safety, selectively placed, down shielded, and directed away from all areas of native habitat to the maximum extent practicable. All unnecessary lighting should be turned off at night to limit attracting migratory birds and bats in search of insects.	Tule Wind Energy Project ; CA El Centro FO; 2012
	Employ only red, or dual red and white strobe, strobe-like, or flashing lights, not steady burning lights, to meet Federal Aviation Administration (FAA) requirements for visibility lighting of wind turbines, permanent met towers, and communication towers. Aircraft safety lighting should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. Only a portion of the turbines within the wind project should be lighted, and all pilot warning lights should fire synchronously.	USFWS Land-Based Wind Energy Guidelines, 2012

Category	BMP	Source
	Avoid guy wires on communication towers and permanent met towers. If guy wires are necessary, bird flight diverters or high visibility marking devices should be used at intervals specified and approved by the BLM and USFWS.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010
	<p>Keep lighting at both operation and maintenance facilities and substations located within half a mile of the turbines to the minimum required:</p> <ul style="list-style-type: none"> a. Use lights with motion or heat sensors and switches to keep lights off when not required. b. Lights should be hooded downward and directed to minimize horizontal and skyward illumination. c. Minimize use of high intensity lighting, steady-burning, or bright lights such as sodium vapor, quartz, halogen, or other bright spotlights. d. All internal turbine nacelle and tower lighting should be extinguished when unoccupied. 	USFWS Land-Based Wind Energy Guidelines, 2012
	Prior to construction, Borderlands Wind, LLC would remove all existing raptor nests (excluding eagle nests) from existing structures that would be affected by Project construction following approval by the BLM. Removal of nests would occur outside of the raptor breeding season (January to July). If it is necessary to remove an existing raptor nest during the breeding season, a qualified biologist would survey the nest prior to removal to determine if it is active. If the nest is inactive, it would be dismantled and removed from the site promptly under the supervision of a biologist to be approved by the BLM. If the nest is determined to be active, it would not be removed and the biologist would monitor the nest to ensure nesting activities and/or breeding activities are not disrupted. If the biologist determines that Project activities are disturbing or disrupting nesting activities, the monitor would make recommendations to reduce the noise and/or disturbance in the vicinity of the nest.	Tule Wind Energy Project ; CA El Centro FO; 2012
	Facilities shall be designed to discourage their use as perching or nesting substrates by birds. For example, power lines and poles shall be configured to minimize raptor electrocutions and discourage raptor and raven nesting and perching	BLM Wind PEIS; 2005
	When practical use tubular towers or best available technology to reduce ability of birds to perch and to reduce risk of collision.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010
	Where post-construction studies show a high rate of bat mortality, or mortality to special status bat species, turbines operation should be curtailed at wind speeds below 4-6 mps, at the relevant time of day and season of the year.	NMDGF Wind Energy Guidelines, 2012

Category	BMP	Source																		
	<p>Prior to the initiation of a surface-disturbing activity, the project area would be surveyed for raptor nests. Surveys would be conducted by professional biologists approved by the Authorized Officer. All raptor nests would be avoided by the distances and seasonal periods listed below:</p> <table border="1"> <thead> <tr> <th>Species</th> <th>Minimum Distance</th> <th>Season</th> </tr> </thead> <tbody> <tr> <td>Aplomado Falcon</td> <td>0.5 mile</td> <td>January 1-July 31</td> </tr> <tr> <td>Eagle</td> <td>0.5 mile</td> <td>February 1-July 15</td> </tr> <tr> <td>Ferruginous Hawk</td> <td>0.5 mile</td> <td>February 1-July 15</td> </tr> <tr> <td>Prairie Falcon</td> <td>0.5 mile</td> <td>March 1-August 1</td> </tr> <tr> <td>All other raptor species</td> <td>0.5 mile</td> <td>during observed nest establishment through fledgling</td> </tr> </tbody> </table>	Species	Minimum Distance	Season	Aplomado Falcon	0.5 mile	January 1-July 31	Eagle	0.5 mile	February 1-July 15	Ferruginous Hawk	0.5 mile	February 1-July 15	Prairie Falcon	0.5 mile	March 1-August 1	All other raptor species	0.5 mile	during observed nest establishment through fledgling	Socorro Field Office RMP; 2010
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	Post-construction studies may show disproportionate mortality at certain towers, for example those located on the end of a tower string, or closest to the edge of a cliff; in these cases, curtailment, retrofitting or relocating is highly recommended.	NMDGF Wind Energy Guidelines, 2012																		
	All surface disturbing activities associated with the project conducted during the general bird nesting season (April 1 through August 1) will require surveys two weeks prior to initiating surface disturbing activities by a qualified biologist. The biologist will inspect the area for nests, or signs of nesting or courtship behavior. If active nests or signs of nesting are observed and recorded, the BLM Biologist will be contacted for specific mitigation. If there is a lapse in construction activities of two or more weeks, a second survey will be required.	BLM Socorro Field Office																		
	Potential for creating temporary or permanent habitats suitable for rodents, such as rock piles, eroded slopes with openings or overhangs, or stockpiling of construction debris will be avoided	Alta East Wind BBCS; CA,																		
Soils and Restoration																				
	After project construction, close roads not needed for site operations and restore these roadbeds to native vegetation, consistent with landowner agreements.	USFWS Land-Based Wind Energy Guidelines, 2012																		

Category	BMP	Source
	All seed shall be certified noxious weed free. Areas would be monitored to determine the success of re-vegetation, the presents of invasive/noxious weeds, and would be reseeded if necessary.	Socorro Field Office RMP; 2010
	Topsoils located in areas to be restored would be conserved and stockpiled during excavation and reused as cover on disturbed areas to facilitate regrowth of vegetation when restoring plant communities. Topsoils should be restored to assist in establishing and maintaining pre-construction native plant communities to the extent possible, consistent with landowner objectives. Topsoil located in developed or disturbed areas is excluded from this BMP.	USFWS Land-Based Wind Energy Guidelines, 2012
	In accordance with the habitat restoration plan, restoration shall be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.	BLM Wind PEIS; 2005
	Site Development: Incorporate native plant species into interim and long-term habitat restoration plans for proposed sites. Avoid or minimize negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. For example, avoid attracting high densities of prey animals (rodents, rabbits, etc.) used by raptors.	NMDGF Wind Energy Guidelines, 2012
	Refer to state and federal agencies guidance when seeding or planting native seeds during restoration.	Bat Conservation International, 2017
	Restore the vegetation cover, composition, and diversity to values commensurate with the ecological setting.	Bat Conservation International, 2017
<i>Special Status Species</i>		
	Prior to the start of construction, surveys for special status plant species would be conducted. Surveys would take place during the appropriate season (i.e. flowering period) for the species and the boundaries of special status plant populations would be delineated by a BLM NM approved botanist with clearly visible flagging or fencing. The flagging and/or fencing would be maintained in place for the duration of construction. Flagged and fenced areas would be avoided to the extent practicable during construction activities in that area.	Tule Wind Energy Project ; CA El Centro FO; 2012
	A BLM approved biologist would perform pre-construction surveys of work areas within suitable habitat, for prairie dogs, raptors, migratory birds, and/or other special status species, which would include BLM sensitive species, two weeks prior to initiating surface disturbing activities. If there is a lapse in construction activities of two or more weeks, a second survey would be required. Since prairie dog, raptors, migratory birds, or other sensitive species move throughout a landscape surveys would be completed in the season during which construction activities are planned during the current year's active season survey.	BLM Socorro Field Office

Category	BMP	Source
<i>Gunnison Prairie Dog</i>		
	BLM's Construction Inspection Contractor would develop a WEAP (Worker Environmental Awareness Program) and Training program to inform all project related personnel of the occurrence of Gunnison prairie dog, their status, and specific avoidance/exclusion, timing limitations, and other mitigation measures.	BLM Socorro Field Office
	Project personnel are not allowed to have pets or firearms in their possession while on the project to prevent unnecessary harm/harassment.	BLM Socorro Field Office
	All exclusion/avoidance areas, such as prairie dog colonies, shall be clearly delineated to ensure project construction avoidance. A combination of flagging, fencing, signage and/or a computer-based tool that ensures, defined work areas, and approved access roads shall be utilized. All personnel would be trained on the meaning of flagging, fencing, signage or use of a computer-based tool.	BLM Socorro Field Office
	A habitat suitability assessment would be completed two-weeks prior to initiating surface disturbing activities and/or construction activities. Based on results of assessment, additional mitigation may be developed and applied. Refer to Gunnison Prairie dog Habitat Assessment Protocol.	BLM Socorro Field Office
	A project speed limit of 15 mph within 350' within suitable prairie dog habitat during the active season and 5 mph within 350' feet of an active prairie dog colony would be established.	BLM Socorro Field Office
	Pads/areas cleared within ¼ miles of occupied habitat would be inspected daily prior to construction activities and fenced (i.e. silt fencing/barriers) to exclude prairie dogs from establishing on site.	BLM Socorro Field Office
	Materials/stock yards would be located ¼ mile for long-term use and 350' for temporary staging areas outside of occupied but suitable prairie dog habitat. Temporary use is defined as work that would not extend beyond the current years active season and long-term use is defined as work which extend past the current years active season (occur within two or more seasons). If this is not possible, area would be fenced (i.e., silt fencing/barriers or something more permanent) to ensure that wildlife do not access and occupy them.	BLM Socorro Field Office
	Equipment and vehicle maintenance activities would avoid prairie dog occupied habitat by 350'. Precautions should be taken to ensure that ground contamination by fuels, motor oils, grease, etc. does not occur and that any waste materials are contained and properly disposed of off-site.	BLM Socorro Field Office

Category	BMP	Source
	A BLM approved monitor would be required to be onsite during all work within 350' of occupied, mapped habitat (i.e. colonies). The monitor would document compliance with design features and any impacts that may occur and would have the authority to halt activities which may be in violation of design features and/or may result in death/ injury, abandonment of active colony or precludes dispersal into otherwise suitable habitat.	BLM Socorro Field Office
	Construction would occur during the extended active season (April 1st – September 30th) to allow animals that may be in harm's way of construction activities an opportunity to move as well as the ability to identify if burrows are active or not.	BLM Socorro Field Office
	Restoration and rehabilitation efforts within prairie dog habitat would utilize seed mixes conducive to maintaining a native grassland.	BLM Socorro Field Office
	In the event that all other mitigation measures/design features have been utilized and impact cannot be mitigated, those prairie dogs in immediate risk of injury or death would be translocated to the nearest occupied colony in accordance with translocation plan.	BLM Socorro Field Office
	<p>Gunnison Prairie Dog Habitat Assessment and Preconstruction Surveys</p> <ul style="list-style-type: none"> A habitat assessment would be completed prior to construction activities. A desktop analysis followed by field review would occur and shall be timed with preconstruction surveys. Areas of unsuitable habitat would be exempt from surveys. Unsuitable habitat is defined as habitat that includes 1) dominant tree sites, 2) >30% shrub canopy, 3) rocky/cliff areas, and 4) playas, wetlands, and areas of saturated soils. Note that shrub/steppe habitats with a minor tree component (i.e. shrub cover < 30% and tree cover < 10%) and secondary floodplains of riparian areas could be suitable habitat. Surveyors would assess the suitability of the habitat and if it is determined that habitat is not suitable for prairie dogs, the surveyor would map (i.e. GPS the beginning and end of the unsuitable habitat) and document (i.e. brief description vegetation component, estimates of shrub/tree canopy cover, reasons for unsuitability determination, and photos) their findings. Qualified surveyors approved by BLM would survey all suitable habitat within new proposed ground disturbance areas, within 0.25 mile buffer prior to construction to document the presence or absence of functional prairie dog burrows within the disturbance areas associated with each construction activity (i.e. temporary workspace, roads/crane paths, electrical collection system, etc.). Transects would be spaced 30 meters apart and the surveyor would ensure 100% visual coverage of the construction areas. All functional prairie dog burrows would be mapped and GPS'd. This information would be used to inform the application of mitigation measures during construction. Surveys data and reports would be provided to the Field Office a minimum of 2 weeks prior to construction. 	BLM Socorro Field Office

Category	BMP	Source
<i>Cultural/Paleontological Resources</i>		
	Unexpected discovery of cultural or paleontological resources during construction shall be brought to the attention of the responsible BLM authorized officer immediately. Work shall be halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation measures are being developed.	BLM Wind PEIS; 2005
<i>Decommissioning</i>		
	Prior to the termination of the rights-of-way authorization, a Decommissioning Plan shall be developed and approved by the BLM. The Decommissioning Plan shall include a Site Reclamation Plan and Monitoring Program.	BLM Wind PEIS; 2005
	All management plans, BMPs, and stipulations developed for the construction phase shall be applied to similar activities during the decommissioning phase.	BLM Wind PEIS; 2005
<i>Excavation, Blasting, and Grading</i>		
	The operator shall develop a Blasting Plan to include identification of planned blasting locations, a description of the planned blasting methods, an inventory of receptors potentially affected by the planned blasting, and determination of the area affected by the planned blasting. Blasting methods would take into consideration the high wildland fire hazard conditions in and surrounding the project area. Precautions to prevent fire would be included in the Blasting Plan and would include requirements to have all blasting charges capped with soil and/or other materials that are not combustible. Blasting activities are required to be observed by a Blasting Inspector. A Blasting Inspector is a person on the Sheriff's approved list of inspectors authorized to conduct inspections, before and after a blast. To be on the Sheriff's approved list, an inspector shall be certified by or registered with the International Conference of Building Officials, the International Code Counsel/Counsel of American Building Officials, the Building Officials & Code Administrator, or the Southern Building Code Congress International.	Tule Wind Energy Project ; CA El Centro FO; 2012
	Operators shall gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface waterbodies shall be identified.	BLM Wind PEIS; 2005
	Foundations and trenches shall be backfilled with originally excavated material as much as possible. Excess excavation materials shall be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities.	BLM Wind PEIS; 2005
	Borrow material shall be obtained only from authorized and permitted sites.	BLM Wind PEIS; 2005

Category	BMP	Source
Fire Safety		
	A Comprehensive Fire Safety Plan shall be prepared for construction and operation of the project. The objective of this plan is to eliminate the causes of fire, prevent loss of life and property by fire, and to comply with the Occupational Safety and Health Administration (OSHA) standard on fire prevention, 29 CFR 1926.24.	Ocotillo Wind Energy Facility, CA El Centro FO; 2012
	To reduce fire hazard from vehicles and human activities, instruct employees to use spark arrestors on power equipment, ensure that no metal parts are dragging from vehicles, and use caution with open flames, cigarettes, etc.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010
Geology and Soils		
	For soil disturbing actions that would require reclamation, soil and/or seed stocks may be salvaged and stockpiled prior to surface disturbances. Seed stock piles shall be windrowed and protected from wind erosion if they are to be left for more than one growing season. Recontour all disturbed areas to blend as seamlessly as possible with the natural topography prior to revegetation. Rip all compacted portions of the disturbed soil to an appropriate depth based on site characteristics. Establish an adequate seed bed to provide good seed-to-soil contact. Note that stockpiling top soil would increase disturbance areas at road and turbine assembly areas.	Ocotillo Wind Energy Facility, CA El Centro FO; 2012
Hazardous Materials and Waste		
	Operators shall develop a Hazardous Materials Management Plan that addresses storage, use, transportation, and disposal of each hazardous material anticipated to be used at the site. The plan shall identify all hazardous materials that would be used, stored, or transported at the site. It shall establish inspection procedures, storage requirements, storage quantity limits, inventory control, nonhazardous product substitutes, and disposal of excess materials. The plan shall also identify requirements for notices to Federal and local emergency response authorities and include emergency response plans.	BLM Wind PEIS; 2005
	Operators shall develop a Waste Management Plan that identifies the waste streams that are expected to be generated at the site and addresses hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste minimization procedures. This plan shall address all solid and liquid wastes that may be generated at the site.	BLM Wind PEIS; 2005

Category	BMP	Source
	Operators shall develop a spill prevention and response plan identifying where hazardous materials and wastes are stored, spill prevention measures, training requirements, spill response actions, locations of spill response kits, procedures for ensuring that the spill response kits are adequately stocked, and procedures for making timely notifications to authorities.	BLM Wind PEIS; 2005
	In the event of an accidental release to the environment, the operator shall document the event, including a root cause analysis, appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event shall be provided to the BLM authorized officer and other federal and state agencies, as required."	BLM Wind PEIS; 2005
	Secondary containment shall be provided for all on-site hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) shall be a temporary activity occurring only for as long as is needed to support construction activities.	BLM Wind PEIS; 2005
	Wastes shall be properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.	BLM Wind PEIS; 2005
	Any wastewater generated in association with temporary, portable sanitary facilities shall be periodically removed by a licensed hauler and disposed of at an existing municipal sewage treatment facility. Temporary, portable sanitary facilities provided for construction crews shall be adequate to support expected on-site personnel and shall be removed at completion of construction activities.	BLM Wind PEIS; 2005
	Federal and state measures for handling toxic substances to minimize danger to water and wildlife resources from spills would be followed. All fuels, waste oils, and solvents would be collected and stored in tanks or drums within a secondary containment area consisting of an impervious floor and bermed sidewalls capable of holding the volume of the largest container stored within. Borderlands Wind, LLC would ensure that all equipment operating in or near a drainage, or in a basin, is in good working condition, and free of leaks. All vehicles would have drip pans during storage to contain minor spills and drips. No refueling or storage would take place within 100 feet (30.5 meters) of a drainage channel or structure. Spill containment materials must be on site or readily available for any equipment maintenance or refueling that occurs adjacent to a drainage. In addition, all maintenance crews working with heavy equipment would maintain Hazardous Materials Spill Kits on site and be trained in spill containment and response. Petroleum product leaks and chemical releases should be remediated prior to completion of decommissioning.	Tule Wind Energy Project ; CA El Centro FO; 2012

Category	BMP	Source
Health and Safety Planning		
	The applicant would notify FAA by filing FAA Form 7460 at least 30 days before construction is to begin or the application for the construction permit is to be filed.	Searchlight Wind Energy Project; NV Las Vegas FO; 2012
	A safety assessment shall be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access, construction, safe work practices, security, heavy equipment transportation, traffic management, emergency procedures, and fire control.	BLM Wind PEIS; 2005
	A health and safety program shall be developed to protect both workers and the general public during construction, operation, and decommissioning of a wind energy project. Regarding occupational health and safety, the program shall identify all applicable Federal and State occupational safety standards; establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses; Occupational Safety and Health Administration [OSHA] standard practices for safe use of explosives and blasting agents; and measures for reducing occupational electric and magnetic fields [EMF] exposures); establish fire safety evacuation procedures; and define safety performance standards (e.g., electrical system standards and lightning protection standards). The program shall include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies shall be established.	BLM Wind PEIS; 2005
	Regarding public health and safety, the health and safety program shall establish a safety zone or setback for wind turbine generators from residences and occupied buildings, roads, rights-of-ways, and other public access areas that is sufficient to prevent accidents resulting from the operation of wind turbine generators. It shall identify requirements for temporary fencing around staging areas, storage yards, and excavations during construction or decommissioning activities. It shall also identify measures to be taken during the operation phase to limit public access to hazardous facilities (e.g., permanent fencing would be installed around electrical substations, and turbine tower access doors would be locked).	BLM Wind PEIS; 2005
	Temporary fencing shall be installed around staging areas, storage yards, and excavations during construction to limit public access.	BLM Wind PEIS; 2005
	Permanent fencing shall be installed and maintained around electrical substations, the switchyard, and the operations and maintenance building. Turbine tower access doors shall be locked to limit public access.	BLM Wind PEIS; 2005

Category	BMP	Source
	In the event an installed wind energy development project results in EMI (e.g., impacts to radar, microwave, television, or radio transmissions), the operator shall work with the owner of the impacted communications system to resolve the problem. Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.	BLM Wind PEIS; 2005
Hydrological Resources and Water Quality		
	Operators shall develop a Stormwater Management Plan for the site to ensure compliance with applicable regulations and prevent off-site migration of contaminated stormwater or increases in soil erosion.	BLM Wind PEIS; 2005
	Surface water flows should be restored to pre-disturbance conditions, including removal of stream crossings, roads, and pads, consistent with storm water management objectives and requirements.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010
	After decommissioning, erosion control measures should be installed in all disturbance areas where potential for erosion exists, consistent with storm water management objectives and requirements.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010
	Avoid impacts to wetlands, hydrology, and stream morphology by using appropriate erosion control measures to limit runoff to nearby water sources. Follow all applicable provisions of the Clean Water Act (33 USC 1311-1313, 1317) and the Rivers and Harbors Act (33 USC 301 et seq.).	Bat Conservation International, 2017
Land Use		
	Borderlands Wind, LLC would coordinate with the grazing permittees during construction to control grazing livestock movement and inform the BLM SFO of the agreed upon method for livestock control. Prior approval from the BLM SFO is required for any temporary fencing.	
Monitoring and Testing		
	The area disturbed by installation of meteorological towers (i.e., footprint) shall be kept to a minimum.	BLM Wind PEIS; 2005
	Meteorological towers shall not be located in sensitive habitats or in areas where ecological resources known to be sensitive to human activities are present. Installation of towers shall be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors.	BLM Wind PEIS; 2005

Category	BMP	Source
	Meteorological towers installed for site monitoring and testing shall be inspected periodically for structural integrity.	BLM Wind PEIS; 2005
	Site monitoring protocols defined in the POD shall be implemented. These shall incorporate monitoring program observations and additional BLM-approved mitigation measures into standard operating procedures and BMPs to minimize future environmental impacts.	BLM Wind PEIS; 2005
Noise		
	Noisy construction activities (including blasting) shall be limited to the least noise-sensitive times of day (i.e., daytime only between 7 a.m. and 10 p.m.) and weekdays.	BLM Wind PEIS; 2005
	All equipment shall have sound-control devices no less effective than those provided on the original equipment. All construction equipment used shall be adequately muffled and maintained.	BLM Wind PEIS; 2005
	All stationary construction equipment (e.g., compressors and generators) shall be located as far as practicable from nearby residences.	BLM Wind PEIS; 2005
	If blasting or other noisy activities are required during the construction period, nearby residents shall be notified in advance.	BLM Wind PEIS; 2005
Noxious/Invasive Weeds		
	Operators shall develop a plan for control of noxious weeds and invasive species, which could occur as a result of new surface disturbance activities at the site. The plan shall address monitoring, education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulching shall be required. If trucks and construction equipment are arriving from locations with known invasive vegetation problems, a controlled inspection and cleaning area shall be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.	BLM Wind PEIS; 2005
	If fill dirt or gravel is brought onto public lands, the source must be noxious weed-free.	Socorro Field Office RMP; 2010
	Surveys should be conducted by qualified experts to detect invasive plants, and comprehensive approaches to controlling any detected plants should be implemented and maintained as long as necessary.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010

Category	BMP	Source
	Construction sites should be monitored for the life of the project for the presence of invasive/noxious weeds (includes maintenance and construction activities). If weeds are found, the Socorro Field Office would be notified and it would determine the best method for the control of the particular weed species.	Socorro Field Office RMP; 2010
	All seed shall be certified noxious weed-free. Areas would be monitored to determine the success of revegetation and the presence of invasive/noxious weeds, and would be reseeded if necessary.	Socorro Field Office RMP; 2010
	Consider livestock quarantine, removal, or timing limitations in invasive/noxious weed-infested areas.	Socorro Field Office RMP; 2010
	All seed, hay, straw, mulch, or other vegetative material transported and used on public land for site stability, rehabilitation, or project facilitation shall be certified noxious weed-free and free of all reproductive parts upon the passage of a weed-free law in the State of New Mexico.	Socorro Field Office RMP; 2010
	It is recommended that all vehicles, including off-road and all-terrain and equipment, traveling in or out of weed-infested areas be cleaned before and after use on public land.	Socorro Field Office RMP; 2010
	Additional BMPs may be developed from the 2007 and 2016 Vegetation Management EISs and the BLM 1740-2 Handbook.	BLM Socorro Field Office
Operations		
	All control and mitigation measures established for the project in the POD and the resource-specific management plans that are part of the POD shall be maintained and implemented throughout the operational phase, as appropriate. These control and mitigation measures shall be reviewed, revised, and approved by the BLM, as needed, to address changing conditions or requirements at the site, throughout the operational phase. This adaptive management approach would help ensure that impacts from operations are kept to a minimum.	BLM Wind PEIS; 2005
	Inoperative turbines shall be repaired, replaced, or removed in a timely manner. Requirements to do so shall be incorporated into the due diligence provisions of the rights-of-way authorization. Operators would be required to demonstrate due diligence in the repair, replacement, or removal of turbines; failure to do so could result in termination of the rights-of-way authorization.	BLM Wind PEIS; 2005

Category	BMP	Source
Recreation		
	To minimize impacts to resource values or to enhance a recreational setting and recreation experience, harden sites and locations subject to prolonged/repetitive concentrated recreational uses with selective placement of gravel or other porous materials and allow for dust abatement, paving, and engineered road construction.	Socorro Field Office RMP; 2010
	As appropriate, employ limitations of specific activities to avoid or correct adverse impacts to resource values, public safety issues, and/or conflicts between recreational uses.	Socorro Field Office RMP; 2010
	Employ land use ethics programs and techniques such as Leave No Trace™ and Tread Lightly!® programs. Use outreach efforts of such programs to lessen needs to implement more stringent regulatory measures to obtain resource protection and a quality recreation experience.	Socorro Field Office RMP; 2010
Roads		
	An Access Road Siting and Management Plan shall be prepared that incorporates existing BLM standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual (BLM 1985) and the Surface Operating Standards for Oil and Gas Exploration and Development (RMRCC 1989) (i.e., the Gold Book).	BLM Wind PEIS; 2005
	Existing roads shall be used, but only if in safe and environmentally sound locations. If new roads are necessary, they shall be designed and constructed to the appropriate standard and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Excessive grades on roads, road embankments, ditches, and drainages shall be avoided, especially in areas with erodible soils. Special construction techniques shall be used, where applicable.	BLM Wind PEIS; 2005
	Access roads and on-site roads shall be surfaced with aggregate materials, wherever appropriate.	BLM Wind PEIS; 2005
	Access roads shall be located to follow natural contours and minimize side hill cuts.	BLM Wind PEIS; 2005
	Roads shall be located away from drainage bottoms and wetlands, if practicable.	BLM Wind PEIS; 2005
	Roads shall be designed so that changes to surface water runoff are avoided and erosion is not initiated.	BLM Wind PEIS; 2005
	Access roads shall be located to minimize stream crossings. All structures that cross streams shall be located and constructed so that they do not decrease channel stability or increase water velocity. Operators shall obtain all applicable Federal and State permits	BLM Wind PEIS; 2005

Category	BMP	Source
	Existing drainage systems shall not be altered, especially in sensitive areas such as erodible soils or steep slopes. Potential soil erosion shall be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts shall be cleaned and maintained regularly.	Socorro Field Office RMP; 2010
	Base the road design criteria and standards on road management objectives (such as traffic requirements of the proposed activity) and the overall transportation objectives, and minimize damage to the environment.	Socorro Field Office RMP; 2010
	Locate roads on stable terrain such as ridgetops, natural benches, and flatter transitional slopes near ridges and valley bottoms and moderate sideslopes and away from slumps, slide-prone areas, concave slopes, clay beds, and where rock layers dip parallel to the slope. Locate roads on well-drained soil types; avoid wet areas.	Socorro Field Office RMP; 2010
	Construct cut-and-fill slopes to be approximately 3(h):1(v) or flatter where feasible. Locate roads to minimize heights of cutbanks. Avoid high, steeply sloping cutbanks in highly fractured bedrock.	Socorro Field Office RMP; 2010
	Avoid head walls; midslope locations on steep, unstable slopes; fragile soils; seeps; old landslides; sideslopes in excess of 70 percent; and areas where the geologic bedding planes or weathering surfaces are inclined with the slope. Implement extra mitigation measures when these areas cannot be avoided.	Socorro Field Office RMP; 2010
	Construct roads for surface drainage by using outslopes, crowns, grade changes, drain dips, waterbars, and/or insloping to ditches as appropriate.	Socorro Field Office RMP; 2010
	Sloping the road base to the outside edge for surface drainage is normally recommended for local spurs or minor collector roads where traffic volume is low and lower traffic speeds are anticipated. This is also recommended in situations where long intervals between maintenance would occur and where minimum excavation is wanted. Out-sloping is not recommended on steep slopes. Sloping the road base to the inside edge is an acceptable practice on roads with steep sideslopes and where the underlying soil formation is very rocky and not subject to appreciable erosion or failure.	Socorro Field Office RMP; 2010
	Crowning and ditching are recommended for arterial and collector roads where traffic volume, speed, intensity, and user comfort are considerations. Recommended gradients range from 0 to 15 percent where crowning and ditching may be applied, as long as adequate drainage away from the road surface and ditch lines is maintained.	Socorro Field Office RMP; 2010
	Minimize excavation when constructing roads through the use of balanced earthwork, narrowing road widths, and end-hauling where sideslopes are between 50 and 70 percent.	Socorro Field Office RMP; 2010

Category	BMP	Source
	If possible, construct roads when soils are dry and not frozen. When soils or road surfaces become saturated to a depth of 3 inches, BLM-authorized activities should be limited or cease unless otherwise approved by the authorized officer.	Socorro Field Office RMP; 2010
	Consider improving inadequately surfaced roads that are to be left open to public traffic during wet weather with gravel or pavement to minimize sediment production and maximize safety.	Socorro Field Office RMP; 2010
	Retain vegetation on cut slopes unless it poses a safety hazard or restricts maintenance activities. Roadside brushing of vegetation should be done in a way that prevents disturbance to root systems and visual intrusions (e.g., avoid using excavators for brushing).	Socorro Field Office RMP; 2010
	Retain adequate vegetation between roads and streams to filter runoff from roads.	Socorro Field Office RMP; 2010
	Avoid riparian/wetland areas where feasible; locate in these areas only if the roads do not interfere with the attainment of proper functioning condition and riparian management objectives.	Socorro Field Office RMP; 2010
	Minimize the number of unimproved stream crossings. When a culvert or bridge is not feasible, locate drive-through (low-water) crossings on stable rock portions of the drainage channel. Harden crossings with the addition of rock and gravel if necessary. Use angular rock if available.	Socorro Field Office RMP; 2010
	Locate roads and limit activities of mechanized equipment within stream channels to minimize their influence on riparian areas. When stream crossing is necessary, design the approach and crossing perpendicular to the channel where practical. Locate the crossing where the channel is well defined, unobstructed, and straight.	Socorro Field Office RMP; 2010
	Avoid placing fill material in floodplains unless the material is large enough to remain in place during flood events.	Socorro Field Office RMP; 2010
	Use drainage dips instead of culverts on roads where gradients would not present a safety issue. Locate drainage dips in such a way so water would not accumulate or where outside berms prevent drainage from the roadway. Locate and design drainage dips immediately upgrade of stream crossings and provide buffer areas and catchment basins to prevent sediment from entering the stream.	Socorro Field Office RMP; 2010
	Construct catchment basins, brush windrows, and culverts in a way to minimize sediment transport from road surfaces to stream channels. Install culverts in natural drainage channels in a way to conform with the natural streambed gradients and with outlets that discharge onto rocky or hardened protected areas.	Socorro Field Office RMP; 2010

Category	BMP	Source
	Design and locate water crossing structures in natural drainage channels to accommodate adequate fish passage, provide for minimum impacts to water quality, and be capable of handling a 100-year event for runoff and floodwaters.	Socorro Field Office RMP; 2010
	Replace undersized culverts and repair or replace damaged culverts and downspouts. Provide energy dissipaters at culvert outlets or drainage dips.	Socorro Field Office RMP; 2010
	Locate culverts or drainage dips in such a manner as to avoid discharge onto unstable terrain such as head walls or slumps. Provide adequate spacing to avoid accumulation of water in ditches or road surfaces. Culverts should be placed on solid ground to avoid road failures.	Socorro Field Office RMP; 2010
	Properly sized aggregate and riprap should be used during culvert construction. Place riprap at culvert entrances to streamline water flow and reduce erosion.	Socorro Field Office RMP; 2010
	Establish adapted vegetation on all cuts and fill immediately following road construction and maintenance.	Socorro Field Office RMP; 2010
	Remove berms from the downslope side of roads, consistent with safety considerations.	Socorro Field Office RMP; 2010
	Rehabilitate roads no longer needed and leave abandoned roads in a condition that provides adequate drainage without further maintenance and remove any existing culverts. Close abandoned roads to traffic by physically obstructing the road with large berms, trenches, logs, stumps, or rock boulders as necessary to accomplish permanent closure.	Socorro Field Office RMP; 2010
	When plowing snow for winter use of roads, provide breaks in snow berms to allow for road drainage. Avoid plowing snow into streams. Plow snow only on existing roads.	Socorro Field Office RMP; 2010
	Maintenance should be performed to conserve existing surface material, retain the original crowned or out-sloped, self-draining cross section, prevent or remove rutting berms (except those designed for slope protection) and other irregularities that retard normal surface runoff. Avoid wasting loose ditch or surface material over the shoulder where it can cause stream sedimentation or weaken slump-prone areas. Avoid undercutting back slopes.	Socorro Field Office RMP; 2010
	Do not disturb the toe of cut slopes while pulling ditches or grading roads. Avoid sidecasting road material into streams.	Socorro Field Office RMP; 2010
	Grade roads only as necessary. Maintain drain dips, waterbars, road crown, in-sloping, and out-sloping, as appropriate, during road maintenance.	Socorro Field Office RMP; 2010

Category	BMP	Source
	When landslides occur, save all soil and material usable for reclamation and stockpile for future reclamation needs. Avoid sidecasting of slide material where it can damage, overload, and saturate embankments, or flow into down-slope drainage courses. Reestablish vegetation as needed in areas where vegetation has been destroyed due to sidecasting.	Socorro Field Office RMP; 2010
	Strip and stockpile topsoil ahead of construction of new roads, if feasible. Reapply soil to cut and fill slopes prior to revegetation.	Socorro Field Office RMP; 2010
	Minimize the number and length of access roads; use existing roads when feasible.	USFWS Wind Turbine Guidelines Advisory Committee Recommendations, 2010
<i>Right of Ways and Utility Corridors</i>		
	Rights-of-way and utility corridors should use areas adjoining or adjacent to previously disturbed areas whenever possible, rather than traverse undisturbed vegetation communities.	Socorro Field Office RMP; 2010
	Waterbars or dikes should be constructed on all of the rights-of-way and utility corridors, and across the full width of the disturbed area, as directed by the authorized officer.	Socorro Field Office RMP; 2010
	Disturbed areas within road rights-of-way and utility corridors should be stabilized by vegetation practices designed to hold soil in place and minimize erosion.	Socorro Field Office RMP; 2010
	Sediment barriers should be constructed when needed to slow runoff, allow deposition of sediment, and prevent transport from the site. Straining or filtration mechanisms may also be employed for the removal of sediment from runoff.	Socorro Field Office RMP; 2010
<i>Traffic and Transportation Planning and Management</i>		
	A Transportation Plan shall be developed, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan shall consider specific object sizes, weights, origin, destination, and unique handling requirements and shall evaluate alternative transportation approaches. In addition, the process to be used to comply with unique State requirements and to obtain all necessary permits shall be clearly identified.	BLM Wind PEIS; 2005

Category	BMP	Source
	A Traffic Management Plan shall be prepared for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration.	BLM Wind PEIS; 2005
	Operators shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) shall be identified and addressed in the Traffic Management Plan.	BLM Wind PEIS; 2005
	Project personnel and contractors shall be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and airborne dust.	BLM Wind PEIS; 2005
	Traffic shall be restricted to the roads developed for the project. Use of other unimproved roads shall be restricted to emergency situations.	BLM Wind PEIS; 2005
	Signs shall be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimize impacts on local commuters, consideration shall be given to limiting construction vehicles traveling on public roadways during the morning and late afternoon commute times.	BLM Wind PEIS; 2005
	Ongoing ground transportation planning shall be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.	BLM Wind PEIS; 2005
Visual Resources		
	Use wind turbine towers, nacelles, and rotors that are locally uniform and that conform to high standards of industrial design to present a trim, uncluttered, aesthetic appearance.	Tule Wind Energy Project ; CA El Centro FO; 2012
	Place much of the facility's electrical collection system underground (as much as possible), minimizing the system's visual impacts.	Tule Wind Energy Project ; CA El Centro FO; 2012
	Borderlands Wind, LLC would integrate the turbine array with the surrounding landscape to the extent practicable. Design elements to be addressed include visual uniformity, use of tubular towers, proportion and color of turbines, non-reflective paints, and prohibition of commercial messages on turbines.	March 2019 POD / Visual Report 2018

Category	BMP	Source
	Borderlands Wind, LLC would integrate other site design elements with the surrounding landscape to the extent practicable including minimizing the profile of the ancillary structures, burial of cables, prohibition of commercial symbols, and lighting. Borderlands Wind, LLC would minimize the need for and amount of lighting on ancillary structures.	March 2019 POD / Visual Report 2018
	Where feasible, non-reflective paints and coatings should be used on wind turbines, visible ancillary structures, and other equipment to reduce reflection and glare. Turbines, visible ancillary structure, and other equipment should be painted before or immediately after installation. Uncoated galvanized metallic surfaces should be avoided because they may create a stronger visual contrast.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013 / Department of Transportation Federal Aviation Administration Advisory Circular Number 70/7460-1L Section 13.4.1 Marking Standards
	Commercial messages and symbols (such as logo or trademarks) on wind turbines should be prohibited.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Wind turbines should be well maintained for the duration of the operating permit. Nacelle covers and rotor nose cones should always be in place and undamaged. Inoperative turbines should be repaired, replaced, or removed as quickly as feasible. A clear delineation of maintenance responsibilities and schedules should be part of the approval process.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Nacelles and towers should be cleaned to remove any spilled or leaking fluids and the dirt and dust that would accumulate on them.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013

Category	BMP	Source
	Colors for paints, stains, coatings, and other surface color treatments to be used on structures should be selected from the BLM Standard Environmental Colors Chart CC-001.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	<p>The use of permanent signs and project construction signs should be minimized. Beyond those required for basic facility and company identification for safety, navigation, and delivery purposes, commercial symbols or signs and associated lighting on buildings and other structures should be minimized. All commercial symbols and signs and associated lighting should be designed to minimize offsite visibility.</p> <ul style="list-style-type: none"> • Necessary signs should be made of non-glare materials and utilize unobtrusive colors. The reverse sides of signs and mounts should be painted or coated using the most suitable color selected from the BLM Standard Environmental Color Chart CC-001 to reduce contrasts with the existing landscape." • Standard Environmental Color Chart CC-001 to reduce contrasts with the existing landscape." 	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Installation of gravel and pavement should be avoided to reduce color and texture contrasts with the existing landscape.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Road cut slopes should be rounded, and the cut-and-fill pitch should be varied to reduce contrasts in form and line; the slope should be varied as needed to preserve specimen trees and nonhazardous rock outcroppings where feasible.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Materials and surface treatments for structures and roads should repeat and/or blend with the existing form, line, color, and texture of the surrounding landscape. For example, if the project will be viewed against an earthen or other non-sky background, appropriately colored materials should be selected to help blend structures with the project's backdrop. Where appropriate, roads should be surfaced with material compatible in color with the local environment.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013

Category	BMP	Source
	Unless safety or functional requirements preclude it, all structures, including but not limited to buildings, tanks, fences and railing, poles, aboveground pipes and culverts, and reverse sides of signs and guardrails, should be color treated to reduce contrasts with existing landscape, using the most suitable color selected from the BLM Standard Environmental Color Chart CC-001.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Materials, coatings, or paints that have little or no reflectivity should be used on structures including, but not limited to, buildings, tanks, fences and railing, poles, aboveground pipes and culverts, and reverse sides of signs and guardrails. Semi-gloss finishes should be used rather than flat or gloss finishes. Substation equipment should be specified with a low-reflectivity, neutral finish. Insulators at substations and on takeoff equipment should be non-reflective and non-refractive. The surfaces of substation structures should be given low-reflectivity finishes with neutral colors to minimize the contrast of the structures with their backdrops. Chain-link fences surrounding the substations should have a dulled, darkened finish to reduce contrast.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Painted, stained, or coated surfaces should be kept in good repair, and the surface treatment should be reapplied when necessary, as the surface color fades or the coating flakes or otherwise deteriorates.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Except as required to meet the minimum safety and security requirements (e.g., collision markers required by the FAA, or other emergency lighting triggered by alarms), all permanent lighting should use full cutoff luminaires, which are fully shielded (i.e., not emitting direct or indirect light above an imaginary horizontal plane passing through the light source), and must meet the Illuminating Engineering Society (IES) glare requirement limiting intensity of light from the luminaire in the region between 80° and 90° from the ground. All fixtures must be mounted properly, at the proper angle.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Construction and permanent lighting should be mounted and directed to focus light only on the intended area, and to avoid light spill and offsite light trespass. Lights pointing upward or horizontally should be avoided.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013

Category	BMP	Source
	When accurate color rendition is not required (e.g., roadway, basic security), lighting should be amber in color, using either low-pressure sodium lamps or yellow LED lighting, or an equivalent. When white light is required for accurate color rendition, it should be less than or equal to 3500° Kelvin color temperature (warm-white). Bluish-white lighting should not be used in permanent outdoor lighting.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Consistent with safety requirements, lighting use should be minimized during construction and operations. During construction, localized and portable lighting should be used where and when the work is occurring. Lighting should be powered by generators and have switches to cut power when lighting is not required during construction.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Lighting for facilities should not exceed the minimum number, intensity, and coverage required for safety and basic security. All area lighting should be divided into separately controlled zones to focus lighting on smaller areas where tasks are being performed and to avoid illuminating unused space. Area lighting should be controlled by timers, sensors, or switches available to facility operators; dusk-to-dawn lighting controlled by photocell alone should not be allowed except where required for safety. The facility operators should identify those components/structures that do not require continuous lighting for safety reasons. Area lights should only be switched on when there is a specific need (e.g., cleaning mirrors and panels at a solar facility, pumping fuel, persons occupying an area, or alarm situation). When not needed, lights should be switched off. Exceptions to switched-off lighting for safety purposes should be articulated in the lighting plan (see BMP 6.5.1). Focused task lighting, portable light towers, or flashlights should be used instead of area lighting, and retro-reflective or luminescent markers should be used in lieu of permanent lighting where feasible.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
	Vehicle-mounted lights or portable light towers are preferred over permanently mounted lighting for nighttime maintenance activities. If possible, such lighting should be equipped with hoods or louvers and be aimed toward the ground to avoid causing glare and skyglow.	Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands; 2013
Plan of Development		
	To plan for efficient use of the land, necessary infrastructure requirements shall be consolidated wherever possible, and current transmission and market access shall be evaluated carefully.	BLM Wind PEIS; 2005
	The project shall be planned to utilize existing roads and utility corridors to the maximum extent feasible, and to minimize the number and length/size of new roads, lay-down areas, and borrow areas.	BLM Wind PEIS; 2005

Category	BMP	Source
	<p>A monitoring program shall be developed to ensure that environmental conditions are monitored during the construction, operation, and decommissioning phases. The monitoring program requirements, including adaptive management strategies, shall be established at the project level to ensure that potential adverse impacts of wind energy development are mitigated. The monitoring program shall identify the monitoring requirements for each environmental resource present at the site, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into standard operating procedures and BMPs.</p>	BLM Wind PEIS; 2005
	<p>“Good housekeeping” procedures shall be developed to ensure that the site would be kept clean of debris, garbage, carrion, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards during operation.</p>	BLM Wind PEIS; 2005

APPENDIX C: BORDERLANDS WIND PROJECT PLAN OF DEVELOPMENT



Borderlands Wind Project Plan of Development

Submitted to

Bureau of Land Management
Socorro Field Office

Submitted by

Borderlands Wind, LLC

April 2019

BORDERLANDS WIND PROJECT PLAN OF DEVELOPMENT

Submitted to

**Bureau of Land Management
Socorro Field Office**
901 South Old U.S. Highway 85
Socorro, New Mexico 87801
Project Case File: NMNM136976

Submitted by

Borderlands Wind, LLC
700 Universe Boulevard (E5E/JB)
Juno Beach, Florida 33408

April 2019 (rev)

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Appendices

Appendix A. Site Plans¹

Appendix B. Legal Descriptions¹

Appendix C. Alternatives Considered by Borderlands Wind

Appendix D. Stormwater Pollution Prevention Plan¹

Appendix E. Integrated Reclamation Plan¹

Appendix F. Health and Safety Plan, including¹:

- Attachment 1: Emergency Action Plan
- Attachment 2: Waste and Hazardous Materials Management Plan
- Attachment 3: Fire Protection and Prevention Plan

Appendix G. Spill Prevention, Control, and Countermeasure Plan¹

Appendix H. Design Criteria (Proponent Constraints and Mitigation Measures)

Appendix I. Blasting Plan¹

Appendix J. Road Design, Traffic and Transportation Plan¹

Appendix K. Flagging, Fencing, and Signage Plan¹

Appendix L. Decommissioning Plan¹

Appendix M. Bird and Bat Conservation Strategy, including Eagle Management Plan¹

Appendix N. Cultural Properties Treatment Plan¹

Appendix O. Dust Control and Air Quality Plan¹

Appendix P. Environmental Construction Compliance Monitoring Program¹

- Attachment 1: Certification of Completion of Worker Environmental Awareness Program
- Attachment 2: Monitoring Report Cover Page Form
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- Attachment 7: Variance Acreage Table
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- Attachment 9: Wildlife Trenching Plan

Appendix Q. Paleontological Mitigation and Monitoring Plan¹

¹ This will be developed over the course of the NEPA process and submitted with the final plan of development (POD).

ACRONYMS AND ABBREVIATIONS

ABC	aggregate base-course
ACEC	Area of Critical Environmental Concern
ADLS	Aircraft Detection Lighting System
BLM	Bureau of Land Management
BMP	best management practice
Borderlands Wind	Borderlands Wind, LLC
COD	commercial operation date
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
GE	General Electric
HDPE	high density polyethylene
IM	Instruction Memorandum
kV	kilovolt(s)
MBTA	Migratory Bird Treaty Act
met	meteorological
mph	miles per hour
MW	megawatt(s)
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMAC	New Mexico Administrative Code
NMDGF	New Mexico Department of Game and Fish
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMSA	New Mexico Statutes Annotated
NMSLO	New Mexico State Land Office
O&M	operations and maintenance
OSHA	Occupational Safety and Health Administration
PM	particulate matter
POD	Plan of Development
project	Borderlands Wind Project
PTC	production tax credit
RMP	Resource Management Plan

ROW	right-of-way
SCADA	Supervisory Control and Data Acquisition
SPCC	Spill Prevention, Control, and Countermeasure
SWCA	SWCA Environmental Consultants
SWPPP	Stormwater Pollution Prevention Plan
TEP	Tucson Electric Power
U.S. 60	U.S. Route 60
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WTG	wind turbine generator

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1.0 PROJECT DESCRIPTION

1.1 Introduction

Borderlands Wind, LLC (Borderlands Wind), is proposing to develop the Borderlands Wind Project (project or proposed project), a commercial wind energy project in Catron County, New Mexico, within lands managed by the Bureau of Land Management (BLM), the New Mexico State Land Office (NMSLO), and private landowners. The project would consist of wind turbine generators (WTGs), with a combination of 2.3-megawatt (MW) General Electric (GE) WTGs, 2.5-MW GE WTGs, and/or 3.0-MW GE WTGs depending on the alternative. The project would deliver up to 100 MW of electricity to the electrical transmission grid in the southwestern United States. The Point of Interconnect would be located adjacent to the existing Tucson Electric Power (TEP) Springerville to Greenlee 345-kilovolt (kV) transmission line that currently traverses the project area.

Borderlands Wind submitted an SF-299 and Plan of Development (POD) for a project of up to 100 MW in May 2017. BLM assigned the project case file number NMNM136976. This POD reflects updated project details, including a more refined (via micro-siting) turbine array and ancillary facilities, and a description of alternatives.

When permanently constructed, project features would include

- WTGs and associated pad-mounted transformers at the base of each turbine;
- new and improved access roads;
- an underground electrical collection system;
- an electrical interconnection switchyard and substation;
- an operations and maintenance (O&M) facility;
- up to two permanent meteorological towers; and
- a distribution line from the existing Socorro Electric Cooperative, Inc. line to the substation.

Additional temporary features that will be necessary for construction include

- three construction laydown areas;
- one concrete batch plant;
- high density polyethylene (HDPE) water lines; and
- One borrow pit (Alternatives 1 and 2 only).

Construction is expected to begin in June 2020, and to continue for 5 to 6 months with a commercial operation date (COD) being achieved by November 30, 2020. This commercial operation date is needed for three specific reasons. First, the customer (TEP) is planning on this power being available in 2020 and has already reported this availability to their regulatory bodies. Grid studies already incorporate this power being readily available. Second, for Borderlands Wind to maximize the Production Tax Credit (PTC) that would be available, COD must occur before the end of the year 2020. If the COD date becomes delayed after 2021, the PTC drops 20 percent. Finally, if the project is delayed to 2021, the availability of turbines becomes a concern. The proposed GE 2.x turbines may simply not be available for a 2021 COD. A schedule for the project is presented below in Table 1. The proposed project requires a new right-of-way (ROW) grant from the BLM for long-term commercial wind energy development. This POD is a required component of the accompanying commercial ROW grant application, and describes how the project would be built, operated, and decommissioned in a manner consistent with federal and

state laws and regulations and BLM policy. The POD is a living document that will continue to be refined during BLM’s evaluation of this application. A final POD will be required upon issuance of the ROW grant, if approved.

Table 1. Anticipated Milestones for Construction of the Borderlands Wind Project

Activity	Date
ROW Grant issued	May 2020
Mobilize to site/Construction start	June 2020
Turbine deliveries	September 2020
Main transformer (GSU) delivery	September 2020
Backfeed power	November 2020
Commercial Operation Date	November 30, 2020

1.1.1 Project Location

The project is located on lands south of U.S. Route 60 (U.S. 60) in Catron County near Quemado, New Mexico, and the Arizona–New Mexico border. For all alternatives, the project area (including all ancillary facilities) consists of public lands administered by the BLM Socorro Field Office, the State of New Mexico, and by private landowners.

1.2 Purpose and Need of the POD

The purpose of the proposed project is to construct, manage, and maintain the energy-generating infrastructure sufficient to provide up to 100 MW of renewable wind energy to the electrical transmission grid in the Southwest. The project is needed in order to meet the renewable energy demand recommendations by various federal and state policies and regulations.

The National Energy Policy recommended that the federal government work to increase renewable energy production on federal lands (National Energy Policy Development Group 2001). Based on these recommendations and Executive Order 13212, the BLM established a Wind Energy Development Program on BLM-administered lands in the western United States. This program is meant to support wind energy development on public lands and establish policies regarding the processing of wind energy development ROW authorization applications (BLM 2005). Therefore, the proposed project needs to be addressed and processed in accordance with the program.

Additionally, the Energy Policy Act of 2005 (Public Law 109-58) Section 211 states, “It is the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity.”

The Socorro Resource Management Plan (RMP) states that renewable energy may be proposed in the Socorro Field Office’s jurisdiction and that applications will follow the guidance outlined in the Wind Energy Development Program (BLM 2010a). Therefore, the Socorro Field Office needs to address the proposed project and process the ROW application in accordance with the Wind Energy Development Program guidance.

The project would comply with policies, processes (including the National Environmental Policy Act [NEPA]), and best management practices (BMPs) outlined in the *Final Programmatic Environmental*

Impact Statement on Wind Energy Development on BLM-Administered Lands in the Western United States (BLM 2005) and Instruction Memorandum (IM) 2017-096, Acreage Rent and Megawatt Capacity Fees (Years 2016-2021) for Solar and Wind Energy ROW Grants and Leases. Entities seeking to develop a wind energy project on BLM-administered public lands shall develop a project-specific POD that incorporates all BMPs and, as appropriate, the requirements of other existing and relevant BLM mitigation guidance. Additional mitigation measures will be incorporated into the POD and into the ROW authorization as project stipulations, as needed, to address site-specific and species-specific issues. The POD will include a site plan showing the locations of turbines, roads, power lines, other infrastructure, and other areas of short- and long-term disturbance.

1.2.1 Project Objectives

The objective of the proposed project is to respond to a TEP proposal for a wind project that is directly interconnected to their transmission system that can generate up to 100 MW of power for their customers. This proposal is in response to market demands, which have caused retirements of coal generating facilities along transmission lines that deliver power to the Four Corners region (Arizona, New Mexico, Colorado, and Utah) and an increased interest in renewable energy to replace this power generation. Due to New Mexico's high capacity to generate wind power, Borderlands Wind considered sites along TEP transmission lines in New Mexico. An additional consideration was to avoid areas that have existing congestion in the transmission network (such as sites surrounding Albuquerque, New Mexico). An additional site on the AZ side of the AZ/NM border was also considered but dropped from consideration. This site contained significant environmental constraints including many eagle nests within the site boundary and within 10 miles of the site. Additionally, this site was located near highly sensitive cultural resources and Native American tribes expressed serious concerns about the development of this site. Based on the considerations and the objectives of the TEP proposal described above, Borderlands Wind ultimately selected the proposed project boundary due to the high quality of wind resource available, the proximity to existing TEP transmission lines, the limited impact to cultural resources (compared to other potential sites), and the compatibility of the proposed project with the existing land uses within the project boundary, which is predominantly cattle grazing.

1.3 General Facility Description

Borderlands Wind is proposing a 100-MW wind energy facility consisting of wind turbines, which would provide renewable energy to the electrical transmission grid in the southwestern United States. The proposed project requires a new ROW grant from the BLM for long-term commercial wind energy development. Borderlands Wind is requesting a 35-year ROW grant based on electrical demand, maintenance, and the expected life of the project facilities and major components. Technology being considered by Borderlands Wind could include a combination of WTGs, including 2.3-MW, 2.5-MW, and/or 3.0X-MW machines depending on the alternative. Maximum turbine height (with turbine blades) may reach up to 180 meters (591 feet) for the 3.0X WTGs. The proposed project would interconnect into the existing TEP Springerville to Greenlee 345-kV transmission line within the boundaries of the project area. Current interconnection details are being finalized with TEP.

WTGs and ancillary facilities would be placed in locations that would maximize energy production while minimizing environmental impacts. Safety during construction, operation, and maintenance is also considered during siting. The following sections provide additional supporting detail on specific components of the project. Detailed construction Site Plans (Appendix A) will be prepared for the proposed project and included in the final POD.

1.3.1 Alternatives

The proposed project includes three alternatives:

- Proposed Action
- Alternative 1
- Alternative 2

All three alternatives would meet project objectives and the purpose and need of the POD. Additionally, all alternatives are similar in ancillary facility description (Section 1.3.3), design criteria and mitigation measures (Section 1.4), and permit requirements (Section 1.5) except where noted. All alternatives would follow the same general construction process (Section 2.0), operations and maintenance procedures (Section 3.0), and project decommissioning (Section 4.0). Therefore, these sections are not discussed by alternative. Over the course of project development, Borderlands Wind considered many different alternatives to the proposed alternatives that were not considered in detail (Appendix C).

PROPOSED ACTION

Under the Proposed Action, Borderlands Wind would construct the proposed project within a boundary that encompasses 40,348 acres of lands, with 28,989 acres being public lands administered by the BLM Socorro Field Office as described in the *Notice of Intent to Prepare a Resource Management Plan Amendment and Environmental Impact Statement for the Borderlands Wind Project in Catron County, New Mexico* (Figures 1 and 2). The remaining lands in the project area are managed by the State of New Mexico (5,185 acres) and by private landowners (6,246 acres).

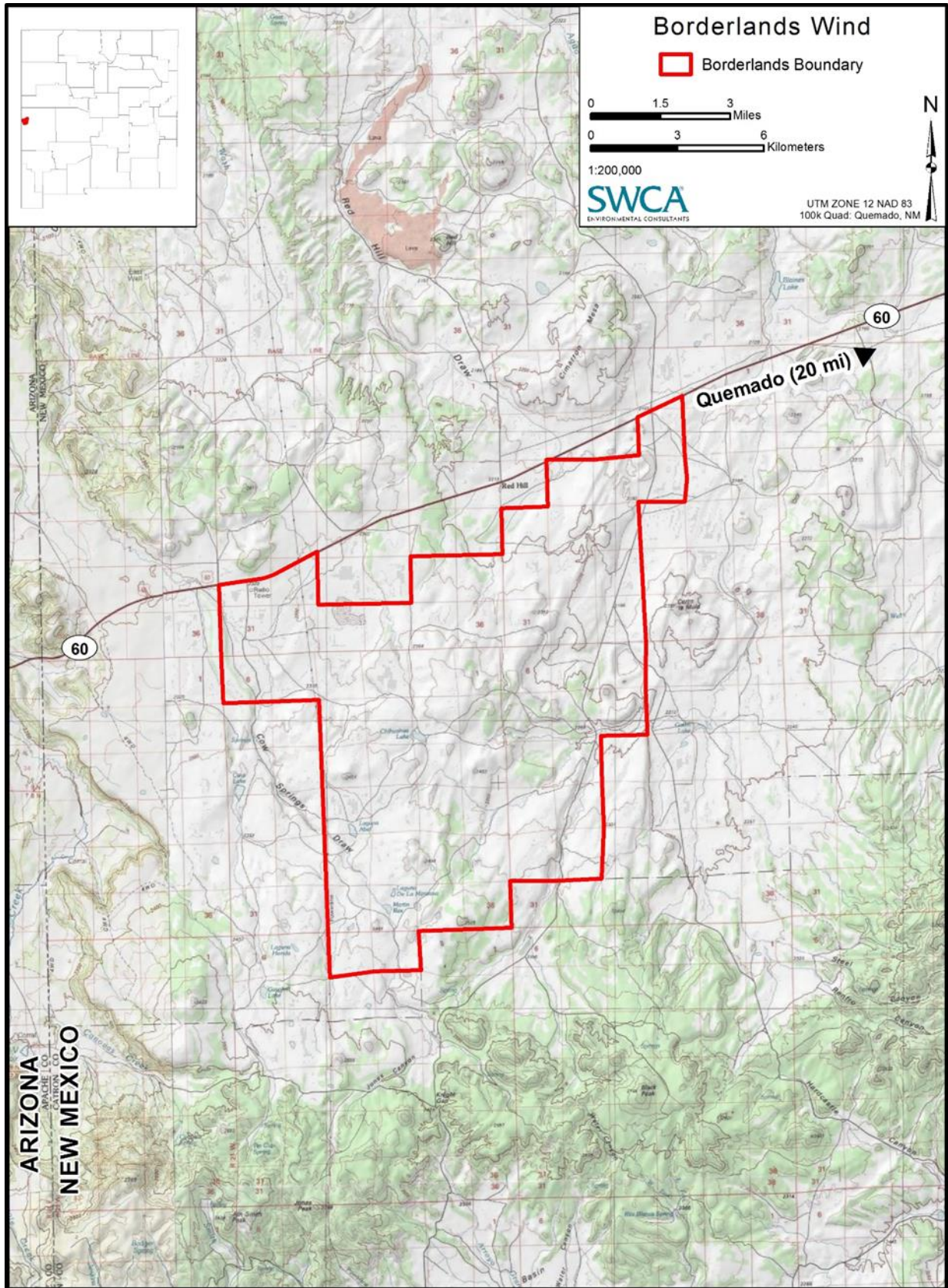


Figure 1. Proposed Action alternative boundary.

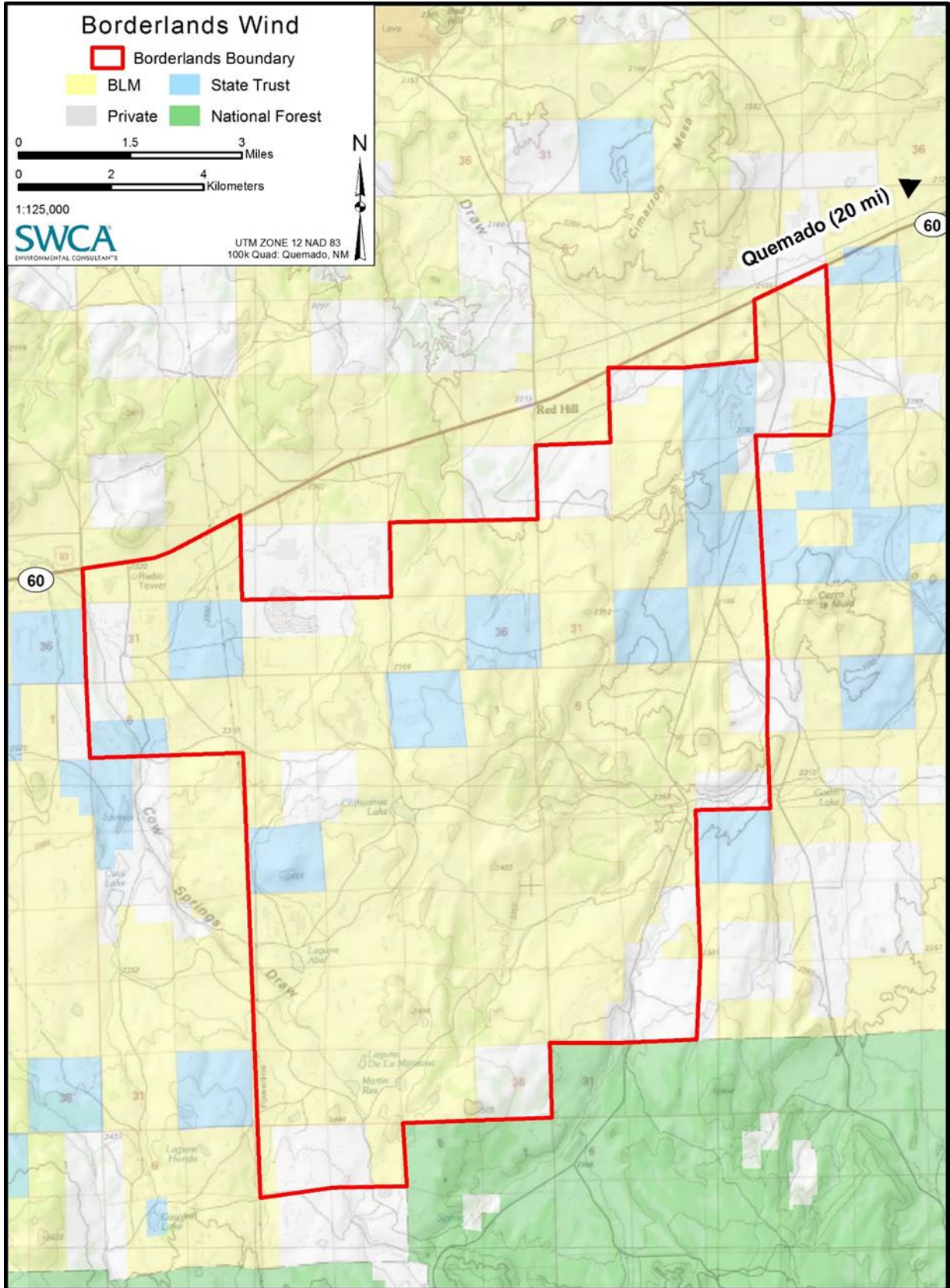


Figure 2. Land ownership of the Proposed Action alternative.

Legal Land Description

The following legal description is for the Proposed Action (federal and non-federal lands), which includes all planned project components. The Proposed Action can be found on the U.S. Geological Survey (USGS) Nelson Reservoir NE (1968), Cow Springs (1963), Red Hill (1951), Jones Creek (1981), and Black Peak (1990) quadrangles. The Proposed Action falls within all or part of the sections listed in Table 2. Complete Legal Descriptions (Appendix B) will be included in the final POD.

Table 2. Proposed Action Location: Township, Range, Section

Township/Range	Sections
T1S, R20W	1–5, 13, 14, 20–36
T1S, R21W	25, 26, 35, 36
T2S, R19W	4–8, 17–19
T1S, R19W	8–10, 15–22, 28–33
T2S, R21W	1, 2, 12
T2S, R20W	1–18, 20–29, 32–36

Wind Turbine and Ancillary Facility Configuration and Layout

A layout of the proposed action alternative including wind turbine locations, and ancillary facilities is shown in Figure 3. A comparison of the number, size, and disturbance of the wind turbine and ancillary facilities by alternative is discussed in Section 1.3.4.

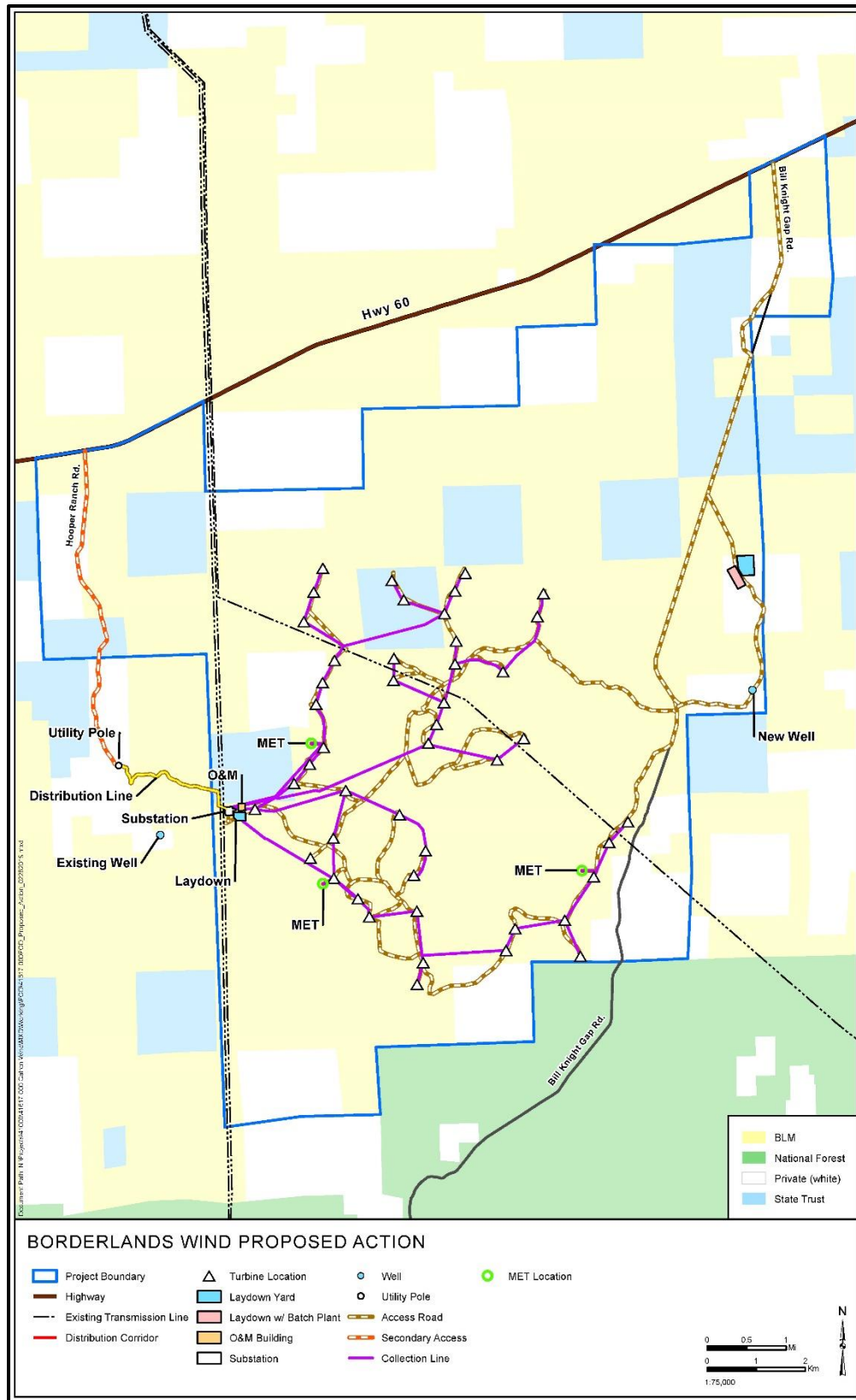


Figure 3. Proposed locations for the wind turbine generators and ancillary facilities under the Proposed Action.

ALTERNATIVE 1

Under Alternative 1, Borderlands Wind would construct the proposed project within a boundary that encompasses 18,910 acres of lands, with 15,838 acres being public lands administered by the BLM Socorro Field Office (Figures 4 and 5). The remaining lands in the project area are managed by the State of New Mexico (1,168 acres) and by private landowners (1,904 acres). Alternative 1 would reduce the total project boundary acreage by 21,438 acres, with 14,151 acres being reduced from public lands administered by the BLM, 4,017 acres being reduced from the State of New Mexico–managed lands, and 4,342 acres being reduced from private landowners. Alternative 1 would reduce the impacts that the Proposed Action would have to some of the environmental consideration resources, which will be described in greater detail in the proposed project’s Environmental Impact Statement (EIS).

Alternative 1 would consist of a total of 45 turbines. These include 36 GE 2.5 WTGs, 127-meter rotor diameter, 89-meter hub height turbines, 4 GE 2.3 WTGs, 116-meter rotor diameter, 80-meter hub height turbines, and 5 alternate turbines that would be the GE 2.5 machines. The ancillary facilities including the laydown yards, batch plant, O&M building and substation locations will all remain the same as the proposed action. Alternative 1 slightly shifts the locations some of the project infrastructure (turbines, roads, collections) to better avoid sensitive environmental resources. Alternative 1 also includes a borrow pit location for sourcing materials needed for concrete and road construction. For the Proposed Action, these materials would have been brought in from an offsite DOT approved location.

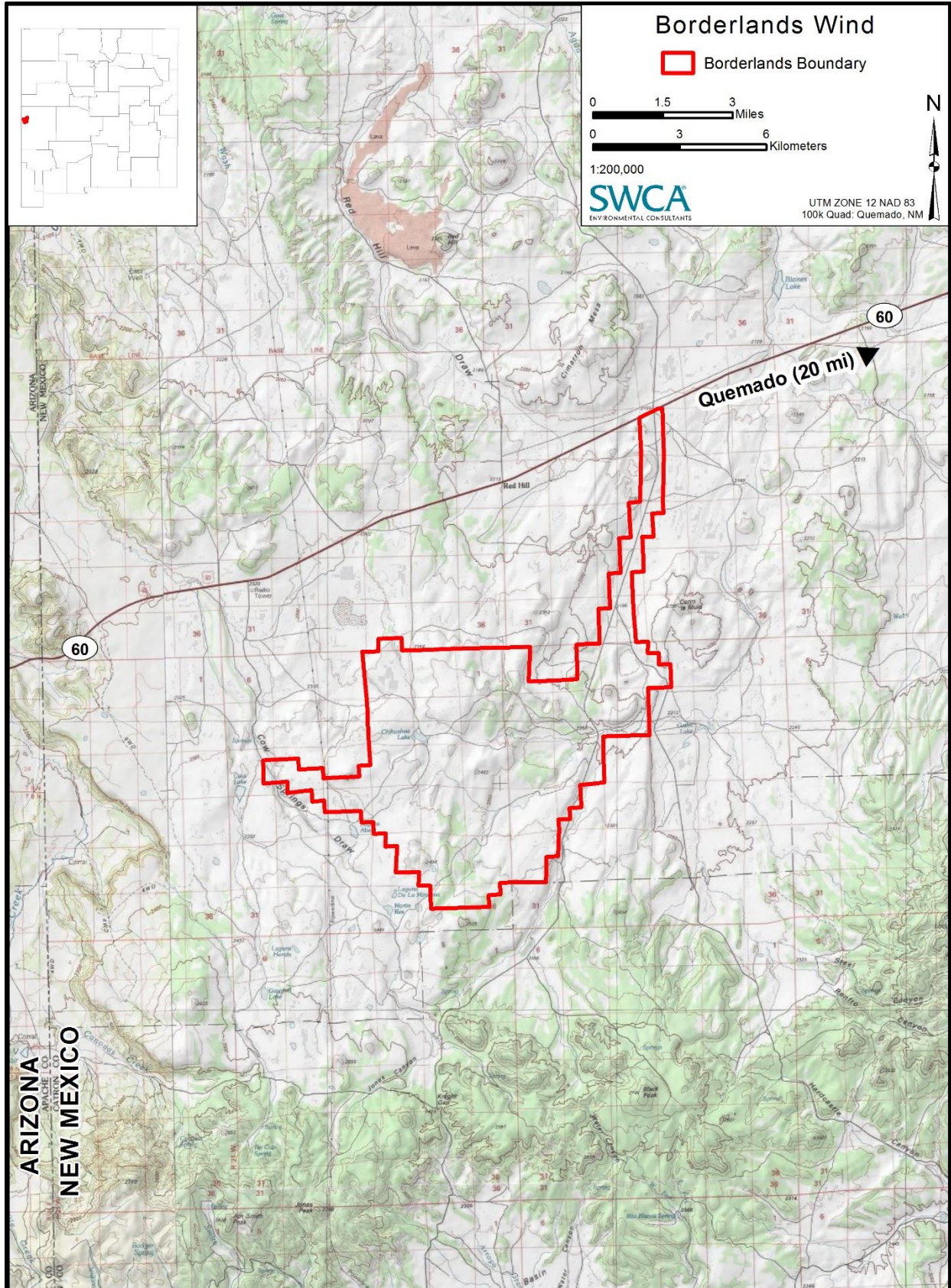


Figure 4. Alternatives 1 and 2 boundary.

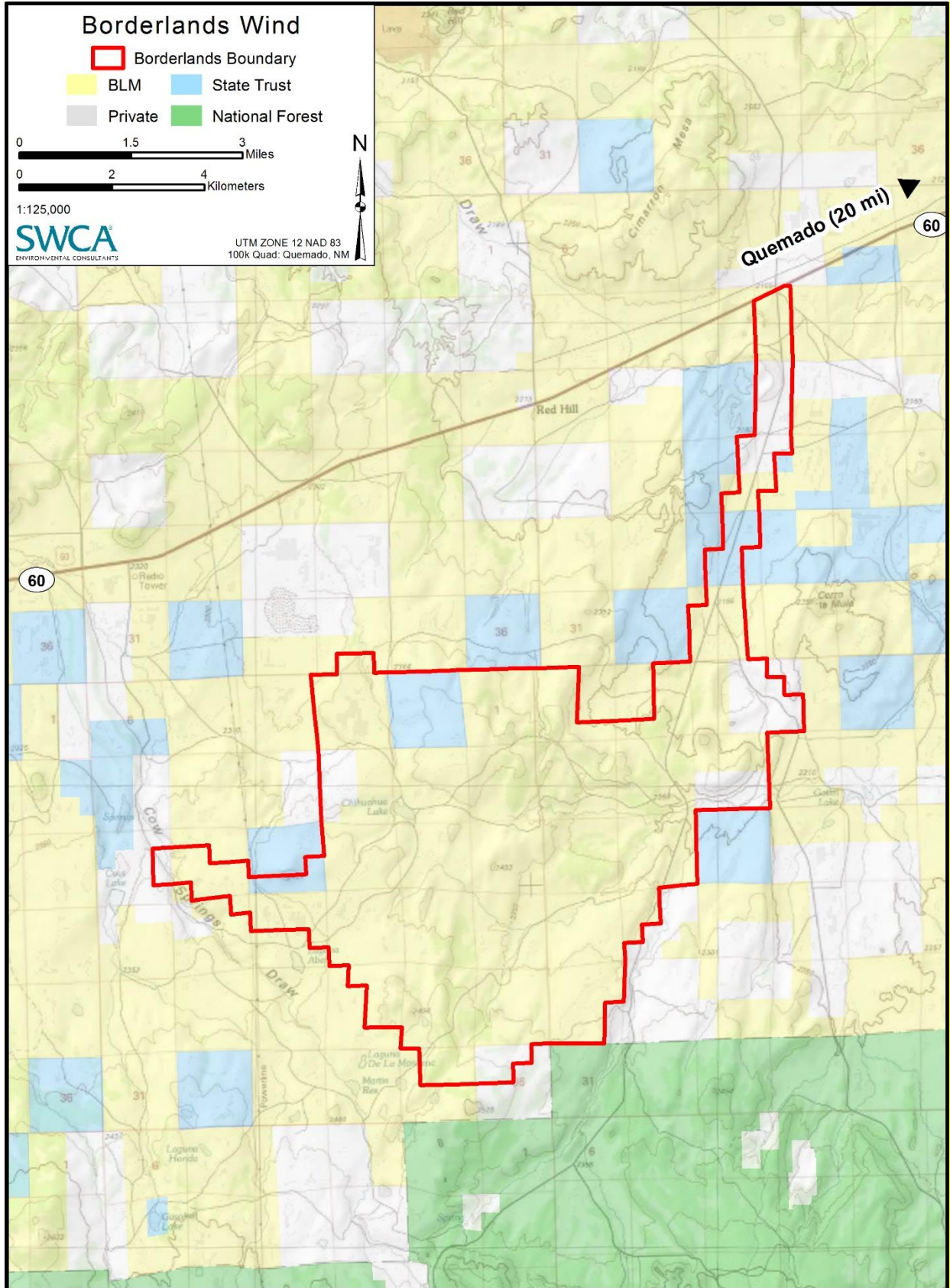


Figure 5. Land ownership of Alternatives 1 and 2.

Legal Land Description

The following legal description is for Alternative 1 (federal and non-federal lands), which includes all planned project components. Alternative 1 can be found on the U.S. Geological Survey (USGS) Nelson Reservoir NE (1968), Cow Springs (1963), Red Hill (1951), Jones Creek (1981), and Black Peak (1990) quadrangles. Alternative 1 falls within all or part of the sections listed in Table 3. Complete Legal Descriptions (see Appendix B) will be included in the final POD.

Table 3. Preferred Action Location: Township, Range, Section

Township/Range	Sections
T1S, R19W	10, 15, 21, 22, 28, 33
T1S, R20W	34
T2S, R19W	3–9, 17–20, 30
T2S, R20W	1–3, 10–18, 20–27, 35–36

Wind Turbine and Ancillary Facility Configuration and Layout

A preliminary layout of proposed locations for the wind turbine generators, the five alternative turbine locations, and ancillary facilities for Alternative 1 are shown in Figure 6. A comparison of the number, size, and disturbance of the wind turbine and ancillary facilities by alternative is discussed in Section 1.3.4.

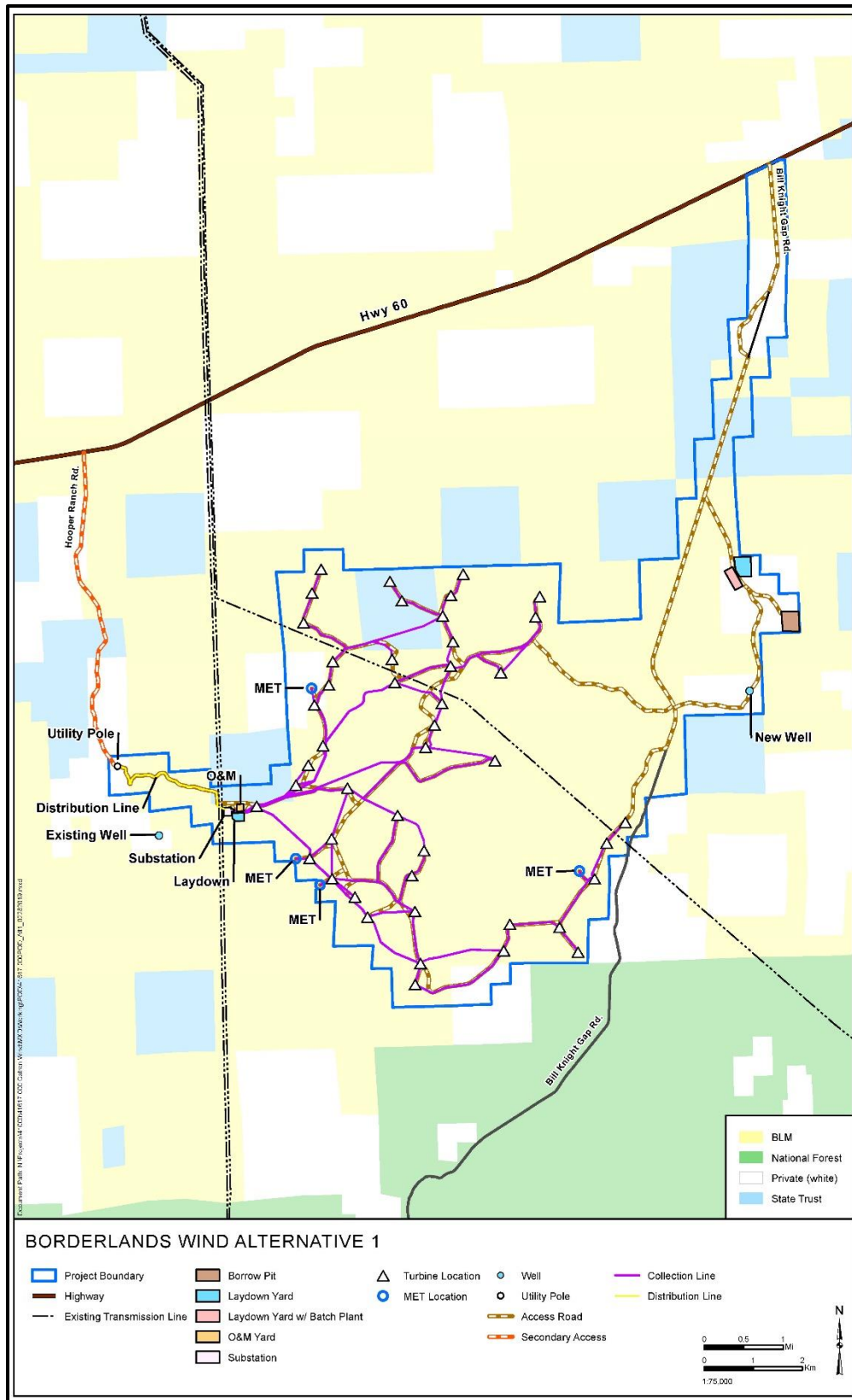


Figure 6. Proposed locations for the wind turbine generators and ancillary facilities under Alternative 1.

ALTERNATIVE 2

Alternative 2 has the same project boundary as Alternative 1 (Figures 4 and 5), therefore, the legal description for Alternative 2 is the same as described under Alternative 1. Alternative 2 would consist of a total of 45 turbines. These include 30 GE 3.03, 140-meter rotor diameter, 110-meter hub height turbines, 4 GE 2.5, 116-meter rotor diameter, 90-meter hub height turbines, and 11 alternate turbines that would be the GE 3.03 machines. Under Alternative 2, Borderlands would use the same collection line system and access road system as Alternative 1. This Alternative would be preferred by Borderlands Wind if the COD date becomes delayed after 2021, as the GE 2.3 turbines and the GE 2.5 with the 127-meter rotor diameter would not be available after 2020. The impacts of Alternative 2 are described in detail in the proposed project's EIS.

Wind Turbine and Ancillary Facility Configuration and Layout

A layout of Alternative 2 turbine location and ancillary facilities is shown in Figure 7. A comparison of the number, size, and disturbance of the wind turbine and ancillary facilities by alternative is discussed in Section 1.3.4.

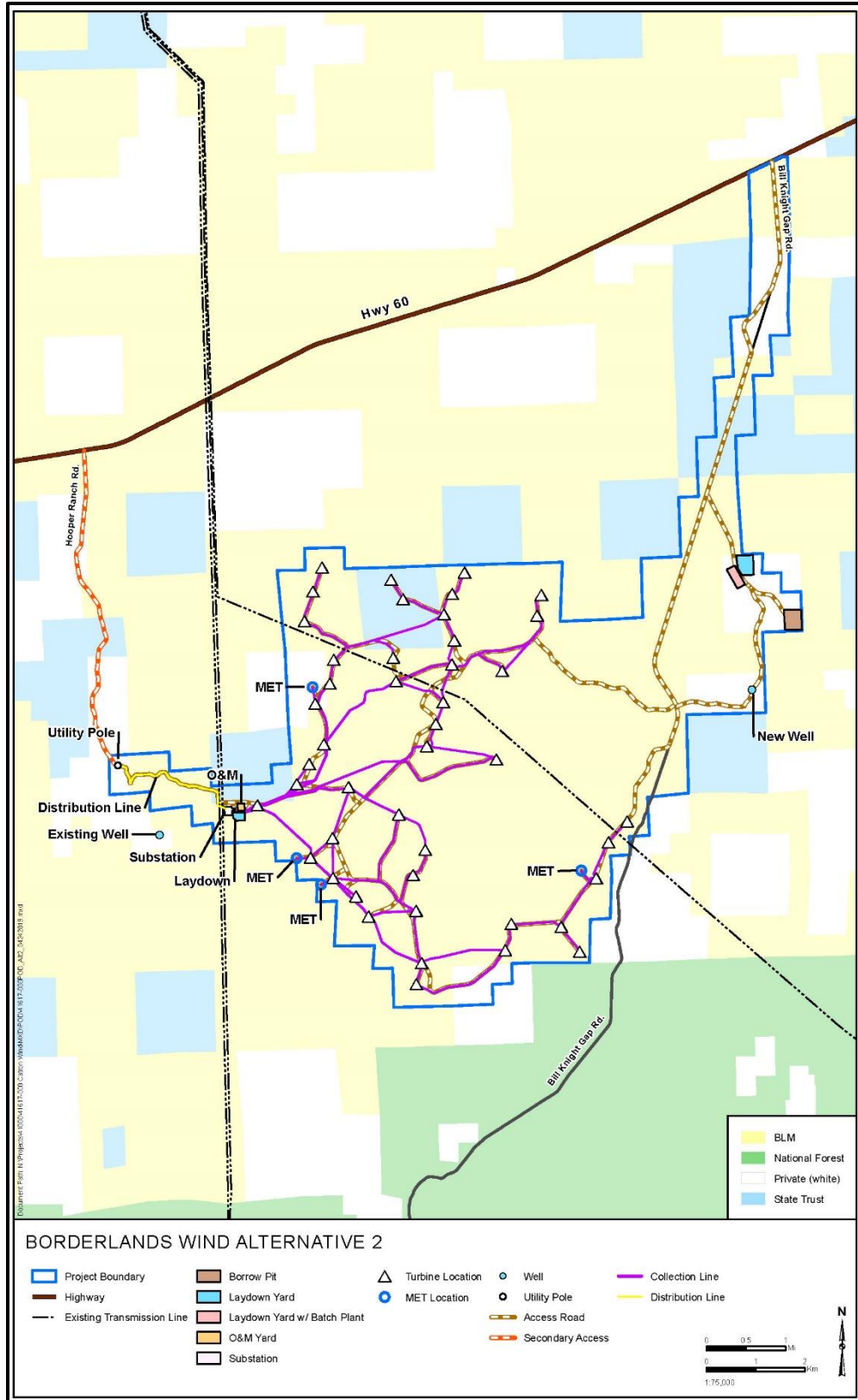


Figure 7. Proposed locations for the wind turbine generators and ancillary facilities under Alternative 2.

1.3.2 Number and Size of Wind Turbines

The number and size of WTGs to be constructed depends on the alternative, which are detailed in Table 4.

Table 4. Proposed Number and Size of Wind Turbine Generators by Alternative

Alternative	GE 2.3-MW WTGs	GE 2.5-MW WTGs	GE 3.0-MW WTGs	Alternative Turbine Locations
Proposed Action	4	36	0	6
Alternative 1	4	36	0	11
Alternative 2	0	4	30	11

Alternative turbine locations would be evaluated in case that proposed WTG locations are not viable. Details of when turbine locations are not viable can only be determined during construction activities, therefore, the alternative turbine locations are considered in disturbance estimates. Details of the construction of the WTGs are presented in Section 2.0.

Table 5 identifies the characteristics of the different proposed WTG types including tower/hub height, rotor radius, rotor diameter, ground clearance, and maximum overall height. Figures 9–11 depict the tower/hub height, rotor radius, ground clearance, and maximum overall height.

Table 5. Proposed Wind Turbine Generator Options – Turbine Characteristics

	GE 2-MW Platform 2.3 MW		GE 2-MW Platform 2.5 MW		GE 3-MW Platform 3.0 MW	
	meters	feet	meters	feet	meters	feet
Tower/hub height	80	262	89	292	110	361
Rotor radius	58	190	63.5	209	70	230
Rotor diameter	116	380	127	417	140	459
Ground clearance	22	72	24.5	84	40	131
Maximum overall height	138	453	152	499	180	591

Note: Technical data represent the maximum worst-case design characteristics for each model, based on available manufacturer specifications (GE 2018).

Additionally, each WTG would have pad-mounted transformers at the base (Figure 8). This equipment is approximately 10 feet in length, 8 feet in width, and 7 feet in height. The transformer box housing the circuitry would be mounted on a pad or vault developed from concrete or fiberglass. Each transformer box would transport the electricity to a substation by means of electrical collection system (see Section 1.3.3). The transformer on each WTG would increase the voltage for efficiency.



Figure 8. Typical pad-mounted transformer.

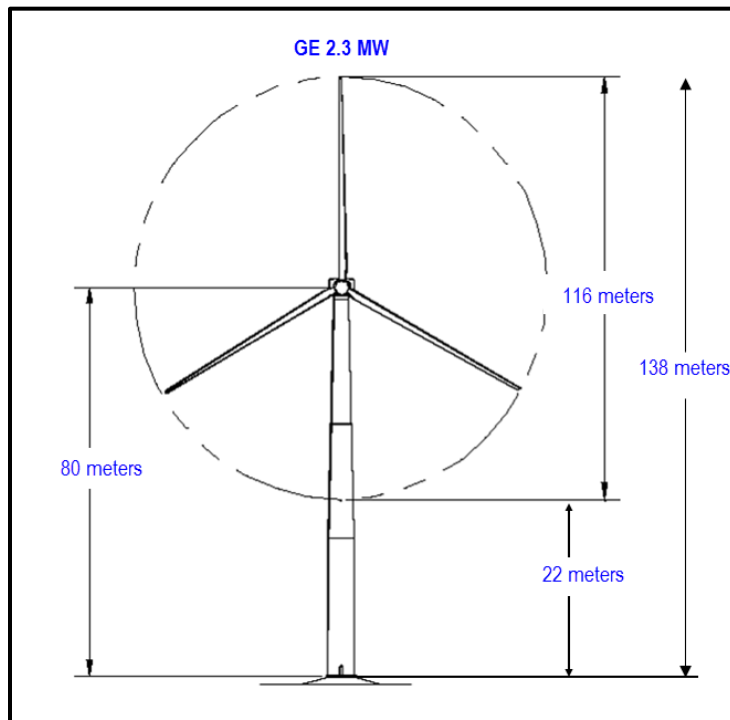


Figure 9. Schematic and dimensions of a GE 2.3-MW turbine.

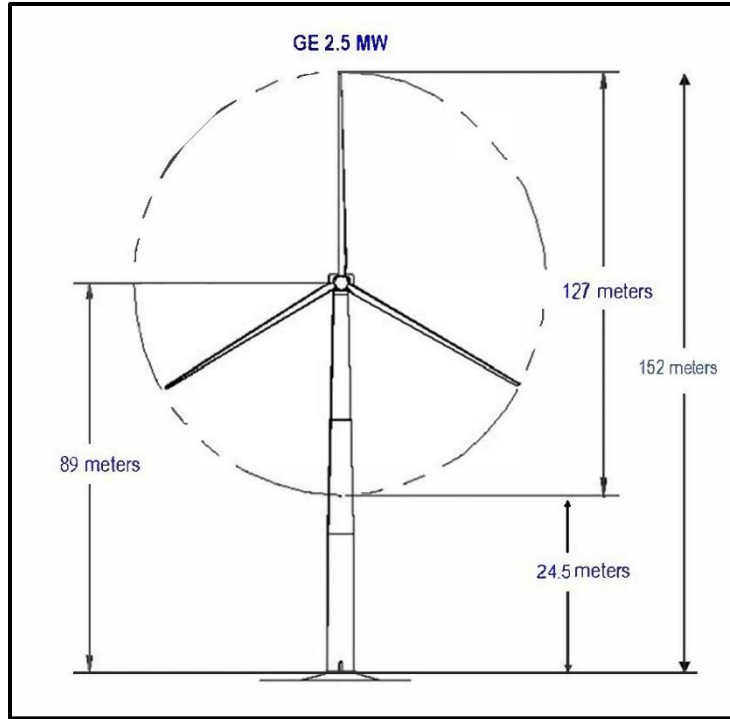


Figure 10. Schematic and dimensions of a GE 2.5-MW turbine.

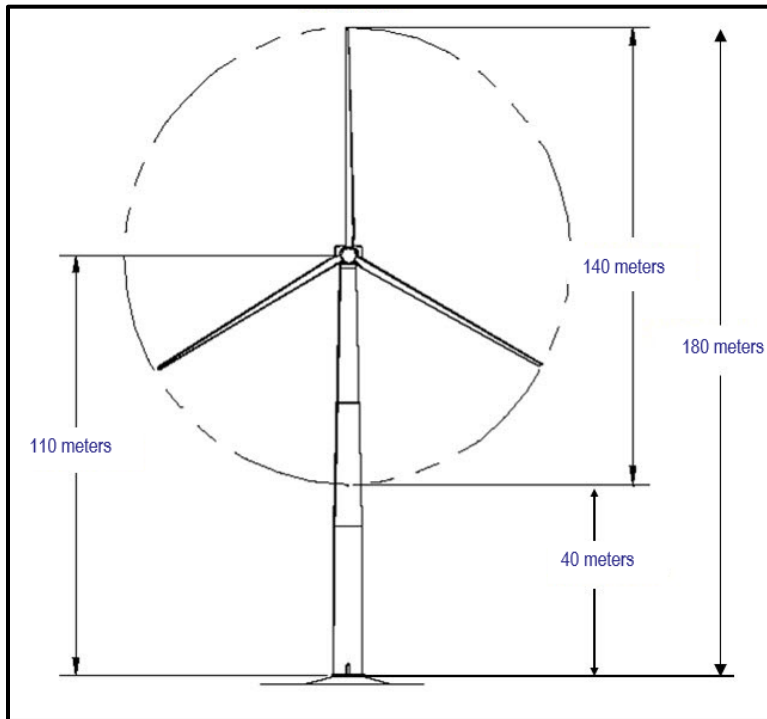


Figure 11. Schematic and dimensions of a GE 3.0-MW turbine.

1.3.3 Ancillary Facilities

The project's permanent facilities under all alternatives would include WTGs and associated pad-mounted transformers, access roads, an underground collection system, the project substation and switchyard, an O&M building, the distribution line and meteorological (met) tower(s). The project's temporary facilities under all alternatives include the construction laydown yards, the concrete batch plant, met tower(s), and for the laydown yard in the eastern area of the site, HDPE piping for conveyance of construction water from a private well to the batch plant. The project's alternative specific temporary facility includes the borrow pit, which is proposed for Alternatives 1 and 2 only.

A brief description and purpose of each ancillary facility for all alternatives is provided below. The locations and disturbance estimates of these ancillary facilities varies by alternative and is presented in Section 1.3.4. Detailed information on the construction of these ancillary facilities is provided in Section 2.0.

ACCESS ROADS

The main access point for the project will be the intersection of U.S. 60 and Bill Knight Gap Road/Country Road/FR-19. This main access point would be used to accommodate construction and maintenance of the project, including the turning-radius needed for turbine delivery. Currently, the proposed access point would not accommodate the proposed project construction and maintenance requirements. Borderlands Wind has proposed to improve this access point and accommodate the proposed project construction and maintenance requirements (see Section 2.2 for more detail regarding the proposed improvements).

An additional network of access roads would be needed to facilitate construction and maintenance of the wind turbines, as well as provide access to the substation, the switchyard, and the project's O&M facility. These roads would have an all-weather aggregate base-course (ABC) surface, and would be acceptable to support the size and weight of maintenance vehicles. Included in this network of access roads is a secondary access road (Hooper Ranch Road), which would run from the intersection of U.S. 60 south to the O&M building. This secondary access road would serve as a potential access road for emergency services if they are required. A portion of this secondary access road (approximately 0.3 miles) between the utility pole and substation would need to be improved to allow safe construction of the distribution line. Only emergency access and construction traffic associated with distribution line would be permitted on the secondary access road between the utility pole and the substation. Only emergency access would be permitted between the utility pole and U.S. 60 on the secondary access road.

COLLECTION LINES

Each wind turbine would be connected to the project substation by underground power and communication cables, called the collection lines. The collection system would consist of underground collecting cables connecting each WTG transformer box together and conducting the electricity to the substation and switchyard (Figure 12). These collection lines would be co-located with the access road footprints when possible to minimize ground disturbance. Where underground collection lines and access roads are co-located, trenching would occur adjacent to the proposed roadbed, an average of 2 to 4 feet from the roadbed.



Figure 12. Typical collection lines.

SUBSTATION AND SWITCHYARD

The project substation is where all underground electrical collection lines would terminate. No overhead collection lines are anticipated to be constructed to the substation. The purpose of the project substation would be to step up the electricity generated by the project to the voltage necessary to transmit it across the transmission system. The substation would include a power transformer, breakers, feeder breakers, switches, an equipment enclosure, and a substation superstructure (Figure 13). Exterior lighting at the substation would be required for safety and would be downshielded. No motion activated lighting is proposed for this facility. The project substation would collect the electricity and interconnect to the nearby switchyard via aboveground transmission poles. The final footprint of the project substation would be 1 acre. This would be fenced with a 9-foot-tall chain-link security fence (the fence would be 8 feet tall with 1 foot of three-strand barbed wire, for a total of 9 feet).



Figure 13. Typical substation.

The proposed switchyard would be connected to the project substation and would be located adjacent to the project substation. The purpose of the switchyard would be to integrate the electricity generated by the project onto the existing high-voltage overhead transmission system. The proposed switchyard may include circuit breakers, overhead electrical work, switches and controls, and an equipment enclosure building. The switchyard would occupy approximately 7 acres adjacent to the 1-acre project substation. Like the substation, all components of the switchyard would be enclosed inside a 9-foot-tall chain-link security fence (the fence would be 8 feet tall with 1 foot of three-strand barbed wire, for a total of 9 feet). The fencing would have a maximum depth of 4 inches and surround the substation (0.032 acres of the 7-acre facility).

Distribution Line

Electricity would be needed for the substation, which would be brought into the area via a distribution line. This would involve tapping the distribution line located near Cow Springs west of the project and constructing a new line east into the substation. The proposed 1.8-mile distribution line would be an approximately 12-kV, single-phase line. The distribution poles would be made of wood and similar to the Socorro Electric poles currently located in the area (Figure 14). The poles would be 45 feet high and approximately 8 inches in diameter. Approximately 38-40 poles spaced approximately 250 feet apart would be needed. The proposed distribution line would be designed and constructed to minimize avian electrocutions and collisions (Avian Power Line Interaction Committee [APLIC] 2006 and 2012).



Figure 14. Type of distribution line pole to be installed

OPERATIONS AND MAINTENANCE FACILITY

The project requires an O&M facility that would include the 2500 square foot (0.06 acres) O&M building and associated outside areas for a total 5 acre facility . The O&M building is a pre-manufactured building assembled on a concrete slab foundation that is used by construction and operations personnel for the proposed project (Figure 15). The O&M building would contain offices, restrooms, a kitchen/breakroom, a room to house the control system for the WTGs, and a warehouse area that would store spare parts, tools, maintenance equipment, etc. Outside the O&M building would be a gravel parking area and outdoor storage. Electricity to the O&M facility would be supplied by the same distribution line as the substation (see above).



Figure 15. Typical O&M building.

METEOROLOGICAL TOWERS

The purpose of a met tower is to profile the wind by measuring the scattering sound waves by atmospheric turbulence. These systems are used to measure wind speed at different heights above ground and the thermodynamic structure of the lower atmosphere (Figure 16). During pre-construction, meteorological collection instruments are needed to study the wind resource in the area. A met tower and SODAR unit have been placed on the study area and may remain through construction and potentially a couple months into operation of the facility. The SODAR on BLM land was permitted under a separate action. The met tower is on private land and was also permitted under a separate action. These pre-construction meteorological collection instruments are not considered or depicted in any of the alternatives. For all alternatives, three to four met tower locations would be considered (Figures 3, 6, and 7); however, only one or two permanent met towers would be needed during operations. The locations of these met towers would be alternative-dependent. Borderlands Wind anticipates that the met towers will be monopole (i.e.- non-guyed). Should guyed-wire met towers be required, Borderlands Wind would consider these locations when conducting post-construction fatality monitoring as detailed in the Bird and Bat Conservation Strategy (Appendix M). Met towers would be lighted as required by the FAA. If the project can use an ADLS lighting system, the met towers would be part of that system such that lights on the towers (met towers as well as wind turbines) would automatically come on when aircraft is detected in the area.



Figure 16. Typical monopole meteorological tower.

CONSTRUCTION LAYDOWN AREAS

Three temporary construction laydown areas would be required during construction. One laydown area on the eastern side of the site would be approximately 31.3 acres and would contain the mobile trailers for construction management/staff and parking areas for construction workers. An equipment laydown area on the eastern side of the site will be approximately 20 acres and will be used for materials storage and a 2 acre concrete batch plant facility. The third laydown area would be on the western side of the site near the substation and switchyard and would be approximately 9.5 acres. This facility would also be used for materials storage. Any power needed for the construction laydown yards would be supplied through generators (Figure 17).



Figure 17. Typical storage/staging/laydown area during construction.

Concrete Batch Plant

The location of the project is remote, and a nearby concrete batch plant does not exist. Therefore, the project would require the use of a temporary concrete batch plant on-site that would be co-located within a construction laydown area on the eastern side of the site (see Figures 3, 6, and 7 for location). The plant would be responsible for supplying the concrete needed for applicable project components, including the WTG foundations and pads, and distribution line pole foundations.

Temporary concrete batch plant facilities typically consist of loading bays, hoppers and mixing equipment, cement and admixture silos, concrete truck loading areas, aboveground water storage tanks, and bins for aggregate and clean sand storage (Figure 18). The height and color of the batch plant equipment will vary depending on the equipment ultimately selected. Generally, facilities will have heights ranging from 30 to 50 feet. A washout area would be located within the laydown/staging area, with the concrete removed and reclaimed when the washout area is no longer needed. The water needed for the concrete batch plant would be supplied from the well located on private property through HDPE piping that would run overland along approximately 1.5 miles of access road to the laydown area/concrete batch plant. (Section 2.17.2 for more detail).



Figure 18. Typical temporary concrete batch plant.

BORROW PIT

A temporary borrow pit would be required during construction to supply the raw earthen materials needed for the on-site concrete batch plant and road construction for Alternatives 1 and 2 only (Figure 19). This borrow pit would be located on private land and disturbance would be limited to approximately 35 acres. During operation, typical construction equipment used at a borrow pit includes excavators, dozers, tipper trucks, graders, water trucks, and lowbed trucks. Under the Proposed Action, raw earthen materials would be supplied through a Department of Transportation (DOT)-certified borrow pit.



Figure 19. Typical borrow pit.

1.3.4 Disturbance Estimates By Alternative

Following is a description of the facility components for the proposed project by alternative. Table 6 describes the potential temporary disturbance from each of the facility components by alternative, which would occur during the construction period of the project (5 to 6 months). Table 7 describes the potential permanent disturbance by alternative, which would occur during the life expectancy of the project (35 years). Construction details of these components are presented in Section 2.0. Temporary and permanent disturbances would be smaller than listed below due to the final design.

Table 6. Facility Components and Estimated Acreage – Temporary Disturbance

Facility Components	Proposed Action	Alternative 1	Alternative 2
Wind turbines and pad-mounted transformers	1.62 acres/turbine 46 turbines permitted, 40 constructed -36 GE 2.5 -4 GE 2.3 -6 alternatives 74.5 acres	1.62 acres/turbine 45 turbines permitted, 40 constructed -36 GE 2.5 -4 GE 2.3 -5 alternatives 72.9 acres	2.87 acres/turbine 45 turbines permitted, 34 constructed -30 GE 3.0 -4 GE 2.5 -11 alternatives 129.2 acres
Access roads	48 miles total 41.2 miles of new roads 150 feet wide 872.7 acres	46.6 miles total 39.8 miles of new roads 150 feet wide 847.3 acres	Same as Alternative 1
Underground electrical collection system and communication lines	29.7 miles 60 feet wide 213.7 acres	39.5 miles 60 feet wide 283.5 acres	Same as Alternative 1
O&M facility	5 acres	Same as the Proposed Action	Same as the Proposed Action
Electrical interconnection switchyard and substation	7 acres	Same as the Proposed Action	Same as the Proposed Action
Laydown/staging area for construction	61 acres needed for laydown/staging area	Same as the Proposed Action	Same as the Proposed Action
Concrete batch plant for construction	2 acres needed for concrete batch plant completely within laydown/staging area	Same as the Proposed Action	Same as the Proposed Action
Meteorological towers	10.5 acres	Same as the Proposed Action	Same as the Proposed Action
Distribution line	1.8 miles 100 feet wide 22.7 acres	Same as the Proposed Action	Same as the Proposed Action
Borrow pit	N/A	35 acres	Same as Alternative 1
HDPE water lines	1.5 miles Will follow access road disturbance No new disturbance	Same as Proposed Action	Same as Proposed Action
ADLS radar units and associated server rack houses	0 acres Will be contained within the access road disturbance No new disturbance	Same as Proposed Action	Same as Proposed Action

Total (acres)	1,269.1	1,346.9	1,403.2
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Note: All values are approximations. These values may change slightly during final engineering design.

N/A = not applicable. The facility component would not be present for that alternative.

Table 7. Facility Components and Estimated Acreage – Permanent Disturbance

Facility Components	Proposed Action	Alternative 1	Alternative 2
Wind turbines and pad-mounted transformers	0.2 acres/turbine 46 turbines permitted, 40 constructed -36 GE 2.5 -4 GE 2.3 -6 alternatives 9.2 acres	0.2 acres/turbine 45 turbines permitted, 40 constructed -36 GE 2.5 -4 GE 2.3 -5 alternatives 9 acres	0.2 acres/turbine 45 turbines permitted, 34 constructed -30 GE 3.0 -4 GE 2.5 -11 alternatives 9 acres
Access roads	48.0 miles total 40.2 miles of new roads 1 mile of Bill Knight reroute 16 feet wide for most roads 24 feet wide for Bill Knight Gap Road (6.8 miles) 101 acres	46.6 miles total 38.8 miles of new roads 1 mile of Bill Knight reroute 16 feet wide for most roads 24 feet wide for Bill Knight Gap Road (6.8 miles) 97 acres	Same as Alternative 1
Underground electrical collection system and communication lines	0 acres All temporary areas would be reclaimed	Same as the Proposed Action	Same as the Proposed Action
O&M facility	5 acres	Same as the Proposed Action	Same as the Proposed Action
Electrical interconnection switchyard and substation	7 acres	Same as the Proposed Action	Same as the Proposed Action
Laydown/staging area for construction	0 acres All temporary areas would be reclaimed	Same as the Proposed Action	Same as the Proposed Action
Concrete batch plant for construction	0 acres All temporary areas would be reclaimed	Same as the Proposed Action	Same as the Proposed Action
Permanent meteorological towers	0.09 acres	Same as the Proposed Action	Same as the Proposed Action
Distribution line	1.8 miles 100 feet wide 22.7 acres	Same as the Proposed Action	Same as the Proposed Action
Borrow pit	N/A	0 acres All temporary areas would be reclaimed	Same as Alternative 1
HDPE water lines	0 acres All HDPE water lines would be removed following construction	Same as the Proposed Action	Same as the Proposed Action
ADLS radar units and associated server rack houses	0.01 acres	0.01 acres	0.01 acres
Total (acres)	145.01	140.81	140.81

Note: All values are approximations. These values may change slightly during final engineering design.

N/A = not applicable. The facility component would not be present for that alternative.

1.4 Additional Design Criteria and Mitigation Measures

A set of general design criteria (proponent constraints and mitigation measures) would be implemented through each phase of the proposed project. A list of these criteria can be found in Appendix H, Design Criteria (Proponent Constraints and Mitigation Measures).

1.5 Other Federal, State, and Local Agency Permit Requirements

Federal, state, and local agencies have jurisdiction over certain aspects of the project. Federal and state agencies and their respective permit/authorizing responsibilities that are anticipated to be required for the project are listed in Table 8. Since the POD is a living document, this table will be updated as additional permits are identified.

Table 8. Proposed Project Permit/Authorizing Responsibilities

Triggering Action	Permit/Approval	Agency / Authority
Federal		
The proposed project and associated facilities (access road, transmission line, and other associated facilities) located on BLM-administered lands.. The BLM is the lead agency for NEPA purposes.	ROW grant	BLM
To comply with NEPA and the Endangered Species Act (ESA), BLM will consult with the U.S. Fish and Wildlife Service (USFWS) on the effects of the proposed project on species listed or critical habitat designated under the ESA.	ESA Section 7 compliance	USFWS
If project activities (i.e., grading, trenching or other construction) may have potential to have adverse effects to historic properties	Native American Section 106 consultation as part of the NHPA compliance	BLM
The project will have a transmission line interconnection point	Interconnection approval	TEP
Potential pollutant discharge during construction, operation, maintenance, and decommissioning	Spill Prevention Control and Countermeasure Plan	U.S. Environmental Protection Agency (EPA)
Potential discharge of dredged or fill material into waters of the U.S. (including wetlands and washes)	Clean Water Act, Section 404 Permit (individual or nationwide)	U.S. Army Corps of Engineers
Structures exceeding 200 feet	Determination of No Hazard to air navigation and operations	Federal Aviation Administration (FAA)
Required lighting on turbines	Tower lighting	FAA
State		
Project construction	General Construction Permit	New Mexico Regulation and Licensing Department- Construction Industries and Manufactured Housing Division
If project activities (i.e., grading, trenching or other construction) may have potential to have adverse effects to historic properties	National Historic Preservation Act (NHPA) compliance	New Mexico State Historic Preservation Division
Required for potential discharge of stormwater from an industrial site	National Pollutant Discharge Elimination System	New Mexico Environment Department (NMED)
The proposed project and associated facilities (access road, transmission line, and other associated facilities) located on NMSLO-administered lands	ROW grant	NMSLO

Triggering Action	Permit/Approval	Agency / Authority
Displacement or removal of regulated native plant species as a result of construction activities	Native plant survey	NMSLO
Air pollutant emissions during construction	Clean Air Act	NMED and EPA
Project activities (i.e., grading, trenching, or other construction) may have potential to impact fish and wildlife	Coordination with New Mexico Department of Game and Fish (NMDGF) regarding impacts to fish and wildlife	NMDGF
Project activities that require oversized commercial delivery and construction of project access on public right-of-way	Commercial Driveway Permit, Approval to construct access on public right-of-way, Traffic Control / Roadway Work Permit	NMDOT
Project activities will use water	Ground Water and Surface Water Filing Forms	New Mexico Office of the State Engineer

1.6 Financial and Technical Capacity of the Applicant

NextEra Energy Resources, LLC, is a wholly owned subsidiary of NextEra Energy Inc. NextEra Energy Inc. is a leader in clean energy with 2016 revenues of more than \$16.2 billion, approximately 45,900 MW of generating capacity, and more than 15,000 employees in 30 states and Canada.

Borderlands Wind is a wholly owned subsidiary of NextEra Energy Resources, LLC. Additionally, NextEra Energy Resources, LLC, a wholly owned subsidiary of NextEra Energy Capital Holdings, Inc., owns, develops, constructs, manages, and operates primarily domestic electric generating facilities that sell power into the wholesale energy markets. NextEra Energy Capital Holdings, Inc., provides full energy and capacity requirements services primarily to distribution utilities in certain markets.

1.7 Preconstruction activities

Prior to the start of construction, Borderlands Wind would conduct geotechnical studies and site preparation, surveying, and staking. Each of these activities is described in detail below.

1.7.1 Geotechnical Studies

A preliminary geotechnical investigation is being conducted and includes standard penetration test borings at proposed turbine sites to visually characterize the soils and to obtain samples for laboratory testing. This survey is critical to inform the preliminary engineering for the turbine foundations, substation/switchyard locations, O&M building location, etc. Suitable geotechnical investigation equipment is being used for the geotechnical investigation, such as a small vehicle or all-terrain vehicle-mounted drill rig. The rig is boring to the engineer's required depths, and a backhoe is identifying the subsurface soil and rock types and strength properties by sampling and lab testing. This geotechnical investigation would include 68 deep borings at the turbine locations (one boring at each location), substation (18 borings), met towers (4 borings), and the O&M building (one boring) at a depth of 40 feet. Additionally, 13 shallow borings would be conducted along the access road locations at a depth of 2 feet. Soil samples would be collected and laboratory tests of the samples would be conducted. The tests to be conducted include in-situ electrical resistivity tests and bulk samples for thermal resistivity testing. Electrical resistivity testing measures how well the soil conducts electricity. This is primarily used in the design of the grounding grids, which are used to dissipate electricity into the ground. Thermal resistivity

testing measures how well heat is dissipated into the soil. This is primarily used in the design of the underground collection circuits to ensure that the heat generated by the cables does not exceed the cable's specification. Corrosion testing measures how corrosive the soils are to concrete and metallic conduits or materials. This is primarily used in specifying the cement type in concrete and corrosion mitigation.

The BLM issued Borderlands Wind a 3-year temporary right-of-way grant (Serial Number NMNM 139677) to conduct geotechnical investigations as described above. Additional information regarding the geotechnical investigation can be found in the *Borderlands Wind Project Geotechnical Investigations Plan of Development* (Exhibit B of the executed temporary right-of-way grant).

1.7.2 Site Preparation, Surveying, and Staking

Limitations of areas to be disturbed would be clearly defined prior to construction of roads, collection system, and turbine location. Limits would be staked or flagged, and other methods for construction staking would be used for the road alignment and turbine construction. Limits of the ROW would also be flagged, where necessary. Construction activities would be confined to these areas, preventing effects on sensitive areas. These temporary and permanent disturbance limits are discussed in Section 1.3.4 by alternative for each facility component. Flagging and stakes that are damaged during construction would be repaired or replaced prior to resuming construction. When construction and restoration are complete, stakes and flagging would be removed. A Flagging, Fencing, and Signage Plan (Appendix K) will be included as an appendix to the final POD that further details the site preparation, surveying, and staking.

2.0 CONSTRUCTION OF FACILITIES

The actions necessary to construct the project are described below. This section of the POD presents a general description of the construction steps for the major components, activities, and construction methods of the project as they are currently anticipated and in the order they are anticipated. Borderlands Wind would continue to remain in contact with BLM as designs for the project are finalized and more detail becomes available. More finalized plans will be presented in the updated POD. It is anticipated that construction would occur in one continuous phase and would take approximately 5 to 6 months. All facilities would be constructed in accordance with the National Electrical Safety Code and Occupational Safety and Health Administration (OSHA) standards. The following major steps are currently anticipated to construct the proposed project:

- Site clearing and grading
- Access road improvement
- Constructing laydown areas (including installing the concrete batch plant)
- Component delivery
- Borrow pit excavation
- Tower foundation excavation and installation
- Tower assembly
- Tower erecting and installation
- Installing underground collection lines
- Installing meteorological towers
- Constructing electrical substations

- Constructing interconnection switchyard
- Constructing the O&M building
- Constructing the distribution line
- Inspecting the facilities
- Site stabilization, protection, and reclamation

The construction of the proposed project would occur in phases. After project engineering and preconstruction activities, construction mobilization would begin. Civil improvements would be the first part of construction, including temporary laydown areas for turbine and tower deliveries, trenching for electrical cabling, access roads, turbine foundation, and crane pads to erect the towers. The second phase of construction would include construction of the switchyard, installation of the electrical hardware, O&M building, project substation, and construction of the turbines. The final construction phase would include the substation and switchyard, mechanical finalization of all turbines, and other facilities followed by commissioning and testing each turbine, restoration of all temporary disturbed areas, utility interconnection, and testing of the electrical system. Specific dates for the various project tasks have not been established but would be dictated by weather, site conditions, and delivery schedule.

2.1 Site Clearing and Grading

Clearing and grading of project site components and ancillary facilities would be required and would be limited to those areas identified previously (see Table 6). Borderlands Wind anticipates that clearing and grading would occur in the following areas: the access road network (including the U.S. 60 and Bill Knight Gap Road intersection), the O&M facility, WTG pads, the substation and switchyard, the construction laydown areas, the underground collection system, and the borrow pit. Additional site clearing and grading would occur at the met tower locations; however, this is expected to be minimal. Bulldozers, road graders, or other standard earth-moving equipment would be used for clearing and grading. The land clearing and grading process would be performed in accordance with BLM policies and a State-approved Stormwater Pollution Prevention Plan (Appendix D).

The total acreage to be temporary cleared and graded, and the acreage to remain permanently disturbed during operations and maintenance, varies by alternative and is presented in Tables 6 (for temporary disturbance) and 7 (for permanent disturbance). Disturbance acreage by project component is also presented in Tables 6 and 7 for temporary and permanent disturbance, respectively.

2.2 Access Road Improvement

As stated previously, the main access point for the proposed project is the U.S. 60 and Bill Knight Gap Road intersection. To determine how to sufficiently improve the access point, Borderlands Wind consulted with the New Mexico Department of Transportation (NMDOT), who is acting on behalf on the Federal Highway Administration (FHWA). During this consultation, Borderlands Wind and NMDOT agreed that the access point should be improved by construction of a 1,000-foot, permanent left-turn lane off of U.S. 60 and a permanent gravel turn-off to the right (Figure 20).

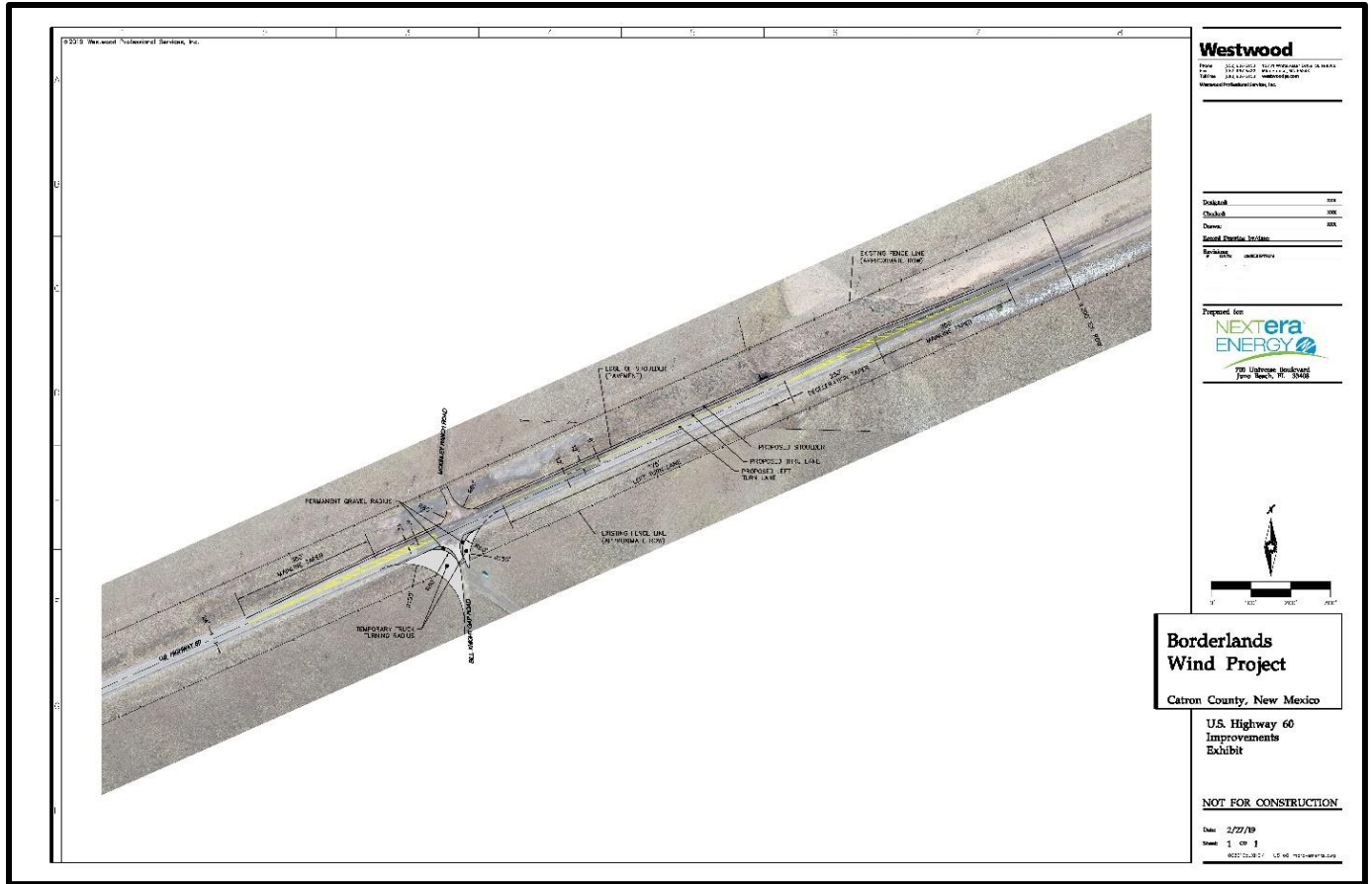


Figure 20. Proposed U.S. 60 and Bill Knight Gap Road intersection improvement.

The proposed project would require an access road network, which would consist of several components: Bill Knight Gap Road, internal access roads, and a secondary access road. Each of these components is discussed in detail below.

The proposed project main access point is Bill Knight Gap road at the U.S. 60 intersection. Improvements to the U.S. 60 and Bill Knight Gap road intersection would be required as described above. During construction, Bill Knight Gap road would be temporarily widened to 150 feet in width (i.e., the limit of construction disturbance) and an alignment change would occur. Due to the proximity of cultural resources, the temporary limits of construction disturbance would shift in the 150 foot corridor to avoid or minimize impacts to cultural resources when possible. These shifts could include limiting construction disturbance to a particular side of the construction disturbance (i.e.- construction disturbance would be limited to the east side). The alignment shift would be located near the northern portion of Bill Knight Gap road and would be modified in the area where known flooding occurs. This alignment change is located on private property and has been discussed and agreed to with the county and the land-owner given the extensive flooding that occurs on Bill Knight Gap Road in this section (Figures 3, 6, and 7). Following construction, Bill Knight Gap road would be reclaimed to a permanent 24 feet. The modified alignments would continue to be used and would be reclaimed to 24 feet as well. The mileage, location, and construction of this component would be the same under all Alternatives.

The internal access roads are those roads depicted (Figures 3, 6, and 7) that are not Bill Knight Gap road or those that have been identified as a secondary access road. All internal access roads would be a total of 150 feet in width during construction (i.e., the limit of construction disturbance). Following construction and during operation, these roads would be reclaimed and maintained to a 16-foot width. All routes used during construction would continue to be used during operations and maintenance. Although internal access roads would be constructed under all Alternatives as described above, the locations and mileage of the internal access roads would vary by alternative as described (Tables 6 and 7) and shown (Figures 3, 6, and 7) previously. In the event that internal access roads intersect with grazing allottee fences, new gates will be constructed.

For both Bill Knight Gap road and internal access roads, local landowners would be consulted and the roads would be developed in accordance with local building requirements where the roads intersect with public roads. All roads would require engineering surveys and would be required to meet or exceed the BLM's *Surface Operating Standards and Guidelines for Oil and Gas Development – The Gold Book* (BLM 2007a).

The secondary access road would require no widening or modifications during construction or operations, except for 0.3 miles between a utility pole and substation (Figures 3, 6, and 7). This is required for the safe construction of the distribution line. For this segment, the access road would be widened to a total of 150 feet in width during construction. Following construction and during operation, this segment of the road would be reclaimed and maintained to a 16-foot width. This segment of the secondary access road would continue to be used during operations and maintenance. The mileage, location, and construction of this component would be the same under all Alternatives.

As project engineering progresses, identification of the other areas for culverts or other drainage crossings will be considered. All access roads (except for the non-improved secondary access road) would be graded, include sufficient drainage, and be surfaced with an aggregate surface material. Surface material may include gravel, caliche, or other locally sourced gravel-like material. Borderlands Wind anticipates no asphalt/paving on any of the access road network, except for the main access point improvement.

2.3 Construction Laydown Area

As stated above, the proposed project would require three temporary construction laydown areas during construction. One laydown area on the eastern side of the site would be approximately 31.3 acres and would contain the mobile trailers for construction management/staff and parking areas for construction workers. An equipment laydown area on the eastern side of the site would be approximately 20 acres and would be used for materials storage and a 2-acre concrete batch plant facility. The third laydown area would be on the western side of the site near the substation and switchyard and would be approximately 9.5 acres. This facility would also be used for materials storage. Any power needed for the construction laydown yards would be supplied through generators (Figure 17). All areas would be cleared and graded during construction. The concrete batch area is expected to compact soil. Following construction, the soils in this area will be recompacted, re-contoured and reclaimed. The other laydown areas will also be reclaimed following construction. The location and acreage of construction laydown areas would be the same under all Alternatives. The concrete batch plant would be located in the same construction laydown area under all Alternatives. All mobile trailers for the construction laydown area would be delivered via delivery trucks, any equipment to be delivered to the construction laydown area would be delivered appropriately (see Section 2.4). Concrete components of the project would be hauled to the on-site batching plant from the borrow pit. Construction of the concrete batch plant is described below.

2.3.1 Concrete Batch Plant

During project construction, it is estimated that a 2-acre on-site concrete batch plant would operate through the duration of the project (location depicted in Figures 3, 6, and 7). Approximately 18,000 cubic yards of concrete is expected to be required for construction that would be produced by the on-site concrete batch plant. The batch plant would have capacity to produce approximately 800 cubic yards of concrete each day. These details would be confirmed as a result of geotechnical exploration. The processing area and materials stockpiling area would be located at the batch plant. To produce the necessary materials, the batch plant would require water and power during construction. Water would be delivered via 2-inch HDPE pipes from a well located on private land to the concrete batch plant. The well would be constructed separately by an on-site landowner and would be leased to Borderlands Wind (see Section 2.17.2 for more information). The 2-inch HDPE pipes would follow existing access roads, would be aboveground, and would not create any additional disturbance. The concrete batch plant water needs are included in the total water needs for the entire construction period (see Section 2.17.2), and fuel/power for the batch plant would be stored in an aboveground storage tank with secondary containment spill prevention.

Stockpiles for aggregate and sand would be constructed near the batch plant in a manner that would minimize wind exposure. A screw conveyor would transport cement discharge into a storage silo. Construction managers and crews would use BMPs and standard operating procedures to keep the batch plant site, stockpile, and storage areas clean.

Washout operation for concrete would be co-located with the batch plant. A small depression would be made within the batch area, and concrete chutes would be washed into the depression. Residual concrete from washing operations would be crushed and cleared for disposal at a nearby landfill or buried in place at the discretion of the landowner.

Preparation of the concrete batch plant site and operation of the batch plant during project construction would be covered under the National Pollutant Discharge Elimination System General Storm Water Construction Permit.

Construction and improvements on roads would require the use of a rock crusher for aggregate fill and road base. The sources of aggregate would be supplied through on-site aggregate by constructing a borrow pit (see Section 2.5). One of the proposed construction staging areas would have a portable rock crusher with a crushing capacity of roughly 20,000 tons per day (this will be confirmed as a result of geotechnical exploration). The rock crusher would be used through the duration of construction, 4 to 5 months.

The batch plant and any excess concrete elements would be removed after the concrete placing phase and could be recycled or used on other projects.

2.4 Component Delivery

Delivery vehicles would be directed to a single point of access exiting U.S. 60 at the Bill Knight Gap Road intersection. The vehicle would then be directed to one of the turbine locations or temporary project laydown areas. On-site speed would be limited to 25 miles per hour (mph) to control for safety and minimize fugitive dust; signage indicating speed would be provided during construction. The project is estimated to generate a peak of approximately 500 trips per day on U.S. 60 (based on 160 construction personnel leaving and entering and 50 delivery trucks leaving and entering the project site). A Road Design, Traffic and Transportation Plan would be included in Appendix J.

Generally, heavy equipment would not pose any unique transportation considerations. Heavy equipment required for the proposed project construction includes bulldozers, graders, excavators, front-end loaders, compactors, semi-trucks, and dump trucks (Figure 21; see summary in Section 2.17). The equipment would be delivered to the site by flatbed combination truck, and most equipment would remain on-site until construction is finalized. Construction materials that would be transported to the project site may include gravel, rock, sand, and water, which usually are locally available.



Figure 21. Turbine tower delivery truck.

2.5 Borrow Pit Excavation

The main construction activities associated with mining of the borrow pit would include the clearing of the borrow pit area (see Section 2.1), removal of topsoil to stockpile, construction of access roads/ramps, excavation of the borrow pit material to stockpile, loading the borrow material into tipper trucks, processing the borrowed material for use at the on-site concrete batch plant, management of the borrow pit, and closure and rehabilitation of the borrow pit.

The proposed borrow pit area would be a temporary 35 acres in size and would be constructed under Alternatives 1 and 2 only. For both Alternatives, the location and acreage would be the same.

2.6 Tower Foundation Excavation and Installation

The areas identified for the WTG tower foundations would be cleared and graded as described in Section 2.1. The areas would then be excavated with a backhoe in order to prepare each area for a concrete foundation. The topsoil element for the turbine excavation would be spread evenly around the base of the turbine to blend with present grades. If the subsurface is too hard to excavate, blasting would be conducted. The Blasting Plan (Appendix I) would be in place from the general contractor before any blasting takes place. Blasting would be about 1.5 seconds, two to four times per day, over a 40- to 50-day period. Once excavated, a seal slab is poured at the bottom of the foundation hole prior to rebar placement. Forms are set in place, and then reinforced with steel and anchor bolts, and conduit is placed into the foundation hole. Once completed, an aluminum tube and bolt cage would be installed and concrete would be placed into the hole (Figures 22–43). The foundation design of the wind turbine would be prepared by a Registered Professional Engineer licensed in the state of New Mexico. The final design parameters of the foundations are dictated by turbine tower load specifications, geotechnical surveys, and cost considerations. The supporting foundations are usually octagonal and would be approximately 60 feet in diameter at the base (Figure 25). Two different foundation types are under investigation depending on the geotechnical investigations for the GE 2.3 and 2.5 machines. For these GE 2.3 and 2.5 machines, foundation type 1 (i.e.- a spreadfoot foundation) would extend up to 65 feet in diameter and 15 feet below the ground surface, and foundation type 2 (i.e.- a P&H foundation) would extend up to 20 feet diameter and 35 feet below the ground surface. Two different foundation types are also under investigation depending on the geotechnical investigations for the GE 3.0 machines. Foundation type 1 would extend up to 72 feet diameter and 15 feet below the ground surface, and foundation type 2 would extend up to 20 feet diameter and 45 feet below the ground surface. Temporary and permanent disturbance of each WTG is presented in tables 6 and 7, respectively. After curing, the foundation would be ready to receive the turbine tower and ground control grids are installed.

Additional excavated material would be recycled for road construction or disposed of in accordance with all applicable regulations and permit conditions. Any concrete spoil would be disposed of by the contractor at a licensed waste facility off-site.



Figure 22. Excavating foundation hole.



Figure 23. Excavated foundation area.



Figure 24. Foundation rebar and bolt cage.



Figure 25. Typical spread-footing foundation.

2.7 Tower Assembly

After road and turbine pad preparation, the individual WTG components would be assembled on-site. Nacelle, hub, tower sections, and rotor blades would be delivered to the construction site using special delivery trailers for components of each wind turbine as needed. Components for each turbine would be

transported directly to each turbine site and unloaded. When unloading at an individual site is not feasible, the components would be unloaded at a laydown yard until the turbine site is ready for installation.

2.8 Tower Erecting and Installation

The lifting equipment to erect the towers and for nacelle and rotor installation would be the same. Cranes would operate in the planned area around each turbine location (Figures 26–28). The cranes would move between tower locations via the roads constructed for the project. Typically, gravel and rock would need to be placed and compacted on the areas around the planned tower locations to support the crane's weight, provide all-weather access in the areas that the crane would operate, and provide a level surface. The beauty ring area would be 40 feet in diameter and the foundation pedestal would be 20 feet in diameter, which in total would encompass 0.20 acres per WTG for the GE 2.3 and 2.5 machines (Figure 31). The beauty ring area would be 45 feet in diameter and the foundation pedestal would be 25 feet in diameter, which in total would encompass 0.20 acres per WTG for the GE 3.0 machines (Figure 32). The beauty ring also connects each turbine to an associated access road. Crane mats may also be used for added stability and weight distribution. Project towers would arrive on-site in segments and would be bolted/welded together as the tower is built. The free-standing tubular wind turbine towers would be connected to an underground concrete foundation via anchor bolts. The nacelle would contain a drive train already assembled, and the hub and blades would be installed on it (Figures 28–30). All internal cabling is then connected and terminated. It is likely that household quantities of paints, lubricants, and grease may be used during construction. The tower, nacelle, and rotors would be finished in white paint.

After commission finalization, the turbine pads would be graded to repair any damages caused by construction and ensure proper drainage of stormwater away from the foundation.



Figure 26. Turbine erection.



Figure 27. Aerial view of preparations to erect a wind turbine tower.



Figure 28. Wind turbine nacelle installation.



Figure 29. Rotor assembly.



Figure 30. Installation of a rotor on a General Electric 1.5-MW wind turbine.

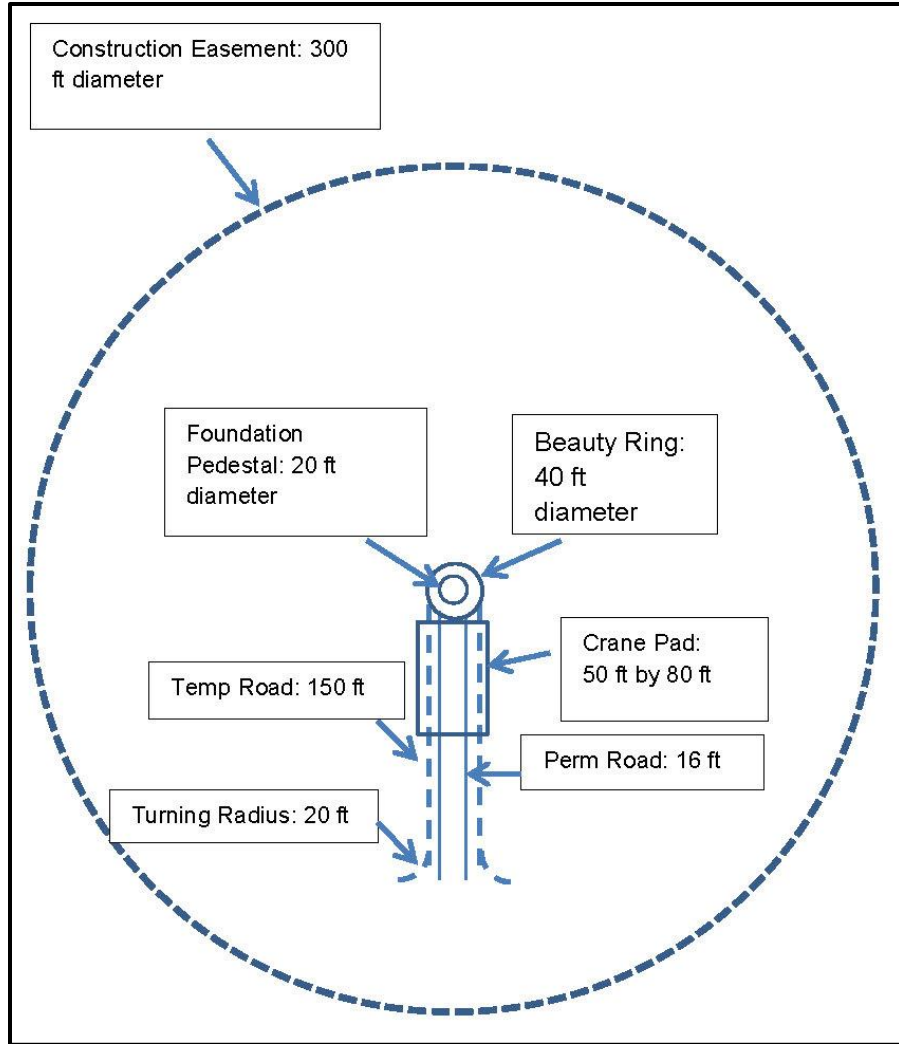


Figure 31. Wind turbine generator component staging dimensions for GE 2.3 and 2.5 machines. Note: dotted areas are temporary impacts.

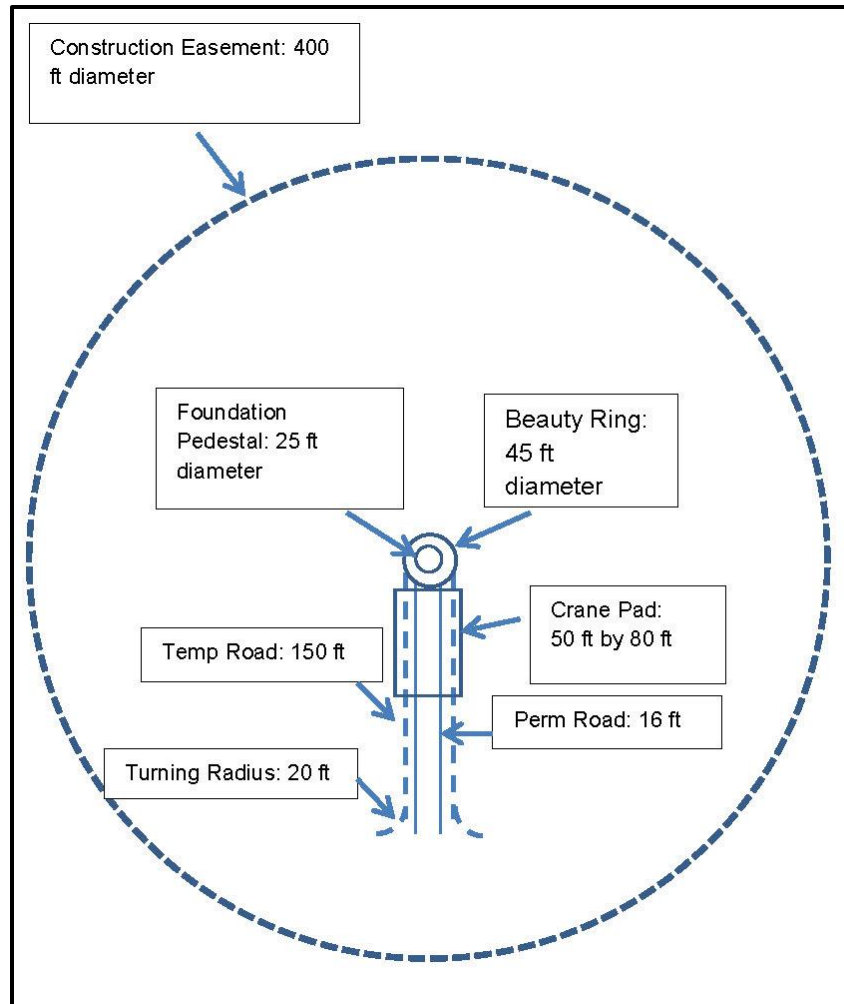


Figure 32. Wind turbine generator component staging dimensions for GE 3.0 machines. Note: dotted areas are temporary impacts

2.9 Installing Underground Collection Lines

Underground collection lines would be installed as part of this project, which would consist of a buried cable in trenches that are approximately 3 feet deep by 4 feet wide and would follow access roads as much as possible. The permanent and temporary disturbance of the collection lines varies and is described (Tables 6 and 7) and depicted (Figures 3, 6, and 7) by alternative. Excavation of the trenches would be completed by trencher and backhoe and would follow the New Mexico Department of Game and Fish Trenching Guidelines (2003) to minimize impacts to wildlife resources (Figure 33). Each proposed linear disturbance would be limited to a short-term, temporary ROW and disturbance area of approximately 60 feet wide. Trenches would be filled with compacted material, and any disturbance associated with the trench would be reclaimed. If there is any remaining trench space not filled by excavated material, clean fill would be placed around the cables and excavated material immediately after construction. No disposal of excavated material would be required.

Horizontal directional drilling would be used to minimize impacts at locations where collection lines would cross features like surface-water drainages. Underground cable would have to connect to an

overhead collection system if the distance to another substation is excessive or where obstacles may be created by the terrain.

Underground lines would be marked by a buried warning tape placed close to the surface to warn personnel of the presence of underground lines. The warning tape would also be used to avoid accidental excavation of the lines in the future. No overhead collection lines are proposed as they would be economically unfeasible.



Figure 33. Typical underground collector cable trench.

2.10 Installing Meteorological Towers

The proposed project would require installation of temporary met towers before construction and permanent met tower(s) during construction for operations of the project. The met towers would be no more than 361 feet (110 meters) with side guy wires spanning 300 feet from the tower on four sides. Borderlands Wind is also considering a monopole tower that would not require guy wires. Alternative met tower(s) are proposed under some of the alternatives in case the proposed location(s) is/are not viable. The met towers would be installed on gently sloping sites (less than 5 degree slope), with the tower laid out downwind of the baseplate. Any low-lying brush around the baseplate, guy wire areas, and anchors sites would need to be cleared to allow for safe installation of the tower(s). The tower(s) would require 3 to 5 days for installation once the anchors have been installed. After the construction of the met tower(s), all installation equipment would be removed from the site. It is anticipated that personnel would visit the met tower(s) one or two times a year to perform routine maintenance.

2.11 Constructing Electrical Substation and Switchyards

In order to construct the project substation and switchyard, the following equipment would be delivered to the project site: the equipment enclosure, electrical breakers, a 345-kV transformer, overhead electrical

bus, and pole structures. Additionally, bulk materials would need to be delivered such as conductor, electrical boxes, conduit, switches, meters, relays, and all other substation-related equipment, as needed. Voltage at the substation would be increased from 34.5 kV to the interconnection voltage of 345 kV. The project substation capacity would be dependent on the number of wind turbines supplying power.

A conductor or bus would be required for the project to carry power from the substation to the interconnection switchyard, where power would be transferred to the electrical power grid. The switchyard and substation facility would be fenced off and graveled, and would total roughly 7 acres, with a parking area and electrical devices. To provide a redundant way to communicate with the switchyard, the telecommunications line to the O&M building would be extended from the O&M building to the switchyard. System studies would determine the location for the interconnection with an existing transmission line. The transmission line would be the same voltage as the power line to which it interconnects.

Construction for the switchyard and substation would consist of site clearing and grading (see Section 2.1), concrete equipment foundation forming and pouring, crane-placed electrical and structural equipment, ground grid trenching, underground and overhead cabling and cable termination, erection of equipment enclosure, and installation of all the equipment for the associated systems. For the substation facility, a fence would be constructed around the perimeter that would consist of a 8-foot-tall chain-link structure with three-strand barbed wire on top (1 foot), resulting in a total height of 9 feet.

2.12 Constructing the O&M building

The O&M facilities would be built near the electrical substation and interconnection switchyard (see Figure 6). The building itself would be approximately 2500 square feet and would be a pre-manufactured building on a 5-acre site. Construction of the O&M building would consist of clearing and grading the site (see Section 2.1), constructing the associated septic tank, pouring the concrete slab foundation, delivering the O&M building via a semi-truck, and placing the pre-manufactured building on the concrete slab. Power to the O&M building would be provided via the newly constructed distribution line from the Cow Springs distribution pole to the substation/O&M area (see Section 2.13 below) The 5 acre O&M facility would be enclosed by a 6-foot-tall chain-link fence with 1 foot of barbed wire on top, for a total height of 7 feet. Exterior lighting at the O&M facility is required for safety and would be downshielded to minimize impacts to the dark-sky nature of the project area.

2.12.1 Constructing the Septic Tank

Borderlands Wind proposes to construct a septic tank for the proposed project. Construction would consist of installing a septic tank with a 1,000-gallon capacity and a percolation rate of approximately 18 minutes per inch. The design flow would be approximately 130 gallons per day. The design flow and percolation rate are subject to change based on field investigations of the O&M site location. For comparison purposes, the proposed septic tank would be like those built for residential use. Should the construction of a septic tank not be possible, a holding tank near the O&M building would be constructed that would be pumped periodically. If a holding tank cannot be constructed, portable toilets (porta-potties) would be placed near the O&M building.

2.13 Constructing the Distribution Line

The proposed project would require construction of a distribution line that would involve tapping the distribution line located near Cow Springs west of the project and constructing a new line east into the

substation. The existing distribution line (operated by Socorro Electric Cooperative, Inc.) is 14.4-kV with a maximum span of 280 feet. The proposed distribution line would be an approximately 12-kV, single-phase line that would be made of wooden poles that are approximately 8 inches in diameter and 45 feet high. The poles would be placed every approximately 250 feet for approximately 1.8 miles. Construction activities include site clearing and grading (see Section 2.1), excavating structure foundations, assembling and erecting structures, wire stringing, and site reclamation (see Section 2.15).

2.14 Inspecting the Facilities

After project construction is complete, the project would be commissioned. Detailed inspection procedures and testing procedures would be provided after final turbine commissioning. Once construction activities are finalized, temporary construction areas would be revegetated and restored according to the Integrated Reclamation Plan (Appendix E).

2.15 Site Stabilization, Protection, and Reclamation Practices

After project construction is finalized, the site would be cleaned up and restored to facilitate only operational activities. Waste, debris, and equipment used during construction would be removed from the site. After project completion, any visible waste on the project site would be removed. Requirements for site restoration would be cited in the project's construction and operation permits and in the project's Integrated Reclamation Plan. Revegetation and habitat restoration would occur on all major staging and laydown areas, although a few sites may remain for long-term use of maintenance and parts storage. The project's roadway footprint would be reduced by reducing the width of the majority of construction roadways, and any areas disturbed during construction but not retained for operations would be revegetated. Construction limits of disturbance for internal project roadways would be 150 feet. These roadways would be reclaimed to 16 feet for the operations of the project. Construction limits of disturbance on Bill Knight Gap road would also be 150 feet. Bill Knight gap Road would be reclaimed to 24 feet for the operations of the project. Borderlands Wind would develop an Integrated Reclamation Plan for the project (see Appendix E).

2.16 Additional Construction Considerations

2.16.1 Construction Workforce Numbers, Vehicles, Equipment, and Time Frames

Project construction would require at least 50 to 70 workers at any given time, and a maximum of 250 workers would be required during peak construction. Construction is anticipated to require 5 to 6 months. Depending on the weather, construction crews would work 8- to 12-hour workdays, 6 days per week. The project team would consist of qualified contractors and subcontractors employing trained, competent personnel. Numerous tasks would be subcontracted out from the general contractor where necessary. Local contractors would include surveyors, clearing and grubbing, all trucking, water supply, rock crushing, etc. The general contractor would also hire local employees (e.g., laborers, concrete workers, and operators). The construction-phase vehicles are listed below in Table 9.

Table 9. Construction Use Areas and Activities

Vehicles	Use Areas	Activities
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Vehicles	Use Areas	Activities
Bulldozers and excavators	Turbine locations and major earthwork locations	Clearing, grading, excavating, and moving large quantities of soil
Crane and forklifts	Turbine locations, operations and maintenance, and substation/switchyard	Lifting and erecting turbine components and unloading and placement of equipment and materials
Graders	Access roads, operations and maintenance, turbine locations, and substation/switchyard	Clearing, finish grading, and moving small amounts of soil
Trenchers and backhoes	Turbine locations and collection system	Small area and trench excavation and backfill
Delivery trucks and semi-trucks	Access roads and all major construction areas and the concrete batch plant	Delivery of finished concrete, aggregate, cement, water, steel, cable, and other bulk construction items
Pick-up trucks and sport-utility vehicles	Access roads and all construction areas	Worker and small equipment transport

2.16.2 Water Usage, Amounts, Sources

Construction would require approximately 26 million gallons of water, assuming standard dust control mitigation measures. Construction activities that may require water use include, but are not necessarily limited to: dust control measures, on-site concrete batch plant, cleaning of trucks entering project site to minimize the spreading of noxious weeds, and for WTG pad foundation construction. All permits or authorizations concerning water use would be obtained from the New Mexico State Engineers Office prior to the start of construction, in addition to landowner authorization. Water would be required temporarily for on-site mixing of concrete and for dust control. A source of water needed for construction would likely be supplied by leasing water from an existing well owned by an on-site landowner at market rate. The on-site landowner would be responsible for the permit authorization for the existing well to be used for this type of activity. Borderlands Wind has agreed to perform any necessary new construction associated with the existing well that has been agreed upon by the on-site landowner. This well would have a capacity of 110 acre-feet and would have a 16-inch casing. If Borderlands Wind is unable to get construction water supplied from this well, then water would be brought in from off-site to meet construction water supply needs.

Operation of the wind energy facility would require very little water use. Water for the O&M building during operation would be provided through an existing 1¼-inch water line that would be constructed and maintained by the on-site landowner. The source of water for the water line is an existing well owned and permitted to the on-site landowner and is permitted for perpetual water use on deeded land. The water line would be in proximity to the O&M facility, therefore, Borderlands Wind would not need to construct any new water lines. Borderlands Wind would tee-tap this water line and store any water needed for the O&M facility in three aboveground holding tanks with a total capacity of 40,000 gallons.

2.16.3 Erosion Control and Stormwater Drainage

A Stormwater Pollution Prevention Plan (SWPPP) would be developed to control off-site migration of sediment and to control erosion during construction of the project (see Appendix D). Construction practices would comply with the SWPPP to ensure appropriate drainage and sediment control measures are in place during construction and during operation of the facility. The SWPPP would be finalized and made available for BLM review prior to construction. The SWPPP would address the following:

- Identification of the SWPPP coordinator with a description of the person’s duties

- Identification of the stormwater pollution prevention team that would assist in the implementation of the SWPPP
- Description of the existing site conditions, including the existing land use for the site (i.e., vehicle circulation, pavement, buildings), soil types at the site, and the location of surface waters which are located on or next to the site (wetlands, streams, washes, etc.)
- Identification of the body or bodies of water that would receive runoff from the construction site, including the ultimate body of water that receives the stormwater
- Identification of drainage areas and potential stormwater contaminants
- Description of stormwater management controls and various BMPs necessary to reduce erosion, sediment, and pollutants in stormwater discharges
- Description of the Facility Monitoring Plan and how controls would be coordinated with construction activities
- Description of the implementation schedule and provisions for amendment of the plan
- Identification of other local, state, and federal permits associated with construction activity

2.16.4 Vegetation Restoration and Weed Management

A Biological Evaluation or similar study that would include evaluation of the project area for the presence of noxious and invasive vegetation species has not yet been completed, so the presence of these species is not yet known. However, in treating noxious or invasive vegetation, Borderlands Wind would follow herbicide application guidelines described by BLM policies and procedures (i.e., *Final Vegetation Treatments Using Herbicides Programmatic Environmental Impact Statement* [BLM 2007b]).

Temporarily disturbed areas would be revegetated using seed mixtures and techniques approved by the BLM Socorro Field Office. Borderlands Wind would develop a preliminary Integrated Reclamation Plan (see Appendix E). The plan would define success criteria and monitoring protocols to assess how successful revegetation efforts have been, and determine whether additional reclamation efforts are needed.

Restoration of disturbed areas would use certified weed-free seed (and mulch, if any is used) to prevent the spread of primary noxious weeds. Additionally, the Integrated Reclamation Plan would be consistent with the BLM's Integrated Pest Management Program, Socorro RMP, and would follow Catron County specifications. The plan would describe the site-specific measures that would be implemented to control noxious weeds and invasive species in the project area.

To minimize the introduction of undesirable plant species into the project area, specific control measures may be implemented, including

- reseeding of temporarily disturbed areas;
- applying weed-free fill;
- cleaning vehicles before entering the proposed project site;
- cleaning vehicles that would need to go off of designated roadways;
- developing specific areas and construction yards for storing equipment, materials, and vehicles;
- implementing annual post-construction management and monitoring of access roads and turbine sites for a designated period after construction (typically a minimum of 3 years);

- keeping personal vehicles, sanitary facilities, and staging areas at specific, limited weed-free locations; and
- restricting and/or monitoring soil import from outside the project site.

2.16.5 Health and Safety

Borderlands Wind would develop a site-specific Health and Safety Program, which includes a Health and Safety Plan (Appendix F) to avoid and mitigate the potential for injuries, where feasible, and protect the project and the general public. The Health and Safety Plan would meet OSHA requirements and would:

- Develop safe work practices for each task, including requirements for personal protective equipment, measures for limiting occupational electric magnetic field exposure, and OSHA standard practices for safe use of explosives and blasting agents;
- determine all federal and state occupational safety standards pertinent to the project;
- explain safety performance standards;
- create fire safety evacuation procedures;
- identify requirements for temporary fencing around project facilities and measures to be taken during operations to limit public access to hazardous facilities; and
- create and implement a program identifying hazard training requirements for each of the tasks and measures for providing the necessary training.

The plant manager or designated response leader would then assess the impact of the emergency and provide appropriate procedures, lead evacuation procedures, and meet with emergency response personnel, if necessary. Telephone numbers for specific project personnel would be provided to the BLM.

The Health and Safety Plan would address waste and hazardous materials management and spill prevention, as well as fire protection. These topics are described briefly below, in addition to general site security and fencing.

WASTE AND HAZARDOUS MATERIALS MANAGEMENT AND SPILL PREVENTION

Borderlands Wind would prepare a preliminary Waste and Hazardous Materials Management Plan. This plan would focus on nonhazardous waste resulting from construction of the proposed project. It would address waste-stream composition including solid wastes, liquids, and wastewater; collection and recycling; and particulate transport pathways and management. The plan would also include protocols for identifying hazardous waste, solid waste minimization, inspection, locations for temporary waste storage, and any specific handling and disposal requirements, as appropriate.

No extremely hazardous materials are expected to be produced, used, stored, transported, or disposed of as a result of the project. Potentially hazardous materials used in the operations and maintenance of the project would be stored in the O&M facility in approved, aboveground containers with appropriate spill containment features.

One potential hazard is turbine lubricants used in the turbine gearboxes. To prevent lubricant leakage, the gearboxes would be sealed. Lubricant from the gearboxes would be tested periodically and samples would confirm whether the lubricating properties are adequate. The gearboxes would be drained and new lubricant would be added when the lubricants have degraded to the point where they no longer contain the required lubricating properties. A Spill Prevention, Control, and Countermeasure (SPCC) Plan (Appendix

G) would be included as part of the final POD, which would address lubricant spills and cleanup procedures.

Additionally, transformers contain oil for heat dissipation; therefore, transformers would be sealed and contain no moving parts. The oil for the transformer does not need periodic inspection and would not need to be replaced (Figure 34).



Figure 34. Typical pad-mounted transformer under construction.

To minimize leaks of motor oils, hydraulic fluids, and fuels, construction equipment and O&M vehicles would be appropriately managed. During construction, maintenance and refueling for vehicles that are permitted for highway travel would be performed off-site at an appropriate facility. A specially designed vehicle-maintenance truck would be on the project site to service construction vehicles that are not highway authorized. O&M vehicles would be serviced and fueled at the O&M building or at an off-site location during operation.

The SPCC Plan (see Appendix G) would be prepared in accordance with federal regulations regarding environmental protection from spills of gasoline, diesel, or transformer oil. The SPCC Plan would describe any measure needed to reduce the risk associated with the use, storage, transportation, production, and disposal of hazardous materials, oil, and oil products during construction and operation of the facility. The SPCC Plan would also include, but would not be limited to, the following:

- assessment of potential spills and secondary containment;
- procedures for proper transportation, handling, use, storage, and disposal;
- a training program that is comprehensive in covering the procedures outlined in the SPCC Plan;
- inspection, record-keeping/documentation, and notification requirements; and
- spill prevention and response procedures for the facility.

Solid non-hazardous waste and hazardous waste management would be implemented for the project in accordance with an approved Waste and Hazardous Materials Management Plan. The waste would be disposed of off-site at a properly licensed facility. Any project wastewater would be disposed of in accordance with federal, state, and county regulations.

FIRE PROTECTION

There is potential for on-site, human-caused fires to occur during the construction and operation phases of the project due to hot machinery or exhaust, on-site equipment fueling, storage of flammable liquids, and smoking. In order to prevent fire emergencies and deal with them quickly and effectively, all workers would be appropriately trained. Workers would have fire prevention equipment and consult with the local fire department and BLM when fire dangers are high.

The height, complexity, and physical dimensions of WTGs may present difficulties for local emergency service providers and fire department to respond to emergencies. There is also potential fire danger from flammable components, electrical-generating equipment, and electrical cables, along with various lubricants used.

Components of the project generate the potential for fire or medical emergency due to use and storage of diesel fuels, lubricating oils, and hydraulic fluids. These substances would be used and stored at each substation, in electrical transmission structures, at staging area(s), or other on-site facilities.

Borderlands Wind would document safety procedures to manage work situations where fire presents a safety hazard, and would develop a Emergency Preparedness and Response Plan and Fire Protection and Prevention Plan (Attachments 1 and 3 of the Health and Safety Plan, respectively) to prevent and manage fire during construction. Borderlands Wind or its contractors would perform safety audits regularly throughout construction.

During operations, workers would ensure that there are sufficient fire extinguishers and other safety devices available in the bases and nacelles of the wind turbine generators, at substations, and other on-site structures.

PROPOSED SITE SECURITY AND FENCING

The only areas of the project to be fenced include the O&M facility and the substation/switchyard area (see Sections 2.11 through 2.12 for fencing details). No individual turbine locations would be fenced. Facility fence gates would be locked when the facility is unattended. During construction activities, temporary gates or signs would be installed on access roads. Consultation with the BLM would determine the necessary control needed to manage public access to the site for safety reasons. Private landowners and BLM-permitted uses would have access preserved, but would be limited during construction.

2.16.6 Aviation Lighting

All structures taller than 200 feet are required by the Federal Aviation Administration (FAA) to have aircraft warning markings. Wind turbine generators and met towers constructed for this project would be more than 200 feet in height and would trigger a review from the FAA. After project layout is completed, Borderlands Wind would develop a Lighting Plan with guidance from *FAA Technical Note: Development of Obstruction Lighting Standards for Wind Turbine Farms* (Patterson 2005). Borderlands Wind is committed to using Aircraft Detection Lighting System (ADLS). These ADLS systems have been developed to allow for automatic obstruction lighting activation for aviation obstructions such as wind turbines, high voltage transmission lines and communication towers. Borderlands Wind is evaluating DeTect's HARRIER ADLS system which provides reliable, continuous 360-degree radar surveillance of the airspace around the wind farm from ground level to above aircraft flight altitudes. Lights on turbines are automatically illuminated when aircraft are detected at a defined outer perimeter. The HARRIER system meets or exceeds all regulatory requirements of the FAA (DeTect 2019). This system would require two radar units and associated server rack houses. These radar and server rack house units would

be located inside the temporary road disturbance areas. This system would require no new temporary disturbance outside the temporary disturbance for the access road and each system would require no more than 0.01 acres of permanent disturbance. The radar units would be no more than 16 feet tall and the server rack house units would be no more than 4 feet tall. It is anticipated that the ADLS system would minimize visual impacts during the night (and therefore minimize impacts to dark skies) compared to traditional lighting systems required on wind farms (i.e.- continuous, medium-intensity red strobe lights).

Once final turbine locations are locked, Borderlands Wind would also submit a Notice of Proposed Construction or Alteration (Form 7460.1) to the FAA for each tower to ensure compliance with FAA regulations (including lighting regulations) and to avoid potential safety issues associated with air navigation. The FAA would issue a determinative notice assessing the hazard potential of the wind energy facility. Additionally, the FAA would determine when notification of actual construction is required. Currently, Borderlands has obtained Determination of No Hazards (DNHs) on the preliminary turbine siting.

2.16.7 Construction Design Criteria and Mitigation Measures

To minimize impacts during construction, design criteria (proponent constraints and mitigation measures) would be implemented, which are provided in Appendix H.

3.0 OPERATION AND MAINTENANCE

Once construction is finalized, on-site personnel would operate and maintain the wind energy facility. The facility would be consistent with existing permitted land uses to include grazing and dispersed recreation. Public access is not expected to be restricted unless vandalism becomes an important issue or there is a threat to public safety. During project operations and maintenance, all permanent facilities (see Table 7) would be visible and maintained accordingly. The remainder of the project facilities and areas would be stabilized, protected, and reclaimed (see Section 2.15).

3.1 Operation and Facility Maintenance Needs

When the initial startup period has concluded, the WTGs would be serviced at regular intervals. Overhaul maintenance service would also need to be performed annually; servicing would be on-site. Typically, the routine would consist of inspecting and testing safety systems, inspecting component wear and tear, mechanical systems lubrication, electronic diagnostic performance on control systems, and an overall inspection of the structural components. Occasional blade cleaning may be necessary and may be required if debris reduces the WTG aerodynamic performance. Water would be used to spray-wash the blades using a high-pressure sprayer.

Routine O&M work would be conducted by the O&M staff on the project site. If specialized equipment or expertise is required, Borderlands Wind would subcontract with an appropriate contractor. Personnel would be on-site from the WTG supplier as needed to perform warranty maintenance and operations servicing while under warranty. Personnel may work off-site in an office in a nearby local community. Borderlands Wind anticipates that most of the O&M activities would be conducted by on-site staff, with most of the necessary materials and supplies to be stored in the O&M building.

3.1.1 Maintenance Activities, including Road Maintenance

All access roads for the project would be graded periodically and compacted to maintain their integrity, safety, and environmental requirements for the life of the project. Maintenance of cut-and-fill slopes, culverts, grade separations, and drainage areas would be performed as needed to control and correct erosion issues and manage functionality of drainage structures. Additionally, new gravel may periodically be needed to maintain the integrity of the roads. Borderlands Wind would be responsible for clearing all construction debris and maintaining the appearance of all project roads and ROWs in association with appropriate parties.

A single point of access to the proposed project would continue to be U.S. 60 at the Bill Knight Gap Road intersection.

3.1.2 Operations Workforce, Equipment, and Ground Transportation

Up to 5 full-time workers would be employed to operate and manage the project on-site. Staff would be working at various times and days for the life of the project. O&M staff would be responsible for system operations, routine performance checks, troubleshooting malfunctions, WTG system checks, shut-down and restart of facilities, and security. Staff would be headquartered at the O&M facility and travel around the site when necessary. Typical operations may involve deploying up to three crews of two technicians around the site and up to three personnel in the office. Staff might not be present all 24 hours per day, but operations would be monitored continually through the Supervisory Control and Data Acquisition (SCADA) system from a Borderlands Wind–operated remote location. Training would be provided to each staff regularly regarding best practices of health, safety, and environmental protection services. Additionally, any equipment used during project operations would be maintained and regularly inspected by authorized and trained personnel. A complete schedule would be developed prior to starting operations.

During site operations, four to six service vehicles may be used, as crews would work and travel in pairs. Vehicles would be kept on-site, and personnel would travel to the site in personal vehicles. Carpooling would be encouraged.

3.2 Operations Design Criteria and Mitigation Measures

To minimize impacts during operations, design criteria (proponent constraints and mitigation measures) would be implemented; these are provided in Appendix H.

4.0 PROJECT DECOMMISSIONING

The project has a life expectancy of 35 years, based on electrical demand, maintenance, and the expected life of the project facilities and major components. If there is continued demand for the electricity generated by the project, outdated or worn facility components could be replaced or upgraded to “repower” the project and keep it operational. Repowering is now a common occurrence in the wind industry for aging facilities. If the project becomes no longer cost-effective to continue operation, then the project would be decommissioned and the existing equipment would be removed.

If the project is decommissioned, all facilities that make up the project would be dismantled and removed in accordance with applicable county, state, and federal laws; however, underground distribution cables, foundations, and structures would remain in place except as follows:

- Turbine foundations would be dismantled below grade.
- Underground cable risers would be cut off below grade and abandoned in place.
- Infrastructure facilities—including the operation and maintenance facilities, switchyards, substations, and overhead transmission and collector lines—would be removed.

Post-operation reclamation of the site would occur in areas disturbed by project decommissioning and/or long-term operations and maintenance activities. An Integrated Reclamation Plan would be included in Appendix E, which would detail reclamation methods. A Decommissioning Plan would be included in Appendix L, which would further detail project decommissioning methods.

To minimize impacts during decommissioning, design criteria (proponent constraints and mitigation measures) would be implemented; these are provided in Appendix H.

5.0 ENVIRONMENTAL CONSIDERATIONS

The following sections identify preliminary potential environmental considerations associated with development of the project for the largest project area (the Proposed Action project boundary). The affected environment and impacts of the proposed project on the environment will be discussed in greater detail in the project EIS.

5.1 General Description of Site Characteristics and Potential Environmental Concerns

The proposed wind energy facility is in Catron County, New Mexico, and is partially located on lands managed by the BLM, NMSLO, and private landowners. BLM lands are administered by the New Mexico BLM Socorro Field Office and managed for multiple uses under the Socorro Resources Management Plan (BLM 2010a). Land in the project area is dominated by shrub/scrub and grassland/herbaceous ground cover, and its primary use is for livestock grazing. The area is a part of the high desert, ranging in elevation from roughly 7,000 to 8,300 feet (2,100 to 2,500 m) above mean sea level.

5.1.1 Land Use

The project area is located just south of U.S. 60, 3 miles east of the Arizona–New Mexico state border. The closest community is Quemado, New Mexico. There are no incorporated areas or Catron County–designated community nodes within the project area. The Gila National Forest is located directly south of the project area.

The project area includes several existing transmission lines. Within and adjacent to the west side of the project area are the El Paso Electric Springerville-Luna 345-kV transmission line and TEP’s Willow-Greenlee-Springerville 345-kV transmission lines.

Lands, including private lands in the project area, are primarily undeveloped, low-density population rural lands. There are two developed rural residences with associated storage/agricultural buildings in the project area. There are three BLM Socorro Field Office special designation areas located more than 3 miles northeast of the project area, including the Cerro Pomo Area of Critical Environmental Concern (ACEC), Zuni Salt Lake ACEC, and the Eagle Peak and Mesita Blanca Wilderness Study Areas. The protection objectives for these areas are as follows:

- Cerro Pomo ACEC: manage to protect unique geological features, paleontological resources, cultural resources, and high scenic quality while preserving appropriate recreation opportunities
- Zuni Salt Lake ACEC: manage to protect cultural resources, sacred sites, and hydrologic resources
- Eagle Peak and Mesita Blanca Wilderness Study Areas: areas under study for possible inclusion as wilderness areas in the National Wilderness Preservation System

BLM lands in the project area are primarily used for grazing. There are six BLM grazing allotments (Red Hill South [10038], Red Hill North [10062], Florenio Orona [00099], Vevarosa [10011], Heavenly Acres [10073], and Cow Springs [01126]) (BLM 2016a). Additionally, there are two cancelled oil and gas leases in the project area located on NMSLO-administered lands (Cotton Wood Canyon Units #009 and #010) (New Mexico Oil Conservation District 2018). State lands in the project area include both surface and subsurface estate and lands, and there are active agricultural leases on all of the State land surface estates (NMSLO 2018). No other lease types exist on the State lands in the project area (NMSLO 2018).

5.1.2 *Biological Resources*

MIGRATORY BIRDS

The regulatory framework for protecting birds includes the Endangered Species Act (ESA), the Migratory Bird Treaty Act of 1918 (MBTA) (which includes any part, nest, or egg), the Bald and Golden Eagle Protection Act, and Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (issued 2001). In addition to migratory birds, this section also addresses raptors and eagles. Additionally, BLM IM 2010-156, Bald and Golden Eagle Protection Act – Golden Eagle National Environmental Policy Act and Avian Protection Plan Guidance for Renewable Energy states that consideration of golden eagles must be incorporated into the NEPA process (BLM 2010b).

All of the sensitive birds, as well as most other bird species that are likely to occur in the project area, are protected by the MBTA. The MBTA prohibits the take of migratory birds and does not include provisions for allowing unauthorized take. Although it is not possible for the U.S. Fish and Wildlife Service (USFWS) to absolve individuals, companies, or agencies from liability, the USFWS and Department of Justice have not focused their prosecutorial efforts on those who have made good-faith efforts to avoid take of migratory birds (USFWS 2003). A good-faith effort is best shown through the development of a Bird and Bat Conservation Strategy that generally follows the final USFWS Land-Based Wind Energy Guidelines (USFWS 2012). To develop this strategy, developers of wind project sites generally conduct preconstruction surveys to determine the extent of use by bird and bats. Avian use surveys for the project area were initiated in March 2017, and will continue through March 2019. The Year One survey consisted of visiting 12 points twice per month for 1 hour to document any avian species observed. The Year Two surveys consist of eight additional points for a total of 20 points, all surveyed twice a month for 1 hour. These points all represent the site spatially and by habitat condition and were micro-sited in the field to maximize views of the surrounding airspace. Bat surveys were initiated in September 2017, and concluded in February 2019. The bat surveys consisted of two bat acoustic stations, one low microphone near a water feature and a high microphone attached to a met tower. Any bat species that passed were recorded with a SongMeter acoustic detector, which records full-spectrum data. The results of these surveys have been used to help inform a project-specific Bird and Bat Conservation Strategy (Appendix M), which will be included as a final appendix to this POD.

The Bald and Golden Eagle Protection Act is similar to the MBTA in that it prohibits the take of bald and golden eagles. The USFWS issued final Eagle Conservation Plan Guidance (USFWS 2013) that outlines a process for eagle avoidance, minimization, and mitigation. Developers of wind project sites generally

conduct preconstruction surveys to determine the extent of use by eagles. These surveys were initiated in March 2017, and continued through March 2019. The Year One survey consisted of visiting 12 points twice per month for 1 hour to document any eagles observed. The Year Two surveys consisted of eight additional points for a total of 20 points, all surveyed twice a month for the 1 hour. These points all represent the site spatially and by habitat condition and were micro-sited in the field to maximize views of the surrounding airspace. Based on the results of these surveys, an Eagle Management Plan (see Appendix M) has been completed and included as an appendix to the POD..

The BLM may coordinate with USFWS on Eagles in order to follow IM 2017-040, Bald and Golden Eagle Protection Act – Eagle Incidental Take Permit Guidance for Renewable Energy Development. The memorandum provides guidance on the processing of ROW applications for wind and solar energy development projects that have the potential to result in mortalities to eagle(s). If the USFWS has determined that take of eagles at a project is likely, the BLM will require stipulations to monitor the project regularly for fatalities. Based on the USFWS assessment, the ROW applicant must inform the BLM of its planned approach to address potential eagle take so that the BLM can incorporate the information as it prepares the draft NEPA document. Since a take permit is not being pursued for the project, the BLM will require implementation of mitigation measures to protect eagles based on level of risk. The Eagle Management Plan provides a review of the project’s potential risk to eagles, and outlines project-specific avoidance, minimization, and mitigation measures. The BLM will coordinate with the USFWS to analyze the applicant’s proposed measures and will seek input from the USFWS on the need for additional design features to further avoid or minimize the project’s impacts on eagles.

The project area does not contain Important Bird Area designation, and is not a Ramsar Convention site or Western Hemisphere Shorebird Reserve Network site. Although not present within the project area, designated critical habitat for the Mexican spotted owl is within 5 miles of the southern boundary of the project area.

The potential for migratory birds and eagles to occur within the project area, and any potential impacts to them, will be analyzed and documented during the NEPA process.

SPECIAL-STATUS SPECIES

Special-status species in this document collectively refer to threatened or endangered species protected under the ESA, as well as species given special status in the state of New Mexico species of concern in the State Wildlife Action Plan (New Mexico Department of Game and Fish 2016), and by the New Mexico BLM as BLM sensitive. This section describes special-status species that have the potential to occur in the project area.

The purpose of the ESA is to protect species in danger of extinction due to low population levels and other environmental hazards. The project area includes federal land; therefore, ESA Section 7 consultation with the USFWS will occur if take of an ESA-listed species would be anticipated. Bald and golden eagles are protected under both the MBTA and the Bald and Golden Eagle Protection Act, and are discussed above.

The New Mexico BLM maintains a list of sensitive species specific to BLM lands, which can be found on the BLM New Mexico website (BLM 2012, 2016b). Rare plant species are protected at the State level under the New Mexico Endangered Plant Species Act (New Mexico Statutes Annotated [NMSA] 75-6-1 and New Mexico Administrative Code [NMAC] 19.21) and managed by the State Forestry Division of the New Mexico Energy, Minerals and Natural Resources Division. Animal species are protected at the State level under the Wildlife Conservation Act (NMSA 17-2-37 and NMAC 19.33) and managed by the New Mexico Department of Game and Fish (NMDGF).

SWCA Environmental Consultants (SWCA) completed a site evaluation and characterization report in March 2018, which followed the USFWS’s Land-Based Wind Energy Guidelines Tiers 1 and 2, and Eagle Conservation Plan Guidance Stage 1. This report provided an initial (pre-NEPA analysis) assessment of special-status wildlife and plant species that are known to or that may occur in the project area. The assessment included evaluation of species occurrence data within 10 miles of the project provided to SWCA by Natural Heritage New Mexico (2017) and official project-specific species and critical habitats via the USFWS Information for Planning and Consultation (IPaC) system (USFWS 2017), among other resources. Ongoing Tier 3 wildlife surveys, initiated in March 2017 and continuing through March 2019, provide an in-depth knowledge of the site’s habitat associations and documentation of relevant species.

As the lead agency, the BLM will initiate Section 7 ESA consultation with the USFWS as part of the NEPA process, if impacts to ESA-listed species are anticipated. In addition, a Biological Assessment may be needed to evaluate the effects of the project on ESA-protected species. The USFWS Land-Based Wind Energy Guidelines (USFWS 2012) recommend a higher-level site characterization be completed to determine which of these species may be affected by the proposed project, and whether those species use the project area. Coordination with the BLM, and NMDGF if they are a cooperating agency, is required to ensure that specific concerns are addressed. Though BLM sensitive species have no specific legal protection, the BLM is to manage BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA (BLM 2008). Therefore, the agency may require additional surveys to determine species presence/absence in the project area and potential impacts.

The potential of special-status species to occur within the project area, and any potential associated impacts to these species, will be analyzed and documented during the NEPA process.

VEGETATION

In accordance with IM 2013-111, The National Vegetation Classification and Associated Mapping Standards for Bureau of Land Management Planning Documents and Assignment of State-Level Vegetation Classification Data Stewards, the existing vegetation within the project area was classified using the National Vegetation Classification Standard that is found within the USGS Gap Analysis Project Land Cover Data (USGS 2011). Classifications of vegetation are provided below (Table 10). Acreages and potential impacts will be analyzed and documented during the NEPA process.

Table 10. National Vegetation Classification Standard Vegetation within the Project Area

Class	Formation	Macrogroup	Ecological System
Forest and Woodland	Cool Temperate Forest and Woodland	Southern Rocky Mountain Lower Montane Forest	Southern Rocky Mountain Ponderosa Pine Woodland
		Intermountain Singleleaf Pinyon-Utah Juniper – West Juniper Woodland	Inter-Mountain Basins Juniper Savanna
		Southern Rocky Mountain and Colorado Plateau Two-needle Pinyon – One-seed Juniper Woodland	Colorado Plateau Pinyon-Juniper Woodland
Shrub and Herb Vegetation	Temperate Grassland and Shrubland	Southern Rocky Mountain Montane Shrubland	Rocky Mountain Gambel Oak-Mixed Montane Shrubland
	Salt Marsh	Warm and Cool Desert Alkali-Saline Marsh, Playa and Shrubland	Inter-Mountain Basins Playa
Desert and Semi-Desert	Cool Semi-Desert Scrub and Grassland	Great Basin-Intermountain Trail Sagebrush Steppe and Shrubland	Inter-Mountain Basins Big Sagebrush Shrubland
		Great Basin-Intermountain Dry Shrubland and Grassland	Inter-Mountain Basins Semi-Desert Grassland

Class	Formation	Macrogroup	Ecological System
			Inter-Mountain Basins Semi-Desert Shrub Steppe
		Intermountain Basins Cliff, Scree and Badlands Sparse Vegetation	Colorado Plateau Mixed Bedrock Canyon and Tableland
Open Rock Vegetation	Temperate and Boreal Cliff, Scree and Other Rock Vegetation	Western North American Temperate Cliff, Scree and Rock Vegetation	Rocky Mountain Cliff, Canyon and Massive Bedrock
Open Water	Open Water	Open Water	Open Water (Fresh)

Noxious Weeds

Nearly all noxious species in New Mexico are found on rangelands and wildlands. Noxious species of weeds may result in reductions in available forage for wildlife and livestock. The New Mexico Department of Agriculture is directed by the Noxious Weeds Management Act to create a noxious weed list for the state, educate the public about these noxious weeds, and identify methods of control for specific species. The New Mexico Department of Agriculture coordinates with local, state, and federal land managers, as well as private landowners, about weed management practices.

Noxious weeds were not found in the initial site survey. However, there is potential for noxious weed seed transport and establishment during project construction activities. Vehicles traverse lands lacking noxious weeds after driving through lands containing noxious weeds. This could lead to potential noxious weed establishment. An Integrated Reclamation Plan consistent with the BLM's Integrated Pest Management Program, Socorro RMP, and following Catron County specifications, is included in Appendix E (Integrated Reclamation Plan).

5.1.3 Cultural Resources

Cultural resources include prehistoric and historic resources, which are protected by federal and state laws. If a project requires a federal permit, license, or approval, the federal agency must comply with Section 106 of the National Historic Preservation Act, which requires that all cultural items found within the area of potential effects must be recorded and assessed for National Register of Historic Places eligibility. Cultural resources refer to both human-made and natural physical features significant to Native identity and, in most cases, are finite, unique, fragile, and nonrenewable. Cultural resources that meet the eligibility criteria for listing in the National Register of Historic Places are considered “significant” resources and must be taken into consideration during the planning of federal projects.

Cultural Resources in the Project Area

A cultural resources survey was completed in coordination with the BLM. Results of the survey are presented in the report “A Class III Cultural Resources Survey for the Borderlands Wind Project, Catron County, New Mexico” (NMCRIIS_140961) that was submitted to the BLM for review. Results of the survey, coordination (including with the Zuni tribe), and an analysis of impacts to cultural resources will be discussed in greater detail in the EIS.

5.1.4 Noise

The nearest sensitive noise receivers are four developed rural residences located within or near the vicinity of the project area. These residences are all approximately 0.8 mile (unknown residence), 2.0 miles (Houston residence), 2.6 miles (Hooper residence), and 6.4 miles (Chavez residence) away

from the nearest turbine. The communities of Red Hill and Quemado are the closest communities and are 4.9 miles and more than 13 miles from the project, respectively. These communities (sensitive receivers) are not expected to be affected by project-related noise due to the distance from the proposed project. There are no incorporated areas or Catron County–designated community nodes in the project area. An analysis of noise impacts to the sensitive noise receivers and communities will be discussed in the EIS.

Construction Noise

During construction, which is expected to last approximately 5 to 6 months, short-term noise would be generated by on-site construction and by the transportation of workers and equipment. Temporarily elevated noise levels can be expected in the project ROW and along the roads to and from the ROW.

The project is estimated to generate a peak of approximately 500 trips per day on U.S. 60 (based on 160 construction personnel leaving and entering and 50 delivery trucks leaving and entering the project site). The highest noise levels typically occur with earthmoving equipment (bulldozers, excavators, backhoes, etc.) and road-building equipment (compactors, scrapers, graders, etc.). Typical operating cycles may involve 1 or 2 minutes at full-power operation, followed by 3 or 4 minutes at lower power settings. If required, blasting may be an additional source of noise during construction. Blasting times would be limited to the hours between 6 a.m. and 8 p.m., and nearby residents would be notified in advance if blasting occurs. The amount of blasting required, if any, is unknown at this time. Should blasting be required, a Blasting Plan (Appendix I) would be included in the POD.

Operational Noise

During commercial operation, the WTGs would generate a swooshing sound as the blades pass through the air. The level of this sound diminishes with distance. For a typical configuration, the sound of the WTGs is barely audible for residences at a distance of 1,500 feet from the WTG under most atmospheric conditions.

Federal codes, and primarily the Occupational Safety and Health Act of 1970, regulate worker exposure to noise levels, and these would apply during construction and maintenance of the project. These codes limit worker exposure to noise levels of 85 decibels or lower over an 8-hour period. The project would comply with all federal, state, and local requirements with respect to noise levels during construction and operation. The Health and Safety Plan (Appendix F) would include methods for avoiding and/or mitigating noise impacts.

5.1.5 Air Quality

The project site is located in the Southwestern Mountains-Augustine Plains Air Quality Control Region 156. The region covers over 20,000 square miles of the western portion of New Mexico, and includes Catron County, Socorro County, portions of McKinley County, and portions of Valencia County. The region is located between Sections 1 and 1, Township 7 North, Range 2 West; then southerly on section lines to the Socorro/Valencia County line at Sections 11–14, Township 5 North, Range 2 West (Figure 35).

There are six pollutants the Clean Air Act established as National Ambient Air Quality Standards (NAAQS): particulate matter (PM), sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, and lead. Compliance with NAAQS for the project area is shown in Table 11.

**Table 11. Southwestern Mountains-Augustine Plains Air Quality Control Region
156 Compliance with NAAQS**

Constituent	Status
Ozone–1-hour	Compliant
Ozone–8-hour	Compliant
PM ₁₀	Minor Source 08/04/1978
PM _{2.5}	Compliant
Carbon monoxide	Compliant
Nitrogen dioxide	None
Sulfur dioxide	Minor Source 08/04/1978
Lead particulates	None

Notes:PM₁₀ = particulate matter less than 10 microns in aerodynamic diameterPM_{2.5} = particulate matter less than 2.5 microns in aerodynamic diameter

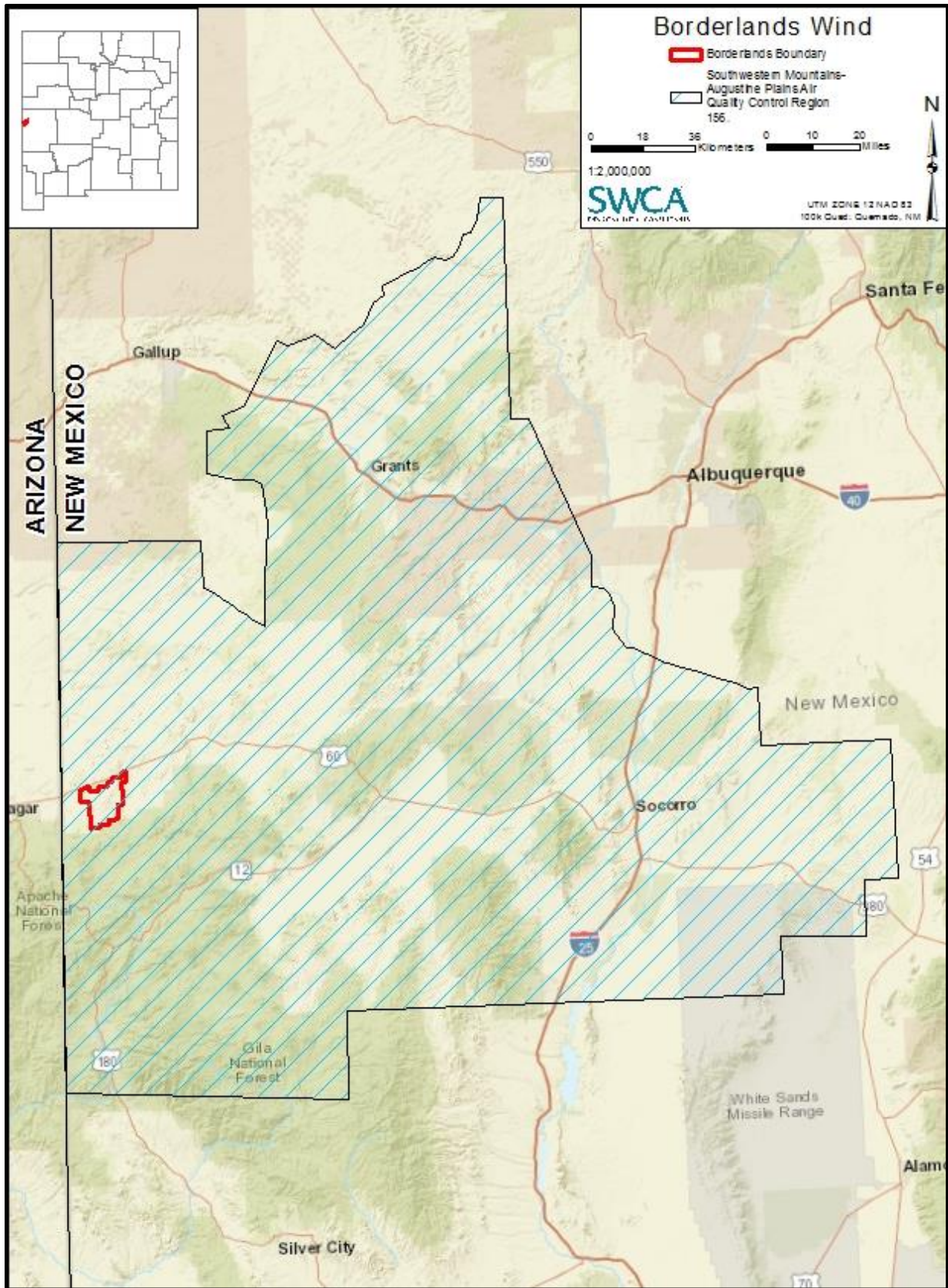


Figure 35. Southwestern Mountains-Augustine Plains Air Quality Control Region 156.

Exhaust from construction equipment may result in short-term emissions of nitrogen oxides and reactive organic compounds. Soil disturbance, mobile-source exhaust emissions, travel on unpaved roads, and on site concrete batch may contribute to PM emissions during construction.

Additionally, the project would involve staff of up to 5 workers on-site during operations. These workers would need to monitor WTG and system operations, troubleshoot malfunctions, perform routine instructions, shut down and restart turbines, and provide security; therefore, workers would travel on-site. Project operations may require the use of a forklift to unload parts and other on-site support equipment.

Additionally, diesel-powered backup generators may be used during operations; therefore, a diesel-powered fire pump may be necessary. Workers driving on-site would create exhaust and on-site support equipment would result in small portions of long-term emission of nitrogen oxides and reactive organic compounds. Workers driving on unpaved roads would also contribute to some long-term emissions of PM₁₀. A Dust Control and Air Quality Plan (Appendix O) would further detail project-specific air quality and dust control methods.

5.1.6 Jurisdictional Waters and Wetlands

The U.S. Army Corps of Engineers (USACE) has jurisdiction over dredge or fill impacts to waters of the U.S., which include wetlands, as well as permanent, intermittent, and ephemeral drainages under Section 404 of the Clean Water Act.

The project area is located in hydrologic basin HUC #15020003 and ranges in elevation from 7,100 to 8,100 feet (USFWS 2016; USGS 2016). A jurisdictional determination for waters of the U.S. would be necessary to determine the presence and extent of water of the U.S. subject to Section 404 of the Clean Water Act. The project would avoid impacts to waters of the U.S. to the extent practicable. If crossings over or borings under potentially jurisdictional features are needed, as the project engineering is finalized, Borderlands Wind would submit a wetland delineation report to the USACE and request a jurisdictional determination and obtain necessary permits from the USACE (i.e.- Nationwide 12 or Nationwide 14).

5.1.7 Visual Quality

Wind turbines can be visible from as far away as 30 miles, depending on the height of the turbines, atmospheric conditions, and lines of sight toward the project from the surrounding landscape.

Potential visual resource impacts from the project would depend on the degree to which it would substantially affect a scenic vista, alter the existing visual character of the area, or be a new source of light and glare in the area. The degree to which project components would appear as new features in the landscape would dictate the extent of potential visual impacts.

Visual impacts that would result from the project are currently undetermined. BLM will undertake a Visual Impact Analysis in the EIS.

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APPENDIX A

Site Plans

(To be submitted with the final POD)

APPENDIX B

Legal Descriptions

(To be submitted with the final POD)

APPENDIX C

Alternatives Considered by Borderlands Wind

The following alternatives were considered by Borderlands Wind for the Borderlands Wind Project, but are not analyzed in detail in this POD.

VRM IV Turbine Array Layout

Under this alternative, all 40 wind turbine generators (WTGs) would be located within the designated Visual Resource Management (VRM) Class IV areas that are in the southern end of the project area near U.S. Forest Service–administered lands. The alternative would concentrate the “high” degree of impacts to visual resources in VRM Class IV areas, where such impacts can occur. Additionally, placing all turbines in the VRM Class IV area would minimize impacts to the potential eagle nest located in the northeast corner of the project area, which is located in VRM Class II (10 miles away from the VRM Class IV area). However, this alternative does not provide the standard amount of land and spacing required for commercial energy projects of this size. Therefore, fewer WTGs would be used for the project, and the project would not be able to output the 100 MW required to satisfy the Power Purchase Agreement (PPA) between TEP and NextEra Energy Resources, LLC.

VRM II Turbine Array Layout

Under this alternative, some of the 40 WTGs would be located within the designated VRM Class II areas located in the northern portion of the project area that follows U.S. 60. This alternative would create a “high” degree of impacts to visual resources in VRM Class II areas, where such impacts cannot occur. This alternative would require a plan amendment to the Socorro RMP and approval by the BLM for impacts to occur in VRM Class II areas. Additionally, this alternative would minimize potential impacts to an eagle nest located in the northeast corner of the project area by moving WTGs away from that area. Since the number of WTGs is the same as the Proposed Action, the terms of the PPA would be met.

250-MW Turbine Array Layout

Under this alternative, the proposed project would deliver up to 250 MW of electricity. This could be achieved by either increasing the size or number of turbines, or a combination of both. The layout of this alternative would likely increase the size of some of the turbines and increase the overall number of WTGs within the project area. No WTGs would occur in VRM Class II areas within the project area. This alternative would increase the impacts to many affected resources within the project area. A site-specific layout would determine the affected resources and extent of impacts. Since the number of WTGs is at least as many as under the Proposed Action, the terms of the PPA would be met.

APPENDIX D

Stormwater Pollution Prevention Plan (To be submitted with the final POD)

APPENDIX E

**Integrated Reclamation Plan
(To be submitted with the final POD)**

APPENDIX F

**Health and Safety Plan
(To be submitted with the final POD)**

APPENDIX G

Spill Prevention, Control, and Countermeasure Plan (To be submitted with the final POD)

APPENDIX H

Design Criteria (Proponent Constraints and Mitigation Measures)

The following design criteria (proponent constraints and mitigation measures) would be implemented during each applicable phase of the proposed project. These design criteria and measures are based upon the BLM’s Final Programmatic Environmental Impact Statement on Wind Energy Development (BLM 2005) and BLM Wind Energy Development Policy (BLM 2009).

Site Monitoring and Testing

- The area disturbed by installation of meteorological towers (i.e., footprint) shall be kept to a minimum.
- Existing roads shall be used to the maximum extent feasible. If new roads are necessary, they shall be designed and constructed to the appropriate standard.
- Meteorological towers shall not be located in sensitive habitats or in areas where ecological resources known to be sensitive to human activities (e.g., prairie grouse) are present. Installation of towers shall be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors.
- Meteorological towers installed for site monitoring and testing shall be inspected periodically for structural integrity.

General

- Borderlands Wind will plan for efficient use of the land. Any necessary infrastructure requirements will be consolidated wherever possible, and current transmission and market access will be evaluated carefully.
- Borderlands Wind will utilize existing roads and utility corridors to the maximum extent feasible, and to minimize the number and length/size of new roads, lay-down areas, and borrow areas.
- Borderlands Wind will develop “good housekeeping” procedures to ensure that during operation the site will be kept clean of debris, garbage, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards.

Wildlife and Other Ecological Resources

- Borderlands Wind will design the project to avoid (if possible), minimize, or mitigate impacts to important, sensitive, or unique habitats in the project vicinity (e.g., locate the turbines, roads, and ancillary facilities in the least environmentally sensitive areas; i.e., away from riparian habitats, streams, wetlands, drainages, or critical wildlife habitats).
- Borderlands Wind will design the project to minimize or mitigate the potential for bird and bat strikes.
- Borderlands Wind will site turbines to avoid landscape features known to attract raptors (to the extent practical) if site studies show that placing turbines there would pose a significant risk to raptors.
- Borderlands Wind will avoid placing turbines near known bat hibernation, breeding, and maternity/nursery colonies; in known migration corridors; or in known flight paths between colonies and feeding areas (to the extent practicable).
- Borderlands Wind will consider measures to reduce raptor use at a project site.

- Borderlands Wind will design facilities to discourage facility structure's use as perching or nesting substrates by birds (to the extent practicable).
- Design the project to avoid (if possible), minimize, or mitigate impacts to these resources. Mitigation may include seasonal use restrictions, if other mitigation is not possible, during construction and operation.

Visual Resources

- Borderlands Wind will integrate the turbine array with the surrounding landscape to the extent practicable. Design elements to be addressed include visual uniformity, use of tubular towers, proportion and color of turbines, nonreflective paints, and prohibition of commercial messages on turbines.
- Borderlands Wind will integrate other site design elements with the surrounding landscape to the extent practicable including minimizing the profile of the ancillary structures, burial of cables, prohibition of commercial symbols, and lighting. Borderlands will minimize the need for and amount of lighting on ancillary structures.
- Borderlands Wind will prepare an access road siting and management plan incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual (BLM 1985).
- Design the project to avoid (if possible), minimize, or mitigate impacts to these resources.

Noxious Weeds and Herbicides

- Borderlands Wind will use certified weed-free mulching. Trucks and construction equipment are arriving from locations with known invasive vegetation problems, will undergo a controlled inspection and a cleaning area will be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.
- Borderlands Wind may use herbicides on the site, and an integrated weed management plan will be developed to ensure that applications would be conducted within the framework of BLM and DOI policies and entail only the use of EPA-registered herbicides. Borderlands will only apply herbicides in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.
- Design the project to avoid (if possible), minimize, or mitigate impacts to these resources.

Cultural/Historic Resources

- Borderlands Wind will avoid cultural resources to the extent practicable and coordinate with BLM and/or tribes on other mitigation measures.
- Borderlands Wind will include in their construction worker training and operations staff training, the protocols for unanticipated discoveries and the consequences of unauthorized collection and destruction of artifacts on public land.
- Design the project to avoid (if possible), minimize, or mitigate impacts to these resources.
- Borderlands Wind will develop a discovery plan for construction activities in case of inadvertent cultural resource discoveries.

Paleontological Resources

- Borderlands Wind will avoid paleontological resources to the extent practicable.
- Borderlands Wind will include in their construction worker training and operations staff training, the protocols for unanticipated discoveries and the consequences of unauthorized collection and destruction of fossils on public land
- Design the project to avoid (if possible), minimize, or mitigate impacts to these resources.

Construction

To minimize impacts during construction, the following design criteria (proponent constraints and mitigation measures) were implemented.

General

- Borderlands Wind will minimize the area disturbed by construction and operation of the project (i.e., footprint).
- Borderlands Wind will minimize the number and size/length of roads, temporary fences, lay-down areas and borrow areas.
- Borderlands Wind will salvage and reapply during reclamation, the topsoil from all excavations and construction activities.
- Borderlands Wind will reclaim all areas of disturbed soil using weed-free native grasses, forbs, and shrubs. Reclamation activities will be undertaken as early as possible on disturbed areas.
- Borderlands Wind will bury all electrical collector lines in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance).
- Borderlands Wind will avoid creating excessive slopes during excavation and blasting operations. Special construction techniques will be used, where applicable, in areas of steep slopes, erodible soil, and stream channel crossings.
- Borderlands Wind will utilize erosion controls that comply with county, state, and federal standards Practices such as jute netting, silt fences, and check dams will be applied near disturbed areas.

Wildlife

- Borderlands Wind will undertake restoration in accordance with the habitat restoration plan as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.
- Borderlands Wind will implement a worker environmental awareness training to educate/instruct all construction employees to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. Borderlands will not allow employees' pets on site during construction.

Visual Resources

- Borderlands Wind will reduce visual impacts during construction by minimizing areas of surface disturbance, controlling erosion, using dust suppression techniques, and restoring exposed soils as closely as possible to their original contour and vegetation.

Roads

- Borderlands Wind will use existing roads but only if in safe and environmentally sound locations. If new roads are necessary, roads will be designed and constructed to the appropriate standard and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Excessive grades on roads, road embankments, ditches, and drainages will be avoided, especially in areas with erodible soils. Special construction techniques will be used, where applicable. Abandoned roads and roads that are no longer needed will be recontoured and revegetated.
- Where appropriate, Borderlands Wind will use aggregate materials on road surfaces.
- Borderlands Wind will design any new roads to follow natural contours and minimize side hill cuts.
- Borderlands Wind will locate roads away from drainage bottoms and avoid wetlands, if practicable.
- Borderlands Wind will design roads so that changes to surface water runoff are avoided and erosion is not initiated.
- Borderlands Wind will locate roads to minimize stream crossings. All structures crossing streams will be located and constructed so that they do not decrease channel stability or increase water velocity. All applicable federal and state permits will be obtained.
- Borderlands Wind will not alter existing drainage systems, especially in sensitive areas such as erodible soils or steep slopes. Potential soil erosion will be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts will be cleaned and maintained regularly.
- Borderlands Wind will construct gates along access roads that intersect allotment pasture fences as necessary.

Ground Transportation

- Borderlands Wind construction personnel and contractors will be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types, and site-specific conditions, to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and airborne dust.
- Borderlands Wind will restrict traffic to the roads developed for the project. Use of other unimproved roads shall be restricted to emergency situations.
- Borderlands Wind will place signs along construction roads to identify speed limits, travel restrictions, and other standard traffic control information.

Air Emissions

- Borderlands Wind will use dust abatement techniques on unpaved, unvegetated surfaces to minimize airborne dust.
- Borderlands Wind will post and enforce speed limits (e.g., 25 mph [40 km/h]) to reduce airborne fugitive dust.
- Borderlands Wind will cover construction materials and stockpiled soils if they are a source of fugitive dust.
- Borderlands Wind will implement dust abatement techniques before and during surface clearing, excavation, or blasting activities.

Excavation and Blasting Activities

- Borderlands Wind will avoid creating hydrologic conduits between two aquifers during foundation excavation and other activities.
- Borderlands Wind will backfill foundations and trenches with originally excavated material as much as possible. Excess excavation materials will be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities.
- Borderlands Wind will obtain borrow material only from authorized and permitted sites and existing sites may be used instead of new sites
- Borderlands Wind will coordinate with BLM and other federal and state agencies to establish the parameters for use of explosives with respect to timing, specified distances from sensitive wildlife or streams and lakes.

Noise

- Borderlands Wind will limit noisy construction activities (including blasting) to the least noise-sensitive times of day (i.e., daytime only between 6 a.m. and 10 p.m.) and weekdays.
- Borderlands Wind will ensure that all construction equipment will have sound-control devices no less effective than those provided on the original equipment. All construction equipment used will be adequately muffled and maintained.
- Borderlands Wind will ensure that all stationary construction equipment (i.e., compressors and generators) will be located as far as practicable from nearby residences.
- Borderlands Wind will notify nearby residents in advance if blasting or other noisy activities are required during the construction period.

Cultural and Paleontological Resources

- Borderlands Wind will bring to the attention of the BLM authorized officer any unexpected discovery of cultural or paleontological resources during construction. Work will be halted in the vicinity of the find to avoid further disturbance to the resources while the resource(s) is being evaluated and appropriate mitigation measures are being developed.

Hazardous Materials and Waste Management

- Borderlands Wind will ensure that secondary containment is provided for all on-site hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) will be a temporary activity occurring only for as long as is needed to support construction activities.
- Borderlands Wind will ensure wastes are properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.
- In the event of an accidental release to the environment, Borderlands Wind will document the event, including a root cause analysis, appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event will be provided to the BLM authorized officer and other federal and state agencies, as required.
- Borderlands Wind will ensure that any wastewater generated in association with temporary, portable sanitary facilities will be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility. Temporary, portable sanitary facilities provided for construction crews will be adequate to support expected on-site personnel and will be removed at completion of construction activities.

Public Health and Safety

- Borderlands Wind will install temporary fencing around staging areas, storage yards, and excavations during construction to limit public access.

Operation

To minimize impacts during the operations phase of the project, the following design criteria (proponent constraints and mitigation measures) will be implemented.

General

- Borderlands Wind will ensure that inoperative turbines will be repaired, replaced, or removed in a timely manner. Borderlands understands that requirements to do so will be incorporated into the due diligence provisions of the ROW authorization. Borderlands will be required to demonstrate due diligence in the repair, replacement, or removal of turbines; failure to do so could result in termination of the ROW authorization.

Wildlife

- Borderlands Wind will ensure that employees, contractors, and site visitors will be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. Borderlands will also ensure that no pets will be allowed on site to avoid harassment and disturbance of wildlife.
- Borderlands Wind will ensure that observations of potential wildlife problems, including wildlife mortality, will be reported to the BLM authorized officer. Threatened and endangered species fatalities, as well as eagle fatalities, will be reported within 24 to 48 hours to the BLM authorized officer. All other fatality events will be reported in a year-end report. This includes following the methodology outlined in the Bird and Bat Conservation Strategy (Appendix M), which will include specifics for a downed wildlife observation program and reporting, as well as a post-

construction fatality monitoring and searcher efficiency program for general avian species, eagles, and bats.

Ground Transportation

- Borderlands Wind will ensure that 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.

Monitoring Program

- Borderlands Wind will ensure that any site monitoring protocols defined in this POD and plans associated with this POD will be implemented. These will incorporate monitoring program observations and additional mitigation measures into standard operating procedures and BMPs to minimize future environmental impacts.
- Borderlands will provide the results of monitoring program efforts to the BLM authorized officer.

Public Health and Safety

- Borderlands Wind will install and maintain permanent fencing around the electrical substation/switchyard. Turbine tower access doors will be locked to limit public access.
- In the event the project results in EMI, Borderlands Wind will work with the owner of the impacted communications system to resolve the problem. Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.

Decommissioning

To minimize impacts during the decommissioning phase of the project, the following design criteria (proponent constraints and mitigation measures) will be implemented.

General

- Borderlands Wind will remove all turbines and ancillary structures.
- Borderlands Wind will salvage and reapply topsoil from all decommissioning activities during final reclamation.
- Borderlands Wind will reclaim (using weed-free native shrubs, grasses and forbs) all areas of disturbed soil.
- Borderlands Wind will ensure that the vegetation cover, composition, and diversity is restored to values commensurate with the ecological setting.

APPENDIX I

Blasting Plan

(To be submitted with the final POD)

APPENDIX J

**Road Design, Traffic and Transportation Plan
(To be submitted with the final POD)**

APPENDIX K

**Flagging, Fencing, and Signage Plan
(To be submitted with the final POD)**

APPENDIX L

Decommissioning Plan

(To be submitted with the final POD)

APPENDIX M

**Bird and Bat Conservation Strategy, including Eagle Management Plan
(To be submitted with the final POD)**

APPENDIX N

**Cultural Properties Treatment Plan
(To be submitted with the final POD)**

APPENDIX O

**Dust Control and Air Quality Plan
(To be submitted with the final POD)**

APPENDIX P

**Environmental Construction Compliance Monitoring Program
(To be submitted with the final POD)**

APPENDIX Q

Paleontological Mitigation and Monitoring Plan (To be submitted with the final POD)

APPENDIX D: FEDERALLY LISTED SPECIES WITH THE POTENTIAL TO OCCUR AND CRITICAL HABITATS OCCURRING IN THE BLWP AREA (TABLE D-1)

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Table D-1. Federally Listed Species with the Potential to Occur and Critical Habitats Occurring in the BLWP Area

Common Name (<i>Scientific Name</i>)	Status [‡]		Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
	Federal	State			
Amphibians					
Chiricahua leopard frog (<i>Rana chiricahuensis</i>)	T w/CH	SGCN	Permanent or semi-permanent springs, livestock tanks, and streams in the upper portions of watersheds at elevations between 3,000 and 9,000 feet. Often do not coexist with nonnative species (e.g., bullfrogs, nonnative fishes, crayfish). In New Mexico, may occur in west-central and southwestern portions of the State. Known or believed to occur in six New Mexico counties, including Catron County.	Unlikely to be present. The project is within the geographic range of the species; however, the water features in the BLWP area are either small, man-made, heavily-managed aboveground cattle tanks or are not permanent or semi-permanent (playas). There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Critical habitat for the species is located approximately 18 miles southeast of the BLWP area (Apache Creek: Kerr Canyon, New Mexico).	Year-round, may disperse
Birds					
Least tern (<i>Sternula antillarum</i>)	E	E, SGCN	Nests in colonies on bare or sparsely vegetated sandy beaches, sandbars, islands, and a variety of deposited materials along coasts, bays, major inland rivers, large lakes and reservoirs, alkali wetlands, and gravel and sand pits; also breeds on flat gravel rooftops in certain coastal areas. Known to breed in the vicinity of Roswell, New Mexico, including regularly at Bitter Lake National Wildlife Refuge. Migrates along major river drainages and may occur as rare vagrant at appropriate wetlands throughout New Mexico. Known or believed to occur in 10 New Mexico counties, including Catron County.	Unlikely to be present. The BLWP area is outside (west) of the species' breeding range and there are no large, permanent aquatic habitats in the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. eBird (2018) indicates the nearest known records of the species are from Nelson Reservoir, Arizona, approximately 15 miles west-southwest of the BLWP area.	Breeding, Migration
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	T w/CH	SGCN	Nests and roosts primarily in high-elevation (4,000-10,000 feet) old growth forests: mixed conifer dominated by Douglas-fir, pine, or true fir and pine-oak forests dominated by ponderosa pine and Gambel oak. Secondarily, in steep, narrow canyons with cliffs and perennial water. Breeding and roosting habitats typically include steep slopes with high canopy closure, high basal area, many snags, and many downed logs. Foraging, juvenile dispersal, and wintering habitats are more diverse and include a wide variety of forest conditions (including pinyon-juniper), canyon bottoms, cliff faces, tops of canyon rims, and riparian areas. Wintering owls will also use mountain-shrub habitat. Known or believed to occur in 21 New Mexico counties, including Catron County.	May be present. While the BLWP area does not contain typical nesting and roosting habitat, sparse (low to moderate canopy closure) ponderosa pine and pinyon-juniper habitats may be used by foraging, juvenile, and wintering birds. The nearest known records (NHHM data) of the species are approximately 4 miles south and 6 miles southwest of the BLWP area. Critical habitat for the species is located approximately 5 miles southwest of the BLWP area (Canovas Spring, Canovas Creek; New Mexico).	Year-round, may disperse/migrate
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	E w/CH, BCC (BCR 16)	E, SGCN	Breeds from sea level to over 8,500 feet in dense, mesic riparian habitats at scattered, isolated sites. Breeds near surface water or saturated soil along rivers and streams, reservoirs, cienegas, and other wetlands. Nesting habitat is typically dense vegetation in the 2- to 5-meter range, with or without a high overstory layer, where surface water or soil moisture is high enough to maintain appropriate vegetation characteristics. During migration, the subspecies uses a wider array of forest and shrub habitats, although riparian vegetation may still be a preferred migration habitat type. Known or believed to occur in 22 New Mexico counties, including Catron County.	Unlikely to be present. The BLWP area does not contain dense, mesic, riparian habitats. There are no known records of the subspecies in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Critical habitat for the subspecies is located approximately 18 miles south of the BLWP area (San Francisco River: Luna Valley, New Mexico).	Breeding, Migration
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	T w/PCH, BCC (BCR 16, 34)	SGCN	Nests in low- to moderate-elevation (usually below 6,600 feet) riparian woodlands with native broadleaf trees and shrubs that are 50 acres or more in extent. Most commonly associated with cottonwood/willow-dominated vegetation cover, but composition of dominant riparian vegetation can vary across range. Has not been found nesting in isolated patches (1-2 acres) or narrow, linear riparian habitats less than 10 to 20 meters wide; migrant cuckoos have been detected in these habitats. During migration uses a wider array of forest and shrub habitats but is rarely observed away from riparian habitats. Known or believed to occur in 25 New Mexico counties, including Catron County.	Unlikely to be present. The BLWP area does not contain riparian habitats. There are no known records of the subspecies in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. eBird (2018) indicates a record of the species at Becker Lake Wildlife Area, Springerville, Arizona (approximately 21 miles west of the BLWP area). Proposed critical habitat for the species is located approximately 41 miles south of the BLWP area (San Francisco River: Pueblo Creek confluence, New Mexico).	Breeding, Migration

Common Name (<i>Scientific Name</i>)	Status [†]		Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
	Federal	State			
Fishes					
Gila chub* (<i>Gila intermedia</i>)	E w/CH	E, SGCN	Deep waters, especially pools, or near cover in headwater streams, cienegas, and artificial impoundments within the Gila River Basin at elevations from 2,000 to 5,500 feet. In New Mexico, known or believed to occur in Grant County.	Unlikely to be present. The BLWP area is outside (north) of the species geographic range, is above the species' elevational range, and does not contain perennial waters. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Critical habitat for the species is located approximately 42 miles southwest of the BLWP area (East Eagle Creek, Arizona).	Year-round
Gila topminnow* (<i>Poeciliopsis occidentalis</i>)	E	T	Small streams, springs, and cienegas below 5,000 feet within the Gila River drainage. Use primarily shallow, warm, quiet waters with aquatic vegetation and debris cover. According to USFWS (2017c), known or believed to occur in two New Mexico counties: Grant and Hidalgo; however, extant populations are not known in the State.	Unlikely to be present. The BLWP area is outside (north) of the species geographic range, is above the species elevational range, and does not contain perennial waters. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Year-round
Gila trout (<i>Oncorhynchus gilae</i>)	T	T, SGCN	Small mountain headwater streams, which are generally narrow and shallow, at elevations between 5,000 and 10,000 feet. Typically congregate in deeper pools or in shallow water with sufficient protective debris or plant beds. Known or believed to occur in three New Mexico counties, including Catron County.	Unlikely to be present. The BLWP area is within the species general geographic and elevational range; however, there are no headwater streams in the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Year-round
Loach minnow (<i>Rhinichthys cobitis</i>)	E w/CH	E, SGCN	Perennial creeks and rivers below 8,000 feet. Typically in shallow turbulent riffles with cobble substrate, swift currents, and filamentous algae. In New Mexico, may be found in the Gila, San Francisco, and Blue Rivers and their tributaries. Known or believed to occur in three New Mexico counties, including Catron County.	Unlikely to be present. The BLWP area is within the species general geographic and elevational range; however, there are no perennial waters in the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Critical habitat for the species is located approximately 19 miles south-southeast of the BLWP area (San Francisco River: The Box).	Year-round
Spikedace (<i>Meda fulgida</i>)	E w/CH	E, SGCN	Moderate to large perennial streams typically under 6,000 feet. Occurs in moderate to fast velocity waters over gravel and rubble substrates. In New Mexico, found in the mainstem and lower end of the West, Middle, and East forks of the Gila River. Known or believed to occur in three New Mexico counties, including Catron County.	Unlikely to be present. The BLWP area is within the species' general geographic range; however, there are no streams in the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Critical habitat for the species is located approximately 22 miles south-southwest of the BLWP area (Dry Blue Creek, New Mexico).	Year-round
Flowering Plants					
Zuni fleabane [†] (<i>Erigeron rhizomatus</i>)	T	E, NMRP (E)	Associated with open pinyon-juniper woodlands at 7,300 to 8,000 feet on nearly barren gray detrital clay or selenium-rich red hillsides with soils derived from shales of the Chinle or Baca formations. Most often on north- or east-facing slopes. Suitable soils occur most extensively in the Sawtooth Mountains and in the northwestern portion of the Datil Mountains in Catron County, New Mexico, where approximately 30 occurrence sites are known. Fewer occurrence sites are known in McKinley County, New Mexico, and Apache County, Arizona. Known or believed to occur in four New Mexico counties, including Catron County.	Unlikely to be present. The Sawtooth and Datil Mountains are located approximately 45 and 55 miles east-northeast of the BLWP area, respectively. The BLWP area contains pinyon-juniper woodlands, soils derived from shale, and is within the appropriate elevational range for the species. During initial site reconnaissance surveys, no nearly barren gray clay or red slopes were identified; characteristic gray clay slopes were observed during helicopter nest surveys approximately 5 miles south of the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. The species was not detected during a survey of the project footprint in July/August 2018.	Flowers in May and June

Common Name (<i>Scientific Name</i>)	Status [†]		Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
	Federal	State			
Mammals					
Mexican wolf (<i>Canis lupus ssp. baileyi</i>)	EP, NE	E, SGCN	Areas with sufficient prey populations, such as deer and elk, and where human-induced mortality is controlled. Current populations typically associated with evergreen pine-oak woodlands, pinyon juniper woodlands, and mixed-conifer montane forests. The Mexican Wolf Recovery (or non-essential Experimental Population) Area encompasses Arizona and New Mexico from Interstate 40 south to Mexico.	Known to be present. The BLWP area contains appropriate elk and cattle-occupied pinyon-juniper habitats. The BLWP area is within the Non-essential Experimental Population Area and borders the secondary recovery zone of the Blue Range Wolf Recovery Area, which is south of the site (Gila National Forest). USFWS (2015b) indicates a record of an un-collared wolf (or wolves) within or directly adjacent to the southern portion of the BLWP area. This portion of the BLWP area is within the 2015 core use area of the Fox Mountain/Mangas packs (only the Mangas Pack still occurs in this area). There have also been recent observations of the species by an SWCA biologist, a local rancher, and hunters. The species can clearly be present on-site; observations appear to indicate the species occurs occasionally/rarely. No critical habitat has been designated for this species.	Year-round, den April through May
New Mexico meadow jumping mouse (<i>Zapus hudsonius luteus</i>)	E w/CH	E	Tall, dense riparian herbaceous vegetation, especially sedges and forbs, associated with seasonally available or perennial flowing water. Also require adjacent intact upland areas for nesting and hibernation. In New Mexico, they have been found in the San Juan, Sangre de Cristo, Jemez, and Sacramento Mountains, and Rio Grande and lower Rio Chama Valleys. Known or believed to occur in 10 New Mexico counties; not known or believed to occur in Catron County.	Unlikely to be present, There are no riparian wetlands in the BLWP area and the BLWP area is outside (east and west) of the species' geographic range. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Critical habitat for the species is located approximately 15 miles west-southwest of the BLWP area (Nutrioso Creek, Arizona).	Year-round, generally nocturnal and generally active only during grass and forb growing season
Reptiles					
Narrow-headed gartersnake (<i>Thamnophis rufipunctatus</i>)	T w/PCH	T, SGCN	Clear, rocky streams and lake shorelines at elevations from 2,300 to 8,000 feet. Typically use pool and riffle habitat that includes sand, cobble, and boulder substrates. Use adjacent terrestrial habitats for foraging, thermoregulation, gestation, shelter, immigration, emigration, and brumation. Found in areas of high native fish concentration. Geographic range in New Mexico includes west-central and southwestern portions of the State in the upper Gila River and San Francisco River sub-basins. Known or believed to occur in four New Mexico counties, including Catron County.	Unlikely to be present. There are no streams or lakes within the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Proposed critical habitat for the species is located approximately 17 miles south of the BLWP area (San Francisco River, New Mexico).	Year-round, generally surface active between March and November
Northern Mexican gartersnake (<i>Thamnophis eques megalops</i>)	T w/PCH	--	Riparian obligate. Lotic and lentic habitats that include cienegas and stock tanks (earthen impoundments), and rivers containing pools and backwaters. Most frequently found between 3,000 and 5,000 feet, but may occur up to approximately 8,500 feet. Use adjacent terrestrial habitats for foraging, thermoregulation, gestation, shelter, immigration, emigration, and brumation. Found in areas of high native prey (fish and leopard frogs) concentration. Prey include leopard frogs and native fish, and secondarily, nonnative larval and juvenile bullfrogs and soft-rayed fish. In New Mexico, found in low population densities in the Gila River and perhaps Mule Creek. Known or believed to occur in three New Mexico counties, including Catron County.	Unlikely to be present. The BLWP area is outside of the extant population (known in the Gila River in southwestern New Mexico). Earthen impoundment stock tanks within the BLWP area contain water seasonally, but are far from riparian habitats; thus, movements associated with foraging, thermoregulation, gestation, shelter, immigration, emigration, and brumation would be unlikely. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Proposed critical habitat for the species is located approximately 34 miles southwest of the BLWP area (Black River, Arizona).	Year-round, generally surface active between June and September

Critical Habitats

There are no critical habitats within the BLWP area.

Notes: Range or habitat requirement information and potential occurrence justification from AGFD (2013), BISON-M (2018), eBird (2018), NatureServe (2017), New Mexico Rare Plant Technical Council (2005a-e), NHHM (2017), USFWS (2011, 2013b, 2014, 2015b, 2015c, 2016d, 2016e, 2017b, 2017c). Cited references are listed in Chapter 5. References of the Borderlands Wind Project Working ADEIS.

* Species is not included in project-specific list of threatened and endangered species that may occur (USFWS 2019c), but is included here because it is listed in the BISON-M-generated TES table for Catron County (BISON-M 2018).

[†] NRCS (2018)-recognized common name is rhizome fleabane.

‡ **Federal Status Definitions**

BCC = Bird of Conservation Concern

BCR = Bird Conservation Region

BLM S = BLM sensitive species for Socorro Field Office

CH = Designated critical habitat

E = Endangered. Endangered species are those in danger of extinction throughout all or a significant portion of their range

EP = Experimental Population

NE = Non-Essential

NHNM = Natural Heritage New Mexico

PCH = Proposed critical habitat

PT = Proposed threatened

T = Threatened. Threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of their range

State Status Definitions

E = Endangered. Endangered species are those in jeopardy of extinction or extirpation from the State

T = Threatened. Threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of their range in the State

NMRP = New Mexico rare plant

SGCN = Species of Greatest Conservation Need; species that are indicative of the diversity and health of the State's wildlife

APPENDIX E: SPECIAL STATUS SPECIES WITH THE POTENTIAL TO OCCUR IN THE BLWP AREA (TABLE E-1)

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Table E-1. Special Status Species with the Potential to Occur in the BLWP Area

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Amphibians				
Arizona toad (<i>Anaxyrus microscaphus</i>)	BLM S, SGCN	Shallow, flowing, permanent water over sandy or rocky substrates, typically in river canyons or foothill streams below 8,000 feet. Range includes west-central New Mexico.	Unlikely to be present: there are no river canyons or foothill streams in the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Year-round; Breed February through July
Arizona tree frog (<i>Hyla wrightorum</i>)	SGCN	Associated with coniferous forest from 3,000 to 9,500 feet where they are found on the ground or in shrubs and trees near ponds, pools, and streams. Known to frequent meadows in oak-pine or pine-fir forests. In New Mexico, occurs in west-central portion of the state.	May be present: the BLWP area is within the species range and includes seasonally wet playas. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Year-round; Breed June through August
Boreal chorus frog (<i>Pseudacris maculata</i>)	SGCN	High grasslands and forests; frequents meadows, lake margins, and generally marshy areas from 6,300 to 8,300 feet. In New Mexico, range includes northwestern portion of state; hypothetical range includes west-central portion of the state.	Unlikely to be present. The BLWP area does not contain meadows/marshy areas or lake margins. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Year-round; Breed November through July
Northern leopard frog (<i>Lithobates pipiens</i>)	BLM S, SGCN	Variety of habitats usually in permanent waters with rooted aquatic vegetation from sea level to 11,000 feet. In New Mexico, range includes northwestern, west-central, and south-central portions of the state.	Unlikely to be present: the BLWP area does not contain permanent waters. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Year-round; Breeds mid-March to early June.
Yavapai (lowland) leopard frog (<i>Lithobates yavapaiensis</i>)	NM-E, SGCN	Rivers, streams, cienegas, cattle tanks, agricultural canals and ditches, mine adits and other aquatic systems from desert grasslands to pinyon-juniper below 6,200 feet. Limited range in southwest New Mexico.	Unlikely to be present: the BLWP area contains cattle tanks; however, it is outside (north and east; >6,200 feet) of the species' general geographic and elevational range. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Year-round
Arthropod (insect)				
Monarch butterfly (<i>Danaus plexippus plexippus</i>)	BLM S	The monarch butterfly is a migratory species found throughout the United States, Canada, and Mexico. Its migration movements in the southwestern US are not well known. Suitable breeding habitat has host plants (milkweeds) where eggs are laid and larvae feed upon the leaves and stems.	May be present: the BLWP area is within the species range and milkweed species are known to occur.	Migration
Birds				
American bittern (<i>Botaurus lentiginosus</i>)	BCC (BCR 16), SGCN	Freshwater wetlands with emergent vegetation, brackish marshes, dry grasslands. Wintering range includes central and southern portions of New Mexico.	Unlikely to be present: BLWP area is situated in northern extreme border of wintering range for the species, and BLWP area wetlands do not contain emergent vegetation. eBird (2018) indicates nearest species records from Bosque del Apache National Wildlife Refuge approximately 117 miles east-southeast of the BLWP area.	Wintering
Baird's sparrow (<i>Ammodramus bairdii</i>)	BLM S, BCC (BCR 34), NM-T, SGCN	Dense, expansive grasslands with minor shrub component. Non-breeding range includes southwestern extreme of New Mexico.	Unlikely to be present: BLWP area is outside (north) of the species non-breeding range. eBird (2018) indicates species records approximately 118 miles east of the BLWP area.	Non-breeding
Bald eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA, BCC (BCR 16, 34), USFS SS, NM-T, SGCN	Aquatic habitats with open water or Southwest arid regions with available food and roost sites. Non-breeding eagles range throughout New Mexico; breeding eagles occur in limited, fragmented locations of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within non-breeding range and may provide foraging resources in the form of waterfowl and carrion.	Non-breeding

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Bell's vireo (<i>Vireo bellii</i>)	BLM S, BCC (BCR 34), NM-T, SGCN	Low, shrubby vegetation in riparian areas, brushy fields, second-growth forest, scrub oak, and mesquite brushlands. Breeding range includes south-central and southwestern portions of New Mexico.	Unlikely to be present: BLWP area is situated in northern extreme border of breeding range for the species and contains marginally suitable habitats. eBird (2018) indicates species recorded approximately 50 miles south of the BLWP area.	Breeding
Bendire's thrasher (<i>Toxostoma bendirei</i>)	BLM S, BCC (BCR 16, 34), SGCN	Desert habitats: grassland, shrubland, or woodland from sea level to approximately 6,000 feet. Breeding range includes west-central and northwestern portions of New Mexico; year-round range includes southwestern New Mexico.	May be present: BLWP area is above typical elevational range for the species; however, eBird (2018) indicates species records in general vicinity.	Breeding
Black swift (<i>Cypseloides niger</i>)	SGCN	Steep rock faces and canyons; range widely to forage over montane forests and open areas. In New Mexico, isolated breeding locations have been documented in north-central portion of the state.	Unlikely to be present: the BLWP area is outside of the species known breeding and migration range; known breeding in New Mexico is rare/isolated and includes north-central portion of the state. eBird (2018) indicates records 80 miles south and 140 miles northeast of the BLWP area.	Breeding, Migration
Black-chinned sparrow (<i>Spizella atrogularis</i>)	BCC (BCR 34), SGCN	Arid brushlands on slopes of chaparral, sagebrush, and pinyon-juniper from sea level to 9,000 feet. Breeding range includes central, west-central, and southern portions of New Mexico.	May be present: project is within the species breeding range and contains sloped-pinyon-juniper and shrub habitats. eBird (2018) indicates species records in general vicinity of BLWP area.	Breeding
Black-throated gray warbler (<i>Setophaga nigrescens</i>)	BCC (BCR 34), SGCN	Open coniferous or mixed coniferous-deciduous woodland with brushy undergrowth, pinyon-juniper and pine-oak associations, and oak scrub. Breeding range includes central, west-central, north-central, and northwestern portions of New Mexico.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species breeding range and contains pinyon-juniper and open coniferous woodland.	Breeding
Blue-throated hummingbird (<i>Lampornis clemenciae</i>)	BCC (BCR 34)	Moist pine-fir and highland deciduous forests, pine-oak woodland, forest edges, second growth, and shrubby areas. Breeding range includes extreme southwestern New Mexico and fragmented location in southeastern portion of the state.	Unlikely to be present: BLWP area is outside (north) of species breeding range. eBird (2018) indicates species records 50 miles south and 70 miles northeast of the BLWP area.	Breeding
Brewer's sparrow (<i>Spizella breweri</i>)	BCC (BCR 16)	Shrublands dominated by big sagebrush. May occur in desert scrub, large openings in pinyon-juniper, or large parklands with coniferous forests. Migration range includes west-central, central, eastern, and northeastern portions of New Mexico. Non-breeding range includes southern New Mexico. Breeds in northwestern portion of state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area contains pinyon-juniper woodland.	Migration
Brown pelican (<i>Pelecanus occidentalis</i>)	NM-E	Generally rare inland, but regular post-breeding visitor to inland waters in the Southwest.	Unlikely to be present: BLWP area is outside of the species typical range; however, may occur in vicinity of BLWP area as wanderer. eBird (2018) indicates species record from Quemado Lake approximately 21 miles east of BLWP area.	Vagrant/Accidental
Canyon towhee (<i>Melospiza fusca</i>)	BCC (BCR 34)	Desert grasslands with scattered, dense shrubs; riparian mesquite bosques; pinyon-juniper-oak; and pine-oak. Year-round range includes most of New Mexico except for eastern border and extreme northeastern portions of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species year-round range.	Year-round
Cassin's finch (<i>Haemorhous cassinii</i>)	BCC (BCR 16), SGCN	Open coniferous forest over broad elevational range including ponderosa pine and pinyon pine associations. Non-breeding range includes most of New Mexico except for eastern border; year-round range includes northern extreme of state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' non-breeding range and contains open ponderosa pine and pinyon-juniper woodlands.	Non-breeding
Cassin's sparrow (<i>Peucaea cassinii</i>)	SGCN	Arid and shrubby grasslands from sea level to 7,000 feet. In New Mexico, the species year-round range includes southern and central portions of the state. Breeding-only range includes northeastern portion of the state; breeding (scarce) includes west-central and north-central portions of the state.	May be present: the BLWP area is within the species' breeding (scarce) range and contains shrubby desert grassland. eBird (2018) indicates species record in vicinity (21 miles northeast) of BLWP area.	Breeding

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Chestnut-collared longspur (<i>Calcarius ornatus</i>)	BLM S, BCC (BCR 16, 34), SGCN	Low-grass desert grasslands and isolated water sources. Associated with prairie dog colonies. Non-breeding range includes most of New Mexico except for north-central portion of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' non-breeding range and contains desert grassland, isolated playas, and Gunnison's prairie dog colonies.	Non-breeding
Clark's nutcracker (<i>Nucifraga columbiana</i>)	SGCN	Generally open pinyon-juniper and pine/pine-fir woodlands from approximately 3,000 to 13,000 feet. In New Mexico, species' year-round range includes central (including west-central and north-central) and northwestern portions of the state.	May be present: the BLWP area is within the species' year-round range and contains open pinyon-juniper and ponderosa pine woodlands. eBird (2018) indicates species' records approximately 21 miles east, 22 miles west, and 34 miles north-northeast of the BLWP area.	Year-round
Common black hawk (<i>Buteogallus anthracinus</i>)	BCC (BCR 34), NM-T, SGCN	Mature gallery riparian forest. Breeding range includes west-central and southwestern portions of New Mexico.	Unlikely to be present: BLWP area does not contain appropriate habitat for the species. eBird (2018) indicates species' records approximately 20 miles south and 41 miles east-northeast of the BLWP area.	Vagrant/Accidental
Common nighthawk (<i>Chordeiles minor</i>)	SGCN	Variety of open habitats including sagebrush and desert grassland, prairies and plains, open forests, croplands, rock outcrops, and gravel rooftops. Breeds throughout New Mexico.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' breeding range and contains appropriate habitats.	Breeding
Eared grebe (<i>Podiceps nigricollis</i>)	SGCN	Use shallow lakes and ponds with emergent vegetation for breeding. Occur in highly saline staging areas and wide variety of ponds and lakes during spring migration. Winter in small numbers in interior lakes and reservoirs. In New Mexico, breeds in northwestern portion of state, migration in northeastern portion of the state, and non-breeding elsewhere.	May be present: The project is within the species' non-breeding range; seasonally wet playas may provide marginally suitable non-breeding habitat. Nearest species' records approximately 21 miles east (Quemado Lake, New Mexico) and 16 miles west-southwest (Nelson Reservoir, Arizona) of the BLWP area.	Non-breeding
Elegant trogon (<i>Trogon elegans</i>)	BCC (BCR 34), NM-E, SGCN	Sycamore, pinyon pine, pine, oak, and juniper riparian habitats and riparian edge vegetation. Breeding range includes southwestern extreme of New Mexico.	Unlikely to be present: BLWP area is well outside (north) of species' breeding range. eBird (2018) records approximately 170 miles from BLWP area.	Vagrant/Accidental
Elf owl (<i>Micrathene whitneyi</i>)	BCC (BCR 34), SGCN	Desert wash woodland, riparian forest, upland desert, and canyon riparian forest, and evergreen woodland. Breeding range includes west-central and southwestern portions of New Mexico.	May be present: BLWP area is situated in northern extreme border of breeding range for the species and contains evergreen woodlands. eBird (2018) indicates nearest species' records approximately 55 miles south of the BLWP area.	Breeding
Evening grosbeak (<i>Coccothraustes vespertinus</i>)	SGCN	Mixed-conifer and spruce-fir forests; less common in pine-oak, pinyon-juniper, ponderosa pine, and aspen forests. In winter, flocks typically observed in pinyon-juniper and ponderosa pine ecotone. In New Mexico, year-round (scarce) range includes west-central, central, north-central, and northwestern portions of the state; non-breeding (scarce) range elsewhere in the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the year-round (scarce) range and contains pinyon-juniper and ponderosa woodlands.	Year-round
Ferruginous hawk (<i>Buteo regalis</i>)	BCC (BCR 16)	Grasslands, shrub-steppe, pinyon-juniper, sparse riparian forests, and canyon areas with cliffs and rock outcrops. Year-round range includes northern half of New Mexico; wintering range includes southern half of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts and nest surveys.	Year-round
Flammulated owl (<i>Psiloscoptes flammeolus</i>)	BCC (BCR 16, 34), SGCN	Open, mature ponderosa pine or other forest (e.g., dry montane conifer, aspen) with similar features often with oak, dense saplings, or other brushy understory. Breed in fragmented locations in western half of New Mexico; migration range includes southwestern portion of the state.	May be present: BLWP area is within the species scattered breeding range and contains open, ponderosa pine woodland. eBird (2018) indicates records for the species in general vicinity of BLWP area.	Breeding
Gila woodpecker (<i>Malanerpes uropygialis</i>)	NM-T, SGCN	Saguaro desert, riparian woodland, and residential areas. Year-round range includes southwestern extreme of New Mexico.	Unlikely to be present: BLWP area is outside (north and east) of species' year-round range and does not contain appropriate habitats. eBird (2018) indicates species' records approximately 70 miles south of the BLWP area.	Vagrant/Accidental

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Golden eagle (<i>Aquila chrysaetos</i>)	BGEPA, BCC (BCR 16)	Mountainous canyon land, rimrock terrain of open desert, grassland, and forested areas. Year-round range includes most of New Mexico; non-breeding range includes southeastern extreme of state.	Known to occur: the species has been documented using the site during pre-construction avian use counts and nest surveys. The BLWP area contains foraging resources in the form of Gunnison's prairie dog colonies, rabbits, and carrion.	Year-round
Grace's warbler (<i>Setophaga graciae</i>)	BCC (BCR 16, 34), SGCN	Pine, pine-oak, and spruce-fir forest. Breeds throughout New Mexico except for southwestern portion of state.	May be present: the BLWP area is within the species' breeding range and contains ponderosa woodland. eBird (2018) indicates nearest species' record approximately 15 miles southeast of the BLWP area.	Breeding
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	BCC (BCR 16, 34)	Moderately open grasslands with patchy bare ground; grasslands may contain shrub cover. Non-breeding range includes southwestern extreme of New Mexico; breeding range includes northeastern extreme of the state.	Unlikely to be present: BLWP area is not within the species' range. eBird (2018) indicates a record of the species approximately 25 miles west-southwest of the BLWP area.	Vagrant/Accidental
Gray vireo (<i>Vireo vicinior</i>)	BCC (BCR 16, 34), USFS SS, NM-T, SGCN	Mixed pinyon-juniper and oak scrub associations and/or chaparral. Breeding range includes central and western New Mexico and a fragmented location in southeastern portion of state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' breeding range and contains pinyon-juniper woodlands.	Breeding
Juniper titmouse (<i>Baeolophus ridgwayi</i>)	BCC (BCR 16), SGCN	Pinyon-juniper woodlands; may be mixed with deciduous or evergreen oaks. May occur year-round throughout New Mexico except for the eastern border of the state; scarce in central and southern portions of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' year-round range and contains pinyon-juniper woodlands.	Year-round
Lark bunting (<i>Calamospiza melanocorys</i>)	BCC (BCR 34)	Grasslands and shrub-steppe, including agricultural areas. Migration range includes central and western New Mexico. Non-breeding range includes southern extreme of state. Year-round and breeding range includes northern and east-central portions of the state.	May be present: BLWP area is within the species' migration range and contains grassland and shrub-steppe habitats. eBird (2018) indicates nearest species' record approximately 14 miles north-northeast of the BLWP area.	Migration
Lewis's woodpecker (<i>Melanerpes lewis</i>)	BCC (BCR 16, 34), SGCN	Ponderosa pine and open riparian forests with brushy understory and dead or downed woody material; may also use oak, pinyon-juniper, and pine-fir woodlands, and nut and fruit orchards. Year-round range includes northern, west-central and south-central New Mexico. Non-breeding range includes central and southwestern portions of the state.	May be present: BLWP area is within the species' year-round range and contains ponderosa pine and pinyon-juniper habitats. eBird (2018) indicates records in general vicinity of BLWP area.	Year-round
Loggerhead shrike (<i>Lanius ludovicianus</i>)	SGCN	Pastureland and other open country including open woodlands and riparian areas with short vegetation and many perches (e.g., fence rows). Year-round resident throughout New Mexico.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' year-round range and contains appropriate habitats.	Year-round
Long-billed curlew (<i>Numenius americanus</i>)	BCC (BCR 16), SGCN	Short-grass prairie and wetlands associated with alkali lakes, playas, tidal flats, salt marshes, and agricultural fields. Migrates throughout New Mexico; breeding range includes north-central and northeastern portions of the state.	May be present: the BLWP area is within the species' migration range and contains playa wetlands. eBird (2018) indicates nearest species' records approximately 22 miles west of the BLWP area.	Migration
Lucy's warbler (<i>Oreothlypis luciae</i>)	SGCN	Riparian mesquite bosques and other riparian associations. Breeding range includes southwestern New Mexico.	Unlikely to be present: the BLWP area is outside (north) of the species' breeding range and does not contain appropriate habitats. eBird (2018) indicates nearest species' records approximately 21 miles east (Quemado Lake, New Mexico) and 22 miles west (Little Colorado River) of the BLWP area.	Vagrant/Accidental
McCown's longspur (<i>Calcarius mccownii</i>)	BLM S, SGCN	Sparse short grass plains, plowed and stubble fields, and bare or nearly bare ground. Nests in short grass prairies from Wyoming to Montana and winters in the desert southwest.	Known to occur, the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' migration range and contains appropriate habitats.	Migration

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Mexican whip-poor-will (<i>Anrostomus arizonae</i>)	BLM S, SGCN	Pine-oak, pine-juniper-oak, and ponderosa pine woodlands. Breeding range in New Mexico includes west-central and southwestern portions of the state and isolated, narrow location in southeastern portion of the state.	May be present: the BLWP area is within the species' breeding range and contains marginally suitable habitats (i.e., fragment of ponderosa pine woodland and pinyon-juniper woodland). eBird (2018) indicates nearest species' record approximately 22 miles southwest of the BLWP area.	Breeding
Mountain bluebird (<i>Sialia currucoides</i>)	SGCN	Prairie-forest ecotone with tree groves, short grasses, and few shrubs; savannas; recently burned areas; regenerating forests; sagebrush flats. Wintering birds primarily found in flat grasslands with scattered shrubs and trees, pinyon-juniper woodlands, and open-oak-juniper woodlands. In New Mexico, year-round range includes west-central, central, north-central, and northwestern portions of the state; non-breeding range elsewhere in the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' year-round range and contains appropriate habitats.	Year-round
Mountain plover (<i>Charadrius montanus</i>)	BCC (BCR 16, 34), SGCN	Short-grass prairie dominated by blue grama; also, fallow or recently tilled agricultural fields. Often associated with prairie dog colonies. Breeding range includes northeastern, east-central, and a portion of northwestern New Mexico. Wintering range includes extreme southwestern portion of the state.	May be present: BLWP area is outside of the species' breeding and wintering range; however, the species may occur widely in New Mexico during migration. The BLWP area contains Gunnison's prairie dog colonies and grasslands dominated by blue grama. NHHM (2017) indicates a species' record in general vicinity (approximately 2 miles northwest of the BLWP area).	Migration
Neotropic cormorant (<i>Phalacrocorax brasilianus</i>)	NM-T, SGCN	Wide variety of wetlands in fresh, brackish, or salt water. Breeding range includes fragmented location of central New Mexico (Rio Grande River).	Unlikely to be present: BLWP area is outside of the species' fragmented breeding range. eBird (2018) indicates nearest species record from Becker Lake, Arizona (approximately 21 miles west of the BLWP area).	Vagrant/Accidental
Northern goshawk (<i>Accipiter gentilis</i>)	USFS SS	Ponderosa pine forests; may also use Douglas fir, various pine, and aspen forests. May hunt in habitats ranging from open sage steppes to dense forests. Year-round range includes roughly the western half of New Mexico; non-breeding range includes northeastern, eastern, south-central, and southeastern portions of the state.	May be present: the BLWP area is within the species' year-round range and contains ponderosa pine woodland. NHHM (2017) indicates nearest species record approximately 10 miles east-southeast of the BLWP area.	Year-round
Olive warbler (<i>Peucedramus taeniatus</i>)	BCC (BCR 34)	Open ponderosa pine, sugar pine, Douglas fir, and pine-oak forests. Transient/migrant birds associated with mountain habitats and riparian forests. Breeding range includes southwestern extreme of New Mexico.	Unlikely to be present: the BLWP area is outside (north and east) of the species' breeding range. eBird (2018) indicates nearest species' record approximately 25 miles east of BLWP area.	Vagrant/Accidental
Olive-sided flycatcher (<i>Contopus cooperi</i>)	SGCN	Mid- to high-elevation open coniferous forest; typically 3,000 to 7,000 feet. Often associated with burned forest. In New Mexico, breeding range includes northwestern half of the state.	May be present: the BLWP area is within the species' breeding range and contains scattered ponderosa pine which may provide marginally suitable habitat. eBird (2018) indicates nearest species' records 18 miles east and 22 miles west of the BLWP area.	Breeding
Painted redstart (<i>Myioborus pictus</i>)	SGCN	Oak and oak-pine riparian woodlands with permanent or semi-permanent water; may also occur in oak and oak-pine woodlands. In New Mexico, breeding range includes west-central and southwestern portions of the state.	Unlikely to be present: the BLWP area is within the species' breeding range but does not contain appropriate habitats. eBird (2018) indicates nearest species' records 13 miles southeast and 17 miles west-southwest of the BLWP area.	Vagrant/Accidental
Peregrine falcon (<i>Falco peregrinus</i>)	BCC (BCR 16, 34), USFS SS, NM-T, SGCN	Variety of biomes; generally associated with cliffs and open landscapes. Migration range includes most of New Mexico; year-round range includes northwestern and southwestern portions of the state.	May be present: the species uses a broad array of habitats during migration and the BLWP area is within the species' migration range. eBird (2018) indicates records in general vicinity.	Migration
Phainopepla (<i>Phainopepla nitens</i>)	BCC (BCR 34)	Desert riparian, desert washes, and adjacent mesquite belts; closely associated with desert mistletoe. Breeding range includes southwestern New Mexico; considered to be transient or occasional along the Rio Grande River.	Unlikely to be present: BLWP area is outside (north) of the species' general breeding range. eBird (2018) indicates species records 20 miles west-southwest of the BLWP area.	Vagrant/Accidental

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Pinyon jay (<i>Gymnorhinus cyanocephalus</i>)	BLM S, BCC (BCR 16, 34), SGCN	Pinyon-juniper woodland; also found in sagebrush, scrub oak, and chaparral. Year-round range includes central west-central, and northern New Mexico.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' year-round range and contains appropriate habitat associations.	Year-round
Prairie falcon (<i>Falco mexicanus</i>)	BCC (BCR 16)	Open shrub-steppe desert, grasslands, mixed shrub and grasslands, and alpine tundra containing cliffs or bluffs for nesting. Year-round resident throughout New Mexico.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species' year-round range and contains appropriate shrub-steppe, grassland, and cliff habitat.	Year-round
Pygmy nuthatch (<i>Sitta pygmaea</i>)	SGCN	Long-needled pine forests. In New Mexico, patchy year-round distribution in central and western portions of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species year-round range and contains patchy ponderosa pine forest.	Year-round
Red-faced warbler (<i>Cardellina rubrifrons</i>)	BCC (BCR 34), SGCN	Montane fir, pine, and open pine-oak forests between 6,500 and 9,100 feet; may contain other deciduous trees (e.g., maple, aspen) in stream and snow-melt drainages. Breeding range includes west-central and southwestern New Mexico.	May be present: the BLWP area is within the species' breeding range and contains ponderosa pine forest. eBird (2018) indicates nearest species' record approximately 21 miles east of the BLWP area.	Breeding
Sagebrush sparrow (<i>Artemisiospiza nevadensis</i>)	SGCN	Breeds in semi-open habitats; closely associated with big sagebrush. In winter, associated with desert washes and arid grasslands with big sagebrush, creosote, cactus scrub, yucca, and honey mesquite. In New Mexico, non-breeding range includes southwestern half of state. Breeds in northwestern and north-central extremes of the state.	Unlikely to be present: the BLWP area does not contain appropriate habitat conditions. eBird (2018) indicates nearest species' record approximately 21 miles west of the BLWP area.	Wintering and/or Vagrant/Accidental
Sprague's pipit (<i>Anthus spragueii</i>)	BLM S	Plains, shortgrass prairies. Breeds in relatively dry grassland, especially native prairie, avoiding brushy areas and cultivated fields. Winters in similar shortgrass habitats in the southwest and Mexico including pastures and prairies, and grassy patches within fields of crops such as alfalfa.	Unlikely to be present the BLWP area is outside of the species known winter, and breeding range but contains suitable habitat. The species could incidentally occur during migration. eBird (2019) indicates the nearest species' record is approximately 60 miles north of the BLWP area.	Migration
Thick-billed kingbird (<i>Tyrannus crassirostris</i>)	NM-E, SGCN	Tropical deciduous gallery forest and brushy edges below 6,100 feet. Breeding range includes extreme southwestern New Mexico.	Unlikely to be present: the BLWP area is outside (north; >6,100 feet) of the species' geographic and elevational range and does not contain deciduous gallery forest. eBird (2018) indicates nearest species' record approximately 21 miles west of the BLWP area.	Vagrant/Accidental
Varied bunting (<i>Passerina versicolor</i>)	BCC (BCR 34), NM-T, SGCN	Desert thorn brush in canyons, desert washes, and riparian edges. Breeding range includes extreme southwestern New Mexico and fragmented location in southeastern portion of state.	Unlikely to be present: the BLWP area is outside (north) of the species' breeding range and does not contain appropriate habitats. eBird (2018) indicates nearest species' record approximately 21 miles west of the BLWP area.	Vagrant/Accidental
Veery (<i>Catharus fuscescens</i>)	BCC (BCR 16)	Damp, deciduous forests, strong association with riparian and disturbed forest with dense understory. Breeding range includes outlier population on west-central border of New Mexico.	Unlikely to be present: there are no riparian or disturbed deciduous forests in the BLWP area. eBird (2018) indicates nearest species' record approximately 115 miles southeast of the BLWP area.	Vagrant/Accidental
Vesper sparrow (<i>Pooecetes gramineus</i>)	SGCN	Breeds in a broad range of grassland types, shrubs, and woodlands bordering fields. Migrates and winters in grasslands, pastures, weedy fields, and brush edges of grasslands. In New Mexico, winters in southern half of the state, migration range includes central and northeastern portions of the state; breeds in north-central and northwestern portions of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area contains grasslands and shrublands appropriate for migrating and wintering individuals.	Non-breeding, Migration
Virginia's warbler (<i>Oreothlypis virginiae</i>)	BLM S, SGCN	Pinyon-juniper and oak woodlands. Migration habitat includes pine and riparian forests. Breeds through much of New Mexico; migration range includes eastern portion of the state.	May be present: the BLWP area is within the species breeding range and contains pinyon-juniper woodlands. eBird (2018) indicates species' records 16 miles west-southwest and 21 miles east of the BLWP area.	Breeding, Migration

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Western bluebird (<i>Sialia mexicana</i>)	SGCN	Open coniferous and deciduous woodlands, riparian woodlands, forest edges, grasslands, and farmlands. Primarily found in ponderosa pine and pinyon-juniper woodlands in the Southwest. Year-round range through much of New Mexico; non-breeding in southern portions of the state; breeds in north-central portion of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area contains appropriate pinyon-juniper and ponderosa pine woodlands.	Year-round
Western burrowing owl (<i>Athene cunicularia</i>)	BLM S, BCC (BCR 16), USFS SS, SGCN	Open, gently-sloping, treeless areas within sparsely vegetated grassland, steppe, and desert biomes. Often associated with high densities of burrowing mammals such as prairie dogs. Year-round range includes southern half of New Mexico; breeding range includes northern half of the state.	Known to occur: the species has been documented on-site during pre-construction avian use counts. The BLWP area is within the species breeding range and is in northern extreme border of species year-round range.	Year-round
White-eared hummingbird (<i>Hylocharis leucotis</i>)	NM-T	Montane pine-oak, oak, and pine-evergreen forests. Breeding range includes southeastern Arizona; infrequent in New Mexico.	Unlikely to be present: the BLWP area is outside (north) of the species' general geographic range. eBird (2018) indicates nearest species record approximately 27 miles west of the BLWP area.	Vagrant/Accidental
Williamson's sapsucker (<i>Sphyrapicus thyroideus</i>)	SGCN	Breeds in mid- to high-elevation conifer and mixed conifer-deciduous forests, including ponderosa pine and pine-fir forests. Winters in low- to mid-elevation oak-juniper, pine-oak, deciduous riparian, and oak forests. Migration habitats include oak scrub, pinyon-juniper, and deciduous riparian forests. In New Mexico, non-breeding range includes central, west-central, and southwestern portions of the state; year-round range extends from north-central to west-central portions of the state; breeds in northwestern New Mexico.	May be present: the BLWP area is on the edge between the species' year-round and non-breeding ranges. The BLWP area contain ponderosa pine forest; pinyon juniper forests may be used during migration. eBird (2018) indicates nearest species' record approximately 15 miles east of the BLWP area.	Year-round, Non-breeding
Yellow warbler (<i>Sonoran; sonora</i> ssp.; <i>Setophaga petechia</i> ssp. <i>sonora</i>)	BCC (BCR 34)	Wet, deciduous thickets, especially those dominated by willows, and in disturbed and early successional habitats. Migration habitat includes scrub/shrub and semi-open, second-growth forest, often associated with wetlands. Migrate through most of New Mexico; breeding range includes west-central, extreme southwestern, and northern portions of the state.	Unlikely to be present: there are no deciduous thickets, scrub-shrub, or disturbed/early-successional habitats associated with wetlands in the BLWP area. eBird (2018) indicates species' records 16 miles west-southwest and 21 miles east of the BLWP area.	Vagrant/Accidental
Crustaceans				
Clam shrimp (<i>Eulimnadia follisimilis</i>)	BLM S, SGCN	Stock tanks and ponds. In New Mexico, collected in stock tanks in Socorro and San Juan counties.	May be present; the species' range is not well defined.	Year-round
San Francisco brine shrimp (<i>Artemia franciscana</i>)	SGCN	Hypersaline pools, lakes, and salt evaporation ponds. In New Mexico, found in natural salt lakes.	Unlikely to be present: the BLWP area does not contain appropriate habitats.	Year-round
Fishes				
Desert sucker (<i>Catostomus clarkii</i>)	BLM S, USFS SS, SGCN	Rapids and flowing pools of streams and rivers primarily over gravel-rubble with sandy silt below 8,800 feet. Range includes extreme headwaters of Gila basin and San Francisco River drainages.	Unlikely to be present: there are no streams or rivers in the BLWP area.	Year-round
Rio Grande chub (<i>Gila pandora</i>)	BLM S	Versatile species capable of surviving riverine and lacustrine habitats at elevations up to 11,370 feet. The species is typically found in pools with overhanging banks and brush. Currently known from tributaries of the Rio Grande river within the Rio Grande basin.	Unlikely to be present: there are no riverine or lacustrine habitats (i.e. streams, rivers, lakes) in the BLWP area.	Year-round
Roundtail chub (<i>Gila robusta</i>)	BLM S	Cool to warm waters of rivers and streams from 1,000 to 7,500 feet, often occupying the deepest pools and eddies. The species is currently found throughout the Colorado River basin and its tributaries, the Little Colorado River, Bill Williams River and in the main stem and tributaries of the Gila, Salt, and Verde Rivers in Arizona and New Mexico.	Unlikely to be present: there are no streams or rivers in the BLWP area.	Year-round

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Rio Grande sucker (<i>Catostomus plebeius</i>)	BLM S, SGCN	Low-gradient, low-velocity stream reaches. In New Mexico, known from the Rio Grande and its tributaries in northern portion of the state, and the Mimbres River in southwestern portion of the state. Introduced populations are established in the Rio Hondo, Gila River basin, and San Francisco drainage.	Unlikely to be present: there are no streams or rivers in the BLWP area.	Year-round
Sonora sucker (<i>Catostomus insignis</i>)	BLM S, SGCN	Gravelly or rocky pools in a variety of habitats from warm water rivers to trout streams between 1,000 and 8,700 feet. Range includes Gila and San Francisco drainages.	Unlikely to be present: there are no streams or rivers in the BLWP area.	Year-round
Flowering Plants				
Apache milkvetch (<i>Astragalus nutriosensis</i>)	NMRP SS	Volcanic silty clay soils in gently sloping grama grassland; occasionally in pinyon-juniper woodland. Elevation between 7,000 and 8,000 feet. Range includes northwestern Catron County, New Mexico.	Known to occur. According to NHHM (2017; data provided to SWCA), the species has been documented within and out to 10 miles from the BLWP area. Specific proximal occurrences have been recorded in the eastern portion of the BLWP area and northern boundary (just outside of the BLWP area). The species may occur in other areas of the BLWP area where appropriate habitat conditions are present.	Flowers in May
Arizona sunflower (<i>Helianthus arizonensis</i>)	NMRP SS	Dry, sandy soil of open pine woodlands at elevations between 4,000 and 7,000 feet. Range in New Mexico: Catron County, west of Quemado.	Unlikely to be present: the BLWP area is just above the elevational range known for the species. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers June through August
Bittercress ragwort (<i>Packera cardamine</i>)	NMRP SS	Steep slopes and forest understory in upper montane coniferous (spruce-fir) forest at elevations between 8,000 and 10,000 feet. Range includes Mogollon Mountains in Catron County.	Unlikely to be present: known only from the Mogollon Mountains of New Mexico (approximately 50 miles south of the BLWP area) and the White Mountains of Arizona. There are no spruce-fir forests in the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers late April through August
Bog alkaligrass (<i>Puccinellia parishii</i>)	BLM S, NM-E, NMRP E	Alkaline springs, seeps, and seasonally wet areas that occur at the heads of drainages or on gentle slopes between 2,600 and 7,200 feet. Often associated with salt grass, alkali sacaton, sedges, bulrushes, rushes, spike rushes, and yerba mansa. Range includes seven New Mexico counties including, Catron County.	May be present: the BLWP area contains seasonally wet areas (playas); however, plant associations (e.g., sedges, rushes) have not been observed during initial site reconnaissance surveys. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Late winter to spring growing period
Davidson's wavewing (<i>Cymopterus davidsonii</i>)	NMRP SS	Cool, rocky area in pinyon-juniper woodland and lower montane coniferous forest between 6,500 and 8,000 feet. Range includes two New Mexico counties including Catron, where it occurs in the Mogollon Mountains.	Unlikely to be present: known range is approximately 50 miles south of the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers in August
Fugate's amsonia (<i>Amsonia fugatei</i>)	BLM S	Limy conglomerate ridges and associated outwash slopes in Chihuahuan desert scrub; 1,500-1,800 m (5,000-5,900 ft). Known distribution includes Socorro County (NMRP 2005b).	Unlikely to be present: BLWP area is outside of the known geographic range of the species.	Flowers April through May
Gila thistle (<i>Cirsium gilense</i>)	NMRP SS	Moist areas or mountain meadows in montane coniferous forest between 7,000 and 8,000 feet. Known distribution includes southern Catron County.	Unlikely to be present: BLWP area is outside (north) of the known geographic range of the species. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers July to September
Goodding's bladderpod (<i>Lesquerella gooddingii</i>)	NMRP SS	Open pinyon-juniper and ponderosa pine forest between 6,000 and 7,500 feet. Range includes two New Mexico counties including Catron.	May be present: the BLWP area is within the species' general geographic and elevation range and contains open pinyon-juniper and ponderosa pine forest. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers June through September

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Goodding's onion (<i>Allium gooddingii</i>)	NM-E, NMRP E	Spruce-fir, mixed conifer, and aspen forest between 6,500 and 9,400 feet. Occurs at the base of steep slopes and moist drainage bottoms. Range includes four New Mexico counties, including Catron County.	Unlikely to be present: nearest known occurrences are within the Gila National Forest, south of the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flowers late June through early September
Groundcover milkvetch (<i>Astragalus humistratus</i> var. <i>crispulus</i>)	USFS SS, NMRP SS	Sandy soils of volcanic origin on slopes, benches, and ledges in xeric pine forest between 7,250 and 8,150 feet. Forms local colonies. Known only from Catron County, New Mexico, and southeastern Apache County, Arizona.	May be present: the BLWP area is within the species' general geographic range and contains pine forest and soils of volcanic origin. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flower timing unknown
Hess' fleabane (<i>Erigeron hessii</i>)	NM-E, NMRP E	Andesitic dikes in otherwise rhyotitic rock in upper montane to subalpine conifer forest between 9,500 and 10,200 feet. Occurs in bedrock cracks in open areas. Known only from the Mogollon Mountains in Catron County.	Unlikely to be present: nearest known occurrences are in extreme southern Catron County, approximately 60 miles south of the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flowers August to early September
Mogoll deathcamas (<i>Zigadenus mogollonensis</i> ; syn: <i>Anticlea mogollonensis</i>)	NMRP SS	Organic soils in understory of upper montane and subalpine mixed coniferous and spruce-fir forests, often with aspen, between 8,700 and 10,500 feet. Known only from the Mogollon Mountains in Catron County.	Unlikely to be present: nearest known occurrences are in extreme southern Catron County, approximately 60 miles south of the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flowers late July to early September
Mogollon hawkweed (<i>Hieracium fendleri</i> var. <i>mogollense</i> ; syn: <i>Hieracium brevopilum</i>)	NMRP SS	Grassy openings in ponderosa pine forest and in mountain meadows between 8,200 and 10,500 feet. Known distribution includes Mogollon Mountains, Catron County, and neighboring White Mountains, Apache County, Arizona.	Unlikely to be present: nearest known occurrences are in extreme southern Catron County, approximately 60 miles south of the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flowers August to September
Mogollon Mountain draba (<i>Draba mogollonica</i>)	NMRP SS	Cool, moist northern slopes of mountains, ravines, and canyons on volcanic rocks and soil in montane forests between 5,000 and 9,000 feet. Distribution includes Mogollon and neighboring mountains; four New Mexico counties, including Catron County.	May be present: the BLWP area is within the species' general geographic and elevation range. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flowers April to May
Todilito stickleaf (<i>Mentzelia todiltoensis</i>)	BLM S	Outcrops of gypsum in the Todilto Formation between 5,600 and 5,840 feet. Known from western Bernalillo County, eastern Cibola County, western Santa Fe County, and reported in Socorro County.	Unlikely to be present: BLWP area is outside of the known geographic range of the species.	Flowers June through September
White Mountain alumroot (<i>Heuchera wootonii</i>)	NMRP SS	Mountain slopes and protected, usually north-facing rock outcrops, or Gambel oak thickets in pinyon-juniper woodland and lower and upper montane coniferous forest between 7,000 and 12,000 feet. Distribution includes three New Mexico counties, including Catron County, where it occurs in the Datil Mountains.	Unlikely to be present: the nearest known species' occurrences are approximately 55 miles west of the BLWP area (Datil Mountains). There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flowers June to September
White Mountain clover (<i>Trifolium neurophyllum</i>)	NMRP SS	Wet meadows, springs, and along riparian corridors in montane coniferous forest between 6,500 and 9,000 feet. Range includes Catron County and adjacent Arizona.	May be present: there are no wet meadows, springs, or riparian corridors in the BLWP area; however, the edges of BLWP area playas may provide suitable conditions. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flowers late July to September
Willow Creek dock (<i>Rumex tomentellus</i>)	NMRP SS	Seasonally wet habitats along streams. Known elevation approximately 8,000 feet. Known from southern Catron County, Willow Creek.	Unlikely to be present: the BLWP area is outside (north) of the species' known occurrence and does not contain streambank habitats. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Flowers in July

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Winn Falls fleabane (<i>Erigeron scopulinus</i>)	NMRP SS	Crevices of rhyolitic rock cliff faces in lower montane coniferous forest between 6,000 and 9,000 feet. Known from the Black Range, Mogollon, San Mateo and Chiricahua Mountains; range includes southern Catron County.	Unlikely to be present: the BLWP area is outside (north) of the species' range. The Mogollon Mountains are approximately 60 miles south of the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers May to June
Wooton's hawthorn (<i>Crataegus wootoniana</i>)	NMRP SS	Canyon bottoms and forest understory in lower montane coniferous forest between 6,500 and 8,000 feet. Range: Pinos Altos and Sacramento Mountains; three New Mexico counties, including Catron County.	Unlikely to be present: nearest known occurrences are in extreme southern Catron County, approximately 60 miles south of the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers April to June
Wright's catchfly (<i>Silene wrightii</i>)	NMRP SS	Cliffs and rocky outcrops in montane and subalpine conifer forests between 6,800 and 8,000 feet. Range includes five New Mexico counties, including Catron County.	May be present: the BLWP area is within the species' general geographic and elevational range and contains rocky outcrops and ponderosa pine woodland. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers mid-July to October
Wright's marsh thistle (<i>Cirsium wrightii</i>)	BLM S	Wet, alkaline soils in spring seeps and marshy edges of streams and ponds between 3,450 and 8,500 feet). Known from New Mexico, Eddy, Chaves, Guadalupe, Otero, Sierra, and Socorro counties.	Unlikely to be present: the BLWP area is outside the species' known geographic range and does not contain streams or ponds.	Flowers August to October
Yeso twinpod (<i>Physaria newberryi</i> var. <i>yesicola</i>)	BLM S	Sandy gypsum and silty strata of the Yeso Formation in short grass steppe and juniper savanna between 5,700 and 6,900 feet). Known from Cibola and Valencia county in the Sierra Lucero Range.	Unlikely to be present: the BLWP area is outside the species' known geographic range.	Flowers April to May
Zuni milkvetch (<i>Astragalus accumbens</i> ; syn: <i>Astragalus missouriensis</i> var. <i>accumbens</i>)	NMRP SS	Gravelly clay banks and knolls, in dry, alkaline soils derived from sandstone, in pinyon-juniper woodlands between 6,200 and 7,900 feet. Range includes three New Mexico counties, including Catron County.	May be present: the BLWP area is within the species' general geographic and elevational range and contains pinyon-juniper woodland. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Flowers May through June
Gastropod				
Gila springsnail (<i>Pyrgulopsis gilae</i>)	NM-T, SGCN	Limited to a series of cool springs along the Gila River in Grant County; has also been found in nearby thermal springs in association with the New Mexico hot springsnail. Associated with mud, debris, and vegetation (e.g., watercress; <i>Nasturtium officinale</i>) of springs, seeps, rivulets.	Unlikely to be present: habitat conditions for the species are not present within the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Known species occurrences are approximately 80 miles southeast of the BLWP area.	Year-round
False marsh slug (<i>Deroceras heterura</i>)	SGCN	Higher elevations fir-aspen and ponderosa pine-oak forests of the Mogollon Mountains and Black Range.	Little information available for this species. Unlikely to be present: based on limited known range/species' records. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Year-round
New Mexico hot springsnail (<i>Pyrgulopsis thermalis</i>)	NM-T, SGCN	Thermal springs along the Gila River in the Gila River in Grant County. Found on vertical rock covered with thin sheets of water.	Unlikely to be present: habitat conditions for the species are not present within the BLWP area. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM. Known species occurrences are approximately 80 miles southeast of the BLWP area.	Year-round

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Mammals				
Allen's big-eared bat (<i>Idionycteris phyllotis</i>)	USFS SS	Roosts in caves and abandoned mineshafts; maternity colonies found in rock piles, mines, and snags. Coniferous and deciduous woodland; favors ponderosa and pinyon-juniper woodlands. Found within a wide range of elevations. Capture locations are typically along streams or over ponds in the vicinity of boulder piles, cliffs, rocky outcrops, or lava flows. Range in New Mexico includes east-central and southwestern portions of the state.	Known to occur: the species has been documented on-site during pre-construction bioacoustic monitoring. The BLWP area is within the species' geographic range.	Year-round; may migrate locally by elevation
Arizona gray squirrel (<i>Sciurus arizonensis</i>)	USFS SS	Deciduous forests with walnut, sycamore, oak, cottonwood, and pine trees. In New Mexico, the species is usually found in canyons with water and food sources such as walnuts and acorns.	Unlikely to be present: there are no riparian or deciduous forest habitats in the BLWP area.	Year-round
Arizona montane vole (<i>Microtus montanus arizonensis</i>)	USFS SS, NM-E, SGCN	Prefers high-elevation wet meadows, seeps, springs, and drainages from 7,000 to 9,000 feet. Often associated with wet soils, wet sedges, patches of cattail, and vertical grass cover. In New Mexico, may be found in Catron County within the San Francisco River drainage.	May be present: habitats adjacent to seasonally wet playas on-site may be marginally suitable for the subspecies. Known occurrences are approximately 15 miles south-southwest of the BLWP area (Jenkins Creek, Flanagan Spring). There are no known records of the subspecies in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Year-round
Black bear (<i>Ursus americanus</i>)	SERI	Found in most woodland habitats, including pinyon-juniper, oak woodland, coniferous forest, and chaparral.	May be present: the BLWP area is within the species' geographic range.	Year-round; hibernates from November through March
Black-tailed prairie dog (<i>Cynomys ludovicianus</i>)	BLM S	Dry, flat, open plains and desert grasslands. Since prairie dogs do not like tall grass (<30cm preferred), they will choose a site with little vegetation, often in areas heavily grazed by cattle.	Unlikely to occur: the BLWP area contains suitable habitat but is outside the species' known range.	Year-round; may enter light hibernation in extreme cold
Cougar (<i>Puma concolor</i>)	SERI	Desert and forested mountains with broken terrain and steep slopes.	May be present: the BLWP area is within the species' geographic range.	Year-round
Elk (<i>Cervus canadensis</i>)	SERI	Mountain meadows and montane coniferous forests are used during the summer. Moves to lower-elevation mixed conifer forest, pinyon-juniper woodland, and grassland habitats in the winter.	Known to occur: there have been observations of the species in the central and southern portions of the BLWP area.	Year-round
Gunnison's prairie dog (prairie subspecies; <i>Cynomys gunnisoni zuniesis</i>)	BLM S, USFS SS, SGCN	Gently sloping grasslands and semi-desert and montane shrublands between 4,600 and 12,000 feet. In New Mexico, range includes northwestern and west-central portions of the state.	Known to occur: the species has been observed while conducting pre-construction wildlife surveys on-site. There are known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Year-round; hibernates from October to mid-February/late-April
Mule deer (<i>Odocoileus hemionus</i>)	SERI	Occurs in a wide range of habitats from desertscrub to montane forests.	May be present: the BLWP area is within the species' geographic range.	Year-round
Spotted bat (<i>Euderma maculatum</i>)	BLM S, NM-T, SGCN	Roosts in crevices and cracks of cliff faces; sometimes roosts in caves or in buildings near cliffs. Variety of habitats including low to high deserts, riparian areas, ponderosa, and spruce-fir forests below 10,600 feet. In New Mexico, range includes western half of the state.	Known to occur: the species has been documented on-site during pre-construction bioacoustic monitoring. The BLWP area is within the species' geographic range. There are known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHNM.	Year-round; may migrate locally by elevation

Common Name (<i>Scientific Name</i>)	Status*	Range/Habitat Requirements	Potential for Occurrence in Project Area	Season/Life History Information Relevant to Project Area
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	BLM S, USFS SS, SGCN	Day roosts and maternity and hibernation colonies in caves, mines, or buildings. Night roosts may include caves, buildings, and tree cavities. Associated with mesic forested habitats, but occupies a broad range of habitats including arid scrub, pine forest, pinyon-juniper, and wooded canyons between 500 and 8,400 feet. Range throughout New Mexico.	Known to occur: the species has been documented on-site during pre-construction bioacoustic monitoring. The BLWP area is within the species' geographic range. There are known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Year-round, may migrate locally by elevation
Reptiles				
Arizona black rattlesnake (<i>Crotalus cerbeus</i>)	SGCN	Variety of biotic communities from approximately 4,000 to 9,000 feet. Often associated with rocky drainages with permanent or semi-permanent water and open, rocky slopes. Range in New Mexico includes western extreme of Catron County.	May be present: the BLWP area is in the extreme eastern edge of the species' geographic range. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Year-round; den in winter and late fall.
Desert massasauga (<i>Sistrurus tergeminus</i>)	BLM S, SGCN	Found in valleys, on low sloping alluvial fans and on rolling grass-covered hills within the semidesert grassland. Found at elevations ranging from 3,500 feet to about 4,600 feet.	Unlikely to be present: the BLWP area is outside the known geographic range of the species.	Year round; den in winter and late fall.
Beg Bend slider (<i>Trachemys gaigeae</i>)	BLM S, SGCN	Freshwater riverine habitats of the desert southwest and northern Mexico. Found in the Rio Grande drainage from south-central New Mexico downstream to western Texas and Mexico. In New Mexico, the species uses ponds, marshes, and canals up to 1.25 mile from the Rio Grande.	Unlikely to be present: the BLWP area is outside the known geographic range of the species.	Year round; hibernate in winter.
Banded rock rattlesnake (<i>Crotalus lepidus klauberi</i>)	SGCN	Large rock outcrops, rocky stream beds, and steep talus slopes from approximately 4,000 to 8,500 feet. Often associated with permanent or intermittent streams, upper desert-grassland, and lower ponderosa pine forest. In New Mexico, occurs in southwestern portion of the state; uncommon in Gila National Forest.	Unlikely to be present: the BLWP area is outside the northern edge of the species' geographic range. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Year-round; active throughout year
Sonora mud turtle (<i>Kinosternon sonoriense</i>)	SGCN	Rocky streams, creeks, and rivers from approximately sea level to approximately 6,700 feet; also in ponds, cattle tanks, and ditches. In New Mexico, occurs in southern and west-central portions of the state; known in the Gila National Forest.	May be present in cattle tanks: the BLWP area is in the extreme northern edge of the species' range. There are no known records of the species in the BLWP area vicinity (within 10 miles) based on data provided to SWCA by NHHM.	Year round; may hibernate in late fall and winter.

Notes: Range or habitat requirement information and potential occurrence justification from AGFD (2013), Audubon (2019), Bat Conservation International (2018), BISON-M (2018), Brennan (2012), eBird (2018 and 2019), Frey (2005), MacCarter (1996), NatureServe (2017), New Mexico Rare Plant Technical Council (NMRP) (2005a-e), Natureserve (2019), NHHM (2017), New Mexico Herpetological Society (2019), Pierce (2008), Rees et al (2005), Reid (2006), Rodewald (2015), Southwestern Center for Herpetological Research (2017), and Stuart and Ward (2009). Cited references are listed in Chapter 5. References of the Borderlands Wind Project ADEIS.

BCC = Bird of Conservation Concern

BCR = Bird Conservation Region

BLM S = BLM sensitive species

USFS SS= USFS sensitive species provided by Gila National Forest; personal communication

NHHM = Natural Heritage New Mexico

NM-E = Endangered. Endangered species are those in jeopardy of extinction or extirpation from the state

NM-T = Threatened. Threatened species are those likely to become endangered within the foreseeable future throughout all or a significant portion of their range in the state

NMRP E = New Mexico Rare Plant Endangered

NMRP SS = New Mexico Rare Plant Strategy Species

SERI = Species of Economic and Recreational Importance

SGCN = Species of Greatest Conservation Need; species that are indicative of the diversity and health of the state's wildlife

APPENDIX F: VISUAL RESOURCE ANALYSIS DOCUMENTATION

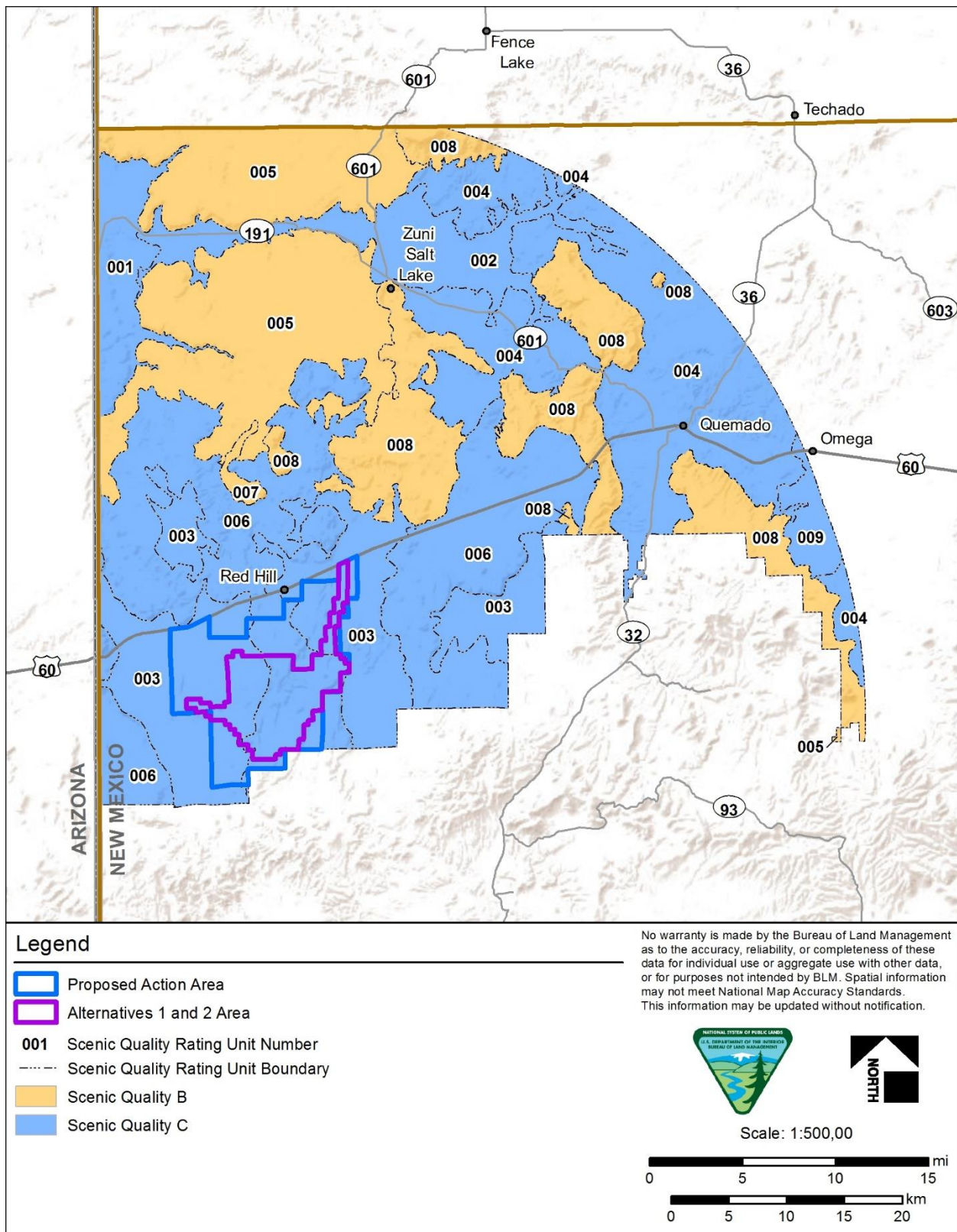


Figure F-1. Scenic Quality Rating Units

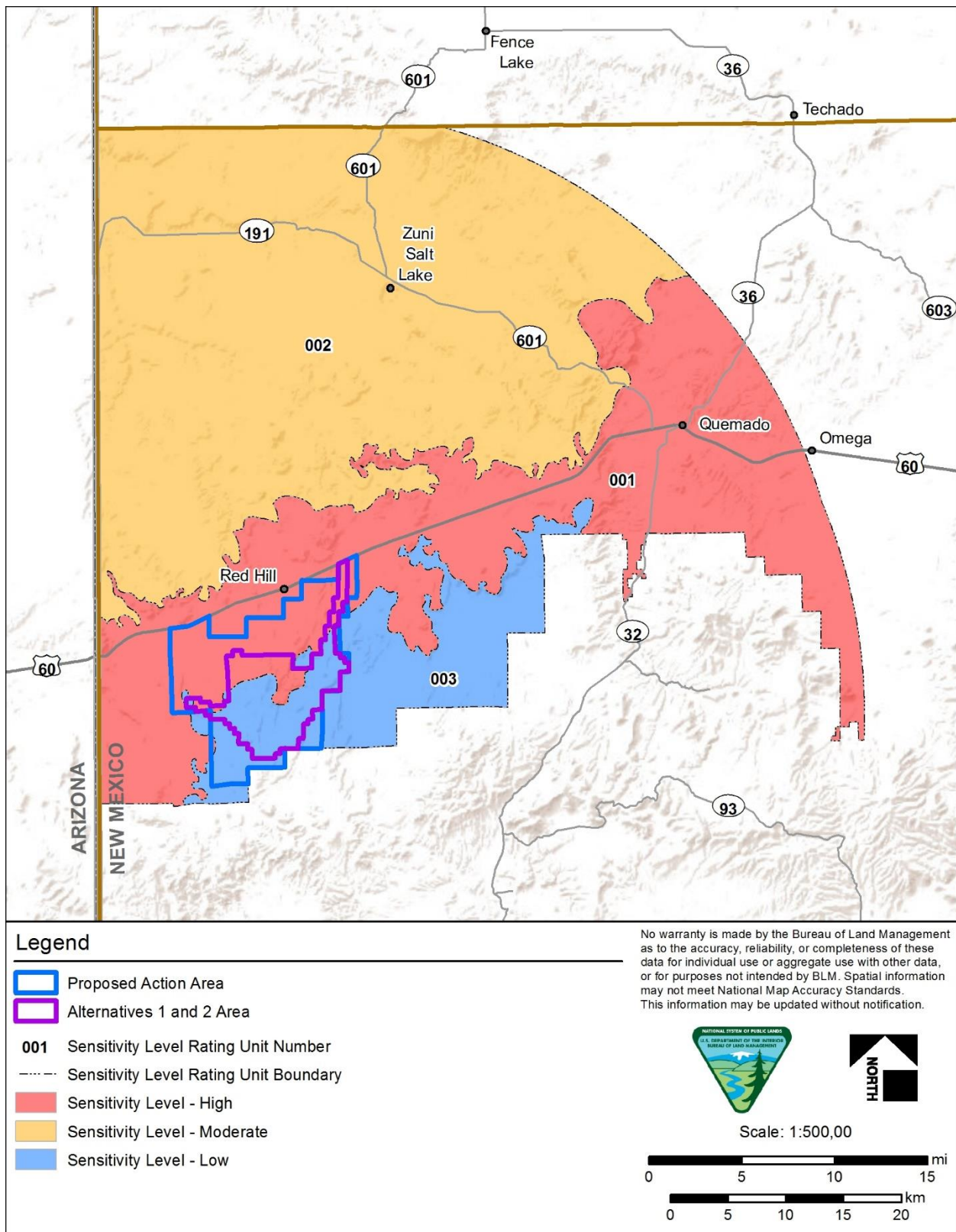


Figure F-2. Sensitivity Level Rating Units

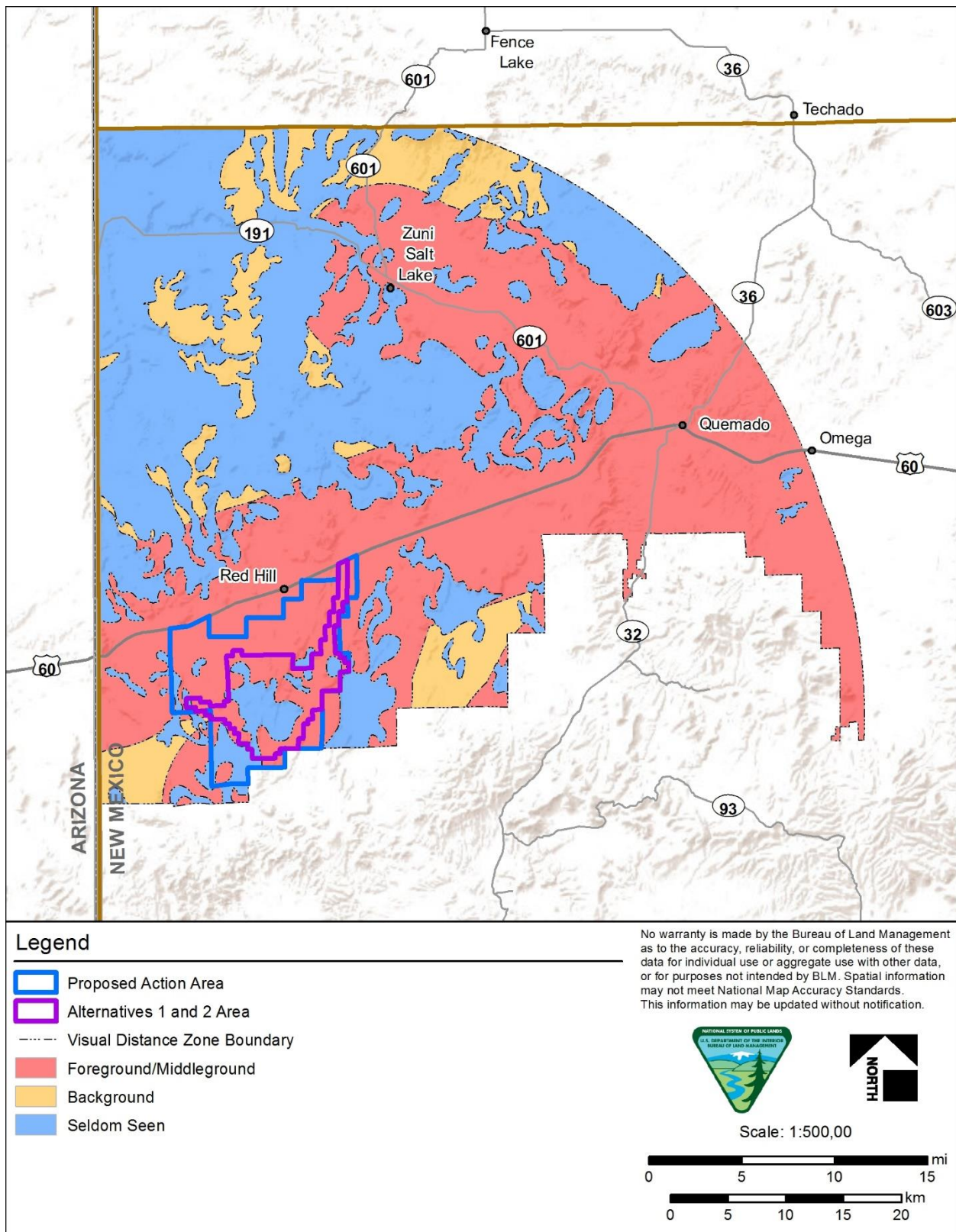


Figure F-3. Visual Distance Zones

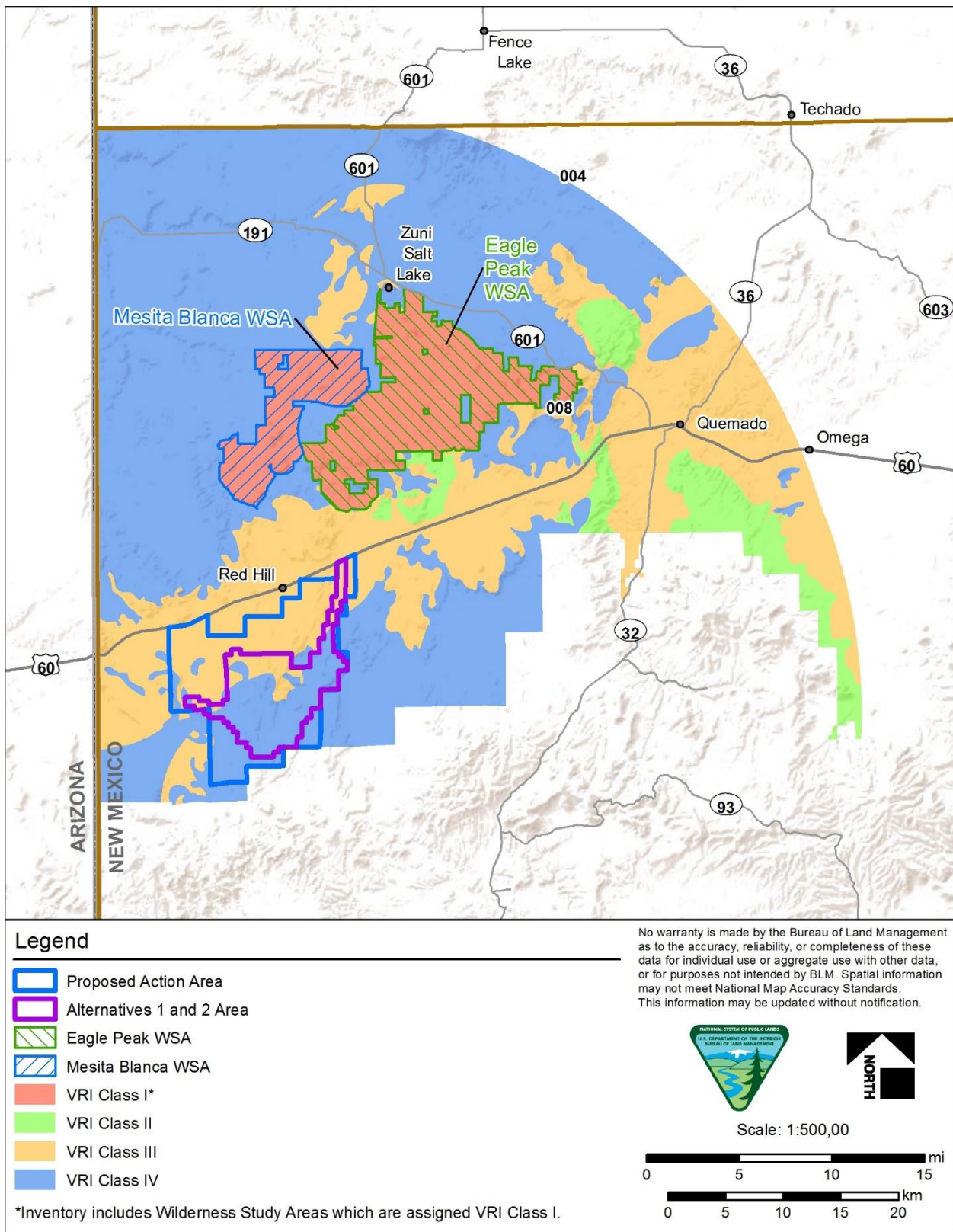


Figure F-4. Visual Resource Inventory Classes

Visual Analysis Units

Visual Analysis

Unit	Landforms	Vegetation	Land Use/ VRI Components
VAU 3	<ul style="list-style-type: none"> • Form: Gently rolling and broad; occasional moderate slopes. • Line: Undulating to flat/gentle rolling. • Color: Light reddish brown to khaki soils; variations in brown. • Texture: Smooth with gentle transitions. • Distinct Natural Features Visible: Cow Springs Draw, Cerro La Mula • Adjacent Scenery: Cimarron Mesa, Largo Mesa, Jones Peak. 	<ul style="list-style-type: none"> • Representative Species: Low indistinct grasses, low rounded shrubs, and occasional rounded pinyon-juniper. • Height: Grasses: <1 foot; shrubs 1-2 feet; pinyon-juniper 10-12 feet. • Texture/Pattern: Consistent grasses and shrubs; broken, patchy, and stippled pinyon-juniper. • Colors: Light straw-buff, yellow-green, dark green. 	<ul style="list-style-type: none"> • Distinct Built Features: Large transmission line running north-south through the unit. • Land Use: Grazing, utility alignment, transportation corridor. • Scenic Quality: C (9.5) Landform: 2.5 Vegetation: 2 Water: 0 Color: 1.5 Adjacent Scenery: 3 Scarcity: 1 Cultural Modifications: -0.5 • Sensitivity: High and low • Visual Distance Zones: Foreground/Middleground Seldom Seen
VAU 6	<ul style="list-style-type: none"> • Form: Rolling low hills with isolated rock outcrops. • Line: Undulating, converging, and horizontal. • Color: Reddish-brown, dark brown volcanic rock, and tan. • Texture: Undulating, bumpy, and varied. • Distinct Natural Features Visible: Cimarron Mesa. • Adjacent Scenery: Cerro La Mula, Red Hill, Black Peak, Jones Peak. 	<ul style="list-style-type: none"> • Representative Species: Rounded pinyon-juniper, indistinct grasses with intermixed shrubs. • Height: Grasses: <1 foot; shrubs 1-2 feet; pinyon-juniper 10-12 feet. • Texture/Pattern: Course, patchy, and inconsistent. • Colors: Dark green-grey, grey-green, straw yellow. 	<ul style="list-style-type: none"> • Distinct Built Features: Isolated residential homes. • Land Use: Grazing, transportation corridor. • Scenic Quality: C (11.0) Landform: 3 Vegetation: 2 Water: 0 Color: 2 Adjacent Scenery: 3 Scarcity: 1 Cultural Modifications: 0 • Sensitivity: High and low • Visual Distance Zones: Foreground/Middleground Seldom Seen

UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 1S Range: 19W Section: 10	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change	No perceived change.	No perceived change.
Line	No perceived change	No perceived change	No perceived change
Color	No perceived change	No perceived change.	No perceived change.

Texture	No perceived change	No perceived change	No perceived change
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: <input checked="" type="checkbox"/> No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X				X	
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	

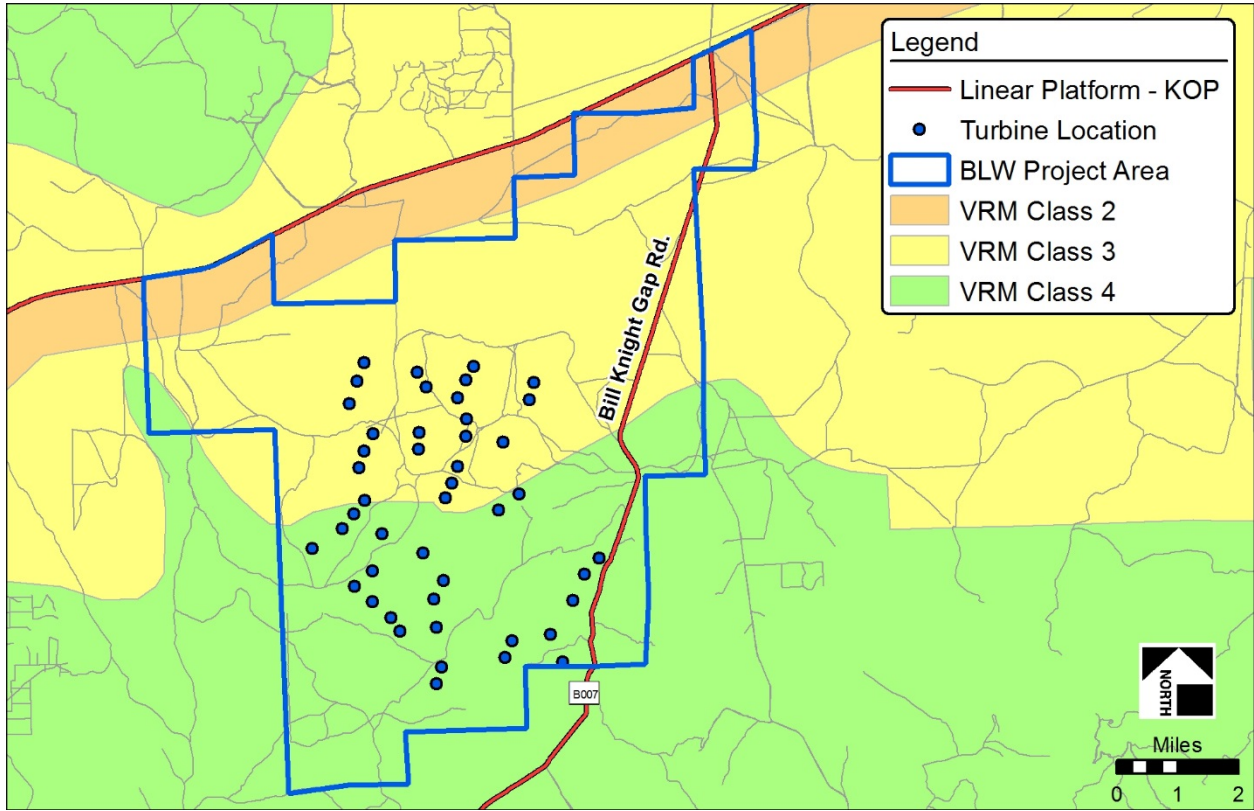
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The proposed turbines, overhead distribution transmission lines, access roads, and US 60 turn lanes would be visible within the foreground of the Bill Knight Gap Road KOP. The visual resource management objective for Class II allows for a low level of change to the characteristic landscape. The visual resource management objective for Class II allows for a low level of change to the characteristic landscape. These changes should repeat the basic elements found in the characteristic landscape and should not attract the attention of the casual observer. Road improvements, access roads, and US 60 turn lane modifications would be visible within the foreground of the Bill Knight Gap Road KOP, but not perceivable. Therefore, the Proposed Action would be in conformance with Class II visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project- Proposed Action	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.

Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/> explain on reverse)	
		Land/Water Body (1)				Vegetation (2)				Structures (3)					
Element		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
		Form			X				X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
		Line			X			X		X					
		Color			X				X	X					
Texture			X			X		X							

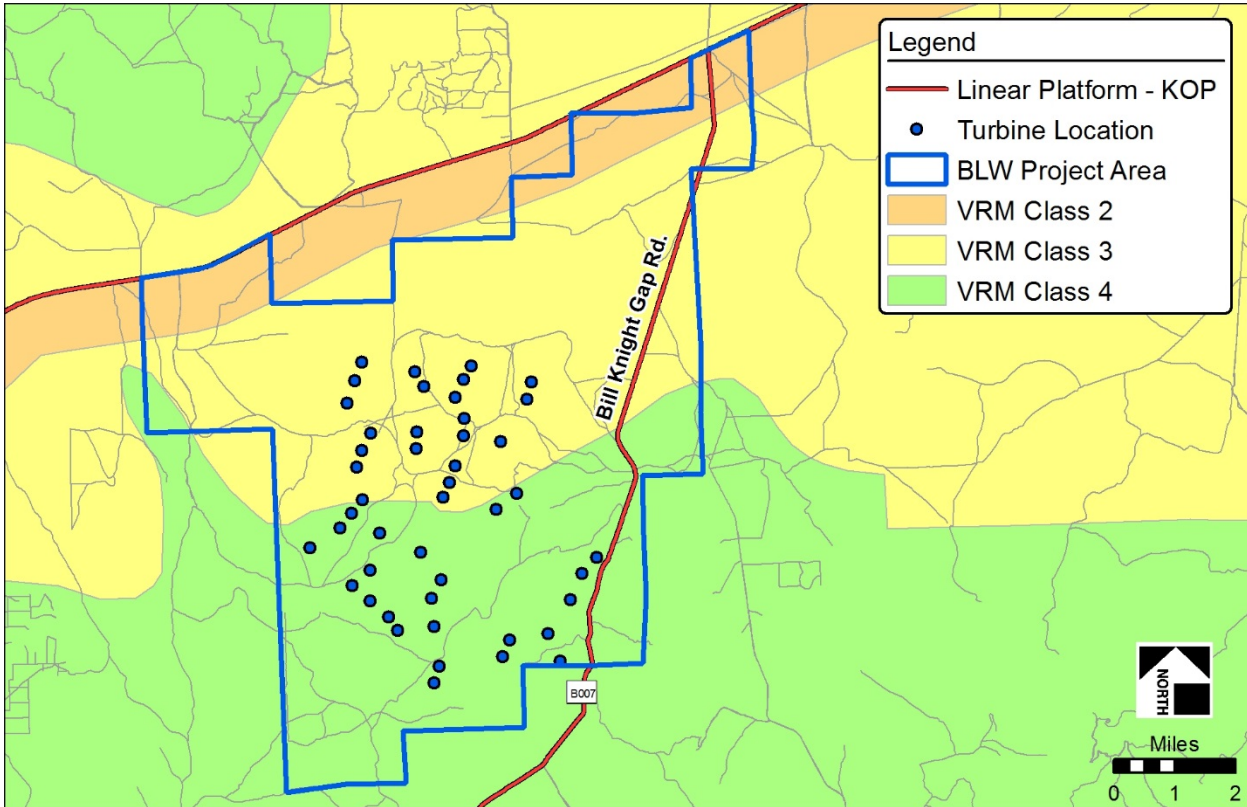
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominate the landscape. The proposed turbines, and access roads would be visible from Bill Knight Gap Road KOP. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. The Proposed Action would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, the Proposed Action would not be in conformance with Class III visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.

Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Dark brown wood of transmission line structures. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

		Land/Water Body (1)				Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
Element	Form			X					X	X				Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
	Line			X				X		X				
	Color			X					X	X				
	Texture			X				X		X				

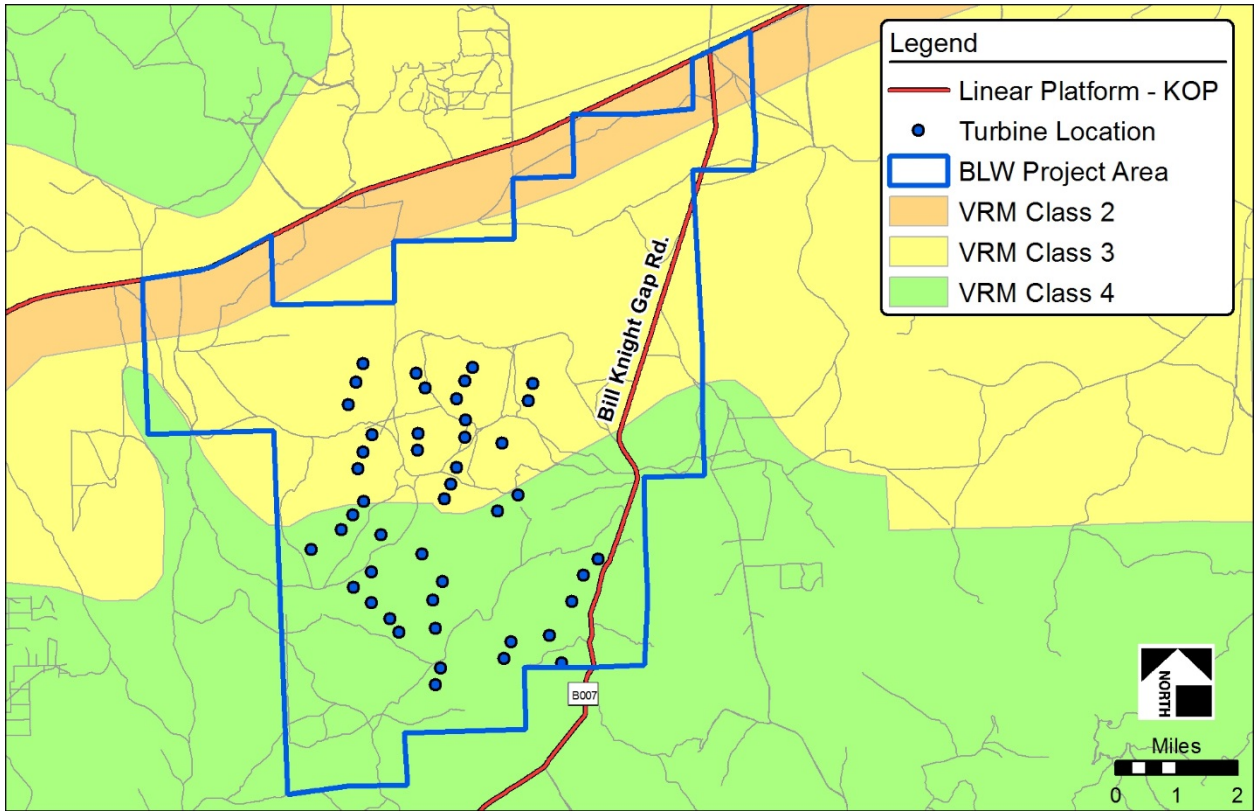
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible within the foreground of Bill Knight Gap Road KOP. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. The Proposed Action would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Proposed Action

Linear Platform Name: Bill Knight Gap Road

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: No

Environmental Factors	As Considered from Linear Platform	Comments
Distance to Project Components	<p>This platform is approximately 850 feet from the nearest visible turbine.</p> <p>This platform intersects project infrastructure (most commonly road improvements).</p>	
Visibility Conditions	<p>This platform is located in a panoramic landscape that includes broad plains and low rolling hills with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height.</p> <p>Traveling in the northbound direction in the foreground (FG) area of the proposed project, views of the project components would be predominately skylined; predominantly unobstructed and predominately continuous.</p> <p>Traveling in the southbound direction in the FG area of the proposed project, views of the project components would be predominately skylined; predominantly partially unobstructed and predominately continuous.</p> <p>Platform does not occur within the middleground or background of the project area.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
Angle of View	<p>Traveling northbound in the FG of the project components, the angle of observation from this platform would be predominately head-on and parallel views. The viewer position would be predominately inferior.</p> <p>Traveling southbound in the FG of the project components, the angle of observation from this platform would be predominately head-on and parallel views. The viewer position would be predominately inferior.</p>	
Quantification of View	<p>Platform percent seen from project components: There are a total of 10.6 miles of linear platform within the analysis area</p> <p>Traveling northbound in the FG there are 10.6 miles of linear platform. The project components would be seen for approximately 10.6 miles or 100% of the total platform miles within the analysis area.</p> <p>Traveling southbound in the FG there are 10.6 miles of linear platform. The project components would be seen for approximately 10.6 miles or 100% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 140.1 acres of project components within the analysis area; approximately 30 acres or 21% would be seen from the platform traveling in the northbound direction within the FG and approximately 41 acres or 29% would be seen from the platform traveling in the southbound direction within the FG.</p> <p>There are 46 turbines within the analysis area: Traveling in the northbound direction within the FG 42 turbines or 91% would be seen from the platform. Traveling in the southbound direction within the FG 42 turbines or 91% would be seen from the platform.</p>	

	<p>Duration of view from linear platform: There are a total of 10.6 miles of linear platform within the analysis area</p> <p>Traveling northbound based on a vehicular travel speed of 45 mph, and a total travel time of 14 minutes within the FG of the project, the project components would be seen for a total of approximately 14 minutes within the FG or 100% of the total travel time within the analysis area.</p> <p>Traveling southbound based on a vehicular travel speed of 45 mph, and a total travel time of 14 minutes within the FG of the project, the project components would be seen for a total of approximately 14 minutes within the FG or 100% of the total travel time within the analysis area.</p> <p>The project components would be equally visible when traveling in either direction.</p>	
<p>Spatial Relationship/ Size and Scale</p>	<p>Traveling northbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components would introduce elements, patterns and scale that would be visually dominant and create strong contrast as compared to other features in the landscape.</p> <p>Traveling southbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components would introduce elements, patterns and scale that would be visually dominant and create strong contrast as compared to other features in the landscape.</p>	

UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 1S Range: 19W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curing, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	No perceived change.
Line	No perceived change.	No perceived change.	No perceived change.
Color	No perceived change.	No perceived change.	No perceived change.
Texture	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING

SHORT TERM X

LONG TERM (>5 years) X

														2. Does the project design meet visual resource management objectives? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (Explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X				X	
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	

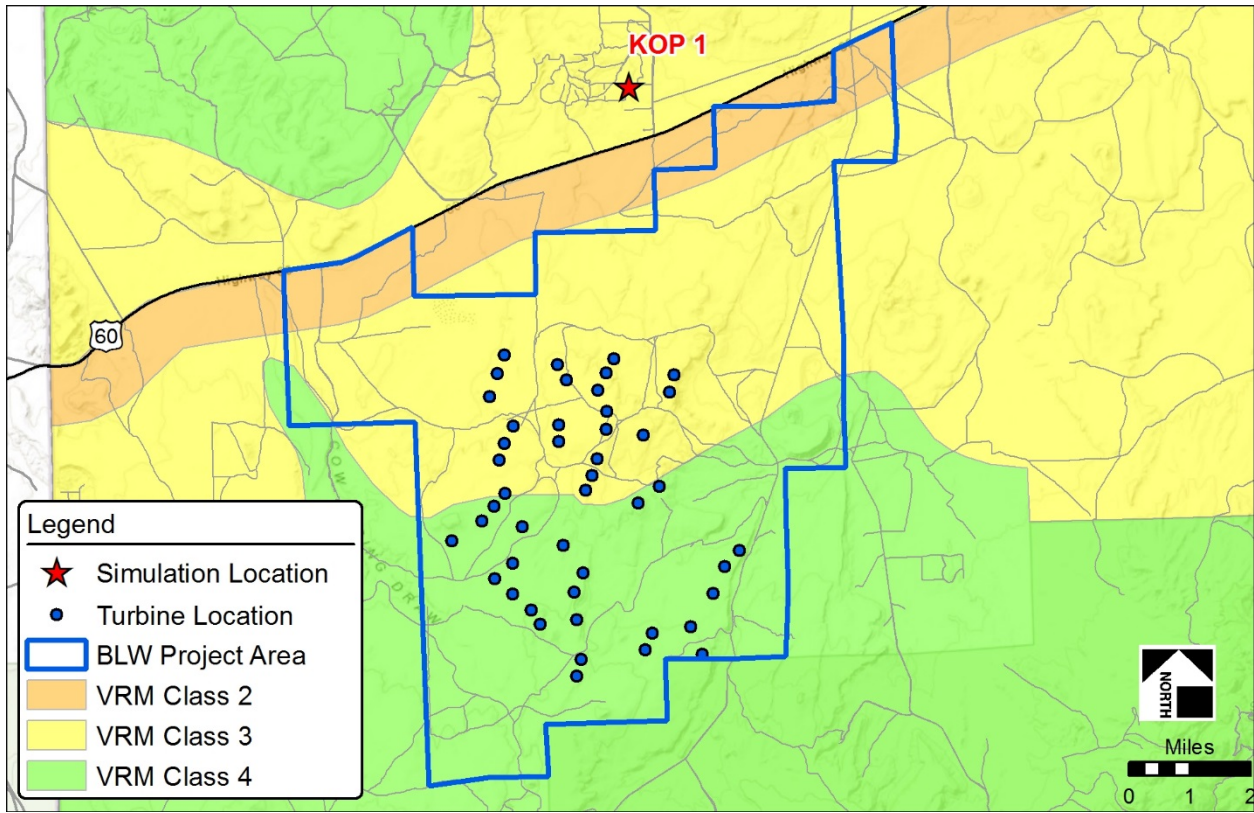
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. There are no proposed BLWP components planned within VRM II that would be visible from this KOP. Therefore, the Proposed Action would be in conformance with VRM II management objectives from the viewpoint of the Cimarron Ranch Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

**SECTION A. PROJECT
 INFORMATION**

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curving, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. .
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: **X**LONG TERM (>5 years): **X**

		2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/>												
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
		3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>												
Element	Form			X				X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
	Line			X			X		X					
	Color			X				X	X					
	Texture			X			X		X					

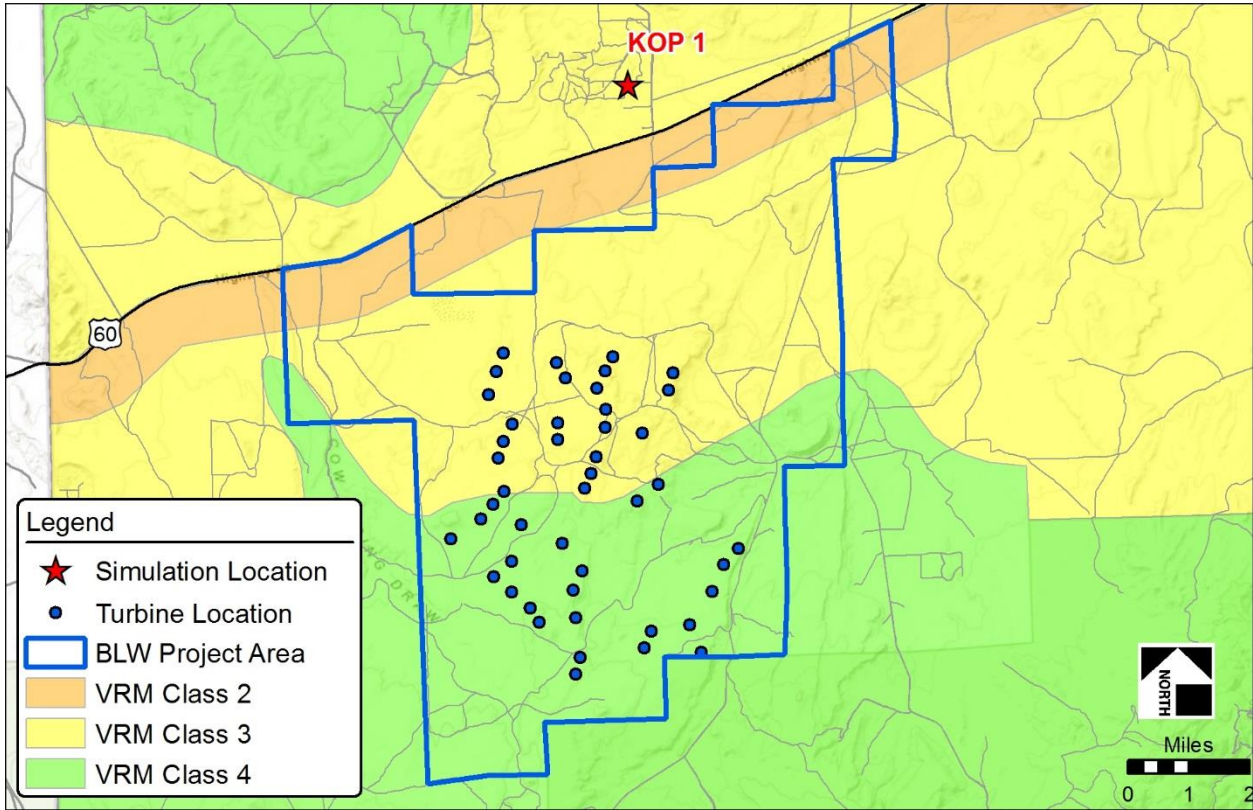
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominate the landscape. The proposed turbines and access roads would be visible within the foreground of the Cimarron Ridge Subdivision KOP. Up to 22 turbines would be visible in VRM Class III from this KOP. The primary focus of the viewer's attention is the broad open landscape from which the project components would be predominately skylined. The visual resource management objective for this class, Class III, allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. The Proposed Action would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, the Proposed Action would not be in conformance with Class III visual resource management objectives from the viewpoint of the Cimarron Ridge Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

**SECTION A. PROJECT
 INFORMATION**

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curing, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. .
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: **X**LONG TERM (>5 years): **X**

		SECTION D. CONTRAST RATING												SHORT TERM: X	LONG TERM (>5 years): X
		Land/Water Body (1)				Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)	
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Element	Form			X				X	X				Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker		
	Line			X			X		X						
	Color			X				X	X						
	Texture			X			X		X						

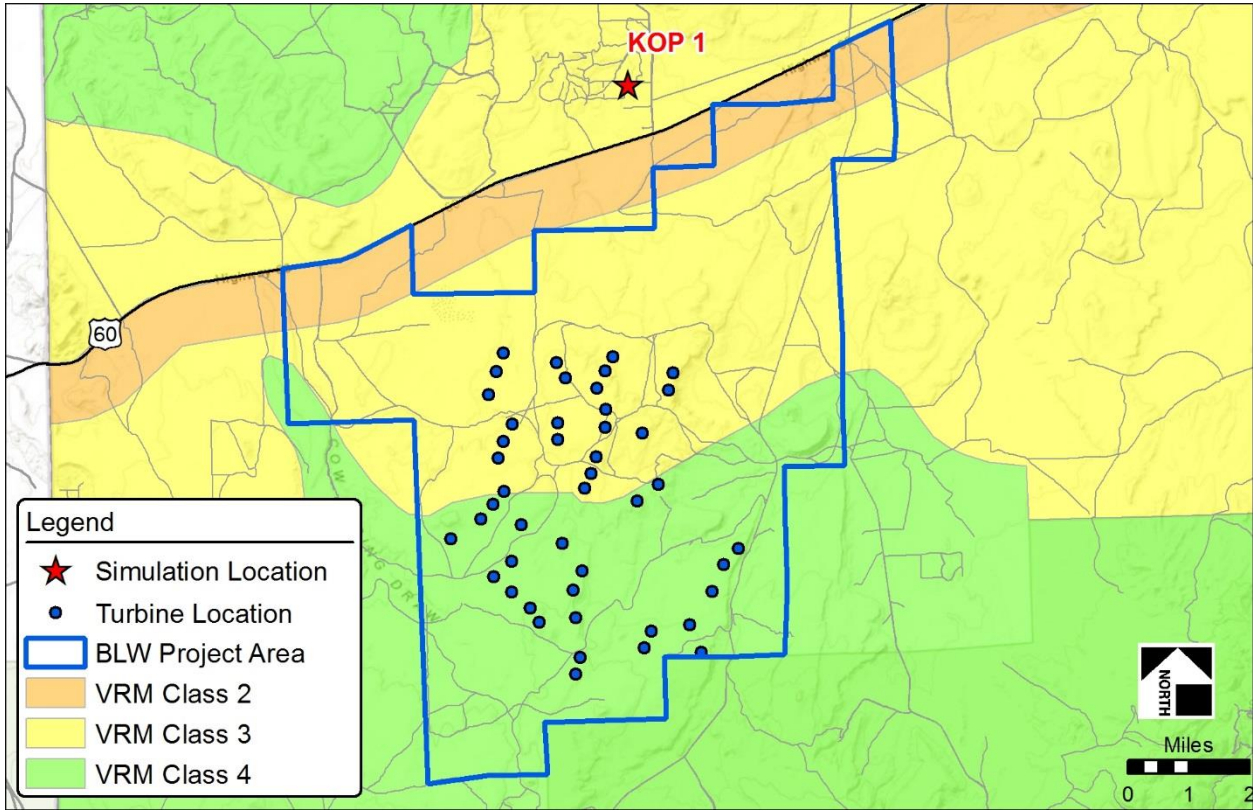
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible within the foreground of the Cimarron Ranch Subdivision KOP. Up to 24 turbines would be visible in VRM Class IV from this KOP. The primary focus of the viewer's attention is the broad open landscape from which the project components would be predominately skylined. The visual resource management objective for Class IV allows for the level of change to the characteristic landscape can be high. The Proposed Action would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the Cimarron Ridge Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Stationary Platform Environmental Factors

Alternative: Proposed Action

Stationary Platform Name: Cimarron Ranch Subdivision

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker; C. Bockey; D. Chavez; V. Alguire

Simulation: Yes

Environmental Factors	As Considered from Stationary Platform	Comments
<p>Distance to Project Components</p>	<p>This platform is approximately 4.5 miles from the nearest visible turbine. This platform is approximately 4.7 miles from the nearest visible project infrastructure (roads/ ancillary facilities).</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
<p>Visibility Conditions</p>	<p>This platform is located in a panoramic landscape that includes broad rolling plains with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height. In the foreground (FG) of the platform, views of the project components would be predominately skylined; equally unobstructed and partially obstructed; equally continuous and intermittent/continuous.</p>	
<p>Angle of View</p>	<p>In the FG, the amount of viewer exposure of the project components from the platform would be approximately 40°. The primary focus of the viewer's attention is the broad open landscape from which the project components would be in view. The viewer position would be predominately neutral.</p>	
<p>Quantification of View (Project percent seen)</p>	<p>Based on bare earth GIS analysis approximately 46 turbines would be seen in the FG of the platform, which would represent 100 percent of the total turbines within the project area. There are 140.1 acres of surface disturbance within the FG of the platform. Based on bare earth GIS analysis approximately 5 acres would be seen in the FG of the platform, which would represent 3 percent of the total acres of surface disturbance within the FG of the platform.</p>	
<p>Scale/Spatial Relationship</p>	<p>The project components within the FG of the platform would demand attention and dominate the visual setting; the visual setting would appear to be severely altered because the dominance of the wind turbines in scale, color and form as well as the motion of the turbine blades would introduce elements and patterns that create strong contrast as compared to other features within the landscape.</p>	

BLWP – Cimarron Ranch Subdivision Simulation - Proposed Action



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

**SECTION A. PROJECT
 INFORMATION**

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Coronado Trail Scenic Road		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes; and isolated rock outcrops	Predominately rounded pinyon-juniper; low indistinctive grasses	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Converging with undulating edges at transition to adjacent landforms.	Round to globe-like of pinyon-juniper; continuous flowing.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown; darker brown volcanic rock.	Light straw-buff of grasses; dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth with some bumpy areas; gentle transitions.	Continuous coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses are inconsistent.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade.
Color	No perceived change	No perceived change	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change	No perceived change	Coarse, rough, discontinuous, and dotted turbines.

SECTION D. CONTRAST RATING

SHORT TERM: **X**LONG TERM (>5 years): **X**

		SECTION D. CONTRAST RATING												SHORT TERM: X		LONG TERM (>5 years): X	
		Land/Water Body (1)				Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Element	Form				X				X				X	Evaluator's Names D. Simpson-Colebank R. Baker			
	Line				X				X				X				
	Color				X				X				X				
	Texture				X				X				X				

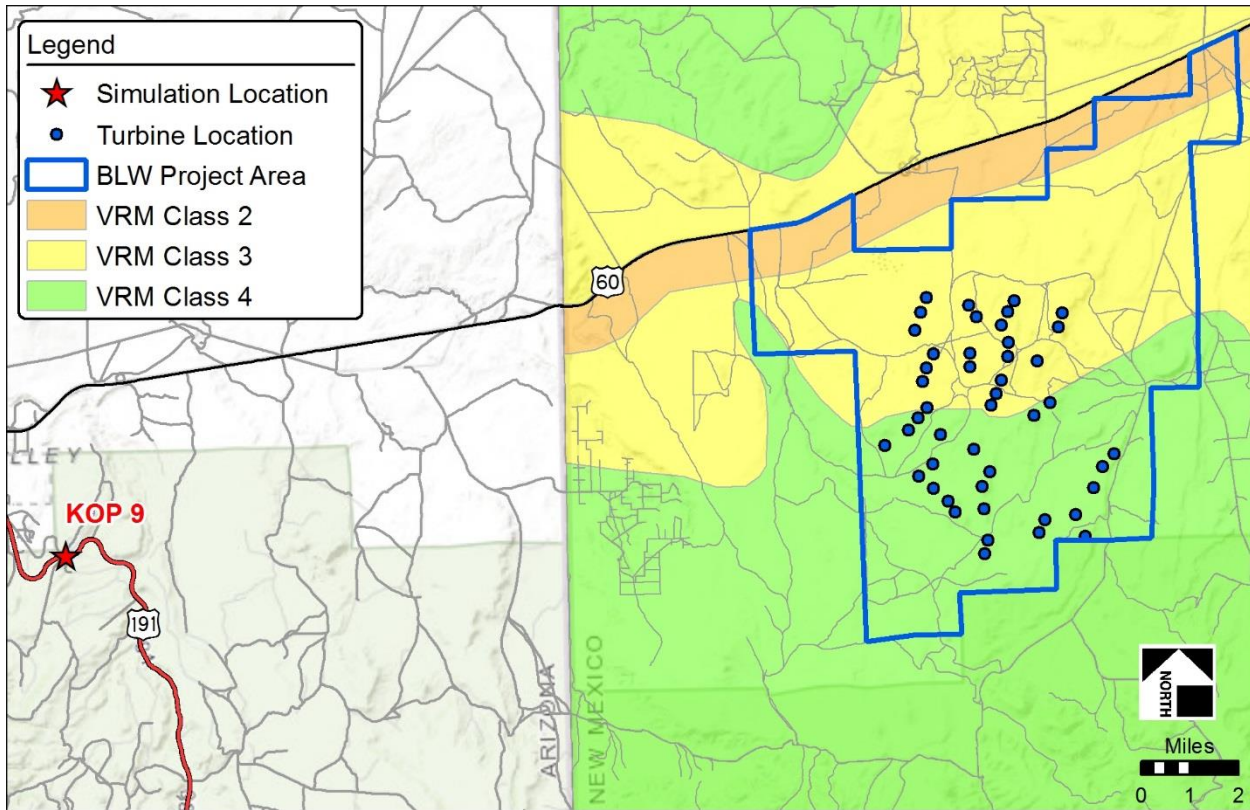
Comments from Item 2.

The view from this linear platform consists of rolling hills and a scattering of distant mountain landforms in the background. The vegetation consists primarily of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class III. The statuesque wind turbines with their rotating blades and lighted hubs would attract attention but would not dominate the landscape. The proposed turbines would be visible within the middleground and background area of the Coronado Trail Scenic Road KOP. This platform is approximately 16 miles from the nearest visible turbines. Views of the project components (turbines) would be skylined; consistently partially obstructed and sporadically intermittent when viewed from this KOP due to visibility conditions. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. The Proposed Action would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day, atmospheric conditions, and direction of view (visible to southbound travelers only). Therefore, the Proposed Action would be in conformance with Class III visual resource management objectives from the viewpoint of Coronado Trail Scenic Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Coronado Trail Scenic Road		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes; and isolated rock outcrops	Predominately rounded pinyon-juniper; low indistinctive grasses	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Converging with undulating edges at transition to adjacent landforms.	Round to globe-like of pinyon-juniper; continuous flowing.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown; darker brown volcanic rock.	Light straw-buff of grasses; dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth with some bumpy areas; gentle transitions.	Continuous coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses are inconsistent.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade.
Color	No perceived change	No perceived change	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change	No perceived change	Coarse, rough, discontinuous, and dotted turbines.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X			X		
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X			X		

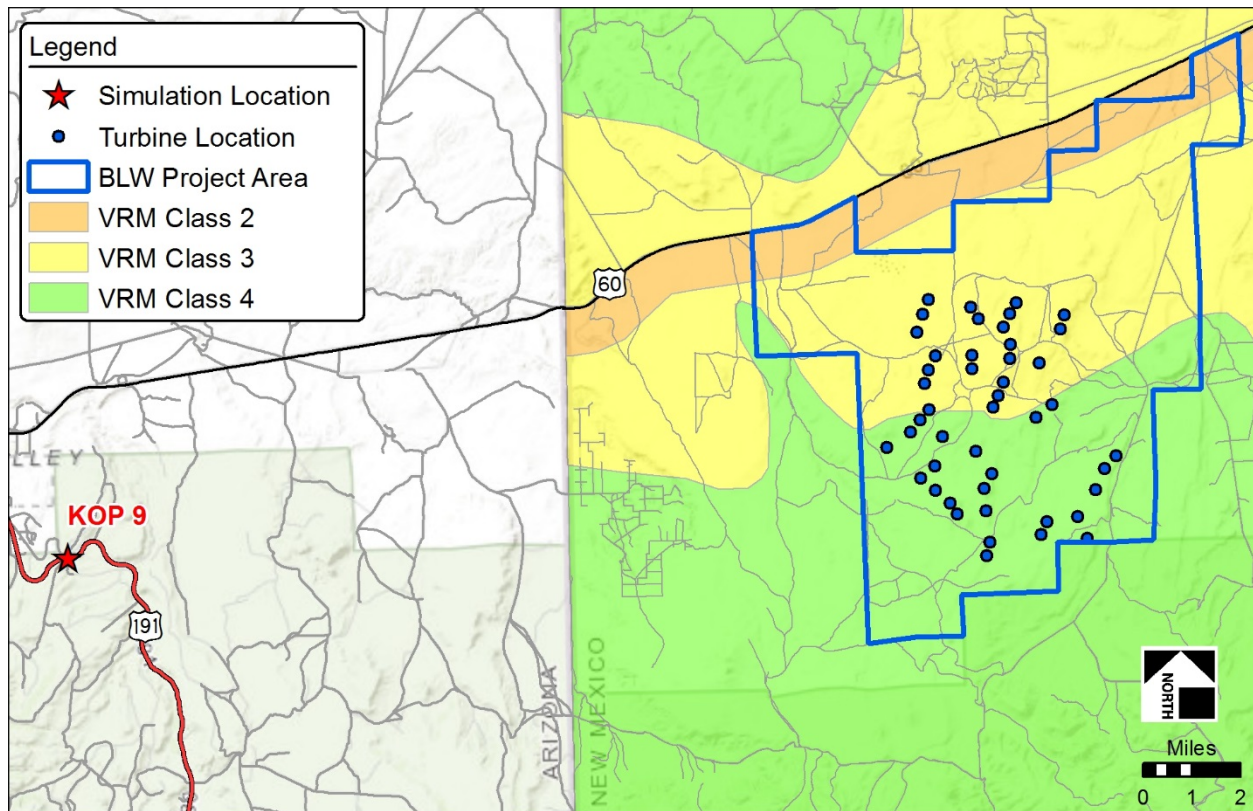
Comments from Item 2.

The view from this linear platform consists of rolling hills and a scattering of distant mountain landforms in the background. The vegetation consists primarily of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would attract attention but would not dominate the landscape. The proposed turbines would be visible within the middleground of the Coronado Trail Scenic Road KOP. This platform is approximately 16 miles from the nearest visible turbines. Views of the project components (turbines) would be predominately skylined; consistently partially obstructed and sporadically intermittent when viewed from this KOP due to visibility conditions. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. The Proposed Action would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day and atmospheric conditions. Therefore, Proposed Action would be in conformance with Class IV visual resource management objectives from the viewpoint of Coronado Trail Scenic Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Proposed Action

Linear Platform Name: Coronado Trail Scenic Road

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: Yes

Environmental Factors	As Considered from Linear Platform	Comments
Distance to Project Components	<p>This platform is approximately 16 miles from the nearest visible turbine.</p> <p>This platform is approximately 14 miles from the nearest visible project infrastructure (distribution line).</p> <p>Platform does not occur within the foreground of the proposed project.</p>	
Visibility Conditions	<p>This platform is located in a panoramic landscape that includes no apparent limit to the view.</p> <p>Traveling in the northbound direction project components would not be visible.</p> <p>Traveling in the southbound direction project components would not be visible within the background area of the proposed project.</p> <p>Traveling in the southbound direction in the middleground (MG) area of the proposed project, views of the project components (turbines) would be predominately skylined; predominately partially obstructed and predominately intermittent.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
Angle of View	<p>Traveling southbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral</p>	
Quantification of View	<p>Platform percent seen from project components: There are a total of 36.6 miles of linear platform within the analysis area.</p> <p>Traveling southbound in the MG there are 22.6 miles of linear platform The project components would be seen for approximately .4 miles within the MG or 1% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 140.1 acres of surface disturbance within the analysis area; 31 acres /22% would be seen from the platform traveling in the southbound direction within the MG.</p> <p>There are 46 turbines within the analysis area: Traveling in the southbound direction within the MG, up to 43 turbines/ 93% would be seen from the platform.</p> <p>Duration of view from linear platform: There are a total of 36.6 miles of linear platform within the analysis area.</p> <p>Traveling southbound based on a vehicular travel speed of 55 mph, and a total travel time of 25 minutes within the MG of the project, the project components would be seen for a total of approximately 24 seconds or 1% of the total travel time within the analysis area.</p> <p>The project components would be more visible traveling in the southbound direction.</p>	

Spatial Relationship/ Size and Scale	Traveling southbound in the MG of the proposed project, the project components would begin to attract attention and be visually subordinate within the visual setting; the visual setting within the MG of the proposed project would appear to be noticeably altered because project components (turbines) would begin to attract attention when visible and would generally create low contrast due to distance and atmospheric conditions when viewed from this platform.	
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BLWP - Coronado Trail Simulation - Proposed Action



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 1S Range: 19W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Linear, flat to rolling, symmetrical, regular form of US 60 turn lanes.
Line	No perceived change.	Straight to curving, horizontal continuous line of vegetation created from the construction of US 60 turning lanes.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Defined, vertical, rigid, and repetitive transmission line structures. Curvilinear, horizontal, continuous, and flowing line of US 60 turn lanes.
Color	No perceived change.	No perceived change.	Monotone color of light/white value turbine structure and blade. Dark brown wood of transmission line structures. Dark monotone color of US 60 turning lanes.

Texture	No perceived change.	Directional, continuous, and ordered adjacent to US 60 turning lanes.	Coarse, rough, discontinuous, and dotted turbines. Consistent, directional, and repetitive transmission line structures. Smooth, directional, continuous, fine texture of US 60 turning lanes.
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: <input checked="" type="checkbox"/> No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
Element		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
		Form				X				X				
Line				X			X					X		
Color				X				X				X		
Texture				X			X					X		

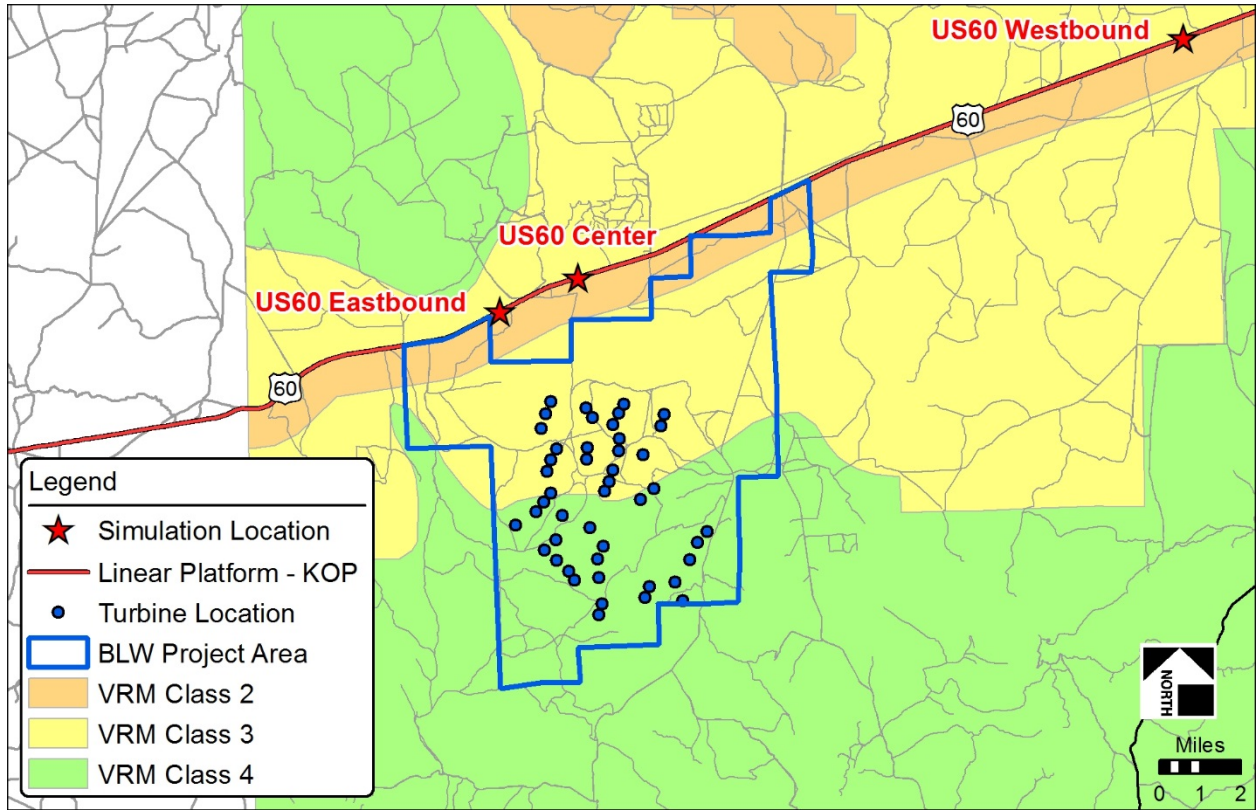
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The proposed turbines, access roads, and US 60 turn lanes would be visible within the foreground of the US 60 (Ocean to Ocean Highway) KOP. The visual resource management objective for Class II allows for a low level of change to the characteristic landscape. These changes should repeat the basic elements found in the characteristic landscape and should not attract the attention of the casual observer. The proposed US 60 turn lanes would be the only project components within the Class II area and would repeat the elements present within the setting and as well, would not attract the attention of the casual observer. Within VRM Class II, the Proposed Action would create weak contrast in form, line, color, and texture in the characteristic landscape from the US 60 turn lanes and overhead transmission line crossing US 60. Therefore, the Proposed Action would be in conformance with Class II visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Defined, vertical, rigid, and repetitive transmission line structures. Curvilinear, horizontal, continuous, and flowing line of access roads.

Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Dark brown wood of transmission line structures. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Consistent, directional, and repetitive transmission line structures. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: **X**

LONG TERM (>5 years): **X**

		SECTION D. CONTRAST RATING												2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
														3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form			X					X	X				Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
	Line			X				X		X				
	Color			X					X	X				
	Texture			X				X		X				

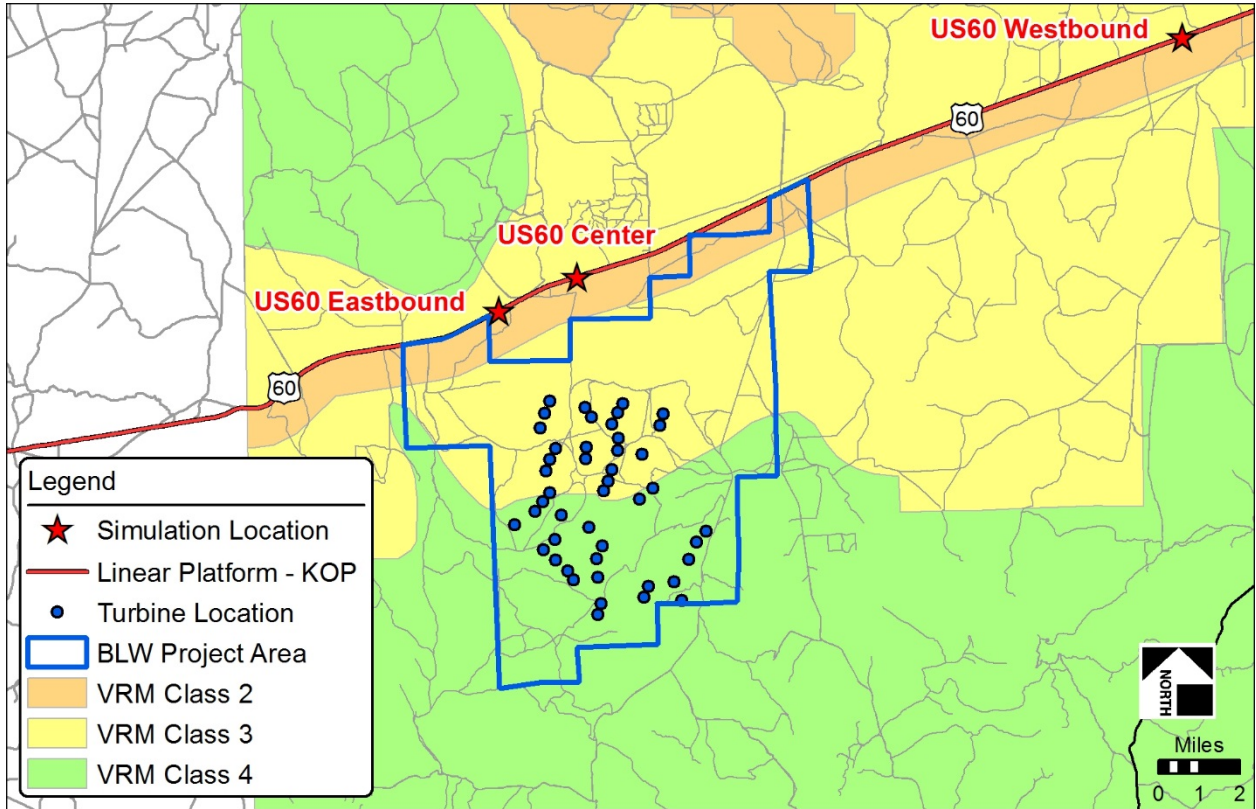
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class III and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines, and access roads would be visible within the foreground of the US 60 (Ocean to Ocean Highway) KOP. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. The Proposed Action would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, the Proposed Action would not be in conformance with Class III visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township:2S Range:19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Defined, vertical, rigid, and repetitive transmission line structures. Curvilinear, horizontal, continuous, and flowing line of access roads.

Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Dark brown wood of transmission line structures. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Consistent, directional, and repetitive transmission line structures. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: **X**

LONG TERM (>5 years): **X**

		Land/Water Body (1)				Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
		3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>												
Element	Form			X					X	X				Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
	Line			X				X		X				
	Color			X					X	X				
	Texture			X				X		X				

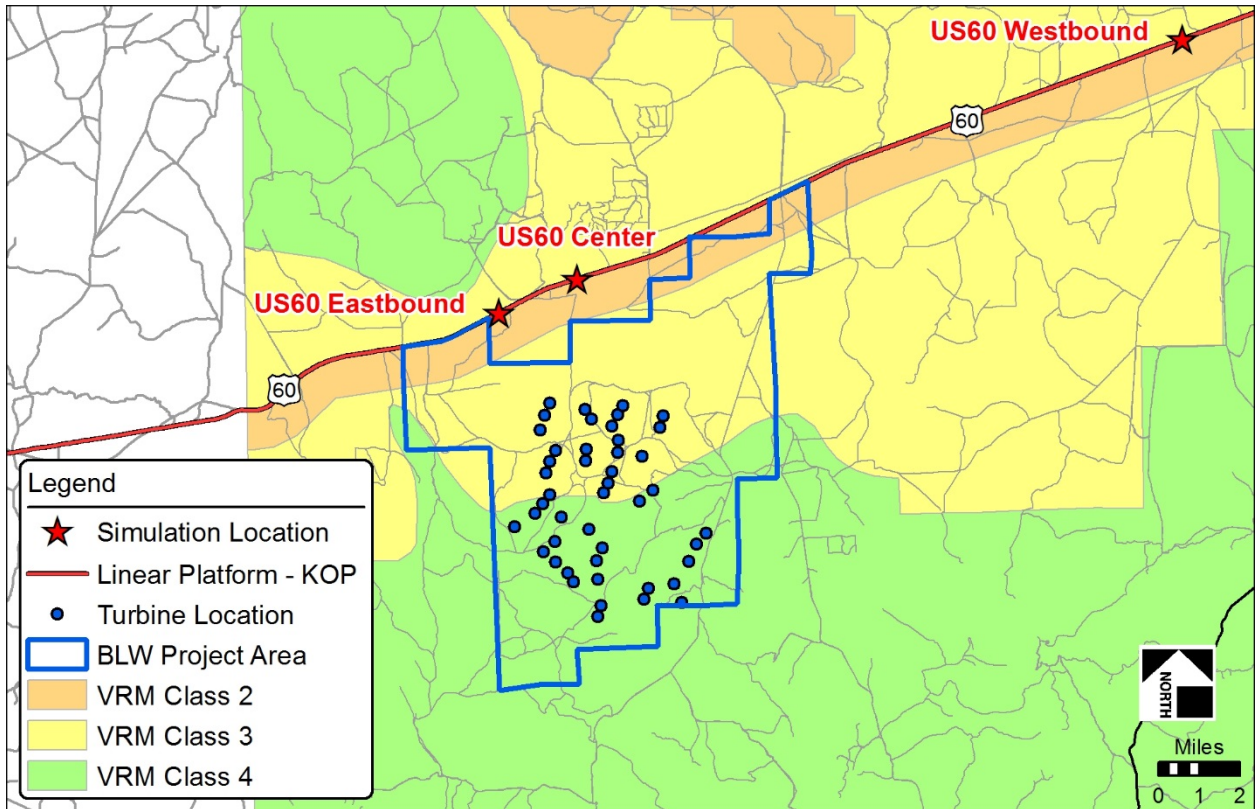
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible within the foreground of US 60 (Ocean to Ocean Highway) KOP. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. The Proposed Action would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Proposed Action

Linear Platform Name: US 60

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: Yes

Environmental Factors	As Considered from Linear Platform	Comments
<p>Distance to Project Components</p>	<p>This platform is approximately 2.5 miles from the nearest visible turbine. This platform intersects project infrastructure (roads or ancillary facilities).</p>	
<p>Visibility Conditions</p>	<p>This platform is located in a panoramic landscape that includes broad plains and low rolling hills with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height.</p> <p>Traveling in the eastbound direction in the foreground (FG) area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skylined; equally unobstructed and partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the eastbound direction in the middleground (MG) area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the eastbound direction in the background (BG) area of the proposed project, views of the project components would be predominately backdropped; partially obstructed and sporadically intermittent. Distance and atmospheric conditions would restrict visibility.</p> <p>Traveling in the westbound direction in the FG area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the westbound direction in the MG area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the westbound direction project components are not visible in the BG area.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
<p>Angle of View</p>	<p>Traveling eastbound in the FG of the project components, the angle of observation from this platform would be predominately parallel views. The viewer position would be predominately neutral. Traveling eastbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral. Traveling eastbound in the BG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately inferior. Distance and atmospheric conditions would restrict visibility.</p> <p>Traveling westbound in the FG of the project components, the angle of observation from this platform would be predominately parallel views. The viewer position would be predominately neutral. Traveling westbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral.</p>	

Quantification of View	<p>Platform percent seen from project components: There are a total of 67.0 miles of linear platform within the analysis area.</p> <p>Traveling eastbound in the FG of the project there are 29.5 miles of linear platform. . The project components would be seen for approximately 15 miles within the FG or 22% of the total platform miles within the analysis area.</p> <p>Traveling eastbound in the MG of the project there are 22.4 miles of linear platform. The project components would be seen for approximately 4 miles within the MG or 6% of the total platform miles within the analysis area.</p> <p>Traveling eastbound in the BG of the project there are 15.1 miles of linear platform. The project components would be seen for approximately 2 miles within the BG or 3% of the total platform miles within the analysis area.</p> <p>Traveling westbound in the FG of the project there are 29.5 miles of linear platform. The project components would be seen for approximately 16 miles within the FG or 23% of the total platform miles within the analysis area.</p> <p>Traveling westbound in the MG of the project there are 22.4 miles of linear platform. The project components would be seen for approximately 2 miles within the MG or 3% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 140.1 acres of surface disturbance within the analysis area; approximately 25 acres or 18% would be seen from the platform traveling in the eastbound direction within the FG and approximately 45 acres or 32% would be seen from the platform traveling in the westbound direction within the FG.</p> <p>There are 46 turbines within the analysis area: Traveling in the eastbound direction within the FG 46 turbines or 100% would be seen from the platform. Traveling in the eastbound direction within the MG 46 turbines or 100% would be seen from the platform. Traveling in the eastbound direction within the BG 14 turbines or 30% would be seen from the platform.</p> <p>Traveling in the westbound direction within the FG 46 turbines or 100% would be seen from the platform. Traveling in the westbound direction within the MG 46 turbines or 100% would be seen from the platform.</p> <p>Duration of view from linear platform: There are a total of 67.0 miles of linear platform within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 27 minutes within the FG of the project, the project components would be seen for a total of approximately 14 minutes within the FG or 23% of the total travel time within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 21 minutes within the MG of the project, the project components would be seen for a total of approximately 4 minutes or 6% of the total travel time within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 14 minutes within the BG of the project, the project components would be seen for a total of approximately 2 minutes or 3% of the total travel time within the analysis area.</p> <p>Traveling westbound based on a vehicular travel speed of 65 mph, and a total travel time of 27 minutes within the FG of the project, the project components would be seen for a total of approximately 15 minutes or 24% of the total travel time within analysis area.</p>	
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	<p>Traveling westbound based on a vehicular travel speed of 65 mph, and a total travel time of 21 minutes within the MG of the project, the project components would be seen for a total of approximately 2 minutes or 3% of the total travel time within the MG of the project.</p> <p>The project components would be more visible traveling in the eastbound direction (20 minutes or 32% of the total travel time within the analysis area) vs. traveling in the westbound direction (17 minutes or 27% of the total travel time within the analysis area).</p>	
<p>Spatial Relationship/ Size and Scale</p>	<p>Traveling eastbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components (infrastructure and turbines) would introduce elements and patterns that would be visually dominant and create strong contrast as compared to the other features in the landscape.</p> <p>Traveling eastbound in the MG of the proposed project, the project components would attract attention, be visually prominent, and begin to dominate the visual setting; the visual setting within the MG of the proposed project would appear to be substantially altered because project components (turbines) would introduce elements and patterns not common in the landscape and would create moderate contrast as compared to other features in the landscape.</p> <p>Traveling eastbound in the BG of the proposed project, the project components would not attract attention and the landscape would appear intact within the visual setting; project component visibility would be limited by distance and atmospheric conditions.</p> <p>Traveling westbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components (infrastructure and turbines) would introduce elements and patterns that would be visually dominant and create strong contrast as compared to the other features in the landscape.</p> <p>Traveling westbound in the MG of the proposed project, the project components would attract attention, be visually prominent, and begin to dominate the visual setting; the visual setting within the MG of the proposed project would appear to be substantially altered because project components (turbines) would introduce elements and patterns not common in the landscape and would create moderate contrast as compared to other features in the landscape.</p>	

BLWP – US 60 Center Simulation - Proposed Action



BLWP – US 60 Eastbound Simulation - Proposed Action



BLWP – US 60 Westbound Simulation - Proposed Action



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Proposed Action	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Zuni Salt Lake		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Low, rectangular scattered building structures. Low, vertical, thin, curving, linear, fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive and fencing structures. Regular, angular, and geometric lines associated with building structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Muted tones of varying shades of building structure. Dark monotone paved roads and light to medium beige/gray unpaved roads. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive fencing. Discontinuous, scattered, medium to coarse, building structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade
Color	No perceived change.	No perceived change.	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change.	No perceived change.	Coarse, rough, discontinuous, and dotted turbines.

		2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/>											
		Land/Water Body (1)				Vegetation (2)				Structures (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
		3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>											
Element	Form			X			X			X			Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
	Line			X			X			X			
	Color			X			X			X			
	Texture			X			X			X			

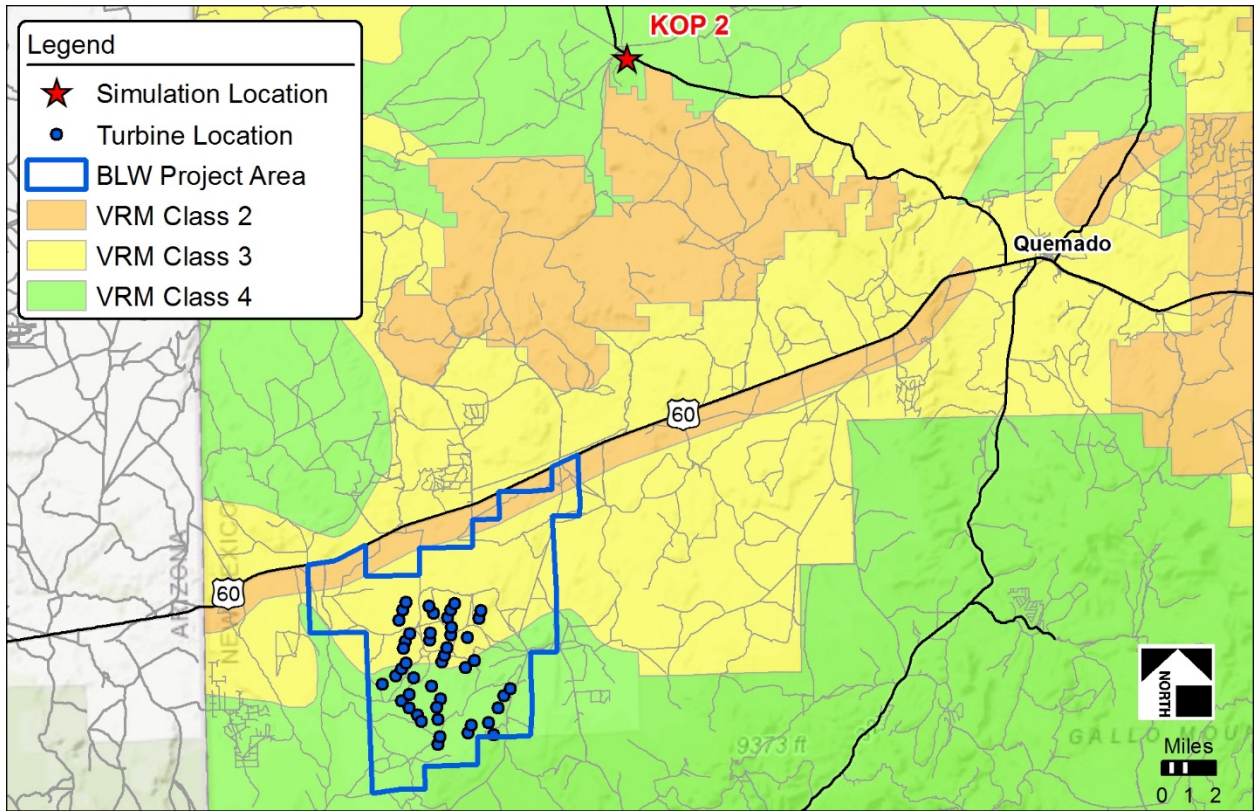
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class III and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. This KOP is approximately 21 miles from the nearest visible turbines. Approximately 26 turbines would be visible within the background of the Zuni Salt Lake KOP. The amount of viewer exposure of the project components from the platform would be approximately 15 degrees. The primary focus of the viewer's attention is Zuni Lake from which the project components would be in view. The viewer position would be predominately inferior. The visual resource management objective for this class, Class III, allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. The Proposed Action would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day and atmospheric conditions. Therefore, the Proposed Action would be in conformance with Class III visual resource management objectives from the viewpoint of Zuni Salt Lake KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Stationary Platform Environmental Factors

Alternative: Proposed Action

Stationary Platform Name: Zuni Salt Lake

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker; C. Bockey; D. Chavez; V. Alguire

Simulation: Yes

Environmental Factors	As Considered from Stationary Platform	Comments
Distance to Project Components	This platform is approximately 21 miles from the nearest visible turbine. Project infrastructure (transmission line/ roads/ ancillary facilities) are not visible from this platform.	Foreground limit 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles
Visibility Conditions	This platform is located in a predominately panoramic landscape that includes plains with scattered low rolling hills and mesas. In the background (BG) of the platform, views of the wind turbine blades would be predominately skylined; towers predominately partially obstructed and predominately intermittent.	The majority of project components (turbines) occur behind landforms when viewed from this platform. Distance and atmospheric conditions reduce visibility of turbines.
Angle of View	In the BG, the amount of viewer exposure of the project components from the platform would be approximately 15°. The primary focus of the viewer's attention is Zuni Lake from which the project components would be in view. The viewer position would be predominately inferior.	
Quantification of View (Project percent seen)	Based on bare earth GIS analysis approximately 26 turbines would be seen in the BG of the platform, which would represent 57 percent of the total turbines within the project area. Project infrastructure (transmission line/ roads/ ancillary facilities) are not visible from this platform.	
Scale/Spatial Relationship	The project components within the BG of the platform and would begin to attract attention and be visually subordinate within the visual setting; the visual setting would appear to be noticeably altered because the turbines would introduce color contrast, vertical elements and motion that would be visually subordinate within the landscape and create generally low contrast due to distance and atmospheric conditions.	

BLWP – Zuni Salt Lake Simulation - Proposed Action



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 1S Range: 19W Section: 10	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change	No perceived change.	No perceived change
Line	No perceived change	No perceived change	No perceived change
Color	No perceived change	No perceived change.	No perceived change

Texture	No perceived change	No perceived change	No perceived change
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: <input checked="" type="checkbox"/> No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X				X	
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	

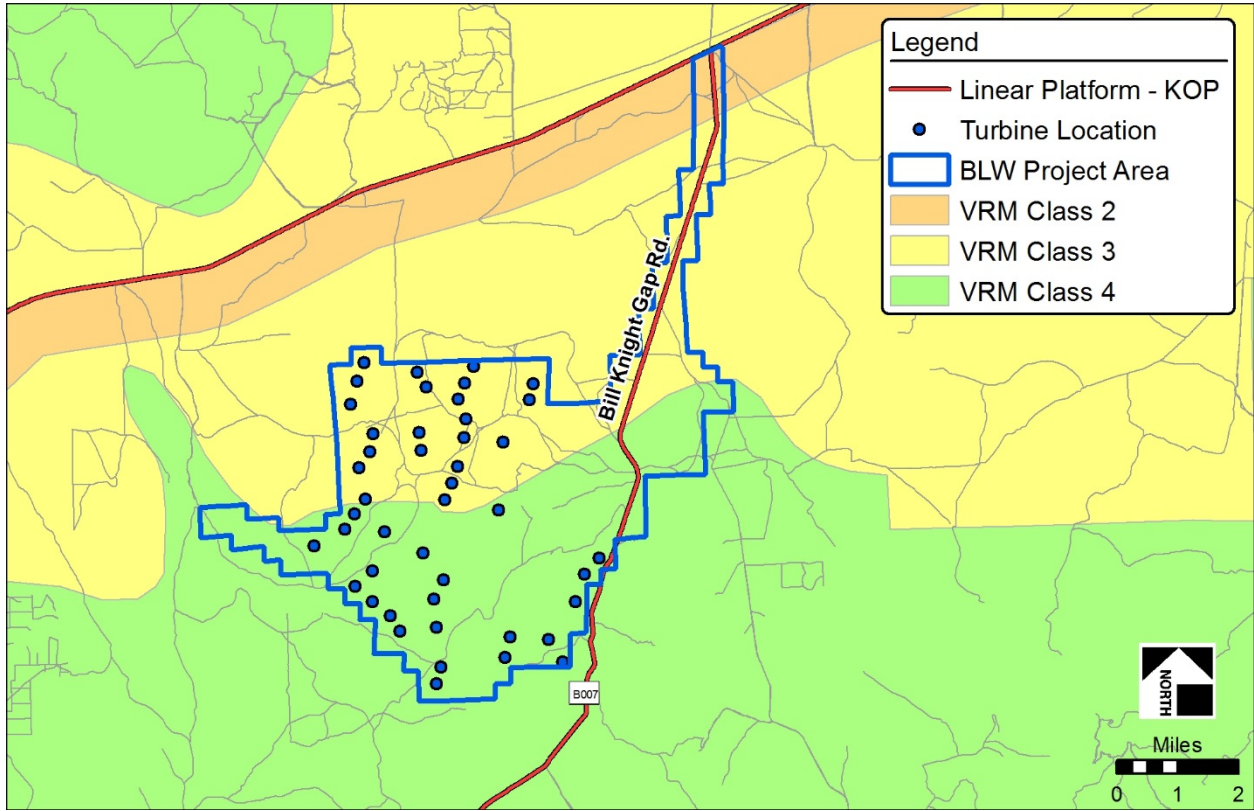
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 1 project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The visual resource management objective for Class II allows for a low level of change to the characteristic landscape. These changes should repeat the basic elements found in the characteristic landscape and should not attract the attention of the casual observer. Road improvements, access roads, and US 60 turn lane modifications would be visible within the foreground of the Bill Knight Gap Road KOP, but not perceivable. Therefore, Alternative 1 would be in conformance with Class II visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project- Alternative 1	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.

Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form			X					X	X				
	Line			X				X		X				
	Color			X					X	X				
	Texture			X				X		X				

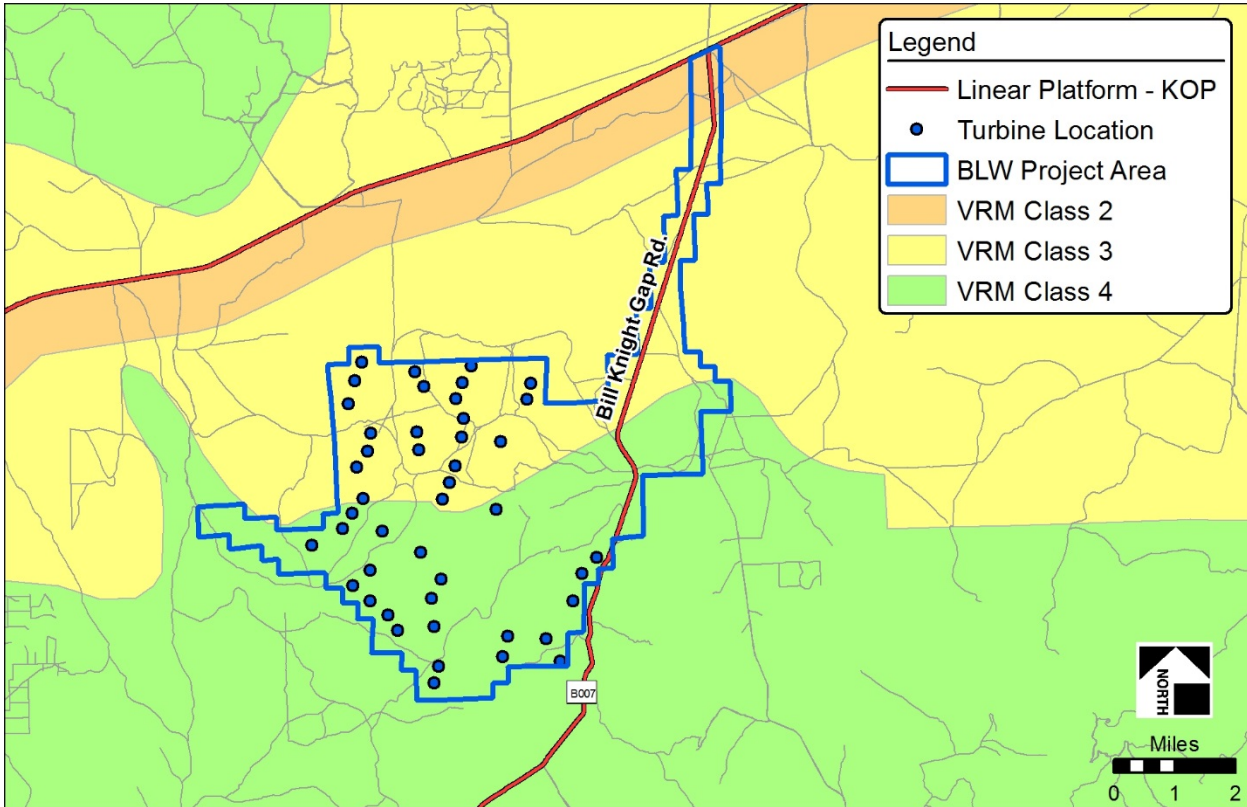
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible from the Bill Knight Gap Road KOP. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 1 would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, Alternative 1 would not be in conformance with Class III visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.

Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

Element		SECTION D. CONTRAST RATING												2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)	
		Land/Water Body (1)				Vegetation (2)				Structures (3)					3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form			X					X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker	
Line			X				X		X						
Color			X					X	X						
Texture			X				X		X						

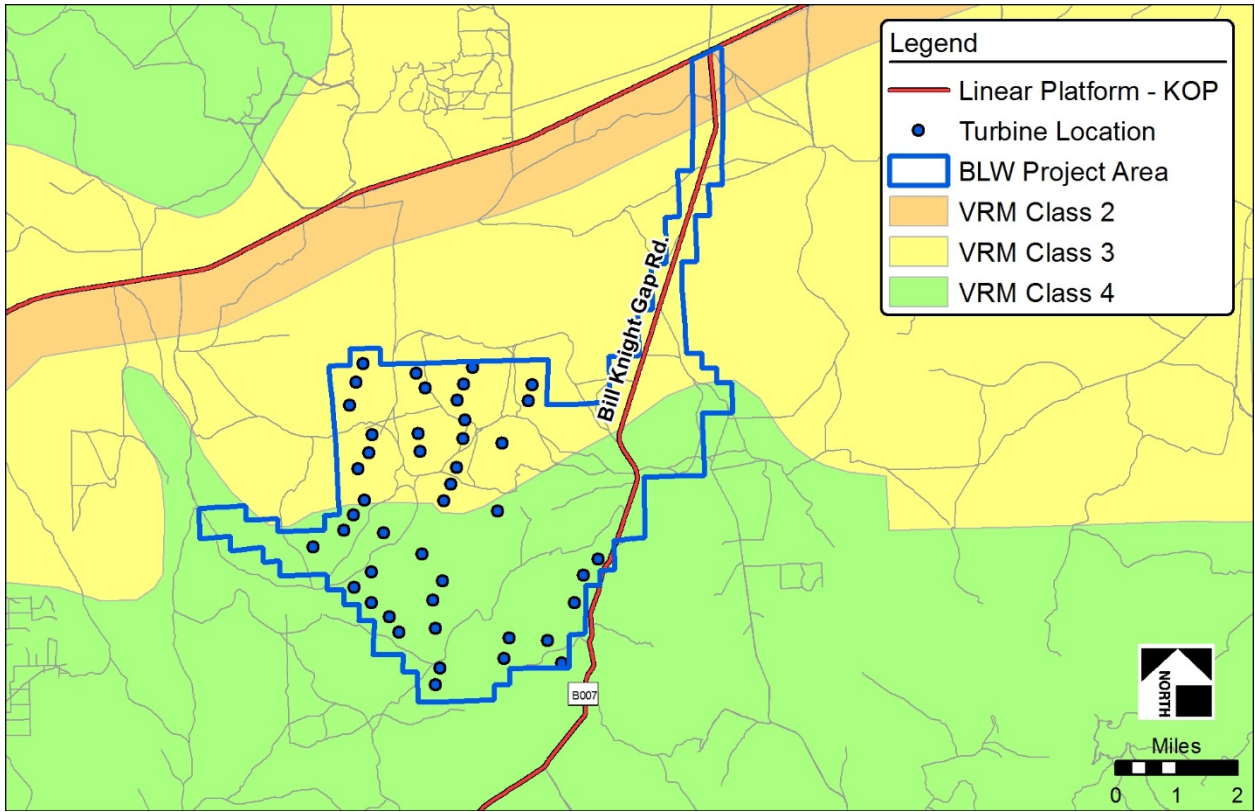
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as VRM Class II, III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible within the foreground of the Bill Knight Gap Road KOP. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. Alternative 2 would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Alternative 1

Linear Platform Name: Bill Knight Gap Road

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: No

Environmental Factors	As Considered from Linear Platform	Comments
Distance to Project Components	<p>This platform is approximately 850 feet from the nearest visible turbine.</p> <p>This platform intersects project infrastructure (most commonly road improvements).</p>	
Visibility Conditions	<p>This platform is located in a panoramic landscape that includes broad plains and low rolling hills with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height.</p> <p>Traveling in the northbound direction in the foreground (FG) area of the proposed project, views of the project components would be predominately skylined; predominantly unobstructed and predominately continuous.</p> <p>Traveling in the southbound direction in the FG area of the proposed project, views of the project components would be predominately skylined; predominantly partially unobstructed and predominately continuous.</p> <p>Platform does not occur within the middleground or background of the project area.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
Angle of View	<p>Traveling northbound in the FG of the project components, the angle of observation from this platform would be predominately head-on and parallel views. The viewer position would be predominately inferior.</p> <p>Traveling southbound in the FG of the project components, the angle of observation from this platform would be predominately head-on and parallel views. The viewer position would be predominately inferior.</p>	
Quantification of View	<p>Platform percent seen from project components: There are a total of 10.6 miles of linear platform within the analysis area</p> <p>Traveling northbound in the FG there are 10.6 miles of linear platform. The project components would be seen for approximately 10.6 miles or 100% of the total platform miles within the analysis area.</p> <p>Traveling southbound in the FG there are 10.6 miles of linear platform. The project components would be seen for approximately 10.6 miles or 100% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 137.0 acres of project components within the analysis area; approximately 30 acres or 21% would be seen from the platform traveling in the northbound direction within the FG and approximately 41 acres or 30% would be seen from the platform traveling in the southbound direction within the FG.</p> <p>There are 45 turbines within the analysis area: Traveling in the northbound direction within the FG 41 turbines or 91% would be seen from the platform. Traveling in the southbound direction within the FG 41 turbines or 91% would be seen from the platform.</p>	

	<p>Duration of view from linear platform: There are a total of 10.6 miles of linear platform within the analysis area</p> <p>Traveling northbound based on a vehicular travel speed of 45 mph, and a total travel time of 14 minutes within the FG of the project, the project components would be seen for a total of approximately 14 minutes within the FG or 100% of the total travel time within the analysis area.</p> <p>Traveling southbound based on a vehicular travel speed of 45 mph, and a total travel time of 14 minutes within the FG of the project, the project components would be seen for a total of approximately 14 minutes within the FG or 100% of the total travel time within the analysis area.</p> <p>The project components would be equally visible when traveling in either direction.</p>	
<p>Spatial Relationship/ Size and Scale</p>	<p>Traveling northbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components would introduce elements, patterns and scale that would be visually dominant and create strong contrast as compared to other features in the landscape.</p> <p>Traveling southbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components would introduce elements, patterns and scale that would be visually dominant and create strong contrast as compared to other features in the landscape.</p>	

UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 1S Range: 19W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curing, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	No perceived change.
Line	No perceived change.	No perceived change.	No perceived change.
Color	No perceived change.	No perceived change.	No perceived change.
Texture	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING

SHORT TERM X

LONG TERM (>5 years) X

														2. Does the project design meet visual resource management objectives? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (Explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X				X	
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	

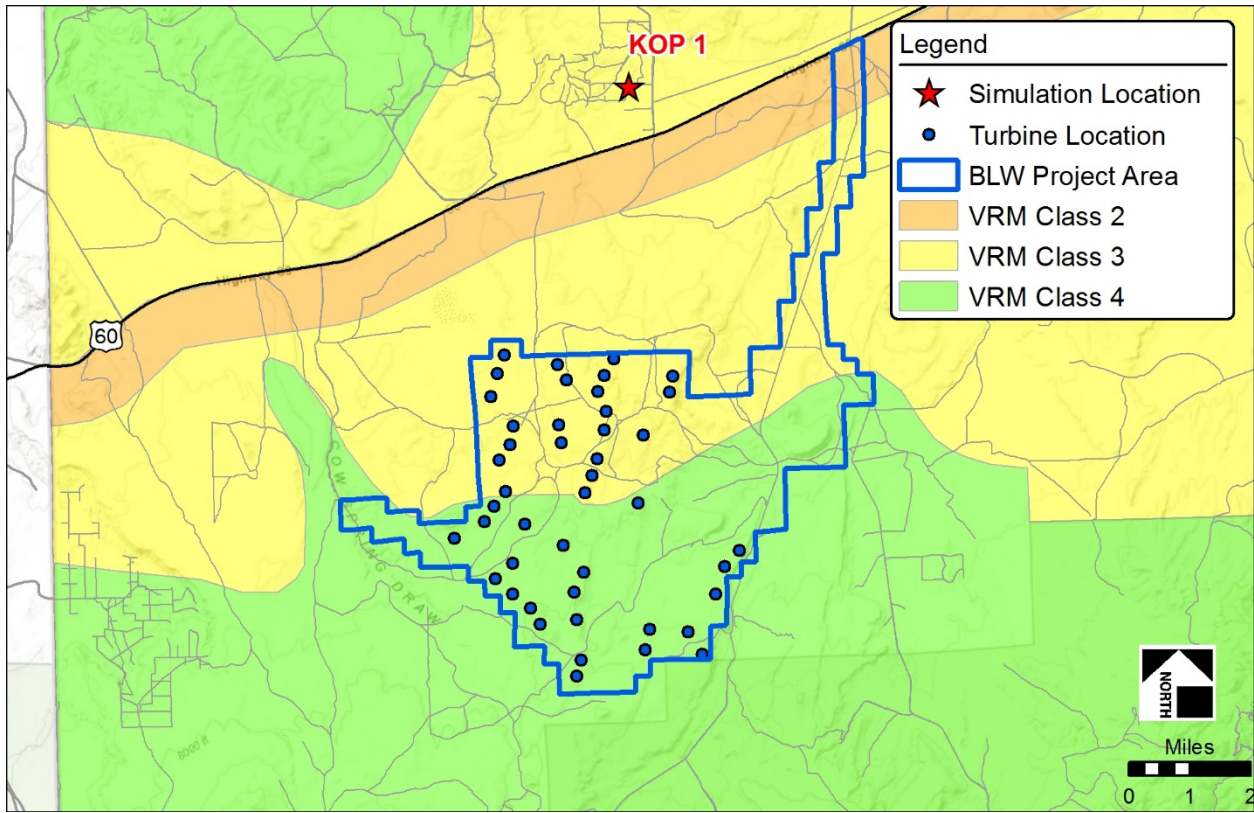
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. There are no proposed BLWP components planned within VRM II that would be visible from this KOP. Therefore, Alternative 1 would be in conformance with VRM II management objectives from the viewpoint of the Cimarron Ranch Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curving, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. .
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

		2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/>												
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
		3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>												
Element	Form			X				X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
	Line			X			X		X					
	Color			X				X	X					
	Texture			X			X		X					

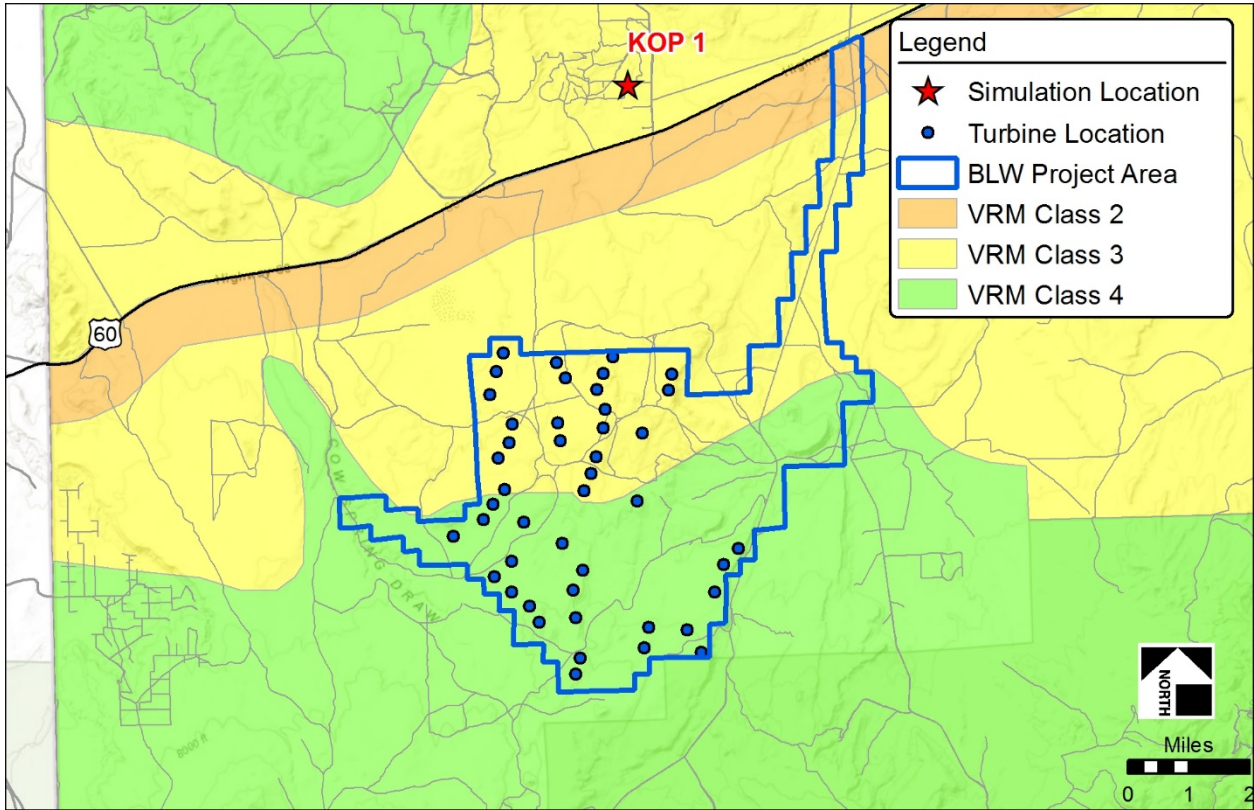
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 1 project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominate the landscape. The turbines and access roads would be visible within the foreground of the Cimarron Ridge Subdivision KOP. Up to 22 turbines would be visible in VRM Class III from this KOP. The primary focus of the viewer's attention is the broad open landscape from which the project components would be predominately skylined. The visual resource management objective for this class, Class III, allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 1 would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, Alternative 1 would not be in conformance with Class III visual resource management objectives from the viewpoint of the Cimarron Ridge Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curving, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. .
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

		SECTION D. CONTRAST RATING												SHORT TERM: X	LONG TERM (>5 years): X
		Land/Water Body (1)				Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)	
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Element	Form			X				X	X				Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker		
	Line			X			X		X						
	Color			X				X	X						
	Texture			X			X		X						

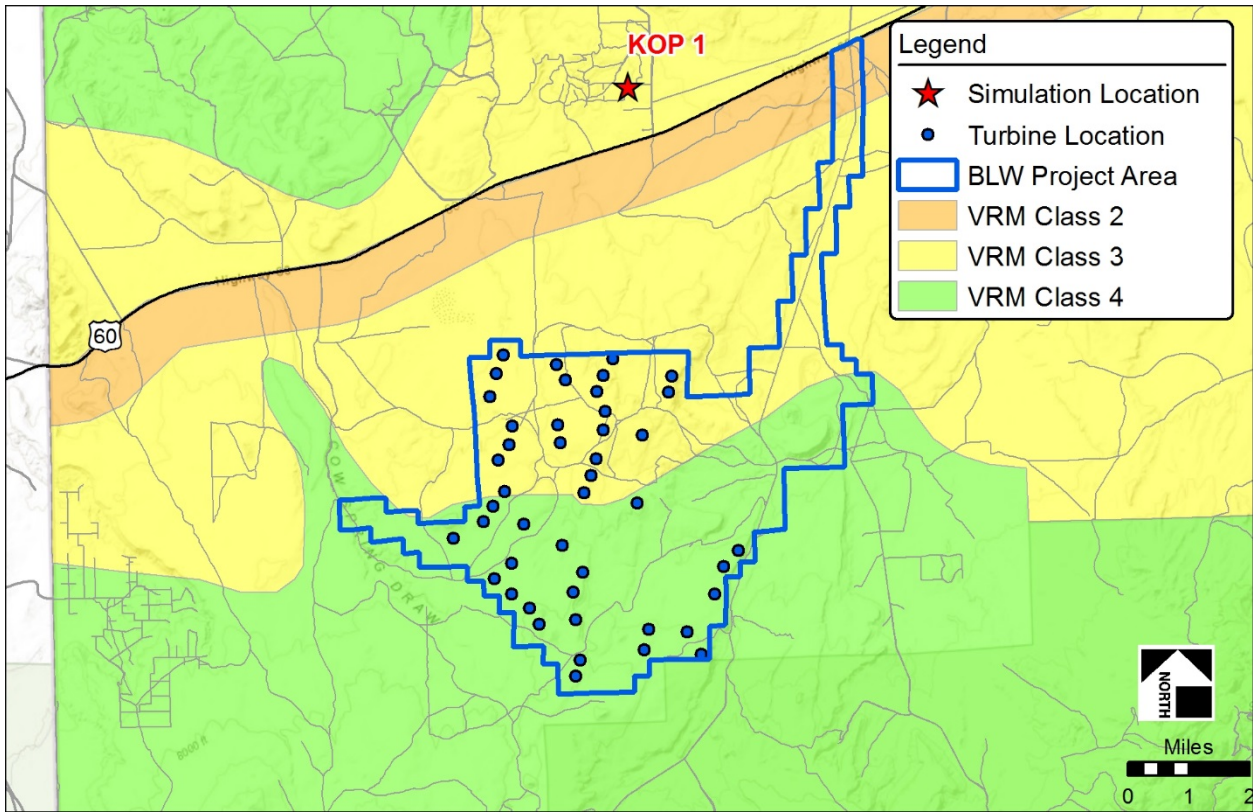
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 1 project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The turbines and access roads would be visible within the foreground of the Cimarron Ranch Subdivision KOP. Up to 23 turbines would be visible in VRM Class IV from this KOP. The primary focus of the viewer's attention is the broad open landscape from which the project components would be predominately skylined. The visual resource management objective for Class IV allows for the level of change to the characteristic landscape can be high. Alternative 1 would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the Cimarron Ridge Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Stationary Platform Environmental Factors

Alternative: Alternative 1

Stationary Platform Name: Cimarron Ranch Subdivision

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker; C. Bockey; D. Chavez; V. Alguire

Simulation: Yes

Environmental Factors	As Considered from Stationary Platform	Comments
<p>Distance to Project Components</p>	<p>This platform is approximately 4.5 miles from the nearest visible turbine. This platform is approximately 4.7 miles from the nearest visible project infrastructure (roads/ ancillary facilities).</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
<p>Visibility Conditions</p>	<p>This platform is located in a panoramic landscape that includes broad rolling plains with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height. In the foreground (FG) of the platform, views of the project components would be predominately skylined; equally unobstructed and partially obstructed; equally continuous and intermittent/continuous.</p>	
<p>Angle of View</p>	<p>In the FG, the amount of viewer exposure of the project components from the platform would be approximately 40°. The primary focus of the viewer's attention is the broad open landscape from which the project components would be in view. The viewer position would be predominately neutral.</p>	
<p>Quantification of View (Project percent seen)</p>	<p>Based on bare earth GIS analysis approximately 45 turbines would be seen in the FG of the platform, which would represent 100 percent of the total turbines within the project area. There are 137.0 acres of surface disturbance within the FG of the platform. Based on bare earth GIS analysis approximately 5 acres would be seen in the FG of the platform, which would represent 4 percent of the total acres of surface disturbance within the FG of the platform.</p>	
<p>Scale/Spatial Relationship</p>	<p>The project components within the FG of the platform would demand attention and dominate the visual setting; the visual setting would appear to be severely altered because the dominance of the wind turbines in scale, color and form as well as the motion of the turbine blades would introduce elements and patterns that create strong contrast as compared to other features within the landscape.</p>	

BLWP – Cimarron Ranch Subdivision Simulation - Alternative 1



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

VISUAL CONTRAST RATING WORKSHEET

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Coronado Trail Scenic Road		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes; and isolated rock outcrops	Predominately rounded pinyon-juniper; low indistinctive grasses	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Converging with undulating edges at transition to adjacent landforms.	Round to globe-like of pinyon-juniper; continuous flowing.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown; darker brown volcanic rock.	Light straw-buff of grasses; dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth with some bumpy areas; gentle transitions.	Continuous coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses are inconsistent.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade.
Color	No perceived change	No perceived change	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change	No perceived change	Coarse, rough, discontinuous, and dotted turbines.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: <input checked="" type="checkbox"/> No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X			X	Evaluator's Names D. Simpson-Colebank R. Baker	
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X			X		

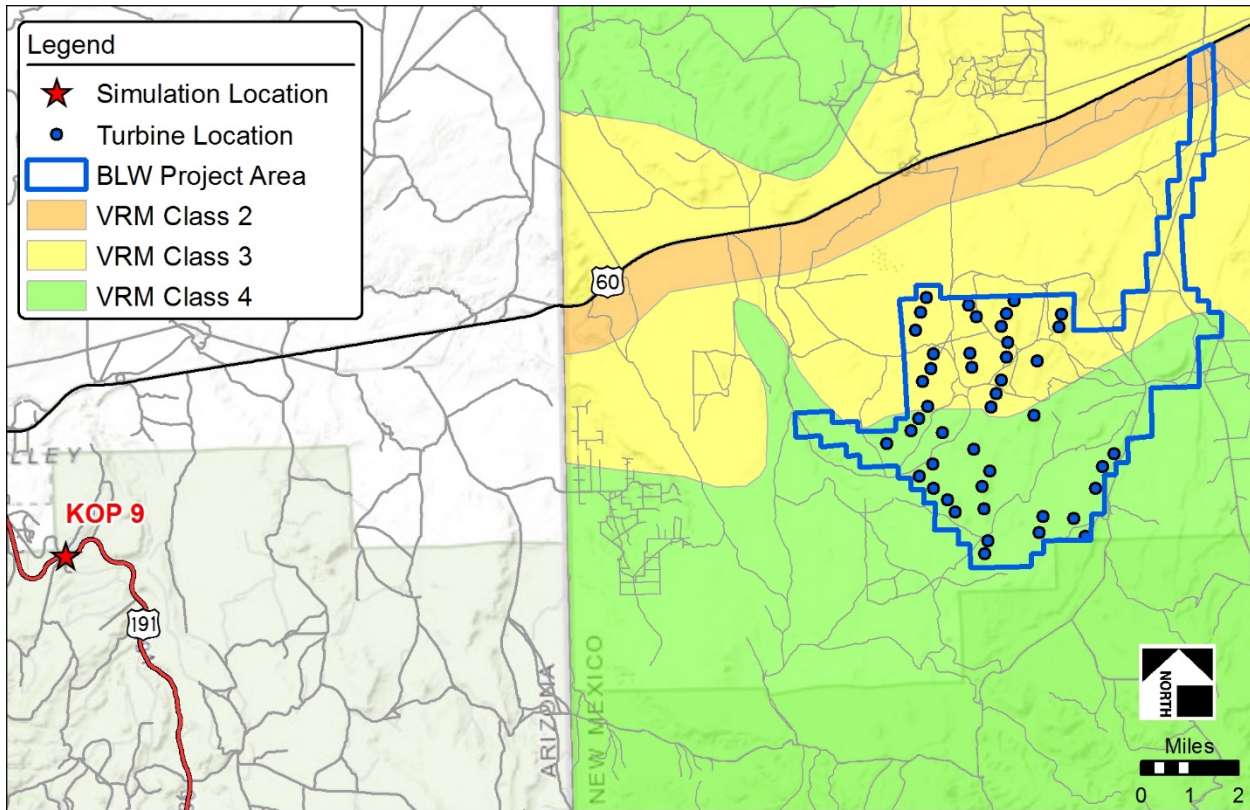
Comments from Item 2.

The view from this linear platform consists of rolling hills and a scattering of distant mountain landforms in the background. The vegetation consists primarily of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class III. The statuesque wind turbines with their rotating blades and lighted hubs would attract attention but would not dominate the landscape. The turbines would be visible within the middleground and background area of the Coronado Trail Scenic Road KOP. This platform is approximately 16 miles from the nearest visible turbines. Views of the project components (turbines) would be skylined; consistently partially obstructed and sporadically intermittent when viewed from this KOP due to visibility conditions. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 1 would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day, atmospheric conditions, and direction of view (visible to southbound travelers only). Therefore, Alternative 1 would be in conformance with Class III visual resource management objectives from the viewpoint of Coronado Trail Scenic Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Coronado Trail Scenic Road		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes; and isolated rock outcrops	Predominately rounded pinyon-juniper; low indistinctive grasses	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Converging with undulating edges at transition to adjacent landforms.	Round to globe-like of pinyon-juniper; continuous flowing.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown; darker brown volcanic rock.	Light straw-buff of grasses; dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth with some bumpy areas; gentle transitions.	Continuous coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses are inconsistent.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade.
Color	No perceived change	No perceived change	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change	No perceived change	Coarse, rough, discontinuous, and dotted turbines.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X			X		
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X			X		

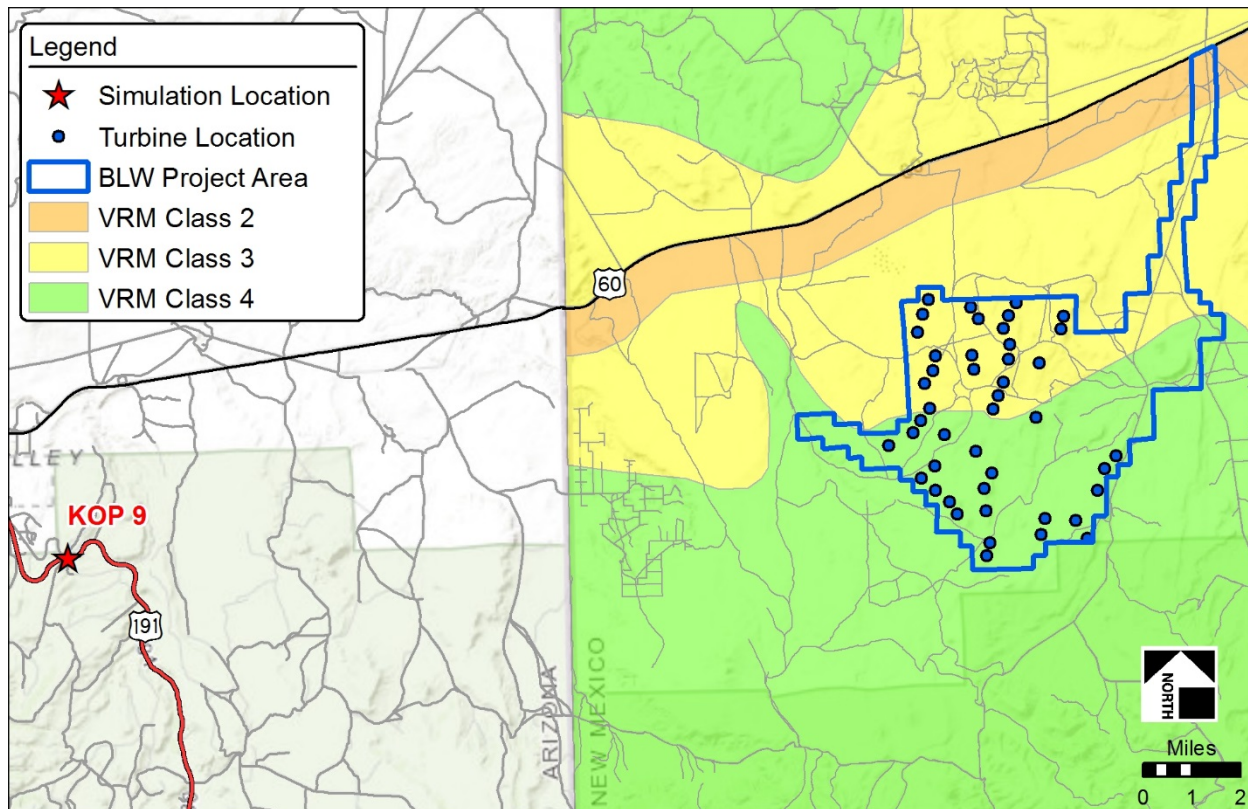
Comments from Item 2.

The view from this linear platform consists of rolling hills and a scattering of distant mountain landforms in the background. The vegetation consists primarily of pinyon-juniper. Alternative 1 project components visible from this KOP would occur in areas currently managed as Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would attract attention but would not dominate the landscape. The proposed turbines would be visible within the middleground of the Coronado Trail Scenic Road KOP. This platform is approximately 16 miles from the nearest visible turbines. Views of the project components (turbines) would be predominately skylined; consistently partially obstructed and sporadically intermittent when viewed from this KOP due to visibility conditions. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. Alternative 1 would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day and atmospheric conditions. Therefore, Alternative 1 would be in conformance with Class IV visual resource management objectives from the viewpoint of Coronado Trail Scenic Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Alternative 1

Linear Platform Name: Coronado Trail Scenic Road

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: Yes

Environmental Factors	As Considered from Linear Platform	Comments
Distance to Project Components	<p>This platform is approximately 16 miles from the nearest visible turbine.</p> <p>This platform is approximately 14 miles from the nearest visible project infrastructure (distribution line).</p> <p>Platform does not occur within the foreground of the proposed project.</p>	
Visibility Conditions	<p>This platform is located in a panoramic landscape that includes no apparent limit to the view.</p> <p>Traveling in the northbound direction project components would not be visible.</p> <p>Traveling in the southbound direction project components would not be visible within the background area of the proposed project.</p> <p>Traveling in the southbound direction in the middleground (MG) area of the proposed project, views of the project components (turbines) would be predominately skylined; predominately partially obstructed and predominately intermittent.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
Angle of View	<p>Traveling southbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral</p>	
Quantification of View	<p>Platform percent seen from project components: There are a total of 36.6 miles of linear platform within the analysis area.</p> <p>Traveling southbound in the MG there are 22.6 miles of linear platform The project components would be seen for approximately .4 miles within the MG or 1% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 137.0 acres of surface disturbance within the analysis area; 31 acres /22% would be seen from the platform traveling in the southbound direction within the MG.</p> <p>There are 45 turbines within the analysis area: Traveling in the southbound direction within the MG, up to 42 turbines/ 93% would be seen from the platform.</p> <p>Duration of view from linear platform: There are a total of 36.6 miles of linear platform within the analysis area.</p> <p>Traveling southbound based on a vehicular travel speed of 55 mph, and a total travel time of 25 minutes within the MG of the project, the project components would be seen for a total of approximately 24 seconds or 2% of the total travel time within the analysis area.</p> <p>The project components would be more visible traveling in the southbound direction.</p>	

Spatial Relationship/ Size and Scale	Traveling southbound in the MG of the proposed project, the project components would begin to attract attention and be visually subordinate within the visual setting; the visual setting within the MG of the proposed project would appear to be noticeably altered because project components (turbines) would begin to attract attention when visible and would generally create low contrast due to distance and atmospheric conditions when viewed from this platform.	
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BLWP - Coronado Trail Simulation - Alternative 1



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 1S Range: 19W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	No perceived change.
Line	No perceived change.	No perceived change.	No perceived change.
Color	No perceived change.	No perceived change.	No perceived change.
Texture	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING

SHORT TERM: **X**LONG TERM (>5 years): **X**

		Land/Water Body (1)												Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None									
																			3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Element	Form				X				X										Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker			
	Line				X				X													
	Color				X				X													
	Texture				X				X													

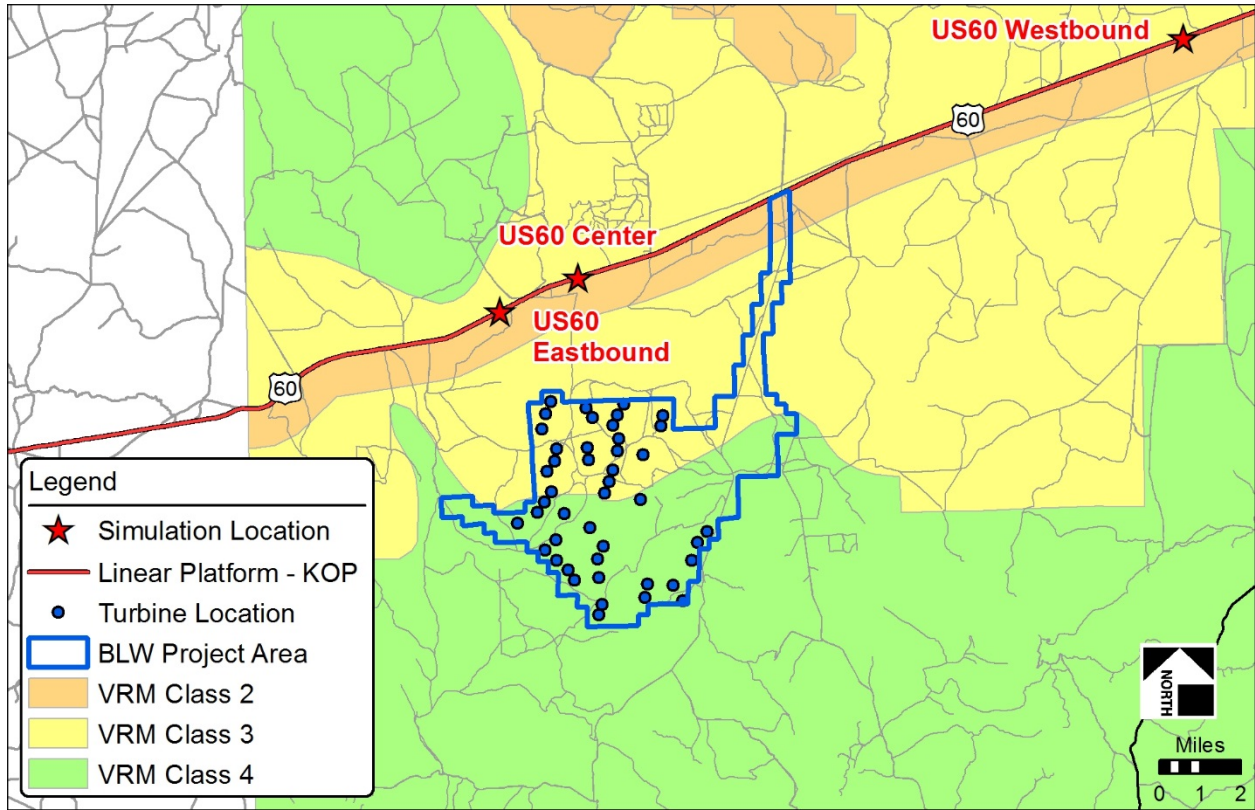
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The visual resource management objective for Class II allows for a low level of change to the characteristic landscape. These changes should repeat the basic elements found in the characteristic landscape and should not attract the attention of the casual observer. Within VRM Class II, the Alternative 1 project components would not be perceivable. Therefore, Alternative 1 would be in conformance with Class II visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.

Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form			X					X	X				
	Line			X				X		X				
	Color			X					X	X				
	Texture			X				X		X				

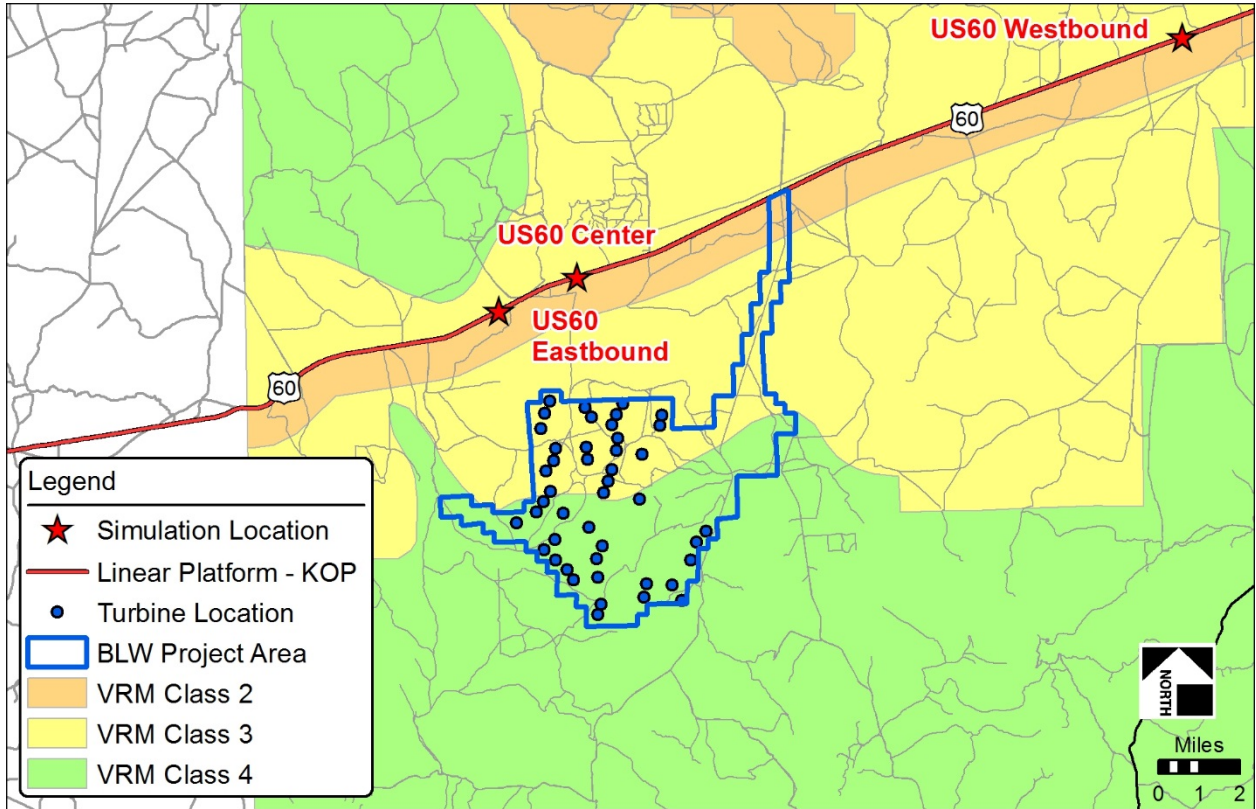
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 1 project components visible from this KOP would occur in areas currently managed as VRM Class III and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominate the landscape. The proposed turbines and access roads would be visible from the US 60 (Ocean to Ocean Highway) KOP. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 1 would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, the Proposed Action would not be in conformance with Class III visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township:2S Range:19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.

Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: <input checked="" type="checkbox"/> No <input type="checkbox"/> explain on reverse)	
		Land/Water Body (1)				Vegetation (2)				Structures (3)					
Element		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
		Form			X				X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
		Line			X			X		X					
		Color			X				X	X					
Texture			X			X		X							

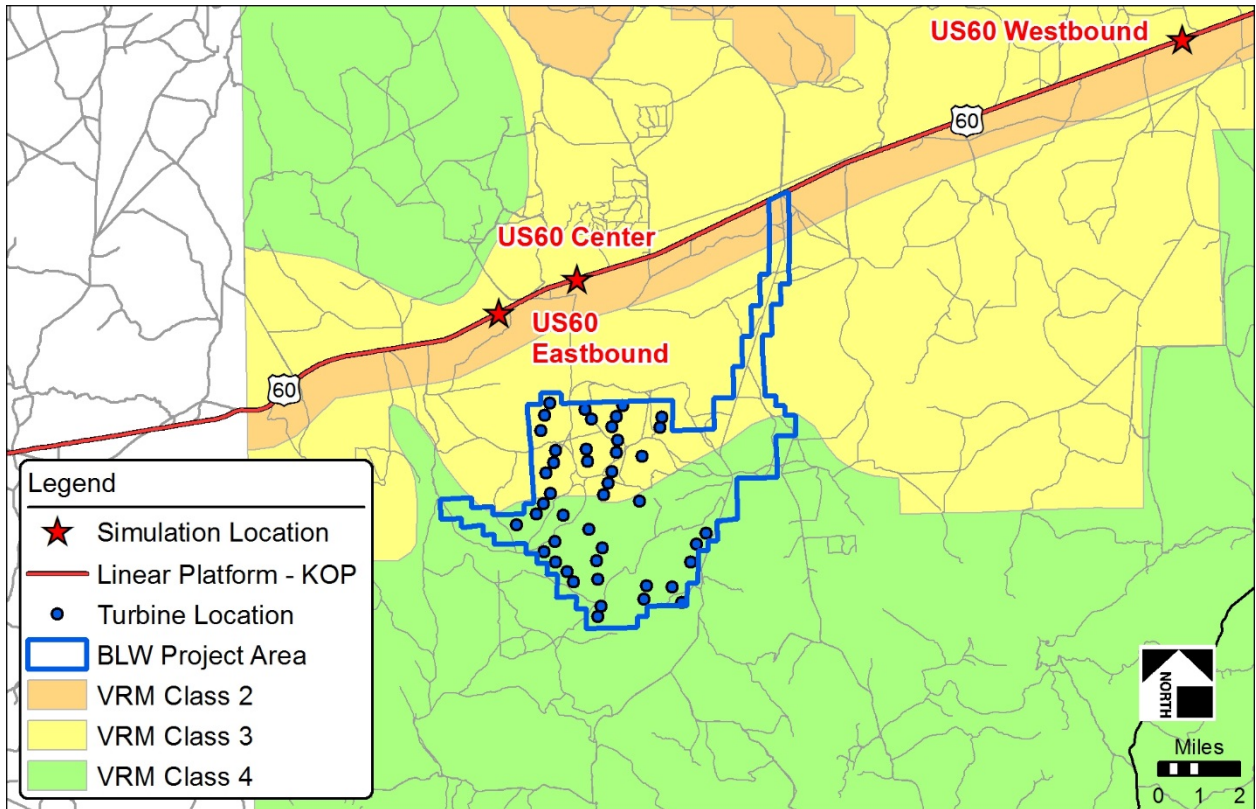
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 1 project components visible from this KOP would occur in areas currently managed as VRM Class II, III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible from the US 60 (Ocean to Ocean Highway) KOP. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. The Proposed Action would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Alternative 1

Linear Platform Name: US 60

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: Yes

Environmental Factors	As Considered from Linear Platform	Comments
Distance to Project Components	<p>This platform is approximately 2.5 miles from the nearest visible turbine.</p> <p>This platform intersects project infrastructure (roads or ancillary facilities).</p>	
Visibility Conditions	<p>This platform is located in a panoramic landscape that includes broad plains and low rolling hills with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height.</p> <p>Traveling in the eastbound direction in the foreground (FG) area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skylined; equally unobstructed and partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the eastbound direction in the middleground (MG) area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the eastbound direction in the background (BG) area of the proposed project, views of the project components would be predominately backdropped; partially obstructed and sporadically intermittent. Distance and atmospheric conditions would restrict visibility.</p> <p>Traveling in the westbound direction in the FG area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the westbound direction in the MG area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the westbound direction project components are not visible in the BG area.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
Angle of View	<p>Traveling eastbound in the FG of the project components, the angle of observation from this platform would be predominately parallel views. The viewer position would be predominately neutral. Traveling eastbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral. Traveling eastbound in the BG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately inferior. Distance and atmospheric conditions would restrict visibility.</p> <p>Traveling westbound in the FG of the project components, the angle of observation from this platform would be predominately parallel views. The viewer position would be predominately neutral. Traveling westbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral.</p>	

Quantification of View	<p>Platform percent seen from project components: There are a total of 67.0 miles of linear platform within the analysis area.</p> <p>Traveling eastbound in the FG of the project there are 29.5 miles of linear platform. . The project components would be seen for approximately 15 miles within the FG or 22% of the total platform miles within the analysis area.</p> <p>Traveling eastbound in the MG of the project there are 22.4 miles of linear platform. The project components would be seen for approximately 4 miles within the MG or 6% of the total platform miles within the analysis area.</p> <p>Traveling eastbound in the BG of the project there are 15.1 miles of linear platform. The project components would be seen for approximately 1 mile within the BG or 1% of the total platform miles within the analysis area.</p> <p>Traveling westbound in the FG of the project there are 29.5 miles of linear platform. The project components would be seen for approximately 16 miles within the FG or 24% of the total platform miles within the analysis area.</p> <p>Traveling westbound in the MG of the project there are 22.4 miles of linear platform. The project components would be seen for approximately 2 miles within the MG or 3% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 140.1 acres of surface disturbance within the analysis area; approximately 25 acres or 18% would be seen from the platform traveling in the eastbound direction within the FG and approximately 45 acres or 32% would be seen from the platform traveling in the westbound direction within the FG.</p> <p>There are 45 turbines within the analysis area: Traveling in the eastbound direction within the FG 45 turbines or 100% would be seen from the platform. Traveling in the eastbound direction within the MG 44 turbines or 98% would be seen from the platform. Traveling in the eastbound direction within the BG 14 turbines or 31% would be seen from the platform.</p> <p>Traveling in the westbound direction within the FG 45 turbines or 100% would be seen from the platform. Traveling in the westbound direction within the MG 45 turbines or 100% would be seen from the platform.</p> <p>Duration of view from linear platform: There are a total of 67.0 miles of linear platform within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 27 minutes within the FG of the project, the project components would be seen for a total of approximately 14 minutes within the FG or 23% of the total travel time within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 21 minutes within the MG of the project, the project components would be seen for a total of approximately 4 minutes or 6% of the total travel time within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 14 minutes within the BG of the project, the project components would be seen for a total of approximately 1 minutes or 2% of the total travel time within the analysis area.</p> <p>Traveling westbound based on a vehicular travel speed of 65 mph, and a total travel time of 27 minutes within the FG of the project, the project components would be seen for a total of approximately 15 minutes or 24% of the total travel time within analysis area.</p>	
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	<p>Traveling westbound based on a vehicular travel speed of 65 mph, and a total travel time of 21 minutes within the MG of the project, the project components would be seen for a total of approximately 2 minutes or 3% of the total travel time within the MG of the project.</p> <p>The project components would be more visible traveling in the eastbound direction (19 minutes or 31% of the total travel time within the analysis area) vs. traveling in the westbound direction (17 minutes or 27% of the total travel time within the analysis area).</p>	
<p>Spatial Relationship/ Size and Scale</p>	<p>Traveling eastbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components (infrastructure and turbines) would introduce elements and patterns that would be visually dominant and create strong contrast as compared to the other features in the landscape.</p> <p>Traveling eastbound in the MG of the proposed project, the project components would attract attention, be visually prominent, and begin to dominate the visual setting; the visual setting within the MG of the proposed project would appear to be substantially altered because project components (turbines) would introduce elements and patterns not common in the landscape and would create moderate contrast as compared to other features in the landscape.</p> <p>Traveling eastbound in the BG of the proposed project, the project components would not attract attention and the landscape would appear intact within the visual setting; project component visibility would be limited by distance and atmospheric conditions.</p> <p>Traveling westbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components (infrastructure and turbines) would introduce elements and patterns that would be visually dominant and create strong contrast as compared to the other features in the landscape.</p> <p>Traveling westbound in the MG of the proposed project, the project components would attract attention, be visually prominent, and begin to dominate the visual setting; the visual setting within the MG of the proposed project would appear to be substantially altered because project components (turbines) would introduce elements and patterns not common in the landscape and would create moderate contrast as compared to other features in the landscape.</p>	

BLWP – US 60 Center Simulation 'Alternative 1



BLWP – US 60 Eastbound Simulation



BLWP – US 60 Westbound Simulation - Alternative 1



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 1	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Zuni Salt Lake		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LANDFORM/WATER		2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Low, rectangular scattered building structures. Low, vertical, thin, curving, linear, fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive and fencing structures. Regular, angular, and geometric lines associated with building structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Muted tones of varying shades of building structure. Dark monotone paved roads and light to medium beige/gray unpaved roads. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive fencing. Discontinuous, scattered, medium to coarse, building structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LANDFORM/WATER		2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade
Color	No perceived change.	No perceived change.	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change.	No perceived change.	Coarse, rough, discontinuous, and dotted turbines.

		SECTION D. CONTRAST RATING												SHORT TERM: X		LONG TERM (>5 years): X	
		Land/Water Body (1)				Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/>			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Element	Form				X				X			X		Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker			
	Line				X				X			X					
	Color				X				X			X					
	Texture				X				X			X					

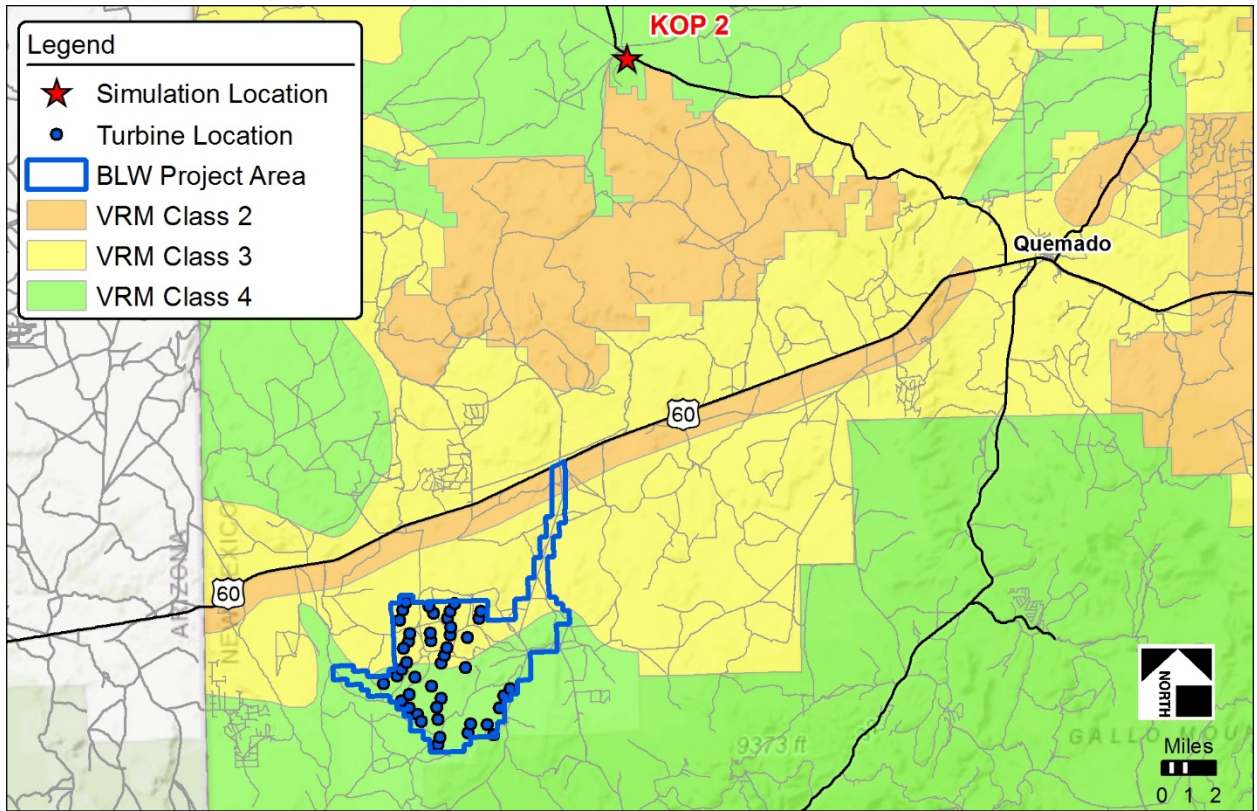
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class III and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. This KOP is approximately 21 miles from the nearest visible turbines. Approximately 26 turbines would be visible within the background of the Zuni Salt Lake KOP. The amount of viewer exposure of the project components from the platform would be approximately 15 degrees. The primary focus of the viewer's attention is Zuni Lake from which the project components would be in view. The viewer position would be predominately inferior. The visual resource management objective for this class, Class III, allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 1 would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day and atmospheric conditions. Therefore, Alternative 1 would be in conformance with Class III visual resource management objectives from the viewpoint of Zuni Salt Lake KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Stationary Platform Environmental Factors

Alternative: Alternative 1

Stationary Platform Name: Zuni Salt Lake

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker; C. Bockey; D. Chavez; V. Alguire

Simulation: Yes

Environmental Factors	As Considered from Stationary Platform	Comments
Distance to Project Components	This platform is approximately 21 miles from the nearest visible turbine. Project infrastructure (transmission line/ roads/ ancillary facilities) are not visible from this platform.	Foreground limit 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles
Visibility Conditions	This platform is located in a predominately panoramic landscape that includes plains with scattered low rolling hills and mesas. In the background (BG) of the platform, views of the wind turbine blades would be predominately skylined; towers predominately partially obstructed and predominately intermittent.	The majority of project components (turbines) occur behind landforms when viewed from this platform. Distance and atmospheric conditions reduce visibility of turbines.
Angle of View	In the BG, the amount of viewer exposure of the project components from the platform would be approximately 15°. The primary focus of the viewer's attention is Zuni Lake from which the project components would be in view. The viewer position would be predominately inferior.	
Quantification of View (Project percent seen)	Based on bare earth GIS analysis approximately 26 turbines would be seen in the BG of the platform, which would represent 58 percent of the total turbines within the project area. Project infrastructure (transmission line/ roads/ ancillary facilities) are not visible from this platform.	
Scale/Spatial Relationship	The project components within the BG of the platform and would begin to attract attention and be visually subordinate within the visual setting; the visual setting would appear to be noticeably altered because the turbines would introduce color contrast, vertical elements and motion that would be visually subordinate within the landscape and create generally low contrast due to distance and atmospheric conditions.	

BLWP – Zuni Salt Lake Simulation - Alternative 1



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

**SECTION A. PROJECT
 INFORMATION**

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 1S Range: 19W Section: 10	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change	No perceived change.	No perceived change
Line	No perceived change	No perceived change	No perceived change
Color	No perceived change	No perceived change.	No perceived change

Texture	No perceived change	No perceived change	No perceived change
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: <input checked="" type="checkbox"/> No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X				X	
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	

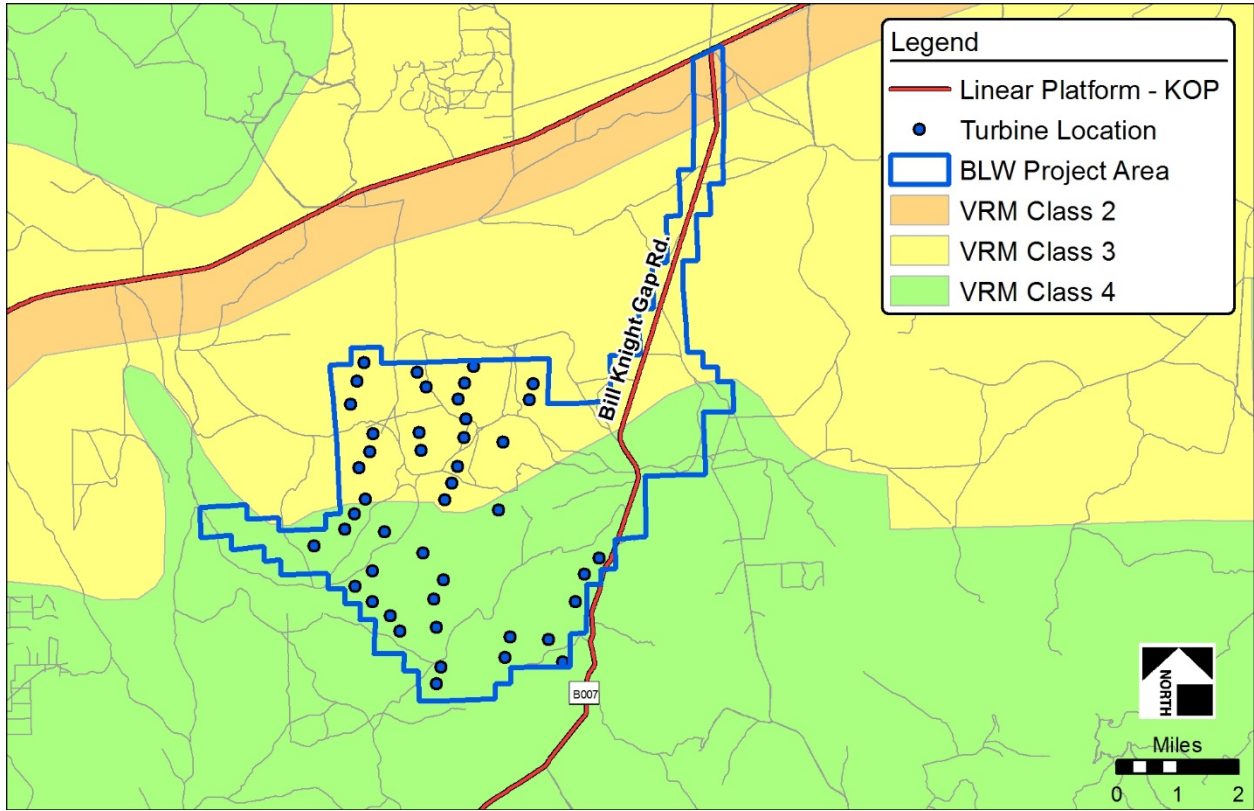
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The visual resource management objective for Class II allows for a low level of change to the characteristic landscape. These changes should repeat the basic elements found in the characteristic landscape and should not attract the attention of the casual observer. Road improvements, access roads, and US 60 turn lane modifications would be visible within the foreground of the Bill Knight Gap Road KOP, but not perceivable. Therefore, Alternative 2 would be in conformance with Class II visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project- Alternative 2	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.

Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form			X					X	X				
	Line			X				X		X				
	Color			X					X	X				
	Texture			X				X		X				

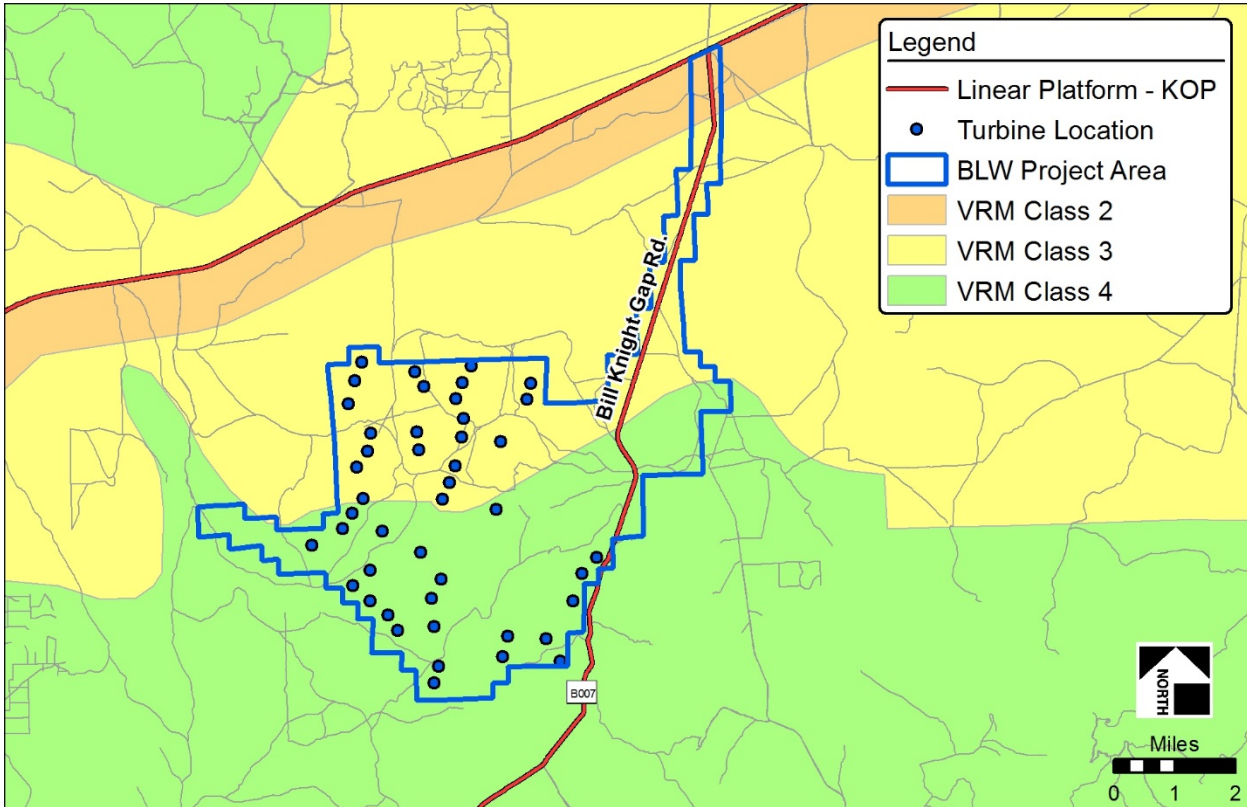
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible from the Bill Knight Gap Road KOP. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 2 would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, Alternative 2 would not be in conformance with Class III visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Bill Knight Gap Rd.		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of unpaved roads. Amorphous, irregular, concave, asymmetrical form of gravel pit.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads. Broken, irregular, complex lines of gravel pit.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Light to medium beige/gray unpaved roads and gravel pit.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine unpaved roads. Coarse to medium discontinuous, clumped texture of gravel pit.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.

Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

Element		SECTION D. CONTRAST RATING												2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)	
		Land/Water Body (1)				Vegetation (2)				Structures (3)					3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None		
Form			X					X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker	
Line			X				X		X						
Color			X					X	X						
Texture			X				X		X						

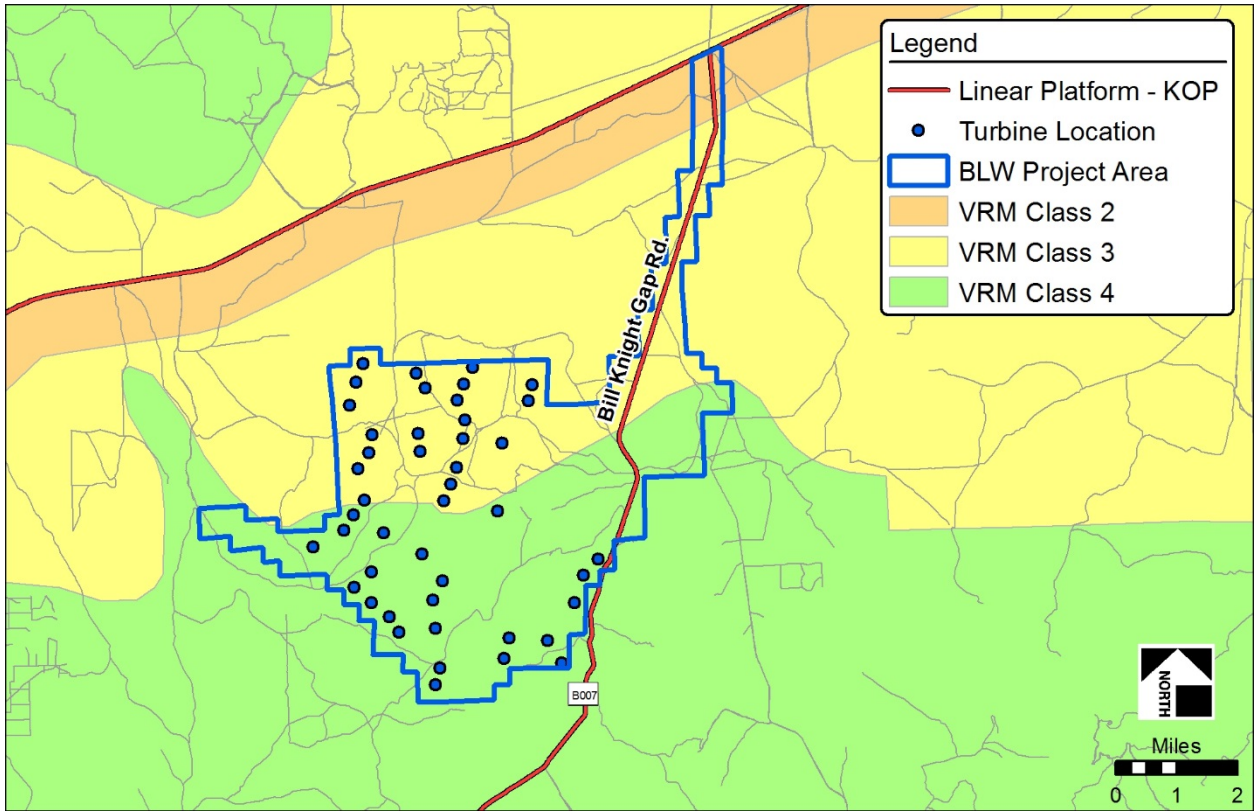
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as VRM Class II, III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible within the foreground of the Bill Knight Gap Road KOP. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. Alternative 2 would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the Bill Knight Gap Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Alternative 2

Linear Platform Name: Bill Knight Gap Road

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: No

Environmental Factors	As Considered from Linear Platform	Comments
Distance to Project Components	<p>This platform is approximately 850 feet from the nearest visible turbine.</p> <p>This platform intersects project infrastructure (most commonly road improvements).</p>	
Visibility Conditions	<p>This platform is located in a panoramic landscape that includes broad plains and low rolling hills with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height.</p> <p>Traveling in the northbound direction in the foreground (FG) area of the proposed project, views of the project components would be predominately skylined; predominantly unobstructed and predominately continuous.</p> <p>Traveling in the southbound direction in the FG area of the proposed project, views of the project components would be predominately skylined; predominantly partially unobstructed and predominately continuous.</p> <p>Platform does not occur within the middleground or background of the project area.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
Angle of View	<p>Traveling northbound in the FG of the project components, the angle of observation from this platform would be predominately head-on and parallel views. The viewer position would be predominately inferior.</p> <p>Traveling southbound in the FG of the project components, the angle of observation from this platform would be predominately head-on and parallel views. The viewer position would be predominately inferior.</p>	
Quantification of View	<p>Platform percent seen from project components: There are a total of 10.6 miles of linear platform within the analysis area</p> <p>Traveling northbound in the FG there are 10.6 miles of linear platform. The project components would be seen for approximately 10.6 miles or 100% of the total platform miles within the analysis area.</p> <p>Traveling southbound in the FG there are 10.6 miles of linear platform. The project components would be seen for approximately 10.6 miles or 100% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 134.2 acres of project components within the analysis area; approximately 29 acres or 22% would be seen from the platform traveling in the northbound direction within the FG and approximately 40 acres or 30% would be seen from the platform traveling in the southbound direction within the FG.</p> <p>There are 45 turbines within the analysis area: Traveling in the northbound direction within the FG 42 turbines or 93% would be seen from the platform. Traveling in the southbound direction within the FG 42 turbines or 93% would be seen from the platform.</p>	

	<p>Duration of view from linear platform: There are a total of 10.6 miles of linear platform within the analysis area</p> <p>Traveling northbound based on a vehicular travel speed of 45 mph, and a total travel time of 14 minutes within the FG of the project, the project components would be seen for a total of approximately 14 minutes within the FG or 100% of the total travel time within the analysis area.</p> <p>Traveling southbound based on a vehicular travel speed of 45 mph, and a total travel time of 14 minutes within the FG of the project, the project components would be seen for a total of approximately 14 minutes within the FG or 100% of the total travel time within the analysis area.</p> <p>The project components would be equally visible when traveling in either direction.</p>	
<p>Spatial Relationship/ Size and Scale</p>	<p>Traveling northbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components would introduce elements, patterns and scale that would be visually dominant and create strong contrast as compared to other features in the landscape.</p> <p>Traveling southbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components would introduce elements, patterns and scale that would be visually dominant and create strong contrast as compared to other features in the landscape.</p>	

UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 1S Range: 19W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curing, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	No perceived change.
Line	No perceived change.	No perceived change.	No perceived change.
Color	No perceived change.	No perceived change.	No perceived change.
Texture	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING

SHORT TERM X

LONG TERM (>5 years) X

														2. Does the project design meet visual resource management objectives? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (Explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X				X	
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	

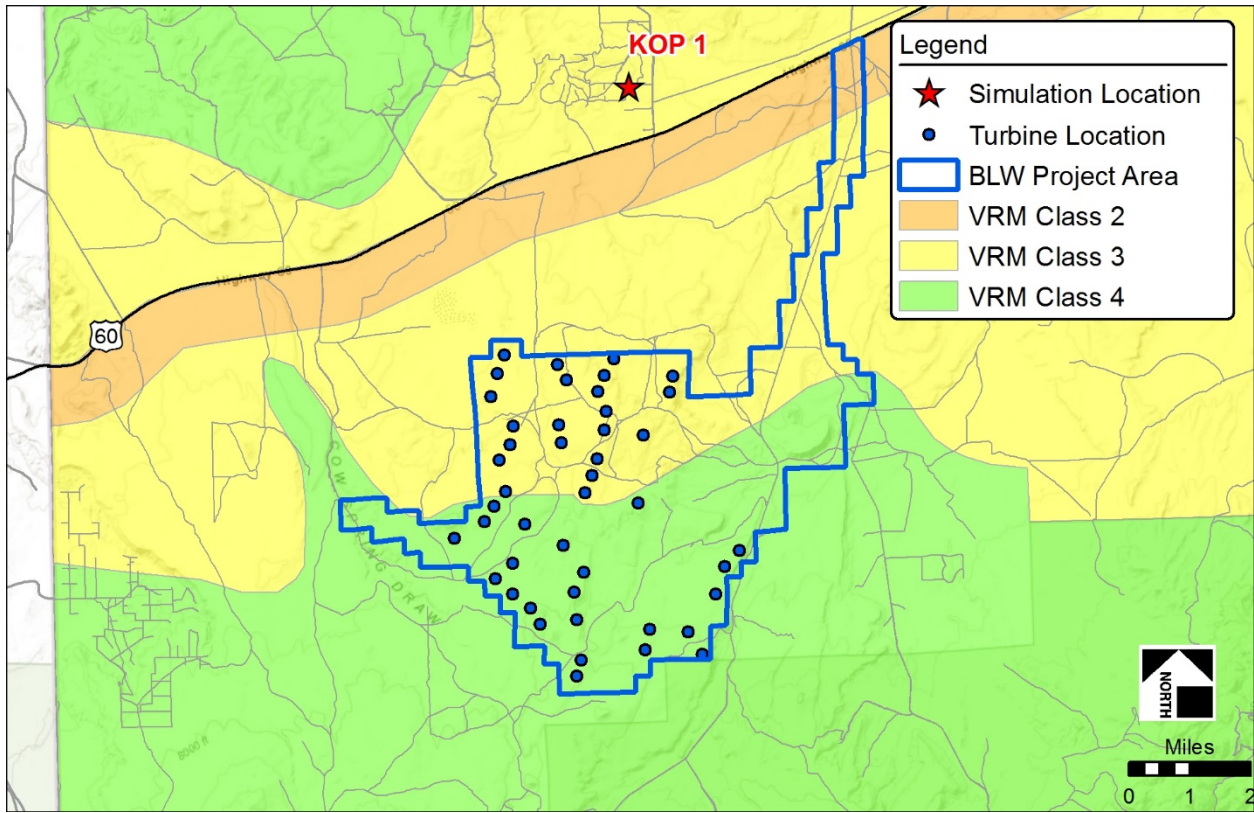
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. There are no proposed BLWP components planned within VRM II that would be visible from this KOP. Therefore, Alternative 1 would be in conformance with VRM II management objectives from the viewpoint of the Cimarron Ranch Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curving, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. .
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

		2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/>												
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
		3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>												
Element	Form			X				X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
	Line			X			X		X					
	Color			X				X	X					
	Texture			X			X		X					

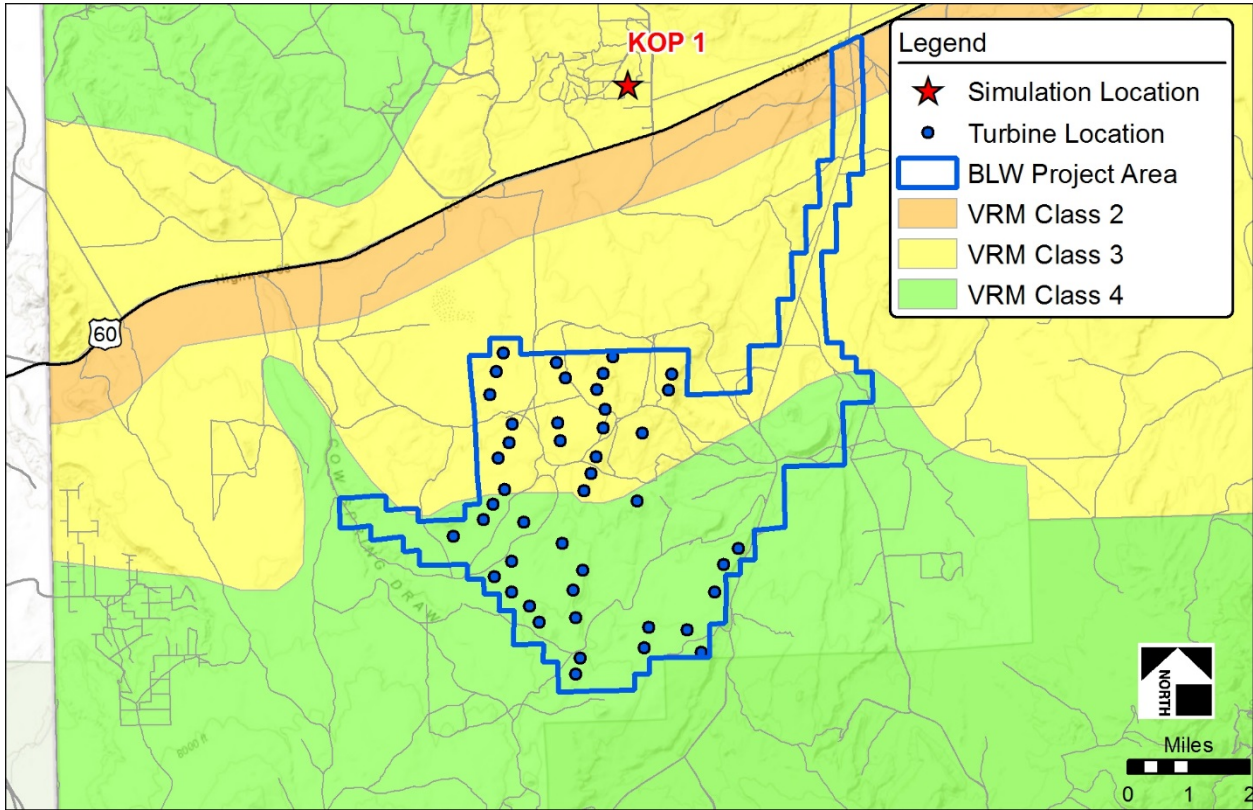
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominate the landscape. The turbines, overhead distribution transmission lines, and access roads would be visible from the Cimarron Ridge Subdivision KOP. Up to 22 turbines would be visible in VRM Class III from this KOP. The primary focus of the viewer's attention is the broad open landscape from which the project components would be predominately skylined. The visual resource management objective for this class, Class III, allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 2 would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, Alternative 2 would not be in conformance with Class III visual resource management objectives from the viewpoint of the Cimarron Ridge Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point #1 Cimarron Ranch Subdivision		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, thin, curing, linear, fencing.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. .
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.
Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

		SECTION D. CONTRAST RATING												SHORT TERM: X	LONG TERM (>5 years): X
		Land/Water Body (1)				Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)	
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Element	Form			X				X	X				Evaluator's Names		
	Line			X			X		X				V. Alguire		
	Color			X				X	X				D. Chavez		
	Texture			X			X		X				D. Simpson-Colebank R. Baker		

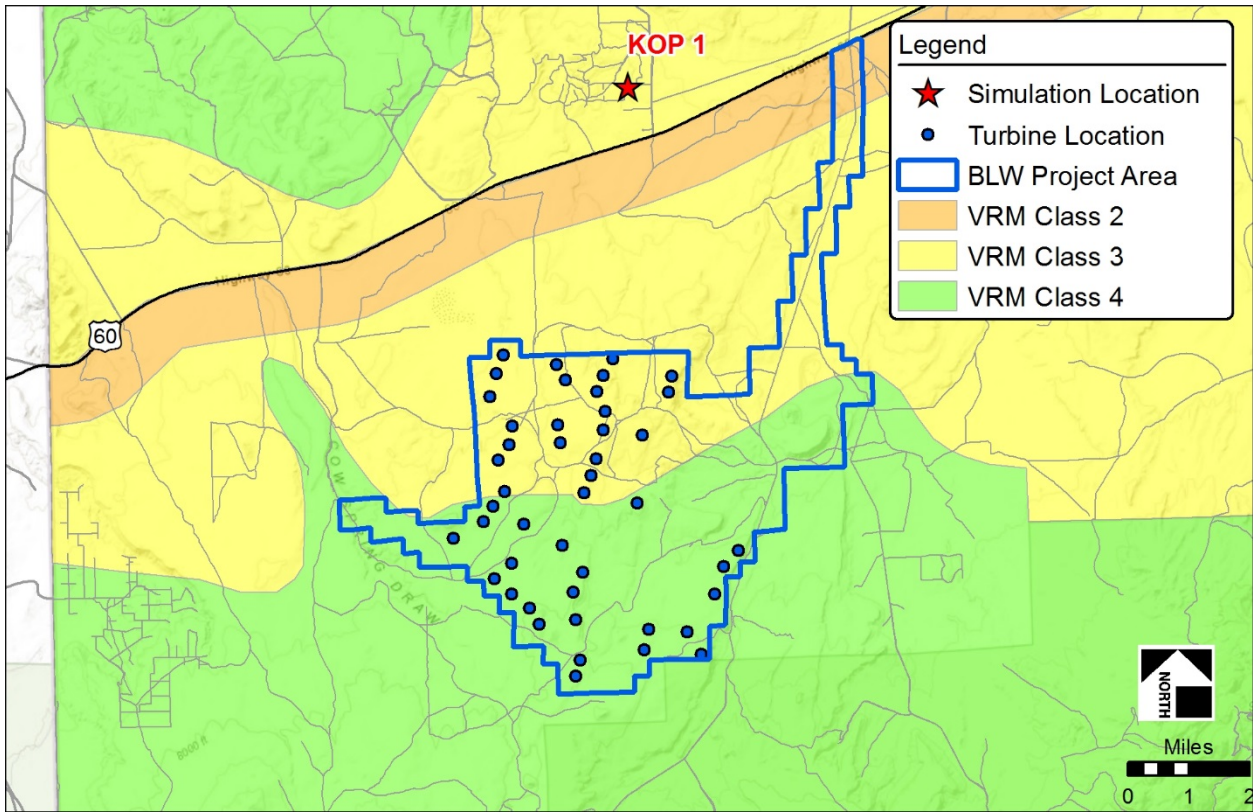
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The turbines, overhead distribution transmission lines, and access roads would be visible from the Cimarron Ranch Subdivision KOP. Up to 23 turbines would be visible in VRM Class IV from this KOP. The primary focus of the viewer's attention is the broad open landscape from which the project components would be predominately skylined. The visual resource management objective for Class IV allows for the level of change to the characteristic landscape can be high. Alternative 2 would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the Cimarron Ridge Subdivision KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Stationary Platform Environmental Factors

Alternative: Alternative 2

Stationary Platform Name: Cimarron Ranch Subdivision

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker; C. Bockey; D. Chavez; V. Alguire

Simulation: Yes

Environmental Factors	As Considered from Stationary Platform	Comments
<p>Distance to Project Components</p>	<p>This platform is approximately 4.5 miles from the nearest visible turbine. This platform is approximately 4.7 miles from the nearest visible project infrastructure (roads/ ancillary facilities).</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
<p>Visibility Conditions</p>	<p>This platform is located in a panoramic landscape that includes broad rolling plains with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height. In the foreground (FG) of the platform, views of the project components would be predominately skylined; equally unobstructed and partially obstructed; equally continuous and intermittent/continuous.</p>	
<p>Angle of View</p>	<p>In the FG, the amount of viewer exposure of the project components from the platform would be approximately 40°. The primary focus of the viewer's attention is the broad open landscape from which the project components would be in view. The viewer position would be predominately neutral.</p>	
<p>Quantification of View (Project percent seen)</p>	<p>Based on bare earth GIS analysis approximately 45 turbines would be seen in the FG of the platform, which would represent 100 percent of the total turbines within the project area. There are 134.2 acres of surface disturbance within the FG of the platform. Based on bare earth GIS analysis approximately 5 acres would be seen in the FG of the platform, which would represent 4 percent of the total acres of surface disturbance within the FG of the platform.</p>	
<p>Scale/Spatial Relationship</p>	<p>The project components within the FG of the platform would demand attention and dominate the visual setting; the visual setting would appear to be severely altered because the dominance of the wind turbines in scale, color and form as well as the motion of the turbine blades would introduce elements and patterns that create strong contrast as compared to other features within the landscape.</p>	

BLWP – Cimarron Ranch Subdivision Simulation - Alternative 2



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Coronado Trail Scenic Road		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes; and isolated rock outcrops	Predominately rounded pinyon-juniper; low indistinctive grasses	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Converging with undulating edges at transition to adjacent landforms.	Round to globe-like of pinyon-juniper; continuous flowing.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown; darker brown volcanic rock.	Light straw-buff of grasses; dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth with some bumpy areas; gentle transitions.	Continuous coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses are inconsistent.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade.
Color	No perceived change	No perceived change	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change	No perceived change	Coarse, rough, discontinuous, and dotted turbines.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: <input checked="" type="checkbox"/> No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X			X	Evaluator's Names D. Simpson-Colebank R. Baker	
	Line				X				X			X		
	Color				X				X			X		
	Texture				X				X			X		

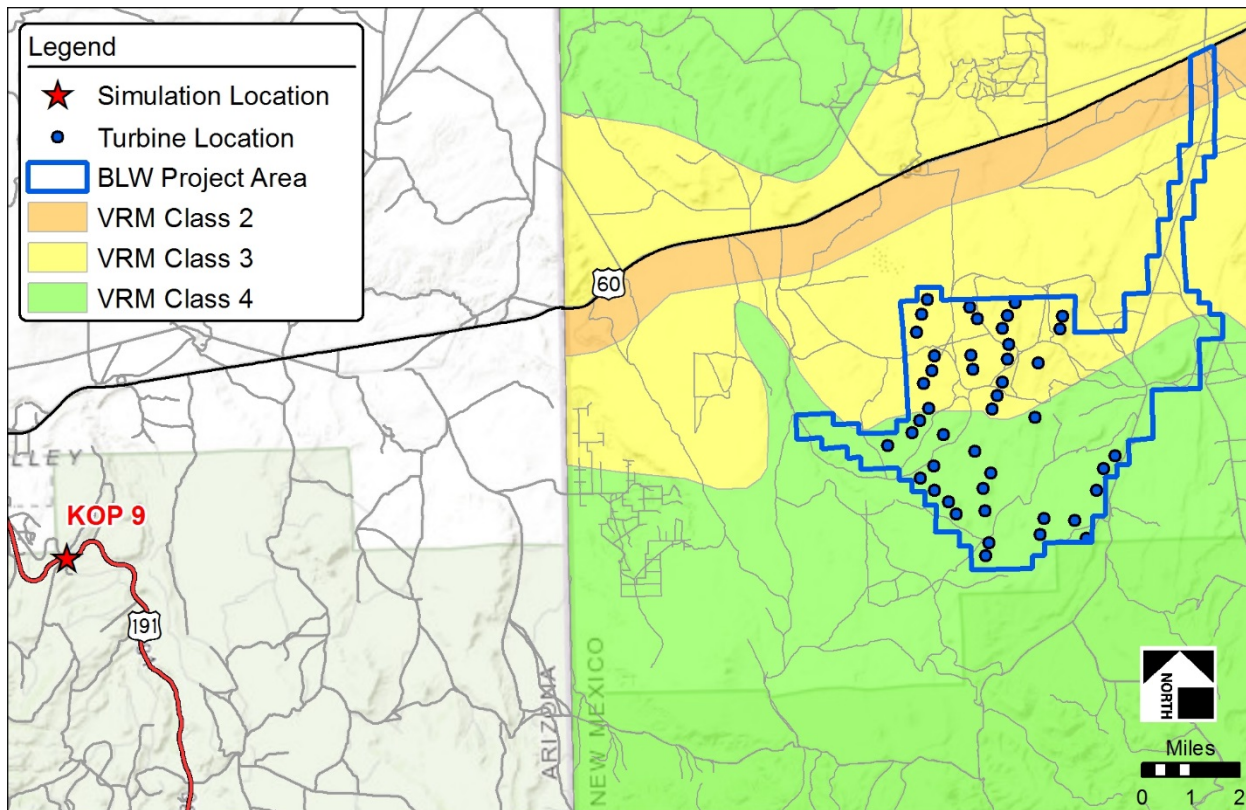
Comments from Item 2.

The view from this linear platform consists of rolling hills and a scattering of distant mountain landforms in the background. The vegetation consists primarily of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class III. The statuesque wind turbines with their rotating blades and lighted hubs would attract attention but would not dominate the landscape. The turbines would be visible within the middleground and background area of the Coronado Trail Scenic Road KOP. This platform is approximately 16 miles from the nearest visible turbines. Views of the project components (turbines) would be skylined; consistently partially obstructed and sporadically intermittent when viewed from this KOP due to visibility conditions. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 2 would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day, atmospheric conditions, and direction of view (visible to southbound travelers only). Therefore, Alternative 2 would be in conformance with Class III visual resource management objectives from the viewpoint of Coronado Trail Scenic Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Coronado Trail Scenic Road		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes; and isolated rock outcrops	Predominately rounded pinyon-juniper; low indistinctive grasses	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Converging with undulating edges at transition to adjacent landforms.	Round to globe-like of pinyon-juniper; continuous flowing.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown; darker brown volcanic rock.	Light straw-buff of grasses; dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth with some bumpy areas; gentle transitions.	Continuous coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses are inconsistent.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade.
Color	No perceived change	No perceived change	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change	No perceived change	Coarse, rough, discontinuous, and dotted turbines.

SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X				X	
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	

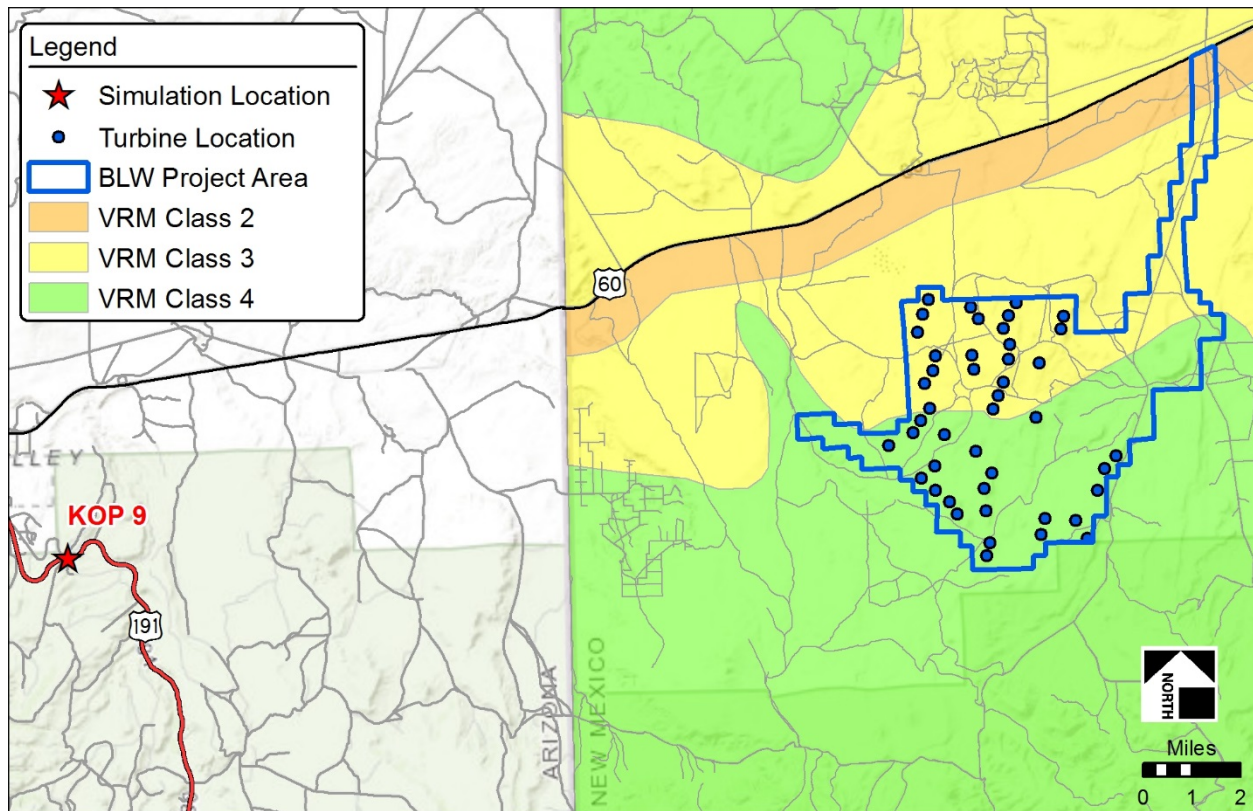
Comments from Item 2.

The view from this linear platform consists of rolling hills and a scattering of distant mountain landforms in the background. The vegetation consists primarily of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would attract attention but would not dominate the landscape. The proposed turbines would be visible within the middleground of the Coronado Trail Scenic Road KOP. This platform is approximately 16 miles from the nearest visible turbines. Views of the project components (turbines) would be predominately skylined; consistently partially obstructed and sporadically intermittent when viewed from this KOP due to visibility conditions. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. Alternative 2 would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day and atmospheric conditions. Therefore, Alternative 2 would be in conformance with Class IV visual resource management objectives from the viewpoint of Coronado Trail Scenic Road KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Alternative 2

Linear Platform Name: Coronado Trail Scenic Road

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: Yes

Environmental Factors	As Considered from Linear Platform	Comments
Distance to Project Components	<p>This platform is approximately 16 miles from the nearest visible turbine.</p> <p>This platform is approximately 14 miles from the nearest visible project infrastructure (distribution line).</p> <p>Platform does not occur within the foreground of the proposed project.</p>	
Visibility Conditions	<p>This platform is located in a panoramic landscape that includes no apparent limit to the view.</p> <p>Traveling in the northbound direction project components would not be visible.</p> <p>Traveling in the southbound direction project components would not be visible within the background area of the proposed project.</p> <p>Traveling in the southbound direction in the middleground (MG) area of the proposed project, views of the project components (turbines) would be predominately skylined; predominately partially obstructed and predominately intermittent.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
Angle of View	<p>Traveling southbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral</p>	
Quantification of View	<p>Platform percent seen from project components: There are a total of 36.6 miles of linear platform within the analysis area.</p> <p>Traveling southbound in the MG there are 22.6 miles of linear platform The project components would be seen for approximately .4 miles within the MG or 1% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 134.2 acres of surface disturbance within the analysis area; 30 acres /22% would be seen from the platform traveling in the southbound direction within the MG.</p> <p>There are 45 turbines within the analysis area: Traveling in the southbound direction within the MG, up to 42 turbines/ 93% would be seen from the platform.</p> <p>Duration of view from linear platform: There are a total of 36.6 miles of linear platform within the analysis area.</p> <p>Traveling southbound based on a vehicular travel speed of 55 mph, and a total travel time of 25 minutes within the MG of the project, the project components would be seen for a total of approximately 24 seconds or 2% of the total travel time within the analysis area.</p> <p>The project components would be more visible traveling in the southbound direction.</p>	

Spatial Relationship/ Size and Scale	Traveling southbound in the MG of the proposed project, the project components would begin to attract attention and be visually subordinate within the visual setting; the visual setting within the MG of the proposed project would appear to be noticeably altered because project components (turbines) would begin to attract attention when visible and would generally create low contrast due to distance and atmospheric conditions when viewed from this platform.	
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BLWP - Coronado Trail Simulation - Alternative 2



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 1S Range: 19W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: II		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	No perceived change.
Line	No perceived change.	No perceived change.	No perceived change.
Color	No perceived change.	No perceived change.	No perceived change.
Texture	No perceived change.	No perceived change.	No perceived change.

SECTION D. CONTRAST RATING

SHORT TERM: **X**LONG TERM (>5 years): **X**

														2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/> explain on reverse)
		Land/Water Body (1)				Vegetation (2)				Structures (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Element	Form				X				X				X	
	Line				X				X				X	
	Color				X				X				X	
	Texture				X				X				X	

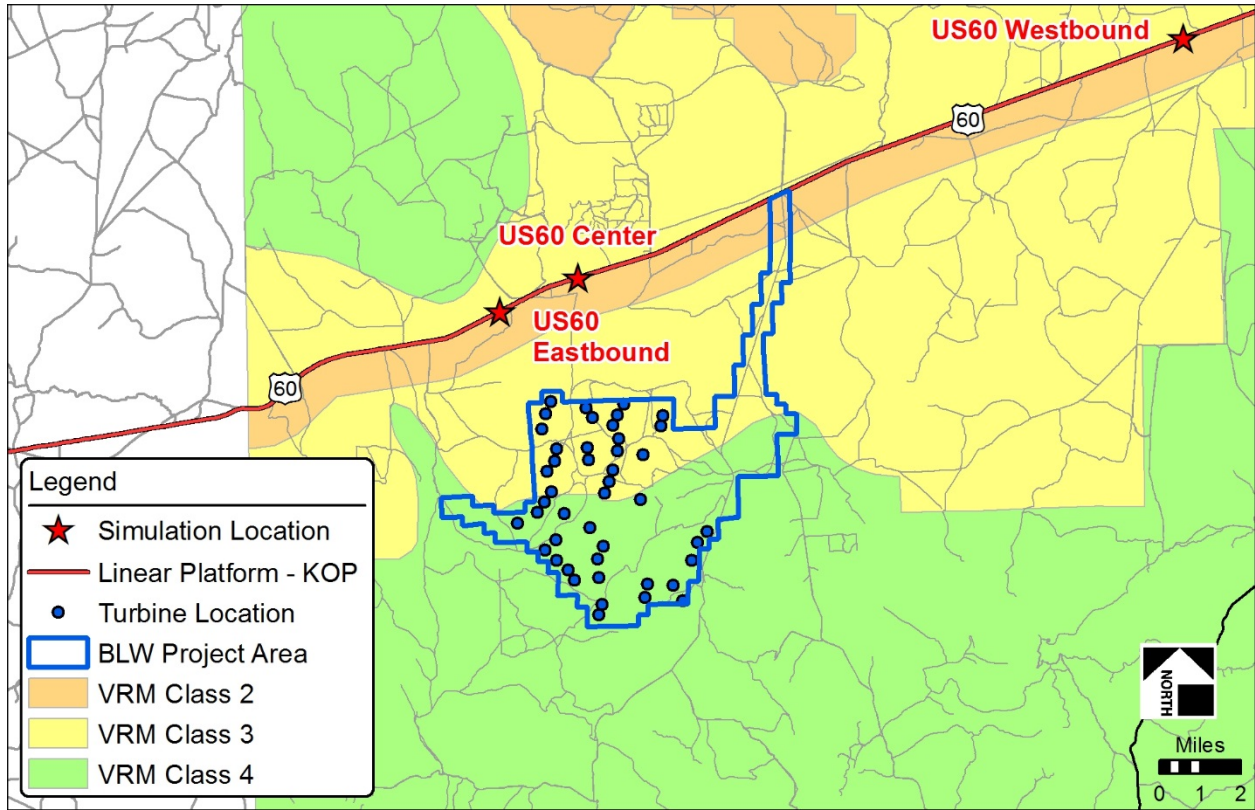
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as VRM Class II, Class III, and Class IV. The visual resource management objective for Class II allows for a low level of change to the characteristic landscape. These changes should repeat the basic elements found in the characteristic landscape and should not attract the attention of the casual observer. Within VRM Class II, the Alternative 2 project components would not be perceivable. Therefore, Alternative 2 would be in conformance with Class II visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.

Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: No <input checked="" type="checkbox"/> explain on reverse)	
		Land/Water Body (1)				Vegetation (2)				Structures (3)					
Element		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
		Form			X				X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
		Line			X			X		X					
		Color			X				X	X					
Texture			X				X	X							

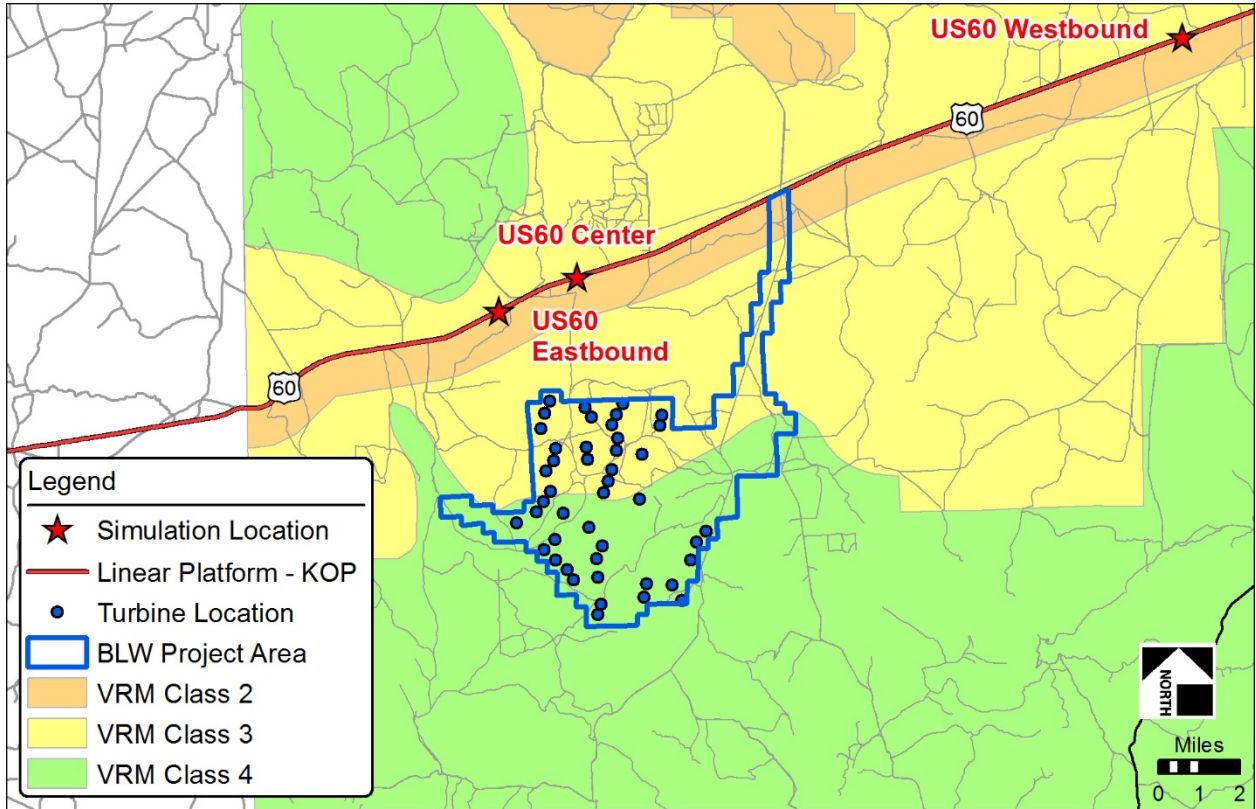
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as VRM Class III and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines, and access roads would be visible from the US 60 (Ocean to Ocean Highway) KOP. The visual resource management objective for Class III allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 2 would create strong contrast in form, line, color, and texture in the characteristic landscape, dominate the view, and would not be overlooked. Therefore, Alternative 2 would not be in conformance with Class III visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township:2S Range:19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point US 60 (Ocean to Ocean Highway)		
3. VRM Class: IV		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Vertical, geometric, thin, triangular transmission line structures, with angular guy-wires. Low, rectangular scattered residential structures. Low, vertical, curving, linear fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive transmission line and fencing structures. Regular, angular, and geometric lines associated with residential structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Dark brown wood of transmission line structures. Muted tones of varying shades of residential structure. Dark gray, dull post and wire of fencing. Dark monotone paved roads and light to medium beige/gray unpaved roads.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive transmission line and fencing. Discontinuous, scattered, medium to coarse, residential structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LANDFORM/WATER	2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Horizontal, block landform modification for turbine construction areas.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night. Linear, flat to rolling, symmetrical, strip, curving, regular form of access roads.
Line	Horizontal, regular, simple, and geometric lines for turbine construction area.	Straight to curving, horizontal continuous line of vegetation created from the construction of access roads.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade. Curvilinear, horizontal, continuous, and flowing line of access roads.
Color	Light, monotone, light, and brown/gray hues of landform exposure for turbine construction area.	No perceived change.	Monotone color of light/white value turbine structure and blade. Monotone color, light brown/gray access roads.

Texture	Smooth, uniform, ordered, scattered landform modification for turbine construction area.	Directional, continuous, and ordered adjacent to access roads.	Coarse, rough, discontinuous, and dotted turbines. Smooth, directional, continuous, and medium to fine access roads.
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SECTION D. CONTRAST RATING

SHORT TERM: X

LONG TERM (>5 years): X

														2. Does the project design meet visual resource management objectives? Yes: <input checked="" type="checkbox"/> No <input type="checkbox"/> explain on reverse)	
		Land/Water Body (1)				Vegetation (2)				Structures (3)					
Element		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
		Form			X				X	X					Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker
		Line			X			X		X					
		Color			X				X	X					
Texture			X			X		X							

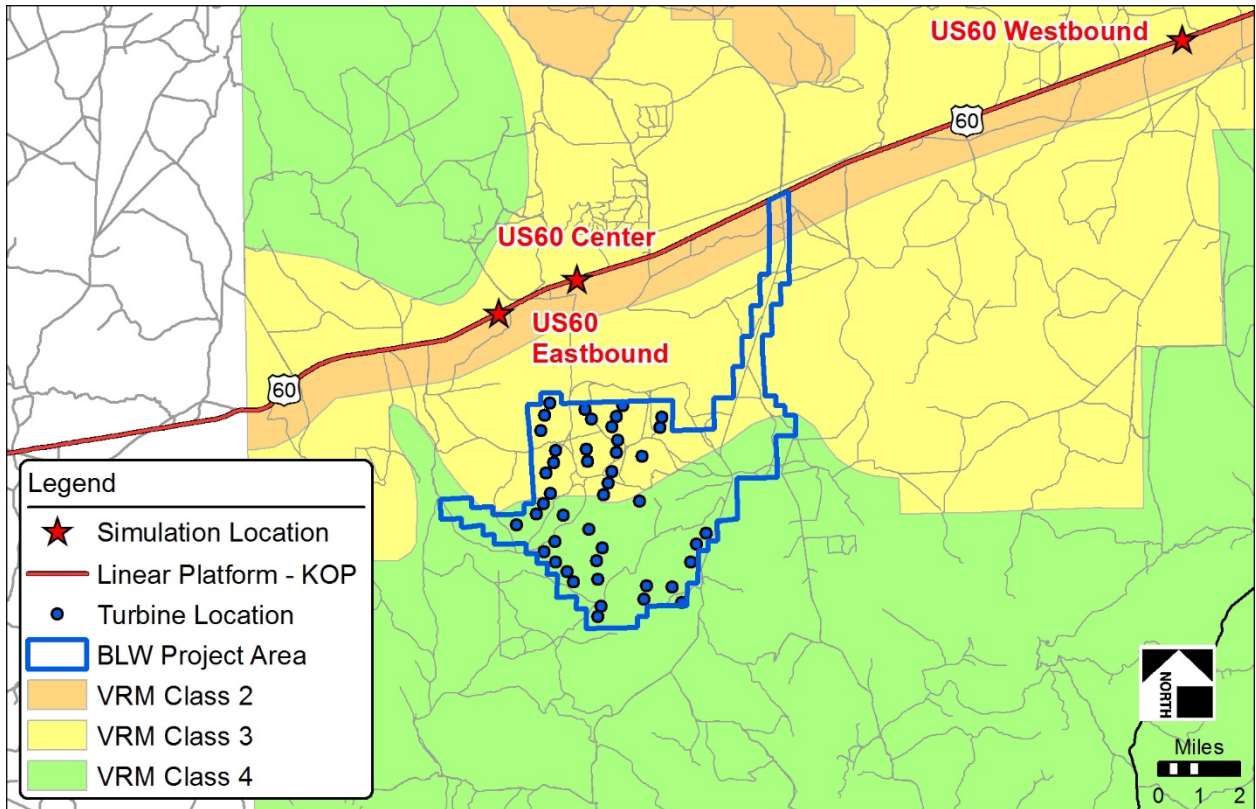
Comments from Item 2.

The view from this linear platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Alternative 2 project components visible from this KOP would occur in areas currently managed as VRM Class II, III, and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. The proposed turbines and access roads would be visible from the US 60 (Ocean to Ocean Highway) KOP. The visual resource management objective for this class, Class IV, allows for the level of change to the characteristic landscape can be high. Alternative 2 would create strong contrast in form, line, color, and texture in the characteristic landscape and would be in conformance with Class IV visual resource management objectives from the viewpoint of the US 60 (Ocean to Ocean Highway) KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Linear Platform Environmental Factors

Alternative: Alternative 2

Linear Platform Name: US 60

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker, C. Bockey

Simulation: Yes

Environmental Factors	As Considered from Linear Platform	Comments
<p>Distance to Project Components</p>	<p>This platform is approximately 2.5 miles from the nearest visible turbine. This platform intersects project infrastructure (roads or ancillary facilities).</p>	
<p>Visibility Conditions</p>	<p>This platform is located in a panoramic landscape that includes broad plains and low rolling hills with low grasses, shrubs and dispersed pinyon-juniper up to approximately 10-feet in height.</p> <p>Traveling in the eastbound direction in the foreground (FG) area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skylined; equally unobstructed and partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the eastbound direction in the middleground (MG) area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the eastbound direction in the background (BG) area of the proposed project, views of the project components would be predominately backdropped; partially obstructed and sporadically intermittent. Distance and atmospheric conditions would restrict visibility.</p> <p>Traveling in the westbound direction in the FG area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the westbound direction in the MG area of the proposed project, views of the project components would be equally backdropped against mountainous terrain and skyline; predominantly partially obstructed and equally continuous and intermittent.</p> <p>Traveling in the westbound direction project components are not visible in the BG area.</p>	<p>Foreground 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles</p>
<p>Angle of View</p>	<p>Traveling eastbound in the FG of the project components, the angle of observation from this platform would be predominately parallel views. The viewer position would be predominately neutral. Traveling eastbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral. Traveling eastbound in the BG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately inferior. Distance and atmospheric conditions would restrict visibility.</p> <p>Traveling westbound in the FG of the project components, the angle of observation from this platform would be predominately parallel views. The viewer position would be predominately neutral. Traveling westbound in the MG of the project components, the angle of observation from this platform would be predominately head-on views. The viewer position would be predominately neutral.</p>	

Quantification of View	<p>Platform percent seen from project components: There are a total of 67.0 miles of linear platform within the analysis area.</p> <p>Traveling eastbound in the FG of the project there are 29.5 miles of linear platform. . The project components would be seen for approximately 16 miles within the FG or 23% of the total platform miles within the analysis area.</p> <p>Traveling eastbound in the MG of the project there are 22.4 miles of linear platform. The project components would be seen for approximately 4 miles within the MG or 6% of the total platform miles within the analysis area.</p> <p>Traveling eastbound in the BG of the project there are 15.1 miles of linear platform. The project components would be seen for approximately 2 miles within the BG or 2% of the total platform miles within the analysis area.</p> <p>Traveling westbound in the FG of the project there are 29.5 miles of linear platform. The project components would be seen for approximately 16 miles within the FG or 24% of the total platform miles within the analysis area.</p> <p>Traveling westbound in the MG of the project there are 22.4 miles of linear platform. The project components would be seen for approximately 2 miles within the MG or 3% of the total platform miles within the analysis area.</p> <p>Project percent seen from linear platform: There are 134.2 acres of surface disturbance within the analysis area; approximately 25 acres or 19% would be seen from the platform traveling in the eastbound direction within the FG and approximately 41 acres or 31% would be seen from the platform traveling in the westbound direction within the FG.</p> <p>There are 45 turbines within the analysis area: Traveling in the eastbound direction within the FG 45 turbines or 100% would be seen from the platform. Traveling in the eastbound direction within the MG 45 turbines or 100% would be seen from the platform. Traveling in the eastbound direction within the BG 19 turbines or 42% would be seen from the platform.</p> <p>Traveling in the westbound direction within the FG 45 turbines or 100% would be seen from the platform. Traveling in the westbound direction within the MG 45 turbines or 100% would be seen from the platform.</p> <p>Duration of view from linear platform: There are a total of 67.0 miles of linear platform within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 27 minutes within the FG of the project, the project components would be seen for a total of approximately 15 minutes within the FG or 24% of the total travel time within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 21 minutes within the MG of the project, the project components would be seen for a total of approximately 4 minutes or 6% of the total travel time within the analysis area.</p> <p>Traveling eastbound based on a vehicular travel speed of 65 mph, and a total travel time of 14 minutes within the BG of the project, the project components would be seen for a total of approximately 2 minutes or 3% of the total travel time within the analysis area.</p> <p>Traveling westbound based on a vehicular travel speed of 65 mph, and a total travel time of 27 minutes within the FG of the project, the project components would be seen for a total of approximately 15 minutes or 24% of the total travel time within analysis area.</p>	
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	<p>Traveling westbound based on a vehicular travel speed of 65 mph, and a total travel time of 21 minutes within the MG of the project, the project components would be seen for a total of approximately 2 minutes or 3% of the total travel time within the MG of the project.</p> <p>The project components would be more visible traveling in the eastbound direction (21 minutes or 34% of the total travel time within the analysis area) vs. traveling in the westbound direction (17 minutes or 27% of the total travel time within the analysis area).</p>	
<p>Spatial Relationship/ Size and Scale</p>	<p>Traveling eastbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components (infrastructure and turbines) would introduce elements and patterns that would be visually dominant and create strong contrast as compared to the other features in the landscape.</p> <p>Traveling eastbound in the MG of the proposed project, the project components would attract attention, be visually prominent, and begin to dominate the visual setting; the visual setting within the MG of the proposed project would appear to be substantially altered because project components (turbines) would introduce elements and patterns not common in the landscape and would create moderate contrast as compared to other features in the landscape.</p> <p>Traveling eastbound in the BG of the proposed project, the project components would not attract attention and the landscape would appear intact within the visual setting; project component visibility would be limited by distance and atmospheric conditions.</p> <p>Traveling westbound in the FG of the proposed project, the project components would demand attention and dominate the visual setting; the visual setting within the FG of the proposed project would appear to be severely altered because project components (infrastructure and turbines) would introduce elements and patterns that would be visually dominant and create strong contrast as compared to the other features in the landscape.</p> <p>Traveling westbound in the MG of the proposed project, the project components would attract attention, be visually prominent, and begin to dominate the visual setting; the visual setting within the MG of the proposed project would appear to be substantially altered because project components (turbines) would introduce elements and patterns not common in the landscape and would create moderate contrast as compared to other features in the landscape.</p>	

BLWP – US 60 Center Simulation ' Alternative 2





BLWP – US 60 Westbound Simulation - Alternative 2



UNITED STATES DEPARTMENT OF
 THE INTERIOR BUREAU OF LAND
 MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date: April 2019

District/ Field Office: Socorro Field Office

Resource Area:

Activity (program): Renewable Energy

SECTION A. PROJECT
 INFORMATION

1. Project Name Borderlands Wind Project – Alternative 2	4. Location Township: 2S Range: 19&20W	5. Location sketch <i>See attached map</i>
2. Key Observation Point Zuni Salt Lake		
3. VRM Class: III		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

1. LANDFORM/WATER		2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	Gently rolling, broad, and continuous with subtle variations; occasional moderate slopes.	A mix of vegetation with low indistinct grasses, low rounded shrubs, and amorphous patches of rounded pinyon-juniper.	Low, rectangular scattered building structures. Low, vertical, thin, curving, linear, fencing. Linear, flat to rolling, symmetrical, strip, curving, regular form of paved and unpaved roads.
Line	Undulating to flat/gentle rolling; undulating edge at transition to adjacent units.	Broken and indistinct.	Defined, vertical, rigid, and repetitive and fencing structures. Regular, angular, and geometric lines associated with building structures. Curvilinear, horizontal, continuous, and flowing line of paved and unpaved roads.
Color	Light reddish brown to khaki soils; variations in brown.	Light straw-buff of grasses, yellow-green of rabbit brush, dark green of pinyon-juniper.	Muted tones of varying shades of building structure. Dark monotone paved roads and light to medium beige/gray unpaved roads. Dark gray, dull post and wire of fencing.
Texture	Predominantly smooth, with gentle transitions.	Broken and patchy with coarse areas of pinyon-juniper. Stippled pinyon-juniper in transition areas. Grasses and shrubs are consistent and continuous.	Consistent, directional, and repetitive fencing. Discontinuous, scattered, medium to coarse, building structures. Smooth, directional, continuous, and medium to fine paved and unpaved roads.

SECTION C. PROPOSED ACTIVITY DESCRIPTION

1. LANDFORM/WATER		2. VEGETATION	3. STRUCTURE (<i>General</i>)
Form	No perceived change.	No perceived change.	Bold, distinct, solid, tall, vertical, and rigid turbine structures. Circular motion of blade during the day and lighted hub at night.
Line	No perceived change.	No perceived change.	Bold, straight, vertical, and perpendicular, turbine structure; bold, circular, and continuous line of blade
Color	No perceived change.	No perceived change.	Monotone color of light/white value turbine structure and blade.
Texture	No perceived change.	No perceived change.	Coarse, rough, discontinuous, and dotted turbines.

		SECTION D. CONTRAST RATING												SHORT TERM: X		LONG TERM (>5 years): X	
		Land/Water Body (1)				Vegetation (2)				Structures (3)				2. Does the project design meet visual resource management objectives? Yes: X No <input type="checkbox"/>			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigation measures recommended Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Element	Form				X				X				X	Evaluator's Names V. Alguire D. Chavez D. Simpson-Colebank R. Baker			
	Line				X				X				X				
	Color				X				X				X				
	Texture				X				X				X				

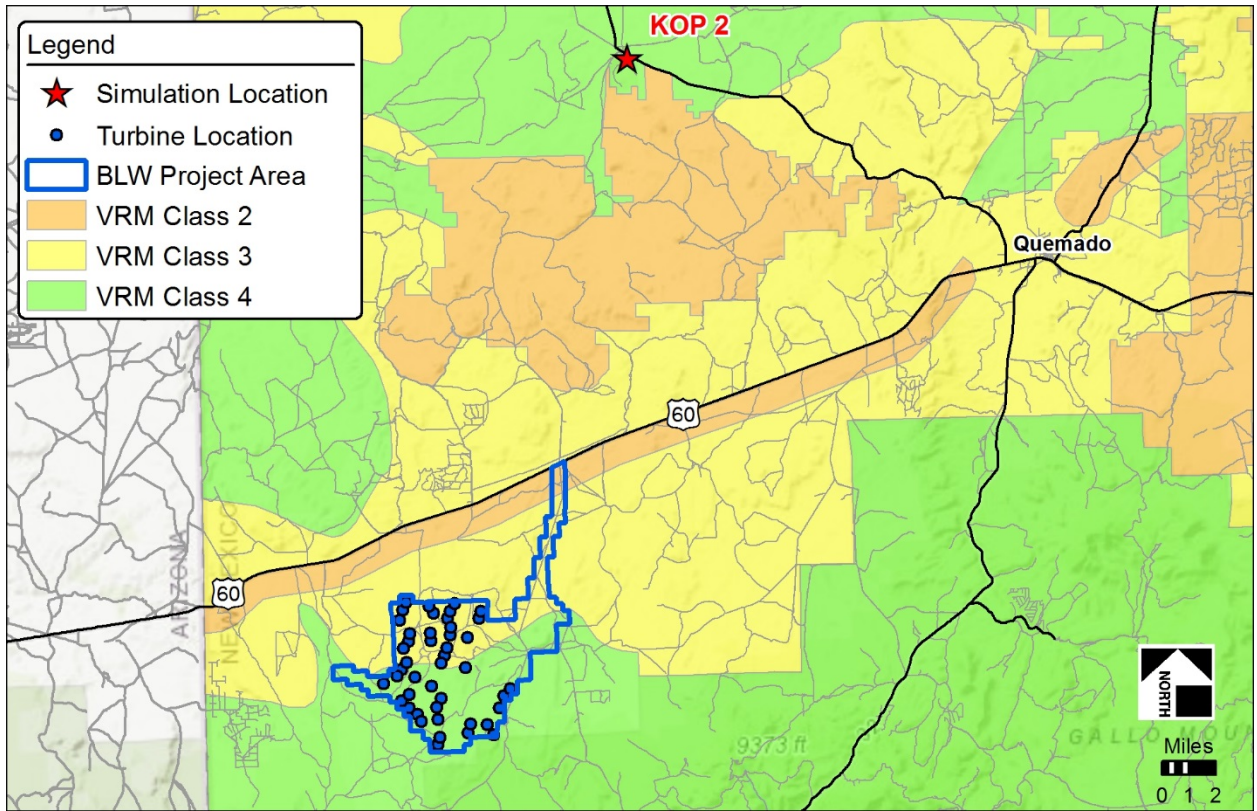
Comments from Item 2.

The view from this stationary platform consists of broad gently rolling hills, with occasional moderately sloped features and a scattering of distant mountain landforms in the background. The vegetation is a mix of short grasses and with large expansive patches of pinyon-juniper. Proposed project components visible from this KOP would occur in areas currently managed as VRM Class III and Class IV. The statuesque wind turbines with their rotating blades and lighted hubs would demand attention and dominant the landscape. This KOP is approximately 21 miles from the nearest visible turbines. Approximately 33 turbines would be visible within the background of the Zuni Salt Lake KOP. The amount of viewer exposure of the project components from the platform would be approximately 15 degrees. The primary focus of the viewer's attention is Zuni Lake from which the project components would be in view. The viewer position would be predominately inferior. The visual resource management objective for this class, Class III, allows for a moderate level of change to the characteristic landscape. However these changes should repeat the basic elements found in the characteristic landscape and should not dominate the view of the casual observer. Alternative 2 would create weak contrast in form, color, and texture in the characteristic landscape and may attract attention depending on the time day and atmospheric conditions. Therefore, Alternative 2 would be in conformance with Class III visual resource management objectives from the viewpoint of Zuni Salt Lake KOP.

Additional Mitigation Measures (see Item 3)

None identified.

KOP Location Map



Borderlands Wind Project Stationary Platform Environmental Factors

Alternative: Alternative 2

Stationary Platform Name: Zuni Salt Lake

Date: April 2019

Evaluator Name: D. Simpson-Colebank, R. Baker; C. Bockey; D. Chavez; V. Alguire

Simulation: Yes

Environmental Factors	As Considered from Stationary Platform	Comments
Distance to Project Components	This platform is approximately 21 miles from the nearest visible turbine. Project infrastructure (transmission line/ roads/ ancillary facilities) are not visible from this platform.	Foreground limit 0-10 miles Middleground 10.1-20 miles Background 20.1-30 miles
Visibility Conditions	This platform is located in a predominately panoramic landscape that includes plains with scattered low rolling hills and mesas. In the background (BG) of the platform, views of the wind turbine blades would be predominately skylined; towers predominately partially obstructed and predominately intermittent.	The majority of project components (turbines) occur behind landforms when viewed from this platform. Distance and atmospheric conditions reduce visibility of turbines.
Angle of View	In the BG, the amount of viewer exposure of the project components from the platform would be approximately 15°. The primary focus of the viewer's attention is Zuni Lake from which the project components would be in view. The viewer position would be predominately inferior.	
Quantification of View (Project percent seen)	Based on bare earth GIS analysis approximately 33 turbines would be seen in the BG of the platform, which would represent 73 percent of the total turbines within the project area. Project infrastructure (transmission line/ roads/ ancillary facilities) are not visible from this platform.	
Scale/Spatial Relationship	The project components within the BG of the platform and would begin to attract attention and be visually subordinate within the visual setting; the visual setting would appear to be noticeably altered because the turbines would introduce color contrast, vertical elements and motion that would be visually subordinate within the landscape and create generally low contrast due to distance and atmospheric conditions.	

BLWP – Zuni Salt Lake Simulation - Alternative 2



**APPENDIX G: NATIONAL HISTORIC PRESERVATION ACT SECTION 106
PROGRAMMATIC AGREEMENT**

Placeholder for National Historic Preservation Act Section 106 Programmatic Agreement

To be included once executed