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Burlington Resources Oil and Gas Company, LP
San Juan 28-6 Unit 167N Proposed Access Road Relocation

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1. PURPOSE AND NEED FOR ACTION

1.1. Background

Burlington Resources Oil and Gas Company LP (BROG) has applied for a Right-of-Way (ROW) Grant with the Bureau of Land Management - Farmington Field Office (BLM-FFO) for the San Juan 28-6 Unit 167N Proposed Access Road Relocation project. The purpose of the project is to build a new access road for the San Juan 28-6 Unit 167N well pad. The previous access road was washed out by recent flood events. The proposed action is the approval of the ROW Grant by the BLM-FFO, located in Farmington, New Mexico.

BROG has applied for a 30-foot-wide ROW Grant with the BLM-FFO for the construction of San Juan 28-6 Unit 167N Proposed Access Road. The new access road reroute would be approximately 1,628.06-feet in length located on public lands managed by the BLM-FFO. Proposed road construction and upgrades will be designed, constructed and maintained in accordance with BLM Gold Book Standards, BLM 9113-1 (Roads Design Handbook), and BLM 9113-2 (Roads Inventory and Condition Assessment Guidance and Instructions Handbook).

Surface disturbance associated with the proposed project area would be approximately 1.13 acres, total. Of this, approximately 0.6 acres would be considered new surface disturbance. Production equipment will be placed on the location in such a manner to allow proper safe access to produce and service the well/facilities while minimizing long-term disturbance and maximizing interim reclamation.

1.2. Purpose and Need for Action

The purpose of the proposed action is to reroute an existing BROG managed access road which has since been washed out due to flooding events. The reroute will allow BROG reasonable access to BLM managed lands to develop their mineral lease.

The need for the proposed action is established by the BLM's responsibility under the Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1701 et seq.) to respond to a request for ROW Grants over public lands.

1.3. Decision to be Made

Based on the information in this environmental assessment (EA), the BLM-FFO will decide whether or not to issue the ROW Grant, and if so, under what terms and conditions. Under the National Environmental Policy Act (NEPA) (Public Law [PL] 91-90, 42 USC 4321 et seq.), the BLM-FFO must determine if there are any significant environmental impacts associated with the proposed action warranting further analysis in an Environmental Impact Statement (EIS). The BLM-FFO Field Manager is the responsible officer who will decide either:

- To approve the ROW Grant with design features as submitted;
- To approve the ROW Grant with additional mitigations;
- To analyze the effects of the proposal in an EIS; or
- To deny the ROW Grant.

1.4. Conformance with Applicable Land Use Plan(s)

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this site-specific EA tiers to and incorporates by reference the information and analysis contained in the Farmington Proposed Resource

Management Plan/Final Environmental Impact Statement [(PRMP/FEIS) BLM 2003a]. This EA is in conformance with the management goals set forth in the Resource Management Plan (RMP) for the Farmington Field Office (FFO) of the BLM, which was approved by the Record of Decision (ROD) signed September 29, 2003, and updated in December 2003 (BLM 2003b).

Specifically, the proposed action supports the following BLM policy:

> It is the policy of the BLM to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs, consistent with national objectives of an adequate supply of minerals at reasonable market prices. At the same time, the BLM strives to ensure that mineral development is carried out in a manner that minimizes environmental damage and provides for the rehabilitation of affected lands (2003b, 2-2 – 2-3).

The PRMP/FEIS, RMP, and ROD are available for review at the BLM Farmington Field Office, 6251 College Blvd., Suite A, Farmington, NM, or electronically at: http://www.nm.blm.gov/ffo/ffo_home.html.

Development of energy-related ROWs, such as access roads, is one of the primary activities of the BLM-FFO lands program. Such ROWs receive environmental review on a case-by-case basis (BLM 2003b). As required by NEPA, this EA addresses site-specific resources and effects of the proposed action that were not specifically covered within the PRMP/FEIS.

1.5. Relationship to Statutes, Regulations or Other Plans

1.5.1. Clean Water Act

Recognizing the potential for the continued or accelerated degradation of the Nation's waters, the U.S. Congress enacted the Clean Water Act (CWA), formerly known as the Federal Water Pollution Control Act (33 USC 1344). The objective of the CWA is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States (U.S.).

Under Section 401 of the CWA, an applicant for a federal license or permit to conduct an activity that may result in a discharge into a water of the U.S. must provide the federal agency with a Section 401 certification declaring that the discharge would comply with the CWA. The certification would be granted by the New Mexico Environment Department (NMED).

Under Section 402 of the CWA, the U.S. Environmental Protection Agency (EPA) regulates storm water discharges from industrial and construction activities under the National Pollution Discharge Elimination System (NPDES) program. Permits are required if discharge results in a reportable quantity for which notification is required (pursuant to 40 CFR 117.21, 40 CFR 302.6, or 40 CFR 110.6) or if the discharge contributes to a violation of a water quality standard.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the waters of the U.S., including wetlands. The U.S. Army Corps of Engineers (USACE) has jurisdiction over "waters of the U.S." These jurisdictional waters include those that have a "significant nexus" to traditional navigable waters. The BLM-FFO and USACE Durango Regulatory Office have determined that jurisdictional waters may include USGS watercourses (i.e., "blue lines" on USGS 1:24,000 topographic maps). One intermittent/ephemeral watercourse is located along the proposed access road and has a defined stream channel (i.e., Ordinary High Water Mark) and would thereby likely be subject to regulatory jurisdiction under the USACE. Assuming the watercourses are jurisdictional, the proposed actions would be authorized under Nationwide Permit No. 12 (Utility Line Activities). The proposed project would be designed to avoid discharge into other watercourses that are potentially USACE jurisdictional and would not result in the loss of greater than ½ acre of waters of the U.S.

1.5.2. National Historic Preservation Act

Compliance with Section 106 responsibilities of the National Historic Preservation Act are adhered to by following the BLM – New Mexico SHPO protocol agreement (2014), which is authorized by the *National Programmatic Agreement between the BLM*, the *Advisory Council on Historic Preservation*, and the *National Conference of State Historic Preservation Officers (2012)*, and other applicable BLM handbooks.

1.5.3. Clean Air Act

The Clean Air Act of 1972, as amended (CAA; 42 USC 7401 et seq.), establishes national ambient air quality standards (NAAQS) to control air pollution. In New Mexico, the NMED has adopted most of the CAA into the New Mexico Administrative Code (NMAC). The NMED issues construction and operating permits for air quality and enforces air quality regulations and permit conditions.

1.6. Scoping, Public Involvement, and Issues

1.6.1. Scoping and Public Involvement

The BLM-FFO publishes a NEPA log for public inspection. This log contains a list of proposed and approved actions within the BLM-FFO. The log is located on the BLM's New Mexico website:

http://www.blm.gov/nm/st/en/prog/planning/nepa_logs.html

An onsite meeting, attended by BROG, BLM-FFO representatives, and an environmental consultant (Adkins Consulting, Inc. [ACI]), was held for the proposed project on February 13th, 2015. The local chapter of the Navajo Nation was invited to the meeting by the BLM-FFO; no members of the Navajo Nation attended the meeting. A public invitation to the on-site meetings was posted online, no private citizens or groups attended the meetings.

http://www.blm.gov/nm/st/en/fo/Farmington_Field_Office/ffo_oil_and_gas/ffo_onsites.html

A BLM-FFO Interdisciplinary Team meeting was held on March 9th, 2015 to discuss the proposed action. At the aforementioned meetings, potential issues of concern were identified by the BLM-FFO and ACI.

Based on the size and scale, routine nature, and potential impacts associated with the proposed action, no additional external scoping was conducted. No public comments were received for the proposed action.

1.6.2. Issues

Issues Analyzed

The following issues were identified during internal scoping as potential issues of concern for the proposed action. These issues will be addressed in this EA.

- How would the proposed project impact air resources?
- How would surface-disturbing activities associated with construction of the proposed project impact cultural resources?
- How would vegetation-clearing, proposed project activities, and final reclamation associated with the proposed project impact upland vegetation?
- How would surface-disturbing activities associated with construction of the proposed project impact soils?
- What would be the impacts of the proposed project on noxious weeds and invasive species?

- What would be the impacts of the proposed project on travel and transportation?
- Areas of Critical Environmental Concern (ACECs) and Specially Designated Areas (SDAs)

Issues Considered but not Analyzed

The following issues were identified during scoping as issues of concern that would not be impacted by the proposed action or that have been covered by prior environmental review. These issues will not be analyzed in this EA.

Groundwater

Stimulation (i.e., hydraulic fracturing or "fracking") is a process used to maximize the extraction of underground resources by allowing oil or natural gas to move more freely from the rock pores to production wells that bring the oil or gas to the surface. Fluids, commonly made up of water (99 percent) and chemical additives (1 percent), are pumped into a geologic formation at high pressure during hydraulic fracturing (USEPA 2004). Chemicals added to stimulation fluids may include friction reducers, surfactants, gelling agents, scale inhibitors, acids, corrosion inhibitors, antibacterial agents, and clay stabilizers. When the fracking pressure exceeds the rock strength, the fluids open or enlarge fractures that typically extend several hundred feet away from the well bore, and may occasionally extend up to 1,000 feet from the well bore. After the fractures are created, a propping agent (usually sand) is pumped into the fractures to keep them from closing when the pumping pressure is released. After fracturing is completed, a portion of the injected fracturing fluids returns to the wellbore and is recovered for future fracturing operations (USEPA 2004) or disposal. Stimulation techniques have been used in the United States since 1949 and in the San Juan Basin since the 1950s. Over the last 10 years, advances in multi-stage and multi-zone hydraulic fracturing have allowed development of gas fields that previously were uneconomic, including the San Juan Basin.

Hydraulic fracturing is a common process in the San Juan Basin and applied to nearly all wells drilled. The producing zone targeted by the proposed action is well below any underground sources of drinking water. The Mancos Shale formation is also overlain by a continuous confining layer. The geological confining layer is the Lewis Shale formation that is located above both the Mancos Shale and Mesaverde formations and provides an impermeable layer that isolates the Mancos Shale and Mesaverde formations from both identified sources of drinking water and surface water. On average, total depth of the proposed well bore would be about 5,000 feet below the ground surface. Fracturing in the Basin Mancos formation is not expected to occur above depths of 4,000 feet below the ground surface. Fracturing could possibly extend into the Mesaverde formation overlying the Basin Mancos; however, the formation has not been identified as an underground source of drinking water based on its depth and relative high levels of TDS. No impacts to surface water or freshwater-bearing groundwater aquifers are expected to occur from hydraulic fracturing of this proposed well.

Endangered Species Act Species

The Endangered Species Act (ESA) of 1973 requires all federal departments and agencies to conserve threatened, endangered, and critical and sensitive species and the habitats on which they depend, and to consult with the U.S. Fish and Wildlife Service (USFWS) on all actions authorized, funded, or carried out by the agency to ensure that the action will not likely jeopardize the continued existence of any threatened and endangered species or adversely modify critical habitat. Consultation with the USFWS, as required by Section 7 of the ESA, was conducted as part of the Farmington PRMP/FEIS (Consultation No. 2-22-01-I-389) to address cumulative effects of RMP implementation. The consultation is summarized in Appendix M of the PRMP/FEIS. No unaccounted-for water depletions within USFWS-listed fish habitat would occur as a result of the proposed project. Therefore, there is no need for additional Section 7 consultation.

Paleontology

The San Juan Basin in northwestern New Mexico is rich in paleontological resources. The BLM used the Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands (Instruction Manual 2008-009) to identify areas with a high potential to produce significant fossil resources (BLM 2008d). Under this system, all lands within the BLM-FFO management area were designated as Class 5 (Very High Potential) for paleontological resources.

Class 5 areas require an assessment of paleontological resources at the project level (BLM 2009). If a paleontological site is discovered during the construction phase of the proposed project, the site would be avoided by personnel, personal vehicles, and company equipment. Therefore, no impacts to paleontological resources are anticipated as a result of the proposed project.

2. PROPOSED ACTION AND ALTERNATIVE(S)

2.1. Alternative A: No Action

Under the No Action Alternative, the ROW Grant associated with the proposed San Juan 28-6 Unit 167N Access Road Relocation project would not be approved. The proposed access road would not be installed. Current land and resource uses would continue to occur in the proposed project area.

2.2. Alternative B: Proposed Action

The proposed action is the BLM-FFO approval of a ROW Grant associated with BROG San Juan 28-6 Unit 167N Proposed Access Road Relocation project. The proposed project would include the construction, maintenance, and final abandonment of a 1628.06-foot, 30-foot-wide access road corridor to access the San Juan 28-6 Unit 167N well site. The proposed project would commence after the ROW Grant is issued. The road would be designed and constructed as a BLM resource road in accordance with the BLM Gold Book Standards, BLM 9113-1 (Roads Design Handbook), and BLM 9113-2 (Roads Inventory and Condition Assessment Guidance and Instructions Handbook).

Surface disturbance associated with the proposed project would encompass approximately 1.13 acres, total. This would include approximately 0.6 acres of new surface disturbance on public lands managed by the BLM-FFO.

2.2.1. Location of Proposed Project area

A map of the proposed project area plotted on USGS topographic quadrangle (Figure A.1) and a drawing of the proposed development on aerial imagery (Figure A.2) are provided in Appendix A.

The proposed project area is located within the BLM-FFO management area on public lands managed by the BLM within the San Juan Basin of northwest New Mexico. The proposed development is located approximately 30 miles southeast of Bloomfield and 22 miles southeast of Blanco within Section 4, Township 27 North, Range 6 West, New Mexico Principle Meridian (NMPM) in Rio Arriba County. Approximately 1,005-feet of the northern section of the proposed access road is located within the Rincon Rock Shelter ACEC.

The general region surrounding the proposed project area is characterized by mesas, large ephemeral washes and relatively flat lowland valleys. The proposed access road travels through gently sloping sagebrush shrubland and is situated within the USGS-designated Carrizo watershed just north of Carrizo Wash. Elevation within the proposed project area ranges from approximately 6,230 to 6,300 feet above mean sea level (AMSL).

The proposed project is in an area that is experiencing increased oil and gas development following advances in horizontal drilling techniques and development of Mancos Shale for liquid (oil) reserves.

Several well pads, CDP sites, pipeline gathering systems and public roads have been constructed or proposed within and in the vicinity of the proposed project area. Existing and/or previously permitted disturbance overlapped by the proposed project is discussed further in Section 2.2.3 (Proposed Surface Disturbance), below.

2.2.2. Description of Proposed Project

A detailed description of design features and construction practices associated with the proposed action can be found below. Plats associated with the proposed project are provided in Appendix B and provide additional details. Photographs of the proposed project area and the area of washout are provided in the Surface Reclamation Plan (Appendix C).

Design Features and Best Management Practices

BROG would adhere to the stipulations attached to the approved ROW Grant. The following general design features and best management practices (BMPs) would occur.

Control of Waste

Liquid and solid wastes would be disposed of at an appropriate waste-disposal site. The proposed project area would be maintained in a sanitary condition. Hazardous substances would be handled and disposed of according to federal law. Waste resulting from construction activities would be removed from the proposed project area and disposed of in an authorized area, such as an approved landfill.

Protection of Paleontological Resources

If a paleontological site is discovered, the BLM would be notified and the site would be avoided by personnel, personal vehicles, and company equipment. Workers would be informed that it is illegal to collect, damage, or disturb some such resources, and that such activities are punishable by criminal and/or administrative penalties.

Protection of Cultural Resources

All cultural resource stipulations would be followed as indicated in the Cultural Resource Records of Review, attached to the stipulations in an approved ROW Grant. These stipulations could include, but would not be limited to, temporary or permanent fencing or other physical barriers, monitoring of earth disturbing construction, reduction of the proposed project areas and/or establishment of specific construction avoidance zones, and employee education.

Employees, contractors, and sub-contractors associated with the proposed project would be informed by BROG that cultural sites are to be avoided by personnel, personal vehicles, and company equipment. These individuals would be informed that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and/or administrative penalties under the provisions of ARPA.

In the event of a cultural discovery during construction, BROG would immediately stop all construction activities in the immediate vicinity of the discovery and immediately notify the archaeological monitor, if present, or the BLM. The BLM would then evaluate or cause the site to be evaluated. Should a discovery be evaluated as significant (e.g., eligible for the National Register of Historic Places [NRHP] or protected under NAGPRA or ARPA), it would be protected in place until mitigating measures could be developed and implemented according to guidelines set by the BLM.

Protection of Areas of Critical Environmental Concern (ACECs)

Approximately 1,005-feet of the northern section of the proposed access road route is located within Rincon Rock Shelter Area of Critical Environmental Concern (ACEC) managed by BLM-FFO. The Rincon Rock Shelter site is listed on the National Register of Historic Places and overlooks the head of a small

tributary to Carrizo Canyon. The site is a 18th century Navajo defensive structure and is significant for its architecture and for its potential contribution to archeological studies. Two additional defensive sites and other associated features are present within the ACEC.

There are a total of 324 acres within the boundary of Rincon Rock Shelter ACEC made up entirely of public lands and federal mineral (BLM 2003a). Management goals for the Rincon Rock Shelter ACEC are to preserve cultural and recreational values. Management prescriptions for Rincon Rock Shelter ACEC state that new ROWs must be placed in existing ROW disturbance (BLM 2003a, Table 2-5). As such, the proposed access has been rerouted to follow existing disturbance and minimize new disturbance to the greatest extent possible.

Protection of Flora and Fauna, including SSS and Livestock

Under the Migratory Bird Treaty Act – BLM/FFO Interim Management Policy (IM No. NM-F00-2010-001), timing limitations on use authorizations will be enforced for projects during the nesting period of May 15 to July 31 to avoid or minimize the possibility of the unintentional take of migratory birds. These timing limitations will be enforced for projects during the nesting period of May 15 to July 31 under the following conditions:

- For proposed projects 4.0 acres or more of vegetative disturbance, no construction activities from May 15 to July 31 will be permitted without a migratory bird nest survey. These surveys will be conducted by a BLM/FFO approved biologist using a survey protocol provided by a BLM/FFO biologist. If any active nests are located within the proposed project area, projects activities will not be permitted until written approval by a BLM/FFO biologist. The BLM/FFO will monitor any active nests located from a nest survey.

- The use of prescribed fire and mechanical thinning equipment (i.e. hydromower and tree axe) during this period (5/15-7/31) will be avoided. Exceptions to this policy will be considered where repeated complications due to weather have prevented the attainment of resource objectives through the use of prescribed fire. In these situations a thorough environmental analysis will be prepared assessing the effects of conducting the burn during the restricted period. The decision to proceed or not will be based upon this analysis. It should be noted also that this policy does not apply to natural ignitions in areas that the District Fire Management Plan has designated as a "wildland fire use area" nor does it apply to treatments 4.0 acres or less in size. In addition, should state or national guidance be issued that differs from this policy; the FFO policy will be modified to conform to it.

- Should active nests be observed, the contractor has determined that project activities cannot be avoided until after the birds have fledged (left the nest), and if no practicable or reasonable avoidance alternatives are identified, then the contractor must contact the USFWS's Migratory Bird Permit Office in Albuquerque, NM at (505) 248-7882. The contractor may proceed with work on the affected project activities following receipt of the approved permit from the USFWS.

Should any active raptor nests be observed within one-third mile of the proposed project area or should any additional SSS (listed by the USFWS or BLM) be observed within the proposed project area prior to or during project implementation, construction would cease and the BLM-FFO would be immediately contacted. The BLM-FFO would then ensure evaluation of the resource. Should a discovery be evaluated as significant (protected under the ESA, etc.), it would be protected in place until mitigation could be developed and implemented according to guidelines set by the BLM.

BROG would notify the livestock grazing lease operator(s) at least 10 business days prior to beginning the construction phase of the proposed project in order to ensure that there would be no conflicts between construction activities and livestock grazing operations. The proposed project area is within the Delgadito Mesa Allotment Number 5107 and Munoz Canyon Allotment Number 5109, both managed by the BLM-FFO. BROG would not cease or delay construction unless directed by the authorized BLM-FFO

officer. If present, any range improvements (e.g., fences, pipelines, and ponds) disturbed by construction activities would be repaired to the condition they were in prior to disturbance. Repairs, if needed, would take place immediately following construction.

The following design features would apply to the proposed project:

- All construction and/or maintenance resulting in surface disturbance would be done in accordance to the BLM Surface Operating Standards and Guidelines for Oil and Gas Development, Fourth Edition-Revised 2007 (The Gold Book).

Protection of Topsoil

Topsoil, which would be stripped from the surface of the proposed access road during the construction phase of the proposed project, would be stored and protected until it is redistributed during reclamation. The topsoil would be stored separately from subsoil or other excavated material within the proposed project area. The topsoil would be free of brush and tree limbs, trunks, and roots. Vehicle/equipment traffic would not be allowed to cross topsoil stockpiles. The topsoil would be protected using wattles or other BMPs so that erosion is minimized. If topsoil is stored for a length of time such that nutrients are depleted from the topsoil, amendments would be added to the topsoil as advised by an appropriate environmental scientist or agent/contractor.

Protection of the Public

The hauling of equipment and materials for the proposed project on public roads would comply with Department of Transportation regulations. No toxic substances would be stored or used within the proposed project area. BROG would have inspectors present during construction. Any accidents involving persons or property would immediately be reported to the BLM-FFO. BROG would notify the public of potential hazards by posting signage, as necessary.

Prevention and Control of Weeds

Prior to construction, equipment entering the proposed project area would be inspected for noxious weeds and cleaned.

It would be BROG's responsibility to monitor, control, and eradicate all invasive, non-native plant species within the proposed project area throughout the life of the project. BROG's weed-control contractor would contact the BLM-FFO regarding acceptable weed-control methods. BROG would be required to submit a Pesticide Use Proposal (PUP) for the location if one does not currently exist. BROG's weed-contractor would need to hold a current pesticide applicator's permit prior to pesticide application. Only pesticides authorized for use on BLM lands would be used. The use of pesticides would comply with federal and state laws, and used only in accordance with their registered use and limitations. BROG's weed-control contractor would contact the BLM-FFO prior to using these chemicals.

Protection of Air Resources

BMPs for dust suppression would be utilized within the proposed project area to reduce fugitive dust during the construction phase of the proposed project. Water application, using a rear-spraying truck or other suitable means, would be the primary method of dust suppression within the proposed project area. Any additional dust-suppression practices would include the BLM-standard BMPs found in the Gold Book (BLM and USFS 2007) and the BMPs outlined in the stipulations attached to the approved ROW Grant.

Additional Design Features and BMPs

Vehicles would be restricted to proposed disturbance areas and existing areas of surface disturbance, such as existing roads and well pads.

Worker safety incidents would be reported to the BLM-FFO as required under Notice to Lessees (NTL) - 3A (USGS 1979). BROG would adhere to company safety policies, Occupational Safety and Health Administration regulations, and Department of Transportation regulations.

BROG would comply with Onshore Oil and Gas Order No. 2, issued under Onshore Oil and Gas Operations (43 CFR 3160).

Construction and maintenance activities would cease when soil or road surfaces become saturated to the extent that construction equipment is unable to stay within the proposed access road and/or when activities would cause irreparable harm to roads, soils, or streams.

Erosion-control and water-management features, such as berms, culverts, diversion ditches, and waterbars, would be applied as specified by the BLM-FFO Authorized Officer. Features suggested by the BLM-FFO representative during the February 13th, 2015 on-site include 1) low water crossing at access road station 4+81.17, 2) 24" x 30' culvert and silt trap at 8+66.90 and 3) 24" x 30' culvert at 11+16.75. Installation and maintenance of erosion-control features would be done in accordance to BLM Gold Book standards. Additional resource protection design features and mitigation associated with construction would be established upon reclamation following construction.

Proposed Project Phases

Under the proposed action, the following phases would occur.

Construction Phase

Once the ROW Grant is approved, project construction can begin. The BLM-FFO would be notified at least 48 hours prior to the start of construction.

Within the proposed project area, all vegetation would be cleared, and approximately the top 6 inches of topsoil would be salvaged and stockpiled. Vegetation removed during construction, including slash/brush, would be chipped or mulched and incorporated into the topsoil as additional organic matter.

The resource road will be designed and constructed in accordance with BLM Gold Book Standards, BLM 9113-1 (Roads Design Handbook), and BLM 9113-2 (Roads Inventory and Condition Assessment Guidance and Instructions Handbook). Average clearing width for resource road development is 30 feet. Final travel surface width on resource roads is approximately 14 feet.

Erosion control and/or water management features would be installed, as necessary. Additional resource protection design features and mitigation associated with construction are listed above, in "Design Features and Best Management Practices".

Interim Reclamation

Interim reclamation would occur within all new disturbance areas associated with the proposed project. Stored topsoil would be spread over the area to be reclaimed area and then seeded. The BLM-FFO would be notified at least 48 hours prior to surface reclamation activities.

During this phase, a bulldozer and a tractor with seeding capabilities would be used for reclamation purposes.

In areas that would be reclaimed, slopes would be re-contoured to pre-construction topographical contours, if possible. Additionally, stockpiled topsoil would be redistributed and the surface would be ripped and seeded.

The proposed access reroute would be maintained in accordance with the BLM Gold Book Standards, BLM 9113-1 (Roads Design Handbook), and BLM 9113-2 (Roads Inventory and Condition Assessment Guidance and Instructions Handbook).

During the February 13th, 2015 pre-disturbance onsite meeting, it was determined that the Sagebrush Community best represents the proposed project area. BROG would use the BLM-approved seed mix appropriate for the project area for reclamation.

Final Reclamation and Abandonment

Once the access road was no longer necessary and would not be expected to be utilized in the foreseeable future, they would be abandoned. Relinquishment of the ROW Grant would be carried out under current BLM regulations.

Final reclamation would occur within any portion of the project area (such as locations of aboveground structures) that would be disturbed to bare soil during the abandonment phase of the proposed project, if these areas meet the acreage requirements for reclamation. These acreage requirements are summarized below:

- If final abandonment activities would disturb less than or equal to 0.1 acre to bare soil, the area(s) would be expected to revegetate naturally (no reclamation or monitoring activities will be required).
- If final abandonment activities would disturb more than 0.1 acre to bare soil, final abandonment reclamation activities would be the same as described for interim reclamation.

2.2.3. Proposed Surface Disturbance

Surface disturbance associated with the proposed project area would be approximately 1.13 acres, total. Of this, approximately 0.6 acres would be considered new surface disturbance on public lands managed by the BLM-FFO. All new surface disturbances associated with the access road would be reclaimed.

Surface disturbance associated with the proposed project is described in detail in Table 1, below. Depictions of the surface-disturbing activity locations are provided in Appendices A (Maps) and B (Plats).

Table 1. Proposed Project Surface Impacts

Surface Disturbance Description (Approximate Stationing)	Existing/Previously Permitted Surface Disturbance	New Surface Disturbance
0+00 to 7+49.91 (previously disturbed sagebrush)	750’ long x 30’ wide (0.517 acre)	-
7+49.91 to 7+63.91 (cross road)	14’ long x 30’ wide (0.010 acre)	-
7+63.91 to 16+28.06 (cross-country access road construction)	-	864’ long x 30’ wide (0.595 acre)
Total Project Surface Disturbance	**0.53 acres**	**0.60 acres**

2.3. Alternatives Considered but Eliminated from Detailed Study

No reasonable alternatives to the proposed action have been developed that would result in significantly fewer impacts or any clear advantages over the proposed action. The proposed access road follows the most economic and direct route based on the location of existing BROG infrastructure, existing disturbance, and surface resources.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Alternative A: No Action

Under the No Action alternative, current land and resource issues within the proposed project area would continue; there would be no new impacts from oil and gas development. The No Action alternative will serve as the baseline for comparing the environmental impacts of the analyzed alternatives, and will not be further evaluated in this EA (BLM 2008a).

Alternative B: Proposed Action

Under the Proposed Action, the San Juan 28-6 Unit 167N Proposed Access Road Relocation project would continue as proposed, all proposed actions outlined in Section 2.2 Alternative B – Proposed Action, would occur. The potential affected environment and environmental consequences for the Proposed Action are described in the following sections.

3.1. Air Resources

3.1.1. Affected Environment

The proposed project is located in Rio Arriba County, New Mexico. Additional general information on air quality in the area is contained in Chapter 3 of the Farmington PRMP/FEIS. In addition, new information about greenhouse gases (GHGs) and their effects on national and global climate conditions has emerged since this document was prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO_2) methane (CH_4); nitrous oxide (N_2O); water vapor; and several trace gases on global climate. Through complex interactions on a global scale, GHG emissions may cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes, typically referred to as global warming.

Much of the information referenced in this section is incorporated from the Air Resources Technical Report for BLM Oil and Gas Development in New Mexico, Kansas, Oklahoma, and Texas (herein referred to as Air Resources Technical Report) (BLM 2014a). This document summarizes the technical information related to air resources and climate change associated with oil and gas development and the methodology and assumptions used for analysis.

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including six nationally regulated ambient air pollutants (criteria pollutants). These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2) and lead (Pb). EPA has established National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. The NAAQS are protective of human health and the environment. EPA has approved New Mexico's State Implementation Plan and the state enforces state and federal air quality regulations on all public and private lands within the state, except for tribal lands and within Bernalillo County. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. EPA has proposed or completed actions recently to implement Clean Air Act requirements for greenhouse gas emissions. Climate has the potential to influence renewable and non-renewable resource management.

Air Quality

The Air Resources Technical Report describes the types of data used for description of the existing conditions of criteria pollutants, how the criteria pollutants are related to the activities involved in oil and gas development, and provides a table of current National and state standards. EPA's Green Book web page (USEPA 2013b) reports that all counties in the Farmington Field Office area are in attainment of all National Ambient Air Quality Standards (NAAQS) as defined by the Clean Air Act. The area is also in attainment of all state air quality standards (NMAAQS). The current status of criteria pollutant levels in the Farmington Field Office are described below.

"Design Values" are the concentrations of air pollution at a specific monitoring site that can be compared to the NAAQS. The 2012 design values for criteria pollutants are listed below in Table 2. There is no monitoring for CO and lead in San Juan County, but because the county is relatively rural, it is likely that these pollutants are not elevated. PM10 design concentrations are not available for San Juan County.

Table 2. Criteria Pollutant Monitored Design Values in San Juan County

Pollutant	2012 Design Concentration	Averaging Time	NAAQS	NMAAQS
O_3	0.071 ppm	8-hour	0.075 ppm[1]	
NO_2	13 ppb	Annual	53 ppb[2]	50 ppb
NO_2	38 ppb	1-hour	100 ppb[3]	
$PM_{2.5}$	4.7 µg/m^3	Annual	12 µg/m^3[3,4]	60 µg/m^3[3,6]
$PM_{2.5}$	14 µg/m^3	24 hour	35 µg/m^3[3,3]	150 µg/m^3[3,6]
SO_2	19 ppb	1-hour	75 ppb[5]	

Source: U.S. Environmental Protection Agency, 2014
[1] Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
[2] Not to be exceeded during the year
[3] 98th percentile, averaged over 3 years
[4] Annual mean, averaged over 3 years
[5] 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
[6] The NMAAQS is for Total Suspended Particulate (TSP)

In 2005, the EPA estimates that there was less than 0.01 ton per square mile of lead emitted in FFO counties, which is less than 2 tons total (USEPA 2012). Lead emissions are not an issue in this area, and will not be discussed further.

Air quality in a given region can be measured by its Air Quality Index value. The air quality index (AQI) is reported according to a 500-point scale for each of the major criteria air pollutants, with the worst denominator determining the ranking. For example, if an area has a CO value of 132 on a given day and all other pollutants are below 50, the AQI for that day would be 132. The AQI scale breaks down into six categories: good (AQI<50), moderate (50-100), unhealthy for sensitive groups (100-150), unhealthy (>150), very unhealthy and hazardous. The AQI is a national index, the air quality rating and the associated level of health concern is the same everywhere in the country. The AQI is an important indicator for populations sensitive to air quality changes.

Mean AQI values for San Juan County were generally in the good range (AQI<50) in 2013 with 80% of the days in that range. The median AQI in 2013 was 42, which indicates "good" air quality. The maximum AQI in 2013 was 156, which is "unhealthy."

Although the AQI in the region has reached the level considered unhealthy for sensitive groups on several days almost every year in the last decade, there are no patterns or trends to the occurrences (Table 3). On 8 days in the past decade, air quality has reached the level of "unhealthy" and on two days, air quality reached the level of "very unhealthy". In 2009 and 2012, there were no days that were "unhealthy for sensitive groups" or worse in air quality. In 2005 and 2013, there was one day that was "unhealthy" during each year. In 2010, there were five "unhealthy" days and two "very unhealthy days."

Table 3. Number of Days classified as "unhealthy for sensitive groups" (AQI 101-150) or worse

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Days	3	6	9	18	1	0	12	9	0	1
Source: U.S. Environmental Protection Agency, 2013a										

Hazardous Air Pollutants

The Air Resources Technical Report discusses the relevance of hazardous air pollutants (HAPs) to oil and gas development and the particular HAPs that are regulated in relation to these activities (BLM 2014a). The EPA conducts a periodic National Air Toxics Assessment (NATA) that quantifies HAP emissions by county in the U.S. The purpose of the NATA is to identify areas where HAP emissions result in high health risks and further emissions reduction strategies are necessary. A review of the results of the 2005 NATA shows that cancer, neurological and respiratory risks in San Juan County are generally lower than statewide and national levels as well as those for Bernalillo County where urban sources are concentrated in the Albuquerque area (USEPA 2012).

Climate

The planning area is located in a semiarid climate regime typified by dry windy conditions and limited rainfall. Summer maximum temperatures are generally in the 80s or 90s (Fahrenheit) and winter minimum temperatures are generally in the teens to 20s. Temperatures occasionally reach above 100 degrees Fahrenheit in June and July and have dipped below zero in December and January. Precipitation is divided between summer thunderstorms associated with the Southwest Monsoon and winter snowfall as Pacific weather systems drop south into New Mexico. Table shows climate normals for the 30-year period from 1981 to 2010 for the Farmington, New Mexico, area.

Table 4. Climate Normals for the Farmington Area, 1981-2010

Month	Average Temperature (^{O}F [(1)])	Average Maximum Temperature (^{O}F)	Average Minimum Temperature (^{O}F)	Average Precipitation (inches)
January	30.5	40.8	20.3	0.53
February	35.8	46.8	24.8	0.59
March	43.2	56.1	30.3	0.78
April	50.4	64.7	36.2	0.65
May	60.4	74.8	46.1	0.54
June	69.8	85.1	54.5	0.21
July	75.4	89.6	61.2	0.90
August	73.2	86.5	59.8	1.26
September	65.4	79.1	51.7	1.04
October	53.3	66.4	40.1	0.91
November	40.5	52.2	28.8	0.68
December	31.0	41.2	20.7	0.50

Source: data collected at New Mexico State Agricultural Science Center - Farmington
[(1)] degrees Fahrenheit

Very recently, pioneering research using space-borne (satellite and aircraft) determination of methane concentrations have indicated anomalously large methane concentrations may occur in the Four Corners region (Kort, Frankenberg, Costigan, Lindenmaier, Dubey, & Wunch, 2014). A subsequent study (Schneising, Burrows, Dickerson, Buchwitz, Reuter, & Bovensmann, 2014) indicated larger anomalies over other oil and gas basins in the U.S. Methane is 34 times more potent at trapping greenhouse gas emissions than CO_2 when considering a time horizon of 100 years (Intergovernmental Panel on Climate Change 2013). While space-borne studies can determine the pollutant concentration in a column of air, these studies cannot pinpoint the specific sources of air pollution. Further study is required to determine

the sources responsible for methane concentrations in the Four Corners region; however, it is known that a significant amount of methane is emitted during oil and gas well completion (Howarth, Santoro, & A.Ingraffea, 2011). Methane is also emitted from process equipment, such as pneumatic controllers and liquids unloading, at oil and gas production sites. Ground-based, direct source monitoring of pneumatic controllers conducted by the Center for Energy and Environmental Resources (Allen, et al., 2014) show that methane emissions from controllers exhibit a wide range of emissions and a small subset of pneumatic controllers emitted more methane than most. Emissions measured in the study varied significantly by region of the U.S., the application of the controller and whether the controller was continuous or intermittently venting. The Center for Energy and Environmental Resources had similar findings of variability of methane emissions from liquid unloading (Allen, et al., 2014a). In October 2012, USEPA promulgated air quality regulations controlling VOC emissions at gas wells. These rules require air pollution mitigation measures that reduce the emissions of volatile organic compounds. These same mitigation measures have a co-benefit of reducing methane emissions. Future ground-based and space-borne studies planned in the Four Corners region with emerging pollutant measurement technology may help to pinpoint significant, specific sources of methane emissions in the region.

The Air Resources Technical Report summarizes information about greenhouse gas emissions from oil and gas development and their effects on national and global climate conditions. While it is difficult to determine the spatial and temporal variability and change of climatic conditions; what is known is that increasing concentrations of GHGs are likely to accelerate the rate of climate change.

3.1.2. Direct and Indirect Impacts

Air quality would temporary be directly impacted with pollution from exhaust emissions and dust. Air pollution from the motorized equipment and dust dissemination would discontinue at the completion of the project. Other factors that currently affect air quality in the area include dust from livestock herding activities, dust from recreational use, dust from use of roads for vehicular traffic, and emissions from oil and gas production activities. Impacts to air quality attributable to this project would be temporary and minor.

Cumulative Impacts

The primary activities that contribute to levels of air pollutant and GHG emissions in the Four Corners area are electricity generation stations, fossil fuel industries, and vehicle travel. The Air Quality Technical Report includes a description of the varied sources of national and regional emissions that are incorporated here to represent the past, present, and reasonably foreseeable impacts to air resources (BLM 2014a). It includes a summary of emissions on the national and regional scale by industry source. Sources that are considered to have notable contributions to air quality impacts and GHG emissions include electrical generating units, fossil fuel production (nationally and regionally), and transportation.

The proposed project could result in a very small direct and indirect increase in several criteria pollutants, HAPs, and GHGs as a result the short term construction activity. The very small increase in emissions from short term construction activity would not be expected to result in exceeding the NAAQS for any criteria pollutants in the analysis area.

The very small increase in GHG emissions that could result from implementing the proposed alternative would not produce climate change impacts that differ from the No Action Alternative. This is because climate change is a global process that is impacted by the sum total of GHGs in the Earth's atmosphere. The incremental contribution to global GHGs from the action alternatives cannot be translated into effects on climate change globally or in the area of this site-specific action. It is currently not feasible to predict with certainty the net impacts from the action alternatives on global or regional climate.

The Air Resources Technical Report (BLM 2014a) discusses the relationship of past, present, and future predicted emissions to climate change and the limitations in predicting local and regional impacts related to emissions. It is currently not feasible to know with certainty the net impacts from particular emissions associated with activities on public lands.

3.2. Cultural Resources

3.2.1. Affected Environment

The proposed project is located within the archaeologically rich San Juan Basin of northwest New Mexico. In general, the history of the San Juan Basin can be divided into five major periods: PaleoIndian (ca. 10000 B.C. to 5500 B.C.), Archaic (ca. 5500 B.C. to A.D. 400), Basketmaker II-III and Pueblo I-IV periods (aka Anasazi; A.D. 1-1540), and the historic (A.D. 1540 to present), which includes Native American as well as later Hispanic and Euro-American settlers. Detailed descriptions of these various periods are provided in the Bureau of Land Management Farmington Field Office Final Environmental Impact Statement (2003a) and will not be reiterated here. Additional information can also be found in an associated documented, Cultural Resources Technical Report (Science Applications International Corporation 2002).

BLM Manual 8100, *The Foundations for Managing Cultural Resources* (2004) defines a cultural resource as "*a definite location of human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structures, or places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. (cf. "traditional cultural property"). Cultural resources are concrete, material places and things that are located, classified, ranked, and managed through the system of identifying, protecting, and utilizing for public benefit described in this Manual series. They may be but are not necessarily eligible for the National Register (a.k.a. "historic property")*." Cultural sites vary considerably, and can include but are not limited to simple artifact scatters, domiciles of various types with a myriad of associated features, rock art and inscriptions, ceremonial/religious features, and roads and trails. Traditional Cultural Properties (TCPs; Parker and King 1998) are a separate class of cultural resources and are places that have cultural values that transcend, for instance, the values of scientific importance that are normally ascribed to cultural resources such as archaeological sites, and may or may not coincide with archaeological sites.

The National Register of Historic Places (NRHP; 36 CFR Part 60) is the basic benchmark by which the significance of cultural resources are evaluated by a federal agency when considering what effects its actions may have on those resources. To summarize, to be considered eligible for the NRHP a cultural resource must meet one or more of the following criteria: a) are associated with events that have significantly contributed to the broad patterns of our history; or b) are associated with the lives of persons significant in our past; or c) embody distinctive characteristics of the type, period, or method of construction, or represents the work of a master, or possesses high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; or d) have yielded, or may be likely to yield, information that is important in a pre-history or history. The resource, as applicable, must possess one or more of the following aspects of integrity; location, design, setting, materials, workmanship, feeling, and association.

Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR Part 800) requires federal agencies to consider what effect their licensing, permitting, funding or otherwise authorizing an undertaking, such as an APD or R-O-W, may have on properties eligible for the National Register. Pursuant to 36 CFR 800.16 (i), "*Effect means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register*." Effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative. Area of Potential Effect (APE) means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The APE is typically defined as areas to be directly disturbed and areas in immediate close proximity. Cultural resources are identified through a combination of literature review and pedestrian survey consistent with guidelines set forth in the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities* (BLM 2005).

Cultural resources within the entire APE for the Proposed Action were identified by a literature review and an archaeological BLM Class III level (100%) pedestrian survey by WCRM in 2014 and amended in 2015. The archaeological reports, [WCRM(F)1347 (Morgan 2014); BLM 2008(IV)040.1F and WCRM(F)1378 (Morgan 2015); BLM 2008(IV)040.2F], were prepared and submitted to the BLM in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities* (BLM 2005). Identification of TCP's were limited to reviewing existing published and unpublished literature (e.g. Van Valkenburgh 1941, 1974; Brugge 1993; Kelly et al 2006), and the site-specific Class III survey report prepared for the Proposed Action. In addition, the BLM's cultural resources program was contacted for information regarding the presence of TCPs identified through ongoing BLM tribal consultation efforts.

During the original Class III survey in October 2014, a total of three new archaeological sites were found and recorded. Of these three sites, two were recommended as eligible for the NRHP based on Criterion "d". The other site was determined to be not eligible for the NRHP. During the February 2015 Class III survey no new sites were recorded, however the two eligible sites were updated. There are no known TCPs within the APE.

3.2.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Cultural resources tend to degrade over time from natural forces; however, many survive for hundreds or thousands of years. Any land-disturbing activity can disturb, damage, or uncover cultural resources. Direct impacts normally include alterations to the physical integrity of a historic property. If a historic property is significant for other than its information potential, direct impacts may also include the introduction of audible, atmospheric, or visual elements that are out of character for the property. A potential indirect impact from the proposed action, particularly in undeveloped areas is the increase in human activity or access to the area with an increased potential of unauthorized damage to historic properties.

Historic properties are being avoided with the implementation of design features such as but not limited to reduction of construction areas, temporary barriers, and site monitoring. These design features are detailed in the Cultural Resource Record of Review, attached to the COA in the ROW. The proposed action is not known to physically threaten any TCP's, prevent access to sacred sites, prevent the possession of sacred objects, or interfere or otherwise hinder the performance of traditional ceremonies/rituals. The proposed action will have no direct or indirect impact on historic properties (no historic properties affected).

Cumulative Impacts

There will be no negative cumulative impact on known historic properties as they are being avoided by relocating the surface disturbing components of the proposed action away from the property. A positive cumulative effect is the additional scientific information yielded by the archaeological survey.

3.3. Upland Vegetation

3.3.1. Affected Environment

The northern portion of the analysis area is located within the United States Environmental Protection Agency (USEPA) designated Colorado Plateaus Level III ecoregion. The southern portion is located within the USEPA designated Arizona/New Mexico Plateau Level III ecoregion

The Colorado Plateaus ecoregion is located in Arizona, Colorado, and Utah, with a small portion in New Mexico. This ecoregion is approximately 32,581,700 acres (131,854 square kilometers), and the elevation ranges from 3,284 to 10,204 feet (1,001 to 3,110 meters). This ecoregion is characterized by rugged tableland topography, with large basins, ridges, spectacular canyons, and colorful geological formations.

The ecoregion is heavily visited for recreational purposes. The higher elevations support extensive piñon-juniper woodlands. Groundcover in these woodlands is sparse and consists of grama and other grasses, forbs, and shrubs, such as big sagebrush and alderleaf mountain-mahogany. Lower areas contain saltbush-greasewood shrublands, typical of hotter, drier areas. Land uses include livestock, some irrigated farming, recreation, mining, and gas and oil production (Wiken et al. 2011).

The Arizona/New Mexico Plateau occurs primarily in Arizona, Colorado, and New Mexico, with a small portion in Nevada. This ecoregion is approximately 45,870,500 acres (185,632 square kilometers [km^2]), and the elevation ranges from 2,165 to 11,949 feet (660 to 3,642 meters) AMSL. The ecoregion's landscapes include low mountains, hills, mesas, foothills, irregular plains, alkaline basins, some sand dunes, and wetlands. This ecoregion is a large transitional region between the semiarid grasslands to the east, the drier shrublands and woodlands to the north, and the lower, hotter, less vegetated areas to the west and south. Vegetation communities include shrublands with big sagebrush, rabbitbrush, winterfat, shadscale saltbush, and greasewood; and grasslands of blue grama, western wheatgrass, green needlegrass, and needle-and-thread grass. Higher elevations may support piñon pine and juniper woodlands. The ecoregion includes the urban areas of Santa Fe and Albuquerque. Important land uses include irrigated farming, recreation, rangeland, wildlife habitat, and oil and natural gas production (Wiken et al. 2011).

The general region surrounding the proposed project area is characterized by densely vegetated sagebrush shrubland valleys and wooded mesas. The eastern portion of the PPA was previously mowed sagebrush and therefore is considered previous disturbance. The proposed project area lies within sagebrush shrubland community composed primarily of greasewood (*Sarcobatus vermiculatus*), four-winged saltbush (Atriplex canescens), big sagebrush (*Seriphidium tridentatum*), rabbitbrush (*Chrysothamnus* sp.), blue grama (*Bouteloua gracilis*), broom snakeweed (*Gutierrezia sarothrae*), galleta (*Pleuraphis jamesii*) and to a lesser degree alkali sacaton (*Sporobolus airoides*), Indian ricegrass (*Achnatherum hymenoides*), New Mexican prickly pear cactus (*Opuntia phaeacantha*), and spiny-star nipple cactus (*Coryphantha vivipara* var. *radiosa*).

3.3.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Potential impacts to shrubland from the development of the proposed project would include direct impacts from habitat removal as well as a wide variety of indirect impacts. Impacts would be incurred during initial site preparation and would continue throughout the operational life of the project, typically extending over a period of several decades. Plant communities and habitats affected by direct or indirect impacts from project activities could incur short- or long-term changes in species composition, abundance, and distribution. Some impacts may also continue after the decommissioning of the project. Land areas available for project development support a wide variety of plant communities and habitats.

In some areas, restoration may potentially include species that are not locally native or plant communities different from local native communities. Although the replanting of disturbed soils may successfully establish vegetation in some locations (i.e., with a biomass and species richness similar to those of local native communities), the resulting plant community may be quite different from native communities in terms of species composition and representation of particular vegetation types, such as shrubs. The community composition of replanted areas would likely be greatly influenced by the species that are initially seeded, and colonization by species from nearby native communities may be slow. In addition, the planting of non-native species may result in the introduction of those species into nearby natural areas. The establishment of mature native plant communities may require decades, and some community types may never fully recover from disturbance. Successful reestablishment of some habitat types, such as some shrubland communities, may be difficult and may require considerably greater periods of time. Restoration of plant communities in areas with arid climates (e.g., averaging less than 9 inches (20 centimeters) of annual precipitation) would be especially difficult (Monsen et al. 2004).

Indirect impacts on upland vegetation on or off the project site could result from land clearing and exposed soil; soil compaction; and changes in topography, surface drainage, and infiltration characteristics. Indirect impacts could include the degradation of habitat from construction activities occurring in adjacent areas.

In addition to habitat removal, the operation of heavy equipment within the action area may result in injury or destruction of existing vegetation and biological (microbiological) soil crusts and the compaction and disturbance of soils (Belnap and Herrick 2006). Soil aeration, infiltration rates, and moisture content could be impacted. Biological soil crusts occur in deserts and other sparsely vegetated arid habitats and are important for soil stability, nutrient cycling, and water infiltration; their disturbance may affect the development of plant communities (Fleischner 1994; Belnap et al. 2001; Gelbard and Belnap 2003). All these factors could affect the rate or success of vegetation reestablishment.

Cumulative Impacts

The proposed action would impact up to approximately 0.6 acres of sagebrush shrubland vegetation. Following construction a majority of the affected environment would be reseeded with a BLM-FFO designated, area appropriate seed mixture. Long-term vegetative reestablishment could take several years, and would be dependent on seasonal variation in rainfall and snowmelt, and overall climatic conditions. Changes in vegetation composition and the potential for invasive, non-native species to establish would also cumulatively impact vegetation in the project area.

The spatial analysis area is the proposed project area and immediately adjacent lands. Within the spatial analysis area, the following vegetative disturbances have occurred or are anticipated to occur in the reasonably foreseeable future:

- San Juan 28-6 Unit 167N well site
- San Juan 28-6 Unit 167M well site
- San Juan 28-6 Unit 40 pipeline
- Maintained resource road
- Active wildlife and livestock grazing occurs in the area. The proposed action is located within the Delgadito Mesa Allotment Number 5107 and Munoz Canyon Allotment Number 5109, both managed by the BLM-FFO.

Indirectly, fugitive dust or deposition associated with existing roads, well pads, utility corridors, and public use in the immediate area could impact the vegetation within the analysis area, and could continue to do so throughout the life of the proposed project. Aside from those discussed above, no additional impacts to vegetation are expected within the analysis area for the reasonably foreseeable future.

3.4. Special Status Species

3.4.1. Affected Environment

The BLM manages certain species which are not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. BLM SSS include BLM Sensitive Species and BLM-FFO Special Management Species (SMS).

In accordance with BLM Manual 6840, the New Mexico BLM State Directors have developed a list of BLM Sensitive Species for the State of New Mexico (BLM 2011a, BLM 2011b, BLM 2011c, BLM 2012a) and the BLM-FFO has prepared a list of BLM-FFO SMS to focus species management efforts toward maintaining habitats under a multiple-use mandate (BLM 2008b, BLM 2008c). BLM-FFO SMS include some BLM Sensitive Species and other species for which the BLM-FFO has determined special

management is appropriate (BLM 2008b). The authority for this policy and guidance is established by the ESA; Title II of the Sikes Act, as amended (16 USC 670a-670o, 74 Stat. 1052); FLPMA; and Department of Interior Manual 235.1.1A.

Table 5 provides an evaluation of the potential for BLM Special Status Species to occur in the analysis area. Potential presence determination is based on evaluation of the proposed action area habitat and the known habitat requirements of the species. Species are listed by the BLM New Mexico State Office as Sensitive (SEN) and/or as Special Management Species (SMS) by the BLM-FFO.

Table 5. BLM Special Status Species

Species Name	Conservation Status		Habitat Associations	Potential to Occur in Analysis Area
	BLM	State of NM		
Birds				
American peregrine falcon (*Falco peregrinus anatum*)	SMS	NM-T	Open country near lakes or rivers with rocky cliffs and canyons. Tall city bridges and buildings also inhabited.	Suitable foraging habitat documented within project area.
Ferruginous hawk (*Buteo regalis*)	SMS		Grasslands and semi-desert shrub; occasionally piñon-juniper edge habitat. Nest on rock spires in NW New Mexico.	Suitable foraging habitat documented within project area.
Golden Eagle (*Aquila chrysaetos*)	SMS		In the West, mostly open habitats in mountainous, canyon terrain. Nests primarily on cliffs and trees.	Suitable foraging habitat documented within project area. A single individual was seen flying overhead during the on-site inspection.
Prairie falcon (*Falco mexicanus*)	SMS		Arid, open country, grasslands or desert scrub, rangeland; nests on cliff ledges, trees, power structures.	Suitable foraging habitat documented within project area.
Flowering Plants				
Brack's hardwall cactus (*Sclerocactus cloveriae* ssp. *brackii*)	SEN SMS	NM-E	Sandy clay slopes of the Nacimiento Formation in sparse semi desert, piñon-juniper grasslands and open arid areas of badland habitat (5,000-6,400 ft).	No suitable habitat was documented within the project area.
Aztec gilia (*Aliciella formosa*)	SEN SMS	NM-E	Arid and sparsely vegetated Badland /Salt desert scrub communities in soils of the Nacimiento Formation (5,000-6,400 ft).	No suitable habitat was documented within the project area.

3.4.2. Impacts from the Proposed Action

Direct and Indirect Impacts

The proposed project would result in the direct removal of approximately 0.6 acres of Sagebrush and Scrubland Community. The proposed project area would be converted to a reseed community following interim reclamation. The impacts to the vegetation communities are described in detail in Section 3.3 (Upland Vegetation).

Discussed in Section 2.2.2 (Description of Proposed Project – Protection of Flora and Fauna, Including SSS and Livestock), under the Migratory Bird Treaty Act – BLM/FFO Interim Management Policy (IM No. NM-F00-2010-001), timing limitations on use authorizations will be enforced for projects during the nesting period of May 15 to July 31 to avoid or minimize the possibility of the unintentional take of migratory birds.

There is available, similar habitat in the surrounding area that special status wildlife species could utilize. However, the clearing of vegetation and ground disturbing activities would remove potential habitat. The transformation of the proposed project area to reseed communities would remove potential habitat for peregrine falcon, ferruginous hawk, golden eagle and prairie falcon.

If interim reclamation is successful, native vegetation communities would become re-established within the proposed project area. However, as discussed in Section 3.3 (Upland Vegetation), the re-establishment of a mature, native plant community could require decades, and it is possible that the plant community could never fully recover from disturbance (BLM 2003a, 4-18).

Audial and visual disturbances associated with the proposed project could temporarily deter SSS from utilizing the proposed project area and immediately adjacent lands.

Cumulative Impacts

The FFO would continue to manage non-federally listed species according to BLM policies and guidelines, with the goal of contributing to the conservation of these species to reduce the potential for being listed under the ESA of 1973, as amended (BLM 2003a, 4-111). For reasonably foreseeable actions on federal lands, direct impacts to SSS would be avoided through the BLM's siting criteria. These effects would be related to availability of undisturbed habitat in the area and the amount of disturbance that would occur within the area. The PRMP/FEIS determined that cumulatively up to 5.5 percent (128,000 acres) of vegetation in the planning area could be impacted by oil and gas development (BLM 2003a, page 4-125). Other reasonably foreseeable actions within the planning area that could impact SSS would include livestock grazing, agriculture, commercial and residential development, mining, wildfire, and vegetation management.

3.5. Soils

3.5.1. Affected Environment

The San Juan Basin is bordered by the Defiance Uplift and Chuska Mountains to the west, San Juan Dome to the north, Chaco Slope and Zuni Uplift to the south and the Nacimiento Uplift to the east. In total, the San Juan Basin covers a surface of approximately 4,600 square miles. The soils in the San Juan Basin were formed primarily from two kinds of parent material: alluvial sediment and sedimentary rock. The alluvial sediment is material that was deposited in river valleys and on mesas, plateaus, and abandoned river terraces. The material has been mixed and sorted in transport and has a wide range of mineralogy and particle size. Sedimentary parent material consists mainly of sandstone and shale bedrock. These shale and resistant sandstone beds form prominent structural benches, buttes, and mesas bounded by cliffs.

According to the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) Web Soil Survey, soils found within the analysis area are comprised of Sparank-San Mateo silt loams, saline, sodic, 0 to 3 percent slopes and Rock outcrop-Vessilla-Menefee complex, 15 to 45 percent slopes.

The Sparank series consists of very deep, well drained, very slowly permeable soils that formed in alluvium, fan alluvium, and stream alluvium derived from shale and sandstone. Sparank soils are on alluvial fans on valley sides and stream terraces, swales, and flood plains on valley floors. Slopes range from 0 to 4 percent. Well drained; low to high runoff; very slow permeability. Water erosion potential is moderate. The San Mateo series consists of very deep, well drained, moderately slowly permeable soils that formed in alluvium, fan alluvium and stream alluvium from mixed sources on alluvial fans on valley sides and flood plains on valley floors. Slopes are 0 to 5 percent. Water erosion potential is slight.

The Rock Outcrop consists of barren or nearly barren areas of exposed bedrock on ridges, ledges, and escarpments. Vessilla soils, found on breaks, is shallow and well drained. Permeability is moderately rapid with a very low available water capacity. Runoff is rapid with the potential for water erosion severe. The hazard of soil blowing is severe. Menefee soil, found on breaks, is shallow and well drained.

Permeability is slow with a very low available water capacity. Runoff tends to be rapid with the potential for water erosion severe. The potential for wind erosion is also severe.

3.5.2. Impacts from the Proposed Action

Direct and Indirect Impacts

The proposed action would result in the removal of approximately 0.6 acres of established vegetation in Sagebrush and Scrubland community to bare mineral soils. Topsoil, which would be stripped from the surface of the access road during the construction phase of the proposed project, would be stored and protected until it is redistributed during reclamation. The topsoil would be protected using wattles or other BMPs so that erosion is minimized. Approximately 0.6 acres would remain as bare, compacted surface for the life of the proposed project.

Construction activities within the proposed project area would result in the mixing, displacement, and compaction of soils within the proposed project area. Soils within the proposed project area are classified as having high to very highly susceptible to water and wind erosion (NRCS 2008). As discussed in Section 2.2.2 (Description of Proposed Project - Protection of Air Resources), BMPs for dust suppression would be utilized within the proposed project area to reduce fugitive dust during the construction phase of the proposed project. The removal of vegetation within the proposed project area could result in increased soil erosion during construction activities. The degree of erosion would be dependent upon precipitation and wind. Following construction, the compaction of soils, reclamation of portions of the proposed project area, and implementation of erosion-control measures would limit soil impacts due to erosion. BROG will follow the Surface Reclamation Plan (Appendix C), as required by the FFO Bare Soil Reclamation Procedure. The reclamation plan outlines the reclamation, revegetation, and monitoring practices that will be followed to ensure optimal revegetation success. Ultimately the revegetation success will minimize the amount of soil erosion caused by the proposed action.

Cumulative Impacts

The spatial analysis area is the proposed project area and immediately adjacent lands. Within the spatial analysis area, ground-disturbing activities have or are anticipated to occur in the reasonably foreseeable future; these disturbances are described in Section 3.3 (Upland Vegetation). In addition, reasonably foreseeable development within the Carrizo watershed may include an estimated additional 1,046 oil and gas wells and related facilities, and 85 miles of new roads. The primary impact on soils would result from an increase in the amount of surface disturbance due to increased oil and gas development activity and other earthmoving activities in the Carrizo sub-watershed of the spatial analysis area. The 1628 foot access road would only add 1.13 acres of disturbance within the Corizzo watershed. Other vegetation damaging practices, such as OHV use, livestock grazing, and vegetation management on non-public lands, could contribute to increased soil erosion.

3.6. Noxious Weeds and Invasive Species

3.6.1. Affected Environment

Management of invasive and non-native plant species is mandated under several pieces of legislation, including the Lacey Act, as amended (16 USC 3371-3378); the Federal Noxious Weed Act of 1974, as amended (7 USC 2801 et seq.); the New Mexico Noxious Weed Management Act of 1998; and EO 13112 regarding Invasive Species. Under EO 13112, Federal agencies are ordered not to authorize or carry out actions that would cause or promote the introduction of invasive species.

In the San Juan Basin, invasive plants are frequently found in areas that have been disturbed by surface activities. A mission of the BLM-FFO is to detect new invasive plant species populations, prevent the spread of these new populations, manage existing populations, and eradicate invasive populations. This is to be accomplished in a timely manner, using the safest environmental methods available. For all actions on BLM-FFO lands that involve surface disturbance or reclamation, reasonable steps are required

to prevent the introduction or spread of invasive plants (BLM 2003a, 3-34). BROG will establish a noxious weed plan for monitoring and treatment of any new infestations will be established for the length of this project.

The U.S. Department of Agriculture (USDA) has designated certain plants as federally listed noxious weeds (NRCS 2010). The New Mexico Department of Agriculture (NMDA) has designated certain plants as state-listed noxious weeds (NMDA 2010). A total of 212 invasive and poisonous weed species have been identified on BLM-FFO lands. The PRMP/FEIS lists the invasive, non-native plant species of concern in the BLM-FFO area (BLM 2003a, 3-34 – 3-35).

During the February 13th, 2015 onsite field inspection of the proposed project area, no USDA-listed noxious weeds (NRCS 2010), NMDA-listed noxious weeds (NMDA 2010), or BLM-FFO invasive or poisonous weed species (BLM 2003a, 3-34 – 3-35) were identified within the proposed project area.

3.6.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Noxious weeds and invasive species are generally tolerant of disturbed conditions, and disturbed soils at project sites could provide an opportunity for the introduction and establishment of noxious weeds and invasive species. Seeds or other propagules of noxious/invasive species could be transported to a project site from infested areas by heavy equipment or other vehicles that are used at the site. Noxious weeds and invasive species could also spread from established populations near a project site and colonize soils disturbed by project activities. In arid regions, such as the area in which the proposed project area is located, longer time periods are required for the re-establishment of plant communities; this could create an increased potential for the establishment and spread of noxious/invasive species. Noxious weeds and invasive species typically develop high population densities and tend to exclude most other plant species, thereby reducing species diversity and potentially resulting in long-term effects. The establishment of noxious/invasive species could greatly reduce the success of native plant community restoration efforts in project areas and create a source of future colonization and degradation of adjacent undisturbed areas.

The establishment of invasive species, particularly annual grasses, such as cheatgrass, which produce large amounts of easily ignitable fuel over large contiguous areas, could also alter fire regimes. This situation could result in an increase in the frequency and intensity of wildfires, and in some areas, such as in some desert-scrub communities, a fire regime could be created where none was present before. In plant communities that are not adapted to frequent or intense fires, native species, particularly shrubs and trees, could be adversely affected, and their populations could be greatly reduced, creating opportunities for greater increases in noxious/invasive species populations (Brooks and Pyke 2001). Increases in fire frequency or severity could thus result in a reduction of biodiversity and could promote the conversion of some habitats (such as forest, shrubland, or shrub-steppe) to other types, prolonging or preventing the development of mature native habitats (BLM and U.S. Department of Energy 2010).

Cumulative Impacts

The spatial analysis area is the proposed project area and immediately adjacent lands. Within the spatial analysis area, a large amount of ground-disturbing activities have or are anticipated to occur in the reasonably foreseeable future; these disturbances are described in Section 3.3 (Upland Vegetation). These ground disturbances could encourage the establishment of noxious weeds. In addition, ongoing activities, such as vehicles driving and livestock grazing, have contributed to the potential for weeds to be introduced to the spatial analysis area from other locations. The disturbances and activities have contributed to the establishment of Russian thistle (tumbleweed), and could contribute to the establishment and spread of other noxious weeds or invasive species. The proposed project would contribute to surface disturbance and ongoing activity, and thus contribute to the potential for the establishment and spread of noxious weeds or invasive plant species within the spatial analysis area.

3.7. Travel and Transportation

3.7.1. Affected Environment

A majority of the roads on BLM-FFO managed lands are unpaved and provide access to resources, predominantly oil and gas facilities. The existing transportation infrastructure located proximate to the proposed project area includes a number of dirt service roads including CR 492 and the San Juan 28-6 Unit 40 resource road. Initial access to the proposed project area would be gained by traveling on U.S. Highway 64 and CR 366. Both roads are highly traveled resource road used to access a number of natural gas well locations and other related facilities.

3.7.2. Impacts from the Proposed Action

Direct and Indirect Impacts

During all proposed project phases, vehicles would use developed roads and highways in the region. Traffic would include light vehicles (such as cars and pick-up trucks) and heavy vehicles (such as water trucks and large tractor-trailers hauling equipment).

During the construction phase of the proposed project, traffic would result on area roads; therefore, there would be an increased potential for traffic accidents. Following construction, traffic directly associated with the proposed action would decrease during interim reclamation.

Existing roads would be maintained in the same or better condition as existed prior to the commencement of proposed operations. The maintenance activities would continue until relinquishment of the ROW Grant and final reclamation of the proposed project area.

Cumulative Impacts

The spatial analysis area for transportation includes U.S. Highway 64 and the existing roads between U.S. Highway 64 and the proposed project area. Within the spatial analysis area, the existing roads are used to access existing oil and gas development, public lands, and residences. The proposed project would contribute to the cumulative transportation impacts within the spatial analysis area.

4. SUPPORTING INFORMATION

4.1. Tribes, Individuals, Organizations, or Agencies Consulted

Table 6 contains a list of tribes, individuals, organizations, and agencies invited to attend the on-site for the project.

Table 6. Tribes, Individuals, Organizations, and Agencies Invited to the On-Site

Name	Tribe, Organization, or Agency	Attended On-Site

The BLM fulfills its responsibilities under the National Historic Preservation Act (NHPA) through a number of agreements. The National Programmatic Agreement (NPA; 2012) between the BLM, Advisory Council on Historic Preservation (ACHP), and the National Council of State Historic Preservation Officers

(NCSHPO) allows the agency to fulfill its NHPA responsibilities according to the provisions of the NPA in lieu of 36 CFR 800.3 through 800.7 regulations. The NPA, which applies to all BLM activities below specified thresholds, provides among other things, regulatory relief in many instances from the requirement for case-by-case review by State Historic Preservation Officers (SHPOs) and the ACHP, in exchange for managers' maintenance of appropriate staff capability and observance of internal BLM standards as set out in the 8100 Manual series.

The New Mexico BLM has a two-party protocol with the New Mexico SHPO (2014) specifically encouraged by the NPA. This protocol details how the New Mexico BLM and SHPO will regulate their relationship and consult. Specifically, this document outlines among other things, how and when consultation will be conducted between the BLM, SHPO, Tribes, and the public. The protocol also outlines when case-by-case SHPO consultation is or is not required for specific undertakings and the procedures for evaluating the effects of common types of undertakings and resolving adverse effects to historic properties. These common types of undertakings regularly include the common actions undertaken in the BLM FFO.

4.2. List of Preparers

- Jim Copeland, Archaeologist – BLM-FFO
- Mike Flaniken, Realty Specialist – BLM-FFO
- John Kendall, Wildlife Management Biologist – BLM-FFO
- Marcella Martinez, Planning and Environmental Specialist – BLM-FFO
- Sarah McCloskey, Environmental Specialist – Adkins Consulting, Inc.
- Amanda Nisula, Planning and Environmental Specialist – BLM-FFO
- Jeff Tafoya, Rangeland Management Specialist – BLM-FFO
- Craig Willems, Environmental Protection Specialist – BLM-FFO
- Ty Swirin, Noxious Weed Coordinator – BLM-FFO
- Western Cultural Resource Management, Inc.
- Sheila Williams, District Botanist – BLM-FFO

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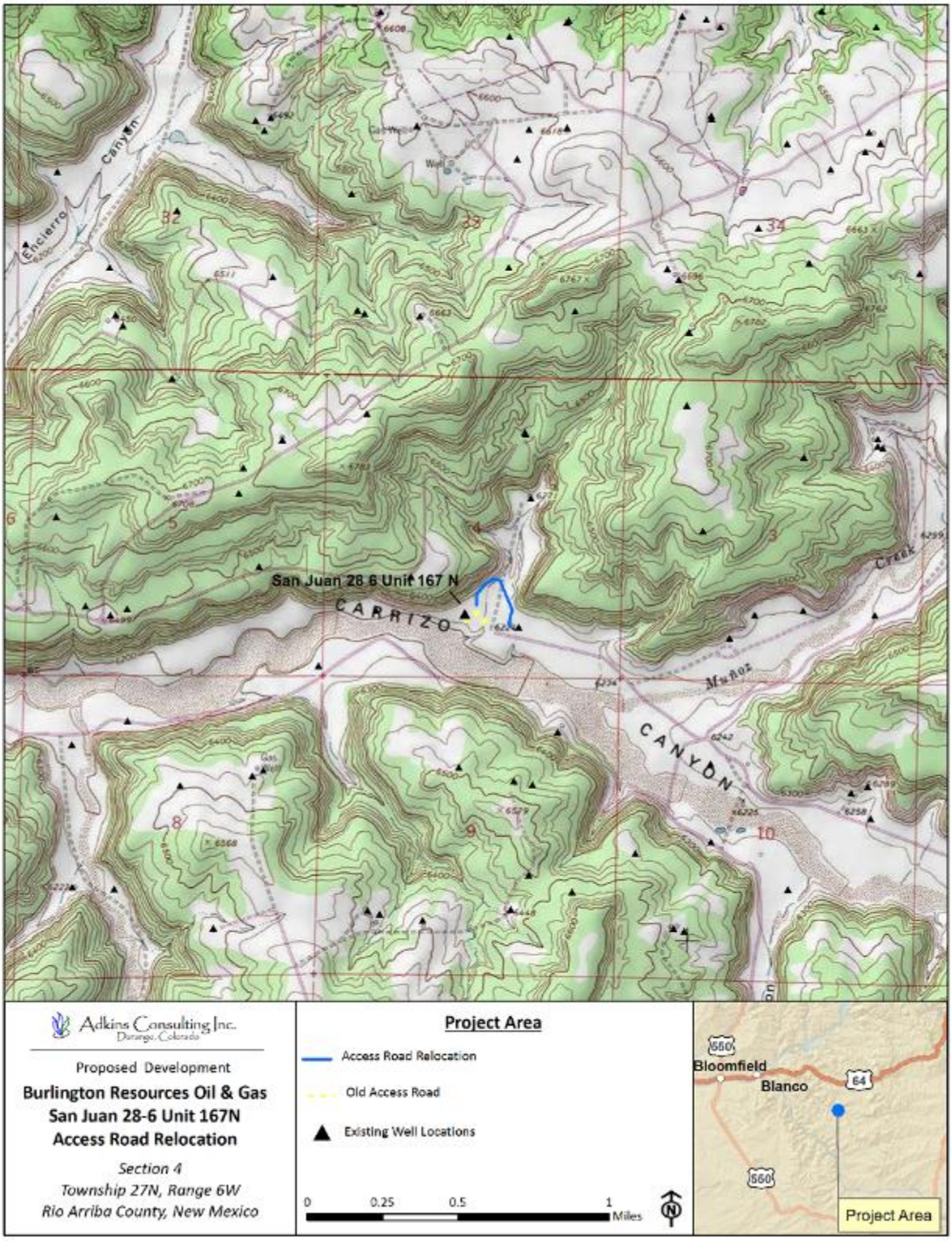
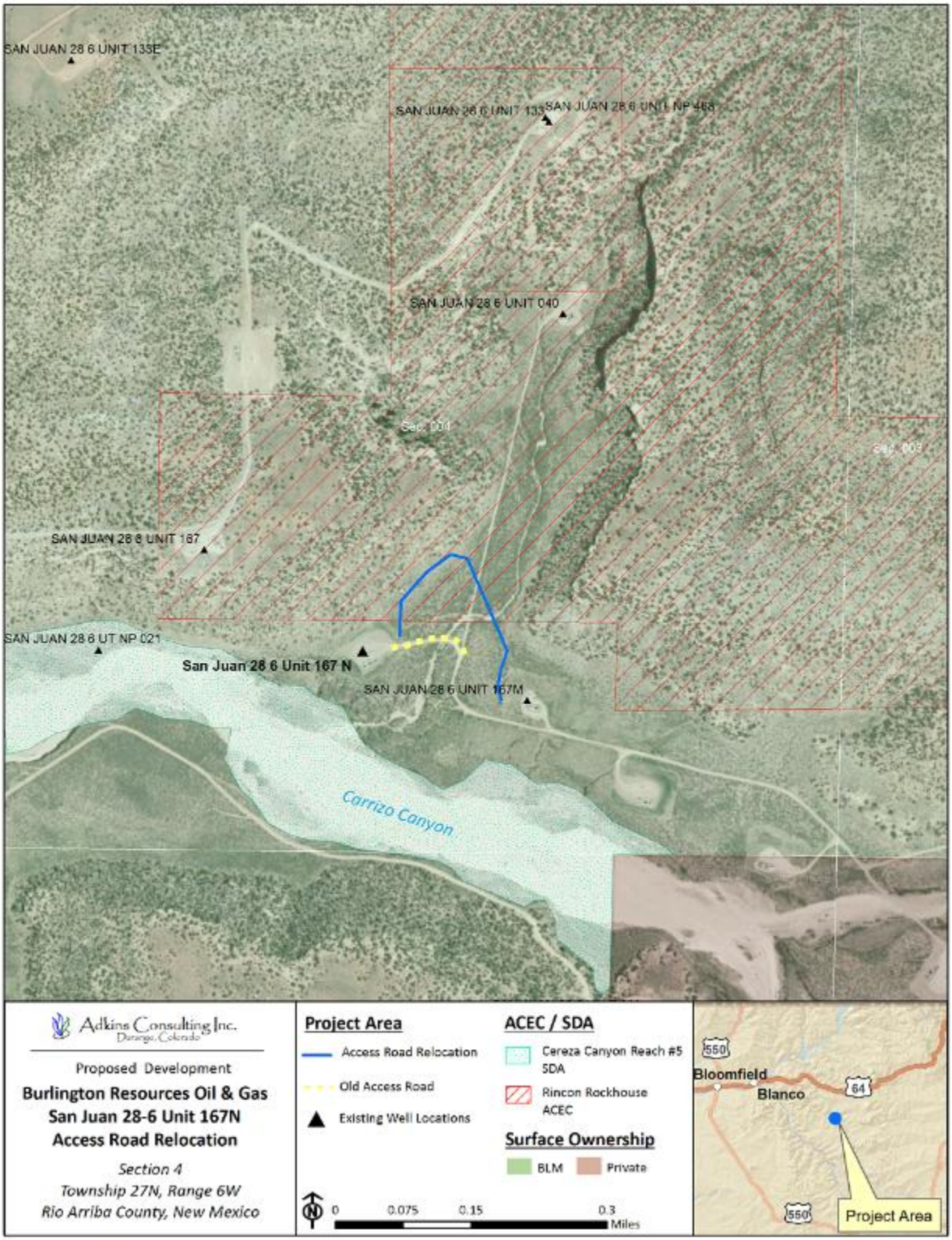
APPENDIX A. MAPS

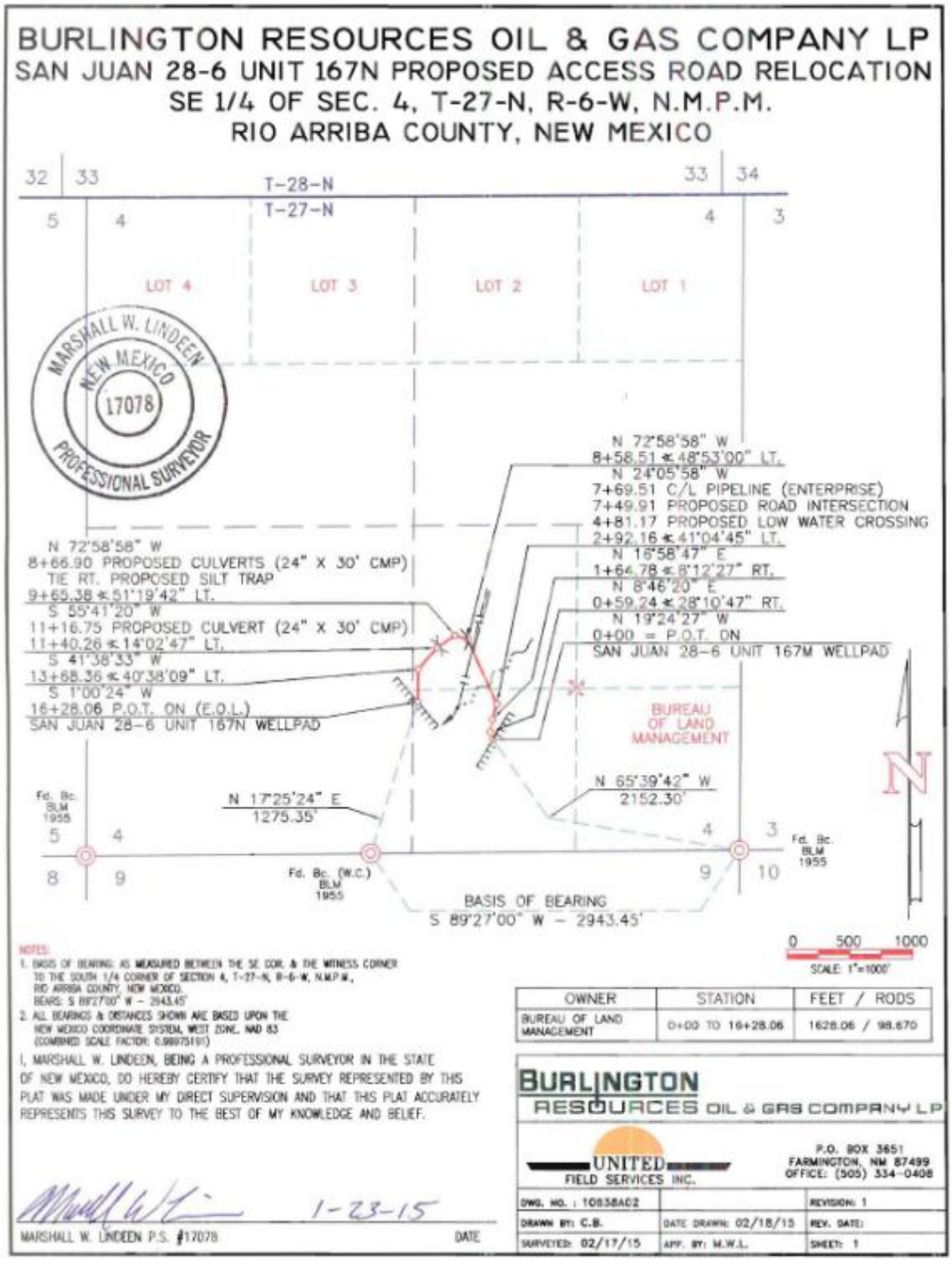
A.1. Proposed Project Area (Topographic Base Map)



A.2. Proposed Project Area (Aerial Imagery Base Map)



APPENDIX B. PLATS



APPENDIX C. SURFACE RECLAMATION PLAN