

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT**

Farmington District
Farmington Field Office
6251 N College Blvd., Ste. A
Farmington, NM 87402

Finding of No Significant Impact

**BP America Production Company's
Storey B LS 6 1H**

NEPA No. DOI-BLM-NM-F010-2015-0220-EA

FINDING OF NO SIGNIFICANT IMPACT

I have determined that the proposed action, as described in Environmental Assessment (EA) DOI-BLM-NM-F010-2015-0220 will not have any significant impact, individually or cumulatively, on the quality of the human environment. Because there would not be any significant impact, an Environmental Impact Statement is not required.

In making this determination, I considered the following factors:

Context

The Farmington Field Office (FFO) is located in northwestern New Mexico. The field office boundaries include approximately 7,800,000 acres; 1.4 million surface acres and an additional 1 million acres of mineral estate are managed by the BLM. The distribution of BLM-managed lands is fairly well consolidated in the north and becomes increasingly mingled with Tribal lands to the south. BLM-managed lands abut the Navajo Reservation to the west and south, Jicarilla Apache Nation Reservation to the east, and the Ute Mountain Reservation and Southern Ute Indian Reservation to the north. Aztec Ruins National Monument and Chaco Culture National Historical Park, managed by the National Park Service, lie within the field office boundaries. The BLM manages approximately 18% of lands within a 10 mile radius of Chaco Culture National Historical Park.

The FFO encompasses the New Mexico portion of the San Juan Basin. The San Juan Basin and surrounding areas have been occupied by varied cultures since the Paleo Indian period (circa 10,000 BC). The San Juan Basin and Four Corners area have one of the most extensive prehistoric and protohistoric occupations in the United States. The most commonly known archaeological resources are the Anasazi structures at Chaco Culture National Historical Park, Mesa Verde National Park, and other National Park Service sites. Scattered across BLM-managed lands are similar, but smaller structures, which were probably related to these larger sites. Twenty-three Chacoan outliers are known to exist within the FFO. Each contains at least one Chacoan structure and most have associated communities, prehistoric roads, and great kivas along with features such as herraduras and special use areas. The FFO contains an extensive system of finely engineered roads radiating out from Chaco Canyon and extending a considerable distance to outlying sites through the San Juan Basin and beyond. These roads are remarkably straight and carefully

constructed. The most notable is the Great North Road, which starts at Chaco Canyon and runs north to the Aztec Ruins.

Located within the boundary of the FFO is much of Dinétah, the ancestral homeland to the Navajo. Here the Navajo constructed forked-stick hogans, shades, sweat lodges, and other structures over a several hundred year span. During a short period between 1680 and the mid-1700s, pueblitos were constructed, often associated with other structures. Although not firmly dated, extensive Navajo pictograph and petroglyph sites were painted, etched, pecked, or ground onto the sandstone cliffs of the canyons of Dinétah. Most are believed to be ceremonial art which is no longer traditionally executed in a permanent form.

Native American Traditional and Sacred Areas are known to exist across the FFO. Many are associated with narrative accounts of origin or other traditional stories. Most of the identified sacred areas are associated with the Navajo culture. These places are still important in Navajo ceremonies and daily activities.

Historic Hispanic or Spanish and Anglo sites within the San Juan Basin primarily date from the late 1800s to the present. Although there are some early Spanish land grants in the southern portion of the FFO, most historic sites located on public lands are either Hispanic or Anglo homesteads with associated structures from the late 1800s and early 1900s. Associated with many clusters of homesteads were a school house and often a church which was visited every few months by a priest.

Cultural resource inventories have been conducted throughout the FFO for project undertakings, management studies, and scientific inquiries. As of April 2014, approximately 760,000 acres of the 7,800,000 acres in the FFO boundaries have been inventoried. Over 46,000 sites have been identified ranging from small artifacts to the 800-room structures in Chaco Canyon. Many of these sites are listed on the National Register of Historic Places and Chaco Culture National Historical Park along with several of the Chacoan sites which have been placed on the World Heritage List. The FFO manages 79 Areas of Critical Environmental Concern (ACECs) for relevant and important cultural values, including five World Heritage Sites.

The San Juan Basin is an important area for mammalian and reptilian fossils. A variety of paleontological resources exist in the FFO including animal fossils, fossil leaves, palynomorphs, petrified wood, and trace fossils occurring in the Triassic, Jurassic, Cretaceous, and Tertiary rocks. Dinosaur and other fossils that have made significant contribution to the scientific record have been found and excavated in the FFO. Paleontological resources are present in the Bisti De-Na-Zin Wilderness Area, Ah-Shi-Sle-Pa Wilderness Study Area, Fossil Forrest Research Natural Area, and seven fossil areas identified in the 2003 Farmington Resource Management Plan.

The San Juan Basin is one of the largest natural gas fields in the nation and has been under development for more than 60 years. Oil was discovered by accident in the Seven Lakes area of McKinley County in 1911. Natural gas was discovered near Aztec, New Mexico, in 1920-1921 with oil of commercial quantity discovered near the Hogback in 1922 (Barnes 1951). Several small pipelines were built to carry the oil and gas from these discoveries to Aztec and Farmington, respectively. Development began in earnest in the late 1940s and early 1950s as the demand for natural gas increased. The FFO manages 2,765 active oil and gas leases in the San Juan Basin

consisting of 2.1 million acres. Leasing began in the mid-1930s and accelerated in the late 1940s. By 1950, over 1 million acres were under lease.

In 1951, El Paso Natural Gas completed the first interstate pipeline out of the San Juan Basin to California. That same year, oil was discovered in the Mancos Shale in Dogie Canyon (Barnes 1951). Since that time, over 30,000 oil and gas wells have been drilled in the San Juan Basin with approximately 16,000 associated rights-of-way. Approximately 23,000 wells are currently producing. Since Stanolind Oil introduced hydraulic fracturing in 1949, nearly every well in the San Juan Basin has been fracture stimulated.

Intensity

1. The activities described in the proposed action do not include any significant beneficial or adverse impacts (40 CFR 1508.27(b)(1)). Per 40 CFR 1500.1(b), the EA concentrated on issues that are truly significant to the action in question, rather than amassing needless detail. Issues have a cause and effect relationship with the proposed action or alternatives; are within the scope of the analysis; have not been decided by law, regulation, or previous decision; and are amendable to scientific analysis rather than conjecture (BLM 2008, page 40). The following issues were identified related to the proposed:

- Air Resources: How would construction and production activities associated with the Proposed Action impact air resources?
- Cultural Resources: How would surface-disturbing activities associated with the Proposed Action affect cultural resources?
- Upland Vegetation: How would surface disturbance associated with the Proposed Action impact vegetation?
- Noxious Weeds and Invasive Species: How would the Proposed Action impact the establishment and distribution of invasive or non-native species?
- Wildlife: How would the Proposed Action impact wildlife, including migratory birds?
- Special Status Species: How would the Proposed Action impact the following BLM special status species: Aztec gilia (*Aliciella formosa*), Brack's fishhook cactus (*Sclerocactus cloverae* var. *brackii*), Bendire's thrasher (*Toxostoma bendirei*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), loggerhead shrike (*Lanius ludovicianus*), and pinyon jay (*Gymnorhinus cyanocephalus*)?
- Travel and Transportation: What effects will the proposed action have on transportation and travel?

The EA includes a description of the expected environmental consequences of the proposed activities for those issues in Chapter 3.

2. The activities included in the proposed action and alternatives would not significantly affect public health or safety (40 CFR 1508.27(b)(2)). The following design features have been included in the proposed action to address any impacts to public health and safety:

- 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. BP would have inspectors present during construction. Any accidents involving persons or property would immediately be reported

to the BLM-FFO. BP would notify the public of potential hazards by posting signage, as necessary.

- There are designated recreation and commercial areas within 1 mile of the project area. The closest populated area is approximately .25 miles to the west. The proposed project area is accessible to the public by dirt roads.
- 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). BP would adhere to company safety policies, Occupational Safety and Health Administration regulations, and Department of Transportation regulations.
- 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 project area and/or when activities would cause irreparable harm to roads, soils, or watercourses.
- The nearest hospital is in Farmington, New Mexico. This hospital is approximately 16 air miles or approximately 18 road miles from the proposed project area.

3. The proposed activities would not significantly affect any unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas (40 CFR 1508.27(b)(3)). Unique characteristics are generally limited to those that have been identified through the land use planning process or other legislative, regulatory or planning processes (BLM 2008, page 71). The FFO does not contain any prime and unique farmlands, suitable or designated wild and scenic rivers, or designated caves. Table 1 discloses the distance of the proposed activities to identified wetlands. Table 2 discloses the distance of the proposed activities to National Park Service units and Congressionally designated areas. The proposed action and alternatives are not located within an Area of Critical Environmental Concern. Impacts to historic or cultural resources are described in the Cultural Resources section of the EA and discussed further under item 8.

Table 1. Distance of the Proposed Activities from Identified Wetlands

Identified Wetlands	Distance from Proposed Activities
Bancos	33 miles
Blanco	10 miles
Bloomfield	9 miles
Cutter Canyon	17 miles
Carrizo Oxbow	20 miles
Desert Hills	11 miles
Valdez	8 miles

Table 2. Distance of the Proposed Activities from Park Lands and Ecologically Critical Areas

Park Land or Ecologically Critical Area	Distance from Proposed Activities
Ah-Shi-Sle-Pah Wilderness Study Area	44 miles
Aztec Ruins National Monument	2 miles
Bisti De-Na-Zin Wilderness Area	33 miles

Chaco Culture National Historical Park	51 miles
Fossil Forest Research Natural Area	41 miles

4. The activities described in the proposed action do not involve effects on the human environment that are likely to be highly controversial (40 CFR 1508.27(b)(4)). Controversy in this context means disagreement about the nature of the effects, not expressions of opposition to the proposed action or preference among the alternatives (BLM 2008, page 71). Oil and gas development has occurred in the San Juan Basin for more than 60 years. While there may be controversy over the appropriateness of oil and gas development, there is not a high level of controversy or substantial scientific dispute over the impacts of that activity. The impacts of the proposed activities are described in Chapter 3 of the EA.

5. The activities described in the proposed action do not involve effects that are highly uncertain or involve unique or unknown risks (40 CFR 1508.27(b)(5)). As described under Context, oil and gas development has occurred in the San Juan Basin since the late 1940s and early 1950s. The field office has permitted over 30,000 wells and 16,000 rights-of-way. Hydraulic fracturing has occurred on nearly every well in the San Juan Basin since the 1950s. As such, the FFO has decades of experience and is knowledgeable about the impacts and risks associated with the proposed activities.

6. My decision to implement these activities does not establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration (40 CFR 1508.27(b)(6)). Approval of these activities in no way assures approval of any future activities.

7. The effects of the proposed activities would not be significant, individually or cumulatively, when considered with the effects of other actions (40 CFR 1508.27(b)(7)). Direct, indirect, and cumulative impacts are described in Chapter 3 of the EA.

8. I have determined that the activities described in the proposed action will not adversely affect or cause loss or destruction of scientific, cultural, or historical resources, including those listed in or eligible for listing in the National Register of Historic Places (40 CFR 1508.27(b)(8)). The proposed activities are not located in an ACEC containing relevant and important cultural values. Cultural resource surveys were completed. Known cultural resources will be avoided with the implementation of design features such as but not limited to reduction of construction areas, temporary barriers, and site monitoring. (DOI-BLM-NM-F010-2015-0220-EA, p. 7, 25).

9. The proposed activities are not likely to adversely affect any endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (40 CFR 1508.27(b)(9)). The project area does not contain any known populations of threatened or endangered species. The project area is entirely within BLM-FFO designated potential habitat area for Aztec gilia and Brack's hardwall cactus. No Aztec gilia, or Brack's cactus were found during the biological survey of the project area. (DOI-BLM-NM-F010-2015-0220-EA, p. 33).

10. The proposed activities will not threaten any violation of Federal, State, or local law or requirements imposed for the protection of the environment (40 CFR 1508.27(b)(10)). Sections 1.4 and 1.5 of the EA describe the relationship of the proposed activities to relevant laws, policies, regulations, and plans.

REFERENCES

Barnes, Frank C., 1951. History of development and production of oil and gas in the San Juan Basin. In *The south and west sides of the San Juan Basin, New Mexico and Arizona*, Smith, C.T.; Silver, C. ed(s), New Mexico Geological Society, Guidebook, 2nd Field Conference, pp. 155-160.

BLM. 2008. *National Environmental Policy Handbook. H-1790-1*. Bureau of Land Management. National Environmental Policy Act Program.

APPROVED:

/s/Richard A. Fields
Richard A. Fields
Field Manager
Farmington Field Office

5/17/2016
Date

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT**

Farmington District
Farmington Field Office
6251 N College Blvd., Ste. A
Farmington, NM 87402

**Decision Record
for the**

**BP America Production Company's
Storey B LS 6 1H**

NEPA No. DOI-BLM-NM-F010-2015-0220-EA

I. Decision

I have decided to select Alternative B (Proposed Action) for implementation as described in the BP America Production Company's Storey B LS 6 1H Environmental Assessment (EA). Based on my review of the Environmental Assessment (EA) and project record, I have concluded that Alternative B was analyzed in sufficient detail to allow me to make an informed decision. I have selected this alternative because the proposed projects would allow BP America Production Company access to their proposed drilling sites in order to vertically drill for natural gas within their valid and existing leases.

II. Conformance and Compliance

The proposed action is in conformance with the 2003 BLM-FFO Resource Management Plan (RMP). Pursuant to 40 CFR 1508.28 and 1502.21, this site-specific Environmental Assessment (EA) tiers into and incorporates by reference the information and analysis contained in the BLM-FFO Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) (BLM 2003a). The RMP was approved by the September 29, 2003 Record of Decision (ROD) (BLM 2003b), and updated in December 2003.

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. (BLM 2003b, 2-2 – 2-3)

III. Finding of No Significant Impact

I have reviewed the direct, indirect and cumulative effects of the proposed activities documented in the EA for BP America Production Company's Storey B LS 1H. I have also reviewed the project record for this analysis. The effects of the proposed action and alternatives are disclosed in the Alternatives and Environmental Consequences sections

of the EA. I have determined that the construction of a well pad, pipeline tie and access road to allow BP America Production Company reasonable access to the mineral lease in order to develop the existing lease as described in the EA will not significantly affect the quality of the human environment. Accordingly, I have determined that the preparation of an Environmental Impact Statement is not necessary.

IV. Other Alternatives Considered

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 and proposed pipeline corridor follows the most economic and direct route based on the location of existing BP America Production Company's infrastructure, existing disturbance, surface resources, and terrain.

V. Rationale for the Decision

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this site-specific environmental assessment (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 (BLM 2003b). Specifically, this action is in conformance with the following: 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). The PRMP/FEIS, RMP, and ROD are available for review at the BLM Farmington Field Office, 6251 College Blvd., Farmington, NM, or electronically at: http://www.nm.blm.gov/ffo/ffo_home.html

I have determined that the activities described in the proposed action will not adversely affect or cause loss or destruction of scientific, cultural, or historical resources, including those listed in or eligible for listing in the National Register of Historic Places (40 CFR 1508.27(b)(8)). The proposed activities are not located in an ACEC containing relevant and important cultural values. BLM Cultural Resource survey # 2015(IV)029F was completed, and determined there would be no effect 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 (DOI-BLM-NM-F010-2015-0220-EA, p. 7, 25).

The proposed activities are not likely to adversely affect any endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act (40 CFR 1508.27(b)(9)). The project area does not contain any known populations of threatened or endangered species. The project area is entirely within BLM-FFO designated potential habitat area for Aztec gilia and Brack's hardwall cactus. No Aztec

gilia, or Brack's cactus were found during the biological survey of the project area. (DOI-BLM-NM-F010-2015-0220-EA, p.33).

VI. Public Involvement

The Notice of Staking was made available for the public to review at the Farmington Field Office. No comments were received. The project was posted on the Farmington Field Office NEPA log http://www.blm.gov/nm/st/en/prog/planning/nepa_logs.html.

VII. Administrative Review and Appeal

Under BLM regulations, this Decision Record (DR) is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this DR, with or without oral presentation, must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, 301 Dinosaur Trail, Santa Fe, NM 87508, no later than 20 business days after this DR is received or considered to have been received.

Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

This decision to authorize a right-of-way may be appealed to the Interior Board of Land Appeals (IBLA), Office of the Secretary, in accordance with the regulations contained in 43 CFR Part 4. Any appeal must be filed within 30 days of this decision. Any notice of appeal must be filed with the Acting Field Manager, Bureau of Land Management, Farmington Field Office, 6251 College Boulevard, Suite A, Farmington, NM 87402. The appellant shall serve a copy of the notice of appeal and any statement of reasons, written arguments, or briefs on each adverse party named in the decision, not later than 15 days after filing such document (see 43 CFR 4.413(a)). Failure to serve within the time required will subject the appeal to summary dismissal (see 43 CFR 4.413(b)). If a statement of reasons for the appeal is not included with the notice, it must be filed with the IBLA, Office of Hearings and Appeals, U. S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203 within 30 days after the notice of appeal is filed with the Farmington Field Office Manager.

Notwithstanding the provisions of 43 CFR 4.21(a)(1), filing a notice of appeal under 43 CFR Part 4 does not automatically suspend the effect of the decision. If you wish to file a petition for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal.

A petition for a stay is required to show sufficient justification based on the following standards:

- (1) The relative harm to the parties if the stay is granted or denied;

- (2) The likelihood of the appellant's success on the merits;
- (3) The likelihood of immediate and irreparable harm if the stay is not granted; and
- (4) Whether the public interest favors granting the stay.

In the event a request for stay or an appeal is filed, the person/party requesting the stay or filing the appeal must serve a copy of the appeal on the Office of the Field Solicitor:
United States Dept. of the Interior, Office of the Solicitor, Southwest Regional Office,
505 Marquette Avenue NW, Suite 1800, Albuquerque, NM 87102

/s/Richard A. Fields
Richard A. Fields
Field Manager
Farmington Field Office

05/17/2016
Date

**United States Department of the Interior
Bureau of Land Management**

Environmental Assessment DOI-BLM-NM-F010-2015-0220-EA

***BP America Production Company's
Storey B LS 6-1H
Well Pad, Access Road and Pipeline
Natural Gas Well Project***

May 2016

U.S. Department of the Interior
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Farmington District
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BLM



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

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1. PURPOSE AND NEED FOR ACTION

1.1. Background

BP America Production Company (BP) has submitted an Application for Permit to Drill (APD) with the Bureau of Land Management - Farmington Field Office (BLM-FFO) for the Storey B LS 6-1H natural gas well and associated access road and well-connect pipeline. The proposed project includes the construction of a single well pad in order to directionally drill and develop federal mineral resources from the Basin Fruitland Coal pool. To access the site BP proposes to use the southern portion of the existing Storey B LS-6 access road then will construct a 228.6-foot access road to connect the proposed well pad to the existing Storey B LS-6 access road. In addition BP proposes a roughly 595.7-foot subsurface well-tie pipeline constructed by Enterprise as part of the project. Please see Table 2 in Section 2.2.2. (Proposed Surface Disturbance) for a summary of the ROW footages and acreages. The proposed action is the approval of the APD and ROW Grant by the BLM-FFO, located in Farmington, New Mexico. The proposed project is located entirely on public lands managed by the BLM-FFO.

New surface disturbances associated with the well pad, access road and well-connect pipeline would be reclaimed to a BLM-approved working area. 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. As practical, access will be provided by a tear-drop shaped road through the production area.

Oil and natural gas, vital components of the nation's energy supply, account for approximately 36 and 25 percent of total energy consumed in the U.S., respectively (U.S. Energy Information Administration 2012). Natural gas is used in homes, commercially, in industry, and in the transportation sector. Common uses for natural gas include space heating, water heating, cooling, cooking, waste treatment and incineration, metals preheating, drying and humidification, glass melting, food processing, fueling industrial boilers, vehicle fueling, and electricity generation. Gases such as butane, ethane, and propane can be extracted from natural gas to be used for products such as fertilizers and pharmaceuticals. Natural gas can also be used to create methanol, which is utilized in the production of formaldehyde, acetic acid, fuel cell sources, and additives for cleaner burning gasoline (Natural Gas Supply Association 2010). Most oil goes into fuels, including gasoline, jet fuel, and home-heating oil. Additionally, non-fuel compounds extracted from oil are used to develop lubricants; asphalt for roads; tar for roofing; waxes for food wrapping; solvents for paints; cosmetics and dry-cleaning products; plastics; and foams (U.S. Energy Information Administration 2012).

Most of the oil and natural gas found in North America is concentrated in distinct basins. The BLM-FFO management area is within the San Juan Basin, one of the most prolific gas-producing basins in the country. Currently, the San Juan Basin produces small amounts of oil (BLM 2003a).

Taxes and royalties on oil, natural gas, and carbon dioxide production contribute approximately 25 percent of New Mexico's general fund, and the oil and gas industry is one of the largest private sector employers in the state (New Mexico Bureau of Geology and Mineral Resources 2012). Additionally, the federal government receives royalties, or a share of the production income, for extracted federal minerals. In 2011, federal natural gas royalties totaled over 2 billion dollars (Office of Natural Resources Revenue 2012).

1.2. Purpose and Need for Action

The purpose of the proposed action would be for the BLM to grant reasonable access to BLM managed lands for the development of mineral lease NMSF078138A. The need for the proposed action is established by the BLM's responsibility to respond to the APD under the Mineral Leasing Act of 1920, as

amended (30 USC [United States Code] 181 et seq.) and the Federal Land Policy and Management Act (FLPMA) of 1976.

1.3. Decision to be Made

Based on the information in this EA, the BLM-FFO will decide whether or not to issue the APD and/or ROW, 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 actions 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 APD and/or ROW with design features as submitted;
- To approve the APD and/or ROW with additional mitigations;
- To analyze the effects of the proposal in an EIS; or
- To deny the APD and/or ROW.

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 (BLM 2003b, 2-2 – 2-3).

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

1.5. Relationship to Statutes, Regulations or Other Plans

BP would comply with applicable federal, state, and local laws and regulations. Necessary permits and approvals for the proposed project would be obtained prior to project implementation.

Many requirements regulating specific environmental elements are found in the appropriate elements sections of this EA (Chapter 3). Several permits, licenses, consultations, or other requirements are discussed below.

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. The proposed action is in conformance with the CWA (33 USC 1251 et seq.).

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).

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 Farmington Field Office (FFO) publishes a NEPA log for public inspection. This log contains a list of proposed and approved actions in the field office. The log is located on the BLM New Mexico website:

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

An initial onsite meeting, attended by BP, BLM-FFO representatives, Enterprise and an environmental consultant (Adkins Consulting, Inc. [ACI]), was held for the Storey B LS 6-1H on July 23rd, 2015. Due to archeological concerns (see Section 3.3 – Cultural Resources for more information) the initial location of the well pad was moved and the current location of the proposed project was re-onsited on February 17th, 2016. The attendees included BP, BLM-FFO representatives, an archeological consultant (San Juan County Museum Association, Division of Conservation Archaeology [DCA]), and an environmental

consultant (Adkins Consulting, Inc. [ACI]). A public invitation to both on-site meetings was posted online, no private citizens or groups attended either meeting:

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 August 10th, 2015 to discuss the proposed action. At the aforementioned meetings, potential issues of concern (Section 1.6.2) 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 dust, equipment emissions, and consumption of hydrocarbons associated with 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 vegetation-clearing, proposed project activities, and final reclamation associated with the proposed project impact the establishment and distribution of noxious weeds and invasive species?
- How would vegetation-clearing, proposed project activities, and final reclamation associated with the proposed project impact wildlife, including migratory birds?
- How would vegetation-clearing, proposed project activities, and final reclamation associated with the proposed project impact the following BLM Special Status Species (SSS): Bendire's thrasher (*Toxostoma bendirei*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*) and prairie falcon (*Falco mexicanus*)?
- How would vegetation-clearing, proposed project activities, and final reclamation associated with the proposed project impact visual resources? What effects would the proposed action have on environmental justice?
- What effects would the proposed action have on public health and safety?
- What effects would the proposed action have on transportation and travel?

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

Comment [MMJ1]: In the draft EA I indicated that VRM was identified as an issue per the 8/10/15 NEPA team meeting. Please add it to this EA.

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. Water used to construct, produce, and maintain the proposed well would be acquired from the City of Aztec (New Mexico Office State Engineer (NMOSE) Point of Diversion (POD) Number SP-2801). No unaccounted-for water depletions within USFWS-listed fish habitat would occur. Therefore, there is no need for additional Section 7 consultation.

Native American Religious Concerns

For the proposed actions, identification efforts for Native American Religious Concerns were limited to a review of existing published and unpublished literature (e.g., Van Valkenburgh 1941, 1974; Brugge 1993; Kelly, et al. 2006), development of the site-specific Class III survey reports prepared for the proposed action (SJ County Museum Association, Division of Conservation Archaeology Report No.: 15-DCA-017 [Meininger 2015a and 2015b]), and a review by the BLM's cultural resources program regarding the presence of Traditional Cultural Properties (TCPs) identified through ongoing BLM tribal consultation efforts. There are currently no known remains that fall within the purview of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA; 25 USC 3001) or the Archaeological Resources Protection Act (ARPA; 16 USC 470) within the proposed project area. The proposed action would not impact any known TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere with or hinder the performance of traditional ceremonies and rituals pursuant to the American Indian Religious Freedom Act of 1978 (AIRFA; 42 USC 1996) or Executive Order (EO) 13007.

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. No Action

Under the No Action Alternative, the APD and ROW Grant associated with the proposed Storey B LS 6-1H well would not be approved. The proposed well pad, access road, and well-connect pipeline corridor would not be constructed. Current land and resource use would continue to occur in the proposed project area.

2.2. Proposed Action

The proposed action is the BLM-FFO approval of an APD and ROW Grant associated with BPs' Storey B LS 6-1H gas well. The proposed action includes the construction of a directional gas well and associated access road. If the well is successful and proves to be viable, a subsurface well-connect pipeline would be constructed by Enterprise to transport produced gas to the existing Storey B LS 6 pipeline infrastructure. The proposed project would commence after the APD and ROW Grant are issued.

The proposed project includes the construction of a new 400-foot by 300-foot well pad with a 50-foot construction buffer. To access the well pad BP proposes to use the existing Storey B LS 6 access road which travels north from State Highway 173 to the Storey B LS 6 well pad. BP would then build a new access road exiting off the Storey B LS 6 road in a westerly direction for approximately 228.6-feet. The proposed access road would be built with a 30-foot right-of-way along a majority of the road and a 90-foot right-of-way where the proposed access meets the existing Storey B LS 6 access road to the east. In addition BP proposes a roughly 595.7-foot subsurface well-tie pipeline to be constructed by Enterprise with a 40-foot right-of-way as part of the project.

Construction plats associated with the proposed project are provided in Appendix B. Photographs of the proposed project area are provided in the Biological Survey Report (Appendix C) and the Surface Reclamation Plan on file with the BLM-FFO.

2.2.1. Location of Proposed Project Area

The proposed project area (PPA) is located within the BLM-FFO management area on public lands in San Juan County, New Mexico. The proposed project is located approximately 2 miles northeast of downtown Aztec, NM, and 11.8 miles south of the Colorado / New Mexico border. Legal locations of the well are provided in Table 1. Refer to Appendix A for project maps.

Table 1. Legal Location of Proposed Well Head

Surface Location								
UL or Lot No.	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	11	30N	11W	1939	NORTH	2078	EAST	SAN JUAN
Bottom Location								
UL or Lot No.	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County

P	11	30N	11W	710	SOUTH	911	EAST	SAN JUAN
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The general region surrounding the proposed project area is characterized by saltbush scrub, sagebrush shrubland valleys, wooded hills and mesas and previously disturbed areas.

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. Construction plans associated with the proposed projects are provided in Appendix B and provide additional details. Photographs of the proposed project area are provided in the Biological Survey Report (Appendix C) and the Surface Reclamation Plan on file with the BLM-FFO.

Design Features and Best Management Practices

BP would adhere to the conditions of approval (COAs) attached to the approved APD and Exhibit A stipulations for the ROW grant from the BLM-FFO. 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

The nearest Area of Critical Environmental Concern (ACEC) to the proposed action is the *River Tracts ACEC*, approximately 3 miles away to the north (BLM 2014d).

All cultural resource stipulations would be followed as indicated in the Cultural Resource Records of Review, attached to the stipulations in an approved APD. 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 BP 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, BP 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 Flora and Fauna, including SSS and Livestock

The proposed project area is entirely within BLM-FFO-designated potential habitat area for Aztec gilia and Brack's hardwall cactus (BLM 2016; Figure A.2 [Appendix A]). Both plants are designated SMS by the BLM-FFO and listed endangered species by the State of New Mexico. However, soils derived from the Nacimiento Formation, which provides the appropriate geologic substrate for the two plants, were not present within the proposed project area.

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.

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.

The project area is located within the Knickerbocker Ranch allotment No. 05037 managed by the BLM-FFO. Grazing lease operator(s) would be notified 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. Construction would not cease or delay 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).
- Backfilling operations would be performed within a reasonable amount of time to ensure that a pipeline trench is not left open for more than 24 hours. If a trench is left open overnight, it will be fenced with a temporary fence or a night watchman will be utilized.
- The operator has proposed a closed-loop system. No drilling pits will be used for the proposed project.

Protection of Topsoil

Topsoil, which would be stripped from the surface 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 permitted 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 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. BP would have inspectors present during construction. Any accidents involving persons or property would immediately be reported to the BLM-FFO. BP 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, construction equipment would be inspected for noxious weeds and cleaned.

It would be BP's responsibility to monitor, control, and eradicate all invasive, non-native plant species within the proposed project area throughout the life of the project. BP's weed-control contractor would contact the BLM-FFO regarding acceptable weed-control methods. BP would be required to submit a Pesticide Use Proposal (PUP) for the location if one does not currently exist. BP'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. BP'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 an approved APD.

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). BP would adhere to company safety policies, Occupational Safety and Health Administration regulations, and Department of Transportation regulations.

BP 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 project area and/or when activities would cause irreparable harm to roads, soils, or watercourses.

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 on-site visit include:

- An appropriate sized culvert where the proposed access road meets the well pad.
- Divert the stormwater flow from the highest elevation point at the southern edge of the pad to both the east and west. The eastern diversion will head east from the split point, around corner D' and travel along the eastern side of the well pad, through the proposed culvert, around corner D, along the northern edge of the pad and finally into the existing drainages to the north of the pad. The western diversion will head west from the split point, around corner B' and fan out in the existing drainages to the west of the well pad.

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 are listed above, in "Design Features and Best Management Practices", or would be established upon reclamation following construction and drilling activities.

Proposed Project Phases

Under the proposed action, the following phases would occur.

Construction Phase

Once the APD and ROW Grant are approved, well site, access road and pipeline 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 and trees would be chipped or mulched and incorporated into the topsoil as additional organic matter. The subsurface portion of any trees (tree stumps) would be placed in adjacent areas needing soil stabilization, or hauled to an approved disposal facility.

Construction of the well pad would involve preparing a level area for the equipment that would drill and complete the well. The proposed well pad would be approximately 400 feet by 300 feet with a 50-foot buffer around the entire well pad area. Disturbance would be confined to the permitted area of 4.59 acres. The well pad area would require a maximum cut of 8.8-feet on the southwest (corner B') side of the well pad, and a maximum fill of 8.5-feet on the northwest (corner B) side of the pad. The well pad would be constructed from the earthen materials present on-site and gravel brought in from off-site. No concrete or other foreign materials would be brought in for use in construction of the well pad. Construction would involve preparing a level area for the equipment that would drill and complete the well. Following removal of vegetation and stockpiling of viable soil material, the pad would be graded using standard, cut-and-fill techniques of construction using a bulldozer, grader, front-end loader, and/or backhoe. Cuts and fills required for the construction of the well pad are described below.

BP would construct a 228.6-foot resource road to provide access to the proposed facilities. Proposed road construction and upgrades 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 right-of-way width for resource road development is 30-feet with a 90-foot right-of-way where the proposed access meets the existing Storey B LS 6 access road. Final travel surface width on resource roads is approximately 14-feet.

Once the proposed well is completed and proves to be viable, roughly 595.7-feet of well-tie pipeline would be constructed to connect with existing Storey B LS 6 pipeline infrastructure operated by Enterprise. The pipeline will be built within a 40-foot ROW within a single trench within the Storey B LS 6 well pad area and parallel to both the existing Storey B LS 6 access road and proposed Storey B LS 6-1H access road.

Please see Table 2 for a summary of the ROW footages and acreages. Additional, related appurtenances, such as above ground valve assembly and above and below ground cathodic protection, would be installed within the proposed pipeline corridor as necessary.

Trenching activities would be conducted using a trencher or backhoe. The trenches would be 16 inches in width if a trencher is used or 24 inches in width if a backhoe is used. After a pipe has been welded and coated, a side-boom tractor would be used to place the pipe into a trench. The pipelines would be buried to a minimum depth of 3 feet.

After trenching and pipe placement in the trench, the soils excavated from the trench would be returned and compacted to prevent subsidence. The trench would be compacted after approximately two feet of fill is placed within the trench and after the ground surface has been leveled.

Prior to the pipeline being placed in service, the pipes would be pressure tested. Pipeline markers would be installed along the proposed pipeline corridors within the line of sight, without voiding safety measures.

Drilling Operations

A drilling rig would be transported in sections and erected on the well site following construction of the well pad. Additional equipment and materials needed for drilling operations would be trucked into the well site. Drilling is a 24-hour operation taking an average of 9 days to drill a conventional gas well. To protect fresh water zone, surface casing is utilized. A 12 ¼-inch (diameter) hole is drilled to a depth of 500 to 1,000 feet, depending on the depth necessary to penetrate the fresh-water zones. Steel casing is lowered into the hole, and then specially designed cement is pumped down inside the casing out the shoe (at the bottom of the pipe) and up the outer annulus of the pipe to protect aquifers above the top of the casing shoe and to secure the base of the pipe. Surface casing is set to below the depth of the nearest potable water well within ½ mile of the surface location, or as specified by the BLM-FFO. After setting the surface casing, drilling resumes. Depending on well bore conditions, additional strings of casings may be run, using the same cementing practices before the well reaches the objective depth (total depth).

After setting the surface casing, directional drilling would begin with a "kick-off" (kick-off point) at which drilling would "build angle" and begin angle drilling which typically cumulates at an angle of 0-50 degrees to reach the bottom hole location and the target formation. A pipe casing is then installed from the surface of the bore hole through the production zone and cemented in place to prevent interzonal communication between gas bearing zones and water zones.

Most of the water used during the life of a producing well is consumed during drilling operations. A small amount of water is used for dust suppression or equipment installation during other phases of development. Recirculating mud systems are used to reduce the total volume of water needed. Drilling mud can be recycled to the next drilling location. Produced water from wells in the area can be used for most drilling operations except mixing cement. Water used to construct, produce, and maintain the proposed well would be acquired from the City of Aztec (NMOSE POD # SP-2801).

The drilling fluid, called "mud," is a mixture of water, bentonite, caustic soda, barite, and polymers. Drilling mud cools and lubricates the bit, while lifting the well cuttings caused by the bit to the surface for examination and disposal. The mud in the well bore prevents the hole walls from sloughing off into the hole, keeps underground pressures stable, and seals the sides of the well bore through formation of a thin "mud cake". Mud properties are carefully supervised, and several measurements of the mud are made by a mud specialist during daily visits to the well site. The drilling mud is mixed on location and stored in above-ground storage tanks. Drilling operations will utilize a closed-loop system with water based mud. Drill cuttings are separated from the drilling mud and placed in roll-off bins and hauled to a commercial disposal facility or land farm at the end of the drilling operation. The mud can be recycled to another drilling operation.

In the event formation evaluation determines the well would not be economically feasible to complete, then the well would be a dry hole, and would be plugged and abandoned in accordance with current BLM procedures.

Completion Operations

A smaller completion rig is used for the final phase of completing the well. Casing is run to the producing zone and cemented in place. To ensure isolation and protection of all zones between the surface and total depth, the BLM requires cement to be circulated from total depth to surface on the production casing, as well as on the surface casing. Remedial measures are taken if cement cannot be circulated to the surface.

If formation pressure can raise oil/gas to the surface, the well would be completed as a flowing well. Several downhole acid or fracture treatments may be necessary to enhance the formation permeability, to make the well flow. At the end of the treatment, the treatment water flows back to the surface and is captured in temporary tanks on location. This fluid is hauled to injection wells or evaporation ponds for disposal with other produced water.

Acidizing a well requires introducing acid in the well bore across the productive interval, which causes the solution of some of the mineral materials (e.g., calcite, dolomite, etc.) around the pore space. Upon solution and removal of these minerals, porosity and permeability are enhanced.

Hydrofracturing is conducted using fluid pumped down the well through perforations in the casing and into the formation. Pressures are increased to the point that the formation fractures or breaks, and sand is added to the injection fluid to "prop open" the crack, once the pressure is released. The pressure required to fracture a given formation is generally predictable. However, some coals require very high pressures to fracture the formation.

Before a well can begin producing gas for sale, the well bore and surrounding reservoir must be "cleaned up" (e.g., any fluids, sand, coal particles, or drill cuttings within the well bore must be removed). The conventional method for doing this is to pump air down the well bore, which lifts the waste fluids and solids out. The solid and liquid waste materials are then dumped into a pit or tank, and any gas that is removed is flared or vented to the atmosphere. In some flareless or green completions, natural gas, rather than air, is pumped down the well bore to clean it out.

The green completion technique is used on some wells in the San Juan Basin, which eliminates flaring and testing. The gas from flowback is run through a special separator and then placed in the pipeline for gathering. This technique reduces flaring and venting overall. The additional equipment for green completion may include considerably more tankage, special gas-liquid-sand separator traps, and portable gas dehydration. In addition to reducing methane emissions, green completions produce an immediate revenue stream with the produced natural gas and gas liquids, less solid waste and water pollution, and a safer operating practice.

During completion and testing of wells, flaring may be used to safely removed gas from the rig and work area. During the process produced gas is ignited and burned rather than directing that gas to sales. Produced gas is piped away from the well bore into a pit constructed on the well pad, ignited and allowed to burn. A berm is usually constructed around the pit to aid in containing the flame and any materials that might be blown out with the gas.

A free flowing well is closed off with an assemblage of valves, pipes, and fittings to control the flow of oil and gas to other production facilities. If the well is not free flowing, artificial-lift (pump) methods would be used.

Production Facilities

The production equipment and facility layout will be deferred until the well's production characteristics can be evaluated after completion. Above ground equipment for all five sites will be painted Juniper Green to reduce visual impacts to the surrounding environment.

Routine production operations occur throughout the year and require use and maintenance of access roads and well pads on a periodic, as needed basis. Maintenance of the various mechanical components used in production occurs at intervals recommended by manufacturers or as needed, based on site inspections. A pumper would visit the producing well to ensure that equipment is functioning properly. Pumpers may visit the well on a daily basis. A pumper may visit the well site once a week by utilizing off site computer based automation systems. Solar panels are used to power the radio telemetry equipment. When a problem is identified through the system a pumper is dispatched to the location. Control and monitoring of well production by radio telemetry reduces regular site inspections of the well, and vehicular traffic.

Periodically, a workover on a well is required. A unit similar to a completion rig is used to conduct maintenance procedures for efficient operation. Workover rigs can include repairs to the well bore equipment (casing, tubing, etc.), the well head, or the production formation itself. These repairs occur during daylight hours only and are usually completed in one day. Some situations may require several days to finish a workover. The frequency for this type of work cannot be accurately projected, since workover rigs vary and depend on site specific circumstances.

Interim Reclamation

Following construction activities, interim reclamation would occur within all new disturbance areas associated with the proposed project. The BLM-FFO would be notified at least 48 hours prior to surface reclamation activities. During this phase, a tractor with seeding capabilities would be used for reclamation purposes. During the pre-disturbance onsite meeting, it was determined that the Sagebrush vegetation community best represents the project area. Details of the interim reclamation process (including species included in the seed mixture), monitoring and reporting are discussed in the Surface Reclamation Plan on file with the BLM-FFO.

In areas that would be reclaimed within the proposed project area, 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 well pad would be reclaimed to a BLM-approved working area. A single working area and a teardrop shaped road to access the well heads and the facilities would remain disturbed for the lifetime of the project (0.7 acres). The remainder of the proposed well pad (approximately 2.0 acres) and construction zone (1.8 acres) would be fully reclaimed during interim reclamation. A 14-foot-wide running surface and the bottoms of the bar ditches along either side of the access road and the 90-foot right-of-way where the proposed access meets the existing Storey B LS 6 access road to the east (approximately 0.15 acres, total) would remain disturbed for the lifetime of the project. The remainder of the disturbed access road corridor (0.06 acres) would be reclaimed during interim reclamation. Access to the well site 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). All new surface disturbances associated with the pipeline corridor (approximately 0.2 acres) would be reclaimed during interim reclamation.

Operation

During the operation phase of the proposed project, BP personnel would perform routine or emergency maintenance on the proposed well location. One light-duty vehicle would continue to access the area on near daily basis. Heavy-duty vehicles (semi-trucks) would access the well site 1 to 2 times a day for approximately 6 months after which traffic trips would decrease to approximately 1 trip per month.

Final Reclamation and Abandonment

Once the well site is no longer necessary and would not be expected to be utilized in the foreseeable future, it would be abandoned. Abandonment of the well would be carried out under current BLM regulations. Aboveground facilities would also be removed.

Final reclamation would occur within any portion of the project area 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 re-vegetate 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.

Details of the Final Reclamation and Abandonment process are provided in the Surface Reclamation Plan on file with the BLM-FFO.

2.2.3. Proposed Surface Disturbance

Total surface disturbance associated with the proposed project would be approximately 5.3 acres. Of this, approximately 4.9 acres would be considered new surface disturbance. New surface disturbances include approximately 4.5 acres for the construction of the well pad and well pad buffer, 0.2 acres for the access road and 0.2 acres for the well-connect pipeline. Details of individual project disturbances can be found in Table 2.

Depictions of the surface-disturbing activity locations are provided in Appendices A (Maps) and B (Plats).

Table 2. Proposed Project Surface Impacts

Surface Disturbance Description (Approximate Stationing)	Existing/Previously Permitted/Proposed Surface Disturbance	New Surface Disturbance (acres)
Well Pad		
Well Pad	-	400-foot by 300-foot location (2.7 acres)
Well Pad Buffer	Existing dirt road (0.05 acres)	50-foot construction buffer zone (1.8 acres – 0.05 acres existing disturbance = 1.8 acres)
Well Pad TOTAL	0.05 acres	4.5 acres
Access Road		
30' ROW for the travel surface and 90' ROW where access meets existing road 0+00 to 2+28.58	-	228.6 long x varying ROW (0.2 acres)

Pipeline		
Within Existing Storey B LS 6 Well Pad Disturbance 0+00.00 to 1+86.55	186.55' long x 40' ROW (0.2 acres)	-
Cross-Country 1+86.55 to 2+15.26	-	28.7' long x 40' ROW (0.03 acres)
Parallels Existing Storey B LS 6 Access Road 2+15.26 to 3+38.80	123.5' long x 20' ROW (0.06 acres)	123.5' long x 20' ROW (0.06 acres)
Parallels Proposed Access Road 3+38.80 to 5+64.55	225.75' long x 20' ROW (0.1 acres)	225.75' long x 20' ROW (0.1 acres)
Overlaps Proposed Well Pad 5+64.55.00 to 5+95.71	31.2' long x 40' ROW (0.03 acres)	-
Pipeline TOTAL	0.4 acres	0.2 acres
Total Project Surface Disturbance	0.4 acres	4.9 acres

2.3. Alternatives Considered but Eliminated from Detailed Study

Originally the project site was proposed to the north of the current location, aligned northwest to southeast to the south of Calloway Road and paralleling the pipeline/two track road to the east. The original location was onsite on July 23rd, 2015 and an EA was submitted and approved by BLM-FFO in November 2015. However, on November 18, 2015 DCA received notification from BLM-FFO that as a result of a compliance check on November 2, 2015 additional cultural material had been identified in the originally proposed site (see Section 3.3 – Cultural Resources and the original project arch report on file at BLM-FFO for more information) and therefore the original location of the well pad was moved to the current location.

During the original onsite inspection of the proposed action the following alternatives were discussed but eliminated from detailed study.

1. Twinning the existing Storey B LS 6 well to the northeast. This alternative was eliminated from detailed study due to the large fills (approximately 10 feet) needed to increase the existing well pad size to accommodate twinning. It was estimated that 26,000 truckloads (approximately 416,000 cubic yards) of material would be required to balance out the pad.
2. Using the existing road (Calloway Road) to the north of the pad that heads west to a paved road (Ancient Trail Road) to access to site. This alternative was eliminated from detailed study due to the fact that the paved road goes through a subdivision / residential area. Increased amounts of traffic through the area could cause and increased risk in public health and safety.
3. Placing the facilities remotely to mitigate visual disturbances (see Section 3.8 for more details). This alternative was eliminated from detailed study as moving the surface equipment off from location would require BP to run piping and automations cables from the wellhead to the new location. In order to maintain the existing permits and ROWs, this would be a significant amount of piping. Additionally, since the Enterprise pipeline connection is already set at the edge of the proposed pad, we would be required to run piping and automations cables back from the new equipment location to the pipeline tie in. These additional pipelines would require more intrusive work and impacts to the surrounding land. This piping will add pressure drop to the well, which means we would also need to either upsize all the existing piping and facilities on existing pad, or

change our design and estimated flow rates to handle the higher pressures. Not only would this add a large expense, but it will require rework of all the existing engineering and design that has already been completed. Additionally, the most likely spot to move the equipment would be to the nearby BP Storey B LS 6 well pad, but that location is physically higher on the hill than on the existing proposed location (5,973 vs. 5,936 AMSL) and the additional required equipment (additional or larger compressor and additional tanks) would likely be more visible on that location than on the existing proposed location.

During the February 2016 onsite inspection of the proposed action a single alternative was discussed but eliminated from detailed study:

1. Constructing the access road from the middle of the western edge of the well pad to the northwest where it would meet up with the existing access road (Calloway Road) to the north. This alternative was eliminated due to drainage issues from a number of ephemeral washes to the north of the pad. Complex diversions would need to be used to direct stormwater away from the well pad / access road and a culvert would need to be placed where the access would meet the existing road.

No other alternatives have been developed that would result in significantly fewer impacts or any clear advantages over the proposed action. Overall impacts to the natural resources, if an alternative well location were required, would be substantially identical to the proposed action with only minor differences in disturbances to soil, vegetation, range management, and wildlife occurring. The proposed action was selected for the best drainage of subsurface resources while protecting surface resources to the maximum extent possible.

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 Storey B LS 6-1H 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. Methodology

3.1.1. Direct and Indirect Impacts

In the following discussion of affected environment and potential environmental consequences, the action area is defined as any area that may be directly or indirectly impacted by the proposed action described in Chapter 2. Impacts to the action area are based on predicted trends and typical current land uses. Impacts can either be direct, referring to immediate impacts in time, or indirect impacts which are effects that occur later in time but are still reasonably likely to occur as a result of project implementation. The analysis area will be a defined area with either a natural or human delineated boundary. Often, the analysis area is the watershed in which the action occurs. For some issues, the analysis area may be a county or grazing allotment boundary.

Environmental consequences of the proposed action can be either long term (permanent or residual) or short term (incidental or temporary). Short-term impacts (usually less than 5-years) affect the environment for only a limited period and then the environment reverts rapidly back to pre-action conditions. Long-term impacts are substantial and permanent alterations to the pre-existing environmental condition.

3.1.2. Cumulative Impacts

A Reasonably Foreseeable Development scenario (RFD) was prepared for the FFO in October 2014 (Engler, et al., 2014). The RFD identified high, moderate, and low potential regions for oil development of the Mancos-Gallup Formation. Within the high potential region, full development would include 5 wells per section, resulting in 1,600 completions. Within the moderate potential region, full development would include one well per section, resulting in 330 completions. Within the low potential region, full development would include one well per township, resulting in 30 well completions. Additionally, the RFD predicted 2,000 gas wells could be development in the northeastern corner of the FFO.

The following methods and assumptions were used to predict the potential impact of the development predicted in the RFD.

Past Oil and Gas Development

Past oil and gas wells were identified using Ongard. Following interim reclamation, the average well pad size for past development is 0.75 acres per well pad.

Present and Future Oil Development

Based on previous development, it was assumed that development of the high potential region would involve the twinning of well pads. This is the placement of two or more wells on one well pad. The assumption for the analysis is that the development of a section would include two twinned well pads and one single well pad, resulting in three well pads for five wells. In the moderate and low potential regions, it was assumed that development would involve single well pads. The proposed action is located in a Wet Gas prone area.

The average well pad size for a twinned well pad was assumed to be 500 feet by 530 feet, or 6.08 acres. An additional 0.6 acres was added to account for any associated road or pipeline development, resulting 6.68 acres of short-term disturbance. Following completion of the well, interim reclamation of the well pad and reclamation of any pipelines would occur, resulting in 1.5 acres of long-term disturbance.

The average well pad size for a single well pad was assumed to be 500 feet by 500 feet, or 5.74 acres. Again, an additional 0.6 acres was added to account for associated road or pipeline development, resulting in 6.34 acres of long-term disturbance. Following completion of the well, interim reclamation of the well pad and reclamation of any pipelines would occur, resulting in 1.5 acres of long-term disturbance.

The Random Point Tool in ArcMap was used to randomly assign points representing well pads and associated disturbance based on the RFD assumptions: five wells per section in the high potential region, one well per section in the moderate potential region, and one well per township in the low potential region. The allowed both long-term and short-term disturbance from oil development of the Mancos-Gallup Formation to be calculated for the analysis areas used in this EA.

Present and Future Gas Development

The RFD predicted 2,000 wells could be developed in the gas prone area. The average well pad size was assumed to be 555 feet by 410 feet, or 5.22 acres. An additional 0.6 acres of disturbance was added to account for associated roads and pipelines, resulting in total disturbance of 5.82 acres. Following completion of the well, interim reclamation of the well pad and reclamation of any pipelines would occur, resulting in 1.5 acres of long-term disturbance.

3.2. Air Resources

3.2.1. Affected Environment

The proposed well is located in San Juan 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 (CO₂), methane (CH₄), nitrous oxide (N₂O), 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; (U.S. Department of Interior Bureau of Land Management, 2014)). 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 (NO₂), ozone (O₃), particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂) 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

Criteria Air Pollutants

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 (U.S. Environmental Protection Agency, 2013) 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 3. 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 3. 2012 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 ^{3,4}	60 µg/m ^{3,6}
PM _{2.5}	14 µg/m ³	24 hour	35 µg/m ^{3,3}	150 µg/m ^{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 99 th 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 (U.S. Environmental Protection Agency, 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 4). 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 4. 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 (U.S. Department of Interior Bureau of Land Management, 2014). 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 (U.S. Environmental Protection Agency, 2012).

Climate

The analysis area is located in a semiarid climate regime typified by dry windy conditions and limited rainfall. Summer maximum temperatures are generally in the range of 80 or 90 degrees Fahrenheit (°F), and winter minimum temperatures are generally in the teens to 20s. Temperatures occasionally reach above 100°F 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 5 shows climate normals for the 30-year period from 1981 to 2010 for the Farmington, New Mexico, area.

Table 5. Climate Normals for the Farmington Area, 1981-2010

Month	Average Temperature (°F ⁽¹⁾)	Average Maximum Temperature (°F)	Average Minimum Temperature (°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 CO₂ 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.

3.2.2. Impacts from the Proposed Action

Methodology and assumptions for calculating air pollutant and greenhouse gas emissions are described in the Air Resources Technical Report. This document incorporates the sections discussing the modification of calculators developed by the BLM to address emissions for one horizontal gas well. The calculators give an approximation of criteria pollutant, HAP, and greenhouse gas (GHG) emissions to be compared to regional and national emissions levels. Also incorporated into this document are the sections describing the assumptions used in developing the inputs for the calculator (U.S. Department of Interior Bureau of Land Management, 2014).

Direct and Indirect Impacts

Criteria Pollutants

Table 6 shows estimated emissions from one proposed horizontal gas well for criteria pollutants, volatile organic compounds (VOC) and greenhouse gas (GHG). For comparison, Table 7 shows total human-caused emissions for each of the counties in the FFO and La Plata County, Colorado, based on USEPA's 2011 emissions inventory (U.S. Environmental Protection Agency, 2014).

Table 6. Criteria Pollutant and VOC Emissions Estimated for Construction of One Horizontal Gas Well; Average 25 Days to Drill and Complete

Activity	NO _x	CO	VOC	PM ₁₀	PM _{2.5}	SO ₂	CH ₄	CO ₂
One time operations (tons)								
Construction	5.5	1.5	0.5	2.5	0.25	0.1	0.007	598.85
Completion	0.5	0.1	0.03	0.025	0.025	-	-	55.00
Interim Reclamation	0.006	0.006	0.006	0.001	-	0.003	-	1.24
Final Reclamation	0.006	0.006	0.006	0.001	-	0.004	-	1.66
Ancillary Operations (tons)								
Workover	0.129	0.04	0.01	0.01	0.01	-	-	10.59
Road Maintenance	-	-	-	-	-	-	-	0.26
Road Traffic	-	-	-	-	-	-	-	0.06
Annual operations (tons/yr)								
Equipment Leaks	-	-	-	-	-	-	0.013	-
Field Compression	0.14	0.29	0.10	0.01	0.01	-	-	19.30
Total	6.28	1.94	0.65	2.55	0.30	0.11	0.02	686.96

Table 7. Analysis Area Emissions in Tons/Year, 2011

County	NO _x ⁽¹⁾	CO ⁽²⁾	VOC ⁽³⁾	PM ₁₀ ⁽⁴⁾	PM _{2.5} ⁽⁵⁾	SO ₂ ⁽⁶⁾
McKinley	11,952.9	17,007.8	3,891.2	70,096.4	7,645.2	1,381.1
Rio Arriba	12,012.3	27,344.6	19,149.8	33,761.2	4,130.6	60.4
San Juan	42,231.5	63,568.9	26,110.8	76,638.3	9,201.0	5,559.3
Sandoval	4,143.8	19,513.9	4,373.1	39,343.0	4,510.8	109.3

La Plata	4,838.2	17,116.3	3,740.1	2,330.0	919.6	127.9
Total	75,187.7	144,551.5	57,265.1	222,168.9	26,407.2	7,237.9
⁽¹⁾ NO _x – nitrogen oxides ⁽²⁾ CO – carbon monoxide ⁽³⁾ VOC – volatile organic compounds ⁽⁴⁾ PM ₁₀ – particulate matter with an aerodynamic diameter equal to or less than 10 microns ⁽⁵⁾ PM _{2.5} – particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ⁽⁶⁾ SO ₂ – sulfur dioxide						

Table 8 displays the percent increase in total emissions in the analysis area from the proposed action to construct and operate one horizontal gas well.

Table 8. Percent Increase in Analysis Area Emissions from the Proposed Action

	NO _x ⁽¹⁾	CO ⁽²⁾	VOC ⁽³⁾	PM ₁₀ ^(4,5)	PM _{2.5} ^(5,6)	SO ₂ ^(5,7)
Total Emissions	75,187.7	144,551.5	57,265.1	222,168.9	26,407.2	7,237.9
Horizontal Gas Well Emissions	6.28	1.94	0.65	2.55	0.30	0.13
Percent Increase	0.008	0.001	0.001	0.001	0.001	0.002
⁽¹⁾ NO _x – nitrogen oxides ⁽²⁾ CO – carbon monoxide ⁽³⁾ VOC – volatile organic compounds ⁽⁴⁾ PM ₁₀ – particulate matter with an aerodynamic diameter equal to or less than 10 microns ⁽⁵⁾ Values derived from average emissions for any well drilling in the analysis area. Calculated results available upon request. ⁽⁶⁾ PM _{2.5} – particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ⁽⁷⁾ SO ₂ – sulfur dioxide						

Hazardous Air Pollutants

The formulas used for calculating HAPs in the calculators are very imprecise. For many processes it is assumed that emission of HAPs will be equivalent to 10 percent of VOC emissions. Therefore, the estimated HAP emissions 0.065 tons/year should be considered a very gross estimate.

Total Greenhouse Gases

The available statewide GHG summary combines GHG emissions from CO₂ and CH₄. To compare the GHG emissions from the Proposed Action estimated by the calculator with statewide GHG emissions, CO₂e emissions for both CH₄ and CO₂ were summed. The total statewide GHG emission estimate for 2007 was 76,200,000 metric tons CO₂e (76.2 million metric tons; (New Mexico Environment Department, 2010)). The estimated CO₂e metric tons emissions from one conventional gas well (623.2 metric tons) would represent a 0.0008 percent increase in New Mexico CO₂ emissions.

Cumulative Impacts

The FFO manages federal hydrocarbon resources in San Juan, Sandoval, Rio Arriba, and McKinley Counties. There are approximately 21,150 wells in the San Juan Basin. About 14,843 of the wells in these counties are federal wells. Analysis of cumulative impacts for reasonable development scenarios and RFDS of oil and gas wells on public lands in the FFO was presented in the 2003 RMP. This included modeling of impacts on air quality. A more detailed discussion of Cumulative Effects can be found in the Air Resources Technical Report (U.S. Department of Interior Bureau of Land Management, 2014).

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 (U.S. Department of Interior Bureau of Land Management, 2014). 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 emissions calculator estimated that there could be very small direct and indirect increases in several criteria pollutants, HAPs, and GHGs as a result of implementing the proposed alternative. The very small increase in emissions that could result 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 (U.S. Department of Interior Bureau of Land Management, 2014) 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.

3.3. Cultural Resources

3.3.1. 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 (BLM 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")."*

In the broadest sense cultural resources include sites, buildings, structures, objects, and districts/landscapes (NPS 1997). Cultural resources (prehistoric or historic) 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) are cultural resources that are eligible for the National Register of Historic Places (NRHP) and have cultural values, sometimes sacred, 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 (Parker and King 1998). Historically Native American communities are most likely to identify TCPs, although TCPs are not restricted to those associations. Some TCPs are well known while others may only be known to a small group or otherwise

only vaguely known. Native American tribal perspectives on what is considered a TCP are not necessarily limited by a places National Register eligibility or lack thereof.

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. In the event a determination of eligibility cannot be made, the resource is treated as eligible (a historic property).

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 archaeological BLM Class III level (100%) pedestrian survey's by San Juan County Museum Association, Division of Conservation Archaeology. Following the original survey conducted between June 3 and August 24, 2015, very heavy rainfall occurred, which exposed two sites that had not been visible on the surface during the survey. This caused the project to fail BLM on-site. The project was subsequently redesigned and the sites recorded. During the second on-site, the BLM asked that aspects of the project redesign be changed resulting in additional changes in the well layout and access and pipeline routing. The following archaeological reports were prepared and submitted to the BLM:

- *The Cultural Resources Inventory of BP America Production Company's Proposed Storey B LS 6 No. 1H Well Pad, Access Road, and Enterprise Field Services LLC's Well Tie Pipeline, San Juan County, New Mexico.* Report No. 15-DCA-017 / BLM Report No.: (Meininger 2015a)
- *The Cultural Resources Inventory of BP America Production Company's Proposed Relocated Storey B LS 6 No. 1H Well Pad, Access Road, and Enterprise Field Services LLC's Well Tie Pipeline, San Juan County, New Mexico.* Report No. 15-DCA-017 / BLM Report No.: 2015(IV)029F (Meininger 2015b)

The Class III inventory of the original project location identified five (5) isolated occurrences (IOs) within the APE. None of the five IOs were determined eligible for inclusion in the NRHP. No TCPs are known to exist in the APE (Meininger 2015a).

The Class III inventory of the proposed site identified three (3) new sites and four (4) isolated occurrences (IOs) within the APE. All three of the new sites are eligible for inclusion on the NRHP based on criterion d.

None of the five IOs were determined eligible for inclusion in the NRHP. No TCPs are known to exist in the APE (Meininger 2015b).

The congressionally designated route of the Old Spanish National Historic Trail (OST) lies ca. .9 miles south of the Proposed Action. On November 6, 1829 Santa Fe merchant Antonio Armijo led 30-60 men and pack mules on an 86 day journey from Abiquiu to San Gabriel Mission. Armijo's journal (Hafen and Armijo 1947) indicates that he passed through this area November 13-14. He left San Gabriel Mission on March 1, 1830 following the same route, arriving home on April 25, 1830, having completed the first round trip trade caravan between New Mexico and California. Armijo apparently used this route only once, and subsequently routes farther to the north took precedence. The OST is a term used largely after the period of significant use and the name Spanish Trail is attributed to John C. Fremont in 1845 and presumably takes its name from the Spanish colonies in northern New Mexico and southern California that were economically linked by this rugged route. During the period of significance (1829-1847) the trail went by the name El Camino de California and El Camino de Nuevo Mexico (Merlin, Marshall, Roney 2011:6).

There are no known traces of the OST Armijo Route in the area of the Proposed Action and its exact location remains unknown. Based on GIS analysis the Proposed Action appears to lie within view of the designated route. However, field visits by BLM cultural staff determined that terrain and vegetation blocks any view of the Proposed Action from the designated trail.

3.3.2. 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's in the APD/ROW as the case may be. 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).

Old Spanish National Historic Trail

The BLM is required to evaluate whether the proposed action would substantially interfere, or be incompatible with the nature and purposes of the National Trail (Manual 6280, Section 1.6.A.2.i-ii).

- Will the BLM's ability to effectively manage the nature and purposes of the trail, trail resources, qualities, values, uses (including public access and enjoyment) and associated settings be affected?
 - No. Public access and enjoyment of the Armijo Route of the OST in this area will not be affected.
- Will it require a major relocation of the National Trail Management Corridor in order to provide for the conservation and enjoyment of the nationally significant resources, qualities, values, and associated settings of the areas through which such trails may pass, or the primary use or uses of the trail?
 - No. The National Trail Management Corridor has not yet been designated.

- Are the characteristics that made the trail worthy of designation, including Federal Protection Components, including high-potential historic sites or high potential route segments located on public land, are affected?
 - No. Based on a viewshed analysis, some or all of the Proposed Action may be visible from within 0-5 miles (e.g. foreground-middle ground) of the OST. A field visit by BLM cultural staff on verified a high level of existing development in this area (power lines, pipelines, improved and paved roads, natural gas wells, etc.) and concluded the impact will not be adverse. In addition there are no known high potential historic sites related to the period of significance for the OST in this area.
- Are designated National Historic Trail properties, including remnants and artifacts from the associated period of use that may be eligible or listed on the National Register and/or determined by the National Trail administering agency to qualify as possible high potential historic sites or high potential route segments affected?
 - No. Decades of cultural resources surveys have not identified any physical evidence of the OST within this area.
- Is the agency's ability to manage the trail for the purpose of identifying and protecting the historic route and its historic remnants and artifacts for public use and enjoyment, including interpretation, education, appreciation, and vicarious experiences affected?
 - No. Public use and enjoyment, including opportunities for interpretation, education, appreciation, and vicarious experiences are not affected.

Since it has been determined that the proposed action does not have the potential to substantially interfere with the nature and purposes, or constitute an incompatible activity, to the level that may cause significant adverse impact to the nature and purposes, no notification to the Deputy State Director and the NLCS Division Chief is required pursuant to BLM Manual 6280, Section 5.3.C.

Cumulative Impacts

The Cumulative Impacts Analysis Area (CIAA) is the associated watershed(s). The United States is divided and sub-divided into successively smaller hydrologic units which are classified into six levels nested within each other, from the largest geographic area (region) to the smallest geographic area (subwatershed). The boundaries are distinguished by hydrographic and topographic criteria that delineate an area of land upstream from a specific point on a river, stream or similar surface waters (USGS 2013, NRCS 2013). Hydrologic units can be viewed as a naturally defined landscape and impacts to cultural resources in one part of that landscape could, theoretically, affect a broader understanding of the interrelationships between sites in the landscape as a whole. The smallest hydrologic unit area, typically from 10 to 40 K acres (15 to 62 mi²; HUC 12) or combination thereof are used as the CIAA.

The CIAA for cultural resources is the proposed project area and the Estes Arroyo-Animas River subwatershed which total 37,011 acres. Based on New Mexico Cultural Resource Information System data (NMCRIS; July 2015), within the subwatershed there are 346 recorded sites and approximately 20% of the subwatershed (7,367 ac) have been inventoried for cultural resources by 755 unique investigations since 1975. The cultural inventory coverage for the CIAA is likely higher as not all survey data is digitally available (e.g., surveys since July 2015).

Aztec Ruins National Monument is within the CIAA and is listed on the National Register of Historic Places, New Mexico State Register of Cultural Properties, and as a World Heritage Sites. The Old Spanish National Historic Trail also intersects the CIAA.

There are no properties listed as Chaco Protection Sites within the CIAA.

- What impacts would surface disturbance for the proposed action have on historic properties in the CIAA?

There will be no negative cumulative impact on cultural resources as no historic properties are present. There will be no known negative cumulative impact on the landscape that would affect the seven aspects

of integrity (location, design, setting, materials, workmanship, feeling, association) of known historic properties. A positive cumulative effect is the additional scientific information yielded by the archaeological survey in terms of the amount of the landscape inventoried for cultural resources.

- What impacts would the project have on unknown (buried, not visible) historic properties in the CIAA?

Risks of impacting unknown (i.e., buried) historic properties is normally negligible as cultural resources “discoveries” during surface disturbing components of a proposed action are infrequent in the FFO. Since FY2000, 28 discoveries have occurred in association with 21,290 actions (e.g. road, well, pipeline, etc.), or 1:760. During that period 153,626 ac of land were inspected for cultural resources, with an average of 7.2 ac per action and one discovery per 5,472 ac. All authorizations (e.g., APDs, R-O-Ws) have stipulations, under penalty of law, require the reporting of and avoidance of further disturbing cultural discoveries during a proposed action. Where the risk of discoveries can be reasonably expected (e.g., $\leq 100'$ of a known historic property, or in environmental settings known or suspected to be conducive to buried sites), archaeological monitoring by a qualified and permitted archaeologist during initial disturbance (e.g., blading, trenching) is normally required. If buried historic properties are discovered, collaborative steps are taken to protect them in place or recover their important information.

3.4. Upland Vegetation

3.4.1. Affected Environment

The analysis area is located within the United States Environmental Protection Agency (USEPA) designated Arizona/New Mexico Plateau Level III ecoregion. 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 [km²]), and the elevation ranges from 2,165 to 11,949 feet AMSL (660 to 3,642 meters). 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 forests. The ecoregion includes the urban areas of Santa Fe and Albuquerque. Important land uses include irrigated farming, recreation, rangeland, wildlife habitat, and some natural gas production (Griffith, et al. 2006).

The general region surrounding the proposed project area is characterized by drier shrublands, semiarid grasslands, sparse woodlands and mesas. The proposed project is located within Inter-Mountain Basins Semi-Desert Shrub-Steppe vegetation community with moderate desert grassland characteristics and piñon-juniper woodland hills (Lowry 2005). Dominant vegetation consists of big sagebrush (*Seriphidium tridentatum*), blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), rabbitbrush (*Chrysothamnus* sp.), New Mexican prickly pear cactus (*Opuntia phaeacantha*), narrowleaf yucca (*Yucca angustissima*) and to a lesser degree, Utah juniper (*Sabina osteosperma*), Piñon pine (*Pinus edulis*), James’ galleta (*Pleuraphis jamesii*), Cholla cactus (*Cylindropuntia* sp.) and Russian thistle (*Salsola australis*). There were approximately 50 – 60 trees documented within the proposed project area.

During the onsite field inspections of the proposed project area no USDA-listed noxious weeds (NRCS 2010), NMDA-listed noxious weeds (NMDA 2009), or BLM-FFO invasive or poisonous weed species (BLM 2003a, 3-34 – 3-35) were identified within the proposed project area (see Section 3.5 - Noxious and Invasive Weeds for more details).

3.4.2. Impacts from the Proposed Action

Direct and Indirect Impacts

During the construction phase of the proposed project, all vegetation within the proposed project area would be cleared. The proposed action would result in the removal of approximately 4.9 acres of Inter-Mountain Basins Semi-Desert Shrub-Steppe vegetation community. Between 50 and 60 trees would be removed as a result of the proposed action.

In areas that would be reclaimed within the proposed project area, 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 well pad would be reclaimed to a BLM-approved working area. A single working area and a teardrop shaped road to access the well heads and the facilities would remain disturbed for the lifetime of the project (0.7 acres). The remainder of the proposed well pad (approximately 2.0 acres) and construction zone (1.8 acres) would be fully reclaimed during interim reclamation. A 14-foot-wide running surface and the bottoms of the bar ditches along either side of the access road and the 90-foot right-of-way where the proposed access meets the existing Storey B LS 6 access road to the east (approximately 0.15 acres, total) would remain disturbed for the lifetime of the project. The remainder of the disturbed access road corridor (0.06 acres) would be reclaimed during interim reclamation. All new surface disturbances associated with the pipeline corridor (approximately 0.2 acres) would be reclaimed during interim reclamation.

Details of the proposed action during interim reclamation can be found in the Surface Reclamation Plan on file with the BLM-FFO. During final reclamation, BP would fully reclaim any portions of the proposed project area that would be disturbed to bare soil as a result of final abandonment earthwork activities (if such areas total greater than 0.1 acre). During interim and final reclamation, the BLM-FFO approved "Sagebrush" seed-mix would be utilized. The species included in this mixture can be found in the Surface Reclamation Plan on file at the BLM-FFO. Reestablished vegetation would consist of native grass, forb, and shrub species included in the seed mixture, as well as native species that are not deliberately planted. It is also possible that invasive, nonnative species could become established within the proposed project area, as such species could be transported by project equipment and tend to thrive in disturbed areas. Following the reclamation process, the resulting vegetation communities could differ from the native plant communities surrounding the proposed project area. Within reclaimed areas, it is not expected that the vegetation communities would return to native conditions within 20 years (BLM 2003a, 4-18).

Cumulative Impacts

The spatial analysis area of the proposed project area is the Animas Watershed (HUC_10 # 1408010410). Existing surface disturbances within the spatial analysis area include an estimated 3,238 well pads for a total disturbance of 6,596.47 acres (2,428.5 acres long term disturbance and 4,167.97 acres reclaimed). Potential surface disturbances within the spatial analysis area, anticipated to occur in the reasonably foreseeable future, include an estimated 197 well pads for a total disturbance of 1,147.04 acres (295.5 acres long term disturbance and 851.54 acres reclaimed, Engler et al. 2014). The Proposed Action would account for 0.9 acres of that long term disturbance total and represent approximately 0.3% of the cumulative impacts to upland vegetation resources.

Additional surface disturbances that have occurred or are anticipated to occur in the reasonably foreseeable future include:

- Within a 1-mile radius of the proposed well site there are approximately 51 active well sites.
- New Mexico State Road 173 (Navajo Dam Road) has been developed to provide access to Navajo Dam as well as numerous residences and wells. In addition, there are a number of dirt resource and access roads used to access surrounding well sites.

- Calloway Road, a dirt road to the north of the proposed well pad, connects to Ancient Trail, a paved road to the west, used to access a number of residences to the west.
- Active wildlife and livestock grazing occurs in the area. The project area is located within the Knickerbocker Ranch allotment No. 05037 managed by the BLM-FFO.

Other reasonably foreseeable actions such as continued livestock grazing, vegetation treatments, and, 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.

3.5. Noxious Weeds and Invasive Species

3.5.1. 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). A noxious weed plan for monitoring and treatment of any existing or new infestations will be established by BP for the length of this project. BMP's for the management of invasive and non-native plants associated with the proposed project are described in detail in Section 2.2.2 (Description of Proposed 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 2009). 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 onsite field inspections of the proposed project area no USDA-listed noxious weeds (NRCS 2010), NMDA-listed noxious weeds (NMDA 2009), or BLM-FFO invasive or poisonous weed species (BLM 2003a, 3-34 – 3-35) were identified within the proposed project area.

3.5.2. 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). BMP's for the management of invasive and non-native plants associated with the proposed project are described in detail in Section 2.2.2 (Description of Proposed Project).

Cumulative Impacts

The spatial analysis area of the proposed project area is the Animas Watershed (HUC_10 # 1408010410). Existing surface disturbances within the spatial analysis area include an estimated 3,238 well pads for a total disturbance of 6,596.47 acres (2,428.5 acres long term disturbance and 4,167.97 acres reclaimed). Potential surface disturbances within the spatial analysis area, anticipated to occur in the reasonably foreseeable future, include an estimated 197 well pads for a total disturbance of 1,147.04 acres (295.5 acres long term disturbance and 851.54 acres reclaimed, Engler et al. 2014). Additional ground-disturbing activities that have or are anticipated to occur in the reasonably foreseeable future described in Section 3.4 (Upland Vegetation). The Proposed Action would account for 0.9 acres of that long term disturbance total and represent approximately 0.3% of the cumulative impacts of noxious and invasive weeds.

These disturbances in addition to ongoing activities, such as vehicles driving and livestock grazing, have contributed to the potential for weeds such as cheatgrass (*Bromus tectorum*) and Russian thistle (*Salsola spp.*), to be introduced into the spatial analysis area from other locations 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.

3.6. Wildlife

3.6.1. Affected Environment

Migratory Birds

Executive Order 13186 dated January 17, 2001 calls for increased efforts to more fully implement the Migratory Bird treaty Act of 1918. In keeping with this mandate, the BLM/FFO has issued an interim policy to minimize unintentional take as defined by the EO 13186 and to better optimize migratory bird efforts related to BLM/FFO activities (BLM 2010). In keeping with this policy, a list of priority birds of conservation concern which occur in similar eco-regions as the proposed action area was compiled through a review of existing bird conservation plans including:

- Fish and Wildlife Service (USFWS) Birds of Conservation Concern (BCC)
- New Mexico Partners in Flight (NMPiF) New Mexico Bird Conservation Plan
- Comprehensive Wildlife Conservation Strategy for New Mexico (CWCS)
- Gray Vireo Recovery Plan
- The North American Waterbird Conservation Plan
- Recovery plans and conservation plans/strategies prepared for federally-listed candidate species.

The selected species have a known distribution in the BLM-FFO area and may be affected by various types of perturbations. The BSR (Appendix C) lists those priority species that have the potential to occur within the proposed project area.

No raptors or their sign were observed during the onsite survey. According to the most recent BLM-FFO raptor nest geographic information system (GIS) data (BLM 2016b), no nest sites are located within 1/3-miles of the PPA.

General Wildlife

The Inter-Mountain Basins Semi-Desert Shrub-Steppe vegetation community found within the proposed project area provides habitat for a variety of vertebrate and invertebrate species. The objectives of the BLM wildlife management program are to “ensure optimum populations and a natural abundance and diversity of fish and wildlife values by restoring, maintaining, and enhancing habitat conditions for consumptive and non-consumptive uses” (BLM 2003a, 2-24).

The analysis area is located in an Inter-Mountain Basins Semi-Desert Shrub-Steppe community dominated by native grasses and big sagebrush. Wildlife common to these habitats include mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), fox (*Vulpes sp.*), black-tailed jackrabbit (*Lepus californicus*), cottontail rabbit (*Sylvilagus sp.*), and various reptiles (snakes and lizards) and birds. Wildlife or signs observed in the analysis area included cottontail rabbit and mule deer. No prairie dog colonies were observed within the proposed project area nor had they been recorded within or adjacent to the proposed project area (BLM 2016c).

3.6.2. Impacts from the Proposed Action

Direct and Indirect Impacts

During the construction phase of the proposed project, all vegetation within the proposed project area would be cleared. The proposed project would result in the removal of approximately 4.9 acres of Inter-Mountain Basins Semi-Desert Shrub-Steppe vegetation community. The well pad would be reclaimed to a BLM-approved working area. The proposed project area would be converted to a reseed community following interim reclamation. If interim reclamation is successful, Sagebrush vegetation community would become re-established within the proposed project area. However, as discussed in Section 3.4 (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). Additionally, the transformation of the proposed project area to a reseed community could remove potential habitat for numerous wildlife species, including the priority bird species listed in the BSR (Appendix C).

There is available, similar habitat in the surrounding area that wildlife could utilize. However, the clearing of vegetation would remove potential habitat. It is assumed that habitat loss and fragmentation likely reduce the carrying capacity for wildlife, including avian species; although the exact level of reduction cannot be quantified (BLM 2003a, 4-29). Initial surface disturbances associated with the proposed project would be approximately 4.9 acres. After interim reclamation surface long-term disturbances would be reduced to approximately 0.87 acres which includes a single working area and a teardrop shaped road to access the well heads and the facilities as well as a 14-foot-wide running surface and the bottoms of the bar ditches along either side of the access road and the 90-foot right-of-way where the proposed access meets the existing Storey B LS 6 access road to the east. The remaining proposed disturbance including the well-connect pipeline has been placed adjacent to existing disturbance and will be fully reclaimed, and as such, would not result in new fragmentation and result in reduced overall fragmentation of the surrounding area. Therefore, the threat of fragmentation from the proposed project in relation to existing disturbance is minimal.

Migratory Birds

Audial and visual disturbances associated with the proposed project could temporarily deter wildlife (including migratory birds) from utilizing the proposed project area and immediately adjacent lands. However, due to the mobility of adult birds, they would be unlikely to be directly harmed by the proposed project. As discussed in Section 2.2.2 (Description of Proposed Project - Protection of Flora and Fauna, Including SSS and Livestock), if the vegetation-clearing phase of construction is scheduled to occur during migratory bird breeding season, a pre-construction migratory bird nest survey would be conducted within the proposed project area. Therefore, it is unlikely that nests, eggs, or young birds within the proposed project area would be directly harmed. If proposed project activities occur during migratory bird breeding season, birds nesting outside of but near the proposed project area could abandon existing nests as a result of visual and audial disturbances.

General Wildlife

It is possible that burrowing animals could be killed or injured during the construction phase of the proposed project, as equipment digs into the earth and rolls over the surface of the ground. During the construction phase of the proposed project, terrestrial wildlife could fall into an open pipeline trench and be injured, stressed, or killed. The presence of an open trench could also disrupt normal wildlife movements to and from water and/or food sources. Wildlife could have to skirt the open-trench portions of the proposed pipeline corridor to access water and/or food; this disruption could stress wildlife and result in the loss of valuable energy resources. As discussed in Section 2.2.2 (Description of Proposed Project – Protection of Flora and Fauna, Including SSS and Livestock), design features and BMPs would be implemented during the construction phase of the proposed project to assist in the prevention of injury, stress, or death of wildlife. Audial and visual disturbances associated with the proposed project could temporarily deter wildlife from utilizing the proposed project area and immediately adjacent lands. However, due to the mobility of adult wildlife, they would be unlikely to be directly harmed by the proposed project.

Cumulative Impacts

The spatial analysis area of the proposed project area is the Animas Watershed (HUC_10 # 1408010410). Existing surface disturbances within the spatial analysis area include an estimated 3,238 well pads for a total disturbance of 6,596.47 acres (2,428.5 acres long term disturbance and 4,167.97 acres reclaimed). Potential surface disturbances within the spatial analysis area, anticipated to occur in the reasonably foreseeable future, include an estimated 197 well pads for a total disturbance of 1,147.04 acres (295.5 acres long term disturbance and 851.54 acres reclaimed, Engler et al. 2014). Additional ground-disturbing activities that have or are anticipated to occur in the reasonably foreseeable future described in Section 3.4 (Upland Vegetation). The Proposed Action would account for 0.9 acres of that long term disturbance total and represent approximately 0.3% of the cumulative impacts to wildlife and migratory birds.

Other reasonably foreseeable actions such as continued livestock grazing, vegetation treatments, and community development would cumulatively impact wildlife, including migratory birds, through direct and effective habitat loss. The intensity of indirect effects would be dependent upon the species, its life history, time of year and/or day and the type and level of human and vehicular activity occurring.

3.7. Special Status Species

3.7.1. 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).

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 2012). In accordance with BLM Manual 6840, 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.

BLM-FFO Sensitive Species and SMS are discussed in detail in the BSR (Appendix C). It was determined that the following species have the potential to occur or are known to occur within the proposed project area:

- **Aztec gilia:** The entire proposed project area is within the BLM-designated potential habitat area for Aztec gilia. However, soils derived from the Nacimiento Formation, which provides the appropriate geologic substrate for the plant, were not present within the proposed project area. No Aztec gilia were found during the biological survey of the Storey B LS 6-1H project area.
- **Brack's hardwall cactus:** The entire proposed project area is within the BLM-designated potential habitat area for Brack's hardwall cactus. However, soils derived from the Nacimiento Formation, which provides the appropriate geologic substrate for the plant, were not present within the proposed project area. No Brack's cacti were found during the biological survey of the Storey B LS 6-1H project area.
- **Ferruginous hawk:** Potential foraging habitat is available within the proposed project area; however, no suitable nesting habitat is present within or adjacent to the proposed project area. No sign of this species was recorded during the biological survey of the Storey B LS 6-1H project area.
- **Bald eagle:** Potential foraging habitat is available within the proposed project area; however, no suitable nesting habitat is present within the proposed project area. No sign of this species was recorded during the biological survey of the Storey B LS 6-1H project area.
- **Golden eagle:** Potential foraging habitat is available within the proposed project area; however, no suitable nesting habitat is present within the proposed project area. The closest previously documented Golden Eagle nest site is located approximately 1.0 miles west of the project area. No sign of this species was recorded during the biological survey of the Storey B LS 6-1H project area.
- **Peregrine falcon:** Potential foraging habitat is available within the proposed project area; however, no suitable nesting habitat is present within or adjacent to the proposed project area. No sign of this species was recorded during the biological survey of the Storey B LS 6-1H project area.
- **Bendire's thrasher:** Marginal habitat is available within the proposed project area. The proposed project area contains approximately 4.9 acres of Sagebrush Community but is likely out of the species typical range. No sign of this species was recorded during the biological survey of the Storey B LS 6-1H project area.
- **Piñon jay:** Marginal habitat is available within the proposed project area. The proposed project area contains approximately 4.9 acres of Sagebrush Community with scattered Piñon and Junipers, however the lack of large continuous blocks of Piñon Juniper woodlands is likely a limiting factor. No sign of this species was recorded during the biological survey of the Storey B LS 6-1H project area.

3.7.2. Impacts from the Proposed Action

Direct and Indirect Impacts

During the construction phase of the proposed project, all vegetation within the proposed project area would be cleared. The proposed project would result in the removal of approximately 4.9 acres of Inter-Mountain Basins Semi-Desert Shrub-Steppe vegetation community as well as approximately 50 – 60 trees. The well pad would be reclaimed to a BLM-approved working area. The proposed project area would be converted to a reseed community following interim reclamation. If interim reclamation is successful, Sagebrush vegetation community would become re-established within the proposed project area. However, as discussed in Section 3.4 (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). Additionally, the transformation of the proposed project area to a reseed community could remove potential habitat for numerous wildlife species, including the SSS ferruginous hawk, bald eagle, golden eagle, and peregrine falcon and to a lesser degree Bendire's thrasher, and piñon jay. Potential impacts to SSS are described in further detail in the site-specific BSR (Appendix C).

There is available, similar habitat in the surrounding area that SSS could utilize. However, the clearing of vegetation would remove potential habitat. It is assumed that habitat loss and fragmentation likely reduce the carrying capacity for wildlife, including avian species; although the exact level of reduction cannot be quantified (BLM 2003a, 4-29). Initial surface disturbances associated with the proposed project would be approximately 4.9 acres. After interim reclamation surface long-term disturbances would be reduced to approximately 0.87 acres which includes a single working area and a teardrop shaped road to access the well heads and the facilities as well as a 14-foot-wide running surface and the bottoms of the bar ditches along either side of the access road and the 90-foot right-of-way where the proposed access meets the existing Storey B LS 6 access road to the east. The remaining proposed disturbance including the well-connect pipeline has been placed adjacent to existing disturbance and will be fully reclaimed, and as such, would not result in new fragmentation and result in reduced overall fragmentation of the surrounding area. Therefore, the threat of fragmentation from the proposed project in relation to existing disturbance is minimal.

Audial and visual disturbances associated with the proposed project could temporarily deter SSS from utilizing the proposed project area and immediately adjacent lands. However, due to the mobility of adult birds, they would be unlikely to be directly harmed by the proposed project.

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.

Cumulative Impacts

The spatial analysis area of the proposed project area is the Animas Watershed (HUC_10 # 1408010410). Existing surface disturbances within the spatial analysis area include an estimated 3,238 well pads for a total disturbance of 6,596.47 acres (2,428.5 acres long term disturbance and 4,167.97 acres reclaimed). Potential surface disturbances within the spatial analysis area, anticipated to occur in the reasonably foreseeable future, include an estimated 197 well pads for a total disturbance of 1,147.04 acres (295.5 acres long term disturbance and 851.54 acres reclaimed, Engler et al. 2014). Additional ground-disturbing activities that have or are anticipated to occur in the reasonably foreseeable future described in Section 3.4 (Upland Vegetation). The Proposed Action would account for 0.9 acres of that long term disturbance total and represent approximately 0.3% of the cumulative impacts to special management species.

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.

3.8. Visual Resources

3.8.1. Affected Environment

The BLM classifies visual resources through a Visual Resource Inventory (VRI). The VRI has three components: scenic quality, sensitivity, and distance zone. Scenic quality is a measure of the visual appeal of a tract of land. In the VRI process, BLM-managed lands are given an A, B, or C rating based on the apparent scenic quality. Scenic quality is determined by using seven key factors: landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modification. Areas with the most visual appeal are rated A, while areas with the least visual appeal are rated C. The proposed project area is within the Hart Canyon area rated "C" for scenic quality. The area contains rolling hills vegetated with sparse, low shrubs and grasses and dense pinon-juniper. There are only subtle changes in landform and vegetation with a few scattered rims and outcrops. Colors are mostly browns, tans, greens, and grays. In addition the natural vegetation in the area is comprised of light brown patches of exposed soils, visually similar well pad disturbance. To the casual observer the reclaimed well pad areas would look similar to surrounding natural vegetative features.

Sensitivity is a measure of the public concern for scenic quality. During the sensitivity rating, public lands are assigned high, medium, or low sensitivity by analyzing six indicators of public concern: type of user, amount of use, public interest, adjacent land uses, special areas, and other factors. The project area is within an area rated medium for sensitivity.

The distance zone analysis is conducted to determine the relative visibility from travel points or observation points. The distance zone for this area is foreground/midground meaning the area can be seen from travel routes of observation points within a distance of 3 to 5 miles. This indicates activities and development may be able to be viewed in detail.

These components resulted in the area being assigned a VRI Class 4.

A Visual Contrast Rating was conducted from the Ancient Trails Subdivision for the analysis area on October 20th, 2015. Characteristic landscape descriptions of the proposed project area included:

Land/Water –Rolling (hills to the north), irregular (mesas to the east) with flat horizontal lines. Colors included tans, dark and light browns, light brown bare patches. Texture was bumpy to coarse.

Vegetation – Form was generally low, scattered sage brush cover, uniform pinon/junipers with horizontal continuous lines. Colors included patches of dark and light greens, greys, tans and earth tones. Texture was bumpy to course.

Structures – Within the area there was a well pad, a fence line, gate, pipeline markers and an access road running east/west and towers on the mesas to the east. Lines were vertical (roads, pipeline markers and towers). Colors included tan, yellow, white and dark green. Overall texture was smooth.

Additional, project specific, visual site descriptions can be found in the Visual Contrast Rating Worksheets provided in Appendix D.

Visual resources are managed by assigning a Visual Resource Management (VRM) Class. The objective for each VRM Class describes how that area should be managed. The project area is within a VRM Class III/IV area. The objective of these classes is as follows: VRM III - to partially retain the existing character of the landscape. The level of change to the landscape can be moderate and should repeat the basic elements found in the natural landscape. Management activities may attract attention, but should not dominate the view of the casual observer; VRM IV – to provide for activities that require major modification of the landscape. The level of change to the landscape can be high, and management activities may dominate the view and be the major focus of attention.

3.8.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Under the Proposed Action, BP would be altering approximately 4.9 acres of public lands containing scattered sagebrush / shrubland and pinon-juniper woodlands. As discussed in Section 2.2.2 (Description of Proposed Project – Production Facilities), all permanent (on location for 6 months or longer) above-ground equipment constructed or installed will be painted Juniper Green and specifically oriented to minimize visual impact as specified by the BLM-FFO. All production facilities will be painted within 6 months of installation. Facilities that are required to comply with Occupation Health and Safety Rules and Regulations will be excluded from this painting requirement.

A Visual Contrast Rating was conducted for the analysis area on October 20th, 2015 to assess potential visual impact of the proposed action from the Ancient Trails Subdivision. Proposed activity descriptions of the proposed project area included:

Land/Water – Form would generally be flat (well pad), flat and linear (pipeline corridor and access road), gently rolling (surrounding area). In areas where the well pad, access road or pipeline corridor could be seen lines would be horizontal. The colors would be mostly light brown and tan. Texture would be smooth.

Vegetation – Form would be bare where the vegetation was removed for the well pad, access road and pipeline. Vegetation would be low, sparse and consistent in reclaimed areas. Lines would be horizontal where vegetation was removed. Colors would include light brown and tan where the vegetation was removed from the well pad, access road and pipeline and light green, dark green, grey and light brown in reclaimed areas. Texture would be smooth where the vegetation was removed from the well pad, access road and pipeline and bumpy and coarse in reclaimed areas.

Structures – Form and lines would be horizontal rectangular and flat for the well pad, vertical and rectangular for the pump and linear for the access road and pipeline corridor. Colors would be juniper green. Overall texture would be smooth.

Reclaimed portions of the proposed project area would be converted to a reseed community. The impacts to the Inter-Mountain Basins Semi-Desert Shrub-Steppe Community are described in detail in Section 3.4 (Upland Vegetation). If reclamation is successful, Sagebrush Community would become re-established within the reclaimed portions of the proposed project area. However, as discussed in Section 3.4, 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). The conversion of the proposed project area to barren surface and reseed community would result in an alteration in the texture and color of the ground and a reduction in the roughness and complexity of the surface. Roads and reclaimed pipeline corridors would introduce linear elements not naturally occurring in a landscape. Additionally, the proposed equipment would be visible on the proposed facility, creating possible color

contrasts, a change in the texture of the landscape due to the smooth surface of tanks, and a break in the horizontal landscape plane.

In general the Storey B LS 6-1H well pad and access road will likely be seen from the KOP due to distance (approximately 971 feet from KOP), topography, above ground facilities and orientation of the access road. However, there is existing infrastructure both within the vicinity of the proposed project and further in the distance that is already visible from the KOP. In addition the vegetation (juniper trees) will likely reduce the visibility of the well pad and access road and natural vegetation in the area is comprised of light brown patches of exposed soils, visually similar well pad disturbance. To the casual observer, the reclaimed well pad areas would look similar to surrounding natural vegetative features and to existing oil and gas infrastructure. The proposed project is congruent with viewer expectation, as the proposed facilities would be located in an area known for oil and gas industrial activity. Proposed project activities could attract attention but would not dominate the view of the casual observer. The C scenic quality rating, the medium sensitivity rating, VRI Class 4 rating, and VRM Class III/IV criteria would be met.

Cumulative Impacts

The spatial analysis area of the proposed project area is the Animas Watershed (HUC_10 # 1408010410). Existing surface disturbances within the spatial analysis area include an estimated 3,238 well pads for a total disturbance of 6,596.47 acres (2,428.5 acres long term disturbance and 4,167.97 acres reclaimed). Potential surface disturbances within the spatial analysis area, anticipated to occur in the reasonably foreseeable future, include an estimated 197 well pads for a total disturbance of 1,147.04 acres (295.5 acres long term disturbance and 851.54 acres reclaimed, Engler et al. 2014). Additional ground-disturbing activities that have or are anticipated to occur in the reasonably foreseeable future described in Section 3.4 (Upland Vegetation). The Proposed Action would account for 0.9 acres of that long term disturbance total and represent approximately 0.3% of the cumulative impacts to visual resources.

Other reasonably foreseeable actions such as continued livestock grazing, vegetation treatments, and community development could impact the visual resources 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 visual resources are expected within the analysis area for the reasonably foreseeable future.

3.9. Environmental Justice

3.9.1. Affected Environment

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, requires that federal agencies identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

Environmental justice refers to the fair treatment and meaningful involvement of people of all races, cultures, and incomes with respect to the development, implementation, and enforcement of environmental laws, regulations, programs, and policies. It focuses on environmental hazards and human health to avoid disproportionately high and adverse human health or environmental effects on minority and low-income populations.

Guidance on environmental justice terminology developed by the President's Council on Environmental Quality (CEQ 1997) is discussed below.

- Low-income population. A low-income population is determined based on annual statistical poverty thresholds developed by the US Census Bureau. In 2012, poverty level is based on total income of \$11,720 for an individual and \$23,283 for a family of four (US Census Bureau 2012d). A low-income community may include either a group of individuals living in geographic proximity to one another or dispersed individuals, such as migrant workers or Native Americans.

- Minority. Minorities are individuals who are members of the following population groups: American Indian, Alaskan Native, Asian, Pacific Islander, Black, or Hispanic.
- Minority population area. A minority population area is so defined if either the aggregate population of all minority groups combined exceeds 50 percent of the total population in the area or if the percentage of the population in the area comprising all minority groups is meaningfully greater than the minority population percentage in the broader region. Like a low-income population, a minority population may include either individuals living in geographic proximity to one another or dispersed individuals.
- Comparison population. For the purpose of identifying a minority population or a low-income population concentration, the comparison population used in this study is the state of New Mexico as a whole

Low-income Populations

Income and poverty data estimates for study area counties from the US Census Small Area Poverty Estimates model indicate that the percent of the population living below the poverty level in the socioeconomic study area as a whole is slightly above that of the state (21.3 percent and 20.6 percent), but it is much higher than the national average of 12.1 percent (Table 9). Poverty levels ranged from 37.7 percent in McKinley County to 13.7 percent in San Juan County. Only that of Sandoval County was below the state average.

Table 9. Study Area County Population in Poverty (2002-2012)

	McKinley County	Rio Arriba County	Sandoval County	San Juan County	Study Area Total	New Mexico	United States
Percent of Population in Poverty 2002	21,766 30.2%	7,165 17.7%	19,934 11.1%	22,152 18.2%	71,017 21.3%	421,123 20.6%	34,569,951 12.1%
Percent of Population in Poverty 2012	27,296 37.7%	8,806 22.0%	18,502 13.7%	25,802 20.3%	80,406 21.5%	327,444 17.7%	48,760,123 15.9%
Median Household Income 2002	\$25,197	\$30,557	\$45,213	\$34,329	N/A	\$34,827	\$45,409
Median Household Income 2012	\$29,821	\$36,900	\$57,376	\$45,901	N/ A	\$42,828	\$51,371
Classified as Low Income Population in 2012 based on CEQ guidelines?	No	No	No	No	No	NA	NA

Source: US Census Bureau 2013b

Similarly, estimates from 2012 indicate that Sandoval and San Juan Counties had household median incomes (\$57,376 and \$45,901) that were above the state level of \$42,828. McKinley County (\$29,821) and Rio Arriba County (\$36,900) were below that of the state in 2012 (Table 10). While no area communities meet the CEQ definition of a low-income population area (50 percent or higher), the highest poverty rates were seen in Bloomfield (29 percent), Espanola (26.3 percent), and Bernalillo (24.1 percent).

Table 10. Study Area Key Community Race/Ethnicity and Poverty Data

Community	% Population Racial or Ethnic Minority	Classified as Minority Population based on CEQ?	% of Individuals Below Poverty	Classified as Low-income Population based on CEQ?
Aztec	36.4%	No	14.4%	No
Bernalillo	78.8%	Yes	24.1%	No
Bloomfield	55.8%	Yes	29.0%	No
Espanola	91.6%	Yes	26.3%	No

Table 10. Study Area Key Community Race/Ethnicity and Poverty Data

Community	% Population Racial or Ethnic Minority	Classified as Minority Population based on CEQ?	% of Individuals Below Poverty	Classified as Low-income Population based on CEQ?
Farmington	48.8%	No	15.5%	No
Gallup	76.9%	Yes	20.9%	No
Rio Rancho	46.7%	No	9.8%	No

Source: US Census Bureau 2012b
 Note: American Community Survey estimates are based on data collected over a 5-year time period. The estimates represent the average characteristics of populations between January 2008 and December 2012 and do not represent a single point in time.

Census Tracts are geographic regions within the United States that are defined by the US Census Bureau in order to track changes in a population over time. Census Tracts are based on population sizes and not geographic areas. The average population of a Census Tracts is about 4,000 people, so rural areas that are sparsely populated may have very large Census Tracts while densely populated urban areas may have very small Census Tracts.

When broken down by Census Tract, 3 out of 87 tracts in the socioeconomic study area have greater than 50 percent of individuals living below the poverty line: Census Tract 9440 in eastern McKinley County had an individual poverty rate of 54.6 percent; Census Tract 9405 in southwestern McKinley County had an individual poverty rate of 59.4 percent; and Census Tract 9409 in northwestern Sandoval County had an individual poverty rate of 51.9 percent (US Census Bureau 2012b). These 3 Census Tracts are all relatively large, indicating a sparsely populated, rural area.

Minority Populations

Based on 2008-2012 data, minorities made up 59.5 percent of the population in New Mexico, compared to 36.3 percent in the United States as a whole (Table 11). The proportion of minorities in the socioeconomic study area (65.3 percent) substantially exceeded the United States and is slightly higher than the state average. At the county level, the population ranged from 89.7 percent minority in McKinley County to 52.8 percent in Sandoval County. Within relevant tribal nations, Native Americans represented the vast majority of the population. The largest minority groups were Hispanics/Latinos in Rio Arriba and Sandoval Counties and Native Americans in McKinley and San Juan Counties.

Table 11. Study Area County Population by Race/Ethnicity (2008-2012)

Population	McKinley County	Rio Arriba County	Sandoval County	San Juan	Study Area	New Mexico	United States	Jicarilla Apache Nation	Navaho Nation	Ute Mountain Nation
Hispanic or Latino ethnicity of any race	9,744 13.6%	28,714 71.4%	46,334 35.3%	24,496 19%	109,288 29%	952,569 46.3%	50,545,275 16.4%	382 11.6%	2,958 1.7%	99 6.0%
White alone	7,413 10.3%	5,370 28.6%	61,977 47.2%	54,218 42.2%	128,978 34.67%	831,543 40.5%	196,903,968 63.7%	74 2.3%	3,762 2.2%	47 2.9%
Black or African American alone	353 0.5%	149 0.4%	2,704 2.1%	794 0.6%	4000 1.08%	35,586 1.7%	37,786,591 12.2%	0 0%	250 0.1%	5 0.3%
American Indian or Alaskan Native alone	52,358 72.8%	5,629 14.0%	15,964 12.2%	46,676 36.3%	120,627 32.43%	176,766 8.6%	2,050,766 0.7%	2,692 82.0%	162,920 94.3%	1,429 87.0%
Asian alone	506	173	1,685	464	2828	25,411	14,692,794	73	834	14

Table 11. Study Area County Population by Race/Ethnicity (2008-2012)

Population	McKinley County	Rio Arriba County	Sandoval	San Juan	Study Area	New Mexico	United States	Jicarilla Apache Nation	Navaho Nation	Ute Mountain Nation
	0.7%	0.4%	1.3%	0.4%	0.76%	1.2%	4.8%	2.2%	0.5%	0.9%
Native Hawaiian and Other Pacific Islander alone	38	7	100	72	217	989	480,063	0	209	0
Some Other Race	0.1%	0%	0.1%	0.1%	0.06%	<.01%	0.2%	0%	0.1%	0%
Two or more Races	7	22	437	84	550	3,623	616,191	0	102	0
Classified as Minority Population based on CEQ guidelines?	<.01%	0.1%	0.3%	0.1%	0.15%	0.2%	0.2%	0%	0.1%	0%
	1,469	137	2,101	1,796	5,503	28,800	6,063,063	62	1,660	49
	2.0%	0.3%	1.6%	1.4%	1.48%	1.4%	2.0%	1.9%	1.0%	3.0%
	Yes	Yes	Yes	Yes		Yes	NA	Yes	Yes	Yes

Source: US Census Bureau 2012b

Note: American Community Survey estimates are based on data collected over a 5-year time period. The estimates represent the average characteristics of populations between January 2008 and December 2012 and do not represent a single point in time

Based on the CEQ definition of a minority population area (minority residents exceed 50 percent of all residents), Bernalillo, Bloomfield, Espanola, and Gallup all are considered minority communities. (See Table 10: Study Area Key Community Race/Ethnicity and Poverty Data)

When examined at the Census Tract level, there are 24 out of 87 tracts that have a minority population greater than 50 percent. These range from Census Tract 6.1 located just north of the city of Aztec with a minority population of 80.5 percent to Census Tract 107.17 located north of the city of Rio Rancho with a minority population of 50.2 percent (US Census Bureau 2012b). These Census Tracts are relatively small and are based around the city of Rio Rancho and the Aztec/Farmington/Bloomfield area.

Native American Populations

Data in Table 11 accounts for a substantial portion of the study area population in some areas, notably McKinley and San Juan Counties, where the population is 72.8 and 36.3 percent American Indian respectively. Three tribal governments have reservations within the planning area: the Jicarilla Apache Nation, the Navajo Nation, and the Ute Mountain Nation (Table 12). The Southern Ute Nation has lands just north of the planning area in the state of Colorado, but none within the planning area. Almost one half of the planning area is tribal lands. Each tribe maintains a general concern for protection of and access to areas of traditional and religious importance, and the welfare of plants, animals, air, landforms, and water on reservation and public lands. Policies established in 2006 by the BLM and US Forest Service, in coordination with federal tribes, ensure access by traditional native practitioners to area plants. The policy also ensures that management of these plants promotes ecosystem health for public lands. The BLM is encouraged to support and incorporate into their planning traditional native and native practitioner plant-gathering for traditional use (Boshell 2010).

Table 12. Tribal Nations in the Planning Area

Tribe	Acres in Planning Area	General Location
Jicarilla Apache Nation	739,600	The majority of the Jicarilla Apache Nation is located in western Rio Arriba County, but within the eastern portion of the planning area
Navajo Nation	860,900	A portion of the Navaho Nation extends into western San Juan County

Table 12. Tribal Nations in the Planning Area

Tribe	Acres in Planning Area	General Location
Ute Mountain Nation	103,500	and into the western portion of the planning area A portion of the Ute Mountain Nation extends into the northern portion of San Juan County, just east of the Navajo Nation, and into the northern portion of the planning area
Unknown	196,300	Lands located in the southern portion of the planning area [Note to BLM: this is due to inconsistencies between US Census Bureau tribal areas dataset and BLM land status dataset.]

Source: BLM GIS 2014, US Census Bureau 2014

3.9.2. Impacts from the Proposed Action

Direct and Indirect Impacts

Minority Populations and Low-income Populations do occur in the analysis area for the proposed action. The closest community that meets the CEQ definition of a low-income population area is Bloomfield, NM 8.2 miles to the southwest of the proposed project area. In addition San Juan County would be considered a minority community based on CEQ guidelines. There are homes within 0.5 mile of the project area.

The proposed action would be in compliance with Executive Order (EO) #12898. No disproportionate adverse impacts to the environmental conditions and overall quality of life of minority and low-income communities is anticipated as a result of the proposed action. Project design features for the protection of Air, Soil, Water, Flora and Fauna, Public Health and Safety are in place to protect the human environment.

Cumulative Impacts

Minority Populations and Low-income Populations do occur in the analysis area for the proposed action. Reasonably foreseeable development within the analysis area was discussed in detail in Section 3.4 (Upland Vegetation). Other reasonably foreseeable actions such as continued livestock grazing, vegetation treatments, and community development would cumulatively impact the environmental justice of the area. Because there would be no change from socioeconomic baseline conditions and no foreseeable environmental hazards, there would be no disproportionate impacts to low income or minority populations.

A positive cumulative effect to socioeconomics associated with the project is the additional employment opportunities in the oil and gas industry and/or increases in business to local service industry due to the presence of work crews. In addition, there could be taxes and royalties to state and county governments as a result of the project.

3.10. Public Health and Safety

3.10.1. Affected Environment

Worker safety is regulated under the Occupational Safety and Health Act of 1970, as amended (29 USC 651). Additional safety regulations found in Pipeline Safety Programs and Rulemaking Procedures (49 CFR 190) and Transportation of Natural and Other Gas by Pipeline: Minimal Federal Safety Standards (40 CFR 192) apply to natural gas pipelines.

The Environmental Protection Agency (EPA) and Department of Transportation (DOT) regulate hazardous materials under the Resource Conservation and Recovery Act (1976). The BLM manages public health and safety by complying with federal and state hazardous materials laws and regulations.

The associated management goal of the BLM is to maintain the health of ecosystems through assessment, cleanup, and restoration of contaminated sites (BLM 2003a).

The project area is in the vicinity of rural development: there are scattered residences approximately 0.2 miles west and denser residences and commercial areas within 1.0 mile of the proposed project area. There are recreational areas (Tiger Park) within a mile of the project area. The proposed project area is accessible to the public by dirt roads.

The nearest hospital is in Farmington, New Mexico. This hospital is approximately 16 air miles or approximately 22 road miles from the proposed project area.

3.10.2. Impacts from the Proposed Action

Direct and Indirect Impacts

The proposed project would affect transportation (see Section 3.11 – Transportation and Travel). During construction, the proposed project would result in increased traffic on area roads; some vehicles would be hauling heavy equipment. Therefore, there would be an increased potential for traffic accidents.

Dust associated with construction activities or travel on existing and proposed dirt access roads could result in poor visibility in the proposed project area. The increased use of dirt access roads during muddy conditions could worsen the roads' conditions. Following proposed construction, traffic levels would be similar to current levels.

During proposed construction, reclamation, and maintenance activities, the operation of heavy equipment could pose potential safety concerns. Existing facilities (such as oil and gas wells, pipelines, and powerlines) could be damaged or ruptured, which could pose a risk to human safety. During operation of the proposed pipeline corridor, facility failure (such as pipeline ruptures) could represent a potential danger to the public health and safety BMPs associated with the proposed projects are described in detail in Section 2.2.2 (Description of Proposed Projects).

Cumulative Impacts

The spatial analysis area of the proposed project area is the Animas Watershed (HUC_10 # 1408010410). Existing surface disturbances within the spatial analysis area include an estimated 3,238 well pads for a total disturbance of 6,596.47 acres (2,428.5 acres long term disturbance and 4,167.97 acres reclaimed). Potential surface disturbances within the spatial analysis area, anticipated to occur in the reasonably foreseeable future, include an estimated 197 well pads for a total disturbance of 1,147.04 acres (295.5 acres long term disturbance and 851.54 acres reclaimed, Engler et al. 2014). Additional ground-disturbing activities that have or are anticipated to occur in the reasonably foreseeable future described in Section 3.4 (Upland Vegetation). The Proposed Action would account for 0.9 acres of that long term disturbance total and represent approximately 0.3% of the cumulative impacts to special management species.

This extensive development could contribute to public health and safety concerns in the general proposed project area. Transportation issues are a primary safety concern. Vehicles associated with oil and gas development utilize the developed highway and county road systems in the spatial analysis area. In addition, the oil and gas industry constructs and utilizes dirt access roads in the spatial analysis area. These roads, most of which are accessible by the public, are often hazardous, particularly during and following periods of inclement weather.

Additional safety concerns in the spatial analysis area include wildfire; oil and gas facility leakage or rupture; moving equipment (such as pump jacks); oil and gas explosions; and the handling, storage, and disposal of wastes, chemicals, or condensate. The proposed project would contribute to the cumulative public safety impacts in the spatial analysis area.

3.11. Transportation and Travel

3.11.1. Affected Environment

Within the BLM-FFO planning area, there are approximately 15,000 miles of roads. Most of the roads are unpaved and provide access to resources on Federal lands, predominantly oil and gas facilities. In areas with a high level of oil and gas development, there are approximately 4 miles of roads per square mile. In areas outside of oil and gas development areas, there are approximately 1 mile of roads per square mile. The major roads within the BLM-FFO planning area are U.S. Highways 550, 64, and 491 and State Highways 96, 170, 173, 371, 511, 537, 544, 574, and 595 (BLM 2003a, 3-57 – 3-58).

The county roads within the BLM-FFO planning area have been categorized (BLM 2003a, 3-58):

- Full county-maintained: maintained at best level possible with resources available
- Lesser county-maintained: bladed twice a year
- Unmaintained roads

There are a number of existing roads within the general vicinity of the proposed project area. The government entity that owns a road is responsible for maintenance (BLM 2003a, 3-58). The major access route to the proposed project area is via U.S. Highway 550 and State Highway 173, approximately 1.1 miles north of Aztec, NM. The transportation network around the project area provides access to a number of different services such as oil and gas infrastructure, residences, and recreational opportunities. According to the Farmington MPO Traffic Count Database System (TCDS) the average annual daily traffic (AADT) count for U.S. Highway 550 just north of Aztec, NM near the intersection with State Highway 173 was 8,230 in 2013 (TCDS 2016). Likewise, the AADT count State Highway 173 near the intersection of the turnoff to the Storey LS B 6 access road entrance was 1,739 in 2014.

Additional road systems within the proposed project area include:

- 1) A single uncategorized two-track road that overlaps the southern portion of the well pad construction buffer for approximately 240-feet. The road continues west along the southern extent of the Ancient Trails subdivision and eventually connects with the subdivision main road. The two-track road is likely used primarily for recreation purposes and would be disturbed due to construction activities. An additional uncategorized two-track road exists just south of the construction buffer and can be used as an alternate access thoroughfare (Figure A.3 [Appendix A]).
- 2) The existing Calloway Road to the north of the pad and connects with the Ancient Trail Road within the Ancient Trails subdivision to the west. This road is gated and does not provide access to or from the subdivision.

3.11.2. Impacts from the Proposed Action

Direct and Indirect Impacts

During all proposed project phases, vehicles would use existing resource roads, as well as developed BLM roads, county 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), as described in Section 2.2.2 (Description of Proposed Project – Proposed Project Phases). As such, the proposed project would result in increased traffic on area roads and therefore would increase the potential for traffic accidents. Traffic accidents would likely be more common during mobilization/demobilization phases, which would include the movement of equipment, pipes, and other materials in/out of a project area using heavy vehicles.

The disturbance of the two-track road within the southern portion of the construction buffer would not limit access to any other roads as there is a similar two-track road just south of the construction buffer that connects to the same road system.

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 final abandonment and reclamation of the proposed project area. The proposed access road would be maintained for the life of the proposed project in accordance with *The Gold Book* (BLM and USFS 2007). BMPs to be utilized along the existing roads and reclamation methods are described further in Section 2.2 (Proposed Action) and the Surface Reclamation Plan on file with the BLM-FFO.

Cumulative Impacts

The spatial analysis area for transportation includes the existing roads between U.S. Highway 550 and the proposed project area. Within the spatial analysis area, the roads are used to access existing oil and gas development, residences and public lands. Combined AADT for the spatial analysis area is approximately 9,969 (TCDS 2016). Proposed project traffic during operations include one light-duty vehicle on near daily basis, and heavy-duty vehicles (semi-trucks) 1 to 2 times a day for approximately 6 months (after which traffic trips would decrease to approximately 1 trip per month) and would represent less than 0.02% of the AADT within the spatial analysis area. Additionally, the disturbance of the two-track road within the southern portion of the construction buffer is for an uncategorized road and therefore no net loss of authorized access to public lands is expected. Overall cumulative impacts to the transportation network and access in general will be negligible.

4. SUPPORTING INFORMATION

4.1. Tribes, Individuals, Organizations, or Agencies Consulted

Table 13 contains a list of tribes, individuals, organizations, and agencies invited to attend the on-site for the project.

Table 13. Tribes, Individuals, Organizations, and Agencies Invited to the On-Site

Name	Tribe, Organization, or Agency	Attended On-Site
Colleen Cooley	Dine Care	No
Thomas Singer	Western Environmental Law Center	No
Mike Eisenfeld	San Juan Citizens Alliance	No
Sarah White		No
Erik Schlenker-Goodrich	Western Environmental Law Center	No
Kyle Tisdale	Western Environmental Law Center	No
Samantha Ruscavage-Barz	WildEarth Guardians	No
Tim Ream	WildEarth Guardians	No
Pete Dronkers	Earthworks	No
Jermy Nichols	WildEarth Guardians	No
Anson Wright	Chaco Alliance	No
Bruce Baizel	Earthworks	No
Tweetie Blancett		No
Lori Goodman	Dine Care	No
Samuel Sage	Counselor Chapter	No
Don Schrieber	Devil Springs Ranch	No
Miya King-Flaherty	Sierra Club	No

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 (BLM-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

- Craig Willems, Environmental Protection Specialist – BLM-FFO
- Jim Copeland, Archaeologist – BLM-FFO
- John Kendall, Wildlife Management Biologist – BLM-FFO
- Heather Perry, Natural Resource Specialist– BLM-FFO
- Jeff Tafoya, Rangeland Management Specialist – BLM-FFO
- Michael Porter, Natural Resource Specialist– BLM-FFO
- Marcella Martinez, Planning and Environmental Specialist – BLM-FFO
- Sarah McCloskey, Environmental Specialist – Adkins Consulting, Inc.
- Division of Conservation Archaeology of the San Juan County Museum Association

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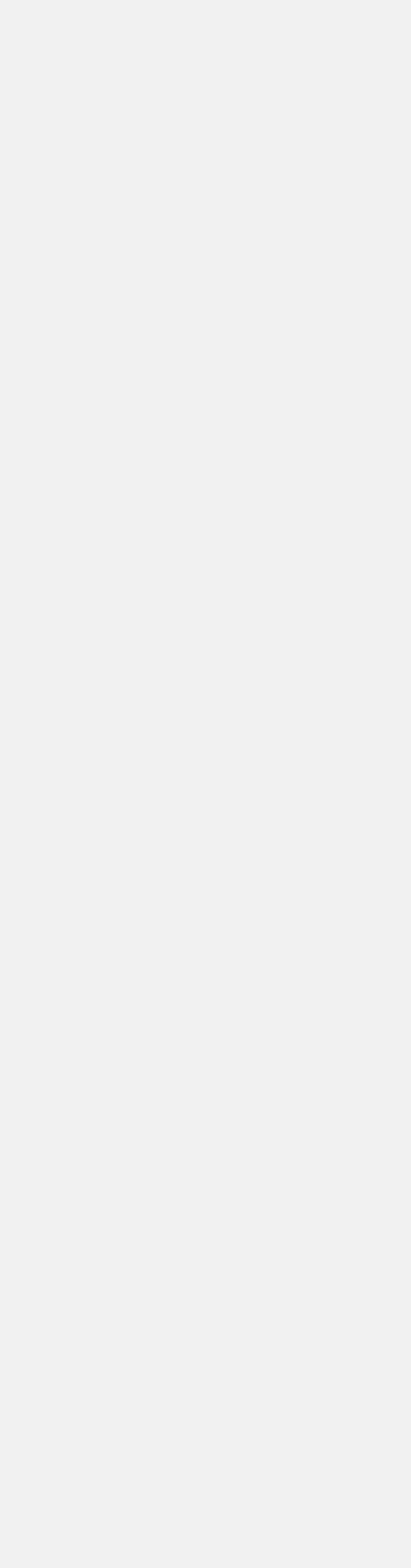
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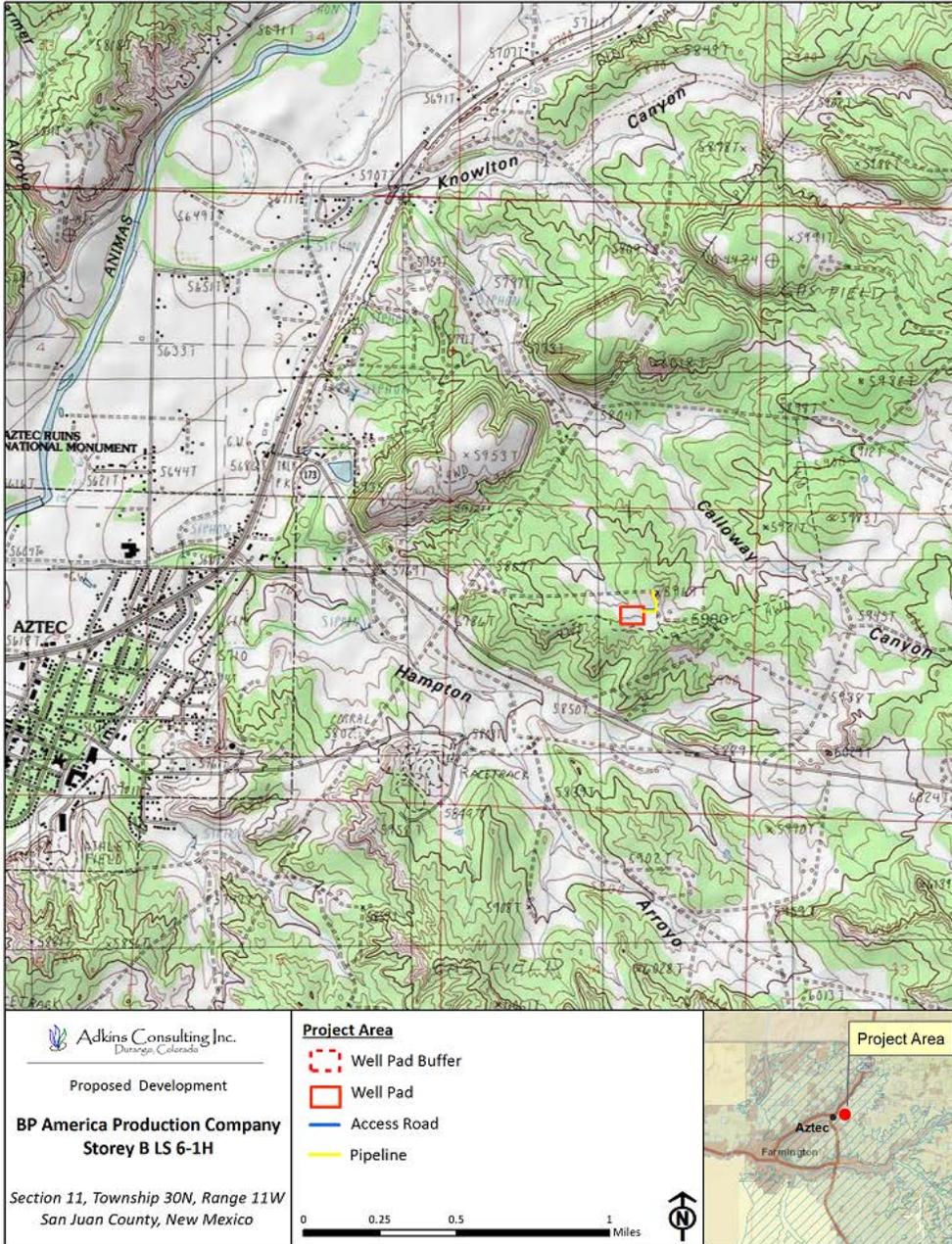
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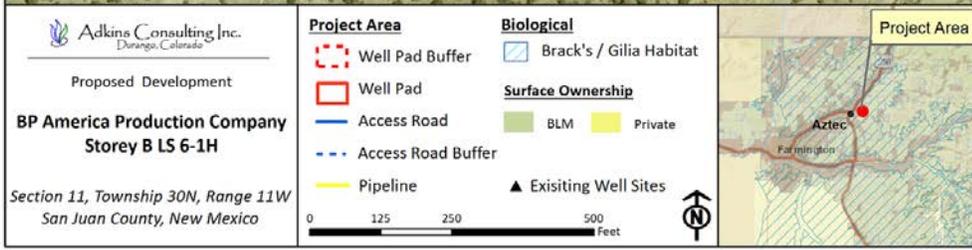
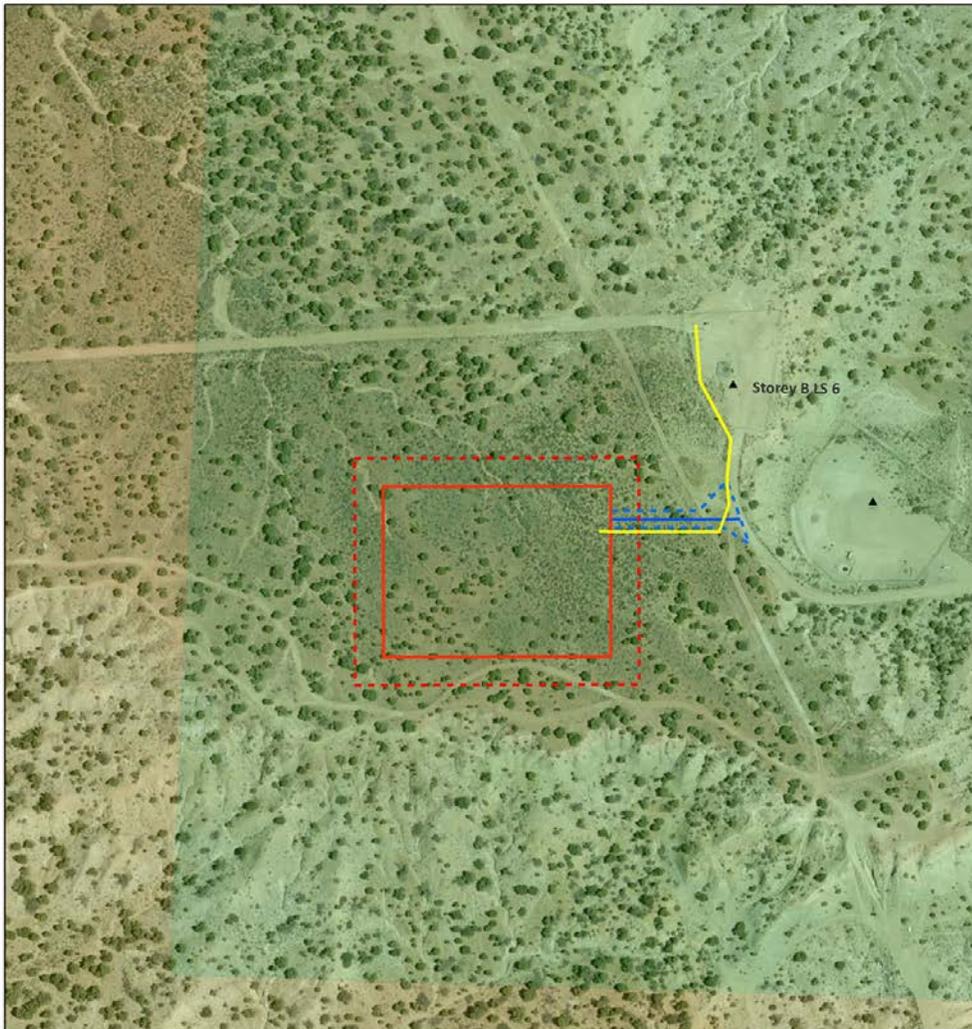
APPENDIX A. MAPS



A.1. Project Area Map (Topographic)



A.2. Surface Ownership Map



A.3. Transportation and Travel Map



APPENDIX B. PLATS

District I
1625 H. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III
1000 Rio Rimador Road, Artesia, NM 87410
Phone: (505) 334-6179 Fax: (505) 334-6170

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

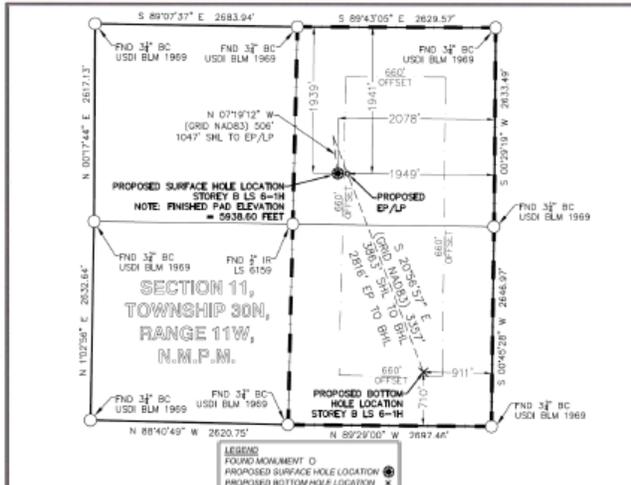
¹ API Number		² Post Code		³ Pool Name	
001136		71629		Basin Fruitland Coal	
⁴ Property Code		⁵ Property Name		⁶ Well Number	
001136		Storey B LS 6		1H	
⁷ OGRID No.		⁸ Operator Name		⁹ Elevation	
000778		BP America Production Company		5939	

" Surface Location									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	11	30N	11W		1939	North	2078	East	San Juan

" Bottom Hole Location If Different From Surface									
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	11	30N	11W		710	South	911	East	San Juan

¹² Dedicated Acres	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
320			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



STOREY B LS 6-1H	NMWS NAD'83	NAD'83	TIES
PROPOSED SURFACE HOLE LOCATION (SHL)	N (Y) = 2,120,838.10' E (X) = 2,686,445.65'	LAT. = 36.82827510°N LON. = 107.95854884°W	FNL = 1939' FEL = 2078'
PROPOSED ENTRY POINT (EP)/LANDING POINT (LP)	N (Y) = 2,120,835.04' E (X) = 2,686,574.52'	LAT. = 36.82826716°N LON. = 107.95810850°W	FNL = 1941' FEL = 1949'
PROPOSED BOTTOM HOLE LOCATION (BHL)	N (Y) = 2,118,204.87' E (X) = 2,687,581.47'	LAT. = 36.82104614°N LON. = 107.95465646°W	FSL = 710' FEL = 911'

" OPERATOR CERTIFICATION
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or undivided mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling, unless heretofore entered by the division.

Toya Colvin 12/16/15
Signature Date

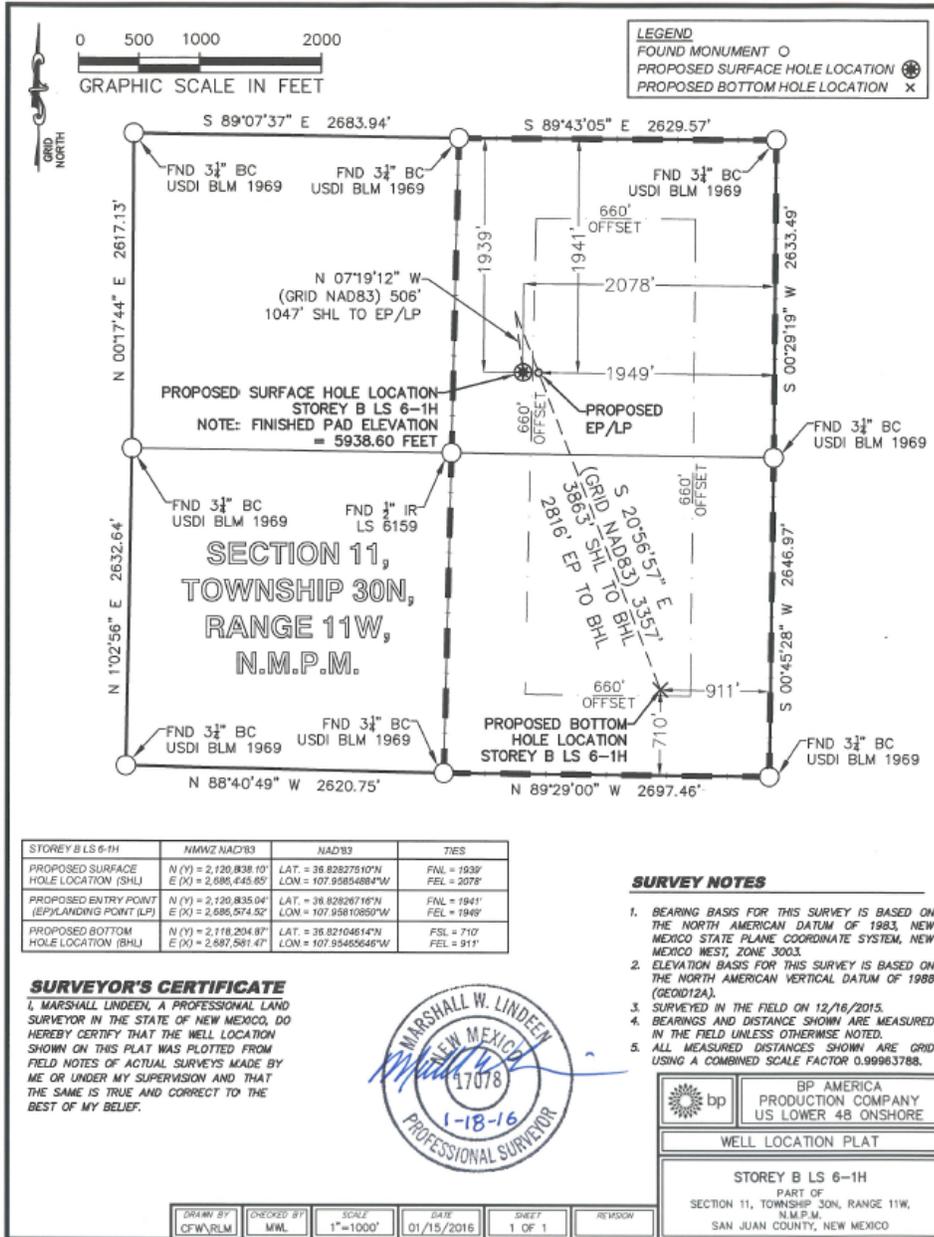
Toya Colvin
Printed Name
Toya.Colvin@bp.com
E-mail Address

"SURVEYOR CERTIFICATION
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

12-16-15
Date of Survey

Marshall W. Lindeen
Signature and Seal of Professional Surveyor

17078
Certificate Number



STOREY B LS 6-1H	NMZ NAD'83	NAD'83	TIES
PROPOSED SURFACE HOLE LOCATION (SHL)	N (Y) = 2,120,838.10' E (X) = 2,589,445.85'	LAT. = 38.8227510°N LON. = 107.95854884°W	FNL = 1939' FEL = 2078'
PROPOSED ENTRY POINT (EP/LANDING POINT) (LP)	N (Y) = 2,120,835.04' E (X) = 2,589,574.52'	LAT. = 38.8228718°N LON. = 107.95810850°W	FNL = 1941' FEL = 1949'
PROPOSED BOTTOM HOLE LOCATION (BHL)	N (Y) = 2,118,204.87' E (X) = 2,587,581.47'	LAT. = 38.82104614°N LON. = 107.95465646°W	FSL = 710' FEL = 911'

SURVEY NOTES

1. BEARING BASIS FOR THIS SURVEY IS BASED ON THE NORTH AMERICAN DATUM OF 1983, NEW MEXICO STATE PLANE COORDINATE SYSTEM, NEW MEXICO WEST, ZONE 3003.
2. ELEVATION BASIS FOR THIS SURVEY IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (GEOID12A).
3. SURVEYED IN THE FIELD ON 12/16/2015.
4. BEARINGS AND DISTANCE SHOWN ARE MEASURED IN THE FIELD UNLESS OTHERWISE NOTED.
5. ALL MEASURED DISTANCES SHOWN ARE GRID USING A COMBINED SCALE FACTOR 0.99963788.

SURVEYOR'S CERTIFICATE

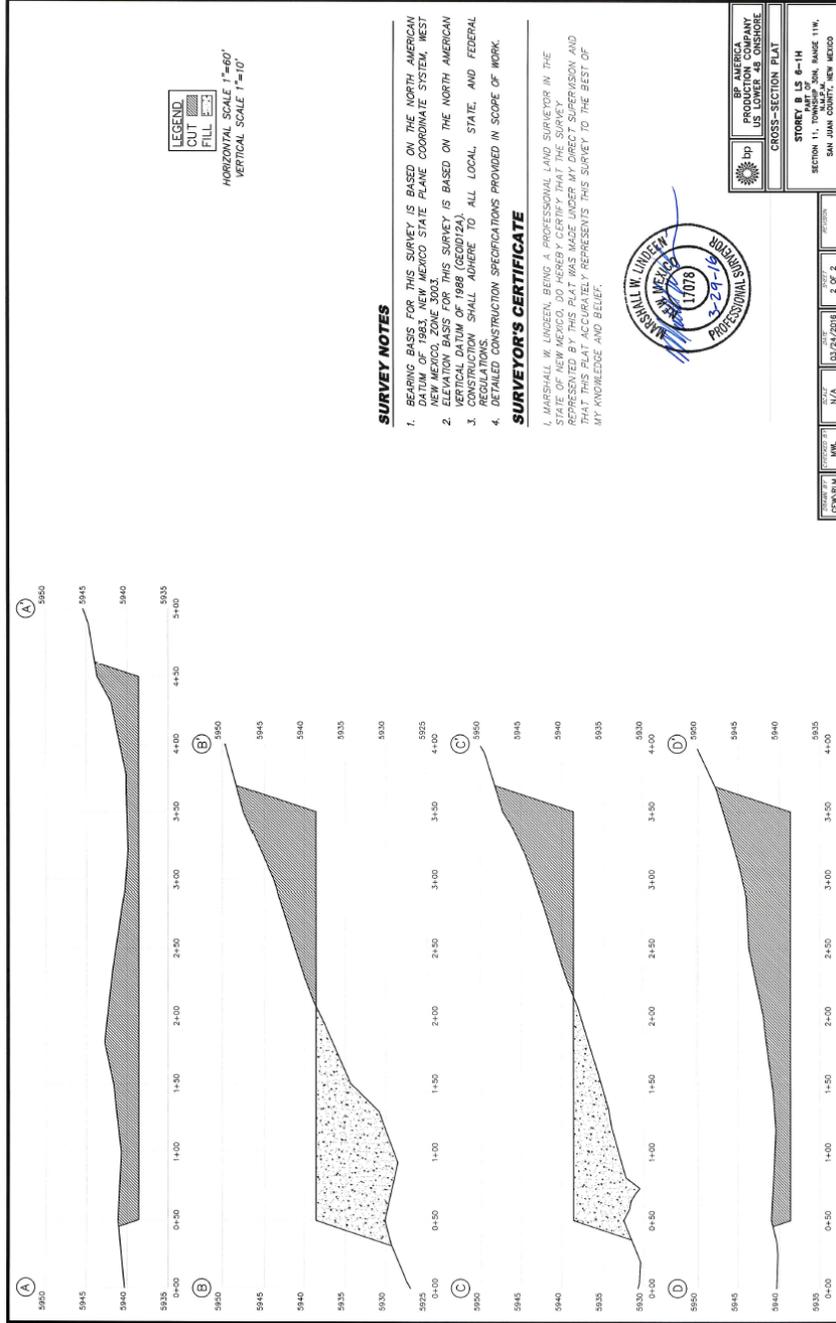
I, MARSHALL LINDEEN, A PROFESSIONAL LAND SURVEYOR IN THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE WELL LOCATION SHOWN ON THIS PLAT WAS PLOTTED FROM FIELD NOTES OF ACTUAL SURVEYS MADE BY ME OR UNDER MY SUPERVISION AND THAT THE SAME IS TRUE AND CORRECT TO THE BEST OF MY BELIEF.



WELL LOCATION PLAT

STOREY B LS 6-1H
PART OF
SECTION 11, TOWNSHIP 30N, RANGE 11W,
N.M.P.M.,
SAN JUAN COUNTY, NEW MEXICO

DRAWN BY CFW/RML	CHECKED BY MML	SCALE 1"=1000'	DATE 01/15/2016	SHEET 1 OF 1	REVISION
---------------------	-------------------	-------------------	--------------------	-----------------	----------



LEGEND
 CUT [Hatched Box]
 FILL [Stippled Box]

HORIZONTAL SCALE 1"=60'
 VERTICAL SCALE 1"=10'

SURVEY NOTES

1. BEARING BASIS FOR THIS SURVEY IS BASED ON THE NORTH AMERICAN DATUM OF 1983, NEW MEXICO STATE PLANE COORDINATE SYSTEM, WEST NEW MEXICO, ZONE 3003.
2. ELEVATION BASIS FOR THIS SURVEY IS BASED ON THE NORTH AMERICAN DATUM OF 1983, NEW MEXICO STATE PLANE COORDINATE SYSTEM, WEST NEW MEXICO, ZONE 3003.
3. CONSTRUCTION SHALL ADHERE TO ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
4. DETAILED CONSTRUCTION SPECIFICATIONS PROVIDED IN SCOPE OF WORK.

SURVEYOR'S CERTIFICATE

I, MARSHALL W. LINDEEN, BEING A PROFESSIONAL LAND SURVEYOR IN THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE SURVEY REPRESENTED ON THESE PLANS WAS MADE BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND THAT THIS SET OF ACCURATELY REPRESENTS THIS SURVEY TO THE BEST OF MY KNOWLEDGE AND BELIEF.



CROSS-SECTION FLAT
 STOREY B L5 6-11
 SECTION 11, TOWNSHIP 20N, RANGE 11W,
 SAN JUAN COUNTY, NEW MEXICO

DATE OF SURVEY	DATE OF PLOTTING	SCALE	NO. OF SHEETS
03/24/2010	03/24/2010	2 OF 2	



Enterprise
Products

ENTERPRISE FIELD SERVICES, LLC
KUTZ GATHERING SYSTEM

DWG. NO. KLB013-094-01

3

LINE BP AMERICA PRODUCTION CO. - STOREY B LS 6 No. 1H

WO NO. A22158

FROM 0+00 = 27+15.76 ON BP AMERICA PRODUCTION CO. - STOREY B LS No. 6

RW NO. 1570021

(KLB013-032-01, R/W No. 6570848)(MC No. 75288)

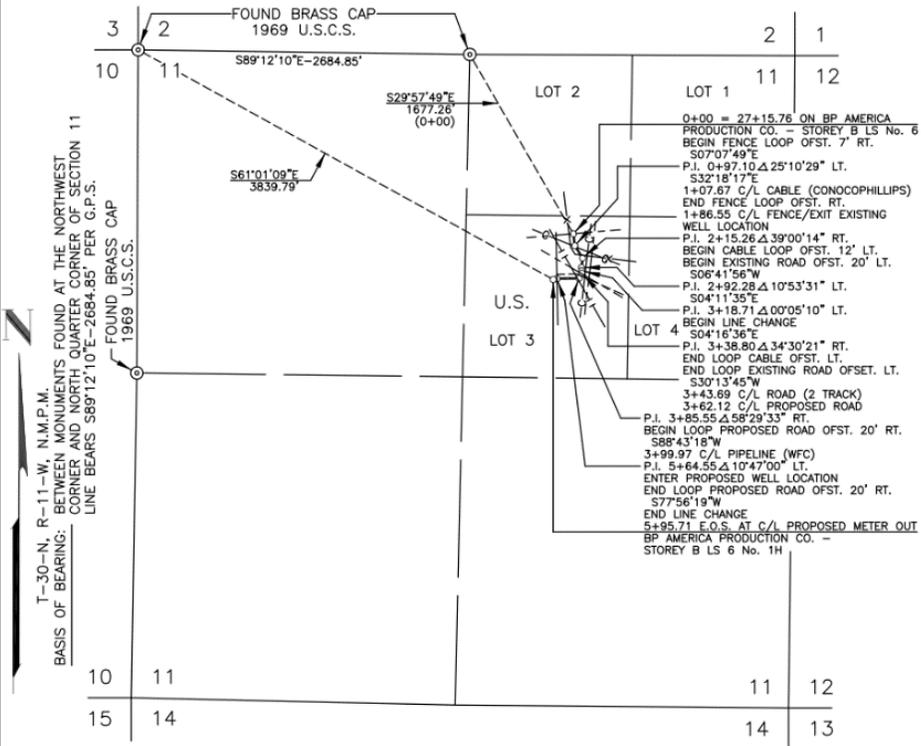
DATE 08/13/15

SCALE 1" = 1000'

SURVEYED 08/10/15

COUNTY SAN JUAN STATE NEW MEXICO SECTION 11 TOWNSHIP 30-N

RANGE 11-W, N.M.P.M.



DWN. BY LB CONSTR. COMMENCED _____ APPL. DWG. _____ SLACK CHAIN _____

CKD. BY MD CONSTR. COMPLETED _____ DATE _____ PIPE SIZE 4.50" O.D.

PRINT RECORD PIPE DATA METER STA. NO.

7	SI DISTRIB	08/14/15
7	SI DISTRIB	01/14/16
7	SI DISTRIB	03/29/16
7	SI DISTRIB	04/20/16

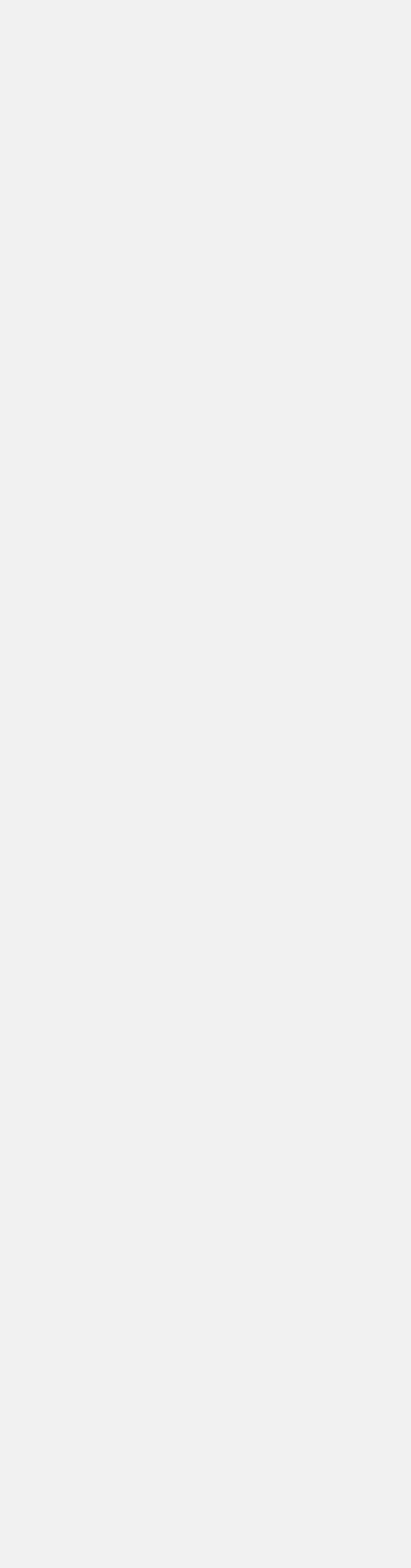
NOTE: WELL FLAG
LINE CHANGE CROSSES PROPOSED ACCESS ROAD, LOOPS PROPOSED ROAD
PROPOSED METER STAKED BY CLIENT. LINE CHANGE DUE TO CLIENT REQUEST
LOCATION NOT BUILT
SURFACE LOCATION: 1939' FNL, 2078' FEL

SUBDIVISION	OWNER	LESSEE	METER(S)	RODS	ACRE(S)
NE/4, SECTION 11	UNITED STATES	KNICKERBOCKER RANCH, LLC		36.104	0.547

REV.	DESCRIPTION
1-	REVISED DRAWING PER RESURVEY NOTES DATED 01/13/16 (01/14/16/LB)
2-	REVISED DRAWING PER 2ND RESURVEY NOTES DATED 03/28/16 (03/29/16/LB)
3-	REVISED DRAWING PER LINE CHANGE NOTES DATED 04/13/16 (04/18/16/LB)

T.M.G. 1/13/12

APPENDIX C. BIOLOGICAL SURVEY REPORT



BIOLOGICAL SURVEY REPORT

For the Proposed:

Storey B LS 6-1H
Oil and Gas Well Project

Sponsored by:

BP America Production Company
Farmington, NM

Prepared by:



Adkins Consulting, Inc.
180 East 12th Street, Unit 5
Durango, Colorado 81301

November 2015
Revised April 2016

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APPENDICES

- Appendix A - Project Area Maps
- Appendix B - Photographs of Survey Area
- Appendix C - Plants and Wildlife Observed in Action Area
- Appendix D - Plats

INTRODUCTION

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 a federal 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 Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) to address cumulative effects of RMP implementation (Consultation No. 2-22-01-I-389). The consultation is summarized in Appendix M of the PRMP/FEIS.

The Bureau of Land Management (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 Special Status Species (SSS) include BLM Sensitive Species and BLM Farmington Field Office (BLM-FFO) Special Management Species (SMS).

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 2012). In accordance with BLM Manual 6840, 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 2008a, BLM 2008b). 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.

This report describes the potential for listed endangered, threatened, candidate, and other designated sensitive flora and fauna species to occur within the proposed action area. The BLM defines the action area as any area that may be directly or indirectly impacted by a proposed action. This report is prepared in accordance with BLM-FFO biological survey guidelines and is intended to provide information to make determinations of effect on species with special conservation status.

PROJECT DESCRIPTION

Background

BP America Production Company (BP) proposes to construct the Storey B LS 6-1H oil and gas well on public lands managed by the BLM-FFO in order to develop their fee mineral lease. The project would include one well pad and associated access road. If the well proves viable, a well-tie pipeline would be constructed to transport produced hydrocarbons to existing pipeline infrastructure in the vicinity.

Location

The proposed project is located in the northeast quarter of Section 11, Township 30 North, Range 11 West, New Mexico Principle Meridian (NMPM) San Juan County, New Mexico. Project area and proposed development maps are provided in Appendix A. The proposed development is located

approximately 2 miles east of downtown Aztec, NM, and 11.8 miles south of the Colorado / New Mexico border.

Details of the proposed well location are found in the following table:

Table 1. Proposed BP Storey B LS 6-1H

Surface Location								
UL or Lot No.	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
G	11	30N	11W	1939	NORTH	2078	East	SAN JUAN
Bottom Hole Location If Different From Surface								
UL or Lot No.	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
P	11	30N	11W	710	South	911	East	SAN JUAN

Disturbance

The proposed Storey B LS 6-1H well pad would be 400-feet by 300-feet with a 50-foot construction buffer zone around the perimeter of the pad. The well pad would require a maximum cut of 8.8 feet on the southwest corner of the well pad, and a maximum fill of 8.5 feet on the northwest side of the location. The construction buffer zone may be used to stockpile topsoil or vegetative material that would be utilized later during reclamation. Cut and fill slopes would be returned to the original contour upon reclamation. New surface disturbance from the construction of the proposed well pad would be within a total permitted area of 4.5 acres.

BP would construct a 228.6-foot resource road with a 30-foot right-of-way to provide access to the proposed facilities. New surface disturbance from the construction of the proposed access roads would be 0.2 acres. The access roads will be designed and constructed as a 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)

Once the well has been completed and proves to be viable, a 595.7-foot subsurface well-tie pipeline within a 40-foot right-of-way would be constructed to transport produced natural gas. New surface disturbance from the construction of the proposed pipeline would be approximately 0.2 acres.

Total surface disturbance associated with the proposed project area would be approximately 5.4 acres of which approximately 4.9 acres would be considered new disturbance. The entire pipeline corridor would be reclaimed following construction. 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. As practical, access will be provided by a tear-drop shaped road through the production area.

METHODOLOGY

Off-site Methods

Prior to conducting fieldwork, Adkins Consulting, Inc. (ACI) compiled data of species listed under the ESA and those listed by the BLM with potential to occur within the proposed project area. ESA-listed species were obtained from USFWS Information, Planning, and Conservation System (iPaC) website (<http://ecos.fws.gov/ipac/>). BLM SSS were obtained from the FFO 2008 Instruction Memorandum (No. NM-200-2008-001) and BLM New Mexico Sensitive species lists.

Survey Methods

An on-site pedestrian survey of the proposed project area was conducted on the 8th of July, 2015 and again on the 20th of November 2016. The survey consisted of walking transects approximately ten feet apart throughout the proposed project area, including the proposed well pad, construction buffer zone, access road, well-tie pipeline corridor. The purpose of the survey was to assess the potential for species of concern to occur within the proposed project area and habitat suitability using information gathered off-site. The surrounding areas were visually inspected with binoculars for nests, raptors, or past signs of raptor use. All plant and wildlife species observed in the action area were recorded, and digital photos were taken (Appendix B and C).

ACTION AREA

Proposed Project Area (PPA)

The proposed project area (PPA) includes the proposed well pad area, access road, well-tie pipeline corridor, and any area that may be directly or indirectly impacted by the proposed development.

Physical Description of Area

The project is proposed to be developed in the San Juan Basin of northwestern New Mexico. The PPA is situated in rolling terrain approximately 2 miles east of the Animas River. No prominent topographical features occur within the PPA. Ground elevation at the proposed well head is approximately 5,936-feet above mean sea level (AMSL).

Hydrology

Recognizing the potential for the continued or accelerated degradation of the Nation's waters, the U.S. Congress enacted the Clean Water Act (CWA) in 1977, formerly known as the Federal Water Pollution Control Act (33 U.S.C. 1344). The objective of the CWA is to maintain and restore the chemical, physical, and biological integrity of the waters of the United States.

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 United States (U.S.), including wetlands. Under the CWA, the US 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). No USGS watercourses were documented within the proposed project area.

Soils

According to the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS 2010) Web Soil Survey, soils found within the PPA are comprised of Gypsiorthids-Badland-Stumble complex, moderately steep.

Gypsiorthids are well drained to excessively drained soils on ridges, hills, knolls, and breaks. The soils form in Gypsum deposits. They are deep and shallow gypsum. Slope is 5 to 30 percent. The soils in Stumble complex are classified as Typic Torripsaments. These deep somewhat, excessively drained soils are on sides of valleys and alluvial drained fans. The soils formed in coarse texture alluvium derived from sandstone and shale. Slope is 0 to 8 percent.

Biological Description of Area

The general region surrounding the proposed project area is characterized by saltbush scrub, sagebrush shrubland valleys, and wooded hills and mesas. The action area contains sagebrush shrubland interspersed with open Piñon-Juniper woodland. The PPA is dominated by big sagebrush (*Seriphidium tridentatum*), blue grama (*Bouteloua gracilis*), sand dropseed (*Sporobolus cryptandrus*), rabbitbrush (*Chrysothamnus* sp.), New Mexican prickly pear cactus (*Opuntia phaeacantha*), narrowleaf yucca (*Yucca angustissima*) and to a lesser degree, Utah juniper (*Sabina osteosperma*), Piñon pine (*Pinus edulis*), James' galleta (*Pleuraphis jamesii*), Cholla cactus (*Cylindropuntia* sp.) and Russian thistle (*Salsola australis*). Approximately 50 - 60 trees were documented within the proposed project area. No Class A or B federal, state, or BLM-designated noxious or invasive weeds were observed during on-site inspection of the proposed project area.

Plants and animals, or evidence of their presence, that were observed in the PPA are listed in Appendix C.

Areas of Critical Environmental Concern (ACECs) and Specially Designated Areas (SDAs)

The nearest Area of Critical Environmental Concern (ACEC) to the proposed action is the *River Tracts ACEC*, approximately 3 miles away to the north (BLM 2014c).

The PPA is located within the FFO-designated special management area for the BLM Sensitive and State of New Mexico Endangered Brack's hardwall (*Sclerocactus cloveriae* ssp *brackii*) cactus and Aztec gilia (*Aliciella Formosa*, BLM 2016c); however, the Nacimiento Formation, which provides the appropriate geologic substrate for the Brack's hardwall cactus and Aztec gilia, is not present within the PPA.

SPECIES ACCOUNTS

Endangered Species Act Species

According to the USFWS Endangered Species Program, there are a total of nine (9) threatened, endangered, or candidate species with potential to occur within the PPA, represented by the New Mexico Ecological Services Field Office in Albuquerque, New Mexico. The species list below discusses the 9 species' habitats and their potential to occur within the project area.

Table 2: ESA Species with Potential to Occur in PPA

Species	Status	Occurrence Within Region	Habitat	Potential to Occur within Project Area
BIRDS				

Table 2: ESA Species with Potential to Occur in PPA

Species	Status	Occurrence Within Region	Habitat	Potential to Occur within Project Area
Southwestern Willow Flycatcher (<i>Empidonax traillii extimus</i>)	Endangered	Summer/breeding range. ²	Breeds in dense riparian habitat. ²	Project area does not provide suitable habitat for species to occur.
Sprague's Pipit (<i>Anthus spragueii</i>)	Candidate	Nonbreeding range extends from south-central and southeastern Arizona, occasionally southern New Mexico. ²	Habitat during migration and in winter consists of pastures and weedy fields, including grasslands with dense herbaceous vegetation or grassy agricultural fields. ²	Project area likely outside of nonbreeding range. No suitable habitat for species to occur.
Western Yellow-Billed Cuckoo (<i>Coccyzus americanus</i>)	Proposed Threatened	Possible rare summer/breeding occurrences. ²	In the southwestern U.S., associated with riparian woodlands dominated by cottonwood or willow trees. In New Mexico, native or exotic species may be used. ²	Project area does not provide suitable habitat for species to occur.
FISHES				
Colorado Pikeminnow (<i>Ptychocheilus lucius</i>)	Endangered	Known to occur in San Juan River. ²	Warm-water rivers and tributaries of the Colorado River basin. ²	Project area does not provide suitable habitat for species to occur.
Razorback Sucker (<i>Xyrauchen texanus</i>)	Endangered	Known to occur in San Juan River. ²	Slow areas, backwaters, and eddies of medium to large rivers. Often associated with sand, mud, and rock substrate in areas with sparse aquatic vegetation, where temperatures are moderate to warm. ²	Project area does not provide suitable habitat for species to occur.
Zuni Bluehead Sucker (<i>Catostomus discobolus yarrowi</i>)	Proposed Endangered	Native to headwater streams of the Little Colorado River in east-central AZ and west-central NM; current range in NM is limited to the upper Río Nutria drainage. ²	Low-velocity pools and pool-runs with seasonally dense perilitic and periphytic algae, particularly shady, cobble/boulder/bedrock substrates in streams with frequent runs and pools. ²	Project area does not provide suitable habitat for species to occur.
FLOWERING PLANTS				

Table 2: ESA Species with Potential to Occur in PPA

Species	Status	Occurrence Within Region	Habitat	Potential to Occur within Project Area
Knowlton's Cactus (<i>Pediocactus knowltonii</i>)	Endangered	One viable population along Los Piños River in San Juan County. ²	Occurs on tertiary alluvial deposits that have formed gravelly, dark, sandy loams on slopes or hills. It is found under the shade of trees and shrubs and in open areas in dry piñon-juniper woodlands at 1800-2000 m elevation. ²	Project area does not provide suitable habitat for species to occur.
Mancos Milk-Vetch (<i>Astragalus humillimus</i>)	Endangered	Known from 20-square mile area in San Juan County. ²	Occurs on Point Lookout and Cliff House sandstones, and tan Cretaceous sandstones of the Mesa Verde series. ²	Project area does not provide suitable habitat for species to occur.
Mesa Verde Cactus (<i>Sclerocactus mesae-verdae</i>)	Threatened	Known from Hogback ACEC area and Navajo Nation in San Juan County. ²	Dry low exposed hills and mesas in full sun of Mancos or Fruitland clays in the desert at about 1200-2000 m elevation. ²	Project area does not provide suitable habitat for species to occur.

¹USFWS NM Ecological Services Field Office, ²NatureServe Explorer

Bureau of Land Management Special Status Species

Table 3 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 3. BLM Special Status Species

Species Name	Conservation Status		Habitat Associations	Potential to Occur in Analysis Area
	BLM	State of NM		
Birds				
American peregrine falcon (<i>Falco peregrinus anatum</i>)	SMS	NM-T	Open country near lakes or rivers with rocky cliffs and canyons. Tall city bridges and buildings also inhabited.	Suitable foraging habitat within project area.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	SEN SMS	NM-T	Near lakes, rivers and cottonwood galleries. Nests near surface water in large trees. May forage terrestrially in winter.	Suitable foraging habitat within project area.
Bendire's thrasher (<i>Toxostoma bendirei</i>)	SEN		Typically inhabits sparse desert shrubland & open woodland with scattered shrubs; breeds in scattered locations in central & western portions of NM; most common in southwest NM.	Marginal habitat within project area for species to occur. Project area likely outside of breeding range.
Burrowing owl (<i>Athene cucularia</i>)	SEN SMS		Associated with prairie dog towns. In dry, open, short-grass, treeless plains	Project area does not provide suitable habitat for species to occur.

				Lack of burrows a limiting factor.
Ferruginous hawk (<i>Buteo regalis</i>)	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 (<i>Aquila chrysaetos</i>)	SMS		In the West, mostly open habitats in mountainous, canyon terrain. Nests primarily on cliffs and trees.	Suitable foraging habitat documented within project area.
Mountain plover (<i>Charadrius montanus</i>)	SMS		Semi-desert, grasslands, open arid areas, bare fields, breeds in open plains or prairie.	Project area does not provide suitable habitat for species to occur.
Piñon jay (<i>Gymnorhinus cyanocephalus</i>)	SEN		Foothills throughout NM wherever large blocks of piñon-juniper woodland habitat occurs.	Marginal habitat for species to occur. Lack of large continuous blocks of piñon-juniper woodland likely a limiting factor.
Prairie falcon (<i>Falco mexicanus</i>)	SMS		Arid, open country, grasslands or desert scrub, rangeland; nests on cliff ledges, trees, power structures.	Project area does not provide suitable habitat for species to occur.
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	SMS		Low to mid-elevation riparian woodlands, deciduous woodlands, and abandoned farms and orchards. Rare in the San Juan River valley.	Project area does not provide suitable habitat for species to occur.
Flowering Plants				
Brack's hardwall cactus (<i>Sclerocactus cloveriae</i> ssp. <i>brackii</i>)	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).	Project area does not provide suitable habitat for species to occur.
Aztec gilia (<i>Aliciella formosa</i>)	SEN SMS	NM-E	Arid and sparsely vegetated Badland /Salt desert scrub communities in soils of the Nacimiento Formation (5,000-6,400 ft).	Project area does not provide suitable habitat for species to occur.

DISCUSSION

The proposed project would be in compliance with threatened and endangered species management guidelines outlined in the September 2002 Biological Assessment (Consultation No. 2-22-01-I-389), conducted for the Farmington Resource Management Plan/Environmental Impact Statement (USDI 2003). No further consultation with the USFWS is required.

The Migratory Bird Treaty Act implements various treaties and conventions between the U.S. and Canada, Japan, Mexico and the former Soviet Union for the protection of migratory birds. Under the Act, taking, killing or possessing migratory birds is unlawful. A National MOU between BLM and the Service was signed on April 4, 2010. Section XI (I) of the MOU states that the BLM may not be able to implement all elements of this MOU upon signature of the MOU. Incorporation of all elements of the

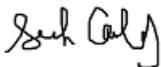
MOU into land use planning will be facilitated by land use plan maintenance, amendment, or revision. In February 2010, the BLM/FFO developed a Migratory Bird Policy (BLM-FFO Instruction Memorandum No. NM-F00-2010-001) in anticipation of the National MOU. This management policy establishes a consistent approach for addressing migratory bird populations and their habitat when making project level implementation decisions.

The proposed action would disturb an estimated 4.9 acres of potential migratory bird habitat primarily within Sagebrush/Grassland and to a lesser degree Piñon-Juniper vegetation communities; approximately 50 - 60 trees would be removed as a result of the proposed action. Adult migratory birds would not be directly harmed by the proposed action because of their mobility and ability to avoid areas of human activity. No active nests within the action area are expected to be directly impacted if project activities occur outside of the typical migratory bird breeding season. The increased human presence during project activities within the breeding season may indirectly disturb or displace adults from nests and foraging habitats for a short period of time. Following the reclamation of the affected environment, long term operations would result in minor human activity in the immediate area.

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. Of these BLM managed species which may occur in the action area (see Table 3), the following have potentially suitable habitat within or in the vicinity to the project area: The proposed action area provides potential foraging habitat for golden eagle (*Aquila chrysaetos*), bald eagle (*Haliaeetus leucocephalus*), ferruginous hawk (*Buteo regalis*), and American peregrine falcon (*Falco peregrinus anatum*). The action area also provides marginal habitat for Bendire's thrasher (*Toxostoma bendirei*) and Piñon jay (*Gymnorhinus cyanocephalus*) to occur.

CERTIFICATION

To the best knowledge of Adkins Consulting, the proposed project, with the successful implementation of mitigation measures, would not violate any provisions of the Endangered Species Act of 1973, as amended. Conclusions are based on actual field examinations and are correct to the best of my knowledge.



Sarah Cowley
Field Biologist/Environmental Specialist
Adkins Consulting, Inc.

17 July 2015
Date



Sarah McCloskey
Field Biologist/Environmental Specialist
Adkins Consulting, Inc.

12 April 2016
Date

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BLM. 2016b. FFO_T_and_E_Raptor_Nests_Buffers_4_14_2016.shp (Shapefile of 0.3-mile buffer around recorded raptor nests within the general BLM-FFO region). Provided by BLM-FFO 2016.

BLM. 2016c. FFO_Wildlife_Specially_Managed_Species_Plant_Habitat_4_14_2016.shx (Shapefile of the new Aztec gilia and Brack's fishhook cactus Potential habitat "zone"). Provided by the BLM-FFO 2016.

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APPENDIX A
Figure A.1

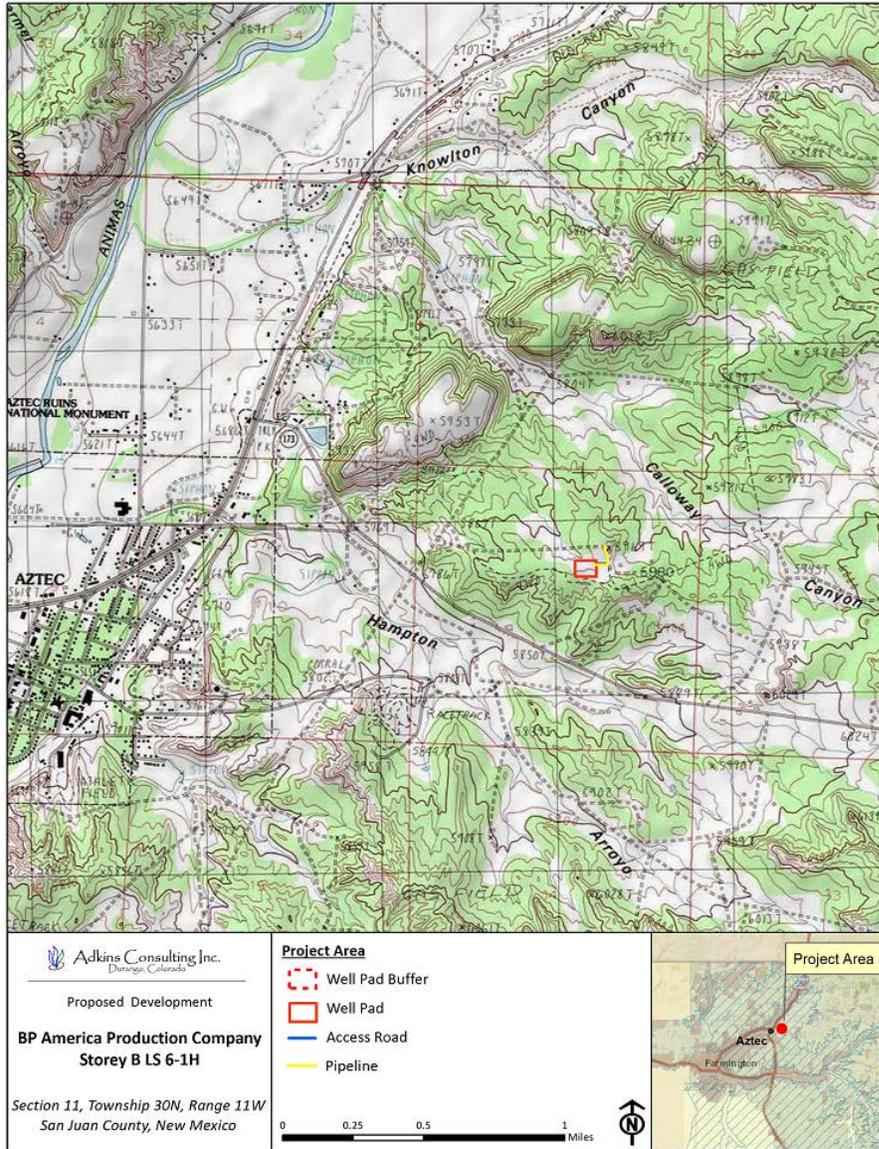
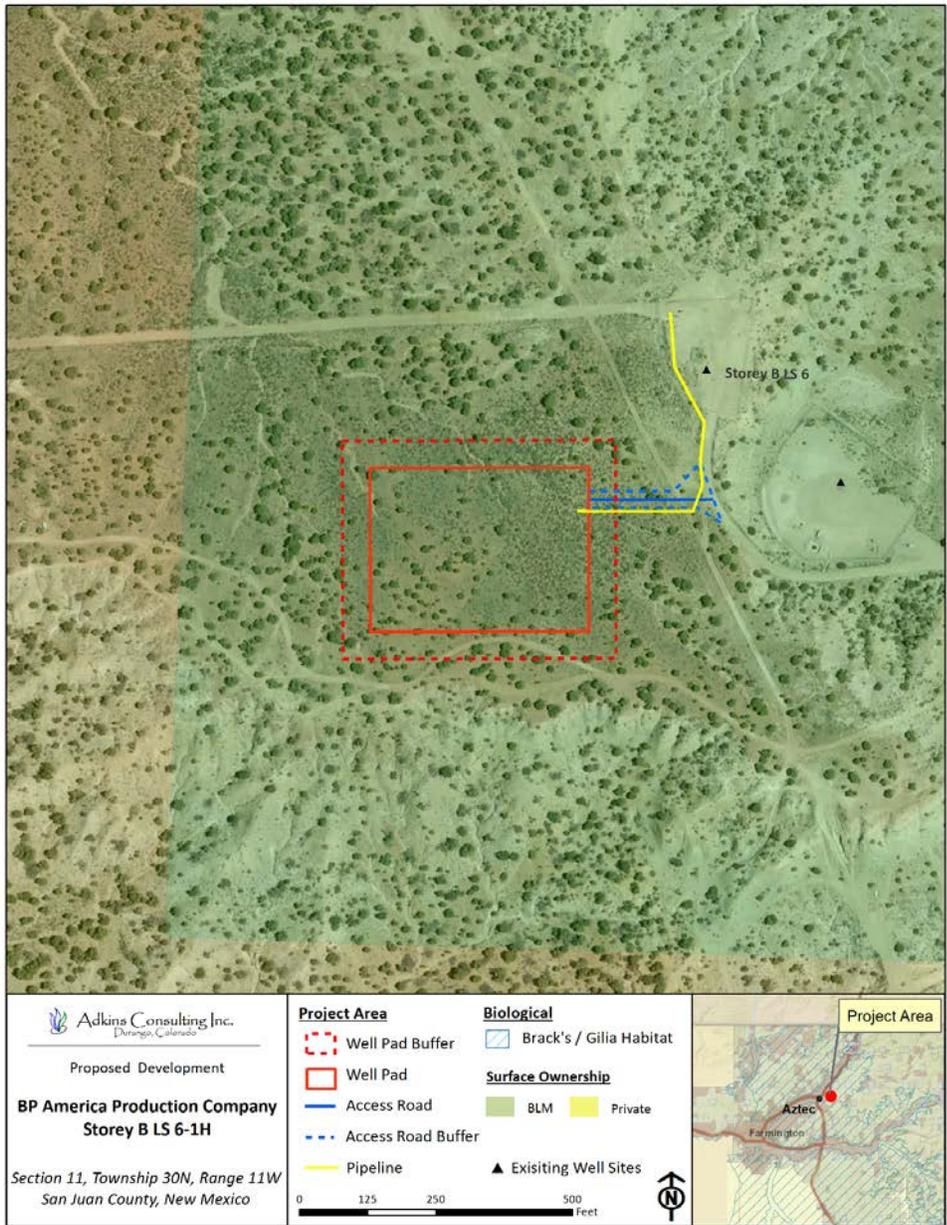


Figure A.2



APPENDIX B
Photographs of Survey Area



View north from wellhead



View east from wellhead



View south from wellhead



View west from wellhead

APPENDIX C
Fauna and Flora Documented Within the Action Area

FAUNA

Birds

Corvus corax
Gymnorhinus cyanocephalus

Common raven
Pinyon Jay

Mammals

Odocoileus hemionus
Sylvilagus nuttallii

Mule deer
Mountain cottontail

FLORA

Cacti / Forbs

Cylindropuntia sp.
Opuntia phaeacantha
Salsola australis
Yucca angustissima

Cholla cactus
New Mexican prickly pear cactus
Russian thistle (tumbleweed)
Narrowleaf yucca

Grasses

Achnatherum hymenoides
Bouteloua gracilis
Pleuraphis jamesii
Sporobolus cryptandrus

Indian Ricegrass
Blue grama
James' galleta
Sand dropseed

Shrubs

Chrysothamnus sp.
Seriphidium tridentatum

Rabbitbrush
Big sagebrush

Trees

Pinus edulis
Sabina osteosperma

Piñon pine
Utah juniper

APPENDIX D Plats

District I
1425 H. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-6720

District II
911 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III
1000 Rio Grande Road, Aztec, NM 87410
Phone: (505) 334-6179 Fax: (505) 334-6170

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number		² Post Code		³ Pool Name	
		71629		Basin Fruitland Coal	
⁴ Property Code		⁵ Property Name		⁶ Well Number	
001136		Storey B LS 6		1H	
⁷ OGRID No.		⁸ Operator Name		⁹ Elevation	
000778		BP America Production Company		5939	

¹⁰ Surface Location

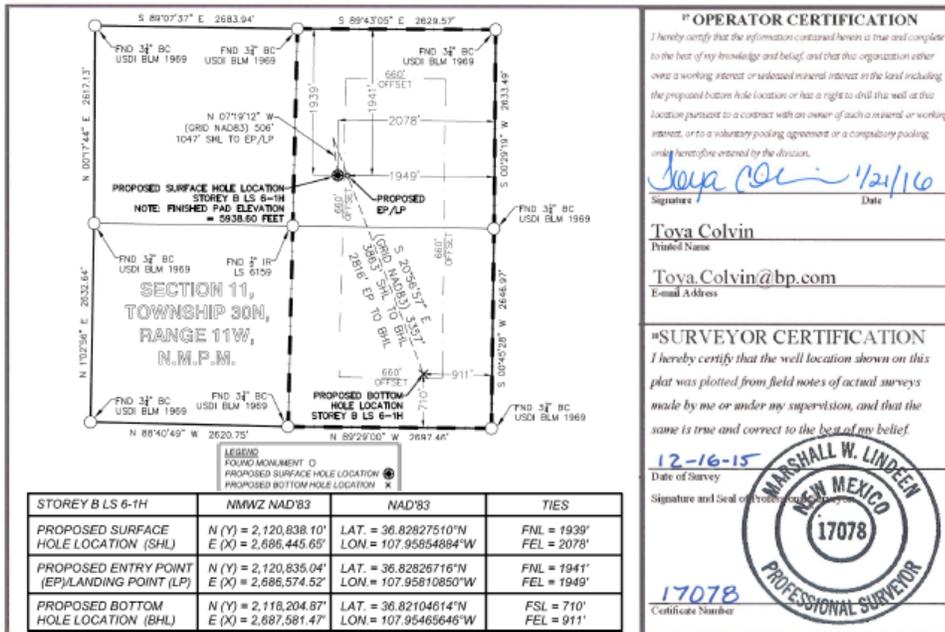
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	11	30N	11W		1939	North	2078	East	San Juan

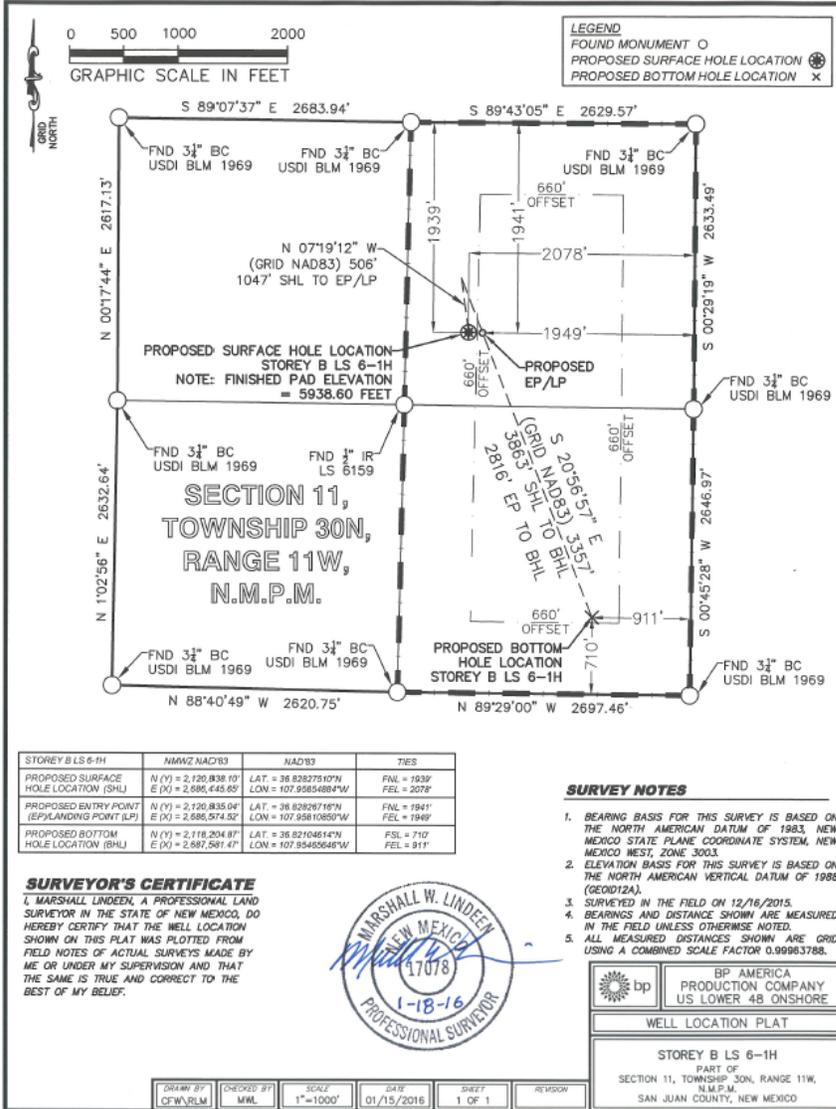
¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	11	30N	11W		710	South	911	East	San Juan

¹² Dedicated Acres	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
320			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.





STOREY B LS 6-1H	NMWS NAD83	NAD83	TIES
PROPOSED SURFACE HOLE LOCATION (SHL)	N (Y) = 2,120,838.10 E (X) = 2,586,443.69	LAT = 36.828275107°N LON = 107.9584884°W	FNL = 1932' FEL = 2079'
PROPOSED ENTRY POINT (EP/LANDING POINT (LP))	N (Y) = 2,120,835.04 E (X) = 2,585,574.52	LAT = 36.8282718°N LON = 107.9581085°W	FNL = 1941' FEL = 1949'
PROPOSED BOTTOM HOLE LOCATION (BHL)	N (Y) = 2,118,204.87 E (X) = 2,587,581.47	LAT = 36.82104614°N LON = 107.9548564°W	FSL = 710' FEL = 911'

SURVEY NOTES

1. BEARING BASIS FOR THIS SURVEY IS BASED ON THE NORTH AMERICAN DATUM OF 1983, NEW MEXICO STATE PLANE COORDINATE SYSTEM, NEW MEXICO WEST, ZONE 3003.
2. ELEVATION BASIS FOR THIS SURVEY IS BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (GEOID12A).
3. SURVEYED IN THE FIELD ON 12/16/2015.
4. BEARINGS AND DISTANCE SHOWN ARE MEASURED IN THE FIELD UNLESS OTHERWISE NOTED.
5. ALL MEASURED DISTANCES SHOWN ARE GRID USING A COMBINED SCALE FACTOR 0.99963788.

SURVEYOR'S CERTIFICATE
 I, MARSHALL LINDEEN, A PROFESSIONAL LAND SURVEYOR IN THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE WELL LOCATION SHOWN ON THIS PLAT WAS PLOTTED FROM FIELD NOTES OF ACTUAL SURVEYS MADE BY ME OR UNDER MY SUPERVISION AND THAT THE SAME IS TRUE AND CORRECT TO THE BEST OF MY BELIEF.

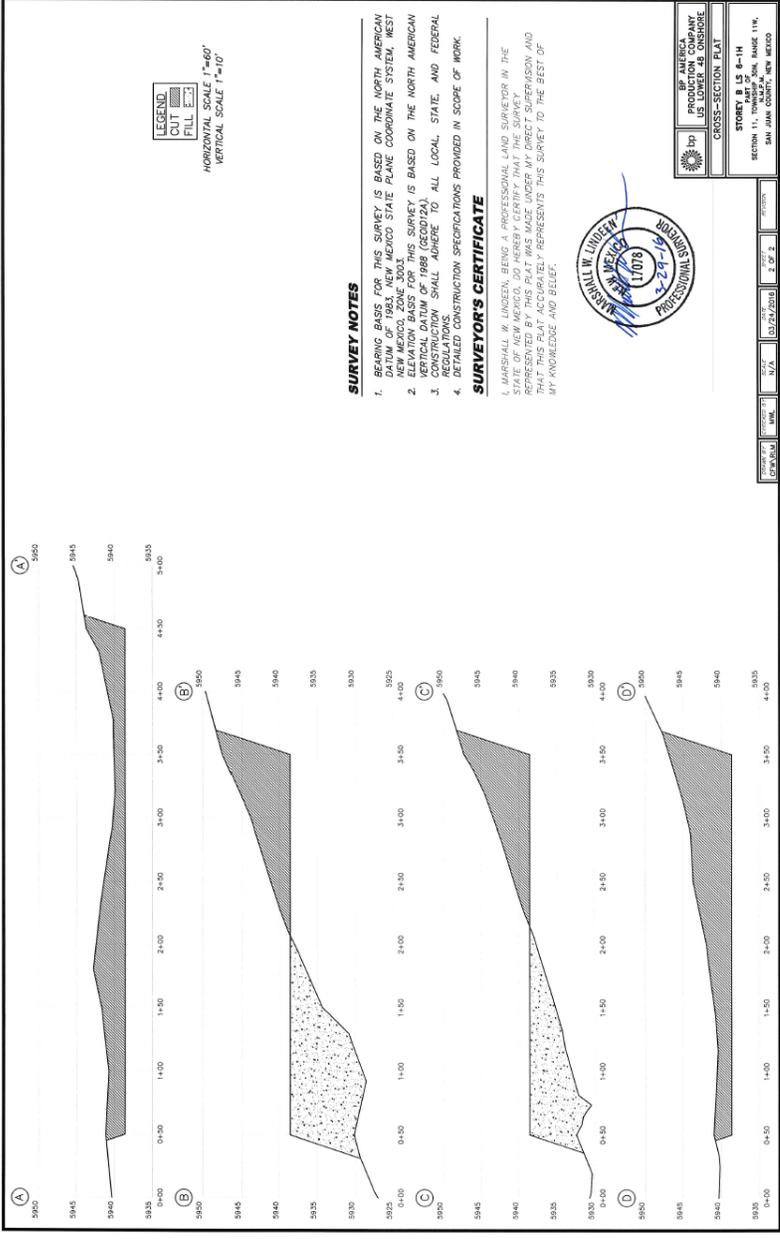


bp BP AMERICA
 PRODUCTION COMPANY
 US LOWER 48 ONSHORE

WELL LOCATION PLAT

STOREY B LS 6-1H
 PART OF
 SECTION 11, TOWNSHIP 30N, RANGE 11W,
 N.M.P.M.
 SAN JUAN COUNTY, NEW MEXICO

DRAWN BY CFW/RLM	CHECKED BY MML	SCALE 1"=1000'	DATE 01/15/2016	SHEET 1 OF 1	REVISION
---------------------	-------------------	-------------------	--------------------	-----------------	----------



SURVEY NOTES

1. BEARING BASIS FOR THIS SURVEY IS BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD 83) NEW MEXICO STATE PLANE COORDINATE SYSTEM, WEST ZONE, WITH THE CENTER OF GRAVITY AS THE POINT OF ORIGIN.
2. ELEVATION BASIS FOR THIS SURVEY IS BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD 83) MEAN SEA LEVEL.
3. ALL CONSTRUCTION SHALL ADHERE TO ALL LOCAL, STATE, AND FEDERAL REGULATIONS.
4. DETAILED CONSTRUCTION SPECIFICATIONS PROVIDED IN SCOPE OF WORK.

SURVEYOR'S CERTIFICATE

I, MARSHALL W. LINDEN, BEING A PROFESSIONAL LAND SURVEYOR IN THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT THE SURVEYORSHIP AND CONSTRUCTION OF THIS PROJECT HAS BEEN UNDER MY PERSONAL SUPERVISION AND THAT THIS PLAT ACCURATELY REPRESENTS THIS SURVEY TO THE BEST OF MY KNOWLEDGE AND BELIEF.



ENTERPRISE FIELD SERVICES, LLC

KUTZ GATHERING SYSTEM

DWG. NO. KLB013-094-01

LINE BP AMERICA PRODUCTION CO. - STOREY B LS No. 1H

WO NO. A22158

RW NO. 1570021

FROM 0+00 = 27+15.76 ON BP AMERICA PRODUCTION CO. - STOREY B LS No. 6

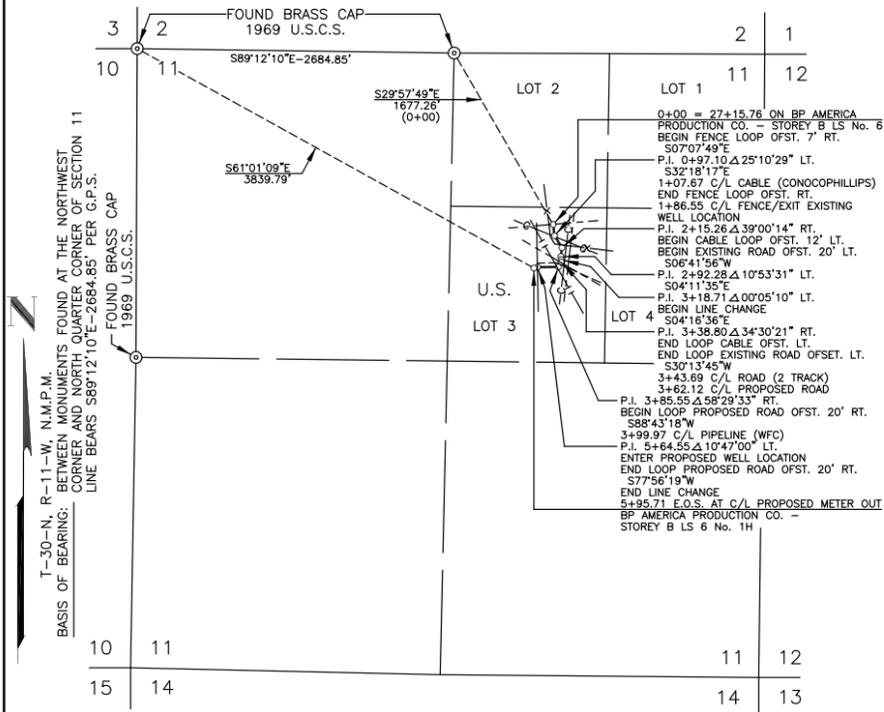
DATE 08/13/15

(KLB013-032-01, R/W No. 6570848)(MC No. 75288)

SCALE 1" = 1000'

SURVEYED 08/10/15

COUNTY SAN JUAN STATE NEW MEXICO SECTION 11 TOWNSHIP 30-N RANGE 11-W, N.M.P.M.



DWN. BY LB CONSTR. COMMENCED _____ APPL. DWG. _____ SLACK CHAIN _____
CKD. BY MD CONSTR. COMPLETED _____ DATE _____ PIPE SIZE 4.50" O.D.

PRINT RECORD PIPE DATA METER STA. NO.

7	SI	DISTR	08/14/16
7	SI	DISTR	01/14/16
7	SI	DISTR	03/29/16
7	SI	DISTR	04/20/16

NOTE: WELL FLAG
LINE CHANGE CROSSES PROPOSED ACCESS ROAD, LOOPS PROPOSED ROAD
PROPOSED METER STAKED BY CLIENT. LINE CHANGE DUE TO CLIENT REQUEST
LOCATION NOT BUILT
SURFACE LOCATION: 1939' FNL, 2078' FEL

SUBDIVISION	OWNER	LESSEE	METER(S)	RODS	ACRE(S)
NE/4, SECTION 11	UNITED STATES	KNICKERBOCKER RANCH, LLC		36.104	0.547

- 1- REVISED DRAWING PER RESURVEY NOTES DATED 01/13/16 (01/14/16/LB)
- 2- REVISED DRAWING PER 2ND RESURVEY NOTES DATED 03/28/16 (03/29/16/LB)
- 3- REVISED DRAWING PER LINE CHANGE NOTES DATED 04/13/16 (04/18/16/LB)

REV. OWNERSHIP

APPENDIX D. VISUAL CONTRACT RATING WORKSHEET

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRACT RATING WORKSHEET

Date: **10/19/15**
District Office: **FFO**
Resource Area: **Residences within Ancient Trails Subdivision**
Activity (program): **Oil and Gas**

SECTION A: PROJECT INFORMATION

1. Project Name Storey B LS 6-1H (BP America Production)	4. Location Township 30N	5. Location Sketch See Attachment A
2. Key Observation Point Ancient Trails Subdivision Lat / Long: 36.829321°N, 107.962280°W	Range 11W	
3. VRM Class III/IV	Section 11	

SECTION B: CHARACTERISTICS LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling (hills around the project location), irregular (mesas to the west)	Scattered low sage brush cover, uniform dense pinon/junipers	Pipeline markers, existing well pad, gate, fence line, access and towers on mesa in the distance
LINE	Flat, horizontal lines	Horizontal, continuous	Vertical (pipeline markers, access and towers on mesa in the distance)
COLOR	Tans, dark browns, light brown bare patches	Patches of dark and light greens, greys, tans and earth tones	Tan, dark green, yellow, white
TEXTURE	Coarse, bumpy	Coarse, bumpy	Smooth

SECTION C: PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat (well pad), flat and linear (pipeline corridor, access road), gently rolling (surrounding area)	Bare (vegetation removed from pad, access road and pipeline) Low, sparse, consistent (reclaimed areas)	Horizontal rectangular flat (wellpad) Vertical rectangular (pump, linear access road and pipeline corridor)
LINE	Horizontal (well pad, access road and pipeline)	Horizontal lines where vegetation removed	Horizontal (access road, pipeline corridor), Vertical (pump)
COLOR	Tan (disturbed areas)	Light brown, tan (vegetation removed from pad, access road and pipeline) Light green, dark green, greys, light browns (reclaimed areas)	Juniper Green
TEXTURE	Smooth	Smooth (vegetation removed from pad, access road and pipeline) Bumpy, coarse (reclaimed areas)	Smooth

SECTION D: CONTRAST RATING SHORT TERM X LONG TERM

1. DEGREE OF CONTRAST		FEATURES									2. Does the project design meet visual resource management objectives? <u> X </u> Yes <u> </u> No (explain on reverse side)				
		LAND/WATER BODY (1)			VEGETATION (2)			STRUCTURES (3)							
ELEMENTS	FORM	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	3. Additional mitigating measures recommended <u> X </u> Yes <u> </u> No (Explain on reverse side) Evaluator's Names Date Sarah McCloskey 10/19/2015	
	LINE		X			X				X					
	COLOR				X				X						X
	TEXTURE			X			X								X

SECTION D. (Continued)

Comments from item 2.

The Storey BLS 6-1H well pad and access road will likely be seen from the KOP due to distance (approximately 971 feet from KOP), topography, above ground facilities and orientation of the access road. However, there is existing infrastructure both within the vicinity of the proposed project and further in the distance that is already visible from the KOP. In addition the vegetation (juniper trees) will likely reduce the visibility of the well pad and access road and natural vegetation in the area is comprised of light brown patches of exposed soils, visually similar well pad disturbance. To the casual observer, the reclaimed well pad areas would look similar to surrounding natural vegetative features.

Additional Mitigating Measures (See item 3)

- Pump jack orientation perpendicular to KOP (roughly east to west).
 - Coloration of above ground equipment to blend in with natural surroundings.
 - Interim reclamation to reduce disturbance footprint and reestablish natural vegetation.
-

Attachment A – Storey B LS 6-1H Location Photographs

