

United States Department of the Interior  
Bureau of Land Management  
And  
United States Department of Agriculture  
Forest Service

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Environmental Assessment  
Tendoy Federal #13-1  
White Pine Federal #18-1  
Beaverhead County, Montana  
June 2019

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Forest Service  
Planning, Appeals, & Litigation  
Project Number: 48576

Bureau of Land Management  
NEPA Project Number:  
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## LIST OF ABBREVIATIONS

| <b><u>Abbreviation</u></b> | <b><u>Term/Phrase/Name</u></b>  |
|----------------------------|---|
| AO                         | Authorized Officer  |
| APD                        | Application for Permit to Drill   |
| AQI                        | Air Quality Index   |
| ARMPA                      | The Idaho and Southwestern Montana Greater Sage-Grouse<br>Approved Resource Management Plan Amendment |
| BCA                        | Beaver Creek Archeology   |
| BCR                        | Bird Conservation Region  |
| BGEPA                      | Bald and Golden Eagle Protection Act  |
| BDNF                       | Beaverhead-Deerlodge National Forest  |
| BLM                        | Bureau of Land Management   |
| CO                         | carbon monoxide   |
| CO <sub>2</sub>            | carbon dioxide  |
| CO <sub>2</sub> e          | carbon dioxide equivalent   |
| COA                        | Conditions of Approval  |
| CEQ                        | Council for Environmental Quality   |
| CFR                        | Code of Federal Regulations   |
| CSU                        | Controlled Surface Use  |
| DFO                        | Dillon Field Office   |
| DOT                        | U.S. Department of Transportation   |
| EA                         | Environmental Assessment  |
| EIS                        | Environmental Impact Statement  |
| EMU                        | Elk Management Unit   |
| EO                         | Executive Order   |

|                |  |
|----------------|--|
| EPA            | Environmental Protection Agency                          |
| ESA            | Endangered Species Act                                   |
| F              | Fahrenheit   |
| FLPMA          | Federal Land Policy and Management Act                   |
| FONSI          | Finding of No Significant Impact                         |
| FOOGLRA        | Federal Onshore Oil and Gas Leasing Reform Act of 1987   |
| Forest Plan    | Land and Resource Management Plan for the BDN            |
| Forest Service | U.S. Department of Agriculture, Forest Service           |
| GHG            | greenhouse gases   |
| GHMA           | general habitat management areas                         |
| HUC            | Hydrologic Unit Code                                     |
| I-15           | Interstate 15  |
| IPaC           | Information for Planning and Consultation                |
| KOP            | Key Observation Point                                    |
| MBMG           | Montana Bureau of Mines and Geology                      |
| MBTA           | Migratory Bird Treaty Act                                |
| MDEQ           | Montana Department of Environmental Quality              |
| MDNRC          | Montana Department of Natural Resources and Conservation |
| MFWP           | Montana Department of Fish Wildlife and Parks            |
| MLA            | Mineral Leasing Act                                      |
| MMt            | million metric tons                                      |
| MNHP           | Montana Natural Heritage Program                         |
| MOU            | Memorandum of Understanding                              |
| MT SHPO        | Montana State Historic Preservation Office               |
| NAAQS          | National Ambient Air Quality Standards                   |



|                  |  |
|------------------|--|
| NAICS            | North American Industry Classification System  |
| NEPA             | National Environmental Policy Act  |
| NHPA             | National Historic Preservation Act   |
| NO <sub>x</sub>  | nitrogen oxide   |
| NO <sub>2</sub>  | nitrogen dioxide   |
| N <sub>2</sub> O | nitrous oxide  |
| NRHP             | National Register of Historic Places   |
| NSO              | No Surface Occupancy   |
| OSHA             | Occupational Safety and Health Administration  |
| PFYC             | Potential Fossil Yield Classification System   |
| PGA              | peak ground acceleration   |
| PHMA             | priority habitat management areas  |
| Project          | Development of an exploratory well and associated infrastructure in Beaverhead County, Montana |
| R1               | Region One   |
| RMP              | Resource Management Plan   |
| ROD              | Record of Decision   |
| ROW              | right-of-way   |
| SDS              | Safety Data Sheet  |
| SERI             | species of economic and recreational importance  |
| SIO              | Scenic Integrity Objective   |
| SIR              | Supplemental Information Report  |
| SLT              | Standard Lease Terms   |
| SO <sub>2</sub>  | sulfur dioxide   |
| SOC              | Species of Concern   |
| SMS              | Scenery Management System  |

|       |   |
|-------|---|
| SPCC  | Spill Prevention Control and Countermeasure |
| SUPO  | surface use plan of operation               |
| SWPPP | Stormwater Pollution Prevention Plan        |
| TL    | Timing Limitation                           |
| U.S.  | United States                               |
| USC   | United States Code                          |
| USDA  | U.S. Department of Agriculture              |
| USDI  | U.S. Department of the Interior             |
| USFWS | U.S. Fish and Wildlife Service              |
| USGS  | U.S. Geological Survey                      |
| VOC   | Volatile Organic Compound                   |
| VRM   | Visual Resource Management                  |
| VQO   | Visual Quality Objective                    |

## 1.1 Introduction

The Bureau of Land Management (BLM) North Central Montana District Division of Oil and Gas, Dillon Field Office (DFO) and the U.S. Department of Agriculture, Forest Service (Forest Service) Beaverhead-Deerlodge National Forest (BDNF) have jointly prepared this Environmental Assessment (EA) to analyze and disclose the environmental effects of the development of a single exploratory oil well and associated infrastructure in Beaverhead County, Montana by Lima Exploration Company, LLC (Lima Exploration). The BLM and the Forest Service have prepared this EA in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and state laws and regulations. This EA is a site-specific analysis of potential impacts that could result from development of a single exploratory well.

Lima Exploration has submitted two Applications for Permit to Drill (APDs) to the BLM for a single exploratory oil well that would target the Quadrant Sandstone formation at depths between approximately 4,800 and 10,800 feet. The APD is for the proposed surface location Tendoy Federal #13-1 Well is on BLM surface land, referred to as the Tendoy location. This well site is proposed near Shearing Pen Gulch (Section 14, Township 14 South, Range 10 West) and is accessed by Big Sheep Creek Road (**Appendix G, Figure 1-1**).

The APD is for the proposed surface location White Pine Federal #18-1 Well is on Forest Service administered land, referred to as the White Pine location. This well site is proposed on White Pine Ridge (Section 18, Township 14 South, Range 9 West) and is accessed by Little Sheep Creek Road and White Pine Ridge Road (**Appendix G, Figure 1-1**). These two locations are the two alternatives being evaluated in this EA. The Proposed Action is for the federal agencies to approve one of these two APDs, resulting in a single exploratory oil well.

This EA serves as a decision-making tool that can assist the BLM and Forest Service in making an informed determination as to whether any significant effects could result from the proposed action which includes road and well pad construction, well drilling, placement of production facilities, and interim reclamation. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or to issue a Finding of No Significant Impact (FONSI). If the BLM and Forest Service determine that this project could result in significant impacts, based on the analysis in the EA, then an EIS would be prepared. If the project would not result in significant environmental effects necessitating the preparation of an EIS, the appropriate FONSI would be issued.

## 1.2 Purpose and Need for Action

The purpose and need of this analysis is to assess the potential environmental impacts associated with the submission of an Application for Permit to Drill by Lima Exploration. Federal agencies have a legal and regulatory responsibility to respond to the application and allow for the exploration and development of oil and gas resources on Federal mineral leases, consistent with lease rights.

It is the BLM's responsibility to respond to any APD under the Mineral Leasing Act of 1920 (MLA) as amended, the Federal Land and Federal Land Policy Management Act of 1976 (FLPMA), and the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (FOOGLRA). The MLA authorizes the BLM to lease public lands for the development of mineral deposits (including oil, gas, and other hydrocarbons) and to permit the development of those leases. FLPMA mandates that the BLM manage public lands based on multiple use (43 U.S. Code [USC] § 1701(a) (7)). Mineral extraction is identified as one of the principal uses of public lands in Section 103 of FLPMA [43 USC § 1702(c)]. The FOOGLRA outlines BLM's and the Forest Service's responsibilities to respond to a request for an APD. Oil and gas exploration and

development is recognized as an appropriate use of public lands in the Dillon Resource Management Plan (RMP) (BLM, 2006) and the Land and Resource Management Plan for the BDNF (Forest Plan) ” offer oil and gas leasing opportunities under stipulations which protect resource values’ (Forest Service, 2009 pg 27).

### 1.3 Proposed Action

Lima Exploration has submitted Applications for Permit to Drill (APD) to the Bureau of Land Management, North Central Montana District Division of Oil and Gas for one federal horizontal oil well on one of two sites being considered. The well would be drilled from a newly constructed well pad. One site is located on BLM (Tendoy), and the other on USFS surface (White Pine). Each site would target the same bottom hole location. Only one surface location would be disturbed. See **Table 1-1** for estimated surface disturbance. See **Appendix G** for proposed surface location maps.

**Table 1-1: Estimated Surface Disturbance Summary**

| Alternative            | Legal Surface Location                 | Project Component                             | Total New Surface Disturbance (acres) | Temporary Disturbance <sup>a</sup> (acres) | Permanent Surface Disturbance (acres) |
|------------------------|--|---|---------------------------------------|--|---------------------------------------|
| Tendoy Alternative     | T. 14 S, R. 10 W<br>Section 14 SESE    | Well pad                                      | 4.9                                   | 2.9  | 2.0                                   |
|                        |  | Road upgrade                                  | 6.6                                   | 0.0  | 6.6                                   |
|                        |  | New access road<br>(4.7 miles, 30-foot width) | 18.3                                  | 0.0  | 18.3                                  |
|                        |  | <b>Total</b>                                  | <b>29.8</b>                           | <b>2.9</b>                                 | <b>26.9</b>                           |
| White Pine Alternative | T. 14 S, R. 09 W<br>Section 18<br>NWSE | Well pad                                      | 5.3                                   | 2.8  | 2.5                                   |
|                        |  | New access road                               | 0.1 <sup>b</sup>                      | 0.0  | 0.1                                   |
|                        |  | White Pine Road upgrades                      | 4.6                                   | 0.0  | 4.6                                   |
|                        |  | Little Sheep Creek Road upgrades              | 2.0 <sup>b</sup>                      | 0.0  | 2.0                                   |
|                        |  | <b>Total</b>                                  | <b>12.0</b>                           | <b>2.8</b>                                 | <b>9.2</b>                            |

(a) Reclaimed within 3 months of disturbance

(b) Estimated disturbance acres.

The MLA and related regulations, as well as the policies by which they are implemented, recognize the right of lease holders to develop Federal mineral resources to meet continuing needs and economic demands, so long as unnecessary or undue degradation is not incurred. These rights include the right to build and maintain necessary improvements, subject to lease and/or landowner terms and conditions. The lessee has the right to use as much of the leased lands as is necessary to explore, develop, and/or dispose of the leased resource [43 Code of Federal Regulations (CFR) 3101.1-2] subject to lease terms, conditions, and stipulations. The lease stipulations are included in **Appendix A**. The FLPMA mandates that these rights be permitted in a manner that provides adequate protection of other resource values.

### 1.4 Decision Framework

The BLM and Forest Service share joint goals in managing Federal oil and gas operations pursuant to Federal oil and gas leases on National Forest Service (NFS) lands. In managing the Federal mineral

estate underlying NFS lands, the BLM cooperates with the Forest Service to ensure that mutual management goals and objectives for oil and gas exploration and development activities are achieved. The BLM issues and administers oil and gas leases on NFS lands. The BLM has the authority and responsibility to provide final approval of all APDs, including those for operations on Federal leases on NFS lands. Each APD includes a Surface Use Plan of Operations (SUPO) and a drilling plan. The BLM has the authority and responsibility to regulate all down-hole operations and directly related surface activities and use, and provide approval of the drilling plan and final approval of the APD on NFS lands.

The Federal Agencies are responding to an APD that has been submitted by Lima Exploration to exercise their lease rights by drilling a single exploratory oil well. Two surface location alternatives are being considered: the Tendoy surface location (Tendoy alternative) located on BLM administered lands and the White Pine surface location (White Pine alternative) located on National Forest Service lands. Both alternatives target the same bottom hole location.

The decision to be made by the Agencies is to approve one of the surface locations with stipulations and conditions of approval. The decision made to approve a location will be made cooperatively by the BLM and Forest Service responsible officials based on public comment and on the analysis in this EA.

The decision framework associated with approving the Tendoy alternative is as follows:

- The BLM will issue a decision on the Tendoy APD without concurrence from the USFS;
- Conditions of Approval (COAs) would be attached to the approval of the APD for the Tendoy Federal #13-1 well according to lease terms and stipulations and applicable regulations. Mitigation measures and design features will be required for the Tendoy alternative to be approved;

The decision framework associated with approving the White Pine alternative is as follows:

- The SUPO for the White Pine Federal #18-1 well on the proposed pad location, with associated pad layout diagram, surface facilities, and access road must be approved by the USFS. The BLM will accept USFS concurrence before approving the White Pine alternative;
- Conditional of Approval (COAs) would be attached to the approval of the APD for the White Pine Federal #18-1 well according to lease terms and stipulations, and applicable regulations, including mitigation measures outlined in the BDNF Forest Plan.

## **1.5 Land Use Plan Conformance**

### **BLM Plan Direction & Consistency**

The proposed Tendoy surface location is consistent with the direction of the Dillon Resource Management Plan (RMP), approved in February 2006, as amended. As stated on page 43 of the Dillon RMP, one of the goals of the RMP is to “advance dependable, affordable, and environmentally responsible production and distribution of leasable minerals [including oil and gas, coal, oil shale, and phosphate] by identifying lands appropriate for lease and development.” The RMP allocates approximately 1,209,278 acres of Federal mineral estate as available for leasing, subject to applicable oil and gas lease terms and stipulations. Federal Lease MTM-98650 is an existing lease in the area administered by the Dillon Field Office. The lease was issued 04/01/2009 and is subject to stipulations listed in **Appendix A** (Lease Stipulations).

In September 2015, the Dillon RMP was amended to incorporate Greater Sage-Grouse conservation measures as part of the Idaho and Southwestern Montana Greater Sage-Grouse Approved Resource Management Plan Amendment (ARMPA; BLM, 2015a). The surface locations were analyzed for consistency with the direction in the Amendment and were determined to be in conformance with the Amendment.

### **Forest Plan Direction and Consistency**

The proposed White Pine surface location is consistent with the Beaverhead National Forest Land and Resource Management Plan, adopted in 1986. The leases associated with the White Pine Federal #18-1 APD were issued in 2007; the Management Plan determined what lands were available for oil and gas leasing and established direction for protection of resources. The Forest Service, in 1990, promulgated national regulations for oil and gas leasing analyses and decisions (36 CFR 228 Subpart E). The Beaverhead National Forest completed a 1995 FEIS and an oil and gas leasing decision (Forest Service, 1996) which complied with the 1990 regulations and amended the 1986 Forest Plan. The 1995 FEIS analyzed the use of different stipulations to protect various resources. Stipulations that varied included No Surface Occupancy (NSO) stipulations, Timing Limitations (TL), Controlled Surface Use (CSU) stipulations, or Standard Lease Terms (SLT). Stipulations required by the 1996 decision were attached to the leases when they were issued in 2007 (see **Appendix A** for stipulation listing).

The leases associated with the White Pine alternative were issued in 2007, before the new availability analysis in the current Beaverhead-Deerlodge National Forest Plan, adopted in January 2009. The 2009 Plan recognizes that any revisions to instruments for occupancy and use of National Forest System lands are subject to valid existing rights, therefore, the stipulations found in Standard 1 of the 2009 Plan do not apply to this project. Forest Plan Standard 2 says that any new road constructed for oil and gas activity will be obliterated after use, unless the road is needed as part of the Forest Service permanent transportation system. Standard 3 says that all drill pads will be obliterated. Forest Plan Standards 2 and 3 are part of the operator-committed design features and will be enforced during the life of this project.

In September 2015, the BDNF Forest Plan was amended to incorporate Greater Sage-Grouse conservation measures as part of the Greater Sage-grouse Record of Decision (ROD) for Southwest Montana and Land Management Plan Amendment for the Beaverhead-Deerlodge National Forest (USFS, 2015). The alternatives were analyzed for consistency with the direction in the Amendment and were determined to be in conformance with the Amendment.

This project implements the BDNF Land Management Plan (Forest Plan) and is not authorized under the Healthy Forest Restoration Action (HFRA); therefore, it is subject to the pre-decisional administrative review process in 36 CFR 218 subparts A and B.

## **1.6 Relationship to Statutes, Regulations, or Policies**

Both alternatives being considered were designed to comply with the existing lease stipulations, the respective land and resource management plans, and the following laws, regulations, and policies:

- Clean Air Act (42 USC §7401 et seq. (1970), as amended through Public Law 108-201, February 24, 2004)
- Clean Water Act (33 USC §1251 et seq. (1972), as amended through Public Law 107-303, November 27, 2002)
- Comprehensive Environmental Response, Compensation, and Liability Act (42 USC §9601 et seq. (1980), as amended through Public Law 107-377, December 31, 2002)
- Mineral Leasing Act of 1920, as amended (30 USC §181, et seq.)

- Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 USC §226 (1987))
- Endangered Species Act of 1973 (16 USC §1531, as amended through Public Law 108-136, November 24, 2003)
- Energy Policy Act of 2005 (42 USC §13201 et seq. (2005)) as amended
- Federal Land Policy and Management Act of 1976 (43 USC §1701 et seq. (1976), as amended through May 1, 2001)
- Organic Administration Act of 1897
- National Environmental Policy Act (42 USC §4321 et seq. (1970), as amended through December 31, 2000)
- National Forest Management Act of 1976 (16 USC §1600 et seq. (1976))
- 36 CFR 228, Subpart E
- National Historic Preservation Act (54 USC §300101 et seq. (1966), as amended through December 19, 2014)
- Resource Conservation and Recovery Act (Public Law 94-580; October 21, 1976)
- Onshore Oil and Gas Operations (43 CFR 3160)
- Onshore Oil and Gas Orders Nos. 1, 2, and 7
- Paleontological Resources Preservation Act (43 CFR 8200), 2009
- Surface Operating Standards for Oil and Gas Exploration and Development (The Gold Book) (U.S. Department of Interior (USDI) / U.S. Department of Agriculture (USDA), 2007)
- Executive Order (EO) 11988, 11990, 12898, 13186
- Beaverhead-Deerlodge National Forest Noxious Weed Control Program. Final Environmental Impact Statement. 2002.
- Dillon Field Office Integrated Weed Management EA - DOI-BLM-MT-B050-2017-0018-EA, signed May 10, 2017
- Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States Programmatic EIS, DOI-BLM-WO-WO2100-2012-0002-EIS, signed August 15, 2016
- Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS, approved September 29, 2007
- Federal Noxious Weed Act of 1974, as amended in 1988, 1994
- Carson Foley Act of 1968 (Weed Control on Public Lands)
- BLM Manual 9015: Integrated Weed Management, 1992
- Migratory Bird Treaty Act of 1918

## 1.7 Permitting Process

Approval of Operations and APD Authorization is defined in Onshore Oil and Gas Order Number 1. All APDs for Federal mineral leases require final approval from the BLM. The BLM does not approve Surface Use Plans of Operations (SUPOs) for National Forest Service (NFS) lands; The FS notifies the BLM of its SUPO approval and the BLM proceeds with the APD review. The BLM may not approve an APD until the FS has approved the SUPO. In addition, a drilling plan of operations on any Federal mineral lease is also subject to approval by the BLM and must adhere to the provision and standards of Onshore Oil and Gas Order Number 2. The FS has no authority over the approval of the drilling plan. Upon approval, an APD is valid for 2 years from the date of approval or until lease expiration, whichever occurs first. If the operator submits a written request before the expiration of the original approval, the BLM, in coordination with the FS, as appropriate may extend the APD's validity for up to 2 additional years.

## 1.8 Scoping

On October 30, 2015, the BLM and Forest Service issued a public scoping notice summarizing the project and inviting comments regarding the scope of this EA. The scoping notice was sent to private landowners, local government officials, environmental groups, and state and federal agencies. Scoping materials were also sent to the Blackfoot Tribe, the Confederated Salish & Kootenai Tribes, the Shoshone-Bannock Tribes, the Nez Perce Tribe, and the Eastern Shoshone. The BLM and Forest Service held two public meetings as part of the scoping process for the project. The public was notified of the meetings through advertisements on two different weeks through the Madisonian (November 5 and 12, 2015) and the Dillon Tribune (November 4 and 11, 2015). Approximately 28 members of the public attended the meetings.

Additionally, information was posted on the BDNF and BLM DFO websites. On January 25, 2016, the BLM and Forest Service issued a second public scoping notice to allow for additional review of the project and public comments. A total of 41 comments were received from agencies, organizations, businesses, and individuals (**Appendix C**). The BLM and Forest Service interdisciplinary team reviewed the scoping comments to identify issues for analysis in this EA.

## 1.9 Resource Issues Identified for Analysis

The BLM focuses its analysis on issues that may be impacted by the action in question, rather than amassing needless detail (40 CFR 1500.1(b)). Issues are defined as those topics that have a relationship with the proposed activities; are within the scope of analysis; and are amenable to scientific analysis. The following resources/issues were identified during scoping and will be analyzed in this EA:

### **Issue 1: Public Safety**

What is the potential for vehicular accidents along the project access routes brought about by the proposed activities?

- Indicator: Qualitative analysis of potential impacts of increased truck traffic on Little Sheep Creek Road and Big Sheep Creek Road on public safety

### **Issue 2: Air Resources**

How would emissions of criteria pollutants, Hazardous Air Pollutants (HAPs), and fugitive dust associated with development of the proposed surface locations potentially impact nearby occupants?

- Indicator: Tons per well and tons per year of PM-10, PM-2.5, NO<sub>x</sub>, SO<sub>2</sub>, CO, VOC<sub>x</sub>, HAPs

How would emissions associated with development of the proposed surface locations potentially contribute to Greenhouse gases and climate change?

- Indicator: Million metric tons (MMT) per year of carbon dioxide equivalents (CO<sub>2</sub>eq)

### **Issue 3: Water resources**

What are the direct, indirect, and cumulative effects of potential oil and gas development for the proposed surface locations?

- Indicator: Qualitative assessment of effects to groundwater from well construction, including consideration of depth to usable water, depth to targeted formation, and well construction requirements such as depth of surface casing and cementing.
- Indicator: Qualitative assessment of effects to surface water and wetlands/riparian areas from well pad construction, spills, and related road maintenance and use.



- Indicator: Quantitative assessment of effects to surface water from sedimentation measured in tons of sediment.

#### **Issue 4: Vegetation**

How is vegetation affected by the proposed action?

- Indicator: Acres of disturbance
- Indicator: Analysis of effect on T&E species or sensitive plant species present in the proposed project location

#### **Issue 5: Terrestrial wildlife, migratory birds, threatened and endangered and sensitive species and associated habitat**

What are the direct, indirect, and cumulative effects of potential oil and gas development on the proposed surface locations on big game, migratory birds, threatened and endangered, and sensitive species?

- Indicator: Qualitative effects to migratory birds from well construction, well operations, and road improvements and maintenance
- Indicator: Qualitative assessment of effects to big game habitat from well construction, well operations, and road improvements and maintenance
- Indicator: Qualitative assessment of effect to T&E and Sensitive Species from well construction, well operations, and road improvements and maintenance

#### **Issue 6: Riparian, Aquatic, and Wetland Habitat**

How does truck traffic affect suitable habitat along the access routes?

- Indicator: Qualitative assessment of suitable habitat present
- Indicator: Qualitative assessment of sedimentation to habitat on proposed access routes

#### **Issue 7: Visual Resources**

How is the visual resource altered by the proposed alternatives?

- Indicator: Qualitative assessment of visual resource classification
- Indicator: Analysis of effects to visual resource designation by the proposed alternatives

#### **Issue 8: Recreation**

How do the proposed alternatives affect recreation?

- Indicator: Qualitative evaluation of the impacts of the proposed alternatives to hunting, fishing, cycling, dispersed camping, and other recreational activities.

### **1.10 Resource Issues Eliminated from Further Analysis**

Issues identified during scoping but not analyzed in depth in this EA were those identified as:

- Outside the scope of the project;
- Already decided by law, regulation, land use plan, or other higher-level decision;
- Mitigated through operator committed measures and/or lease stipulations;
- Not present in the analysis area/not potentially impacted by the project;

- Not relevant to the decision to be made; or
- Conjectural and not supported by scientific or factual evidence.

### **1. Hazardous materials spills**

According to the EPA, there are no known existing hazardous material spills in the vicinity of the project or the access roads (EPA, 2018a). The applicant would be required to have a Spill Prevention, Control, and Countermeasure (SPCC) plan to help facilities prevent a discharge of oil into navigable waters. Additionally, the operator will be required to submit a Stormwater Pollution Prevention Plan (SWPPP) to address site-specific activities and conditions at the project location that could cause water pollution, and details the steps the operator will take to prevent the discharge of any unpermitted pollution. These two plans are intended to mitigate any spill that may occur on the access road or well pad.

### **2. Noxious Weeds and Invasive Plant Species**

Lima Exploration has proposed a variety of operator committed mitigation measures designed to reduce impacts and the spread of invasive and noxious weeds from increased truck traffic and development of one of the well pad location. These measures include, prior to initiating construction operations, all heavy equipment and vehicles would be pressure washed at an offsite location and inspected prior to entering the access roads and project location. A weed control program would be developed by Lima Exploration prior to construction and implemented throughout the project duration in accordance with agency guidelines and agreements. Noxious weeds identified during monitoring would be treated with a BLM- and/or Forest Service-approved herbicide as needed to maintain control and prevent their spread. All weed control measures would be coordinated with either the BLM or Forest Service.

### **3. Socioeconomics and Environmental Justice**

The area was screened for the presence of minority and low-income populations using the EPA EJSCREEN tool (EPA, 2018c). The tool contains demographic indexes, including percent low-income and percent minority, based on the U.S. Census 2011-2015 ACS 5-Year Estimates. The tool calculates percent low income as the percent of a block group's population in households where the household income is less than or equal to twice the Federal poverty level. A comparison of the percent minority and low-income for the block group, county, and state was performed; the minority population did not exceed 50 percent and was not 10 percentage points higher than the county or state. Also, the low-income population within the block group was not 10 percentage points greater than the county or state. Due to this, the project block group is not considered an environmental justice minority or low-income area.

### **4. Soils**

Increased erosion can lead to a decrease in soil fertility and an increase in sedimentation. The duration and intensity of these impacts would vary according to the type of construction activity to be completed and the inherent characteristics of the soils to be impacted. The potential for erosion would increase through the loss of vegetative cover and soil structure, as compared to an undisturbed state. These impacts would be minimized by rigorous compliance with the project-specific Stormwater Pollution Prevention Plan, the reclamation methods, site-specific reclamation plans, and the design features in **Table 2-3**.

MTM-98650 (Tendoy Alternative) lease stipulation MT-12-1 requires that an engineering/reclamation plan be approved for the project by the AO prior to surface disturbance on slopes over 30 percent. Additional implementation of the applicant-committed design features and the existing site-specific reclamation plan in the proposed surface use plans for the submitted APDs would minimize effects to the project area from soil erosion in the short-term and result in long-term success of interim reclamation. MTM-96679 (White Pine Alternative) lease stipulation (Soil Stipulation #10 in **Appendix A**) requires no surface occupancy or use within portions of Section 18 in T14W R9W to preclude construction of well sites and related facilities on slopes over 60% which would be difficult to rehabilitate. The proposed well

pad and facilities related to the White Pine alternative have been designed to avoid disturbing any areas with steep slopes. Also, MTM-96682 also contains this stipulation for Sections 33, 34, and 35 of T14W R9W.

## **5. Geology**

Because of the severe fold-thrust history of the Tendoy Mountains, the geology consists of mostly of block faulting. The proposed actions drill through the complex subsurface geology of the Tendoy Mountains and although the proposed bottom hole location for both alternatives is the same target formation (difference in depths needed for testing and production from alternative locations), the surface elevation and locations are different. The risk of seismic activity in the vicinity of the project area is moderate; there are five faults recorded within 10 miles of the project area, none of which is considered active at this time with exception to the M3.2 earthquake recorded in Lima on April 9, 2019. Site-specific geologic and engineering reviews of Lima Exploration's proposed drilling program were conducted by the BLM to evaluate adequacy of casing, cementing, and ground water protection. No substantial subsurface geologic hazards are expected. The potential for lost circulation is not expected. The drilling program would be designed to include sufficient materials on hand to control any loss of circulation. Although unusual or high subsurface pressures are not expected to be encountered, adequate blowout preventers and related equipment would be installed and tested prior to drilling.

## **6. Cultural and Paleontological Resources**

A paleontological survey was done for the Tendoy Alternative (BCA, 2015a) since there are known paleontological sites in the immediate region and the geological formations underlying the Tendoy Alternative have Potential Fossil Yield Classification (PFYC) values that are rated as having a moderate to high potential for fossils. No paleontological sites were found at during the paleontological survey for the Tendoy Alternative. A paleontological survey was not conducted on the White Pine Alternative because there are not any known paleontological sites in the immediate region and the geological formations underlying the White Pine alternative have PFYC values that are rated low potential for fossils. A paleontological survey would be conducted for the White Pine location prior to operations if that location is selected for the project.

Beaver Creek Archaeology, Inc. (BCA) conducted cultural resources investigations for the Tendoy well pad and access road corridor (BCA, 2015b). The July 2015 survey revealed six new cultural resources (one historic archaeological site, two pre-contact archaeological sites, two historic isolated finds, and one pre-contact isolated find). These sites and isolated finds are not eligible to the National Register of Historic Places (NRHP) with the exception of the two pre-contact archaeological sites (24BE2367 and 24BE2368). Site 24BE2367, a cairn/mound, is recommended eligible for NRHP and the eligibility of 24BE2368, lithic scatter, is undetermined pending further investigation. Both of these sites will be avoided by the project per Conditions of Approval of the APD and Lease Stipulation MT-11-23 which prohibits surface occupancy and use within one-half mile of the boundaries of cultural properties...; to avoid disturbance and to protect archaeological properties of known significance to Native American groups, as well as traditional cultural properties, and the setting in which they occur.

BCA conducted cultural resources investigations for the White Pine well pad and proposed 85-foot-long access road corridor in October 2015 (BCA, 2016). The October 2015 field investigations revealed five new cultural resources (one pre-contact archeological site and four historic archaeological isolated finds). All cultural resources were recommended as ineligible to the NRHP. An in-field survey of the White Pine Ridge Road and Little Sheep Creek Road locations of road upgrades were conducted by the South Zone Archaeologist. One newly recorded site (24BE2398) was recorded. It is within the project Area of Potential Effect. The Montana State Historic Preservation Office concurred the site 24BE2398 is not eligible for the National Register of Historic. The White Pine alternative will have No Adverse Effect on Historic Properties (MT SHPO concurrence letter 3/30/2016).

## 7. Public Safety

The geographic scope for the cumulative effects analysis consists of the access routes for the two alternatives. There is currently substantial year-round traffic on both Little Sheep Creek and Big Sheep Creek Roads. This traffic volume varies by season but is generally higher on Big Sheep Creek Road than Little Sheep Creek Road due to the larger area served by the road, and the presence of year-round residences on Big Sheep Creek Road. If this project is not approved, the road safety will remain as it currently is. If the project is approved safety concerns on these roads will be mitigated to an acceptable level by applying safety measures in the operator committed measures, design features, and COAs. Recent improvements to the Big Sheep Creek Road by Beaverhead County help in reducing any risk of accidents and spills; the proposed activities in either action alternative increases the risk of both accidents and spills from the current level of risk due to the increase in truck traffic. With the implementation of mitigation measures it is possible that the risk of either accident or spills can be reduced to a level that is not substantial and, therefore, no cumulative effects will occur.

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## 2.0 DESCRIPTION OF ALTERNATIVES

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### 2.1 Introduction

Lima Exploration has submitted two APDs for consideration, with the intent of drilling on only one of the locations. In 2015, Lima Exploration expressed interest to the BLM for one exploratory oil well within the Tendoy Unit Area. To satisfy the public interest requirement for an approved unit agreement, Lima Exploration must drill a unit obligation well. Either of the proposed well surface locations would satisfy that purpose. This EA considers the effects of three alternatives: No Action, Tendoy (BLM surface) location, and White Pine (USFS surface) location. Alternatives were developed based upon National and State BLM direction and policy, existing conditions, and resource issues.

### 2.2 No Action Alternative

Under the No Action Alternative, neither APD for a proposed Federal well would be approved. By selecting the No Action Alternative, the proposed construction and operation of the well would not occur on Federal lands. The BLM can deny an APD application if the proposal would violate lease stipulations or applicable laws and/or regulations to prevent undue or unnecessary environmental degradation. The denial does not deny the right to drill and develop a leasehold, and Lima Exploration could submit an APD proposing an alternative location or methods to develop this lease in the future.

### 2.3 Tendoy Alternative

An APD was submitted for the Tendoy Federal #13-1 surface well location on Federal Lease MTM-98650 (SESE Sec. 14, T. 14 S., R. 10 W.) on July 10, 2015. This location is referred to as the Tendoy Alternative. The proposed Tendoy surface well pad is located on BLM-administered public land, approximately 18.8 miles southwest of Dell, Montana. Under the Tendoy Alternative, the BLM would approve Lima Exploration's APD to drill the Tendoy Federal #13-1 well to develop federally owned minerals held by the lease. The primary formation being targeted is the Quadrant Sandstone formation at depths between approximately 4,800 and 10,800 feet. The Tendoy Alternative includes use of existing road, constructing new road, constructing a drill pad, drilling an oil well, carrying out a production test of the new well, and producing the well if commercial resources are identified. Descriptions of the proposed construction and well development activities are provided in **Section 2.5**.

The application of lease terms and the following stipulations apply to this alternative:

- MT 11-23 – Surface occupancy and use is prohibited within one-half mile of the boundaries of cultural properties determined to be of particular importance to Native American groups, determined to be traditional cultural properties, and/or designated for traditional use.
- MT 11-20 – Surface occupancy and use is prohibited within one-half mile from the centerline of class 1 fishery streams (blue ribbon trout streams).
- MT 11-2 – Surface occupancy and use is prohibited within riparian areas, 100-year flood plains of major rivers, and on water bodies and streams.
- MT 13-7 – Surface use is prohibited from December 1 through May 15 within Big Game Winter/Spring range for wildlife. This stipulation does not apply to the operation and maintenance of production facilities.
- MT 13-9 – Surface use is prohibited from November 1 through June 30 in Bighorn Rutting, winter and lambing habitat. This stipulation does not apply to operation and maintenance of production facilities.
- MT 13-11 – Surface use is prohibited from March 1 through July 31 within one-half mile of raptor nest sites which have been active within the past five years. This stipulation does not apply to operation and maintenance of production facilities.
- MT 12-1 – Prior to surface disturbance on slopes over 30 percent, an engineering/reclamation plan must be approved by the authorized office.
- MT 12-11 – a field inspection will be conducted for special status plant species by the lessee prior to any surface disturbance.
- MT 12-10 – All surface disturbing activities and construction of semi-permanent facilities in VRM class II, III, and IV areas may require special design including location, painting, and camouflage to blend with the natural surround and meet the visual quality objectives for each respective class.

See **Appendix A** for the complete definitions of stipulations.

### **2.3.1 Tendoy Well Pad and access route**

The permanent surface disturbance utilized for the Tendoy surface location would be approximately 26.9 acres. The initial disturbed area associated with the well pad and facilities proposed for the Tendoy Alternative would occupy approximately 4.9 acres. The well pad would be oblong-shaped to conform as closely as possible with the existing topography and would have a maximum easterly-westerly dimension of approximately 850 feet and a maximum northerly-southerly dimension of approximately 250 feet, including areas for segregated spoil piles (topsoil and subsoil) and for cuts and fills (See **Figure 2-2 in Appendix G**). Cut and fill slopes would be a maximum of 3:1 where practicable. If the well is productive, approximately 2.9 acres would be reclaimed after drilling and completion, leaving a long-term disturbance of 2.0 acres. During interim reclamation activities cuts and fills are re-contoured to blend with adjacent natural slopes and are revegetated. Long-term surface disturbance at the well pad would be reduced to approximately 2.0 acres (**Figure 2-3 in Appendix G**). If the well proves to be unproductive, the entire well pad would be reclaimed. The proposed well site would be accessed by approximately 14.1 miles of existing road and 4.7 miles of upgraded primitive trail. The existing county roads would be maintained as required in Onshore Order Number 1, and existing bridges would require routine inspection or maintenance as determined by Beaverhead County. The proposed new portions of the access road would be entirely on BLM land and within Federal leases MTM-098650, MTM-96679, MTM-099270 and MTM-098651.

## **2.4 White Pine Alternative**

An APD was submitted for the White Pine Federal #18-1 surface well location on Federal Lease MTM-96679 (NWSE Sec. 18, T. 14 S., R. 9 W.) on March 7, 2016. This location is referred to as the White Pine Alternative. The proposed White Pine well pad is located on Forest Service-administered public land, approximately 16.3 miles south and west of Lima, Montana. The primary formation being targeted is the Quadrant Sandstone formation at depths between approximately 4,800 and 10,800 feet. The White Pine Alternative includes upgrading existing road, constructing 0.1 acres (85 feet) of new road, constructing a drill pad, drilling an oil well, carrying out a production test of the new well, and producing the well if commercial resources are identified. Descriptions of the proposed construction and well development activities are provided in Section 2.5.

The application of lease terms and the following stipulations apply to this alternative:

- Soils Stipulation #1 – NSO – No surface occupancy or use is allowed...to preclude construction of well sites and related facilities on slopes over 60% which would be difficult to rehabilitate.
- Fisheries Stipulation #3 – CSU – Surface occupancy or use is subject to the following special operating constraints:
  - A watershed assessment in unsurveyed streams with “potential” (suspected but occurrence not yet documented) populations may be needed.
  - No NET increase in sediment over existing condition.
  - No adverse effect to water quality or quantity which may require the use of extraordinary construction equipment or facilities to prevent the discharge of drilling fluids or production effluents.
- Fisheries Stipulation #4 – NSO – No surface occupancy or use is allowed...to ensure a healthy aquatic habitat exists in watershed important to the viability of pure Upper Missouri Westslope Cutthroat Trout occupying roaded drainages with high or extreme risk of extinction...through application of the following mitigation measures:
  - No net increase in sediment over existing conditions
  - No adverse effects on water quality or quantity
- Wildlife Stipulation #3 – TL – No surface use is allowed from December 1 to May 15. This stipulation does not apply to operation and maintenance of production facilities.
- Scenic Resources Stipulation #4 – CSU – Surface occupancy or use is subject to the following special operating constraints: Proposed activities could be required to be located or designated to meet the visual quality objectives of retention.
- Scenic Resources Stipulation #5 – CSU – Surface occupancy or use is subject to the following special operating constraints: Proposed activities could be required to be located or designated to meet the visual quality objectives of retention.
- CSU 12-10 – All surface disturbing activities and construction of semi-permanent facilities in VRM class II, III, and IV areas may require special design including location, painting, and camouflage to blend with the natural surround and meet the visual quality objectives for each respective class.

See **Appendix A** for the complete definitions of stipulations.

#### **2.4.1 White Pine Well Pad and access route**

The total area of permanent surface disturbance utilized for the White Pine surface location would be approximately 9.2 acres. The initial disturbed area associated with the well pad and facilities pad required for the White Pine Alternative would occupy approximately 5.3 acres. The well pad would be square-shaped and would have a northeasterly-southwesterly dimension of 400 feet and a northwesterly-southeasterly dimension of 400 feet, areas for segregated spoil piles (topsoil and subsoil) and for cuts and fills (**Appendix G, Figure 2-5**). Maximum cut and fill slopes would be 3:1 where practicable. If the well

is productive, approximately 2.8 acres would be reclaimed, leaving approximately 2.5 acres for the production pad (**Appendix G, Figure 2-6**). If the well is not productive, the well pad would be reclaimed. See Section 2.5.8 for more details regarding reclamation.

Approximately 15.8 miles of existing county and Forest Service roads and construction of an additional 85 feet of road would be used to access the proposed well pad location. The entirety of the new access road would be on Forest Service land and within Federal Lease MTM-96679. The existing county roads would be maintained as required in Onshore Order Number 1. Existing bridges and cattle guards would require routine inspection or maintenance as determined by Beaverhead County.

## **2.5 Elements Common to Both Action Alternatives**

Under the Tendoy and the White Pine Alternative, Lima Exploration would develop a single exploratory well to evaluate oil resources in the area, while minimizing environmental effects to surface resources. Both Alternatives propose to upgrade and/or construct new roads, construct a drill pad, drill an oil well, carry out a production test of the new well, and produce the well if commercial resources are identified. Archaeological, paleontological, biological (including both wildlife and plants), and surface hydrological resources were considered when locating the proposed access road and drill pad locations. These well surface locations were proposed in order to minimize resource impacts while allowing for efficient and economical development of the mineral resources. All construction operations would conform to standards indicated in the *Gold Book* (USDI/USDA, 2007). The following sections provide information relevant for either alternative site.

### **2.5.1 Construction**

#### **Well pad and access roads**

Layouts for the Tendoy and White Pine well pads layout were designed to minimize the size of the surface needed for safe drilling and completion operations and to maximize the area that would be reclaimed during interim reclamation. All well pad construction would follow the guidelines for construction as outlined in the *Gold Book* (USDI/USDA, 2007), and would be constructed as approved in the APD.

The well pad location would be constructed from the present native soil/rock material. The pad area would be cleared of vegetation, leveled by standard cut and fill techniques, and graded to provide a work area for the drilling and producing activities. The well pad would be designed to balance the cut and fill, thereby minimizing the need for an excess spoils stockpile. Maximum slope for cut and fill would be 3:1. Stripped vegetation and topsoil material would be segregated and stockpiled separately. These materials would be reserved for use during interim and final reclamation. Erosion control measures, such as water bars, lateral furrows, weed-free straw bales, silt fences, or other appropriate measures, would be installed on cut and fill slopes to protect against erosion, as appropriate. Existing vegetation between the well pad and existing proposed access roads would be preserved to the extent practicable to reduce viewshed issues from each road, respectively.

Access roads would be designed for the tractor-trailer trucks required for the project. Upgrades and new road construction would create a 14-foot-wide travel way with turnouts, as necessary. The access roads would be maintained to accommodate year-round traffic and to minimize soil erosion. Road designs would be approved by the agencies prior to commencement of construction.

#### **Water Source**

Water for drilling and completing the well would come from a municipal water source as described in the SUPO. Approximately 5,000 barrels (0.65 acre feet) of water would be needed to drill and complete the proposed well and control fugitive dust. The water would be transported to the location by tanker truck.

## **Drilling Operations**

A diesel electric mobile drilling rig would be transported to the well site by tractor-trailer trucks. The well would be directionally drilled with water-based and invert drilling fluids using a closed-loop drilling system, thus enabling the cuttings to be removed from the drilling fluid and transferred to a steel hopper on the pad as the drilling fluid is recycled; a reserve pit would not be necessary for the drilling of the proposed well. The wells would be drilled and completed in full compliance with all applicable laws, regulation (43 CFR 3100), Onshore Oil and Gas Orders, the Applications for Permit to Drill APDs, and the Conditions of Approval. Drilling operations are expected to take no longer than 30 days, at which time the drilling rig would be removed from the location.

### **2.5.2 Completion and Testing**

If the drilled well indicates economic productivity, a completion rig would be moved to the well site for completion operations, which would commence approximately 1 to 2 weeks after exploratory drilling is completed. Rig demobilization would have a duration of approximately 10 days. Well completion would consist of perforating the production casing, treating the perforated interval with an acid blend, flowback of completion fluids, flow testing to determine productivity, and installation of production equipment to facilitate hydrocarbon sales. Completion and testing would have a duration of approximately 30 days. Prior to completion, the integrity of the cement in the wellbore would be confirmed by running and then evaluating the results of a cement bond log. The production casing would be perforated across the productive zones to allow the flow of hydrocarbons to the surface. A blend of water, surfactants, demulsifiers, and other chemicals would be pumped down the wellbore and through the perforations to remove near wellbore damage and induce greater permeability in the target formation. The proposed well would not require hydraulic fracturing. No hydraulic fracturing activities are proposed on this well.

Post-completion flow tests would evaluate the well's productivity. The duration of flow testing would vary according to well performance, but it typically would be conducted only long enough for the recovery of fluids. Produced fluids (including any oil/condensate) would be delivered to test tanks on the well pad. Oil/condensate would be skimmed from the surface and transferred to production tanks. During completion operations, it may be necessary to flare gas temporarily from a stack prior to installing production equipment.

In the event that the exploratory well does not indicate economic productivity, no further activities will take place and the wellbore will be abandoned as required by Montana Board of Oil and Gas and BLM regulations, Onshore Order #1 Part XII (43 CFR 3160) and 43 CFR 3126.3-4. All equipment will be removed and the well pad and access roads for the approved location (4.7 miles for Tendoy the alternative, 85 ft. for the White Pine alternative) will be reclaimed as proposed in the SUPO.

### **2.5.3 Production Operations**

All equipment and materials not necessary for production operations would be removed from the well pad. Assuming the well is deemed successful, well production facilities would be installed after drilling, testing, and completion operations are finished. All-weather gravel surfacing would be distributed on the pad where vehicles may drive, and, if necessary, on the area of the well pad on which the production equipment would be installed. Weed-free gravel would be inspected (either by Beaverhead County, BLM,



or Forest Service) and obtained from suppliers within Beaverhead County or the surrounding counties, as available.

Production equipment would be installed on the well pad to allow for safe operations and maximum interim reclamation. Facilities on the well pad may include equipment such as a wellhead, valves and piping, separator, heater-treater, production tanks, gas recovery equipment, solar panels, telemetry equipment, dehydrator, and a gas meter. Open stacks would be screened to prevent entry by birds. If tests determine oil can be produced, a pump may need to be installed to provide additional lift to get fluids to the surface if formation pressures are not sufficient.

An estimated three to five 400 - 700 barrel tanks would be placed on the well pad for storing oil/condensate and produced water. The exact number of tanks would be determined by production volumes encountered during testing operations. The low profile tanks would be approximately 16 feet in diameter and will not exceed 16' in height, with stairs and a walkway. Secondary containment berms would be constructed to surround production vessels, including production fluid storage tanks and the separator. The containment would be able to contain a minimum of 110 percent of the storage capacity of the largest tank in the battery. The integrity of the containment would be continually maintained. The berms would be built in compliance with EPA regulation 40 CFR 112.7 and all applicable Spill Prevention, Control, and Countermeasure (SPCC) measures and plans. Secondary containment trays would be utilized for all chemical containers, or they would be placed inside the tank containment area. The trays would promptly be emptied of any spills or precipitation that may accumulate. Spilled material is required to be disposed of at a licensed (state or federal) disposal facility. All infrastructure would conform to applicable regulations such as those in Onshore Order #1, the Gold Book, and 43 CFR 3126 or 36 CFR 228E.

All aboveground structures remaining onsite longer than 6 months would be painted as directed by the BLM or Forest Service. Surface facility painting would exclude those facilities and equipment required to comply with Occupational Safety and Health Administration (OSHA) regulations.

All production measurement facilities would conform to American Petroleum Institute or American Gas Association standards for liquid hydrocarbon and gas measurement. Lima Exploration would adhere to the site security guidelines and regulations identified in 43 CFR 3126.7.

Flaring may be utilized to manage gas that could be encountered with this well. Any flaring during production would be done in an enclosed flare that limits noise and visual impacts.

#### **2.5.4 Solid Waste Management, Hazardous Materials, and Safety**

Drill cuttings generated while drilling with water-based mud would be mechanically dried and then transferred to a cuttings disposal trench located in a cut section of the drilling pad. Drill cuttings generated while drilling with invert mud would be mechanically dried, solidified by mixing with fly ash or a similar solidifying agent, and then transferred to the cuttings disposal trench. The cuttings trench would be designed to allow at least 2 feet of freeboard at the end of the well. The cuttings disposal trench would be lined with a 12-mil plastic polyethylene (or similar material) liner, including enough excess to allow the liner to be folded over the top of the deposited cuttings prior to final backfill. Additional 12-mil plastic liners would be placed beneath the rig's sub-base and any tanks used to store base-oil for the mud system. All liners would be installed over sufficient bedding to cover any rocks. Prior to use, the entire location would be fenced and a cattle guard would be installed at the access road location, in order to protect both wildlife and livestock. Fencing around the cuttings burial trench would be installed in accordance with The Gold Book guidelines and maintained until the cuttings disposal trench is backfilled. Produced fluids other than water would be stored in temporary tanks on the well pad. Disposal of produced water would be done in accordance with Onshore Order No.7 at an approved production waste disposal facility.

All trash would be stored in a trash cage and hauled to an appropriate landfill during and after drilling and completion operations. Sewage would be contained in a commercial portable chemical toilet and sewage holding tanks in trailers during drilling and completion operations and would be disposed at a permitted disposal facility.

Materials including lubricants and additives will be used to drill and complete the well. These materials would be temporarily kept in limited quantities on the well pad. Some of these may contain hazardous materials in small percentages that include, for example, greases, lubricants, solvents, and paints. Materials that would be used during completion and production operations may include surfactants, demulsifiers, scale inhibitors, and corrosion inhibitors. These materials would be stored appropriately and within a secondary containment structure.

Safety Data Sheets (SDS) would be maintained by Lima Exploration or its contractors for all materials used on the location, and any chemical containers would display SDS labels. The transport, use, storage, and handling of hazardous materials would follow procedures specified by Federal and state regulations. Transportation of the materials to the well location is regulated by the U.S. Department of Transportation (DOT) under 49 CFR 171–180. DOT regulations pertain to the packing, container handling, labeling, vehicle placarding, and other safety aspects pertaining to hazardous materials.

Chemicals meeting the criteria for being acutely hazardous materials/substances or meeting the quantities criteria per BLM Instruction Memorandum No. 93-344 would not be used. Chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act of 1986 in quantities of 15,000 pounds or more would not be necessary or used, produced, stored, or transported during the drilling, completion, or operation of the well. In addition, no extremely hazardous substance (as defined in 40 CFR 355) in threshold planning quantities would be used, produced, stored, or transported while producing the well.

Hazardous waste as defined by the Resource Conservation and Recovery Act would not be generated in association with drilling the proposed well. Wastes that would result from drilling and operating the proposed well are considered solid wastes and are regulated as such. Such wastes include those generated at the wellhead and through the production stream. Typical solid wastes may include produced water, production fluids such as drilling mud, and well stimulation flowback fluids.

Lima Exploration will develop and implement a Spill Prevention, Control, and Countermeasure (SPCC) plan and a Storm Water Pollution Prevention Plan (SWPPP). Accidental spills of drilling fluids, oil, produced water, or other produced fluids would be cleaned up and disposed of in accordance with appropriate regulations and the SPCC plan. The SWPPP would control run-on or runoff and erosion from precipitation events.

Spills of hazardous materials are an extremely rare occurrence and are not anticipated as part of this project. However, Lima Exploration does have a spill contingency plan in place for all operations. Personnel are trained in how to safely respond and whom to contact in the event of a spill. Spill mitigation equipment is carried by all Lima field personnel.

### **2.5.5 Personnel, Equipment, and Traffic**

Timing limitations for both leases prohibit surface use from December 1 to May 15 to decrease surface disturbing activities in big game winter range. Additional timing limitations for the Tendoy Alternative prohibit surface use from November 1 to June 30 in bighorn rutting, winter and lambing habitat. Personnel performing construction, drilling, and completion operations would commute from the

surrounding area daily, within these timing limitations, for the named activities. During drilling and completion operations, five to seven trailers or motor homes would remain on location for use by the drilling crew supervisor, geologists, and other necessary personnel, and for equipment storage.

Constructing/upgrading the access road and constructing the well pad would require approximately 3 to 8 months or more depending on the decision and the final agency authorization. Five to ten individuals would comprise the construction crew and access the location daily, using an average of three light trucks. Road construction would be conducted in the project area during daylight hours. Bulldozers, motor graders, and other heavy equipment would be used as necessary to perform the earth-moving operations and install the culverts during construction. This truck and equipment traffic would be associated with the locations of the road being constructed and would be in addition to the traffic totals for drilling and production that are presented below. **Table 2-1** provides the approximate number of workers required during each phase of the project.

**Table 2-1: Estimated Workforce during Project**

| Project Phase               | Estimated Workers | Phase Duration   |
|-----------------------------|-------------------|--|
| Construction (road and pad) | 10                | Estimated 3 months for White Pine<br>Estimated 6-8 months for Tendoy |
| Rig mobilization            | 75                | 10 days  |
| Drilling                    | 30                | 30 days  |
| Rig demobilization          | 75                | 10 days  |
| Completion and testing      | 14                | 24 to 30 days  |
| Production                  | 5                 | From 1 to 20 years   |

Drilling operations would be conducted 24 hours a day, 7 days per week. During the 10-day rig mobilization operation, approximately 80 to 90 tractor-trailer loads (8 to 9 a day) and approximately 150 pickup truck loads (estimated average of 15 loads per day) of equipment would be required to transport the drilling rig and associated equipment to the well pad for assembly (Error! Not a valid bookmark self-reference.). These trucks would be road-legal tractor-trailers and pickup trucks. During the 30-day drilling operation, there would be approximately 90 to 150 additional tractor-trailer loads (estimated average of 3 to 5 per day) and approximately 250 additional pickup truck loads (estimated average of 8 to 9 a day) of material and equipment brought to or removed from the location. During the 10-day de-mobilization operation, approximately 80 to 90 tractor-trailer loads (estimated average of 8 to 9 a day) and approximately 150 pickup truck loads (estimated average of 15 loads per day) of equipment would be required to disassemble and transport the drilling rig and associated equipment off the pad.

**Table 2-2: Truck Traffic Estimate**

| Phase        | Estimated Duration | Estimated Average Tractor-Trailer Roundtrips per Day | Estimated Average Pickup Roundtrips per Day |
|--------------|--------------------|--|---|
| Mobilization | 10 days            | 8-9  | 15  |

| Phase                   | Estimated Duration                | Estimated Average Tractor-Trailer Roundtrips per Day | Estimated Average Pickup Roundtrips per Day |
|-------------------------|-----------------------------------|--|---|
| Road upgrades           | 30 to 60 days                     | Varies depending on final approved design            | Varies depending on final approved design   |
| Pad construction        | Concurrent with Road work         | Varies depending on final approved design            | Varies depending on final approved design   |
| Drilling                | 30 days                           | 3-5  | 8-9   |
| De-Mobilization         | 10 days                           | 8-9  | 15  |
| Completion <sup>a</sup> | 10 days                           | 10   | 11  |
| Testing <sup>a</sup>    | 14 days                           | 2  | 7-8   |
| Production              | Unknown. Range from 1 to 20 years | 1-2  | 1-2   |

(a) Tanker trucks would be required for these phases. The number of tanker trucks required would be determined by the volume of fluids produced during operations and would typically average between 1 to 5 trucks per day.

Completion operations would occur during daylight hours, 7 days per week, and would require approximately 10 days (estimated crew of 14 workers). During completion operations, approximately 100 tractor-trailer loads (estimated average of 10 per day) and approximately 110 pickup truck loads (estimated average of 11 per day) of material, personnel, and equipment would be brought to or removed from the well pad. Tanker trucks would also be needed to deliver water to the location and remove produced fluids. The number of these tanker trucks would be determined by the volume of fluids required and produced during completion operations but would typically average between 1 and 5 trucks per day.

Testing operations would occur on a 24-hour per day, 7 days a week basis and would require approximately 14 days (estimated crew of 14 workers). During testing operations, approximately 20 to 30 tractor-trailer loads (estimated average of 2 per day) and approximately 100 pickup truck loads (estimated average of 7 to 8 per day) of material and equipment would be brought to or removed from the well pad. Tanker trucks would also be needed to remove produced fluids to an approved disposal facility. The number of these tanker trucks would be determined by the volume of fluids produced during testing operations but would typically average between 1 and 5 trucks per day.

The production phase could last as long as 20 years and would involve a crew of approximately 5 workers. During production, an estimated 1 to 2 oil transport trucks per day would be needed to remove produced oil. Produced water trucks may also be needed but that amount of traffic is not known at this stage of the project planning. A reasonable estimate would be one truck every two days. However, the actual number of truck trips during production would vary based on the amount of oil produced. Estimated pickup truck traffic during production would range from 1 to 2 round trips per day year-round.

### 2.5.6 Maintenance

All vehicle traffic, personnel movement, and construction/restoration operations would be confined to permitted areas. The producing well would typically be visited daily by a pumper, depending upon well performance. Visits may be reduced to the extent practical utilizing remote monitoring of the well. The access road and well pad would be kept free of trash during production operations. Produced water would

be hauled by truck to an approved disposal facility. Oil/condensate would be contained in tanks on the well pads and transported by truck to the point of sale.

Lima Exploration would maintain the access roads to Onshore Order Number 1 and agency resource road standards as applicable, providing a reasonably smooth surface free of rocks and ruts no greater than 4 inches deep for 10 feet or longer. Vehicle travel would be restricted to the access roads, established vehicle turnouts, and well pads. Dust control measures would be performed when necessary during dry conditions. Any specific requirements by the agencies for this effort shall be stipulated in the COAs. Lima Exploration would instruct its employees and contractors not to exceed 20 miles per hour on the access road to discourage the generation of fugitive dust.

Lima Exploration would control noxious weeds and invasive plants by utilizing a state-certified licensed herbicide applicator and using BLM- and/or Forest Service-approved herbicides. All weeds would be treated annually or as needed to maintain control.

Snow removal and drainage ditch maintenance would be performed on an as-needed basis. Snow from the pad would be stored on the well pad and/or at the spatial extent of approved disturbance boundaries to facilitate its removal during the remainder of the winter.

A workover operation on the well may be periodically required to sustain production. A workover operation typically would use a small rig to perform a variety of maintenance procedures including repairs to the wellbore equipment (casing, tubing, etc.), the wellhead, or the producing formation. These repairs generally occur only during daylight hours and typically require 3 to 5 days to complete. Workover frequency cannot be accurately projected, because the type of workover depends on well-specific circumstances. No additional surface disturbance would result from workover operations. If these workover operations are needed, some additional truck traffic would be experienced. This would be on the order of approximately 4 extra pickup truck round trips per day and 2 extra tractor trailer trips per day on average over 3 to 5 days.

## **2.5.7 Reclamation and Abandonment**

### **Reclamation**

All disturbed areas would be reclaimed according to instruction from the Authorized Officer (AO) and measures contained in the APD SUPO, which contains provisions and procedures for reclamation. Reclaimed areas receiving incidental disturbance during production operations would be reseeded as soon as practical and at times of the year intended to facilitate regrowth of vegetation. Earthwork for interim and/or final reclamation would be completed within 6 months of well completion or abandonment, weather and timing stipulations permitting. Lima Exploration would modify its reclamation procedures as necessary to achieve the reclamation outcomes mutually agreed-upon with the AO. Lima Exploration would submit all required documentation to notify the AO of reclamation actions and extent of reclamation progress or completion.

The goal of surface reclamation is to achieve final reclamation standards (given natural conditions such as soil productivity and drought), including the development of a self-sustaining, vigorous native and/or desirable vegetation community with a density sufficient to provide a stable soil surface and inhibit the growth of noxious and/or invasive species. Reclamation operations would be performed to return the disturbed area to productive use and to meet the resource objectives of the land. Reclamation would be conducted in two phases – interim and final.

### **Interim Reclamation**

Interim reclamation would be performed following well completion and extend through the production period. It would be performed on disturbed areas not required for production operations. Final reclamation would be performed following well plugging and abandonment. Reclamation operations in both phases may include, but are not limited to, re-contouring the surface to approximate the feature of the pre-existing natural topography, restoring drainage systems, distributing topsoil and/or excess material, seeding with desired vegetation, and weed control.

Re-contouring would be performed to blend with the surrounding topography but left with a slight crown to compensate for settling and reduce water infiltration. Stormwater management, the ability to facilitate revegetation, and visual resources would be considered in re-contouring the site. Slopes would be reduced to 3:1 or less where feasible. Prior to spreading topsoil, the surface would be prepared by ripping the rough grade of soils to a depth of 18 to 24 inches on 12- to 24-inch spacing. The last pass would be ripped on the contour to promote water infiltration and reduce the opportunity for erosion. No large depressions would be left that would cause water to pool or pond. All salvaged topsoil would be spread and seeded, including cut/fill slopes and borrow ditches. Final surface preparation would depend on the condition of the soil surface and include scarifying a crusted soil surface or roller packing an excessively loose soil surface.

Reclaimed areas would be reseeded using seed mixes and methods intended to maximize germination. Seeding would be completed, as described in the SUPO, by drilling or by broadcasting at twice the specified application rate or as directed by the AO.

Seeding would occur no more than 24 hours after final seedbed preparation. The seed mixture would be certified weed-free. Seeds may be drilled or broadcast. Seed drills would be operated on the contour. If the seed mixture is broadcast, the seeding rate would be doubled, and the seeds covered with the use of a drag. Seeds would be planted to the appropriate depth for the species, generally 0.25- to 0.50-inch-deep. The specific seed mixture would be specified by the surface use agency.

### **Final Reclamation**

Final reclamation will reclaim all disturbed areas including those used for production purposes. The depleted wellbore would be properly plugged and abandoned, and marked with the location, lease number, and operator name. All surface facilities would be removed, and gravel or other surfacing materials would be removed from the well pad as approved by the surface use agency.

The remaining disturbed surface would be re-contoured, the rough grade ripped, topsoil spread, and the seedbed prepared, as previously described. On the well pad, Lima Exploration would push fill material into the cuts and up over the back slope to blend with the natural topography.

Lima Exploration would monitor interim and final reclamation efforts and conduct annual assessments to determine if reclamation objectives have been met or if objectives are likely to be met within a reasonable time. If necessary, Lima Exploration would identify additional actions that may be required to meet reclamation objectives within a reasonable time.

Successful reclamation would be measured by the establishment of desired vegetation, prevention of erosion, and no new weed establishment or spread from existing locations. Interim and final reclamation would be considered successful if all the following criteria are met:

- Seventy percent vegetative cover (basal for grasses; canopy for shrubs) of a nearby area with a comparable vegetation type;

- Ninety percent of the vegetative cover consists of species included in the seed mix or native species of the area;
- Erosion control where water naturally infiltrates into the soil, and gullying, headcutting, slumping, and deep or excessive drilling is not observed.

If noxious weeds establish within reclaimed areas, Lima Exploration would treat and control weeds with a BLM- and/or Forest Service-approved herbicide for up to 3 years or until reclamation is determined to be successful. The agencies have the authority to request weed control for 5 years after final reclamation. All control activities would be coordinated with the AO prior to treatment.

## **2.6 Alternative Considered but Eliminated from Further Consideration**

During public scoping for this EA, a comment was received suggesting that Lima Exploration consider an alternative well pad location near the mouth of Chute Canyon or the mouth of Norris Canyon. Lima Exploration evaluated the feasibility of drilling from these locations and determined that these locations are not drillable due to the horizontal distances from the geologic target. The BLM has concurred with this conclusion. The most likely useable surface location in the vicinity of the mouth of Chute Canyon is in the northeast quarter of Section 3, Township 14 South, Range 9 West. This surface location is approximately 4 miles northeast of the geologic target. In order to reach the target from the Chute Canyon surface location, it would require drilling to a total distance of 31,042 feet, including over 21,400 feet of horizontal drilling. The torque required for a wellbore with this geometry is not possible to achieve with existing technologies and equipment. The horizontal section of the wellbore would be at a vertical depth of about 2,000 feet. This shallow depth means that the length of drill pipe that is above the horizontal section is too short to generate the required “push” necessary to shove the bit forward as the horizontal section is drilled.

The most likely useable surface location in the vicinity of the mouth of Norris Canyon is in the southwest quarter of Section 2, Township 14 South, Range 9W and is approximately 4.5 miles northeast of the geologic target. In order to reach the target from the Norris Canyon surface location, it would require drilling to a total distance of 35,414 feet, including over 25,800 feet of horizontal drilling. As with the Chute Canyon location, the torque required for a wellbore with this geometry is not possible to achieve with existing technologies and equipment.

As such, an alternative well pad location at the mouth of Chute Canyon or the mouth of Norris Canyon was eliminated from further analysis because it is not possible to drill these wells.

## **2.7 Applicant-Committed Project Design Features**

Lima Exploration would perform all operations consistent with the details of the project description in this EA, the contents of the APDs, any COAs prescribed by the agencies, the Gold Book Standards, and the applicant-committed design features listed in **Table 2-3**.

**Table 2-3: Applicant-Committed Design Features**

| <b>General</b>  |
|---|
| 1. Lima Exploration will monitor its facilities in a manner that achieves compliance with the Onshore Orders, its SUPO contained in the APD, other rules and regulations that apply to the Tendoy Alternative or White Pine Alternative, commitments agreed to by Lima Exploration (as contained in this EA), and any conditions that may result from approval of activities under this EA. |
| 2. Lima Exploration will secure all required permits and approvals from the BLM, State of Montana, and Beaverhead County prior to construction. Lima Exploration will adhere to all applicable Federal, state, and county regulations while performing all operations associated with any activities approved under this EA.  |
| 3. Lima Exploration will conduct construction and production activities consistent with its SWPPP to prevent erosion and sedimentation to the extent possible.  |
| 4. Vehicle operators will obey posted speed restrictions and observe safe speeds commensurate with road and weather conditions. On roads with no posted speed limit, vehicle operators will not exceed 25MPH.   |
| 5. Lima Exploration will utilize BMPs for control of nonpoint sources of water pollution to prevent erosion, allow year-round traffic, and provide safe conditions in its general operating procedures.   |
| 6. No illegal drugs, alcohol, or firearms will be allowed on location.  |
| <b>Construction and Drilling</b>  |
| 7. A closed-loop drilling system will be implemented for the drilling of this well.   |
| 8. Construction operations will be conducted in accordance with the Gold Book (USDI/USDA, 2007).  |
| 9. Lima Exploration will obtain necessary ROWs for the access road prior to any construction operations.  |
| 10. Lima Exploration would use a Tier II drilling rig or better to decrease nitrogen oxide (NOx) emissions.   |
| 11. As needed, during drilling and completion operations, Lima Exploration will perform dust abatement measures on the access road and/or well pad as necessary. Dust control measures will also be performed (as needed) on the pad or access road during production operations.   |
| 12. Prior to initiating construction operations, all heavy equipment will be pressure washed at an offsite location to reduce the possibility of transporting seeds of noxious weeds to the project area. Equipment shall also be inspected by appropriate Agency personnel before mobilization to the project site.  |
| 13. Lima Exploration will equip required engines on the well pad with a muffler capable of noise reduction to less than 70 decibels at a 500-foot radius  |
| 14. Lima Exploration will conduct biological surveys (as needed) at the direction of the AO.  |
| 15. A comprehensive survey for active and inactive raptor nests within 1 mile of the well pad site, disturbance areas, or new access roads will be conducted for the selected alternative prior to commencement of construction activities.   |



| General   |
|---|
| <p>16. The applicant has agreed to conduct pre-construction field clearance surveys for some special status species including plants, raptors, migratory birds, and pygmy rabbits in areas where there is suitable habitat for these species and also where there will be construction ground disturbance. The survey areas will include habitat within the two well pad alternative locations, proposed new or upgraded access roads, and appropriate species-specific buffers based on established U.S. Fish and Wildlife Service (USFWS), Montana Fish, Wildlife &amp; Parks (MFWP), and/or BLM and Forest Service survey protocols.</p> |
| <p>17. Two cultural resource sites, 24BE2367 and 24BE2368 will be avoided by the project per stipulation MT-11-23.</p>  |
| <p>18. Timing limitations for both leases prohibit surface use from December 1 to May 15 to decrease surface disturbing activities in big game winter range. Additional timing limitations for the Tendoy Alternative prohibit surface use from November 1 to June 30 in bighorn rutting, winter and lambing habitat. Construction of the well pad and access road will not occur during these timing restrictions.</p>   |
| <p>19. Additional road drainage improvements and erosion mitigation BMPs will be designed by Applicant and approved by Agencies prior to commencement of construction. All BMPs and road drainage improvement will be maintained by Applicant through the life of the project. Cut and fill slopes will be limited to 3:1 steepness where practicable.</p>  |
| <p>20. If cultural and/or paleontological materials are found during construction (including subsurface cultural and paleontological resources), Lima Exploration will halt surface disturbing activities, notify the AO within 24 hours, and conduct future operations according to direction from the AO. Lima Exploration will require that their personnel, contractors, and subcontractors comply with Federal regulations intended to protect archeological and paleontological resources.</p>  |
| <p>21. Lima Exploration will provide escorts to accompany public land users through the project area during drilling and completion operations to ensure the health and safety of the public.</p>   |
| <p>22. Lima Exploration will implement the recommendations in <b>Appendix D</b> of this EA for reducing sediment loading on the Little Sheep Creek and Big Sheep Creek Roads. Site-specific engineered designs for these road improvements will be submitted and approved by relevant agencies prior to commencement of construction.</p>   |
| <p>23. Lima Exploration will conduct pre-construction weed surveys and will control noxious and invasive weed species in the project area. All weeds will be treated with a BLM- and/or Forest Service-approved herbicide as needed to maintain control and prevent their spread.</p>   |
| <p>24. Lima Exploration will conduct pre-construction T&amp;E Species and Sensitive plant surveys prior to any surface disturbance. An acceptable report must be provided to the BLM documenting the presence or absence of special status plants in the area proposed for surface disturbing activities.</p>   |
| Production and Maintenance Operations   |
| <p>25. Lima Exploration will maintain existing roads and well pads in consideration of regulations found in Onshore Order #1 and Gold Book standards, and/or as described in the COAs and as directed by the AO.</p>  |
| <p>26. Any flaring will take place in an enclosed flare operated according to manufacturer's specifications.</p>  |
| <p>27. Open stacks will be screened to prevent entry by birds, bats, or other wildlife.</p>   |
| <p>28. If Lima Exploration discovers any dead or injured federally protected species during construction or operation, it will notify the BLM AO within 24 hours.</p>   |

| <b>General</b>  |
|---|
| 29. Lima Exploration will paint all permanent aboveground structures within 6 months of installation with a flat, non-reflective color to match the surrounding landscape color, as determined by the AO.   |
| 30. Lima Exploration will develop and implement a Spill Prevention, Control, and Countermeasure Plan for the location.  |
| 31. Lima Exploration will construct a secondary containment system that can contain a minimum 110 percent of the storage capacity of the largest tank on the well pad.  |
| <b>Reclamation</b>  |
| 32. Construction earthwork activities associated with interim and final reclamation, including salvaging and spreading topsoil, will not be performed when topsoil is frozen or when soils are saturated.   |
| 33. Lima Exploration will monitor interim and final reclamation efforts and document the results annually.  |
| 34. Seeding will occur no more than 24 hours after final seedbed preparation. Seed will be certified weed free.   |
| 35. If noxious weeds become established within reclaimed areas, Lima Exploration will treat and control weeds with a BLM and/or Forest Service-approved herbicide or by removal for up to 3 years or until reclamation is determined to be successful. The agencies will have the authority to request weed control for 5 years after final reclamation. All control activities will be coordinated with the AO prior to treatment. |

This chapter describes the existing environment (i.e., the physical, biological, social, and economic values, and resources) that could be affected by implementation of the alternatives described in Chapter 2, as well as the potential environmental effects of the alternatives on the physical, biological, and other resources in the project area in accordance with 40 CFR 1502.16. The term “project area” is utilized in this EA as a general term that indicates the general project vicinity. The actual analysis area varies by resource and is defined in each resource section in this chapter. For some resources, such as soils or vegetation, the analysis area consists of just those areas that would be directly disturbed by project construction (roads and well pad). For other resources, such as air quality or water resources, where effects could extend beyond the project construction footprint, the analysis area is larger. Only those aspects of the affected environment that are potentially impacted by this project are discussed. See Section 1.9 (Resource Issues Identified for Analysis) for a discussion of resource issues identified during scoping.

The applicant-committed design features, as described in **Table 2-3** and by the operator in the APDs, are analyzed as part of the two action alternatives. The BLM and/or Forest Service will apply COAs that will serve as measures that protect public safety and resources after conducting the effects analysis.

An environmental effect is defined as a change in the quality or quantity of a given resource due to a modification in the existing environment resulting from project-related activities. Effects may be beneficial or adverse, may be a primary result (direct) or secondary result (indirect) of an action, and may be short-term, long-term, or permanent. The Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508) defines the effects and effects that must be addressed and considered by Federal agencies in satisfying the requirements of the NEPA process. Effects may vary in degree from a slight discernible change to a total change in the environment. Unless specifically described, short-term effects are defined as those lasting 1 to 5 years or less and long-term effects last more than 5 years.

### 3.1 Air Resources

The analysis area for air resources consists of the overall air shed of Beaverhead County. Air resources include air quality, visibility, and climate change. Metrics used to analyze effects include:

- Tons per well and tons per year of PM-10, PM-2.5, NO<sub>x</sub>, SO<sub>2</sub>, CO, VOC<sub>x</sub>, HAPs
- Million metric tons (MMT) per year of carbon dioxide equivalents (CO<sub>2</sub>eq)

#### 3.1.1 Air Quality Existing Conditions

##### Air Quality

As described in the *Dillon Field Office Oil and Gas Lease Sale Environmental Assessment* (BLM, 2014), air quality is good in rural areas within the DFO, including Beaverhead County. As described in the *Air Quality Analysis for the Beaverhead-Deerlodge National Forest, Forest Plan Revision* (Forest Service, 2009a), air quality within the BDNF, including those portions in Beaverhead County, is generally excellent with very limited local pollution sources and consistent wind dispersion of contaminants. The Environmental Protection Agency (EPA) Air Quality Index (AQI) is an index used for reporting daily air quality. The AQI focuses on the potential health effects a person may experience within a few hours or days after breathing polluted air. The EPA calculates the AQI for the five major criteria air pollutants regulated by the Clean Air Act: ground-level ozone, particulate matter, carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and nitrogen dioxide (NO<sub>2</sub>). For each of these pollutants, EPA has established national air quality standards to protect public health. An AQI value of 100 generally corresponds to the national air quality standard for the pollutant, which is the level the EPA has set to protect public health.

The following terms help interpret the AQI information:

- Good – The AQI value is between 0 and 50. Air quality is considered satisfactory and air pollution poses little or no risk;
- Moderate – The AQI is between 51 and 100. Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people. For example, people who are unusually sensitive to ozone may experience respiratory symptoms;
- Unhealthy for Sensitive Groups – When AQI values are between 101 and 150, members of “sensitive groups” may experience health effects. These groups are likely to be affected at lower levels than the general public. For example, people with lung disease are at greater risk from exposure to ozone, while people with either lung disease or heart disease are at greater risk from exposure to particle pollution. The general public is not likely to be affected when the AQI is in this range;
- Unhealthy – The AQI is between 151 and 200. Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects;
- Very Unhealthy – The AQI is between 201 and 300. This index level would trigger a health alert signifying that everyone may experience more serious health effects.

There are no Montana Department of Environmental Quality (MDEQ) ambient air quality monitors located in Beaverhead County due to the low population and the fact that there are few large sources of air pollution in the area. The nearest MDEQ monitors are located in Butte (Silver Bow County), West Yellowstone (Gallatin County), and Bozeman (Gallatin County). AQI data for these monitors are summarized in **Table 3-1** for a 3-year period from 2014 through 2016.

**Table 3-1: EPA Air Data Air Quality Index Report (2015–2017)**

| County     | Total Days | Days Rated Good | Days Rated Moderate | Days Rated Unhealthy for Sensitive Groups | Days Rated Unhealthy | Days Rated Very Unhealthy | Median Air Quality Index              |
|------------|------------|-----------------|---------------------|---|----------------------|---------------------------|---------------------------------------|
| Gallatin   | 1,096      | 924             | 154                 | 12  | 5                    | 1                         | 23 (2017)<br>25 (2016)<br>22 (2015)   |
| Silver Bow | 1,085      | 828             | 223                 | 24  | 10                   | 0                         | 34.5 (2017)<br>22 (2016)<br>30 (2015) |

Source: EPA, 2018b

The data shows that air quality in Gallatin and Silver Bow Counties is good or moderate. The days with unhealthful air are due primarily to wood-burning during winter temperature inversions and to wildfires. All areas within Beaverhead County are considered in attainment with the National Ambient Air Quality Standards (NAAQS) and state air quality standards (EPA, 2016a; MDEQ, 2016).

### Visibility

Visibility is a particular concern in areas with scenic views, such as national parks and wilderness areas. Beaverhead County contains two Class I areas that have special visibility protection under the Clean Air Act: the Anaconda-Pintler Wilderness (managed by the BDNF) and the Red Rock Lakes Wilderness (managed by the U.S. Fish and Wildlife Service [USFWS]). Yellowstone National Park and other Class I areas are also located in the region. The closest Class I area to the project location is the Red Rock Lakes Wilderness, located about 40 miles east.

## **Climate Change**

Climate change and climate science are discussed in the Climate Change Supplementary Information Report (SIR) for Montana, North Dakota, and South Dakota, Bureau of Land Management (BLM, 2010). As described in the *Dillon Field Office Oil and Gas Lease Sale Environmental Assessment*, surface air temperatures in southwestern Montana over the past 114 years have increased by an average of 0.16 °F annually (BLM, 2014). Long-term precipitation changes have also been observed in southwestern Montana. Total precipitation and shifts in precipitation timing and intensity have been observed. Within southwestern Montana, annual precipitation has changed at an annual rate of -0.13 inches per decade from 1900 to 2013 (BLM, 2014).

As summarized in the Climate Change SIR (BLM, 2010), earth has a natural greenhouse effect wherein naturally occurring gases such as water vapor, carbon dioxide (CO<sub>2</sub>), methane, and nitrous oxide (N<sub>2</sub>O) absorb and retain heat. Current ongoing global climate change is linked to the atmospheric buildup of greenhouse gases (GHGs). Each GHG has a global warming potential that accounts for the intensity of each GHG's heat trapping effect and its longevity in the atmosphere (BLM, 2010). For example, CO<sub>2</sub> may last 50 to 200 years in the atmosphere while the estimated atmospheric lifetime of methane is 12 years (BLM, 2010). To account for differences in global warming potential, various GHGs are normalized relative to CO<sub>2</sub> to calculate a standard unit of measurement: carbon dioxide equivalent (CO<sub>2</sub>e).

Montana ranks in the lowest decile in statewide GHG emissions when compared to all the states (Ramseur, 2007). The estimate of Montana's 2005 GHG emissions of 37 million metric tons (MMt) of gross consumption-based CO<sub>2</sub>e accounts for approximately 0.6 percent of U.S. GHG emissions (Center for Climate Strategies, 2007). The *Dillon Field Office Oil and Gas Lease Sale Environmental Assessment* further describes the potential impacts of climate change that are expected to occur on a regional and Montana-specific scale (BLM, 2014).

### **3.1.2 Environmental Consequences**

#### **Direct and Indirect Effects**

##### **Effects Common to Both Alternatives**

Potential air quality impacts from oil and gas energy development are described in the Air Quality Analysis for the Beaverhead-Deerlodge National Forest, Forest Plan Revision (Story, 2012). Impacts include: (1) particulates (dust) during construction and from vehicle traffic on unpaved roads; (2) CO, hydrocarbons, and nitrogen oxide (NO<sub>x</sub>) emissions from service vehicles (primarily pickup trucks and vans); (3) CO and NO<sub>x</sub> from gasoline and diesel engines (including vehicle engines and stationary engines, such as electric generators); and (4) hydrogen sulfide and SO<sub>2</sub> from flaring and/or treater firing. During the life of the project, the primary impact to air quality would result from fugitive dust arising from earth work during site and access road preparation and construction. Fugitive dust emissions would also occur from windblown erosion across the new well pad and soils piles near the well site; however, these impacts would be reduced after interim reclamation re-establishes growth on portions of the well pad not needed for long-term use.

Fugitive dust generated by vehicles will occur during road and well site construction, and would occur in the project area during daylight hours. Operations that would occur over 24 hour periods include drilling and completion; during this time fugitive dust generated by vehicles may be increased for a short time frame. Limited visibility may result on roads from vehicle use in dry conditions. If necessary, gravel would be applied to specific road locations utilized during active construction and well drilling and completion activities to reduce fugitive dust from vehicle traffic. Additionally, mitigation including water

applied to roads utilized during active construction and well drilling and completion activities would substantially reduce dust from roads.

Temporary and localized increases in atmospheric concentrations of  $N_2O$ ,  $CO_2$ ,  $SO_2$ , and volatile organic compounds would result from exhaust emissions of workers' vehicles, heavy construction vehicles, drilling rigs, and other completion equipment, machinery, equipment and tools. Exhaust emissions from drilling rigs and other construction equipment would be temporary and localized. The primary pollutant emitted by the operation of drilling rigs would consist of  $NO_x$  emissions, which would be short-term over an approximately 30-day drilling period and localized near the well site. The contribution to an increase in  $NO_x$  emissions and acid deposition would be temporary, limited to the drilling time frame.

Exhaust emissions from vehicles during construction and drilling and completion operations would also constitute a primary source of  $NO_x$  emissions. They would also be short-term and localized near the well site and roads. Vehicle emissions produced in association with each well would primarily occur during the period of drilling and completion. The EPA regulates vehicle exhaust emissions through the implementation of standards for new vehicles.

Road use following the construction and drilling and completion phases would be limited to periodic maintenance activities by industry. Control and monitoring of well production would typically result in daily visits to wells by maintenance personnel. Fugitive dust and exhaust emissions generated by vehicles at and en route to the well site would be localized, short-term, and negligible. Vehicles used to access the proposed well would release  $NO_x$  emissions.

Flares may be used temporarily during testing operations after the well is completed and may be used continuously during production depending on the volume of gas encountered. Flares are used to dispose of unrecoverable gas emerging concurrently with the crude oil. During flaring, gaseous methane and other hydrocarbons react with atmospheric oxygen to form  $CO_2$  and water. Emissions from flaring include unburned hydrocarbons, CO, and other partially burned and altered hydrocarbons. Acetylene (a non-hazardous air pollutant) is typically formed as a stable intermediate product; however, acetylene formed in combustion reactions may react further to form polycyclic hydrocarbons, which are hazardous air pollutants. Flaring operations usually achieve 98 percent combustion, such that hydrocarbon and CO emissions amount to less than 2 percent of the gas stream (EPA, 2005). Emissions from flares are difficult to predict as their volume depends on the amount of gas encountered. One flare that was measured in Texas in 2017 emitted 0.08 tons per year of  $NO_x$ , 0.70 tons per year of CO, and 12.4 tons per year of VOCs (Soyars, Pers. Comm. 2018). While this is just one example and individual wells may vary by two orders of magnitude, it gives some indication of the small impacts that are likely to result from this single well.

The use of pumping units, stock tanks, treaters, and heaters to separate the liquid hydrocarbons from the gas would result in the emission of  $NO_x$ , CO, VOCs, and hazardous air pollutants. Working and breathing losses of VOCs would result from displacement of the vapors within a tank as it is being filled and due to changes in tank temperature and pressure throughout the day and year.

Emissions concentrations were estimated for areas surrounding 14 hypothetical well sites within the BDNF using air quality models in the Air Quality Analysis for the Beaverhead-Deerlodge National Forest Plan Revision (Story, 2012). The results of the analysis indicated that none of the well sites would produce emissions that would violate air quality standards. The analysis also modeled potential emission impacts on visibility for nearby Class I areas, including a hypothetical well site located 9 miles from Red Rock Lakes Wilderness. The visibility analysis indicated that emissions would have localized and very minimal impacts, which would be essentially invisible to observers from Red Rock Lake Wilderness. Potential GHG emissions from the project would primarily be from the drilling rig, tank heaters, and pump jack used during well production operations. The small magnitude of the estimated combustion

emissions from the project would be expected to generate similarly insignificant amounts of GHG emissions (see section 3.2.6).

### **3.1.3 No Action Alternative**

Under the No Action Alternative, the project would not be authorized, and, therefore, none of the potential emissions would occur. Air quality impacts associated with existing sources would remain. No GHG emissions from the project would occur.

### **3.1.4 Tendoy Alternative**

Under the Tendoy Alternative, emissions would be released to the atmosphere during well site construction, drilling, and completion activities and during well operations. Fugitive dust emissions would occur from windblown erosion across approximately 29.8 acres of total new surface disturbance (2.9 acres of temporary disturbance and 26.9 acres of permanent disturbance). The total mileage of access roads that could contribute fugitive dust would be 18.8 miles for this alternative. Based on the results of the BDNF air quality analysis, maximum concentrations of hazardous air pollutant emissions from the Tendoy Alternative are expected to be negligible and well-below applicable state and Federal criteria. No violations to the NAAQS or state air quality standards would result from implementation of the Tendoy Alternative. The Tendoy Alternative is not anticipated to impair visibility in Class I areas due to the distance (about 40 miles to Red Rock Lakes Wilderness) of the project location from these protected areas. GHGs from the Tendoy Alternative would be a minor contribution to the overall emissions in the State (estimated at 37 MMt of CO<sub>2</sub>e in 2005).

### **3.1.5 White Pine Alternative**

Air quality impacts from the White Pine Alternative would be the same as the Tendoy Alternative, with the exception of potential fugitive dust emissions from approximately 12.0 acres of total new surface disturbance (2.8 acres of temporary disturbance and 9.2 acres of permanent disturbance). The total mileage of access roads that could contribute fugitive dust would be 15.8 miles for this alternative.

### **3.1.6 Cumulative Effects**

There are no known activities within Beaverhead County nor the project vicinity that contribute substantially to air quality degradation. The current activity is a single well (with accompanying truck traffic). Based on the results of the BDNF air quality analysis, maximum concentrations of hazardous air pollutant emissions from the project are expected to be negligible and well-below applicable state and Federal criteria. No violations of the NAAQS or state air quality standards would result from implementation of the project. The project is not anticipated to impair visibility in Class I areas due to the distance of the project location from these protected areas. GHGs from the project would be a minor contribution to the overall emissions in the State (estimated at 37 MMt of CO<sub>2</sub>e in 2005). Since no measurable effects are anticipated from the project, there will be no cumulative effects to air resources.

## **3.2 Water Resources**

The analysis area for water resources is the Big Sheep Creek and Little Sheep Creek watersheds. This analysis considers impacts to surface, groundwater, and wetlands/riparian resources from well pad and well construction, spills, and related road maintenance and use to access the well pad. Metrics used to analyze effects include:

- Qualitative assessment of effects to groundwater from well construction, including consideration of depth to usable water, depth to targeted formation, and well construction requirements such as depth of surface casing and cementing.

- Qualitative assessment of effects to surface water and wetlands/riparian areas from well pad construction, spills, and related road maintenance and use.
- Quantitative assessment of effects to surface water from sedimentation measured in tons of sediment.

### 3.2.1 Water Resources Existing Conditions

#### Groundwater

Aquifers in western Montana are typically unconsolidated, alluvial valley-fill materials within intermontane valleys and at lower elevations associated with streams, drainages, and existing surface waters. These intermontane valley aquifers often yield relatively large quantities of high-quality water to relatively shallow water wells. Most of the consumptive water use in Beaverhead County comes from water associated with Holocene and Pleistocene alluviums, tertiary sediments, quaternary alluviums, terrace deposits, and tertiary sand and gravels.

The total vertical depth to a useable water formation at the Tendoy site ranges from the surface to 795 feet below ground surface; the formation is 795 feet thick. The total vertical depth to a usable water formation at the White Pine site ranges from the surface to 1,345 feet below ground surface; the formation is 1,345 feet thick. The closest public water source to the Tendoy pad location is 9.2 miles away, and the closest domestic water well is 1.1 miles away (Montana Bureau of Mines and Geology [MBMG], 2015). The closest public water source to the White Pine pad location is 7.8 miles away, and the closest domestic water well is 2.3 miles away (Montana Bureau of Mines and Geology [MBMG], 2015).

#### Surface Water

Both of the Tendoy and White Pine sites are located in the Big Sheep Creek Watershed (BSCW) in Beaverhead County, and drain portions of the Tendoy and Beaverhead Mountain ranges (See **Appendix G, Figure 1-1**).

Elevations range from 6,000 feet at the mouth of Big Sheep Creek to nearly 11,000 feet on top of the continental Divide near Italian Peak. The entire BSCW contains approximately 181,302 acres of BLM, private, State of Montana and Forest Service administered land (BLM, 2016). As noted in the Big Sheep Creek Watershed EA (BLM 2016) there are approximately 53 miles of stream in the BSCW, consisting of numerous smaller intermittent and perennial reaches in the higher elevations that feed the larger perennial streams down in the valley bottoms. Stream flow in the BSCW fluctuates annually and seasonally in response to precipitation in the form of rain and snow. Additionally, there are 25 spring developments in the BSCW that BLM staff monitor for resource condition, condition of infrastructure, and water production (flow).

As shown in **Appendix G Figure 1-1**, Big Sheep Creek Road is the proposed access route to the Tendoy location and is situated in or near the valley bottom of Big Sheep Creek for much of its length. The proposed access road crosses intermittent drainages of Shearing Pen Gulch that generally flow west and northwest into Big Sheep Creek. The confluence of Big Sheep Creek and the Red Rock River is approximately 10 miles downstream of the Project area.

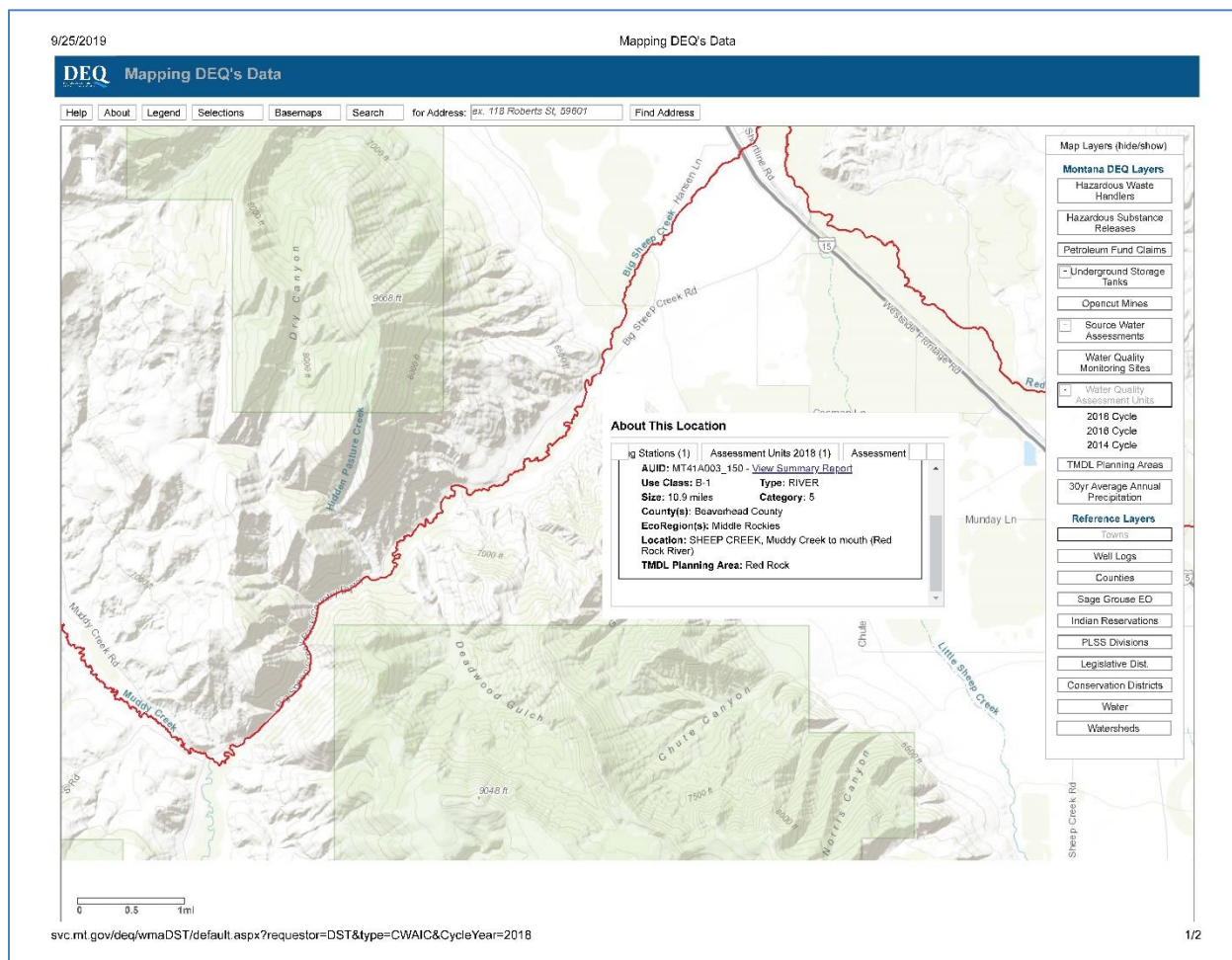
Water quality in Big Sheep Creek is generally in good condition, with localized issues caused by livestock and/or roads. A road sediment assessment report completed for the project indicates that mainstem roads (i.e Big Sheep Creek Road and Little Sheep Creek Road) are currently contributing sediment to the associated waterbodies (see **Appendix D**). The road sediment assessment considered factors such as non-erodible cover, traffic and snow, and percent delivery; calculation of the sediment load was based on the natural erosion rate, the area of erosion, and modifying factors.



**Appendix D**, Tables D-5 and D-7 provide observations, recommendations, and estimated quantities of observed sediment delivery sites along the Big Sheep Creek Road that may affect sediment load into the creek. Current sediment loading into Big Sheep Creek from the portion of the road to be used for access for the Tendoy pad location is estimated to be 16.2 tons per year. **Appendix D** also includes maps and photos of the sediment delivery sites in Attachment A and B.

MT DEQ data indicates Sheep Creek, from Muddy Creek to the mouth (Red Rock River) fully supports beneficial uses for agriculture and drinking water, but does not fully support aquatic life and primary contact recreation (**Figure 1**). Probable causes of impairment include algae, alteration in stream-side or littoral vegetative covers, flow regime modification and sediment-siltation. Probable sources of impairment include grazing in riparian or shoreline zones, crop production. A TMDL has not been completed. MT DEQ classifies the stream stretch as B-1 - waters classified as suitable for drinking, culinary, and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply (MT DEQ Water Quality Standards Attainment Record, 2018).

Figure 1: MT DEQ Interactive Mapping Data displaying impaired waters in the Project Area.



Map produced 9/25/2019 at: [svc.mt.gov/deq/wmaDST/default.aspx?requestor=DST&type=CWAIC&CycleYear=2018](http://svc.mt.gov/deq/wmaDST/default.aspx?requestor=DST&type=CWAIC&CycleYear=2018).

Little Sheep Creek Road and approximately 2 miles of the White Pine Ridge Road/Forest Service Road #1033 would provide access to the White Pine location (**Appendix G, Figure 1-1**). These roads cross several intermittent drainages generally flowing east and southeast into the Little Sheep Creek. Overall

drainage of this Little Sheep Creek is west into Big Sheep Creek; the confluence of Big Sheep Creek and the Red Rock River is approximately 10 miles downstream of the project area.

Based on the sediment assessment report (**Appendix D**), current sediment loading into Little Sheep Creek from the portion of the road to be used for access for the White Pine pad location is estimated to be 13.8 tons per year. **Appendix D, Table D-4 and D-6** provides observations, recommendations, and estimated quantities of sediment for observed sediment delivery sites along the Little Sheep Creek Road. **Appendix D** also includes maps and photos of the sediment delivery sites in Attachment A and B. Little Sheep Creek is not listed on the MT DEQ 303d list (2018).

Approximately 5,000 barrels (0.65 acre-feet) of water would be needed to drill and complete the proposed well. Water would come from a municipal source and would be trucked to the site. No new water wells would be drilled for the Project. All wastewater generated on site would be trucked off site for disposal. No on site disposal is proposed.

### **Wetlands/Riparian Areas**

According to the Montana Natural Heritage Program (MNHP) Wetland and Riparian Framework data set (2019), there are palustrine emergent wetlands, palustrine scrub-shrub, riparian scrub-shrub and riparian emergent lands adjacent to Big Sheep Creek Road. See **Appendix H**, MNHP Wetland and Riparian Mapping.

The MNHP (MNHP) data base also identifies palustrine scrub-shrub wetlands with intermittent palustrine emergent wetlands associated with ephemeral drainages adjacent to Little Sheep Creek Road. The proposed Little Sheep Creek Road upgrades on the White Pine access routes would cross a small portion of a 9.0-acre MNHP-mapped wetland along the Little Sheep Creek (LS7-9 **Appendix D**) and two MNHP-mapped wetlands totaling approximately 2.7 acres. See **Appendix H**, MNHP Wetland and Riparian Mapping.

## **3.2.2 Environmental Consequences**

### **3.2.3 Common to both Alternatives**

Direct impacts to surface waters could potentially occur through increased sediment loading (direct sedimentation or fugitive dust) through increased truck traffic. By far the greatest risk of this occurring is from the use of the mainstem roads (Little Sheep Creek Road and Big Sheep Creek Road). The risk of sedimentation to live water from roads crossing ephemeral drainages associated with this project is negligible due to distance from streams and the buffering of erosion and sediment movement by topography and vegetation. The Road Sediment Assessment Report (**Appendix D**) illustrates that road construction and upgrade associated with both location alternatives will reduce exiting sediment loads on Big Sheep Creek Road and Little Sheep Creek Road by 10.49% and 48.55%, respectively and is discussed in greater detail below.

Stipulations assigned to the leased parcels regarding steep slopes, erosive soils, streams, waterbodies, floodplains and wetlands would minimize impacts to aquatic resources that may be associated with future development. Both the Tendoy and White Pine well pads would be constructed in uplands and would not affect any wetland/riparian resources. Additional proposed access roads are not located in riparian or wetland mapped areas. Depending on which site is selected, road maintenance would occur on either Big Sheep Creek or Little Sheep Creek Road. Maintenance to Big Sheep Creek or Little Sheep Creek Road would be done in coordination with Beaverhead County. However, no turnouts or road widening is proposed into adjacent wetlands and riparian areas. As discussed below, road maintenance would reduce sediment delivery into waterways, resulting in a beneficial effect to water quality.

Standard operating procedures include the requirements contained in Onshore Oil and Gas Order No. 7 for disposal of produced water, and the requirements for drilling operations contained in Onshore Oil and Gas Order No. 2. Approximately 5,000 barrels (0.65 acre-feet) of water would be needed to drill and complete the proposed well. Water would come from a municipal source and would be trucked to the site. No new water wells would be drilled for the Project. Lima Exploration would also haul all wastewater off site. Therefore, there would be no impact to water resources from water withdrawal or wastewater disposal in the project area.

All wells would be cased and cemented pursuant to Montana Board of Oil and Gas Conservation (MBOGC), Onshore Orders No. 1 & 2 and 43 CFR §3162.5-2. Aquifers exhibiting potential usable quality water would be cased and cemented a minimum of 100 feet below the base of the water-bearing zone (see below for more detail). The casing would be pressure tested to determine integrity prior to drilling out the surface and intermediate casing shoes. Well design is intended to last for the life of the well. If the integrity of the casing is in question, BLM can request a Mechanical Integrity Test that tests the casing. Generally, a Mechanical Integrity Test is only requested if the well has been shut in for a period of time and there is a possibility of downhole collapse.

As described below, all wells would be constructed according to relevant MBOGC and Montana Department of Environmental Quality (MDEQ) regulations to prevent cross-aquifer contamination. There would be minor potential for commingling of waters during well construction if proper well drilling procedures and completion techniques are employed. Adhering to the operating regulations at 43 CFR 3160, onshore oil and gas orders, notices to lessees, and standard and special COAs attached to BLM's approval of the APD would reduce or eliminate impacts to subsurface water resources and protect public health and safety. Lima Exploration is not proposing to hydraulically fracture the wells proposed in either alternative; therefore no aquifer contamination is possible by the introduction of frac fluids.

Oil and gas exploration could result in spills from traffic accidents, uncontained drilling/production fluids, detergents, solvents, hydrocarbons, metals, naturally occurring radioactive materials, nutrients, or produced fluids that could potentially affect surface and/or groundwater resources in the short and/or long term. These or other constituents utilized during access road construction, well pad construction, and drilling activities could be washed into surface drainages during storm events. Spill prevention and response factors, including a Sill Prevention Control and Countermeasure Plan (SPCC plan), Stormwater Pollution Prevention Plan (SWPPP), and Conditions of Approval of the APD would reduce the frequency and severity of impacts to water resources from spills.

### **3.2.4 No Action Alternative**

There would be no direct or indirect impacts to surface or groundwater resources from the No Action Alternative, because no construction or drilling would occur. Under this alternative no road improvements would be made; therefore there would be no change in sediment loading; Big Sheep and Little Sheep Creeks would continue to be impacted by sedimentation from the road network at existing levels.

### **3.2.5 Tendoy Alternative**

Depth to usable water ranges from the surface to 795 feet. The total vertical depth for the proposed Tendoy well is 12,498 feet from surface. The primary formation being targeted for development of oil resources is the Quadrant Sandstone formation at depths between approximately 4,800 and 10,800 feet; there would be more than 3500 vertical separation feet between usable water and the targeted formation. The drilling plan, as proposed, indicates that surface casing will be set from surface to measured depth 1000 feet below the surface to protect this usable water resource. The closest public water source to the Tendoy pad location is 9.2 miles away, and the closest domestic water well is 1.1 miles away (Montana Bureau of Mines and Geology [MBMG], 2015). Due to distance from the well site to the nearest water well, the substantially greater depth of the well (more than 4,800 feet) compared to depth of groundwater

(less than 1,000 feet), and the required methods utilized to protect aquifers during drilling, no impacts are anticipated to groundwater resources from drilling operations.

Approximately 14.1 miles of Big Sheep Creek Road would be maintained or upgraded to transport drilling equipment. Current sediment loading into Big Sheep Creek from the portion of the road to be used for access to the Tendoy pad location is estimated to be 16.1 tons per year. After proposed road upgrades and improvements, the road sediment analysis (**Appendix D**) indicates that the road improvements on Big Sheep Creek Road would reduce sediment delivery to Big Sheep Creek by 1.5 tons per year, a reduction of 10.49% (**Appendix D, Table D-7**). This reduction is an estimate based on the assessment method described in **Appendix D**. It may vary substantially from the actual situation due to an incomplete understanding of road sediment erosion and delivery dynamics by the scientific community. Implementation of the SPCC plan, SWPPP, and other applicant-committed design features such as erosion mitigation BMPs and drainage improvements would mitigate project-related impacts to water quality and aquatic habitat in Big Sheep Creek.

Approximately five miles of new road would be constructed to access the Tendoy well pad. The new road construction would cross dry drainage features noted in **Appendix D, Figure 1**. While these drainages are all within the watershed of Big Sheep Creek, there is no evidence of sediment transport from these drainages into Big Sheep Creek. The potential for sediment delivery to Big Sheep Creek from these drainages is a reality in some locations for certain low-recurrence-interval rain events. For many of the drainages, there is not hydraulic connectivity to the Creek (**Appendix B, p. B-12**).

### **3.2.6 White Pine Alternative**

Depth to usable water ranges from the surface to 1,345 feet. Total vertical depth for the proposed White Pine well is 10,784 feet from surface. The primary formation being targeted for development of oil resources is the Quadrant Sandstone formation at depths between approximately 5,524 and 10,784 feet. There would be more than 4,000 vertical separation feet between usable water and the targeted formation. The drilling plan, as proposed, indicates that surface casing will be set from surface to measured depth 3000 feet to protect this usable water resource. The closest public water source to the White Pine pad location is 7.8 miles away, and the closest domestic water well is 2.3 miles away (Montana Bureau of Mines and Geology [MBMG], 2015). Due to this distance, the substantially greater depth of the well (more than 5,500 feet) compared to depth of groundwater (less than 1,500 feet), and the required methods utilized to protect aquifers during drilling and completion, no impacts are anticipated to groundwater resources from drilling operations.

Approximately 3,900 feet (0.74 mile) of Little Sheep Creek Road (known as Forest Service Road 179 within the Unit Boundary) would be upgraded to transport drilling equipment. Current sediment loading into Little Sheep Creek from the portion of the road to be used for access for the White Pine pad location is estimated to be 13.7 tons per year. After proposed road upgrades and improvements, the road sediment analysis (**Appendix D**) indicates that the road improvements associated with the project would reduce sediment delivery 48.55% (-6.7 tons) to Little Sheep Creek per year (**Table D-7**). This reduction is an estimate based on the assessment method described in **Appendix D**. It may vary substantially from the actual situation due to an incomplete understanding of road sediment erosion and delivery dynamics by the scientific community. Implementation of the Spill Prevention, Control, and Countermeasure plan, Storm Water Pollution Prevention Plan, and other applicant-committed design features would mitigate project-related impacts to water quality and aquatic habitat in Little Sheep Creek. There is one short (less than 100 feet) segment of new road proposed with the White Pine pad location. This road location is proposed in an area near the top of White Pine Ridge that is without much slope and considered to have negligible risk of sediment deliver to any live water from this site.

### **3.2.7 Cumulative Effects**

The baseline condition of the proposed access roads for both alternatives contributes to sedimentation of Big Sheep and Little Sheep Creeks. Either actions alternative would result in a beneficial effect with respect to reduction of sediment in surface waters, and improved watershed condition.

Compliance with all applicable state and federal laws with respect to well design and construction, implementation of the SPCC plan, SWPPP, an approved road and well pad design, and other applicant-committed design features would avoid or minimize project-related impacts to water quality and aquatic habitat in the project area. There are no other existing or reasonably foreseeable drilling operations in the Project Area that would contribute towards cumulative effects. Therefore, implementation of either action alternative would not result in significant cumulative impacts on surface and groundwater quality or quantity in the project area.

### **3.3 Vegetation**

The analysis area for vegetation consists of all areas that would be directly disturbed by project construction, including the well pad disturbance area and the construction right-of-way (ROW) for access roads. Resources discussed in this section include overall plant communities and vegetation types.

Metrics used to analyze effect include:

- Acres of disturbance
- Analysis of effect on T&E species or sensitive plant species present in the proposed project location

#### **3.3.1 Vegetation Existing Conditions**

The majority of BLM-administered lands in the vicinity of the Tendoy location are comprised of sagebrush and grassland habitat types with about 80 percent sagebrush/mountain shrub cover type. There is a diverse mixture of sagebrush species in the Big and Little Sheep Creek watershed which are outlined below. The Forest Service-administered lands of the BDNF in the vicinity of the White Pine pad location are a mixture of sagebrush/mountain shrub at the lower elevations, riparian shrublands along Little Sheep Creek, and forested at higher elevation near the White Pine well pad site. The dry foothills at lower elevations, as well as the montane grassland/shrubland, contain various bunchgrasses, forbs, and shrubs which are outlined below.

The Tendoy and White Pine surface locations are both within the northwestern forested mountains of the Middle Rockies ecoregion (EPA, 2016b). In this ecoregion, higher elevation mountains generally contain various conifer species, while the lower elevation foothills are partly wooded with a mosaic of grass and shrub cover. The activities within the two alternatives are within several general vegetation types: forested land, shrubland, grassland, developed, and other types. Several classes of vegetation exist within each vegetation type and are presented in **Table 3-2**. A 50-foot buffer of project components was used as a conservative measure of potential direct and indirect impacts to vegetation.



**Table 3-2: Location Vegetation Types**

| <b>Vegetation Type</b>         | <b>Vegetation Class</b>  | <b>Present in Tendency</b> | <b>Present in White Pine</b> | <b>Acreage of Vegetation Class at Tendency</b> | <b>Acreage of Vegetation Class at White Pine</b> |
|--------------------------------|--|----------------------------|------------------------------|--|--|
| Grassland                      | Northern Rocky Mountain Lower Montane-Foothill-Valley Grassland          | Y                          | Y                            | 1.7  | 1.3  |
|                                | Northern Rocky Mountain Subalpine-Upper Montane Grassland                | N                          | Y                            | 0.0  | 0.3  |
|                                | Rocky Mountain Subalpine-Montane Mesic Meadow                            | Y                          | Y                            | 9.9  | 2.6  |
|                                | Developed Ruderal Grassland  | Y                          | Y                            | 0.3  | 1.0  |
|                                | Undeveloped Ruderal Grassland  | Y                          | N                            | 0.5  | 0.0  |
|                                | Urban Herbaceous   | Y                          | Y                            | 2.1  | 6.1  |
|                                |  |                            | <b>Sub Total</b>             | <b>14.4</b>                                    | <b>11.3</b>                                      |
| Shrubland                      | Artemisia tridentata ssp. vaseyana Shrubland Alliance                    | Y                          | Y                            | 18.5   | 60.7   |
|                                | Columbia Plateau Low Sagebrush Steppe                                    | Y                          | N                            | 0.3  | 0.0  |
|                                | Inter-Mountain Basins Big Sagebrush Shrubland                            | Y                          | Y                            | 61.6   | 13.6   |
|                                | Inter-Mountain Basins Big Sagebrush Steppe                               | Y                          | Y                            | 46.5   | 44.5   |
|                                | Inter-Mountain Basins Montane Sagebrush Steppe                           | Y                          | Y                            | 31.2   | 13.5   |
|                                | Northern Rocky Mountain Montane-Foothill Deciduous Shrubland             | Y                          | N                            | 2.3  | 0.0  |
|                                | Northern Rocky Mountain Subalpine Deciduous Shrubland                    | Y                          | Y                            | 3.4  | 1.1  |
|                                | Urban Shrubland  | Y                          | N                            | 0.1  | 0.0  |
|                                |  |                            | <b>Sub Total</b>             | <b>163.8</b>                                   | <b>133.4</b>                                     |
| Forested                       | Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland | Y                          | N                            | 0.6  | 0.0  |
|                                | Middle Rocky Mountain Montane Douglas-fir Forest and Woodland            | N                          | Y                            | 0.0  | 0.1  |
|                                | Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest           | Y                          | Y                            | 0.2  | 0.3  |
|                                | Pseudotsuga menziesii Forest Alliance                                    | Y                          | N                            | 4.2  | 0.0  |
|                                | Rocky Mountain Aspen Forest and Woodland                                 | Y                          | Y                            | 0.2  | 0.2  |
|                                | Rocky Mountain Foothill Limber Pine-Juniper Woodland                     | Y                          | N                            | 0.3  | 0.1  |
|                                | Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland        | Y                          | Y                            | 2.3  | 0.9  |
|                                | Rocky Mountain Subalpine/Upper Montane Riparian Systems                  | Y                          | Y                            | 6.1  | 12.4   |
|                                | Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest           | N                          | Y                            | 0.0  | 0.3  |
|                                | Northern Rocky Mountain Subalpine Woodland and Parkland                  | N                          | Y                            | 0.0  | 0.4  |
|                                | Rocky Mountain Lodgepole Pine Forest                                     | N                          | Y                            | 0.0  | 0.2  |
|                                | Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland        | N                          | Y                            | 0.0  | 0.1  |
|                                | Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland | N                          | Y                            | 0.0  | 0.1  |
|                                |  |                            | <b>Sub Total</b>             | <b>13.9</b>                                    | <b>15.1</b>                                      |
| Developed and Other Land Types | Developed-Low Intensity  | Y                          | Y                            | 1.9  | 0.8  |
|                                | Developed-Medium Intensity   | Y                          | Y                            | 2.1  | 3.5  |
|                                | Developed-Roads  | Y                          | Y                            | 37.8   | 25.6   |
|                                | Inter-Mountain Basins Sparsely Vegetated Systems                         | Y                          | Y                            | 0.1  | 0.8  |
|                                | Rocky Mountain Alpine/Montane Sparsely Vegetated Systems                 | Y                          | Y                            | 0.5  | 0.1  |
|                                |  |                            | <b>Sub Total</b>             | <b>42.3</b>                                    | <b>30.8</b>                                      |
|                                |  |                            | <b>Total Acreage</b>         | <b>234.5</b>                                   | <b>190.6</b>                                     |

Source: LandFire, 2016

## **Shrublands**

Shrublands are generally classified as plant associations where shrubs compose at least 5 percent of the canopy cover. Shrublands is the dominant vegetation cover type at both project locations. Within these areas, there is a diverse mixture of sagebrush species that include Wyoming big sagebrush, mountain big sagebrush, basin big sagebrush, low sagebrush, silver sagebrush, black sagebrush, alkali sagebrush, and three tip sagebrush. Other common botanical species include Idaho fescue, bluebunch wheatgrass, rough fescue, wax currant, snowberry, phlox, bitterbrush, and rabbitbrush.

## **Forested Land**

Forested land cover makes up a small portion of the overall White Pine disturbed area and does not occur at the Tendoy location. Botanical species found in these forests include Douglas-fir, lodgepole pine, limber pine, Englemann spruce, subalpine fir, Rocky Mountain juniper, and whitebark pine. Scattered stands of aspen, black cottonwood, water birch, and thin-leaved alder contribute to structural diversity and canopy cover. Patches of curleaf mountain mahogany could occur on rocky slopes and ridges.

## **Grasslands**

Grasslands are absent within the disturbance area for the Tendoy location, while the White Pine location contains various grasslands. Grasslands are defined as plant associations where shrub canopy cover is less than 5 percent, and perennial graminoids constitute at least 50 percent of the total herbaceous canopy cover. Common botanical species in these areas include needle-and-thread, blue grama, prairie junegrass, bluebunch wheatgrass, bearded wheatgrass, western wheatgrass, green needlegrass, Sandberg's bluegrass, needleleaf sedge, and Idaho fescue.

## **Developed and other land types**

Developed and other land types occur at both locations. Developed lands include areas with a mixture of constructed materials and vegetation, generally structures and roads. Impervious surfaces account for 20 – 100 percent of the total cover.

Other land types are present at both locations, and include sparsely vegetated systems. These systems are composed of scree slopes, cliff faces, narrow canyons, open tablelands, saline playas, eroded badlands, and volcanic areas (cinder fields and cones, lava flows), active inland dunes, and smaller rock outcrops of various igneous, sedimentary, and metamorphic bedrock type. Exposure to desiccating winds, rocky and sometimes unstable substrates, and a short growing season limit plant growth. Substrates are rocky and soil development is limited. Vegetation on these harsh sites is characterized by sparse cover of trees, shrubs, dwarf-shrubs, forbs or grasses of various mixtures. Nonvascular cover may be sparse to moderately dense.

## **Threatened and Endangered Species and Special Status Species**

Whitebark pine (*Pinus albicaulis*) is a USFWS candidate plant species identified as potentially inhabiting the project area and is discussed below in Section 3.5.2.1. There are no further federally protected plant species identified as potentially inhabiting the project area. The project proponent has agreed to conduct pre-construction field clearance surveys for some BLM/FS special status species in areas where there is suitable habitat for these species and also where there will be construction ground disturbance. The survey areas will include habitat within the two well pad alternative locations, proposed new or upgraded access roads, and appropriate species-specific buffers based on established USFWS, MFWP, and/or BLM and FS survey protocols. **Table 3-3** provides a list of BLM and Forest Service plant species of concern in both alternatives with appropriate survey periods.



**Table 3-3: BLM/Forest Service - Plant Species of Concern**

| Common/Scientific Name                                   | Suitable Habitat | Survey Period  |
|--|------------------|--|
| <b>Forest Service</b>                                    |                  |  |
| Lemhi penstemon<br>( <i>Penstemon lemhiensis</i> )       | Yes              | White Pine access road improvement areas with suitable habitat – late June to early July |
| Bitterroot milkvetch<br>( <i>Astragalus scaphoides</i> ) | Yes              | White Pine access road improvement areas with suitable habitat – late June to early July |
| Cusick’s horse-mint<br>( <i>Agastache cusickii</i> )     | Yes              | White Pine access road improvement areas with suitable habitat - late June through July  |
| Alkali primrose ( <i>Primula alkali</i> )                | Yes              | White Pine access road improvement areas with suitable habitat - May to June             |
| Idaho sedge<br>( <i>Carex idaho</i> )                    | Yes              | White Pine access road improvement areas with suitable habitat - late June through July  |
| <b>BLM</b>   |                  |  |
| Idaho sedge<br>( <i>Carex idaho</i> )                    | Yes              | Tendoy county road improvement areas with suitable habitat – late July through August    |
| Cusick’s horse-mint<br>( <i>Agastache cusickii</i> )     | Yes              | Tendoy new access road and well pad areas with suitable habitat – late June through July |
| Chicken sage<br>( <i>Sphaeromeria argentea</i> )         | Yes              | Tendoy new access road and well pad areas with suitable habitat – June to early July     |
| Alkali primrose<br>( <i>Primula alkali</i> )             | Yes              | Tendoy new access road and well pad areas with suitable habitat – May to June            |
| Railhead milkvetch<br>( <i>Astragalus terminalis</i> )   | Yes              | Tendoy new access road and well pad areas with suitable habitat – June to July           |
| Bitterroot milkvetch<br>( <i>Astragalus scaphoides</i> ) | Yes              | Tendoy new access road and well pad areas with suitable habitat – late May through June  |

Source: USFWS, 2017; BLM, 2005; Forest Service 2009b; Montana Bald Eagle Working Group, 2010

MFWP conducted a state-wide Crucial Areas Assessment in 2008, which evaluated the fish, wildlife, and recreational resources in Montana to identify crucial habitat areas and fish and wildlife corridors. The web-based Crucial Areas Planning System (CAPS) was used to determine if any crucial areas were located near the project areas. The MFWP CAPS tool defines the Habitat for Species of Concern (SOC) areas as having “species of state and/or national conservation importance, including those vulnerable to extinction or those undergoing regional decline or other species requiring special management attention” (MFWP, 2015.) Priority levels are ranked 1 through 6 and measured as hexagon areas (**Table 3-4**).

**Table 3-4: Habitat of Species of Concern Priority Level Definitions**

| Priority Level | Definition   |
|----------------|--|
| 1              | Hexagons with at least one Federal Threatened, Federal Endangered, NatureServe G1 <sup>a</sup> or NatureServe S1 <sup>b</sup> species observation.   |
| 2              | Hexagons with at least one NatureServe G2 or NatureServe S2 species observation.   |
| 3              | Hexagons with at least one Federal Candidate, NatureServe G3 or NatureServe S3 species observation, or at least one Federal Threatened or Federal Endangered species modeled distribution. |
| 4              | Hexagons with a Federal Candidate species modeled distribution, or a cumulative modeled distribution count > 14 SGCN <sup>c</sup> species.   |
| 5              | Hexagons with a cumulative modeled distribution count > 11 SGCN species.   |
| 6              | Hexagons with a cumulative modeled distribution count > 7 SGCN species.  |

Source: MFWP, 2015

- (a) NatureServe global conservation status ranks range from G1 to G5, with G1 considered critically imperiled to G5 being demonstrably secure.
- (b) NatureServe national and subnational conservation status ranks range from S1 to S5, with S1 considered critically imperiled and S5 being secure.
- (c) SGCN = species of greatest conservation need

Priority levels in the project vicinity range from level 2 to level 6 (**Table 3-4**). There are also unranked areas; level 2 areas near the project are located along Little Sheep Creek. Big Sheep Creek has level 2 and level 3 areas along its length near the project. The Tendoy Alternative site is in a priority level 4 area. Its access road passes through level 3, 4, and 6 areas. The White Pine Alternative site is in an unranked area. Its access road passes through level 2, 4, and 6 areas.

### **Threatened and Endangered Species**

Candidate species are those which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. The whitebark pine is the only USFWS candidate species identified as potentially inhabiting the project area and no threatened or endangered plant species were identified.

Whitebark pine is found in high-elevation forested areas in montane habitat near the tree line. This species is a cold and drought tolerant native tree of western North America. It may occur on dry, rocky sites and in a variety of topographies from gently rolling terrain to cliffs. A whitebark pine survey was conducted on the White Pine Alternative proposed well site on October 25, 2015. A single sapling has been documented on Forest Service managed lands near the White Pine well pad site. This species is not known to occur in the Tendoy Alternative project area.

### **Special Status Species**

The BLM policy in *Manual 6840 - Special Status Species Management* requires the BLM to manage and protect any USFWS candidate species, State sensitive species, or State species of concern to prevent the need for future Federal listing as threatened or endangered. A list of BLM DFO special status plant species and Forest Service Region 1 (R1) sensitive plant species that may occur within the BDNF and their habitat preferences is included below in Table 3-5. A total of 53 BLM special status sensitive species occur in the DFO. Of these 53 special status sensitive species, 6 plant species may occur within the vicinity of project activities for the Tendoy Alternative, based on a review of preferred habitat types associated with the Tendoy Alternative.

Forest Service policies, Forest Plans, and Executive Orders require that the Forest Service utilize various sources of information and existing conservation plans to manage and protect any USFWS candidate species, State sensitive species, or State species of concern to prevent the need for future Federal listing as threatened or endangered. As indicated in Table 3-5, five of these Forest Service R1 sensitive plant species may occur within the White Pine Alternative project area based on a review of preferred habitat types.

Table 3-5: BLM DFO and Forest Service R1 Special Status and Sensitive Plant Species and Habitat Preferences

| Species   | BLM / FS | Status                  | Preferred Habitat   | May Occur at the Tendoy Alternative Site <sup>a</sup> | May occur at the White Pine Alternative Site <sup>b</sup> |
|---|----------|-------------------------|---|---|---|
| Idaho sedge ( <i>Carex idahoensis</i> )               | BLM/FS   | Sensitive\ R1 sensitive | Wet to moist alkaline meadows   | Yes   | Yes   |
| Cusick's horse-mint ( <i>Agastache cusickii</i> )     | BLM/FS   | Sensitive\ R1 sensitive | Steep, loose talus slopes often below limestone outcrops                          | Yes   | Yes   |
| Lemhi penstemon ( <i>Penstemon lemhiensis</i> )       | FS       | R1 Sensitive            | Moderate to steep, east- to southwest-facing slopes, often on open soils          | No  | Yes   |
| Chicken-sage ( <i>Sphaeromeria argentea</i> )         | BLM      | Sensitive               | Sagebrush steppe and grasslands   | Yes   | No  |
| Alkali primrose ( <i>Primula alcalina</i> )           | BLM\FS   | Sensitive\ R1 Sensitive | Wet to moist alkaline   | Yes   | Yes   |
| Bitterroot milkvetch ( <i>Astragalus scaphoides</i> ) | BLM\FS   | Sensitive\ R1 Sensitive | Sagebrush grassland, silty soils, along drainages                                 | Yes   | Yes   |
| Railhead milkvetch ( <i>Astragalus terminalis</i> )   | BLM      | Sensitive               | Grassland slopes, sagebrush, ridgetops, dry subalpine meadows and stony hillsides | Yes   | No  |

Source: BLM, 2016; MNHP and MFWP, 2018b, USDA NRCS, 2016; MNHP and MFWP, 2018b and 2018c

- (a) Yes = May occur in or in the vicinity of the Tendoy project area based on habitat preference; No = Not likely to occur in or in the vicinity of the Tendoy project area based on habitat.
- (b) Yes = May occur in or in the vicinity of the White Pine project area based on habitat preference; No = Not likely to occur in or in the vicinity of the White Pine project area based on habitat.

**Idaho sedge:** Within the sedge family (*Cyperaceae*), this regional endemic species has an estimated occupied habitat of fewer than 200 acres. The Idaho sedge stands approximately 5 to 24 inches tall with basal leaves and small brown spikes that enclose the flowers. It prefers moist alkaline meadows, often along streams and areas between wet meadow and sagebrush steppe habitats. Suitable habitat for this species may occur in portions of the White Pine Alternative project area along Little Sheep Creek.

**Cusick's horse-mint:** Also known as Cusick's giant hyssop, Cusick's horse-mint is an herbaceous perennial in the mint family (*Lamiaceae*) with numerous stems and small white flowers within purple tipped bracts. This species is quite rare and is only known in a few areas within the Tendoy and Beaverhead Mountains of Montana where it grows on open talus slopes with minimal vegetation. Suitable habitat for this species may occur in portions of both Alternative project areas

**Lemhi penstemon:** Part of the plantain family (*Plantaginaceae*), this large perennial can reach approximately 27 inches in height. It has narrow leaves and short stalked, bright blue, tubular flowers. The Lemhi penstemon is a regional endemic that only occurs in northern Idaho and southwest Montana including Beaverhead County. Its preferential habitat is moderate to steep slopes, often on open soils. In Beaverhead County, it generally grows near lodgepole-pine and Douglas-fir forests in areas dominated by big sagebrush and bunchgrasses. Suitable habitat for this species may occur in portions of the White Pine Alternative project area.

**Chicken-sage:** A member of the sunflower family (*Asteraceae*), the chicken-sage is a perennial herb with narrow, fan shaped, alternate leaves and small, yellow, ray-less flowers. Chicken-sage is endemic to east-central Idaho and southwest Montana and Beaverhead County where it normally grows on shallow limestone-derived soil of sagebrush steppe in the valleys and foothills. Suitable habitat for this species may occur in portions of the Tendoy Alternative project area.

**Alkali primrose:** Alkali primrose is a perennial herb in the primrose family (*Primulaceae*) and is found only in east-central Idaho and southwestern Montana with a documented population in Beaverhead County. It forms a basal rosette of leaves and a leafless flowering stem with white flowers with a yellow center. The alkali primrose can be found in wet, alkaline meadows at the headwaters of spring-fed creeks. Suitable habitat for this species may occur in portions of both Alternative project areas.

**Bitterroot milkvetch:** The bitterroot milkvetch, an herbaceous perennial within the pea family (*Fabaceae*), is only found in southwest Montana and northern Idaho and has been reported in the Tendoy Mountains. It has pale yellow flowers and pinnate leaves and occurs in sagebrush grassland often on silty soils. Populations are often found along drainages and have been most frequently observed on warmer, south- and southwest-facing slopes. Suitable habitat for this species may occur in portions of both Alternative project areas.

**Railhead milkvetch:** The railhead milkvetch is endemic to southwest Montana, northwest Wyoming, and east Idaho, and is documented in Beaverhead County. This tufted perennial herb in the pea family (*Fabaceae*) has small white flowers and cigar shaped seed pods. Its habitat varies from valley grasslands and steep slopes, to ridgetops, and dry subalpine meadows. Suitable habitat for this species may occur in portions of the Tendoy Alternative project area.

### 3.3.2 Environmental Consequences

Direct impacts to vegetation include short-term and long-term removal of vegetative communities as a result of construction disturbance for the well pad and access road. Indirect impacts to the plant communities may include vegetation loss from dust emissions and the introduction of noxious weeds and invasive plant species. Dust deposited on plants may reduce plant vigor, productivity, and health. Over time, plant diversity and communities may change. The extent of the impacts would depend on plant sensitivity, type and timing of project activities, acres of disturbance (both temporary and permanent), and physical parameters.

Lima Exploration would minimize vegetation disturbance by maintaining activities within the designated construction area and the minimal amount of area necessary to construct the well pad and access road safely and as designed. Following completion of construction and drilling, Lima Exploration would implement interim reclamation plans for the well pad and access road to restore site stability and revegetate disturbed areas to provide a self-sustaining and productive use of the land during production operations (interim reclamation phase). After final plug and abandonment has commenced, Lima Exploration would implement the final reclamation phase to restore the native characteristics of the site.

### 3.3.3 No Action Alternative

Under the No Action Alternative, there would be no direct or indirect effects to vegetation or special status species from the project, because no construction disturbance or activities would occur.

### 3.3.4 Tendoy Alternative

Surface disturbance along the 4.7 miles of the proposed new access road and creation of the well pad would result in 29.8 acres of new disturbance. After interim reclamation, 26.9 acres of long term disturbance will remain. Sagebrush shrubland would be the primary vegetation type disturbed for construction of the well pad and access road. On these disturbed areas, the vegetation would be lost either permanently or until such time the sites are reclaimed. Implementation of the applicant-committed design features, weed control program, and site-specific reclamation plan in the APD would minimize effects to vegetation from the Tendoy Alternative. The potential for noxious weeds and non-native plants to become established in these disturbed areas would possibly displace native special status plants from their habitat, alter the vegetation community structure, and contribute to increased potential for wildfires in the area, further impacting these species.

#### **Threatened and Endangered Species and Special Status Species**

The Tendoy Alternative area does not have suitable habitat for whitebark pine, and no populations are known to occur in or near the project location. Due to this, the Tendoy Alternative would have no effect on whitebark pine. Suitable habitat for Cusick's horse-mint, chicken-sage, alkali primrose, bitterroot milkvetch, railhead milkvetch, and Idaho sedge, may occur in the Tendoy Alternative area.

BLM lease stipulation MT-12-11 requires a field inspection to be conducted for special status plant species prior to any surface disturbance, to protect and conserve rare plants, associated plant communities, and the habitat that supports them (**Appendix A**). A list of special status plant species will be provided to the lessee at the time of the lease and are subject to change over time as new information becomes available. Plant inventories must be conducted at a time of year when the target species are actively growing and flowering. An acceptable report must be provided to the BLM documenting the presence or absence of special status plants in the area proposed for surface disturbing activities, and the findings may result in restrictions to the operator's plans or may preclude use and occupancy.

Implementation of the applicant-committed design features, seasonal construction timing constraints, pre-construction plant surveys, and the site-specific reclamation plan, including noxious weed preventative measures, in the APD would minimize effects to special status plants from the Tendoy Alternative. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to Cusick's horse-mint, chicken-sage, alkali primrose, bitterroot milkvetch, railhead milkvetch, and Idaho sedge populations or present in the area.

### **3.3.5 White Pine Alternative**

There would be a direct impact to approximately 12.0 acres of vegetation from surface disturbance and vegetation removal associated with access road improvements and well pad construction. This initial disturbance would impact grassland, sagebrush, and forest; some of this vegetation has already been disturbed from construction of the existing roads. There is potential for noxious weeds and non-native plants to become established in these disturbed areas which would displace native special status plants from their habitat, alter the vegetation community structure, and contribute to increased potential for wildfires in the area further impacting these species. Implementation of the applicant-committed design features, weed control program, and site-specific reclamation plan in the White Pine APD would minimize effects to vegetation from the White Pine Alternative.

#### **Threatened and Endangered Species and Special Status Species**

The White Pine Alternative project area has suitable habitat for whitebark pine; a single sapling has been located near the project area. The White Pine Alternative may affect but is not likely to adversely affect whitebark pine and/or habitat. Implementation of the applicant-committed design features and pre-construction sapling protection fencing mitigation in the White Pine APD would minimize effects from the White Pine Alternative.

Suitable habitat for Cusick's horse-mint, alkali primrose, bitterroot milkvetch, Idaho sedge, and Lemhi penstemon may occur in the project area. Pre-construction surveys would be conducted in areas with suitable habitat and proposed ground disturbance activities for Cusick's horse-mint, alkali primrose, bitterroot milkvetch, Idaho sedge, and Lemhi penstemon within the White Pine Alternative. Alkali primrose habitat does not occur where proposed disturbance activities will occur and is not anticipated to be impacted by project activities.

The White Pine Alternative would implement the applicant-committed design features, seasonal construction timing constraints, pre-construction plant surveys, and site-specific reclamation plan, including noxious weed preventative measures, in the White Pine APD which would minimize impacts to special status plants due to the White Pine Alternative. The White Pine Alternative may impact individuals and habitat, without contributing to a loss of viability to Cusick's horse-mint, alkali primrose, bitterroot milkvetch, Idaho sedge, and Lemhi penstemon populations or species within the project area.

### **3.3.6 Cumulative Effects**

The direct and indirect effects of the project combined with the effects of past, present, and future activities in the area would likely result in cumulative effects. The primary past, ongoing, and foreseeable future actions that would contribute to potential cumulative effects to vegetation include:

- Livestock grazing;
- Recreational use, including hunting and fishing;
- Timber harvesting;
- Ongoing road maintenance, fiber optic installation, and bridge replacements;
- Land management actions from the Big Sheep Creek Watershed Assessment (BLM, 2015b)
- Oil and gas development

It is anticipated the direct and indirect effects of these actions on vegetation will be similar and depend on the size and scope of these actions. Cumulative effects to vegetation would include short and long-term removal of plant communities as a result of disturbance due to construction activities and timber harvesting. Plant communities may also be indirectly impacted from dust emissions as a result of these activities, which would reduce plant productivity.

The introduction of noxious weeds and invasive plant species as a result of the project combined with other construction related activities, timber harvesting, land grazing, recreation, and land management actions would indirectly affect vegetation by displacing native plant communities and increasing fire regimes ultimately altering plant diversity and the natural plant community. Disturbed surfaces from the project combined with other actions and livestock grazing would potentially create a favorable environment for the establishment and spread of noxious weeds/invasive plants. Vehicles and machinery could bring non-native plant species to the area via transport on tires and undercarriages. Livestock and wildlife could also spread seeds and plant parts which cling to hooves and fur from existing noxious weed and invasive plant populations within the cumulative effects analysis area.

The extent of impacts from past, present, and future foreseeable actions combined with the project would depend on plant sensitivity, type and timing of project activities, acres of disturbance (both long-term and short-term), and physical parameters. It is anticipated other actions would be required to implement similar applicant-committed design features, such as interim reclamation where ground disturbance occurs to minimize impacts to vegetation by restoring site stability and revegetating disturbed areas. Preventative measures to control the introduction and spread of noxious weeds and invasive species, such

as cleaning vehicles and equipment prior to entering the cumulative effects impact area and implementing a weed control program, would lessen these effects as required by the appropriate agency.

### **Threatened and Endangered Species and Special Status Species**

Threatened and endangered, BLM DFO Special Status Species, and Forest Service R1 Sensitive Species within the cumulative effects analysis area could be impacted by the project combined with effects from livestock grazing, recreational uses, timber harvesting, other construction (e.g., ongoing road maintenance, fiber optic installation, and bridge replacements), land management action from Big Sheep Creek Watershed Assessment (BLM 2015), and existing or future oil and gas leases. It is anticipated the direct and indirect adverse effects of these actions would be similar in nature as the project depending on the size and scope of the actions. Analysis of cumulative effect for threatened and endangered, special status, and sensitive species are outlined below.

The cumulative effects of the project combined with other actions would be minimal due to the amount of relatively undisturbed habitat in the surrounding area. In addition, the project and other actions would be required by the agencies to implement pre-construction survey for these species in order to avoid impacts, implement seasonal timing constraints, and restore disturbed areas through reclamation activities that would allow vegetation and habitat to recover.

Under the Tendoy Alternative, no cumulative effects are anticipated because the Tendoy Alternative project area does not have suitable habitat for whitebark pine and no populations are known to occur. For the White Pine Alternative, minor cumulative effects could result from the surface disturbance and vegetation removal associated with the access road improvements and well pad construction. This effect would be minimized by properly fencing and marking the location of the single whitebark sapling identified in the previous survey for this alternative. Cumulative effects of the project would be minimal with the implementation of applicant-committed design features and pre-construction sapling protection fencing mitigation.

Suitable habitat for Cusick's horse-mint, chicken-sage, alkali primrose, bitterroot milkvetch, Idaho sedge, and railhead milkvetch may occur in the project area resulting in cumulative disturbance to habitat for these species. Under the Tendoy Alternative, there would be a direct impact to vegetation, where surface disturbance and vegetation removal would occur along the 4.7 miles of new access road and well pad which is located primarily in sagebrush shrubland habitat. The White Pine Alternative would also directly impact vegetation from surface disturbance and vegetation removal associated with access road improvements and well pad construction. This disturbance would impact grassland, sagebrush, and forest. The cumulative disturbance as a result of the project combined with other actions would be minimal in the project area as a whole due to the amount of relatively undisturbed habitat in the surrounding area. In addition, the project and other actions would be required by the agencies to implement pre-construction survey for these species in order to avoid impacts, implement seasonal timing constraints, and restore disturbed areas through reclamation activities that would allow vegetation and habitat to recover.

Cumulative effects on Idaho sedge, bitterroot milkvetch, Lemhi penstemon, Cusick's horse-mint, and alkali primrose are anticipated due to presence of their habitat and disturbance as a result of project activities combined with other actions. The Tendoy Alternative would result in direct impact to vegetation, where surface disturbance and vegetation removal would occur along the 4.7 miles of new access road and well pad in primarily sagebrush shrubland habitat. The Tendoy Alternative does not include habitat for Lemhi penstemon. The White Pine Alternative would directly impact vegetation from surface disturbance and vegetation removal associated with access road improvements and well pad construction. This disturbance would impact approximately grassland, sagebrush, and forest. The project would result in incremental increased disturbance for these species, except Lemhi penstemon under the Tendoy Alternative due to lack of suitable habitat.

### 3.4 Wildlife

The analysis area for Wildlife includes the Big Sheep and Little Sheep Creek watersheds. This analysis considers impacts to wildlife from the well pad and well construction, road maintenance and upgrades.

Metrics used to analyze effects include:

- Qualitative effects to migratory birds from well construction, well operations, and road improvements and maintenance
- Qualitative assessment of effects to big game habitat from well construction, well operations, and road improvements and maintenance
- Qualitative assessment of effect to T&E and Sensitive Species from well construction, well operations, and road improvements and maintenance

#### 3.4.1 Wildlife Existing Conditions

The Tendoy location is at approximately 6,000 feet elevation while the White Pine Alternative Site is at nearly 10,000 feet. The vegetation and habitat types in the vicinity of the project area are listed in **Table 3-2**. This diverse landscape and variety of vegetation communities provides habitat during various seasons for a wide variety and abundance of wildlife including Greater Sage-Grouse (*Centocercus urophasianus*), migratory birds, raptors, pygmy rabbit (*Brachylagus idahoensis*), black bear (*Ursus americanus*), mountain lion (*Puma concolor*), gray wolf (*Canis lupus*), and other big game animals. In addition, the riparian communities associated with the project area provide important forage and cover for big game and Neotropical migratory birds.

##### **Migratory Bird Species (including Raptors)**

The Migratory Bird Treaty Act (MBTA) was implemented for the protection of migratory birds. Unless permitted by other regulations, the MBTA makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition to the MBTA, EO 13186 sets forth the responsibilities of Federal agencies to further implement the provisions of the MBTA by integrating bird conservation principles and practices into agency activities and by requiring that Federal agencies evaluate the effects of actions and agency plans on migratory birds.

The BLM-USFWS Memorandum of Understanding (MOU) signed in 2010 promotes the conservation of migratory birds and guides compliance with EO 13186 (Federal Register Volume 66, Number 11). BLM encourages voluntary design features and conservation measures supporting migratory bird conservation, in addition to appropriate restrictions. Another MOU between the Forest Service and USFWS was signed in December 2008. This MOU also meets the requirements of EO 13186. The purpose of both MOUs is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds when planning for land management activities.

Numerous raptor and migratory bird species may migrate through, or nest within the project area. This section identifies migratory birds that may inhabit the project area, including BLM and Forest Service Sensitive Species, according to the habitat types found within the project area:

- *Mixed-grass prairie*: golden eagle, McCown's longspur, american peregrine falcon
- *Sagebrush*: ferruginous hawk, greater sage grouse, loggerhead shrike, sagebrush sparrow, sage thrasher
- *Shrub-steppe*: Brewer's sparrow, ferruginous hawk
- *Forest*: Lewis's woodpecker, flammulated owl



- *Riparian areas*: bald eagle, long-billed curlew, veery, western toad

### **Raptors**

Some of the more prominent birds that may utilize the project area and surrounding areas include northern goshawk, great gray owl, northern harrier, golden eagle, red-tailed hawk, Swainson's hawk, ferruginous hawk, American kestrel, prairie falcon, short-eared owl, and great horned owl. Less common raptors in the project area include osprey, bald eagle, peregrine falcon, rough legged hawk, merlin, and flammulated owl. Several of these species (bald and golden eagle, peregrine falcon, ferruginous hawk, great gray owl, and flammulated owl) have been recognized as BLM and Forest Service sensitive species.

Most raptor species nest in a variety of habitats including, but not limited to, native and non-native grasslands, agricultural lands, live and dead trees, cliff faces, rock outcrops, and tree cavities. Based on the species of concern data from the MNHP, no known nests are within 0.5 mile of proposed construction areas. BLM inventories conducted approximately 10 years ago were generally limited to historic nests located within the Big Sheep Creek watershed. The historic nest data shows one golden eagle stick nest along the Big Sheep Creek Road and within 1 mile of the Tendoy well pad site. There are no recorded raptor nests in the data for the Little Sheep Creek drainage or White Pine alternative well pad site.

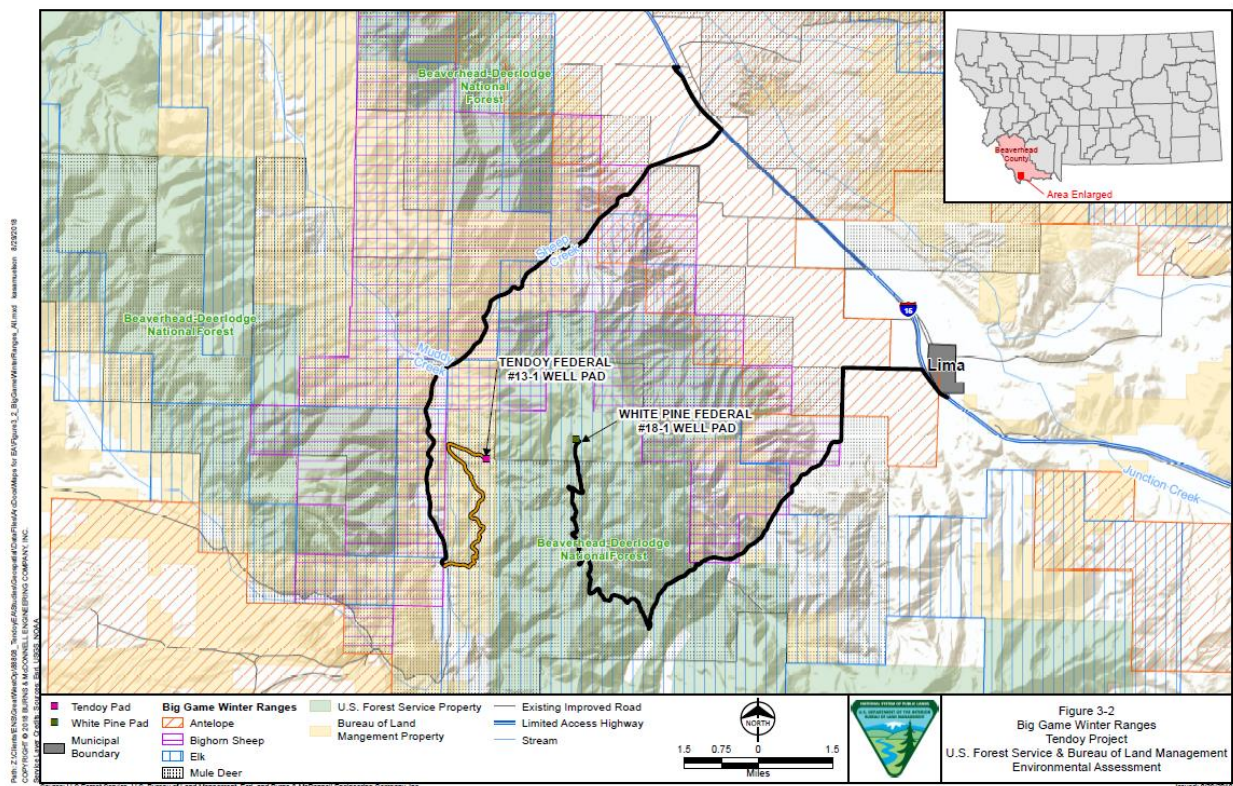
The lease stipulation for raptor protection applicable to the Tendoy alternative prohibits surface use from March 1 through July 31 within one-half mile of raptor nest sites which have been active within the past five years. This stipulation does not apply to operation and maintenance of production facilities. There are no such lease stipulation for timing limitations or prohibited surface use stipulations associated with the White Pine alternative. For either alternative, a raptor survey must be completed after APD approval before construction can begin to locate raptor nests that have been active within the last 5 years, and apply the stipulation or appropriate condition of approval to avoid any negative impact that could result from construction of a road and well pad.

### **Big Game Species**

Big game species, including elk, mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), moose, and bighorn sheep (*Ovis canadensis*) inhabit the area and nearby landscapes. There are several designated crucial winter range and parturition areas (i.e., lambing, fawning, and calving areas), or migration routes for these big game species within the project area, and it is yearlong range for elk and mule deer. Big game range designated by MFWP as winter/yearlong is generally used by a population or portion of the population on a year-round basis, with significant influx of additional animals into the area from other seasonal ranges during the winter months (between December 1 and April 30).

This area has been designated by MFWP as winter range for elk and mule deer, with a portion of the Little Sheep Creek drainage designated as pronghorn winter range; mule deer and pronghorn may forage in the lower elevation mountain mahogany, sagebrush, and grassland habitat in the BSC and LSC drainages seasonally when suitable conditions exist. Habitat suitable for bighorn sheep has been identified by MFWP, and this core habitat is found on the east side of the Tendoy Mountains. **Figure 2** provides the location of big game winter range in relation the two project alternatives.

**Figure 2: Big Game Winter Range**



Bighorn sheep core habitat is located on the east side of the Tendoy Mountains with only historic winter range near the project area. Historically, bighorn sheep have experienced population die-offs with one occurring in 1993 and another die-off in 1999. The population was augmented in 2002 and 2012 with bighorns relocated from other populations. Since then, the population has steadily declined due to endemic pneumonia. In fall 2015, MFWP opened a hunt to the public to remove all individuals from the population. The MFWP objective is to remove the bighorn sheep population and to reintroduce a new population of bighorn sheep into the area after the chance for a re-occurrence of endemic pneumonia has diminished (pers. comm. Fager, 2015). This area will continue to be managed as core bighorn sheep habitat by MFWP in support of future reintroduction efforts.

Mule deer year-long range and suitable habitat can be found on both the BLM and Forest Service managed lands where the two well sites are proposed. Mule deer utilizing the project area are within the Mountain Foothills mule deer management units 300 and 302 managed by MFWP Region 3. This population of mule deer has continued to show a slight decline since 2005, following the state-wide trend of resource and forage competition from elk and other big game species and conifer/juniper encroachment that has displaced browse species utilized by mule deer (pers. comm Fager, 2016).

Within the Tendoy Mountains, the White Pine Ridge area and areas to the south are important elk winter range. Some elk migrate from Idaho and have been documented to winter in this area. The project area is overlapped by the Tendoy Elk Management Unit (EMU) and hunting district units 300 and 302. The elk population objectives for this EMU are at or above the objective range set by the Montana Statewide Elk Management Plan. Elk year-long range and suitable wintering habitat can be found on both the BLM and Forest Service managed lands where the two proposed well sites are located. Elk can be observed during the winter from I-15 near Lima, along both Little and Big Sheep Creek Roads.

Pronghorn utilizing habitat in the project area are classified within the 300 and 301 pronghorn management units with Big Sheep Creek Road as the boundary between the two units. MFWP has reported that both pronghorn units have maintained stable populations ranging between 200 and 225 head per herd unit (pers. comm. Fager, 2016). The MFWP reports pronghorn numbers have increased since 2011 (MFWP, 2019). Pronghorn year-long range and suitable habitat can be found on both the BLM and Forest Service adjacent managed lands west of I-15 and within the Little Sheep Creek drainage, but not in close proximity to where the two proposed well sites or access roads are located. **Table 3-6** provides a list of game species that may utilize the project area and potential season of use.

**Table 3-6: Game Species Seasonal Use within Project Area**

| Species       | Tendoy Project Area (BLM)<br>(Sagebrush and Riparian) <sup>a</sup> | White Pine Project Area<br>(Forest Service)<br>(Forested and Riparian) <sup>a</sup> |
|---------------|--|---|
| Bighorn sheep | W  | W   |
| Pronghorn     | W  | —   |
| Mule deer     | Y,W  | S,C   |
| Elk           | W,C  | S,C   |
| Black bear    | S  | Y   |
| Moose         | Y  | Y   |
| Mountain lion | Y  | Y   |
| Gray wolf     | Y  | Y   |

Source: MFWP, 2016

(a) Y = yearlong, S = summer, B = brood rearing, C = calving/fawning, W = winter

### Threatened and Endangered Species

An endangered species is a species listed under the Endangered Species Act (ESA) of 1973, as amended, as being in danger of extinction throughout all or a portion of its range. A threatened species is a species listed under the ESA as likely to become endangered within the foreseeable future throughout all or a portion of its range.

In accordance with the ESA, the lead agency in coordination with the USFWS must require that any authorized, funded, or implemented Federal action not adversely affect a federally listed threatened or endangered species or its critical habitat. **Table 3-7** lists federally listed species identified as potentially occurring in Beaverhead County.

**Table 3-7: USFWS Federally Listed Species Identified in Beaverhead County, Montana, as Potentially Occurring within the Project Area**

| Species Name                                       | Designation             | Habitat Type   | Habitat Present in Project Area | Potential Species Occurrence in the Project Area |
|--|-------------------------|--|---------------------------------|--|
| Grizzly bear<br>( <i>Ursus arctos horribilis</i> ) | Threatened <sup>a</sup> | Transient; alpine/subalpine coniferous forest                            | Yes                             | Yes  |
| Canada lynx<br>( <i>Lynx Canadensis</i> )          | Threatened <sup>a</sup> | Transient; moist boreal forests with dense understory for snowshoe hares | No                              | Unlikely   |

|   |                                  |  |     |     |
|---|----------------------------------|--|-----|-----|
| North American wolverine ( <i>Gulo luscus</i> )     | Proposed Threatened <sup>a</sup> | High elevation alpine and boreal forests that are cold and receive enough winter precipitation to reliably maintain deep persistent snow late into the warm season | Yes | Yes |
| Ute ladies' tresses ( <i>Spranthes diluvialis</i> ) | Threatened                       | Wetland, pastures and flood plains along streams and creeks  | Yes | No  |

Source: USFWS, 2018b

(a) These species are also listed with these designations for the Beaverhead-Deerlodge National Forest. **Grizzly bear:** The grizzly bear, currently listed as threatened, is typically found in alpine and subalpine coniferous forests and higher elevations with mixed shrubby vegetation. The White Pine Alternative is located in forested vegetation that could be considered suitable habitat. Grizzly bears have been documented in Beaverhead County in sagebrush habitat, which is present in both action alternatives. No grizzly bears have been documented within the project area and any would be considered transient and not resident. Annual home ranges of grizzly bear in the Swan Mountains of Montana were documented to average 768 square kilometers for males and 125 square kilometers for females (MNHP and MFWP, 2018a). No true migration occurs, although grizzly bears often exhibit discrete elevational movements from spring to fall, following seasonal food availability (LeFranc et al., 1987). They are generally at lower elevations in spring and higher elevations in mid-summer and winter. Depending on the home range, season, and food availability, grizzly bears may be present in the project area.

**Canada lynx:** The Canada lynx, which is listed as a threatened species, lives in moist boreal forests that include dense understories that provide foraging habitat and cover for the lynx's main prey, the snowshoe hare. The forest habitat within the Dillon Field Office and Beaverhead-Deerlodge National Forest in southwestern Montana is generally drier than the preferred habitat of Canada lynx. USFWS has determined that forests in southwestern Montana and the DFO are not essential to the conservation of lynx and do not meet the definition of critical habitat (USFWS, 2014a). No lynx have been documented within the project area, and any would be considered transient and not resident; therefore, this species is not likely to be present.

**North American wolverine:** In 2014, the USFWS withdrew a proposal to list the North American wolverine in the contiguous United States as a threatened species under the ESA; however, that list withdrawal was overturned by a Montana District Court in 2016 (USFWS, 2014b, 2016), resulting in the species status remaining a proposed threatened species under ESA. Wolverines occur in coniferous montane forest types, preferring rugged, roadless, isolated habitats. Wolverines are most likely to occur at higher elevations on Forest Service land in the Tendoy Mountains including the White Pine alternative as transient individuals and not resident. No wolverines have been documented within the project area, and any would be considered transient and not resident.

### BLM DFO Special Status Species and Forest Service Region 1 Sensitive Species

The BLM policy in *Manual 6840 - Special Status Species Management* requires the BLM to manage and protect any USFWS candidate species, State sensitive species, or State species of concern to prevent the need for future Federal listing as threatened or endangered. A list of BLM DFO special status species is included below in Table 3-8: Special Status Sensitive species and habitat preferences for both alternatives Table 3-8. A total of 53 BLM special status sensitive species occur in the DFO. Of these 53

special status sensitive species, 18 animal species may occur within the vicinity of project activities for the Tendoy alternative, based on a review of preferred habitat types associated with the Tendoy alternative.

Forest Service policies, Forest Plans, and Executive Orders require that the Forest Service utilize various sources of information and existing conservation plans to manage and protect any USFWS candidate species, State sensitive species, or State species of concern to prevent the need for future Federal listing as threatened or endangered. **Table 3-8** lists Forest Service Region 1 (R1) sensitive wildlife species that may occur within the BDNF and their habitat preferences. As indicated in **Table 3-8**, nine of these Forest Service R1 sensitive wildlife species may occur within the White Pine Alternative project area, which is the only alternative on Forest Service land, based on a review of preferred habitat types.

**Table 3-8: Special Status Sensitive species and habitat preferences for both alternatives**

| Species  | BLM Status/USFS Status      | Preferred habitat   | May occur at Tendoy alternative | May occur at White Pine Alternative |
|--|-----------------------------|---|---------------------------------|-------------------------------------|
| <b>Mammals</b>   |                             |   |                                 |                                     |
| Gray wolf ( <i>Canis lupus</i> )                         | Sensitive/R1 Sensitive      | Sagebrush shrub lands and forests   | Transient                       | Transient                           |
| Pygmy rabbit ( <i>Brachylagus idahoensis</i> )           | Sensitive/R1 Sensitive      | Sagebrush shrub lands with deep alluvial soils  | Yes                             | No                                  |
| Bighorn sheep ( <i>Ovis canadensis</i> )                 | Not listed/R1 Sensitive     | Open habitats, such as alpine meadows, open grasslands, shrub-steppe, talus slopes, rock outcrops, and cliffs | Yes                             | Yes                                 |
| Townsend's big-eared bat ( <i>Plecotus townsendii</i> )  | Sensitive/R1 Sensitive      | Forests, basin-prairie shrub, caves and mines   | Yes                             | Yes                                 |
| <b>Birds</b>   |                             |   |                                 |                                     |
| Bald eagle ( <i>Haliaeetus leucocephalus</i> )           | Sensitive/R1 Sensitive      | River and lake habitat, riparian forested areas   | Yes                             | Yes                                 |
| Brewer's sparrow ( <i>Spizella breweri</i> )             | Sensitive/Not listed        | Shrub-steppe, shortgrass prairie with scattered shrubs  | Yes                             | No                                  |
| Ferruginous hawk ( <i>Buteo regalis</i> )                | Sensitive/Not listed        | Shrub-steppe, sagebrush and shortgrass prairies   | Yes                             | No                                  |
| Golden eagle ( <i>Aquila chrysaetos</i> )                | Sensitive/Not listed        | Open shrub and grasslands with adequate prey  | Yes                             | Yes                                 |
| Greater Sage-Grouse ( <i>Centrocercus urophasianus</i> ) | Sensitive/R1 Sensitive      | Sagebrush shrub-steppe, riparian meadows  | Yes                             | Yes                                 |
| Lewis's woodpecker ( <i>Melanerpes lewis</i> )           | Sensitive/Not Listed        | Forests and woodlands   | Low likelihood                  | Low likelihood                      |
| Loggerhead shrike ( <i>Lanius ludovicianus</i> )         | Sensitive/Not Listed for MT | Sagebrush shrublands  | Yes                             | No                                  |

|  |                             |   |                |                |
|--|-----------------------------|---|----------------|----------------|
| Long-billed curlew ( <i>Numenius americanus</i> )            | Sensitive/Not Listed for MT | Shortgrass prairies and meadows, riparian                               | Yes            | No             |
| McCown's longspur ( <i>Calcarius mccownii</i> )              | Sensitive/Not Listed        | Grasslands  | Low likelihood | Low likelihood |
| American peregrine falcon ( <i>Falco peregrinus anatum</i> ) | Sensitive/R1 Sensitive      | Wetlands, open water, grass and shrub lands with cliffs for nesting     | Yes            | Yes            |
| Sagebrush sparrow ( <i>Artemisiospiza nevadensis</i> )       | Sensitive/Not Listed        | Sagebrush shrublands  | Yes            | No             |
| Sage thrasher ( <i>Oreoscoptes montanus</i> )                | Sensitive/Not Listed        | Sagebrush shrublands  | Yes            | No             |
| Flammulated owl ( <i>Otus flammeolus</i> )                   | Not listed/R1 Sensitive     | Cavity nester in ponderosa pine and mixed coniferous forests            | Yes            | No             |
| Veery ( <i>Catharus fuscescens</i> )                         | Sensitive/Not Listed        | Moist low elevation forests and thick willow and alder riparian habitat | Yes            | Yes            |
| <b>Amphibian/reptiles</b>                                    |                             |   |                |                |
| Boreal/western toad ( <i>Bufo boreas</i> )                   | Sensitive/R1 Sensitive      | Riparian wetlands and moist forested areas                              | Yes            | Yes            |

Source: BLM, 2016; MNHP and MFWP, 2018b and 2018c

(a) Yes = May occur in or in the vicinity of the project based on habitat preference; No = Not likely to occur in or in the vicinity of the project location based on habitat.

**Gray wolf:** The northern Rocky Mountain population of gray wolves (including the Montana population) was delisted from the ESA in 2011. Gray wolves move seasonally following migrating ungulates within their territory. They exhibit no particular habitat preference except for the presence of native ungulates or other prey within its territory on a year-round basis. Their primary prey species include deer, elk, and moose as well as carrion, rodents, and domestic livestock such as cattle and sheep. Wolf populations are increasing and may use the both alternative project areas seasonally dependent upon availability of prey.

**Pygmy rabbit:** Big Sheep Creek watershed provides year-round pygmy rabbit habitat, and active burrows have been documented in a variety of sagebrush communities, including areas near the Tendoy alternative project area. Pygmy rabbits require sagebrush for forage and cover, as well as deep alluvial soil to dig their burrows. Sagebrush comprises nearly 100 percent of their winter diet and over half of their summer diet. The White Pine alternative does not have suitable habitat. There may be limited habitat in the lower foothills or near Little Sheep Creek. Surveys in suitable habitat will be completed prior to construction activities, and if pygmy rabbits are found, their habitat would be avoided.

**Bighorn sheep:** Bighorn sheep core habitat is located on the east side of the Tendoy Mountains with only historic winter range near the project area. Current bighorn sheep populations are being removed from the area due to disease concerns. Reintroduced big horn sheep populations, however, will likely inhabit both alternative project areas.

**Townsend's big-eared bat:** Townsend's big-eared bat is found in forests, basin-prairie shrub, caves and mines (Foresman, 2012; MNHP, 2016). Habitat for this species occurs in the Tendoy alternative project

area and the species has been documented in adjacent areas. This species, however, was not documented in the Big Sheep Creek watershed survey completed by MNHP (Maxell et al., 2016). There are no documented occurrences in the White Pine alternative area, but there is habitat available and documented occurrence adjacent to the White Pine alternative area.

**Bald eagle:** Bald eagles were down-listed from Endangered to Threatened in 1995 and delisted in 2007. They currently are protected under the Bald and Golden Eagle Protection Act (BGEPA) and MBTA. Bald eagle habitat usually consists of large forested areas near large lakes and rivers with open water. Bald eagles may seasonally use areas along the cottonwood and riparian reaches of Big Sheep Creek and Little Sheep Creek for roosting and foraging. No previously identified nests have been documented within either alternative project area.

**Brewer's sparrow, loggerhead shrike, sagebrush sparrow, and sage thrasher:** These BLM species utilize sagebrush and shrub-steppe grassland habitats which occur in the project area. Thus, the species are likely to be found in the Tendoy Alternative project area.

**Ferruginous hawk:** The ferruginous hawk breeds across a large portion of Montana but are migratory with fall migration beginning in late August through early September. This species occupies arid and open grassland, and shrub-steppe. Ferruginous hawks rely on large areas of native grass and shrubs with abundant prey. In southwestern Montana, primary prey include ground squirrels, passerines, grasshoppers, and voles (Restani, 1991). In addition, this species is sensitive to human activities and disturbances during the breeding season and appears to have high site fidelity. This species is likely to occur in the Tendoy Alternative project area.

**Golden eagle:** Golden eagles are protected under the BGEPA and the MBTA. Montana has migratory and year-round populations of golden eagles, but resident birds move from mountains to valleys in the winter for prey consisting of jackrabbits, ground squirrels, and carrion. They generally nest on cliffs when available, or in large trees associated with sagebrush/grassland. Golden eagles have been observed in the Big Sheep Creek watershed and are likely to use both alternative areas for foraging.

**Greater Sage-Grouse:** The Greater Sage-Grouse occurs throughout Montana where sagebrush is present, and this project is located within the Southwestern Montana Greater Sage-Grouse Conservation Area and Population Areas (BLM, 2015a). This species depends on sagebrush habitat. Suitable habitat consists of plant communities dominated by sagebrush and a diverse native grass and forb understory. Abundance of suitable habitat has declined, primarily as a result of loss, fragmentation, and degradation of sagebrush habitat (Stiver et. al., 2015). Major threats to Greater Sage-Grouse include wildfire, invasive species, conifer invasion, infrastructure, grazing, mining, mineral developments, agriculture, predation, disease, water development, and hunting (BLM, 2015a).

**Lewis's woodpecker:** Lewis's woodpecker habitat requirements include coniferous forests with open tree canopy, brushy ground cover, dead trees for perching with cavities for nesting, and dead woody debris with abundant insects. This type of habitat is very limited, and the species has a low likelihood of occurrence in either alternative areas.

**Long-billed curlew:** The long-billed curlew occurs in a variety of grasslands communities, from shortgrass prairies to cultivated hay fields to sagebrush-grasslands. Long-billed curlew populations have declined throughout much of their range (Casey, 2013). The long-billed curlew is migratory and arrives in Montana in mid-April. Breeding habitat includes mixed grass prairie habitats and moist meadows, preferring to nest in open, short-statured grasslands and avoiding trees, dense shrubs, or tall, dense grasses (MNHP, 2016). Curlews forage in open prairie grasslands and meadows, at the edges of prairie ponds and



sloughs, feeding primarily on invertebrates and small vertebrates (Dugger and Dugger, 2002). Curlew habitat and presence may occur in the Tendoy alternative project area.

**McCown's longspur:** This species is migratory in Montana and can be found from mid-April to early September. Habitat for the McCown's longspur is semi-arid areas of shortgrass prairie with sparse vegetation. This type of habitat is very limited in the Big Sheep Creek and Little Sheep Creek drainage; it is low likelihood that this species may occur.

**American peregrine falcon:** The peregrine falcon was delisted from the list of Endangered and Threatened Species in 1999 but is still protected under MBTA. Peregrine falcons migrate to Montana in late April and may remain until early September. Peregrine falcons feed primarily on medium-size passerines and small waterfowl. Nests typically are situated on ledges of vertical cliffs but have adapted to artificial nest structures close to plentiful prey. There are no known nest sites in the Tendoy alternative area, but there is nesting habitat available in the BSC watershed. In the White Pine alternative area, there are no known nest sites, but there is nesting habitat available in the watershed and birds could use the White Pine Alternative project area for foraging.

**Flammulated owl:** Flammulated owls are found in cooler, semi-arid climates, with a high abundance of nocturnal arthropod prey and some dense foliage for roosting (MNHP and MFWP, 2018c). They are most often found on ridges and upper slopes and show a strong preference for Ponderosa pine throughout their range. Habitat for this species is limited in the White Pine alternative project area, and the species has not been documented in the White Pine well pad site area or Little Sheep Creek watershed.

**Veery:** Veery migrate to Montana in the summer and utilize riparian habitats with dense thickets of willows or alders near water or low elevation woodlands with dense understory. This type of habitat occurs along portions of Big Sheep Creek but not in areas where construction activities are proposed; therefore, veery have potential to occur in the Tendoy Alternative project area.

**Boreal/western toad:** This species can occupy low elevation beaver ponds, reservoirs, and streams, to high elevation coniferous forests and subalpine meadows, lakes, ponds, and marshes (Werner et al., 2004). Western toads mate between May and July in any clean standing water including livestock watering areas. While not identified on BLM administered lands within the Tendoy alternative area, habitat likely occurs within the springs and marshes of the Big Sheep Creek watershed; this species is not known on Forest Service administered land within the White Pine alternative area, although habitat likely occurs within the springs and marshes of the Little Sheep Creek watershed.

Per BLM standard lease terms and to be in compliance with Endangered Species Act, the operator must conduct pre-construction field clearance surveys for special status wildlife species in the lease area where there is known suitable habitat for these species. **Table 3-9** provides a list of the proposed survey timing for each respective species.

**Table 3-9: Proposed Special Status Species Surveys and Survey Periods**

| Common/Scientific Name   | Suitable Habitat | Survey Location/Period  |
|--|------------------|---|
| <b>Birds</b>   |                  |   |
| Bald eagle ( <i>Haliaeetus leucocephalus</i> ) and golden eagle ( <i>Aquila chrysaetos</i> ) | Yes              | Survey Tendoy and White Pine Alternatives well pad/access roads, 1-mile buffer nest survey area, spring   |
| Other raptors  | Yes              | Survey Tendoy and White Pine Alternatives well pad/access roads, 0.5-mile buffer nest survey area, spring |



|   |  |  |
|---|--|--|
| Greater Sage-Grouse<br>( <i>Centrocercus urophasianus</i> ) | Yes.<br>Tendoy Alternative – Core and General Habitat, PHMA <sup>a</sup> and GHMA <sup>b</sup> within existing and new access road<br>White Pine – General Habitat and GHMA existing access road | Survey Tendoy and White Pine Alternatives well pad/access roads for lek, nesting, and brood rearing activity, April to June, 3-mile buffer survey area and disturbance from active leks. |
| Migratory bird species nest survey                          | Yes  | Survey areas of proposed vegetation removal within 100 feet of new construction ground disturbance, up to 2 weeks prior to vegetation removal if proposed during April 1 to August 15    |
| <b>Mammals</b>  |  |  |
| Pygmy rabbit ( <i>Brachylagus idahoensis</i> )              | Yes  | Survey Tendoy Alternative well pad/new access roads, suitable habitat ground disturbance areas, summer period  |

Source: USFWS, 2017; BLM, 2005; Forest Service 2009b; Montana Bald Eagle Working Group, 2010; Montana Sage Grouse Work Group, 2005.

(a) PHMA = priority habitat management areas

(b) GHMA = general habitat management areas

### 3.4.2 Environmental Consequences

The following sections describe the potential effects of the Tendoy Alternative, White Pine Alternative, and No Action Alternative on wildlife, migratory birds, big game species, raptors, and threatened and endangered and special status species. Only those species with suitable habitat in the project area, likelihood of occurrence, or potential to be affected by the project are discussed.

#### Common to both alternatives

##### Migratory Bird Species (including Raptors)

Direct impacts as a result of surface-disturbing activities from the either alternative would include a loss of potential nesting and foraging habitats for migratory birds. Other indirect impacts to migratory birds associated with either alternative would depend on seasonal timing of road construction, drilling, and completion activities. If these activities were conducted in the late fall, many of the migratory species would have left the project area for southern wintering grounds. If construction activities were to occur during the spring or summer months (April 1 – August 15), they could discourage nesting pairs from establishing nests or cause nest abandonment. Mitigation would include avoiding performing construction activities and vegetation removal during the nesting season (April 1 - August 15) and performing surveys prior to these activities to identify active nests for avoidance. Neither alternative has a lease timing limitation to avoid the nesting season. Given the availability of habitat elsewhere in the Tendoy Range and Big Sheep Creek and Little Sheep Creek watershed, either alternative may impact individuals and habitat; but the impacts could be minimized through the implementation of COAs and additional mitigation measures.

Surface disturbance, visual, lighting, and noise impacts during non-nesting season may affect migratory bird species. Associated noise and increased human presence could also cause displacement from foraging and nesting habitats. Additionally, successful interim and final site reclamation, in conjunction with weed control efforts, would help to restore the needed forage and cover types required by migratory birds over time to minimize effects.

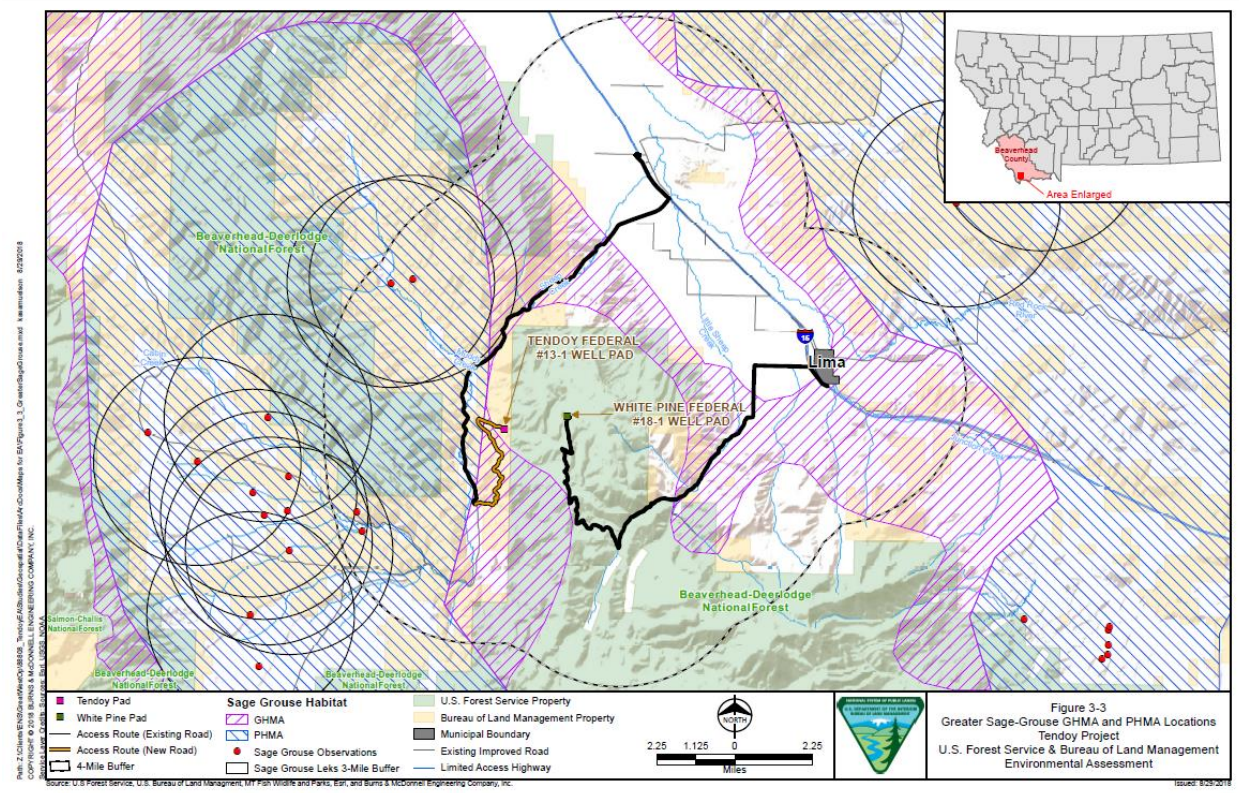
**Greater Sage-Grouse:** Sagebrush habitat for this species is present within both alternatives. Greater Sage-Grouse within Forest Service Region 1 are within the Idaho and Southwestern Montana Greater Sage-Grouse EIS as identified in the USDA Forest Service Greater Sage-Grouse Record of Decision (Forest Service, 2015). Decision areas under Forest Service lands are defined as PHMA and GHMA. PHMA are areas identified as having highest habitat value for maintaining sustainable Greater Sage-Grouse populations and GHMA areas are occupied seasonally or year-round habitat outside of PHMA where some special management would apply to sustain Greater Sage-Grouse populations. The White Pine Alternative would not be located on any Beaverhead-Deerlodge National Forest Service System Greater Sage-Grouse EIS lands, but is proximal to GHMA.

Sparse to moderately dense stands of sagebrush with mixed grasses and forbs are present throughout the vicinity of the Tendoy Alternative and provide areas of suitable Greater Sage-Grouse habitat. Six active leks have been reported within the Big Sheep Creek watershed, with the closest leks located more than 3 miles from the Tendoy well pad location. Year-round sage grouse habitat is present in the Big Sheep Creek watershed and some birds are present yearlong, traveling no farther than 2 to 3 miles from leks. Multiple year telemetry data has shown some birds captured on leks in the Big Sheep Creek watershed may winter in the area while others migrate southeast into Idaho during the winter.

ARMPA administers Greater Sage-Grouse lands allocated as priority habitat management areas (PHMA) and general habitat management areas (GHMA) in a southwestern Montana (BLM, 2015a) which has been incorporated into the Dillon RMP (BLM, 2005). PHMA is identified as having the highest value to maintaining sustainable Greater Sage-Grouse populations and largely coincide with areas identified as priority areas for conservation including breeding, late brood-rearing, winter concentration areas, and migration or connectivity corridors. GHMA will have some special management applied to them to sustain Greater Sage-Grouse populations, areas of occupied seasonal or year-round habitat outside of PHMA.

The Tendoy Alternative project area is located within Sage-Grouse Executive Order General Habitat; the Big Sheep Creek Road is within BLM PHMA and Core Area; and the new access road for the Tendoy project Area is within BLM (GHMA) (Montana Department of Natural Resources and Conservation [MDNRC], 2018). The White Pine Alternative access road along Little Sheep Creek Road crosses Sage-Grouse Executive Order General Habitat and BLM GHMA. **Figure 3** shows the location of GHMA and PHMA overlapping each project alternative.

Figure 3: GHMA and PHMA Locations



## Raptors

Direct effects to raptors are not anticipated because the project would comply with BLM NSO and TL stipulations to avoid impacting active nesting sites. Direct impacts to potential nesting and/or foraging habitat for raptor species would be limited to access road construction/improvements and well pad construction areas of 29.8 acres and 12.0 acres for the alternative and White Pine alternative, respectively. Indirect effects could include limited and temporary habitat loss adjacent associated with avoidance due to disturbance from construction activities of a well pad, new access roads, road improvements, and other ancillary facilities. The minimal loss or alteration in habitat, reduction in prey base, and increased human disturbance would not likely result in lower raptor densities.

A comprehensive survey for active and inactive raptor nests within 1.0 mile of the well pad site, disturbance areas, or new access roads is required to identify any raptor nests that have been active within the last 5 years prior to construction activities when the APD approved. Any active nesting sites identified would be monitored, and construction or disturbance activities would be avoided within the disturbance buffer until the nesting season is past. Impacts to raptors and raptor habitat from construction, drilling, and completion activities would be short-term. Production trucking and operational activities could potentially create long-term disturbance impacts to raptors that build nests and/or forage in close proximity to the well or near the access road.

## Wildlife

Potential impacts to wildlife as a result of the either alternative would include habitat loss or degradation, habitat fragmentation and edge effects, and loss or displacement of individuals based on selected alternative. Construction of well pads and access roads would directly remove and fragment habitat.

Habitat within the project area is relatively undisturbed and removal and fragmentation of this habitat could create edge effects and reduce contiguous blocks of habitat. Increased habitat edges reduce interior habitats for habitat specialists less suitable to disturbance. Increased edge habitat creates more habitat for habitat generalists that are better adapted to disturbances. Confining disturbance of the area to the minimum amount necessary to construct the project safely and as designed and verifying work remains within those limits will lessen the impact to wildlife resources. Existing roads are also being utilized to the extent possible, minimizing impacts to native wildlife habitat. Reclamation using native seed mixes would mitigate the impacts on wildlife by allowing vegetation and habitat to be restored. Mortality or injury from vehicles and equipment could also result from the project, which would be mitigated by reduced speed limits and traffic control. Many wildlife species would likely avoid the area during construction and drilling, but most would resume use of the area upon completion of construction.

### **3.4.3 No Action Alternative**

Under the No Action Alternative, there would be no effects on Special Status or Sensitive Species, USFWS ESA listed species, raptors, migratory birds, wildlife species or habitat within the Tendoy or White Pine Alternatives. Wildlife inhabiting the alternatives would not be impacted as a result of disturbance or operational activities and habitat would remain intact.

### **3.4.4 Tendoy Alternative**

Under the Tendoy Alternative, wildlife and habitat disturbance would be limited to the well pad and new access roads. A total 28.9 long term disturbance (26.9 acres for access road, 2.0 acres of well pad) of wildlife habitat would be permanently disturbed as a result of the construction of the Tendoy alternative well pad. Short term disturbance includes an additional 2.9 acres of well pad that would be required to be reclaimed after completion of the well.

Minimizing disturbance by confining work to designated areas and access roads, implementing a site-specific vegetation reclamation plan in the APD, and other applicant-committed design features would minimize impacts to wildlife species and habitat in the Tendoy Alternative. The Tendoy Alternative would result in impacts that would be minimal to individuals and habitat, without contributing to a loss of viability to wildlife populations or species.

### **Migratory Bird Species (Including Raptors)**

The loss of migratory bird habitat could result from approximately 28.9 acres of long-term disturbance. Impacts as a result of construction would be short-term due to human presence and noise and long-term due to vegetation removal creating habitat impacts. Operation and maintenance of the well could also displace migratory birds over the long-term due to noise and human presence. Implementation of the applicant-committed design features, construction timing constraints, or nest surveys and the site-specific reclamation plan in the APD would minimize effects to migratory birds from the Tendoy Alternative. Due to this, it is anticipated that the Tendoy Alternative may impact individuals and habitat, but is not anticipated to result in a loss of individuals or the migratory bird population in the project area with the implementation of mitigation and minimization measures.

### **Raptors**

Under this alternative, impacts to raptors would be a result of the surface disturbance and vegetation removal that would occur on the 29.8 acres permanent disturbance associated with the new access road and well pad in primarily sagebrush shrubland habitat. This vegetation would be lost, either permanently or until such time when the areas are reclaimed. Raptors are expected to utilize more area than just the

project area, however, construction would create impacts to raptors in the short-term due to activities that could result in injury, mortality, reproductive failure and displacement of raptors in the project area and long-term due to habitat loss. Implementation of the applicant-committed design features, seasonal construction timing constraints, pre-construction raptor nest surveys and the site-specific reclamation plan in the APD would minimize effects to raptors for this alternative. Lease stipulation MT-13-11 prohibits surface use from March 1 through July 31 within 0.5 mile of raptor nest sites that have been active within the past 5 years, which does not apply to operation and maintenance of production facilities. Impacts to raptors would continue during the long-term operation and maintenance phases as a result of the lease stipulation not applying to these activities, but impacts would be minimal considering the activities would not result in the direct removal or habitat and the level of activity would primarily be traffic and maintenance work. The Tendoy Alternative may impact raptors and habitat, but is not anticipated to result in loss of the raptor population or individuals using the area because mitigation measures and BLM lease stipulations would be implemented.

### **Big Game Species**

Approximately 29.8 acres of big game habitat, including permanent disturbance and the removal of vegetation primarily in sagebrush shrubland habitat would be directly affected by this alternative. Disturbance associated with the truck traffic, operational noise, and human presence is likely to displace and have an adverse impact on big game species using the adjacent area as winter range. A greater volume of truck traffic is anticipated during drill rig mobilization and demobilization but will be substantially reduced during the drilling and production phases. Some truck trips (both pickups and tankers) would be necessary during the winter to operate the well. According to MFWP (pers., comm. Fager 2015) the winter range area in which the proposed new 4.7 miles of access road would be constructed is considered high value winter range for both mule deer and elk, and truck related impacts could be substantial.

Implementation of the applicant-committed design features, seasonal construction timing constraints, and the site-specific reclamation plan in the APD would minimize effects to big game from the Tendoy Alternative. In addition, lease stipulation MT-13-7 prohibits surface use from December 1 through May 15 within big game winter/spring range for wildlife. This stipulation would protect mule deer, elk, antelope, and moose winter range from disturbance during the winter/spring season and facilitate long-term maintenance of wildlife populations. Lease stipulation MT-13-9 prohibits surface use from November 1 through June 30 in bighorn rutting, winter, and lambing habitat to protect this habitat from disturbance and facilitate long-term maintenance of bighorn sheep populations. These stipulations do not apply to operation and maintenance of production facilities, so big game would continue to be affected by operation and maintenance activities. Should the well be productive, and operation and maintenance activities occur during the winter period, impacts to big game winter range are expected to be high because winter range habitat occurs directly in the Tendoy project area. With the implementation of minimization measures and lease stipulations, impacts to big game would be reduced and short-term during the construction and development phase. Long-term impacts as a result of ongoing operation and maintenance, and permanent disturbance would also be minimized through mitigation measures such as educating personnel on the presence of and protection measures for big game, enforcing speed limits, confining activities to designated areas, and reclamation following construction. The Tendoy alternative may impact individuals and habitat, but are not anticipated to result in loss of individual big game animals or the populations using the project area.

### **Special Status and Threatened and Endangered Species**

Under the Tendoy Alternative, there would be a direct effect to sagebrush habitat. The surface disturbance and vegetation removal would occur along the 4.7 miles of new access road and well pad in primarily sagebrush shrubland habitat.

**Grizzly bear:** Sagebrush shrubland habitat may be used by grizzly bears moving through the project area due to the size of their home range and spring/winter movements to follow food sources. It is anticipated the Tendoy Alternative may affect but is not likely to adversely affect grizzly bears using the area based on the lack of historical use of the area by grizzly bear, the small amount of limited use grizzly bear habitat impacted, and the amount of habitat available in the nearby area.

**North American wolverine:** Sagebrush shrubland habitat is not considered wolverine habitat. Wolverines may move through the area due to the size of their home range and spring/winter movements to follow food sources. It is anticipated that the Tendoy Alternative would have no effect on wolverines using the area based on the lack of historical presence in the area by wolverines, the lack of wolverine habitat, and the amount of habitat available in the nearby.

### **BLM DFO Species Status Species**

BLM special status sensitive animal species may be potentially found in the project area. Construction, drilling, completion, and production trucking activities could result in effects to BLM sensitive species, as described below. BLM sensitive species that may potentially be impacted are:

- Gray wolf;
- Pygmy rabbit;
- Townsend's big-eared bat
- Bald eagle;
- Brewer's sparrow, loggerhead shrike, sagebrush sparrow, and sage thrasher;
- Ferruginous hawk;
- Golden eagle;
- Greater Sage-Grouse;
- Lewis's woodpecker;
- Long-billed curlew;
- McCown's longspur;
- American peregrine falcon;
- Veery; and
- Boreal/western toad

Under the Tendoy alternative, there would be a direct impact to sagebrush habitat, ongoing short-term disturbance activities from construction, and ongoing long-term disturbance from human presence during operation. Also, under the Tendoy alternative, aquatic and riparian habitat disturbance would occur (that could affect migratory bird species), but would be limited to road improvements along Big Sheep Creek.

**Gray wolf:** Direct effects could be mortality or displacement of gray wolves. Confining activities to the designated work areas and observing speed limits within the project would lessen impacts to this species. The Tendoy alternative activities would not likely result in a trend towards decline of the species due to the limited amount of habitat disturbance, localized nature of short-term construction impacts, and limited intermittent long-term impacts of human presence during operation. The Tendoy alternative may impact individuals and habitat, without contributing to a loss of viability to gray wolf populations or species using the area.

**Pygmy rabbit:** The Tendoy Alternative would result in a direct loss of this habitat for the pygmy rabbit. A comprehensive pre-construction survey for active and inactive pygmy rabbit burrows within suitable habitat on the well pad site, disturbance areas, or new access roads would be conducted when the APD is

processed and prior to construction activities. If pygmy rabbit burrows are found during pre-construction surveys, they will be marked for avoidance during construction to minimize impacts.

Direct impacts to pygmy rabbits would result from increased collision risk due to increased traffic in the area and the construction of 4.7 miles of new access road; however, the proposed alternatives would avoid impacting active burrows by marking them for avoidance. Pygmy rabbits could also potentially be displaced due to human presence and noise resulting from activities in the area. Disturbance within the construction footprint could cause edge effects due to the remote location and lack of disturbance in the surrounding area. Edge effects could result in increased predation pressure on pygmy rabbits due to lack of cover. The potential for noxious weeds to invade the disturbed areas could result in changes in available forage, alteration of the vegetation community, and increased fire regimes, which would be lessened by implementing a reclamation and noxious weed prevention plan.

The Tendoy Alternative activities would not likely result in a trend towards decline of the species due to the limited amount of habitat disturbance, localized nature of short-term construction impacts, and limited intermittent long-term impacts of human presence during operation. The loss of sagebrush habitat for the Tendoy Alternative results in a larger disturbance footprint within sagebrush habitat compared to the White Pine Alternative; however, this habitat disturbance is still relatively minor compared to the amount of available surrounding sagebrush habitat. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to pygmy rabbit populations or species using the area.

***Townsend's big-eared bat:*** The Tendoy Alternative could result in mortality or displacement of Townsend's big-eared bat should they be present. The Tendoy Alternative activities would not likely result in a trend towards decline of the species due to the limited amount of habitat disturbance, localized nature of short-term construction impacts, and limited intermittent long-term impacts of human presence during operation. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to Townsend's big-ear bat populations or species using the area.

***Bald eagle:*** The Tendoy Alternative may impact bald eagle individuals or habitat using the riparian, wetland, or aquatic habitat in the Tendoy Alternative area due to loss of habitat, direct mortality, displacement, or reproductive failure as a result of project activities. The alternative may impact individuals and habitat, without contributing to a loss of viability to bald eagle populations or species using the area. A comprehensive survey for active and inactive eagle nests within 1.0 mile of the well pad site disturbance areas, or new access roads would be conducted when the APD is processed and prior to construction activities, which would minimize effects and further protect bald eagles.

***Brewer's sparrow, loggerhead shrike, sagebrush sparrow, and sage thrasher:*** The Tendoy Alternative could result in direct mortality or injury, displacement, or reproductive failure in these species and may impact individuals and habitat, without contributing to a loss of viability to Brewer's sparrow, loggerhead shrike, sagebrush sparrow, and sage thrasher populations or species using the project area. Implementation of nest surveys during the appropriate seasonal timeframe (April 1 to August 15) and establishing appropriate spatial buffers from active nests until young have fledged or avoiding breeding season would minimize impacts. The loss of sagebrush habitat, of which 26.9 acres would remain permanently disturbed for the well pad and access road, would represent a loss of habitat for these species.

***Ferruginous hawk:*** The Tendoy Alternative activities would not likely result in a trend towards decline of the ferruginous hawk. The loss of sagebrush habitat for the well pad and access road represents a minor habitat loss relative to the available habitat in the surrounding area. A comprehensive survey for active and inactive raptor nests within 1.0 mile of the well pad site, disturbance areas, or new access roads would be conducted for the selected alternative when the APD is processed and prior to construction



activities. Active nests would be buffered according to agency guidelines to minimize disturbance and further protect ferruginous hawks. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to ferruginous hawk populations or species using the area.

**Golden eagle:** Golden eagles are likely to experience direct mortality or injury; displacement due to human presence, noise, and loss of habitat; and reproductive failure as a result of the Tendoy Alternative. A comprehensive survey during the appropriate nesting season according to agency guidelines and agreements for active and inactive eagle nests within 1.0 mile of the well pad site, disturbance areas, or new access roads would be conducted for the selected alternative when the APD is processed and prior to construction activities. Any identified active nests would be buffered to minimize disturbance and further protect golden eagles. The permanent loss of habitat due to disturbance for the new access road and well pad represents a minor loss relative to available sagebrush habitat in the surrounding area, and reclamation activities would restore some habitat. Thus, the Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to golden eagle populations or species using the area.

**Greater Sage-Grouse:** The Tendoy Alternative is located within Sage-Grouse Executive Order General Habitat; the Big Sheep Creek Road is within BLM PHMA and Executive Order Core Area; and the new access road for the Tendoy alternative is within BLM GHMA (MDNRC, 2018). There are no previously identified active leks within 3 miles of the proposed disturbance area, but year-round habitat occurs within the Big Sheep Creek watershed.

Project-related activities and creation of the new access road could lead to increased risk of collision with vehicles or structures, resulting in injury or mortality. The new access road would result in a loss of GHMA habitat for Greater Sage-Grouse, although this loss is minor relative to available habitat in the surrounding area and direct impacts resulting from surface disturbance would be lessened through pre-construction surveys to identify active leks, nesting, or brood rearing sites. Implementation of 3-mile buffers from active leks or nesting/brood rearing areas within GHMA would be required and would lessen impacts on Greater Sage-Grouse reproductive success. Also, the project would avoid impacting active nesting sites or brood rearing areas if no new active leks were identified in closer proximity than 3 miles to the project or construction were to occur outside the Greater Sage-Grouse nesting/brood rearing season. Indirect impacts on Greater Sage-Grouse as a result of the project would include a loss of potentially suitable habitats for nesting and/or foraging due to surface disturbance, increased habitat fragmentation from development of well pad and roads, and disturbance from increased vehicle traffic and human presence. Disturbance from the project could result in edge effects altering the habitat in the disturbance area, creating a medium for invasion by noxious weeds and non-native species, reducing cover and food resources, and creating increased predation opportunities for raptors where Greater Sage-Grouse are exposed due to lack of cover. Structures installed during production could also provide perching opportunities for predators of Greater Sage-Grouse.

Required design features identified in ARMPA may be required for certain activities in all Greater Sage-Grouse habitat to establish the minimum specifications for certain activities to mitigate adverse impacts and may be considered and applied according to the site-specific circumstances (BLM, 2015a). The application of standard operating procedures, applied mitigation, required design features, and any stipulated COAs identified for Greater Sage-Grouse under the selected alternative, would minimize impacts caused by surface-disturbing and disruptive activities. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to Greater Sage Grouse populations or species using the area.

**Lewis's woodpecker:** Sagebrush habitat is not suitable habitat for Lewis's woodpecker. The Tendoy Alternative activities would not result in a decline of the Lewis's woodpecker due to lack of habitat



disturbance for this species. Pre-construction surveys would eliminate potential direct impacts to Lewis's woodpeckers by confirming their absence in the area. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to Lewis's woodpecker populations or species using the area, particularly due to the lack of habitat and low likelihood of this species occurring at this site.

***Long-billed curlew:*** Localized and minimal habitat disturbance to potential long-billed curlew habitat may indirectly impact long-billed curlew individuals and/or habitat that is adjacent to road improvements along Big Sheep Creek. Due to the minimal habitat disturbance and pre-construction surveys to confirm absence of this species, the Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to long-billed curlew populations or species using the area. The effects would be minimized by confining disturbance to designated areas, conducting pre-construction migratory bird surveys, and restoring habitat where appropriate.

***McCown's longspur:*** Sagebrush habitat on the Tendoy Alternative Site may be marginal habitat for McCown's longspur due to lack of semi-arid areas of shortgrass prairie with sparse vegetation. Ongoing disturbance activities and human presence could displace this species from what may be considered marginal habitat. It is not likely the Tendoy Alternative activities would result in a trend towards decline of the McCown's longspur because pre-construction surveys would confirm absence of this species and it is not anticipated this species nests or forages in this habitat. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to McCown's longspur populations or species using the area.

***American peregrine falcon:*** A comprehensive survey for active and inactive raptor nests within 0.5 mile of the well pad site, disturbance areas, or new access roads would be conducted when the APD is processed and prior to construction activities. Active nests would be appropriately buffered and avoided by activities to minimize impacts on this species, and no surface occupancy within 0.5 mile of nests active within the last five years would be implemented. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to American peregrine falcon populations or species using the area. Implementation of pre-construction raptor surveys, NSO and TL from active nests, and restoration of habitat would minimize impacts on the American peregrine falcon.

***Veery:*** Under the Tendoy Alternative, aquatic, wetland, and riparian habitat disturbance would not occur in suitable veery habitat. However, increased vehicle traffic throughout all phases of well development would occur in suitable veery habitat. The Tendoy Alternative activities would impact veery using suitable habitat in the project area due to displacement from human presence and noise. Implementation of pre-construction surveys for veery during the appropriate nesting season and establishing buffers to protect any nesting veery would minimize potential impacts. The Tendoy Alternative may impact individuals and habitat, without contributing to a loss of viability to veery populations or species using the area.

***Boreal/western toad:*** Under the Tendoy Alternative, any potential habitat disturbance would be limited to road improvements and adjacent habitat along Big Sheep Creek, which may impact boreal/western toads. Boreal/western toads may be impacted from increased activities and vehicle volume, resulting in direct mortality or injury from collisions with vehicles. Suitable habitat for this species may be lost as a result of road improvements, creating edge effects in which this species is more vulnerable to predation due to changes in or lack of vegetation cover. Implementation of the SWPPP, weed control measures, site specific vegetation reclamation plan in the APD, and other applicant-committed design features would lessen the impacts to water quality, riparian vegetation, and wetland habitat used by boreal/western toad. The Tendoy Alternative activities may impact individuals and habitat, without contributing to a loss of viability to boreal and western toad populations or species using the area.

### **3.4.5 White Pine Alternative**

The White Pine Alternative would result in disturbance to habitat and wildlife limited to the well pad and improvements to the access road. A total of 12.0 acres of habitat would be directly disturbed as a result of the White Pine Alternative with a long-term surface disturbance of 9.2, assuming interim reclamation success. The new road and upgraded access routes to the White Pine Alternative would result in 6.7 acres of permanent habitat disturbance.

The disturbance to wildlife and habitat would be minimized by confining work and disturbance to designated areas and access roads, implementing a site-specific vegetation reclamation plan in the APD, and other applicant-committed design features in the White Alternative. The White Pine Alternative would result in impacts that would be minimal to individuals and habitat, without contributing to a loss of viability to wildlife populations or species.

#### **Migratory Bird Species (Including Raptors)**

For the White Pine Alternative, loss of migratory bird habitat could result from the approximately 2.8 acres of temporary surface disturbance and vegetation removal associated with well pad construction and 9.2 acres of permanent disturbance in the long-term. This initial disturbance would impact sagebrush, and some of this vegetation has already been disturbed from the existing roads. Short-term impacts as a result of construction would displace migratory birds due to human presence and noise and long-term impacts would result from vegetation loss effecting habitat in the area. Long-term impacts resulting from operation and maintenance would also displace migratory birds due to noise and human presence, however direct impacts as a result of vegetation clearing would no longer be an impact during this phase. Implementation of the applicant-committed design features, weed control program, seasonal constraints, or nest surveys and site-specific reclamation plan in the White Pine APD would minimize effects to migratory birds from the White Pine Alternative. Due to this, it is anticipated that the White Pine Alternative may impact individuals and habitat, and lessening these impacts through the implementation of mitigation measures as identified above would not result in the loss of individuals or the population within the area.

#### **Raptors**

For the White Pine Alternative, loss of potential raptor foraging and nesting habitat could result from the approximately 12.0 acres of surface disturbance and tree, grass, or shrub vegetation removal associated with access road improvements and well pad construction. This initial disturbance would impact grasslands, sagebrush, and forest. Construction activities would impact raptors in the short-term that could result in injury, mortality, reproductive failure and displacement of raptors in the area and long-term due to habitat loss. Operation and maintenance activities would impact raptors in the long-term due to human presence and noise. Applicant-committed design features, seasonal construction timing constraints, pre-construction raptor nest surveys and the site-specific reclamation plan in the White Pine APD would minimize effects to raptors from the White Pine Alternative. Due to this, it is anticipated that the White Pine Alternative may impact individuals and habitat, but would not result in loss of individuals or the raptor population in the project area.

#### **Big Game Species**

For the White Pine Alternative, loss of big game habitat would result from the approximately 12.0 acres of surface disturbance and vegetation removal associated with access road improvements and well pad construction. This disturbance would impact grasslands, sagebrush, and forest. Big game species are expected to avoid the well pad and associated facilities during summer and fall construction and operations due to the increase in human activity in the area. Similarly, big game species are likely to avoid roadways with higher levels of traffic and instead utilize areas along roads with low use during

winter periods. Increased traffic is also likely to cause increased vehicle collisions or during increased movement periods (i.e., breeding season).

Although it is anticipated big game would avoid construction activities, direct effects to big game species from project construction and activities could displace these species due to noise and human activity. Direct impacts to crucial big game winter range or parturition areas would be limited to the access road construction/improvement and well pad construction areas. Interim reclamation would decrease surface disturbance, but some disturbed areas would remain as habitat loss for the life of the project. Indirect effects would include increased habitat loss and degradation adjacent to the project area associated with avoidance due to disturbance from construction activities of the well pad, new access roads, road improvements, and other ancillary components of the Tendoy Alternative or White Pine Alternative. The loss and disturbance of habitat for the well pads and access roads within habitat that is intact could create edge effects for big game, resulting in changes to the vegetation composition and exposure to predators. Other indirect impacts to big game species include dust effects from unpaved road traffic and increased vehicle traffic, potential increase in vehicle collisions, harassment or displacement from adjacent winter range, increased access to the area from road improvements, habitat fragmentation, and noise impacts from construction and operation.

Effects to big game species from construction, drilling, and completion activities would be short-term, and impacts from truck hauling production activities would be long-term. Big game species impacts would increase during production phases dependent upon frequency of vehicle traffic, human presence, and other factors.

Wildlife stipulation # 3 for MTM-96679 and MTM-96682 requires no surface use from December 1 to May 15 on the following lands:

- MTM-96679: Township 14S, Range 9W, PMM, Lots 1-4, E2, E2W2 of Section 7; Section 16 and 17; Lots 1-4, E2, E2W2 of Section 18.
- MTM-96682: Township 14S, Range 9W, PMM, all of Section 33; W2NE, W2, SE of Section 34; and N2N2, SENE, SWNW, W2SW; portions of SWNE, SENW, E2SW, N2SE, SESE of Section 35.

This stipulation is to preclude surface disturbing activities in big game winter range (elk, mule deer, bighorn sheep, and moose) which could cause increased stress and/or displacement of animals during the critical time period (**Appendix A**). In addition to this lease stipulation, implementation of the applicant-committed design features, seasonal construction timing constraints, and site-specific reclamation plan in the White Pine APD would minimize effects to big game from the White Pine Alternative and short-term during the construction and development phase. Should the well commence production, this alternative would also require regular truck traffic and associated disturbance, which would have an adverse effect on big game species using the project area. Wildlife Stipulation #3 does not apply to the operation and maintenance of production facilities; should the well prove productive, these activities would occur during the winter period and impacts to big game winter range are expected to be high because winter range habitat occurs directly in the White Pine Alternative area. Indirect impacts to big game species are similar to the Tendoy Alternative, including displacement and stress on big game due to truck traffic, human presence, and operational noise. Long-term impacts as a result of ongoing operation and maintenance, and permanent disturbance would also be minimized through mitigation measures such as educating personnel on the presence of and protection measures for big game, enforcing speed limits, confining activities to designated areas, and reclamation following construction. The White Pine Alternative may impact bighorn sheep individuals and habitat, without contributing to a loss of viability to big game populations or species using the project area. Other big game species may also be impacted, but with the implementation of the mitigation measures as identified for the Tendoy Alternative, the

impacts would be minimized and not expected to result in loss of individuals or the big game population in the area.

### **Special Status and Threatened and Endangered Species**

For the White Pine Alternative, loss of potential foraging habitat could result from the surface disturbance and vegetation removal associated with the access road improvements and new well pad construction.

**Grizzly bear:** Initial disturbance would impact grasslands and forest habitat that grizzly bears could utilize while moving through the project area. This alternative may affect but is not likely to adversely affect grizzly bears due to the small amount of disturbance in an area surrounded by plenty of suitable habitat and the limited use of this area by grizzly bear due to their transient nature.

**North American wolverine:** Initial disturbance would impact forest habitat that wolverines could utilize while moving through the project area. This alternative is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of proposed critical habitat for wolverines that may occur in the project area based on the lack of historical use of the area by wolverines, lack of habitat, and the amount of habitat available in the nearby area.

### **Forest Service Region 1 Sensitive Species**

As discussed above, nine of the Forest Service R1 sensitive species may be potentially found in the project area: pygmy rabbit, bighorn sheep, gray wolf, Townsend's big-eared bat, American peregrine falcon, bald eagle, Greater Sage-Grouse, flammulated owl, and boreal/western toad.

**Pygmy rabbit:** The White Pine Alternative is considered marginal habitat for the pygmy rabbit except in the lower foothills and near Little Sheep Creek. Impacts could result from the surface disturbance and vegetation removal associated with the access road improvements and well pad construction. The White Pine Alternative does not require new access road within sagebrush habitat, whereas the Tendoy Alternative would result in loss of potential pygmy rabbit sagebrush habitat for new access road and well pad. Pygmy rabbits could be directly impacted due to increased risk for collisions with vehicles, causing injury or mortality. Pre-construction surveys for pygmy rabbits and active burrows would allow these areas to be avoided during construction. Pygmy rabbits could also potentially be displaced due to human presence and noise resulting from activities in the area. Disturbance within the construction footprint could cause edge effects due to the remote location and lack of disturbance in the surrounding area. Edge effects could result in increased predation pressure on pygmy rabbits due to lack of cover. The potential for noxious weeds to invade the disturbed areas could result in changes in available forage, alteration of the vegetation community, and increased fire regimes.

A comprehensive pre-construction survey for active and inactive pygmy rabbit burrows within suitable habitat on the well pad site, disturbance areas, or new access roads would be conducted when the APD is processed and prior to construction activities. If pygmy rabbits are found, active burrows and foraging site would be marked for avoidance during construction. The loss of marginal pygmy rabbit sagebrush habitat for the White Pine Alternative is minor compared to the amount of available surrounding sagebrush habitat. The White Pine Alternative may impact individuals and habitat, without contributing to a loss of viability to pygmy rabbit populations or species using the project area.

**Bighorn sheep:** Bighorn sheep habitat was identified in the Tendoy Mountains, and bighorn sheep are more likely to be encountered along the access roads and construction disturbance area for the well pad in the White Pine Alternative, than the Tendoy Alternative. Increased human activity associated with the project could displace bighorn sheep during the short-term as a result of construction and over the long-term due to truck traffic should the well be productive. Bighorn sheep would be at risk for collision with vehicles resulting in injury or mortality along the proposed access roads in the Tendoy Mountains, but

this risk would be minimized by confining travel to designated roads and observing speed limits to protect wildlife. Habitat would be lost permanently or temporarily until reclamation can proceed. The White Pine Alternative would implement the applicant-committed design features, seasonal construction timing constraints, and site-specific reclamation plan in the White Pine APD, which would minimize effects to bighorn sheep from the White Pine Alternative. The White Pine Alternative may impact individuals and habitat, without contributing to a loss of viability to bighorn sheep populations or species using the project area.

**Gray wolf:** The White Pine Alternative activities would not likely result in a trend towards decline of the species due to limited impacts on gray wolf habitat and prey species relative to the available habitat and prey base surrounding the project. This species is likely to avoid human activities, and confining construction to the designated work areas and driving at appropriate speed limits would reduce impacts to this species. The White Pine Alternative may impact individuals and habitat, without contributing to a loss of viability to gray wolf populations or species using the project area.

**Townsend's big-eared bat:** The White Pine Alternative could result in mortality or displacement of Townsend's big-eared bat. The White Pine Alternative activities would not likely result in a trend towards decline of the species due to limited impacts to Townsend's big-eared bat habitat. The White Pine Alternative may impact individual Townsend's big-eared bat, without contributing to a loss of viability to populations or species using the project area.

**American peregrine falcon:** Under this alternative, initial disturbance would primarily impact sagebrush and some of this vegetation has already been disturbed near the existing roads. A comprehensive survey for active and inactive raptor nests within 1.0 mile of the well pad site, disturbance areas, or new access roads would be conducted when the APD is processed and prior to construction activities during the appropriate breeding season. Active nests would be appropriately buffered and avoided by project activities to minimize impacts on this species. The White Pine Alternative may impact individuals and habitat, without contributing to a loss of viability to American peregrine falcon populations or species using the project area.

**Bald eagle:** Under the White Pine Alternative, the initial disturbance would primarily impact sagebrush. A portion of this vegetation has already been disturbed along the existing roads. The White Pine Alternative may impact bald eagle individuals and/or habitat due to loss of habitat, direct mortality, displacement, or reproductive failure as a result of development activities. The project may impact individuals and habitat, without contributing to a loss of viability to bald eagle populations or species using the project area. The effects would be minimized by confining disturbance to designated areas, conducting a comprehensive survey for active and inactive eagle nests within 1.0 mile of the well pad site disturbance areas or new access roads when the APD is processed and prior to construction activities. There are no lease stipulations to protect bald eagle nests; mitigation will be applied through COAs.

**Greater Sage-Grouse:** For the White Pine Alternative, impacts to Greater Sage-Grouse sagebrush habitat could result from the surface disturbance and vegetation removal associated with the new access road improvements and well pad construction. The White Pine Alternative access road crosses Sage-Grouse Executive Order General Habitat and BLM GHMA. No Greater Sage-Grouse active leks are within 3 miles of the White Pine Alternative. Indirect impacts on Greater Sage-Grouse as a result of the project would include a loss of potentially suitable habitats from surface disturbance, increased habitat fragmentation from development of well pad and roads, disturbance from increased vehicle traffic, and human presence. Project-related activities could also lead to increased risk of collision with structures and vehicles resulting in injury or mortality.

The alternative would avoid impacting active nesting sites or brood rearing areas, should no new active leks be identified in closer proximity to the project or should construction occur outside the Greater Sage-Grouse nesting/brood rearing season. Implementation of 3-mile buffers from active leks or nesting/brood rearing areas would also lessen the impacts on Greater Sage-Grouse reproductive success. Indirect impacts on Greater Sage-Grouse as a result of the project would include a loss of potentially suitable habitats for nesting and/or foraging due to surface disturbance; increased habitat fragmentation from development of well pad and road improvements; and disturbance from increased vehicle traffic and human presence. Disturbance from the project could result in edge effects altering the habitat in the disturbance area creating a medium for invasion by noxious weeds and non-native species, reducing cover and food resources, and creating increased predation opportunities for raptors where Greater Sage-Grouse are exposed due to lack of cover. Structures installed for the project could provide perching opportunities for predators of Greater Sage-Grouse.

Required design features identified in ARMPA may be required for certain activities in all Greater Sage-Grouse habitat to establish the minimum specifications for certain activities to mitigate adverse impacts and may be considered and applied according to the site-specific circumstances (BLM, 2015a). The application of standard operating procedures, applied mitigation, required design features, and any COAs identified for Greater Sage-Grouse under the selected alternative, would minimize impacts caused by surface-disturbing and disruptive activities. The White Pine Alternative may impact individuals and habitat, without contributing to a loss of viability to Greater Sage Grouse populations or species using the project area.

**Flammulated owl:** This species is a cavity nester in ponderosa pine and mixed coniferous forest, which is present in the White Pine Alternative. However, the loss of coniferous forest habitat for the well pad and access road would represent a minor loss relative to the amount of intact habitat surrounding the project. The flammulated owl could experience direct and indirect impacts as a result of habitat disturbance, loss, and fragmentation due to construction for the well pad and upgrades to the existing road. These impacts could also result in direct mortality or injury, displacement, or reproductive failure. These activities would not likely contribute to a trend towards decline in flammulated owl with implementation of raptor surveys during appropriate seasonal timeframes and establishment of spatial buffers from active nests until young have fledged. The White Pine Alternative may impact individuals and habitat, without contributing to a loss of viability to flammulated owl populations or species using the project area. The implementation of pre-construction raptor surveys, required mitigation measures, and applicant committed design features would minimize the negative effects on this species.

**Boreal/western toad:** The White Pine Alternative may result in direct and indirect impacts to boreal/western toad. Initial disturbance would primarily impact sagebrush, and some of this vegetation has already been disturbed from existing road improvements; however, increased activities and vehicle volume could result in direct mortality or injury from collisions with vehicles. In addition, any suitable habitat for this species may be lost as a result of road improvements, creating edge effects in which this species is more vulnerable to predation due to changes in or lack of vegetation cover.

Implementation of the SWPPP, weed control measures, site specific vegetation reclamation plan in the APD, and other applicant-committed design features would lessen the impacts to water quality, riparian vegetation, and wetland habitat used by boreal/western toad. The White Pine Alternative may impact individuals and habitat, without contributing to a loss of viability to boreal and western toad populations or species using the project area.

### 3.4.6 Cumulative Effects

The direct and indirect effects to wildlife, migratory birds, big game, and raptors as a result of the project could combine with the effects of other past present and reasonably foreseeable actions to result in cumulative effects. These effects include habitat loss or degradation, habitat fragmentation and edge effects in the project vicinity that have occurred due to livestock grazing, impacts to recreational uses, timber harvesting, other construction (e.g., ongoing road maintenance, fiber optic installation, and bridge replacements), and land management actions. These are described in the Big Sheep Creek Watershed Assessment (BLM, 2015b). Livestock grazing will continue into the future but no other road building or timber harvest is foreseeable in the vicinity.

It is anticipated that with COAs, applicant committed measures, and the lease stipulations such as timing restrictions, the impacts from the White Pine alternative would not result in substantial cumulative effects due to the relatively small number of acres of disturbance. While there are direct and indirect effects due to drilling and operation of the well, these are not significant and there are no other similar past activities in the project vicinity, so these direct and indirect effects do not result in cumulative effects. The Tendoy alternative could have substantial direct effects, particularly on big game winter range and therefore, those impacts could result in substantial cumulative effects when combined with other past activities in the area.

### **3.5 Riparian, Aquatic, and Wetland Habitat Species**

Riparian, aquatic, and wetland habitat offers diversity and crucial water sources for wildlife. Riparian areas provide important habitat for moose (*Alces americanus*), elk (*Cervus canadensis*), beaver (*Castor canadensis*), songbirds, and Greater Sage-Grouse, and amphibian species. Wildlife and livestock often concentrate in riparian habitat later into the summer and fall, creating additional impacts. Metrics used to analyze effects include:

- Qualitative assessment of suitable habitat present
- Qualitative assessment of sedimentation to habitat on proposed access routes

#### **3.5.1 Riparian, Aquatic, and Wetland Habitat Existing Conditions**

##### **Fish Species**

Fish species present in the Big Sheep Creek drainage include rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), westslope cutthroat trout (*Oncorhynchus clarki lewisi*), brook trout (*Salvelinus fontinalis*) (in low numbers), whitefish (*Coregoninae*), sculpin species (*Cottoidea*), longnose dace (*Rhinichthys cataractae*), and mountain sucker (*Catostomus platyrhynchus*) and white sucker (*Catostomus commersonii*) (BLM, 2015b). The majority of the fish present in the lower mainstem Big Sheep Creek are brown trout and hybrids of rainbow trout and westslope cutthroat trout based on experimental data collected in October 1990 (MFWP, 2018).

Long-term monitoring of Big Sheep Creek in the Canyon section during 1990 to 2000 identified brown trout, rainbow trout, and westslope cutthroat trout (MFWP, 2018). The Shearing Pen section of Big Sheep Creek studied from 1980 - 1996 revealed a trend toward increased population densities and standing crops of brown trout. Although the population density declined slightly in the 2000 sample, the species remained relatively abundant (Oswald, 2003). Rainbow trout have been documented through long-term monitoring in the Shearing Pen section of Big Sheep Creek (MFWP, 2018) and although population trends had exhibited a declining trend over the 1980 - 1996 period of study, the population improved markedly in density in 2000 (Oswald, 2003).

Fish species identified in the Middle Fork of Little Sheep Creek in 2012 were brook trout and westslope cutthroat trout. The Middle Fork upper reach of Little Sheep Creek is also inhabited by westslope cutthroat trout, and MFWP FishMT data indicated Little Sheep Creek is inhabited by brown trout, although both brook and brown trout are introduced species to Montana (MFWP, 2018).

### **Riparian and Wetland Areas**

Riparian woodlands support many passerine bird species. Migratory corridors from low elevation wetlands to high elevation forests are crucial to northern-breeding neotropical migrants and local breeding, summer residents, or wintering species that use these habitats for breeding and raising young. Most of the passerine species are migratory, but small populations of some species may stay yearlong depending on seasonal conditions.

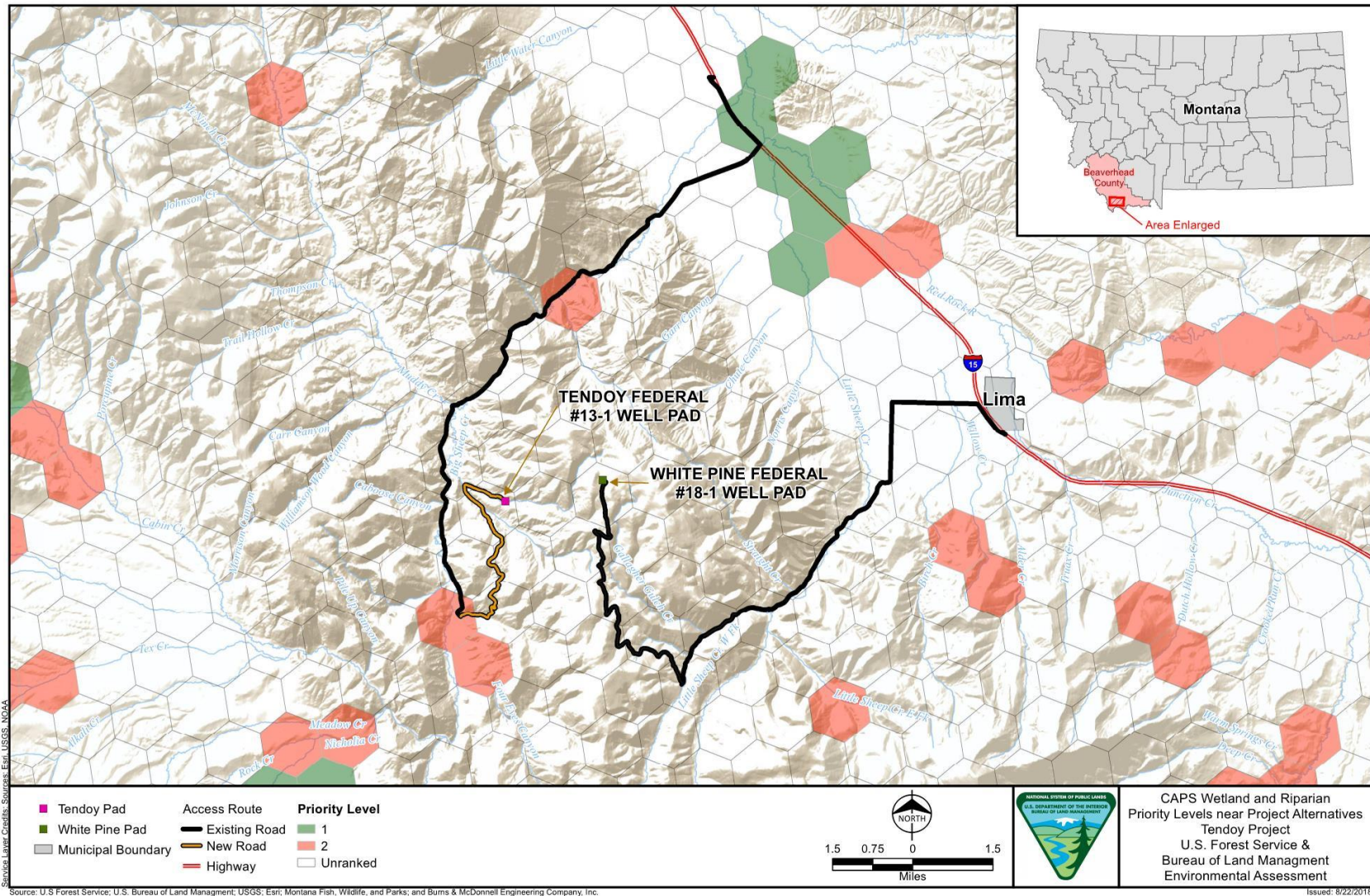
Riparian and wetland areas are habitat for amphibian species. In the vicinity of the project, the species that could be present include boreal/western toad (*Anaxyrus boreas*), Columbia spotted frog (*Rana luteiventris*), boreal chorus frog (*Pseudacris maculata*), and tiger salamander (*Ambystoma tigrinum*) (data obtained from MNHP on February 7, 2017). The MNHP data showed many amphibian surveys in the project area but few actual observations within 5 miles of proposed project activities.

The species identified are somewhat mobile; in the spring they are actively moving between feeding areas (typically riparian areas) and brood areas (commonly upland wetlands). To help evaluate risk to individuals that are crossing access roads the project team measured (using estimates from aerial imagery) the length of access road which had riparian and/or wetland habitat on both sides of the road. The results indicated Big Sheep Creek Road has an estimated 1,350 feet of road have riparian and/or wetland habitat on both sides of the road. Little Sheep Creek Road has 100 feet of riparian and/or wetland habitat on both sides of the road. Amphibians may move miles from breeding sites; however, determining their precise movements is not possible at this time. The analysis method described above may not fully capture all potential impacts to amphibians but does provide a means of comparing the relative impact to amphibian species by the three alternatives.

The CAPS tool identified wetland and riparian areas that “represent unique and/or sensitive environments and function to support animal and plant diversity with respect to wildlife objectives and connectivity” (MFWP, 2015; Figure 4). Two priority levels were designated in the dataset. Priority level 1 included areas with the landcover class Northwestern Great Plains Floodplain or a total wetland area greater than or equal to 10 percent for the 1 square mile hexagon area. Priority level 2 areas were classified as 1 square mile hexagons with the landcover classes Northern Rock Mountain Lower Montane Riparian Woodland and Shrubland, Northwestern Great Plains Riparian, or Rocky Mountain Lower Montane Foothill Riparian Woodland and Shrubland for greater than or equal to 5 percent of the hexagon. Alternatively, priority level 2 areas could have a total wetland area of greater than or equal to 5 percent of the hexagon area. Areas outside these two categories are classified as unranked in the dataset.



**Figure 4: CAPS Wetland and Riparian Priority Levels near Project Alternatives**



The project vicinity was primarily unranked for wetland and riparian areas in the CAPS dataset. A small area of priority level 1 was located near the intersection of I-15 and Big Sheep Creek and Little Sheep Creek. Several small areas of priority level 2 were located along both creeks as well. The Tendoy and White Pine Alternative Sites are located within unranked areas. The access road for the Tendoy Alternative crosses a short portion of priority level 2 near the intersection with Big Sheep Creek Road. The White Pine Alternative access road is completely within unranked area.

### **3.5.2 Environmental Consequences**

#### **Common to Both Alternatives**

Increased truck traffic from construction and operation of the project could impact aquatic/riparian habitat and species through increased sedimentation (either direct delivery or through fugitive dust) and direct mortality of amphibians. Increased sediment delivery may also in-fill breeding, rearing, and over-wintering habitat for amphibian species in stream and wetland systems (Maxell 2000). The activities associated with the project also include road improvements that will result in a net reduction in direct delivery of eroded sediment to streams.

Road improvements may involve some minor disturbance along either Big or Little Sheep Creeks. Recent county road improvements, county road maintenance, minor improvements and implementation of best management practices (i.e., SWPPP, speed limits, wet-work restrictions, etc.) to roads would reduce the potential for direct impacts to wildlife species in riparian and wetland habitat. Sediment loading from both Big and Little Sheep Creek Roads would be reduced as a result of road drainage improvements that are a part of this project (see Section 2.7).

New activities and truck traffic in proximity to known sensitive amphibian breeding sites and natal areas during breeding and juvenile rearing periods could pose a threat to individuals of the species. Amphibians may potentially be impacted by sediment loading to stream and wetland habitat and vehicular mortality. The risk of vehicular mortality is heightened in the spring when amphibian species are more active and mobile. It is assumed that any wetlands or streams could potentially be habitat for amphibians. MNHP data shows six amphibian surveys within 1 mile of project activities, but no actual observations of amphibians during these surveys. The relative impacts for each alternative can be evaluated by comparing the length of access road for each alternative (determined by aerial imagery) along which suitable habitat (wetlands, streams, ponds, or riparian areas) is present on both sides of proposed access routes. The rationale for this metric is that if there is suitable habitat on both sides of a road, the amphibians would be more likely to cross the road, and, therefore be at greater risk of being injured or killed by motor vehicles. It is recognized that amphibians may move miles from breeding sites; however, determining their precise movements is not possible at this time. The analysis method described above may not fully capture all potential impacts to amphibians but does provide a means of comparing the likely impact of the three alternatives.

#### **3.5.3 No Action Alternative**

Under the No Action Alternative, there would be no new or additional direct or indirect effects to wildlife using the riparian or wetland habitat in the project, because no construction disturbance or operational activities would occur. Under this alternative, no additional road improvements would be made. Current sedimentation, traffic, and associated dust and noise impacts would remain unchanged.

#### **3.5.4 Tendoy Alternative**

Road sediment loading to Big Sheep Creek would be reduced by road improvement activities that are part of the Tendoy Alternative by an estimated 1.8 tons/year (details provided in **Appendix D**). Surface disturbance along the 4.7 miles of new access road would be located in upland sagebrush dominated vegetation and would not affect live water or aquatic species. However, amphibian mortality could occur along 1,350 feet of road for this alternative. Implementation of the SWPPP, weed control measures, site specific vegetation reclamation plan in the APD, and other applicant-committed design features would lessen impacts to water quality, riparian vegetation, and wetland habitat used by these wildlife species. In addition to the measures above, lease stipulation MT-11-20 requires surface occupancy and use is prohibited within 0.5 mile from the centerline of Class 1 fishery streams (Blue Ribbon Trout Streams) to maintain the health of aquatic habitat along Class 1 fisheries (**Appendix A**). Lease stipulation MT-11-2 prohibits surface occupancy within riparian areas, in 100-year floodplains of major rivers, and on water bodies and streams to protect the unique biological and hydrological features associated with these areas, and to maintain riparian/wetland function and water quality. Implementation of the above measures and the lease stipulation would lessen impacts to individuals and habitat, without contributing to a loss of viability to the population or species using the riparian, wetland, or aquatic habitat in the project area.

### **3.5.5 White Pine Alternative**

Road sediment loading to Little Sheep Creek will be reduced as part of the White Pine Alternative by an estimated 6.8 tons/year through the improvement of road drainage to reduce sediment delivery. Surface disturbance would occur at several locations of road improvement along the access road (total of approximately 6.6 acres), but these activities would not pose a threat of sediment delivery to live water due to topographic and vegetative buffering and the distance to live water. Amphibian mortality could occur along 100 feet of road for this alternative.

Fisheries stipulation #4 of MTM-96679 and MTM-96682 requires no surface occupancy or use in Township 14S, Range 9W, in portions of Sections 17, 18, 33, and 34 (**Appendix A**). This stipulation aims to maintain a healthy aquatic habitat in the watershed, which is important to the viability of pure Upper Missouri westslope cutthroat trout occupying roaded drainages with high or extreme risk of extinction. The stipulation also aims to maintain a healthy aquatic habitat in watersheds important to the viability of pure Upper Missouri westslope cutthroat trout occupying unroaded portions of partially roaded drainages and roaded sections of partially roaded drainages with high or extreme risk of extinction through application of the following mitigation measures:

- No net increase in sediment over existing conditions
- No adverse effects on water quality or quantity.

Increased sediment and/or decreased water quality or quantity within these drainages could adversely affect sensitive trout viability.

Fisheries stipulation #3 of MTM-96679 states that, surface occupancy or use is subject to the following special operating constraints:

1. A watershed assessment in unsurveyed streams with “potential” (suspected but occurrence not yet documented) populations may be needed.
2. No net increase in sediment over existing condition.
3. No adverse effect to water quality or quantity which may require the use of extraordinary construction equipment or facilities to prevent the discard of drilling fluids or production effluents.

This stipulation applies to portions of Sections 7 and 18 in Township 14S, Range 9W (**Appendix A**). Fisheries stipulation #3 of MTM-96682 applies numbers 2 and 3 from the above list to portions of Sections 7 and 18 of Township 14S, Range 9W. This stipulation is to provide a healthy aquatic habitat in

watersheds important to the viability of potential Upper Missouri westslope cutthroat trout populations. Increased sediment and/or decreased water quality or quantity within these drainages could adversely affect sensitive trout viability. The implementation of measures outlined above and the fisheries stipulations would result in no adverse effect on wildlife species using the riparian, wetland, or aquatic habitat in the White Pine Alternative project area. Since it is largely located on Forest Service-administered land, an Aquatics Biological Evaluation checklist was completed for this project. It is presented in **Appendix E**.

Implementation of the SWPPP, weed control measures, site specific vegetation reclamation plan in the APD, and other applicant-committed design features along with additional mitigation and minimization measures and lease stipulations outlined above would result lessen impacts to individuals and habitat, without contributing to a loss of viability to the population or species using the riparian, wetland, or aquatic habitat in the project area.

### **3.5.6 Cumulative Effects**

Past and current land uses and activities that have potentially contributed to impacts to riparian, aquatic, and wetland habitat species within the Big and Little Sheep Creek watersheds include road construction and maintenance, forest management activities, and livestock grazing. These types of activities are foreseeable in the future.

Potential impacts to riparian, aquatic, and wetland habitat species as a result of the project combined with the effects of other actions would result in cumulative effects. The effects from the project would include reduced sediment loading in general to nearby streams and amphibian mortality. The Tendoy Alternative would disturb 29.8 acres of soils. The White Pine Alternative would require disturbance of 12.0 acres of soils. All of this area is subject to erosion for some period of time. However, due to BMPs and other natural buffering, it is highly improbable that any substantial amount of sediment would travel from these disturbed areas to live streams. The impact of truck traffic on the mainstem roads would increase sediment that is available to be eroded. However, the improvements to road drainage as stipulated in the design features would result in a net reduction in actual sediment loading. In addition, implementation of the design features, SPCC, and SWPPP would eliminate or reduce project-related impacts to water quality and aquatic habitat. It is anticipated other actions would require implementation of mitigation and minimization measures similar to those proposed for this project, which would lessen the cumulative effects. Reclamation using native seed mixes would mitigate the impacts on riparian and wetland species by allowing vegetation and habitat to be restored. A noxious weed plan would prevent the spread of noxious weeds and non-native plants into riparian, aquatic, and wetland habitats.

## **3.6 Visual Resources**

Both alternatives are located within the Medicine Lodge – Tendoy Management Area. This area is managed for livestock grazing, dispersed recreation, and wildlife habitat. Land management includes timber harvest and prescribed burning to achieve vegetation and other resource objectives for the forest (Forest Service, 2009a). The Tendoy viewshed is characterized by sagebrush-covered steep hillsides of Shearing Pen Gulch. Big Sheep Creek meanders through the valley. Big Sheep Creek Road, primitive roads, ranch buildings, range improvements including fences, and small power lines are visible elements in the viewshed. The area is popular for recreational activities, such as hunting and fishing. The Town of Lima and I-15 are located approximately 9 miles east of the Tendoy well pad location. The Continental Divide National Scenic Trail is located approximately 7.8 miles from the Tendoy pad location. Metrics used to analyze effects of the proposed alternatives to visual resources include:

- Qualitative assessment of visual resource classification

- Analysis of effects to visual resource designation by the proposed alternatives

### **3.6.1 Visual Resources Existing Conditions**

#### **Landscape Character Description**

The Lima Tendoy Landscape Character is described in the BDNF Forest Plan as:

The Lima Tendoy Landscape is located in the southwest corner of Montana. BLM lands are a large component of the overall landscape. The Horse Prairie and Big Sheep Creek Valleys surround the Tendoy Mountains. These valleys in turn are bordered by the Beaverhead Mountains, the crest of which form the Idaho border and Continental Divide. This section of the Continental Divide contains one of the tallest groups of mountain peaks in Montana. Along the southern edge of the landscape grasslands uniquely transition directly to rocky peaks, without the usual band of conifers between these two cover types (Forest Service, 2009a, p. 181).

#### **Scenic Attractiveness**

Scenic attractiveness is measured based on human perceptions of the intrinsic beauty of an area. It is categorized based on criteria developed by landscape architects into three classes: Class A (Distinctive), Class B (Typical or Common), and Class C (Indistinctive). The Scenic Attractiveness of the Medicine Lodge – Tendoy Management Area is notable as the landscape contains variety in landforms, vegetation, and ecology, as well as the presence of creeks.

#### **Existing Scenic Integrity**

Scenic integrity “indicates the degree of intactness and wholeness of the landscape character” (USDA, 1995; p. 2-2) and is held to three standards:

- Standard 1: Where no minimum SIOs are identified by landscape or management area - prior to the completion of a forestwide scenic integrity map – the objectives for scenery shall be determined by procedures outlined in the Landscape Aesthetics Handbook, Agricultural Handbook No. 701.
- Standard 2: Projects in non-motorized and summer backcountry allocations will be designed to meet a minimum SIO of Moderate.
- Standard 3: Projects in foreground areas of scenic byways, national scenic trails or wild and scenic rivers will be designed to meet the SIO of at least High.

#### **Landscape Visibility**

Landscape visibility takes into consideration the context of the viewer, duration of viewing, degree of discernable detail, seasonal variations, and number of viewers in an area. Visibility is influenced by viewing angles, seasons, and screening by landforms. The project area has moderate topographical relief, which minimizes the visibility of the project alternatives, for example. Deviations from the landscape character in the immediate foreground are often more noticeable than those visible at greater distances. Visibility is often assessed using specific viewing platforms which are designated by Concern Levels. Any activities visible from Concern Level 1 routes or sites must meet an SIO of High.



### **3.6.2 Environmental Consequences**

#### **Common to both alternatives**

Direct impacts to visual resources would include changes to the existing visual landscape of the project area from construction, drilling, completion, and production activities associated with the project. The removal of vegetation and soil as a result of surface-disturbing activities for well pad and access road construction would be a noticeable, visual change to the landscape. Additional visual impacts would include the presence of construction, drilling, and completion equipment and vehicle traffic that would be visible to ranchers, hunters, recreational users, and others accessing public lands.

The visual resource impacts from construction, drilling, and completion activities would be short-term, and impacts from production activities would be long-term. Visual intrusions would be reduced during long-term production phases, because fewer facilities, less equipment, less vehicle traffic, etc. would be required for well operation and production. Furthermore, interim reclamation would decrease surface disturbance in the long-term.

The most visible element at the well pad location (for either alternative) in the short-term would be the drilling rig. The drilling rig would be approximately 145 feet tall. Drilling operations would require approximately 30 days. During production operations, facilities on the well pad would consist of the wellhead, production tanks, and other production equipment. The most visible permanent element would be the production tanks. Up to six 400-700 barrel tanks would be placed on the well pad for storing oil/condensate and produced water. The low profile tanks would be approximately 16 feet in diameter and 16 feet high. To mitigate impacts to visual resources, all persistent facilities would be painted to match the surrounding landscape color, as directed by the BLM or Forest Service. Production equipment would remain on the well pad for the operational life of the well (potentially up to 20 years).

A flare would be utilized to burn off any excess gas encountered during any stage of the drilling and production. It is uncertain how much gas would be encountered. During drilling, only a small amount of gas is anticipated, and typically for a very short duration (i.e., fewer than 30 minutes). The gas would be burned off with the use of a conventional flare stack. This flare method could have a visual impact, but it would be short in duration (approximately 30 days). During production, gas would be produced and would need to be flared since no gas pipeline is available in this area. Gas volumes at this stage are expected to be low enough that the gas would be combusted with the use of an enclosed combustor rated at a minimum of 98 percent destruction efficiency. No visual flaring is anticipated.

Lighting would be utilized as needed during drilling and at times during other project stages. These lights would be located only within the fenceline of the well pad and would be no taller than 15 feet in height. These lights would only be used as needed and would be turned off at other times. Any other specifications required by agencies related to lighting will be included in the COAs.

Both flaring and lighting would make the project more visible at night, and, if an observer has a clear line of sight to the well pad location, the flare or lights would contrast with the dark surrounding landscape.

### **3.6.3 No Action Alternative**

Under the No Action alternative, no new project-related effects to visual resources would occur. The existing visual landscape within the project area would remain as it is currently.

### **3.6.4 Tendoy Alternative**

The Visual Resource Management (VRM) system is the tool used by BLM to inventory and manage visual resources on public lands when the leases were issued. Using the VRM system, all lands within the DFO were classified into one of four classes (Class I, II, III, and IV), with management objectives defined for each class according to the BLM Visual Resource Handbook 8410-1.

The Tendoy Alternative is mostly on BLM land that has VRM classes mapped. All viewable areas, or the viewshed, for the proposed well pad and access road are within a VRM Class II area. The objective in a Class II area is to retain the existing character of the landscape. Activities or modifications of the environment should not be evident or attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

The surrounding area contains a mix of natural appearing and intact landforms and vegetation as well as human influence in the form of roads, structures, timber harvesting, recreational infrastructure (campground, signage, etc.), ranching operations, and residences and other structures. An existing two-track road is located where the proposed access via Big Sheep Creek Road.

Operation of the well pad would convert an area of primarily sagebrush-shrubland to an industrial use with a pumpjack, large tanks, and other equipment. The approximately 4.7 mile proposed access road would be a new horizontal feature in the landscape, cutting across the hillsides. The steep hillsides and gulches in the topography would partially obscure well pad and access road disturbance from surrounding areas and the project would not be visible from the town of Lima or the I-15 travel corridor due to distance and topography.

To determine visibility of the proposed action on BLM land, three Key Observation Points (KOPs) were established to record the existing scenic conditions and evaluate potential visual effects of the most visible portions of the well pad and access road. Photographs were taken at these KOPs in September 2016, and photosimulations were created based on the operational, long-term project components, including the well pad, pumpjack, tanks, and access road (**Appendix F**):

- KOP #1 is looking up Four Eyes Creek to the southeast from the main Big Sheep Creek Road. The proposed new access road is visible but does not contrast dramatically with the surrounding landscape and fits with the overall landscape elements that are encountered throughout Big Sheep Creek drainage.
- KOP #2 is looking towards the southeast from Big Sheep Creek Road. The proposed access road improvements up Shearing Pen Gulch are visible from this perspective. The project elements that are visible are approximately 1.4 miles distant from the KOP and are short segments of road that will allow for retention of the visual resource quality in this location.
- KOP #3 is looking east up Shearing Pen Gulch from a perspective on a hillside across Big Sheep Creek Road. The Tendoy well pad would be visible from KOP #3 along Big Sheep Creek Road only.

The landscape from these views has been altered by the installation of fences, roads, and Big Sheep Creek Road and therefore, while the new features proposed by the Tendoy Alternative do result in additional disturbance on the landscape, it is not entirely out of context with the current land uses.

Stipulation MT-12-10 states that all surface disturbing activities and construction of semi-permanent and permanent facilities in VRM Class II, III, and IV areas may require special design. This may include specific location design, painting, and camouflage to help the facility blend in with the surrounding area

to meet the visual quality objectives for the VRM class. The goal of this lease stipulation is to control the visual impacts of activities and facilities within acceptable levels. Lima Exploration has committed to painting any aboveground structures with a flat, non-reflective color, determined by the BLM to be Covert Green or other color as directed by the AO. Painting equipment would help reduce the visual contrast of equipment with surrounding vegetation and mitigate any visual effects of the project.

Based on the topography of the viewshed, the distance from sensitive viewpoints, the slightly altered nature of the existing landscape, and the low contrast of the project elements and with the implementation of the applicant-committed design features, the Tendoy Alternative would meet the VRM guidance for a Class II area, which allows for changes to the landscape that do not attract attention of the casual observer. Impacts during the drilling stage (approximately 30 days) may not be determined to meet this VRM guidance but would be short-term in nature.

### **3.6.5 White Pine Alternative**

The Forest Service developed its Scenery Management System<sup>1</sup> (SMS), after the current leases were issued (Forest Service, 1995). The SMS includes an analysis of the scenic values associated with cultural features and settings. The SMS process starts with the identification of scenic components, mapping of the features, and assigning a value for aesthetics of the features. The result of this process influences the development of Scenic Integrity Objectives (SIOs) which help guide the management of a resource. The BDNF Revised Forest Plan (2009a) dictates the management of scenic resources within the BDNF and are based on the procedures outlined in the Landscape Aesthetics Handbook #701 (Forest Service, 1995). SIOs are categorized into five levels from Very High to Very Low based on intactness of the landscape character of an area. The SMS assesses existing scenic integrity, landscape character, scenic attractiveness, and landscape visibility of an area in its analysis.

The Landscape Character description for the White Pine location viewshed is characterized by a forested area on a ridge top, surrounded by hillsides of sagebrush shrublands. The well pad is located in a previous timber harvest area with approximately 20-foot-tall lodgepole pine regenerating the area. Little Sheep Creek meanders through the valley southeast of the well pad location, and Big Sheep Creek is in the valley to the west. Little Sheep Creek Road, White Pine Ridge Road, and range improvements including fences are visible elements in the viewshed.

Construction of the well pad would convert second-growth forestland to an industrial use with a pumpjack, large tanks, and other equipment. While the well pad site is located on a ridge top, it is surrounded by forestland with approximately 20-foot-tall trees that would partially obscure the well pad and equipment from surrounding areas. Several locations along the access road would require improvements. This disturbance would total approximately 6.6 acres. The road general would require widening or turnouts with some road drainage improvements. The disturbance would be small areas (generally, less than a quarter acre) but distributed along the access road.

This Alternative is located within a designated Scenic Attractiveness Class B (Typical) area. Class B is described as:

Areas where landform, vegetation patterns, water characteristics, and cultural features use combine to provide ordinary or common scenic quality. These landscapes have generally positive, yet common, attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance. Normally they would form the basic matrix within the ecological unit (USDA, 1995; p 1-16).

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<sup>1</sup> See Agriculture Handbook #701, *Landscape Aesthetics*, for additional information related to the SMS.



A small area of Class A (Distinctive) Scenic Attractiveness is located approximately 0.3 mile west of the proposed well pad. Class A is described as:

Areas where landform, vegetation patterns, water characteristics, and cultural features combine to provide unusual, unique, or outstanding scenic quality. These landscapes have strong positive attributes of variety, unity, vividness, mystery, intactness, order, harmony, uniqueness, pattern, and balance (USDA, 1995; p 1-16).

This alternative is located within a Scenic Integrity Objective (SIO) of Moderate, and much of the viewshed in the area is categorized as Moderate. Any alterations to the landscape should remain “visually subordinate” to the landscape character. The Alternative would use an existing road for access, which would require upgrades. It is anticipated that the upgrades would be visually subordinate to the landscape character being viewed in the area, and the area would remain slightly altered in appearance.

The nearest Concern Level 1 (High Interest in scenery) routes near the White Pine Alternative are I-15, Big Sheep Creek Road, and the Continental Divide National Scenic Trail and are located in Lima, Montana, Dell, Montana, and the East Creek Campground southeast of the alternative site. Table 3-10 summarizes the distance from the White Pine alternative and each Concern Level 1 site.

**Table 3-10: Concern Level 1 Routes and Sites near White Pine Alternative**

| Concern Level 1 Route or Site              | Distance from White Pine Alternative |
|--|--------------------------------------|
| Interstate Highway 15                      | 7.2 miles                            |
| Big Sheep Creek Road                       | 2.8 miles                            |
| Continental Division National Scenic Trail | 7.5 miles                            |
| Lima, Montana                              | 7.2 miles                            |
| Dell, Montana                              | 7.5 miles                            |
| East Creek Campground                      | 5.8 miles                            |

The proposed pad location is not currently visible from any Concern Level 1 routes or sites; as such, the SIO of the area remains Moderate.

Scenic Resources Stipulation #5 applies to Lease MTM-96679, and the objective is to meet a visual Quality Objective (VQO) of retention in the middle and background seen area. Lima Exploration has committed to painting any aboveground structures with a flat, non-reflective color, determined by the Forest Service to be the most effective at camouflaging the equipment. Painting equipment would help reduce the visual contrast of equipment with surrounding vegetation.

Visual effects of the White Pine alternative determined that while the top of the drill rig would likely be visible from a distance, it would be present for only a short time (approximately 30 days) and would not be noticeable to the casual observer. If a flare is needed to burn excess natural gas that is encountered during drilling and production, it is possible this flare would be visible from some distance away at night. However, it is considered a minimal impact because any direct line of sight is likely to be blocked by the surrounding forest.

Based on the forested vegetation surrounding the well pad providing visual screening (**Appendix F, Figure F-4**); the temporary drill rig presence and limited visibility; the fact that the access road is an existing feature that is being upgraded and not built new; and implementation of the stipulations and

applicant-committed design features, the White Pine Alternative would meet its existing SIO of Moderate, which allows changes to the landscape that are noticeable but not dominant.

### **3.6.6 Cumulative Effects**

The viewsheds within which both the Tendoy and White Pine Alternatives have been altered by the construction and maintenance of road and residences and by other activities such as timber harvest or grazing (changes to vegetative communities). There are few other anthropogenic disturbances (either past, present, or reasonably foreseeable) that are planned in areas that are in the vicinity of either of the action alternatives. Either alternative would have a small but not negligible impact on visual resources. Therefore, the additional impact that would be experienced with either alternative would not result in a substantial incremental contribution to a cumulative impact.

## **3.7 Recreation**

Recreation occurs mostly in the summer and is semi-primitive with natural appearing scenery. The Continental Divide National Scenic Trail is located approximately 7.5 miles from the White Pine well pad location. East Creek Campground is located approximately 5.8 miles from the well pad location. An area of winter non-motorized allocations is located southeast and southwest of the alternative sites to provide secure winter habitat for big game. It is assumed that potential impacts such as increases in traffic and noise, changes to the visual integrity of the landscape, and displacement of wildlife, could affect recreation. Therefore, a larger analysis area than just the immediate vicinity of the project is warranted. The metric used to analyze the effects of the proposed action to recreation is:

- The qualitative evaluation of the impacts of the proposed alternatives to hunting, fishing, cycling, dispersed camping, and other recreational activities.

### **3.7.1 Recreation Existing Conditions**

Based on scoping comments and anecdotal information, hunting is the most popular recreational activity in both Big and Little Sheep Creek watersheds. A review of MFWP elk harvest data from 2015 indicated that the two EMUs encompassing the project area had a combined 2,600 hunters that spent a total of 15,539 days in the field to harvest 820 elk. Data from 2013 indicated that, within the two deer management units, a combined 584 hunters spent a total of 3,739 days in the field to harvest 184 mule deer. Fishing, camping, and sight-seeing are also recreational uses known to take place within the analysis area. Big Sheep Creek is a popular sport fishery providing an average of 1,138 angler use days of fishing (MFWP, 2013).

Big Sheep Creek Road is designated by BLM as a Backcountry Byway. Backcountry Byways are a designation system for “low standard roads and trails that pass through areas of public lands that have high scenic or public interest value” (BLM, 1993). The Big Sheep Creek Backcountry Byway is popular with touring cyclists.

The Continental Divide National Scenic Trail crosses Forest Service land approximately 7 miles south of the project area. The trail is managed to provide high-quality scenic, primitive hiking and horseback riding opportunities and to conserve natural, historic, and cultural resources.

While bird-watching and solitude-seeking are commonly believed to be recreational uses that take place in the area, no data exists on the extent to which these activities occur. Anecdotal evidence from agency staff indicates that it is rare for these activities to occur in the vicinity of either well pad location.

The MFWP CAPS tool provides a ranking of areas with species of economic and recreational importance (SERI). These areas are defined as “meeting the biological requirements and objectives of fish and wildlife species regulated by harvest such as important breeding areas or winter concentration areas” (MFWP, 2015). The CAPS analysis used terrestrial game quality data and game fish quality data to determine areas with priority levels ranging from 1 to 4 (depicted as 1 square mile hexagons). Terrestrial game quality data used in the CAPS analysis includes 12 native game species categorized into four functional groups: big game, bighorn sheep and mountain goat, prairie grouse, and forest carnivores. The game fish quality data used in the CAPS analysis depicts the relative quality of 46 cold and warm water game fish populations available to anglers in Montana. Priority levels are defined in **Table 3-11**.

**Table 3-11: Species of Economic and Recreational Importance Priority Level Definitions**

| <b>Priority Level</b> | <b>Definition</b>   |
|-----------------------|---|
| 1                     | Hexagons with Terrestrial Game Quality values > 71% OR Game Fish Quality values in the top 3% of waterbodies with sport fish.                     |
| 2                     | Hexagons with Terrestrial Game Quality values of 48-71% OR Game Fish Quality values in the 90-97th percentile of all waterbodies with sport fish. |
| 3                     | Hexagons with Terrestrial Game Quality values of 26-48% OR Game Fish Quality values in the 75-90th percentile of all waterbodies with sport fish. |
| 4                     | Hexagons with Terrestrial Game Quality values of <26% OR Game Fish Quality values in the lowest 75% of all waterbodies with sport fish.           |

Source: MFWP, 2015

The project vicinity has priority levels 1 through 4. A small area of priority level 1 area is located northeast of the alternative sites that parallels the west side of I-15 approximately 1.3 miles west of the interstate. This level 1 area extends from north of Big Sheep Creek Road to the southeast to the east side of Little Sheep Creek Road. The area in the immediate vicinity of the Alternatives, and the project access road is level 2 through 4. Big Sheep Creek is primarily within a level 2 area. Little Sheep Creek crosses all four levels but is primarily within levels 1, 2, and 3. South and west-northwest of the project is level 3 area. Farther south and west of the project are level 4 areas. The Tendoy Alternative Site is within a level 2 area. Its access roads cross level 2 and 3 areas. The White Pine Alternative Site and its access road are completely within level 3 areas.

### **3.7.2 Environmental Consequences**

#### **3.7.3 No Action Alternative**

Under the No Action alternative, no new project-related effects to recreational resources would occur. The existing recreational resources within the project area would remain as they are currently.

#### **3.7.4 Tendoy and White Pine Comparison**

The potential for impacts to recreation from the project were mentioned by several commenters during scoping. The mechanisms by which recreation could potentially be impacted by this project are as presented in **Table 3-12**.

**Table 3-12: Potential Mechanisms for Impacts to Recreation**

| Potential Mechanism for Impact   | Description   | Anticipated Degree of Impact Tendoy   | Anticipated Degree of Impact White Pine   | Difference in Potential Impacts of Action Alternatives  |
|--|---|---|---|---|
| Indirect impact to hunters due to negative impacts on big game herds                   | Activities (i.e., truck traffic and drilling equipment operation) would likely cause negative impacts on big game (both winter range and spring/summer).  | Tendoy Alternative poses the biggest risk to big game through impacts on critical winter range areas.   | The White Pine Alternative may also have impacts on big game but with less acute risk through impacts in spring and summer range.   | No difference in impacts for each alternative   |
| Direct impacts to hunters due to traffic or reduction in quality of hunting experience | The highest volumes of truck traffic are during drill rig mobilization and demobilization. Timing restrictions on activities are as stipulated in the COAs. The project-related truck traffic that occurs during hunting season will be minimal and is not anticipated to have an appreciable impact on hunters or other fall recreationists. | <p>More recreation traffic on Big Sheep Creek Road.</p> <p>Truck traffic during production (the only activities to occur during the hunting season) is relatively small in volume (2 to 4 round trips per day),</p>   | <p>Less recreation traffic on Little Sheep Creek Road</p> <p>Truck traffic during production (the only activities to occur during the hunting season) is relatively small in volume (2 to 4 round trips per day),</p>   | <p>No difference in impacts for each alternative</p> <p>No measurable negative impacts to hunters.</p>                |
| Direct impact to fisherman due to truck traffic.                                       | This impact mechanism would occur only on the main roads up Big Sheep Creek and Little Sheep Creek. The impact would be due to a reduction in the quality of the experience due to increased truck traffic.   | <p>The highest volume of truck traffic would occur during mobilization and demobilization of the drill rig.</p> <p>Truck traffic during production would not be of a volume that would have a noticeable impact on a recreational fisherman (2 to 4 round trips per day).</p> | <p>Highest volume of truck traffic would occur during mobilization and demobilization of the drill rig.</p> <p>Truck traffic during production would not be of a volume that would have a noticeable impact on a recreational fisherman (2 to 4 round trips per day).</p> | <p>No difference in impacts for each alternative.</p> <p>No measureable negative impacts to recreational fishing.</p> |

| Potential Mechanism for Impact  | Description  | Anticipated Degree of Impact Tendoy   | Anticipated Degree of Impact White Pine   | Difference in Potential Impacts of Action Alternatives  |
|---|--|---|---|---|
| Indirect impact to fisherman due to changes in water quality.                       | If fish are impacted, then fisherman are impacted. The results of the road sediment assessment (Appendix D) indicate that water quality will be improved through either action alternative. Therefore, the impact on fisheries will be positive. | <p>Sediment load in Big Sheep Creek is anticipated to be 10.49% less than the assessed baseline (See Appendix D) after road improvements and upgrades.</p> <p>Big Sheep Creek frequently receives recreational fisherman and therefore an improvement in water quality due to reduction in sediment may be highly valued.</p>   | <p>Sediment load in Little Sheep Creek is anticipated to be 48.55% less than the assessed baseline (see Appendix D) after road improvements and upgrades.</p> <p>Although recreational fisherman utilize Little Sheep Creek less frequently than Big Sheep Creek an improvement in water quality due to reduction in sediment may be highly valued.</p>   | <p>The White Pine alternative will see a greater beneficial effect to water quality because of the reduction of sediment load (48.55%) to the stream.</p> <p>The Tendoy alternative will also see a beneficial effect, but the sediment load reduction will not be as great (10.49%)</p> <p>No measureable negative impacts to recreational fishing.</p>  |
| Direct impact to dispersed camping through truck traffic, noise, or visual impacts. | The truck traffic and equipment operation associated with action alternatives could be disturbing to campers at dispersed campsites.   | <p>Large volumes of truck traffic associated with mobilization and demobilization is expected to be only 10 days for each.</p> <p>Operational truck traffic is expected to be 2 to 4 round trips per day.</p> <p>Noise levels equipment would conform to regulation . Well drilling is expected to cause the largest disturbance to recreational campers due to noise and visual impacts, and is expected to last only 14 days.</p> | <p>Large volumes of truck traffic associated with mobilization and demobilization is expected to be only 10 days for each.</p> <p>Operational truck traffic is expected to be 2 to 4 round trips per day.</p> <p>Noise levels equipment would conform to regulation . Well drilling is expected to cause the largest disturbance to recreational campers due to noise and visual impacts, and is expected to last only 14 days.</p> | <p>There are no differences in impacts for each alternative.</p> <p>There could be measureable negative impacts to dispersed camping during the Construction, Rig mobilization, Drilling, Rig demobilization, and completion phases of the well.</p> <p>There are other camping opportunities elsewhere in both Little and Big Sheep Creek drainages which may enable campers to relocate during these stages thereby reducing the potential negative effects to dispersed camping.</p> |

| Potential Mechanism for Impact                                | Description  | Anticipated Degree of Impact Tendency  | Anticipated Degree of Impact White Pine  | Difference in Potential Impacts of Action Alternatives  |
|---|--|--|--|---|
| Direct impact to hikers, birdwatchers, solitude-seekers, etc. | Anecdotal evidence from agency staff and other local residents indicates that the areas associated with the two well pad locations are only rarely used by hikers, birdwatchers, and solitude-seekers. Scoping comments have mentioned that certain users value the naturalness of the landscape in this region very highly. The presence of the proposed equipment during drilling stage could cause a negative impact on the experience of these users for approximately 30 to 45 days. During production stage, the equipment and activities would be largely unnoticeable except to any user that was very close to the sites. | <p>Small anticipated impacts during production due to lower levels of noise and negligible visual impacts.</p> <p>Greater impacts during drilling but for a short duration of time (approximately 2 months).</p> | <p>Small anticipated impacts during production due to lower levels of noise and negligible visual impacts.</p> <p>Greater impacts during drilling but for a short duration of time (approximately 2 months).</p> | <p>No difference in impacts for each alternative.</p> <p>There could be measureable negative impacts hikers, birdwatchers, solitude seekers, etc. during the Construction, Rig mobilization, Drilling, Rig demobilization, and completion phases of the well because of noise and visual effects.</p> <p>Potential impacts during the production phase could be visual effects as a well pad and production equipment will be present.</p> <p>There are other opportunities elsewhere in both Little and Big Sheep Creek drainages which may enable hikers, birdwatchers, and solitude seekers to relocate during these stages thereby reducing the potential negative effects to these activities.</p> |

| Potential Mechanism for Impact     | Description  | Anticipated Degree of Impact Tendency   | Anticipated Degree of Impact White Pine   | Difference in Potential Impacts of Action Alternatives  |
|------------------------------------|--|---|---|---|
| Direct impact to cycle tour groups | The truck traffic and equipment operation associated with action alternatives presents safety risk to cyclists by sharing the small roads with commercial truck traffic. | <p>Large volumes of truck traffic associated with mobilization and demobilization is expected to be only 10 days for each.</p> <p>Operational truck traffic is expected to be 2 to 4 round trips per day.</p> <p>Noise levels equipment would conform to regulation</p> | <p>Large volumes of truck traffic associated with mobilization and demobilization is expected to be only 10 days for each.</p> <p>Operational truck traffic is expected to be 2 to 4 round trips per day.</p> <p>Noise levels equipment would conform to regulation .</p> | <p>No difference in impacts for each alternative.</p> <p>Operator committed measures #4, #11, and the mitigation measures outlined in section 3.1.2 (Public Safety) will be applied to help negate any potential negative impacts to cycle tour groups.</p> |

### **3.7.5 Cumulative Effects**

Existing development in the project area, such as roads, residences, and farming, has likely impacted big game and big game habitat through habitat fragmentation and removal. The project has the potential to cumulatively contribute impacts to big game through the construction of the well pad, removal of habitat, and construction of roads and upgraded roads. This would also mean that the project has the potential to contribute cumulatively to recreation impacts by impacting big game, which draw hunters and visitors to the area. The project also has the potential to contribute to existing traffic through construction and maintenance of the well pad and associated facilities.

Truck traffic may also impact recreationists in both direct and indirect ways. However, the only period of time that this would be measurable is during the short periods of time (fewer than 2 months) where the drill rig is being mobilized and demobilized and the drilling is occurring. Thus, additional project-related truck traffic would not be anticipated to contribute to a cumulative impact on recreation.



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