

Environmental Assessment for the Richardson Operating Company Bison Basin Development and West Bison Basin Water Flooding Project

June 2012

BLM



FINDING OF NO SIGNIFICANT IMPACT

Environmental Assessment: WY-050-EA12-15

Richardson Operating Company

Bison Basin Development and West Bison Basin Water Flooding Project

BLM Federal Oil and Gas Leases WYE-020172, WYE-022203,

WYW-174072, WYW-174294, WYW-175668

Sections 9, 17, 18, 20, Township 27 North, Range 95 West

Finding of No Significant Impacts:

Based on my review of the analysis of the potential environmental impacts of the Bison Basin Development and West Bison Basin Water Flooding Project Environmental Assessment (EA), I have determined that the Proposed Action is in conformance with the approved land use plan, and will not have any significant impact on the human, natural and physical environment. Therefore, an environmental impact statement is not required.

The EA shows that adverse impacts to the surface ownership/land use and grazing; socioeconomics/environmental justice; cultural/paleontological resources and Native American religious concerns; soils/watershed; water resource; air quality; vegetation/wetland/noxious weeds; wildlife/fisheries; threatened, endangered, candidate, and special status species; wild horses; visual resources; transportation; and from the use of hazardous materials will all be mitigable impacts. Potentially, substantial positive economic impacts could result for the operator, and local, state, and federal, governments.

The Lander Resource Management Plan (LRMP) provides for the use of these public lands for this type of drilling and natural gas exploration. The Proposed Action will be in conformance with these land use plans, and no amendments to the LRMP will be necessary to implement the Proposed Action

Field Manager, Lander Field Office, Richard Vander Voet
Attachment: EA No. WY-050-EA12-15

Date

DECISION RECORD

Environmental Assessment: WY-050-EA12-15
Richardson Operating Company
Bison Basin Development and West Bison Basin Water Flooding Project
BLM Federal Oil and Gas Leases WYE-020172, WYE-022203,
WYW-174072, WYW-174294 and WYW-175668
Sections 9, 17, 18, 20, Township 27 North, Range 95 West

Introduction:

Richardson Operating Company (Richardson) filed ten Applications for Permit to Drill (APD) and one Sundry Notice with the Bureau of Land Management, Lander Field Office. The Sundry Notice for the Fathead No. 18-22-01 production facility was filed on October 11th, 2011. APD documents were filed on November 28th, 2011 for the Fathead Federal Injector Wells Nos. 1 through 5, Fathead Federal No. 11 Well, and North Bison Basin Well No. 1-9, and on December 27th, 2011 for Bison Basin Fatback Well Nos. 73, 78, and 80. The specific proposal is to drill and install associated facilities for these wells located in Sections 9, 17, 18, 20, Township 27 North, Range 95 West, on BLM Federal oil and gas leases WYE-020172, WYE-022203, WYW-174072, WYW-174294 WYW-175668 and Right-of-Way WYW-168240. The Sundry Notice and APD documents include proposals to construct access roads, utility lines and pipelines, which will be tied into existing oil field facilities.

Decision:

It is my decision to authorize the Sundry Notice, APD documents and Right-of-Way application submitted by Richardson for the Fathead No. 18-22-01 facility expansion, Fathead Federal Injector Wells Nos. 1 through 5, Fathead Federal No. 11, Bison Basin Fatback Wells Nos. 73, 78, 80, and North Bison Basin Well No. 1-9. The wells and facilities are located on Federal Oil and Gas Leases WYE-020172, WYE-022203, WYW-174072, WYW-174294 and WYW-175668. The wells are administered by the Lander Field Office, State of Wyoming. Design features and procedures are included in the EA, Sundry Notice, APD documents, and Conditions of Approval (COA).

Rationale for Decision:

The decision to approve the Proposed Action is based on the following: 1) consistency with resource management plan and land use plan; 2) national policy; 3) agency statutory requirements; 4) relevant resource and economic issues; 5) application of measures to avoid or minimize environmental impacts; 6) finding of no significant impact; and 7) public comments.

1. Consistency with Resource Management Plan and Land Use Plan

Current policies for development and land use decisions within this area are contained in the *Lander Resource Area Resource Management Plan (RMP) EIS* (BLM 1986) and the *Lander Resource Area RMP Record of Decision (ROD)* [BLM 1987]. The RMP states, "In areas of moderate, low and no potential for occurrence of oil and gas, this plan will allow for enhanced management of the surface resources, while providing opportunities for exploration and development of the oil and gas. Conversely, in areas of high potential for the occurrence of oil and gas or in areas of established production such as Known Geologic Structures (KGS), this

plan will allow for enhanced management of exploration and development activities by minimizing the restriction imposed on these activities."

2. National Policy

The Bison Basin Unit Development and West Bison Basin Water Flooding Project is a private exploration and development operation of federal oil and gas leases, which is an integral part of the BLM oil and gas leasing program under the authority of Mineral Leasing Act of 1920, as amended, and the Federal Land Policy and Management Act of 1976, as amended. The United States continues to rely heavily on foreign energy sources. Oil and gas leasing is needed to encourage development of domestic oil and gas reserves to reduce the United States' dependence of foreign energy supplies. The BLM oil and gas program is designed to encourage such development. Therefore, the decision is consistent with national policy.

3. Agency Statutory Requirements

The decision is consistent with all federal, state, and county authorizing actions required to implement as the Proposed Action. All pertinent statutory requirements applicable to this proposal were considered including informal consultation and formal conferencing with the U.S. Fish and Wildlife Service (USFWS). Cultural surveys and compliance with Section 106 of the National Historic Preservation Act will be completed prior to approval of permits for individual components.

4. Relevant Resource and Economic Issues

Potential environmental impacts from the Bison Basin Development and West Bison Basin Water Flooding Project proposal to surface and sub-surface resources identified in the Environmental Assessment are all deemed acceptable with mitigation. The economic benefits derived from the implementation of the Proposed Action in the form of continuing employment opportunities, equipment, services, and potential revenues should production occur are considered important.

5. Application of Measures to Avoid or Minimize Environmental Impacts

Federal environmental protection laws, such as the Clean Air Act, and the National Historic Preservation Act, apply to all lands and are included as part of the standard oil and gas lease terms and the terms and conditions of the APD and Sundry Notice documents. The adoption of measures identified in Chapter 2.0 and 4.0 of the West Bison Basin Water Flooding Project EA provides practicable means to avoid or minimize potential environmental impacts. Should conditions warrant, additional, measures could be applied to individual permits subject to additional analysis.

6. Finding of No Significant Impact

Based upon the analysis contained in the Environmental Assessment for the Bison Basin Development and West Bison Basin Water Flooding Project, along with the implementation of the protection measures, I have determined that the proposed action will not cause any significant impacts on the human, natural, and physical environment. Therefore, an environmental impact statement is not required.

7. Opportunity for Public Involvement

Scoping is an important part of the National Environmental Policy Act (NEPA) process and is used to determine the scope of issues to be addressed and for identifying the key issues related to a proposed action (40 CFR 1500.7). The scoping process can involve federal, state, and local government agencies, resource specialists, industry representatives, local interest groups, and members of the public. Scoping is an interdisciplinary process.

The Notices of Staking for Fathead Federal Injection Wells Nos. 1 through 5, Fathead Federal No. 11 and North Bison Basin No. 1-9 were received by the Lander Field Office on April 29th, 2011. In accordance with 43 CFR 3162.3-1 (g), the notices were made available to the public for comment for 30 days ending May 29th, 2011. The Notices of Staking for Fatback Federal Wells Nos. 73, 78 and 80 were received by the Lander Field Office on October 13th, 2011. In accordance with 43 CFR 3162.3-1 (g), the notices were made available to the public for comment for 30 days ending November 12th, 2011. There were no issues raised by the public during this review. It was determined that the nature of the action is routine and that a public notice session will not be necessary. Staff specialists reviewed the proposal and identified impacts and appropriate mitigation measures. The application was considered technically and administratively complete on June 30th, 2012.

8. Compliance and Monitoring:

Monitoring will be done by the area Natural Resource Specialist, Surface Compliance Technician, and Petroleum Engineering Technicians to ensure compliance with this authorization.

9. Appeals:

Under BLM regulations, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, Wyoming 82003, no later than 20 business days after this Decision Record is received or considered to have been received. Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Field Manager, Lander Field Office, Richard Vander Voet
Attachment: EA No. WY-050-EA12-15

Date

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Lander Field Office**

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BLM Federal Oil and Gas Leases WYE-020172, WYE-022203, WYW-174072,
WYW-174294, WYW-175668
Sections 9, 17, 18, 20, Township 27 North, Range 95 West

NUMBER: WY-050-EA12-15

CASEFILE/PROJECT NUMBER: WYW 109426X, WYW 180407X

PROJECT NAME: Richardson Operating Company Bison Basin Development and West
Bison Basin Water Flooding Project

LEGAL DESCRIPTION: Sections 9, 17, 18, 20, Township 27 North, Range 95 West

APPLICANT: Richardson Operating Company

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1.0 Purpose and Need for Action

1.1 Introduction:

This environmental assessment (EA) has been prepared to analyze and disclose the environmental consequences of the Richardson Operating Company Bison Basin Unit Development and West Bison Basin Water Flooding Project as Proposed by Richardson Operating Company (Richardson). The EA is a site specific analysis of potential impacts that could result with the implementation of a proposed action or alternatives to the proposed action. The EA assists the BLM in project planning and ensuring compliance with the National Environmental Policy Act (NEPA), and in making a determination as to whether any “significant” impacts could result from the analyzed actions. “Significance” is defined by NEPA and is found in regulation 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an Environmental Impact Statement (EIS) or a statement of “Finding of No Significant impacts” (FONSI). If the decision maker determines that this project has “significant” impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a Decision Record (DR) may be signed for the EA approving the selected alternative, whether the proposed action or another alternative. A DR, including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts.

1.2 Project Area Description:

Richardson Operating Company (Richardson) filed ten Applications for Permit to Drill (APD) and one Sundry Notice with the Bureau of Land Management, Lander Field Office. The Sundry Notice for the 18-22-01 facility expansion was filed on October 11th, 2011. APD documents were filed on November 28th, 2011 for the Fathead Federal Injector Wells Nos. 1 through 5, Fathead Federal Well No. 11, and North Bison Basin Well No. 1-9 ; and on December 27th, 2011 for Bison Basin Fatbacks Well Nos. 73, 78, and 80. The specific proposal is to drill and install associated facilities for these wells located in Sections 9, 17, 18, 20, Township 27 North, Range 95 West, on BLM Federal oil and gas leases WYE-020172, WYE-022203, WYW-174072, WYW-174294, and WYW-175668. The Sundry Notice and APD documents include proposals to construct access roads and pipelines, which will be tied into existing oil field facilities.

The proposed project area is in the Bison Basin, approximately 20 miles south of Sweetwater Station, in Sections 9, 17, 18, 20, Township 27 North, Range 95 West, 6th P.M., Fremont County, Wyoming. The production facility and proposed wells are located on Federal mineral and surface estate, and administered by the Bureau of Land Management Lander Field Office, located in Lander, Wyoming.

1.3 Purpose of the Proposed Action:

The purpose of this proposed action is for BLM to process the requests (APD and Sundry Notice) for Richardson (as operator) to explore and develop the oil and gas reserves within Federal mineral leases WYE-020172, WYE-022203, WYW-174072, WYW-174294, and WYW-175668; to fulfill the valid and existing oil and gas leases; and provide for the sale of developed minerals. Specifically, 43 CFR3101.1-2 states, “The lessee shall have the right to use so much of the leased land that is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource in a leasehold...” Consistent with these rights, the lessee has filed APD to develop the wells listed above. Any hydrocarbons products derived from this action will help meet the public’s demand for the product.

1.4 Need for the Proposed Action:

The need for action is reflected in BLM’s role in permitting of exploration and development of federal oil and gas leases by private industry, including transport and delivery of produced oil and gas. The requirement to act in consideration of an APD is an integral part of the BLM’s oil and gas program under authority of the Mineral Leasing Act of 1920 as amended; the Mining and Minerals Policy Act of 1970; the Federal Land Policy and Management Act of 1976; the National Materials and Minerals Policy, Research and Development Act of 1980; and the Federal Onshore Oil and Gas Leasing Reform Act of 1987.

1.5 Conformance to BLM Land Use Plan(s):

The Proposed Action is subject to the Lander Resource Management Plan (RMP), approved on June 9, 1987. The Lander Field Office as required by 43 CFR 1610.5, has determined that the Proposed Action conforms to the decisions, guidelines, terms and conditions as described in the Final Environmental Impact Statement and Record of Decision of the Lander RMP.

1.6 Relationship to Other Statutes, Regulations or Plans:

This Environmental Assessment is being prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended. The authority for the APD is the Mineral Leasing Act of 1920 as amended and supplemented (30 U.S.C. 181 et seq.), and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The APD and Sundry Notice have been submitted in conformance to Department of the Interior and Bureau of Land Management (BLM) regulations.

1.7 Identification of Issues and Resources:

BLM is directed by guidance, statute, or regulation to describe the environment of area(s) to be affected or created by alternatives under consideration. CEQ regulations direct BLM to concentrate effort on attention on important issues, especially the presence or absence of the potentially significant resources presented in Table 1. All areas presented in Table 1 were considered but many were not determined pertinent to the proposed action or affected to a degree of any importance, and therefore were not carried forward for further analysis. If particular resources are not affected beyond minimal amount, or if the resource is not present, there will be no further discussion of the resources in the affected Environment (Chapter 3), or in any of the subsequent impact analysis. The discussion of these environmental impacts is therefore restricted to topics related to resources which are affected and carried forward for analysis.

Table 1: Potentially Significant Resources

Resource	Guidance or authority
Floodplains	EO 11998; 10 CFR 1022
Wetlands	EO 11990; 10 CFR 1022, CEQ 1508.27(b)(3)
Threatened, endangered, or candidate species and/or their critical habitat, and other special status (e. g., state-listed) species	CEQ 1508.27(b)(9)
Prime or unique farmland	7 USC 4201; CEQ 1508.27(b)(3)
State or national parks, forests, conservation areas, or other areas of recreational, ecological, scenic, or aesthetic importance	CEQ 1508.27(b)(3)
Wild and Scenic Rivers	16 USC 1271; CEQ 1508.27(b)(3)
Natural resources (e.g., vegetation, rangeland, soils, minerals, fish, wildlife, water bodies)	CEQ 1508.8
Coastal Zone areas	16 USC 1451 et seq.
Property of historic, archeological, or architectural significance (including sites on or eligible for the National Register of Historic Places and the National Registry of Natural Landmarks)	EO 11593; CEQ 1508.27(b)(3)(8)
Native American Concerns	EO 13007
Minority and low-income populations (including a description of their use and consumption of environmental resources)	EO 12898

1.7.1 Identified Relevant Issues and Resources

1.7.1.1 Climate, Climate Change & Air Quality –

Potential effects to climate and climate change have been identified in an Instruction Memorandum No. 2008-171 to include analysis of climate change in EA's. Potential temporary (30 to 45 days) impacts to air quality during the project drilling and construction related activities and long-term (20+ years) impacts for the duration of each well's operating life were identified.

1.7.1.2 Cultural and Paleontological Resources –

Potential for Cultural and Paleontological Resources such as vertebrate fossils and scientifically important invertebrate fossils is present in the project area which could be impacted by direct disturbance associated with drilling and construction activities.

1.7.1.3 Wildlife Including BLM Wyoming Sensitive and Special Status Species –

Potential habitat for BLM Wyoming Sensitive Species Raptors and Ferruginous Hawks may occur in the project area. In addition, the project area lies completely within BLM Wyoming designated Greater Sage-Grouse Core Area.

1.7.1.4 Soils –

Potential loss of soil stability and fertility and increase in soil compaction could exist from soil disturbance activities and heavy truck and equipment activities in the project area.

1.7.1.5 Vegetation including BLM Wyoming Sensitive and Noxious/Invasive Plants –

Potential loss of vegetative cover and ecological diversity, and increase in noxious/invasive plants in the project area could be caused by direct impacts from construction activities and indirect establishment of noxious/invasive plants from seed sources by vehicles traveling to and from project sites.

The BLM Wildlife Biologist identified potential habitat in the project area for BLM Wyoming Sensitive Species Cedar Rim Thistle and Beaver Rim Phlox.

1.7.2 Resources Considered but Eliminated from Further Analysis

1.7.2.1 Floodplains –

No Floodplains were observed or identified in the project Area.

1.7.2.2 Prime or Unique Farmlands –

No Prime or Unique Farmlands were observed or identified in the project Area.

1.7.2.3 Wild and Scenic Rivers –

No Wild and Scenic Rivers were observed or identified in the project Area.

1.7.2.4 Coastal Zone Areas –

No Coastal Zone Areas were observed or identified in the project Area.

1.7.2.5 Minority and low-income Populations –

No determination was made regarding the minority and low-income populations of this action. The project area is located in an unpopulated area.

1.7.2.6 State, or Natural Parks, Forests, Conservation Areas, or other Areas of Recreational, Ecological, Scenic, or Aesthetic Importance –

No areas relating to these criteria were observed or identified in the project Area.

1.7.2.7 Vegetative Resource Threatened and Endangered Species –

BLM Wildlife Biologist conducted a Plant clearance of the project area and determined that no Threatened, Endangered, or listed species or habitats are present in the project area.

1.7.2.8 Rangeland Resources –

A rangeland resource clearance was conducted by a BLM Rangeland Management Specialist. It was determined that no impacts would occur to rangeland facilities or to grazing activities by this action.

1.7.2.9 Socioeconomics –

No determination was made regarding the socioeconomics of this action. A Wyoming State Treasurer's report indicated federal mineral royalty distribution to local and state governments exists, but there is not scientific analysis that can project how this will have either a beneficial or adverse impact to the local state, or federal communities or governments.

1.7.2.10 Visual Resources –

The project area occurs in a Visual Resource Management Class IV designation. The objective of Class IV designation is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

1.7.2.11 Geology –

No special Geological Areas or concerns were observed or identified in the project area.

1.7.2.12 Wetlands –

No wetlands were observed or identified in the project area.

1.7.2.13 Water Quality (Ground and Surface) -

Groundwater: Richardson received an Aquifer Exemption for the West Bison Basin Unit Nugget Formation from the Wyoming Oil and Gas Conservation Commission on October 26th, 2011. The regional static depth to groundwater ranges from 100 to 500 feet in this area (Mason and Miller, 2005). Given the depth to groundwater, the potential for groundwater contamination from this action is not anticipated due to spills or potential seepage from the reserve pits.

Drilling may penetrate several water bearing zones, and fresh water will be expected in the surface sediments. There will be a potential to contaminate aquifers due to equipment failures, high-pressure zone blowouts, or if standard operating procedures are not followed. Casings may develop leaks or, if not plugged properly, contaminants could move and commingle with other aquifers or groundwater. To lesson any potential impacts, the BLM Petroleum Engineer and Geologist will review the proposed Drilling Programs submitted by the operator to ensure that casing and cementing designs meet or exceed standard safety factors. Any sub-surface water will be protected with special casing and cementing designs. Operations will be monitored and inspected during the drilling process and throughout the duration of each well's operating life. Any additional activities such as re-completions or plugging are similarly designed and reviewed to protect groundwater resources.

Surface Water: The closest source of surface water is West Alkali Creek, approximately 1.5 miles northwest of the proposed project area. Mitigation in the form of erosion control structures will be installed to prevent the movement of sediment off the well sites, drainages, or roadways. As the nearest surface water is approximately 1.5 miles from the project area, no erosion, sedimentation or contaminants will be expected to reach this surface water due to the distance, topography, and soil characteristics.

North Platte River Depletion: In 1997, Colorado, Wyoming, Nebraska and the Department of the Interior formed a partnership with the goal of developing a shared approach for managing the Platte River Basin. Production water will be used for drilling operations, and any fresh water needed for cementing will be provided from a private water well by M-I Swaco in Riverton, Wyoming, which is not located in the North Platte River Basin. Therefore, the proposed action is not expected to deplete or impair water in the North Platte River System.

1.7.2.14 Wildlife Threatened and Endangered Species, and some Special Status Species-

The BLM Wildlife Biologist determined that no habitat for Threatened and Endangered Species occurs in the project area.

BLM Wyoming Sensitive Species that may be present in the project area include sagebrush obligate species (i.e. Sage Thrasher, Loggerhead Shrike, Sage Sparrow, Brewer's Sparrow and

Pygmy Rabbit). The design features, stipulations and mitigation measures applied for the protection of Greater Sage-Grouse will provide sufficient protection for and prevent significant impacts to these species. Pygmy Rabbits have a relatively small home range compared to other Special Status species, but there are no known home ranges that will be impacted.

Potential habitat for BLM Wyoming Sensitive Species White-tailed Prairie Dogs exists in the project area. However, the proposed action will not result in any disturbance to active Prairie Dog Towns.

Federal Oil and Gas Leases WYW 174294, WYW 174072 and WYW 175668 have a stipulation for protecting Mountain Plover habitat. However, the project area does not contain suitable or designated habitat for Mountain Plover. Therefore, the stipulation is not being applied.

1.8 - Decision:

The decision to be made is whether to approve or reject Richardson's Sundry Notice and APD documents for the Fathead No. 18-22-01 facility expansion, Fathead Federal Injector Wells Nos. 1 through 5, Fathead Federal Well No. 11, Bison Basin Fatback Well Nos. 73, 78, 80, and North Bison Basin Well No. 1-9 well sites, access roads and associated infrastructure. Design features and procedures are included in the EA, Sundry Notice, APD and Conditions of Approval (COA).

1.9 Remarks:

On May 17th, 2011, onsite field examinations were held for the wells and facilities associated with the 18-22-01 facility, Federal Injectors Well Nos. 1 through 5, Fathead Federal Well No. 11, and North Bison Basin Well No. 1-9. The examinations were attended by Chris Krassin (BLM), Josh Axelson, (Richardson), Tom Bergin (Richardson), and David Richardson Jr. (Richardson). On November 17th, 2011, onsite field examinations were held for the wells and facilities associated with Bison Basin Fatback Wells Nos. 73, 78 and 80. The examinations were attended by Chris Krassin (BLM), Andrew Gibbs (BLM), Laura Lozier (BLM), Jonathan Tatlock (BLM), Josh Axelson (Richardson), and Tom Bergin (Richardson). Surface Use and Drilling Conditions of Approval (COA) are attached to the APD as part of this approval along with the General COA as directed by Wyoming State IM No. 94-052 dated Feb. 7th, 1994. Their combined contents will mitigate the potential impacts associated with the activities of the proposed action. As directed by WO IM No. 2004-194, should the permits be approved, all applicable Best Management Practices (BMP) will be incorporated into the proposed actions, and/or will be included in the BLM applied COA.

2.0 Description of Alternatives, Including Proposed Action

2.1 Introduction:

Chapter 2 describes in detail the Proposed Action and alternatives, and compares the alternatives in terms of the environmental impacts as identified in Section 1.8, Identification of Issues. The proposed action is to expand the Fathead No. 18-22-01 facility, drill Fathead Federal Injector Wells Nos. 1 through 5, Fathead Federal Well No. 11, Bison Basin Fatback Wells Nos. 73, 78, 80, and North Bison Basin Well No. 1-9 to explore, and if successful, develop oil and gas resources in a Federal Oil and Gas Lease. BLM under the MLA, must allow for the exploration and development of these resources, but would authorize use of the Federal surface and mineral resources to minimize, reduce, and avoid impacts.

Design Features, as presented in Section 2.2.1.1, have been incorporated into the Proposed Action by Richardson and were agreed upon with BLM during the onsite discussion. In addition, the Design Features may include standard operating procedures, Conditions of Approval, Stipulations, and all applicable Federal, State and local laws, regulations, Onshore Oil and Gas Orders, and Instruction Memorandums, Management Decision of the Lander RMP.

2.2 Description of Alternatives, Including the Proposed Action and No Action:

2.2.1 Alternative A- No Action:

The No Action alternative provides a baseline for comparison of the alternatives. This alternative describes the existing conditions and the continuing trends. If this alternative was selected, it involves denial of the operator's Sundry Notice and APD. The lessee will not be able to fulfill their valid leases to produce hydrocarbon products to meet the public's demand. The wells will not be drilled under the submitted APD. Also under this alternative, the well pads, pipelines and access roads will not be constructed. In addition, 12.3 acres of new surface disturbance associated with construction and drilling activities would not occur under the No Action alternative. No additional production facilities will be necessary. The proposed project area would not be disturbed, requiring no reclamation of the site associated with the project.

The No Action alternative would result in existing conditions of oil and gas production in the Bison Basin Unit and West Bison Basin Units. The best available data (Wyoming Oil and Gas Conservation Commission, 2012) indicate that there are currently 73 existing wells within the Bison Basin Unit, and one well in the West Bison Basin Unit. The West Bison Basin Unit also contains the 18-22-01 production facility, and the Bison Basin Unit is an established oil and gas field with an extensive network of roads, pipelines and power lines. The No Action Alternative would result in the existing level of oil and gas production in the area to continue.

2.2.2 Alternative B- Proposed Action:

Description of Proposed Action

The proposed action will include well pads, access roads, pipelines, and underground utility lines for the wells (Exhibit "A"). Total new temporary (30 to 45 days) disturbance from construction of this action will be approximately 12.3 acres. Upon completion of drilling and interim reclamation, it is estimated that approximately 8.0 acres of disturbance will remain for the duration of each well's operating life (20+ years).

The proposed wells will be vertically drilled. The primary objective for Fathead Well No. 11 and the five injection wells will be the Nugget formation. The primary objective for Bison Basin Fatback Well Nos. 73, 78 and 80 will be the Frontier formation. The primary objective for exploratory gas well North Bison Basin Well No. 1-9 will be the Dakota formation. Approximate depths of these wells will be between 1,000 and 2,000 feet. As a result of this action, there will be surface use actions as described below. Authorizations of these APD are subject to the attached Surface Use, Drilling, and General Conditions of Approval (Exhibit "B").

Regarding the North Bison Basin Well No. 1-9, only the well pad and access road will be permitted under the APD. The pipelines for this well will be authorized separately under Right-of-Way No. WYW168240.

Access: The project includes construction of nine new access roads. The cumulative length will be approximately 3,057 feet, with a maximum disturbance width of 30 feet (approximately 2.2 acres). Culverts and water bars will be installed where necessary along the route. After roadway construction is complete, the total disturbance will be required to support the proposed maintenance activities for the duration of each well's operating life (20+ years). If the wells enter into commercial production, the access roads will be surfaced as necessary with gravel or crushed rock to blend with the surrounding landscape from an approved off-site location. The roads will be maintained in good repair throughout all operations associated with the wells.

All roads will be required to be constructed so as not to impede natural drainage and to prevent erosion. Erosion and sediment control structures will be installed below all fill slopes. The project will be monitored on a regular basis, and any erosion problems will be corrected immediately. Water bars will be installed along roadways where grades exceed a slope of 2%. All water bars will be constructed with the berm on the downhill side to prevent the trench from silting up. Water bar spacing will be as follows:

<u>% Slope</u>	<u>Spacing Interval</u>
2 or <	200'
2-4	100'
4-5	75'
5 or >	50'

Construction activities will not begin until immediately prior to drilling, and reclamation activities will be completed within six months of drilling completion. All suitable topsoil will be conserved for use in future reclamation.

To prevent excessive loss of soil as a result of wind erosion on the well pads and along the access roads, water applications or other non-saline suppressants with at least 50 percent control efficiency will be required. Dust inhibitors will be used as necessary and any erosion problems will be corrected immediately. The well pads and reserve pits will be designed and located to prevent the collection of surface runoff and to prevent pit blowouts.

Well Site Layouts: Ten regular shaped well sites will be constructed at the proposed well sites. At least six inches of topsoil will be removed from all undisturbed areas prior to beginning construction, and will be stockpiled for use in future reclamation of the well sites. The topsoil and spoil piles will be mounded separately to prevent mixing. Reserve pits measuring 40 feet x 20 feet x 8 feet deep will be constructed within the cut area of the well sites. Total disturbance associated with the well pads, adjacent topsoil and spoil piles, and construction affected areas will be approximately 5.1 acres. Upon completion of drilling and interim reclamation, the well sites will be reclaimed, leaving an estimated 3.0 acres of un-reclaimed disturbance.

All drilling fluids will be contained in the reserve pits. Upon well completion, drilling fluids will be recycled, returned to the contractor and removed from the site. All cuttings will be solidified and buried in the lined reserve pits. The reserve pits shall be lined with impermeable, synthetic material to prevent seepage into underlying soil and water. No hydrocarbons will be allowed in the reserve pits. Any hydrocarbons inadvertently entering the reserve pits will be removed immediately. All structures designed to hold fluids will have impervious dikes constructed around them designed to contain any spills or leaks. Any spill or leak will be immediately reported and cleaned up.

In addition, a composite sample of the oil based mud cuttings will be analyzed using the Toxic characteristic Leachate Procedure (TCLP) (See 40 CFR 261 Appendix II) for the presence of heavy metals. The sample will also be tested for chlorides and Total Petroleum Hydrocarbons (TPH). If the analysis shows any toxicity levels above regulatory levels established by the Environmental Protection Agency (EPA) or the State Department of Environmental Quality (DEQ), a plan for disposal and/or treatment of the cuttings shall be submitted to the Administrative Officer for approval.

Surface Facilities: The well pump jacks will be the only proposed production facilities located on the oil well sites. Existing tanks and additional equipment located on the Bison Basin production facility and the West Bison Basin Fathead No. 18-22-01 facility will be used for production purposes. This facility will be expanded with a proposed 100 feet x 75 feet shop, two 1000-gallon water tanks and four 1000-gallon oil tanks. Total new disturbance, which will remain for the life of this facility, will be approximately 3.1 acres. All temporary tank batteries and facilities designed to contain fluids shall be surrounded by an impervious dike designed to contain 110% of the contents of the largest vessel should a leak or spill occur. Facilities will be standard in size. All pipeline and other load lines will terminate within the bermed area. All

permanent above ground production facilities shall be painted the color *Covert Green* 18-0617 TPX.

Pipelines: Ten pipeline corridors consisting of 3-inch SDR- 9 poly-pipe will be installed along the access roads. The 15-foot wide pipeline corridors will overlap the new and existing access road corridors (30 feet in width), resulting in road and pipeline corridors of approximately 45 feet in width. The proposed pipeline routes have a total length of 17,074 feet. Total new disturbance from installation of these pipelines will result in approximately 5.88 acres of additional disturbance beyond the access road corridors. All pipelines will be buried to a sufficient depth to allow for a minimum of 60 inches of backfill overtop. The total surface disturbance will be reclaimed after installation, and no new surface disturbance will be expected.

Pipeline for North Bison Basin Well No. 1-9: The pipeline for North Bison Basin No. 1-9 will not be permitted under the APD but will be permitted separately under Right-of-Way No. WYW No. 168240.

Utility Lines: Electric utility lines will be installed to power the pumping units at the well heads. The lines will be installed underground and placed in the same trench as the pipelines. No additional disturbance will be required.

Water Supply: The operator will obtain water for drilling operations from M-I Swaco out of Riverton, Wyoming. The water will be transported on existing roads via truck, and no pipeline will be used to transport water for drilling purposes. No new water wells will be drilled at these locations.

2.2.2.1 Design Features of the Proposed Action

The activities, procedures, and design features to which Richardson has committed in agency submittals, or agreed upon based on the onsite inspections with BLM, are compiled below. These design features are included as part of the proposed project as COA in an effort to prevent environmental impacts from occurring during project implementation, and minimize the type and magnitude of impacts to resources in the project area.

Air Quality: The operator will contact the Wyoming Department of Environmental Quality (WDEQ), Air Quality Division to determine the permit requirements prior to the installation of any oil and gas well production equipment. The Air Quality Division will provide the owner/operator with forms and guidelines for permitting and controlling air contaminant emissions from this equipment. The production of dust will be significantly reduced through accepted dust abatement techniques. Techniques include, but are not limited to, the seeding of all disturbed areas that are not utilized during the well production phase (e.g., borrow ditches and topsoil and spoil piles), and the application of water to roadways during dry periods.

Cultural, Paleontological, and Historic Resources: The holder is defined as whoever holds the BLM authorization for the proposed action. Class III cultural inventories for the proposed project have been completed. No additional cultural monitoring will be required. The project area is considered to have a potential for vertebrate fossils and scientifically significant invertebrate fossils. If cultural or Paleontological resources are discovered at any time during construction,

all construction activities will stop and the BLM will be immediately notified. Work will not resume until a Notice to Proceed is issued by the BLM.

Due to the presence of sites considered sensitive to Native American tribes, the holder shall ensure that all project impacts associated with the No. 1-9 pipeline authorization remain on the **north** side of the county road. This stipulation applies within the following legal locations: **Section 17 All (pipeline), Township 27 North, Range 95 West**. Violation of this stipulation may result in the holder being subject to the penalties and actions contained in regulations found in 43 CFR 7 Regulations, which are on file at all BLM offices.

Any cultural and/or paleontological resource (historic or prehistoric site or object or fossil) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures shall be made by the authorized officer after consulting with the holder.

Wildlife: A BLM Wildlife Biologist has determined that no proposed, threatened, and endangered species are present, and no suitable or critical habitat has been identified nor will be affected in the project area (Exhibit “D”). However, the BLM Wildlife Biologist determined that potential habitat for certain BLM Wyoming Sensitive Species exists in the project area. The following Sensitive Species were identified: Greater Sage-Grouse, Ferruginous Hawks, Raptors, White-tailed Prairie Dogs, and Sagebrush Obligates (i.e. Sage Thrasher, Loggerhead Shrike, Brewer’s Sparrow, Sage Sparrow and Pygmy Rabbits).

The Greater Sage-Grouse, a candidate species, was determined to occur in the area, and is a BLM Sensitive Species. USFWS identified it as warranted for listing under the Endangered Species Act, but it is precluded from listing due to other higher priority species. The project area lies within contiguous Greater Sage-Grouse Core Area.

In regard to Greater Sage-Grouse nesting and early brood rearing habitat, surface disturbing activities associated with this proposal occurring during the nesting period from **March 15th to June 30th** will be prohibited. Should an exception to this COA be requested, multiple surveys will be required to determine the presence or absence of Greater Sage-Grouse.

In regard to locations identified to be in potential Ferruginous Hawk and Raptor habitat, surface disturbing activities associated with this proposal occurring during the nesting period from **February 1st to July 31st** will be prohibited within 0.75 mile of nests. Should an exception to this COA be requested, multiple surveys will be required to determine the presence or absence of raptors.

In regard to locations identified to be in potential habitat for White-tailed Prairie Dogs, Pygmy Rabbits and Sagebrush Obligate bird species, habitat shall be avoided and disturbance minimized where possible.

All pits and open cellars will be fenced to prevent access by wildlife and livestock. Fencing will meet BLM specifications. Netting will be placed over all production pits to minimize access by migratory birds and wildlife. Netting will also be required over reserve pits that have been identified to contain oil or hazardous substances, as defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), section 101 (14), as determined by visual evaluation or testing.

Offsite activities in the project area by operational personnel that are unrelated to the proposed project will be prohibited. All project employees will be notified of all applicable wildlife laws and penalties associated with unlawful take and harassment.

Water and Waste Disposal: These wells will be drilled using a native mud program down to 800 feet. Drilling below 800 feet will be conducted using a gel-chemical mud system. Water flows may be encountered while drilling out the surface hole (between 350 feet to 1,000 feet) in the proposed area. This water will be diverted into the reserve pits.

All drill cuttings will be contained in the lined reserve pits. Upon well completion, any remaining fluids will be allowed to evaporate, and the cuttings will be buried within the reserve pits. Any produced water and hydrocarbons will be separated and hydrocarbons entering the pits will be removed to an approved central processing facility. The operator must dispose of produced water into the reserve pits in accordance with the Oil and Gas Onshore Order No. 7, water disposal regulations.

Garbage and other waste debris will be contained in portable wire mesh trash cages, and will be removed upon completion and disposed of at a Wyoming Department of Environmental Quality (WDEQ) approved disposal site. Self-contained portable chemical toilets will be used for human waste containment. All sewage and waste disposal will be conducted in strict accordance with applicable state and local rules and regulations.

Drilling Operations: The operator will construct the reserve pits on the cut portion of the well sites, and will maintain a minimum of two feet of freeboard. Produced water from newly completed wells may be temporarily disposed into the reserve pit for up to 90 days. Prior to the end of the 90 days, the operator shall submit a Sundry Notice for approval of a permanent water disposal method. The only materials allowed to be disposed in the pit are wastes that are generated by and are intrinsic to oil/gas exploration, development, and production activities. The Operator may dispose of produced water into the reserve pit in accordance with the Oil and Gas Onshore Order No.7.

After cessation of drilling and completion operations, any visible or measurable layer of oil must be removed from the surface of the reserve pit and the pit kept free of oil. Prior to reclamation of the reserve pit, an onsite shall be held between the operator and BLM to determine pit closure procedures. In addition, a composite sample of the cuttings shall be analyzed using the Toxic characteristic Leachate Procedure (TCLP) (See 40 CFR Part 261 Appendix II) for the presence of heavy metals. The sample shall also be tested for chlorides and Total Petroleum Hydrocarbons (TPH). If the analysis shows any toxicity levels above regulatory levels

established by the Environmental Protection Agency (EPA) or the State Department of Environmental Quality (DEQ), a plan for disposal and/or treatment of the cuttings shall be submitted to the Administrative Officer for approval.

Facilities: The existing and new access roads will be designed, constructed, and maintained as crowned and ditched road in accordance with the minimum standards of a local or resource road as established in the BLM Road Standards Manual, Section 9113; and in The Gold Book, Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Fourth Edition, 2007. No flat blading of access roads is permitted.

The reserve pits will be lined with a 12-mil synthetic liner. The reserve pit areas will be fenced and maintained until the pits are reclaimed. All temporary tank batteries and facilities designed to contain fluids will be surrounded by an impervious dike designed to contain 110% of the contents of the largest vessel should a leak or spill occur. Facilities will be standard in size. All pipeline and other load lines will terminate within the bermed area. All permanent above ground production facilities will be painted the color *Covert Green* 18-0617 TPX.

Health and Safety Practices: To minimize undue exposure to hazardous situations, and to provide for the health and safety of workers, the operator will comply with all existing applicable rules and regulations (for example, Onshore Orders, Occupational Safety and Health Administration (OSHA) requirements, Resource Conservation and Recovery Act (RCRA), and others), that preclude the public from entering hazardous areas, and place warning signs alerting the public, as required by the BLM.

Surface Reclamation: The operator's APD and Sundry Notice include reclamation plans within the Surface Use Plan of Operations. These plans must meet the interim and final reclamation objectives of Chapter 6 of The Gold Book, Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Fourth Edition, (The Gold Book, 2007).

Planning for successful reclamation begins by selecting the most optimal location to reduce unnecessary erosion and by limiting the cut and fill of slopes. The footprint to be reclaimed is minimized by authorizing surface disturbance that is as small as possible, while still allowing for safe and efficient operations.

Once drilling and construction activities are complete, the operator is required to begin interim reclamation, which involves reclaiming all portions of the power line and flow line corridors not needed for production. The portions of the construction area not needed for operational and safety purposes are to be re-contoured to a final or intermediate contour that blends with the surrounding topography as much as possible.

The disturbed areas shall be scarified, topsoil shall be re-spread evenly over areas not needed for all-weather operations, and the area seeded with a certified noxious weed free, BLM approved, seed mix of native species appropriate for the site (Exhibit "B", Surface Use Plan COA). Any topsoil and spoil piles set aside shall be re-vegetated upon well production to prevent the soil from eroding, and to help maintain its biological viability (The Gold Book, 2007). In addition,

all rat and mouse holes shall be backfilled and compacted immediately after well completions, and the reserve pits shall be dried and backfilled.

On slopes greater than 3:1, erosion blankets or mats will be required. Weed-free straw or hay will be placed and crimped in to the soil for slopes less than or equal to 3:1. The disturbed area will be seeded with a certified noxious weed free, BLM approved, seed mix of native species appropriate for the sites (Exhibit "B", Surface Use Plan COA). Any topsoil and spoil piles set aside will be required to follow the same methods as on the reclaimed areas to prevent it from eroding and to help maintain its biological viability (The Gold Book, 2007). Interim road reclamation consists of reclaiming portions of the road not needed for vehicle travel.

If during interim reclamation, noxious or invasive plants become established, the operator will be responsible for developing an eradication plan. This will include a comprehensive approach such as Integrated Pest Management (IPM). If chemicals are necessary, the operator will be required to obtain a Pesticide Use Proposal (PUP) with BLM authorization.

Final reclamation occurs when the operator plugs the well due to a commercially unviable well site or the end of production. To achieve final reclamation of a recently drilled dry hole, the well site must be re-contoured to the original contour or a contour that blends with the surrounding landform, stockpiled topsoil redistributed, and the site re-vegetated as stated above.

To achieve final reclamation of a formerly producing well, all topsoil and vegetation must be re-stripped from all portions of the old well site that was not previously reshaped to blend with the surrounding contour and seeded as stated above. Gravel and similar materials must be removed from the well location or buried deep in the re-contoured cut. The entire well location shall be fenced following seeding until rehabilitation has been completed. Final road reclamation includes re-contouring the road back to the original contour, seeding, and any other techniques that will be helpful to improving reclamation success (The Gold Book, 2007). Weeds shall be controlled on all disturbed areas within the exterior limits of the permit during the life of the project. Weed control methods shall be in accordance with guidelines established by the EPA, BLM, or appropriate authorities.

2.3 - Alternatives Considered, But Eliminated From Further

Analysis:

Onsite field examinations were held and alternative well pads, pipelines, and access roads locations were identified. However, the alternative locations would result in greater surface disturbance than the Proposed Action, or would not offer additional protection of the resources than the applied common to all design features would provide.

These wells have been placed in optimal geologic locations so that existing roads, pipelines, and other disturbances can be utilized to the greatest extent as possible in an attempt to reduce the need for new surface disturbance and to centralize disturbance corridors. All suitable alternatives examined at the field review have been incorporated into the Proposed Action.

Therefore, the only alternatives considered further in this assessment are the Proposed Action and the No Action Alternative.

3.0 Affected Environment and Environmental Impacts

3.1 Introduction:

This section describes the current conditions, organized by resources, as identified in Section 1.7, Identification of Issues that could be affected by the Proposed Action and the No Action alternative.

3.1.1 General Setting

The proposed project area is in the Bison Basin and West Bison Basin Units, approximately 20 miles south of Sweetwater Station, Wyoming. This area lies within the Wyoming Basin Eco-region, Rolling Sagebrush Steppe. This eco-region is a broad arid intermontane basin interrupted by hills and low mountains and dominated by grasslands and shrub lands. Primary uses in the area are mineral exploration and production, utility corridors, livestock grazing and wildlife habitat. Much of the region is used for livestock grazing, although many areas lack sufficient forage to support this activity. The region contains major natural gas and petroleum producing fields (Chapman et al., 2004).

The project will be located within mineral leases WYE-020172, WYE-022203, WYW-174072, WYW-174294, and WYW-175668, and includes proposals for the construction of a new well pads, access roads, pipelines, and utility lines. According to the Wyoming Oil and Gas Commission database, there are 73 existing wells in the Bison Basin Unit, 29 of which are producing. Within the West Bison Basin Unit, there are eleven proposed wells, and one existing well. Primary uses in the area are mineral exploration and production, utility corridors, livestock grazing and wildlife habitat.

3.1.2 Resources/Issues Brought Forward for Analysis

The level of resources presented are ordered and addressed in the same order presented in Chapter 1. Resources that are not impacted and are not of concern in the project area are not discussed.

3.1.3 General Impact Analysis Assumptions and Guidelines

This section is based on the resource specialists' reports and provides the analytical basis for comparison of the alternatives. The section organizes the resources as identified in Chapter 1.0,

Section 1.7 Identification of Issues, and compares the general current conditions to impacts between the Proposed Action and No Action alternatives. Design Features identified in Chapter 2.0, Section 2.2.1.1 have been incorporated into the analysis as a means to reduce or eliminate impacts and will be discussed in further detail.

Impacts have been categorized according to the phase of development and duration of activities on the resources. Temporary impacts would be defined in this section as impacts that occur during drilling and construction operations (30 to 45 days). Short-term impacts would be defined as impacts to the resources that persist after drilling operations have been completed and remain until interim reclamation has been successfully completed. Short-term impacts could last up to five years or until reclamation standards are achieved. Long-term impacts would be defined as the duration of each well's operating life (20+ years).

Impacts are also categorized as being direct or indirect, and beneficial or adverse. The analysis identifies these types of impacts and compares the alternatives accordingly.

Direct impacts are those impacts which are caused by the action and occur at the same time and place. Indirect impacts are those impacts which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Sometimes it is difficult to separate these impacts, and so the impacts may be described together.

3.1.4 Cumulative Impacts

The Council on Environmental Quality (CEQ) defines cumulative impacts as:

The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7).

The National Environmental Policy Act (NEPA, 1969) requires an assessment of the potential cumulative impacts of the proposed project. Cumulative impacts evaluate the incremental impacts of actions under each alternative when added to other past, present and reasonably foreseeable future activities. Cumulative impacts can result from individually minor, but collectively significant actions occurring over a period of time. The Cumulative Impacts Analysis Area (CIAA) and Cumulative Impacts Temporal Boundary (CITB) may be different for each resource and will be defined accordingly.

The analysis of cumulative impacts serves to place the projected incremental impacts from the management alternatives in the context of past, present, and future impacts. Analyses are limited because there is incomplete documentation of all past and present impacts on private and public lands, and limited knowledge of future development because of changing economic and technical conditions.

The CEQ regulations do not require that cumulative impacts to all resources be analyzed. Instead, the CEQ indicates that the cumulative impact analysis should focus on meaningful impacts. Therefore, the analysis in this document focuses on past, present, and future actions anticipated to result in substantial impacts to historically important resources. This analysis is likely predictive of cumulative impacts to other resources not analyzed here. Impacts to Greater Sage-Grouse, for example, are likely to be predictive of impacts to other wildlife species. The resources to be analyzed identified as important in internal scoping are Greater Sage-Grouse, surface disturbance, and socio-economics. Necessarily, some of these analyses will be qualitative; while others can be quantified.

The best available data (Wyoming Oil and Gas Conservation Commission, 2012) indicate that there are currently 73 existing wells within the Bison Basin Unit, and one well in the West Bison Basin Unit. The Bison Basin also contains the 18-22-01 production facility and an extensive network of roads, pipelines and power lines. Using an average of approximately six acres of surface resource disturbance for each well project (well pad/access road/pipeline), the cumulative impacts from drilling operations to date in the Bison Basin amount to approximately 444 acres of disturbance. The Bison Basin and West Bison Basin Units have a total combined acreage of 1511 acres. The cumulative impacts of past drilling and potential new drilling will amount to a total of approximately 456 acres of disturbance expected in the near future. The level of expected development activity outside of the proposed action is not available. This authorization will result in approximately 12.3 acres of temporary (30 to 45 days) disturbance and 8.0 acres of long-term (20+ years) disturbance to surface resources.

Petroleum and natural gas currently provide about 62% of America's energy needs (U.S. Energy Information Administration, 2012). Assuming that current market prices and demand for petroleum remains high, the BLM anticipates continued development at the current rate or more for the next one to five years. The operator and companies in nearby units have made a commitment of surface resources, and are expected to continue to drill for many years, thereby increasing cumulative impacts throughout the region. Taking into account the other roads, power lines, major pipelines, gas processing facilities, and non-energy related land use activities in the area, there are additional disturbed landscape acres of which the BLM does not have an accurate measure.

3.2 Climate, Climate Change and Air Quality:

3.2.1 Description of Climate, Climate Change and Air Quality Resources

Climate: The project area is located in a semi-arid (dry and cold), mid-continental climate regime. The area is typified by dry, windy conditions with limited rainfall, and long, cold winters.

The nearest meteorological monitoring station is located in Jeffrey City, approximately 30 miles east of the project area. The annual average total precipitation in Jeffrey City from 1964 to 2011 was 9.96 inches. Precipitation is greatest from spring to summer, tapering off during the fall and

winter months. An average of 57.0 inches of snow falls during the year, with the majority of the snow distributed evenly between November and April (Western Regional Climate Center, 2012).

The region has cool temperatures, with average temperatures (in degrees Fahrenheit) ranging between 8.4°F and 30.6°F in January, and between 49.7°F and 85.0°F in July. The frost-free period generally occurs from May to September. Figure 3.2 shows the mean monthly temperature ranges and total precipitation amounts for Jeffrey City (Western Regional Climate Center, 2012).

Figure 1: Mean Monthly Temperature Ranges and Total Precipitation Amounts

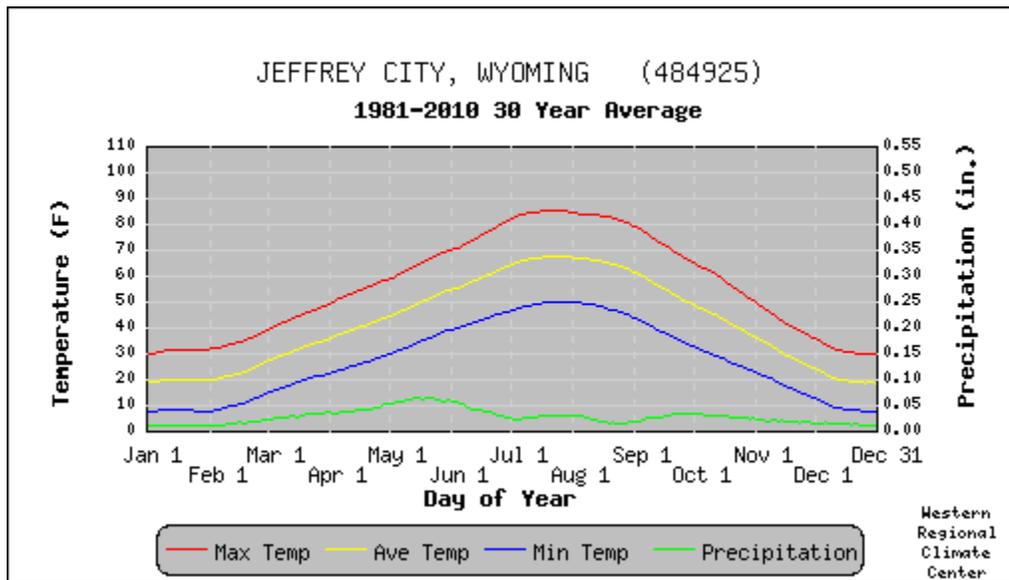


Figure 1 Courtesy of Western Regional Climate Center

- Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1981 and 2010.
- Ave. Temp. is the average of all daily average temperatures recorded for the day of the year between the years 1981 and 2010.
- Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1981 and 2010.
- Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1981 and 2010.

Climate Change: There is substantial scientific evidence that there is an increase in average global temperatures due to atmospheric concentrations of Greenhouse Gases (GHG) as well as land-use changes. This warming is associated with climatic variability that exceeds the historic norm (climate change). Observed temperature increases in northern latitudes have been greater than those in other areas, and seasonal low temperatures are generally increasing faster than high temperatures. Other unevenly distributed effects of climate change include altered weather patterns, sea levels, precipitation rates, wildfire occurrences, seasonal timing, desert distribution, and plant and animal distribution. Existing climate prediction models are global in nature;

therefore they are not at the appropriate scale to estimate potential impacts of climate change on the project area.

A growing body of evidence indicates that Earth's atmosphere is warming. Records show that surface temperatures in the Wyoming region have risen approximately 1.5 degrees Fahrenheit since the 1960 to 1979 baseline years (Global Change Research Program, 2009b). The largest increase in average temperature has occurred in the winter months in the northern portions of the region. Relatively cold days in the region are becoming less frequent, and relatively hot days are becoming more frequent (GCRP, 2009b). Observed changes in oceans, ecosystems, and ice cover are consistent with this warming trend (National Academy of Sciences, 2006).

Concentrations of certain gases in Earth's atmosphere have been identified as being effective at trapping heat reflected off Earth's surface, thereby creating a "greenhouse effect." As concentrations of Greenhouse Gases (GHG) increase, Earth's surface warms, the composition of the atmosphere changes and global climate is affected. Concentrations of GHG have increased dramatically in Earth's atmosphere in the past century. These increases, particularly in carbon dioxide (CO₂), nitrous oxide (N₂O), and fluorinated gases have been attributed to man-made sources and human activities (EPA, 2010a).

Climate change is likely to combine with other human-induced stress to further increase the vulnerability of ecosystems to other pests, invasive species, and loss of native species. Climate change is likely to affect breeding patterns, water and food supply, and habitat availability to some degree. Sensitive species in the planning area, such as Greater Sage-Grouse, which are already stressed by declining habitat, increased development and other factors, could experience additional pressures as a result of climate change.

Air Quality: In the surrounding geographic area, the air quality is currently impacted by oil and gas operations associated with exhaust from drilling rigs, heavy trucks and heavy dirt moving equipment. The extent to which these factors may affect air quality on any given day is dependent primarily on production activity, wind conditions, topography, and soil moisture levels. Some degree of air movement across the project area is usually evident.

The closest comprehensive wind measurements are collected at the Riverton Airport meteorological monitoring station, approximately 50 miles north of the project area. The average wind speed at the Riverton Airport from 1996 to 2006 was 8.6 mph and the prevailing direction was west-southwest (Western Regional Climate Center, 2011). The open rolling topography and near constant wind prevent the buildup of stagnant air in the project area, but the wind also tends to accelerate the drying of disturbed soil and contributes to the creation of dust.

3.2.2 Impacts on Climate, Climate Change, and Air Quality under Alternative A- No Action

3.2.2.1 Direct and Indirect Impacts

The No Action Alternative will result in existing climate and air quality resource conditions.

3.2.2.2 Cumulative Impacts

The No Action Alternative will result in existing climate and air quality resource conditions.

3.2.3 Impacts on Climate, Climate Change, and Air Quality under Alternative B- Proposed Action

3.2.3.1 Direct and Indirect Impacts

Climate and Climate Change: A variety of activities in the planning area currently generates Greenhouse Gases (GHG). Fuels combustion, industrial processes and any number of other activities on public lands result in direct emissions of GHG. Direct emissions in the planning area include those related to current and ongoing oil and gas and other minerals development, fire events, motorized vehicle use (e.g., OHV), livestock grazing, facilities development, and other fugitive emissions. Indirect GHG emissions in the planning area include the demand for electricity outside the area. If authorized by the BLM, the proposed action will result in additional GHG emissions.

In general, the largest sources of GHG emissions in the oil and gas sector are CO₂ emissions from natural gas compressors and drill rig engines, and fugitive CH₄ emissions from wellhead equipment, pneumatic devices and tanks. Emissions will occur from well drilling and completion, road and well pad construction, flaring and venting, compressor operations, dehydrator and separator operations, tank venting and loadout, wellhead fugitives, pneumatic device operations, and vehicle traffic.

There is no reliable methodology to assess the relationship between the Proposed Action contributing to these produced levels and the overall climate change. An attempt to analyze the impacts of GHG emissions and other climate change factors from the ultimate consumption of the resources produced from the project area would be a highly speculative exercise unnecessary for the land management decisions for which the BLM is responsible. The BLM does not dictate the destination of the resource produced from federal lands. The effects from consumption are not only speculative, but beyond the scope of agency authority or control.

Air Quality: Temporary, short-term and long-term impacts to air emissions would be expected from the initial construction phase through to final reclamation completion. This could last up to 20 years if the wells are successful. Activities would also have direct and indirect impacts to these resources depending on the type of activities.

Temporary impacts to air emissions would occur from construction operations including use of temporary generators in the project area and would continue as long as equipment and/or vehicle and truck are needed to operate, maintain and reclaim the location. These impacts to air quality would be both from fugitive dust and emissions.

Fugitive dust is basically air born particles resulting from heavy equipment and vehicle traffic being in contact with the soil surface. The effects of fugitive dust on air quality would be minimized through dust abatement practices, as discussed in the design features in Chapter 2.

Emissions caused by heavy equipment, drilling and completion rigs include the following particles:

1. particles 10 micrometers and smaller in diameter (PM₁₀);
2. sulfur dioxide (SO₂);
3. nitrogen oxides (NO_x);
4. carbon monoxide (CO); and
5. volatile organic compounds (VOC's).

Some temporary impacts on air quality in the immediate vicinity of the project could be caused by particulate matter and exhaust from vehicles and equipment. These effects would be local and would likely be dispersed by prevailing winds.

3.2.3.2 Cumulative Impacts

Climate and Climate Change: The CIAA for climate change includes the entire planet Earth and the surrounding atmosphere. The CITB for climate change would be the duration of each well's operating life (20+ years). The Proposed Action would add incrementally to the cumulative impacts to climate change in the CIAA. Initial impacts during the drilling and construction stages from trucks and equipment would be the most pronounced, but these would decrease rapidly after drilling and construction activities are completed.

Air Quality: The CIAA for air quality is the area within 5 km of the project area. The CITB for air quality in the area is the time period required for the construction of the proposed well pads, access roads, pipeline corridors, and drilling of the wells (30 to 45 days). The Proposed Action will add incrementally to the cumulative impacts to air quality in the CIAA. Initial impacts during the construction stage from trucks and equipment would be the most pronounced, but these would decrease rapidly after drilling and construction activities are completed.

3.3 Cultural and Paleontological Resources:

3.3.1 Description of Cultural and Paleontological Resources

Cultural resources that occur in the surrounding geographic area include prehistoric and historic sites, such as prehistoric lithic scatters, stone circles, fire hearths, and rock cairns and historic homesteads, expansion era road and trails, and modern era road and ditches. The project area is considered to have a potential for vertebrate fossils and scientifically significant invertebrate fossils. Archeological Energy Consulting (AEC) conducted Class III inventories for the project area. The inventories were conducted in October, 2011 and April and May, 2012. The Class III inventories found no prehistoric archaeological resource. No National Register Eligible sites were recorded, and no historic properties are within the Area of Potential Effect (APE).

The Holder is defined as whoever holds the BLM authorization for the proposed action. Any cultural or paleontological resource (historic or prehistoric site or object or fossil) discovered by the holder, or any person working on their behalf, on public or Federal land shall be immediately reported to the authorized officer. The holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures shall be made by the authorized officer after consulting with the holder.

The BLM archeologist determined that the North Bison Basin Well No. 1-9 pipeline route is near two previously recorded sites that are sensitive to Native American tribes. Both sites are located over 300 feet from the proposed project, will not be impacted, and are not visible from the project area. Due to the presence of sites considered sensitive to Native American tribes, the holder shall ensure that all project impacts associated with the No. 1-9 pipeline authorization remain on the **north** side of the county road. This stipulation applied within the following legal locations: **Section 17 All (pipeline), Township 27 North, Range 95 West**. Violation of this stipulation may result in the holder being subject to the penalties and actions contained in the 43 CFR 7 Regulations, which are on file at all BLM offices.

3.3.2 Impacts on Cultural and Paleontological Resources under Alternative A- No Action

3.3.2.1 Direct and Indirect Impacts

The No Action Alternative will result in existing cultural and paleontological resource conditions.

3.3.2.2 Cumulative Impacts

The No Action Alternative will result in existing cultural and paleontological resource conditions.

3.3.3 Impacts on Cultural and Paleontological Resources under Alternative B- Proposed Action

3.3.3.1 Direct and Indirect Impacts

In parts of the project area, there are known exposed geological formations having potential for vertebrate fossils and scientifically significant invertebrate fossils. Temporary impacts may occur during construction activities that remove soil and vegetation in the area. This exposes buried paleontological and cultural resources to potential damage by heavy equipment. Direct damage could result from heavy equipment blading over or crushing the fossils. There is also potential to

destroy the scientific information and the resource context in relationship to the site. Reduced impact to this resource is projected by implementing the design features in Chapter 2.

3.3.2.2 Cumulative Impacts

The CIAA for cultural and paleontological resources is the known surveyed area that the project is located within. The CITB for cultural and paleontological resources is permanent since impacts to cultural and paleontological resources cannot be undone. This area has a potential for surface and buried cultural and paleontological resources. Every new disturbance in this area has an increased and incremental potential to disturb or destroy these resources.

3.4 Soils:

3.4.1 Description of Soil Resources

The proposed project is located primarily on six soil units as defined in the Soil Survey of Fremont County, East Part of Dubois Area, Wyoming, July, 1993 Issue. The units are the Diamondville-Forelle association, rolling; Cragosen-Carmody-Blazon complex, hilly; Havre-Forelle-Glendive zero to three percent slopes; Havre-Absher-Forelle Loams, zero to six percent slopes; Cushool-Rock River association, two to eight percent slopes; and Poposhia-sodic-Blazon complex, rolling (See Soil Map, Appendix A).

3.4.1.1- The Diamondville-Forelle association, rolling, map unit is composed of Diamondville loam and Forelle loam. The map unit is located on hills and fan aprons. The slopes range from two to 15 percent. These soils are moderately to very deep and well drained, with moderately slow permeability. Runoff is medium with a moderate hazard of water erosion. The hazard of wind erosion is moderate.

3.4.1.2- The Cragosen-Carmody-Blazon complex, hilly map unit is composed of Cragosen gravelly loam, Carmody gravelly sandy loam, and Blazon sandy clay loam. The map unit is on hills and ridges. The slopes range from six to 40 percent. The soils are shallow to moderately deep and well drained, with moderate to moderately slow permeability. Runoff is rapid with a severe hazard of water erosion. The hazard of wind erosion is slight to severe.

3.4.1.3- The Havre-Forelle-Glendive zero to three percent slopes map unit is composed of Havre loam, Forelle loam and Glendive sandy loam. The map unit is on flood plains and toe slopes. The slopes range from zero to 20 percent. The soils are very deep and well drained, with moderately slow to moderately rapid permeability. Runoff is slow with a slight hazard of water erosion. The hazard of wind erosion is moderate to severe.

3.4.1.4- The Havre-Absher-Forelle loams, zero to six percent slopes map unit is composed of Havre loam, Absher load and Forelle loams. The map unit is on floodplains, terraces and toe slopes. The slopes range from one to 20 percent. The soils are very deep and well drained, with moderate to very slow permeability. Runoff is slow with a slight to moderate hazard of water erosion. The hazard of wind erosion is moderate.

3.4.1.5- The Cushool-Rock River association, two to eight percent slopes map unit is composed of Cushool sandy loam and Rock River fine sandy loam. The map unit is hill slopes, terraces and aprons. The soils are moderate to very deep and well drained, with moderate permeability. Runoff is slow to medium with a moderate hazard of water erosion. The hazard of wind erosion is severe.

3.4.1.6- The Poposhia-sodic-Blazon complex, rolling map unit is composed of Poposhia loam and Blazon clay loam. The map unit is on hill slopes, ridges and fan aprons. The slopes range from two to 15 percent. The soils are shallow to deep and well drained, with moderately slow permeability. Runoff is medium with a moderate hazard of water erosion. The hazard of wind erosion is moderate.

3.4.2 Impacts on Soils under Alternative A- No Action

3.4.2.1 Direct and Indirect Impacts

The No Action Alternative will result in existing soil resource conditions.

3.4.2.2 Cumulative Impacts

The No Action Alternative will result in existing soil resource conditions.

3.4.3 Impacts on Soils under Alternative B- Proposed Action

3.4.3.1 Direct and Indirect Impacts

Direct adverse impacts to soil resources result from actions that remove vegetative cover, compact soil, reduce infiltration, create changes in physical and biological properties, and reduce organic matter content. These direct impacts to soils tend to result primarily from removing vegetative cover, loosening the surface soil, formation of compacted layers, and increasing the potential for accelerated erosion by exposing soil particles to wind and water. Disrupting natural soil horizons and removing vegetation to construct roads, well pads and other facilities cause a loss of soil productivity.

The direct impacts would be greatest upon the initiation of construction and disturbance cause by associated with the well locations, access roads and pipeline/utility line corridors. Additional disturbance occurs to the subsoil during drilling activities and trenching for the pipeline/utility lines. These actions could result in mixing of the topsoil and subsoil horizons and destroying the structure of the soil that is required to have a functional matrix for soil fertility and hydrologic capacity. Initially, a total of approximately 12.3 acres of soils would be disturbed.

The Cragosen-Carmody-Blazon and Poposhia-sodic-Blazon soils are considered to have Limited Reclamation Potential (LRP). LRP areas are those defined by BLM Wyoming as having the most extreme reclamation challenges. These areas are often characterized by highly sensitive and erosive soils, highly sensitive vegetation types with severe physical or chemical limitations, steep slopes, etc.

The disturbances to soils and the removal of cover vegetation could result in accelerated rates of wind and water erosion, especially in the Cragosen-Carmody-Blazon, Havre-Forelle-Glendive and Cushool-Rock River soil units, as these soils are rated slight to severe for water erosion and slight to severe for wind erosion (See Section 3.4.1). Equipment traffic may create localized areas of soil compaction, decreasing infiltration rates, which could compound the effects of erosion and runoff into the watershed.

Activities occurring on overly wet or saturated soils could compound compaction and further destroy soil structure, adding to the potential impacts of reduced infiltration rates, thus reducing the likelihood of successful vegetation rehabilitation. Topsoil and subsoil materials could be mixed during construction and subsequent activities, resulting in less fertile soils and a lack of a viable seed bank. Mixed soil materials decrease the likelihood of successful re-vegetation, whether natural or reclaimed.

The potential exists for contamination of soil from fluids associated with drilling, reduction in industrial hygiene and safe working environment for employees, and for fire if high flash point No. 2 diesel is used as an additive. The potential exists for chemicals to be transported, used, and temporarily stored in the project area, creating the potential for soil contamination should chemicals be used in an improper manner or in the event of an accidental spill or inappropriate release.

These impacts would be expected for the temporary during drilling operations and construction related activities, and until successful interim reclamation. Upon successful interim reclamation, a total of 8.0 acres of long-term disturbance to soils would remain for the duration of each well's operating life (20+ years).

Reclamation methods and standards as described in the Section 2.2.1.1 Design Features of the Proposed Action will effectively reduce impacts to the soil resource. Short-term impacts are unavoidable, but improved reclamation techniques have reduced the long-term impacts to an acceptable level.

3.4.3.2 Cumulative Impacts

The CIAA for soil resources is the surrounding project area. The CITB for soil resources is the time period required for successful reseeding and reclamation of the disturbed soils (3 to 5 years). Most of the cumulative impacts to soils are a result of the need for road running surfaces, production facilities and producing well site activities. These activities have an incremental impact to the existing disturbances. The additional increase is small considering the project adds 12.3 acres of initial disturbance to the surrounding area.

3.5 Vegetation, Including Noxious/Invasive Plants and BLM

Wyoming Sensitive Species

3.5.1 Description of Ecological Sites and Potential Vegetation

3.5.1.1- The ecological site associated with the Diamondville-Forelle association, rolling, soils map unit is Loamy 10 to 14-inch precipitation, Foothills and Basin East range site. Potential vegetation in the Loamy 10 to 14-inch precipitation, Foothills and Basin East range ecological site includes Bluebunch Wheatgrass, Needle-and-Thread, Indian Ricegrass, Green Needlegrass, Rhizomatous Wheatgrass, and Big Sagebrush. Species such as Blue Grama, Big Sagebrush and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 600 pounds per acre in unfavorable years, to 1,400 pounds per acre in favorable years for these soils.

3.5.1.2- The ecological sites associated with the Cragosen-Rock Outcrop-Carmody complex, hilly map unit include Shallow Loamy, Sandy and Shallow Clayey, 10 to 14-inch precipitation High Plains Southeast range site. Potential vegetation in the Shallow Loamy, 10 to 14-inch High Plains Southeast ecological site includes Bluebunch Wheatgrass, Western Wheatgrass, Needle and Thread, Indian Ricegrass, Prairie Junegrass, Rhizomatous Wheatgrasses, and Big Sagebrush. Species such as Threadleaf Sedge, Sandberg Bluegrass, and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 350 pounds per acre in unfavorable years, to 700 pounds per acre in favorable years for these soils.

Potential vegetation in the Sandy, 10-14-inch, High Plains Southeast ecological site includes Needle-and-Thread, Bluebunch Wheatgrass, Indian Ricegrass, Sandberg Bluegrass, Prairie Junegrass, and Big Sagebrush. Species such as Threadleaf Sedge and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 700 pounds per acre in unfavorable years, to 1,200 pounds per acre in favorable years for these soils.

Potential vegetation in the Shallow Clayey, 10 to 14-inch, High Plains Southeast ecological site includes Bluebunch Wheatgrass, Western Wheatgrass, Mutton Bluegrass, Bottlebrush Squirreltail, and Big Sagebrush. Species such as Sandberg Bluegrass, Big Sagebrush and annual

forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 500 pounds per acre in unfavorable years, to 1000 pounds per acre in favorable years for these soils.

3.5.1.3- The ecological sites associated with the Havre-Forelle-Glendive, zero to three percent slopes map unit include the Loamy Overflow, 10 to 14-inch precipitation, High Plains Southeast range site, and Loamy, 10 to 14-inch precipitation, High Plains Southeast range site. Potential vegetation in the Loamy Overflow, 10 to 14-inch precipitation, High Plains Southeast range site includes Western Wheatgrass, Slender Wheatgrass, and Silver Sagebrush. Species such as Silver Sagebrush, Rabbitbrush and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 1200 pounds per acre in unfavorable years, to 2200 pounds per acre in favorable years for these soils.

Potential vegetation in the Loamy, 10 to 14-inch precipitation, High Plains Southeast range site includes Rhizomatous Wheatgrass, Needle and Thread, Bluebunch Wheatgrass, and Big Sagebrush. Woody species such as Big Sagebrush, Rabbitbrush, Blue Grama and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 600 pounds per acre in unfavorable years, to 1400 pounds per acre in favorable years for these soils.

3.5.1.4- The ecological sites associated with the Havre-Absher-Forelle, zero to six percent slopes map unit include the Loamy Overflow, 10 to 14-inch precipitation, High Plains Southeast range site; Saline Lowland, 10 to 14-inch precipitation, High Plains Southeast range site; and the Loamy, 10 to 14-inch precipitation, High Plains Southeast range site. Potential vegetation in the Loamy Overflow, 10 to 14-inch precipitation, High Plains Southeast range site includes Western Wheatgrass, Slender Wheatgrass, and Silver Sagebrush. Species such as Silver Sagebrush, Rabbitbrush and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 1200 pounds per acre in unfavorable years, to 2200 pounds per acre in favorable years for these soils.

Potential vegetation in the Saline Lowland, 10 to 14-inch precipitation, High Plains Southeast range site includes Alkali Sacaton, Basin Wildrye, Greasewood and Rhizomatous Wheatgrass. Species such as Greasewood and invasive annuals increase in abundance as range conditions deteriorate. Potential production by weight (dry-air) of the desirable plant community ranges from 1200 pounds per acre in unfavorable years, to 2500 pounds per acre in favorable years for these soils.

Potential vegetation in the Loamy, 10 to 14-inch precipitation, High Plains Southeast range site includes Rhizomatous Wheatgrass, Needle and Thread, Bluebunch Wheatgrass and Big Sagebrush. Woody species such as Big Sagebrush, Rabbitbrush, Blue Grama and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 600 pounds per acre in unfavorable years, to 1400 pounds per acre in favorable years for these soils.

3.5.1.5- The ecological site associated with the The Cushool-Rock River association, two to eight percent slopes, map unit is the Sandy, 10 to 14-inch precipitation, High Plains Southeast range site. Potential vegetation in the Sandy, 10 to 14-inch precipitation, High Plains Southeast range site includes Needle and Thread, Bluebunch Wheatgrass, Indian Ricegrass, Sandberg Bluegrass, Prairie Junegrass, and Big Sagebrush. Species such as Threadleaf Sedge and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 700 pounds per acre in unfavorable years, to 1,200 pounds per acre in favorable years for these soils.

3.5.1.6- The ecological sites associated with the Poposhia-sodic-Blazon complex, rolling map unit include Saline Upland, 10 to 14-inch precipitation, High Plains Southeast range site, and the Shallow Clayey, 10 to 14-inch precipitation, High Plains Southeast Range site. Potential vegetation in the Saline Upland, 10 to 14-inch precipitation, High Plains Southeast range site includes Gardner Saltbush, Western Wheatgrass, Indian Ricegrass, Bottlebrush Squirreltail, and Sandberg Bluegrass. Species such as Greasewood and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 300 pounds per acre in unfavorable years, to 650 pounds per acre in favorable years for these soils.

Potential vegetation in the Shallow Clayey, 10 to 14-inch, High Plains Southeast ecological site includes Bluebunch Wheatgrass, Western Wheatgrass, Mutton Bluegrass, Bottlebrush Squirreltail, and Big Sagebrush. Species such as Sandberg Bluegrass, Big Sagebrush and annual forbs increase in abundance as range conditions deteriorate. Potential production by weight (air-dry) of the desirable plant community ranges from 500 pounds per acre in unfavorable years, to 1000 pounds per acre in favorable years for these soils.

Noxious/Invasive Plants: A number of invasive, non-native and noxious species occur in the geographic region surrounding the project, and may already be established in the project area itself. Species such as Halogeton, Russian Knapweed, and Cheatgrass have the capability to dominate a site if appropriate weed abatement action is not taken. All noxious weeds being sprayed with herbicides should be treated only by a certified applicator in accordance with Federal and State regulations and procedures.

BLM Wyoming Sensitive Species: A BLM Wildlife Biologist determined that the proposed project area for North Bison Basin Federal Well No. 1-9 lies within potential habitat for BLM Wyoming Sensitive Species Cedar Rim Thistle and Beaver Rim Phlox. Habitat for these species shall be avoided and disturbance minimized where possible.

3.5.2 Impacts on Vegetation under Alternative A- No Action

3.5.2.1 Direct and Indirect Impacts

The No Action Alternative will result in existing vegetation resource conditions.

3.5.2.2 Cumulative Impacts

The No Action Alternative will result in existing vegetation resource conditions.

3.5.3 Impacts on Vegetation under Alternative B- Proposed Action

3.5.3.1 Direct and Indirect Impacts

General Vegetation: Direct impacts include vegetation removal, topsoil loss and compaction, disturbance of biological soil crusts, and increased fugitive dust. Surface disturbance associated with drilling operations and construction phase consisting of well sites, access roads, and pipelines will account for 12.3 acres of short-term construction disturbance. After successful interim reclamation, which may require three to five years for vegetation to re-establish, a total of 8.0 acres of long-term disturbance will remain for the duration of each well's operating life (20+ years).

Remaining vegetation will re-grow and disturbed areas will be reclaimed to BLM standards as described in the project design features identified in the COA. Wyoming standard mitigation guidelines, lease stipulations, decisions in the Lander RMP (BLM, 1987) associated with air quality, soils, surface, and groundwater; and vegetation involving interim reclamation and dust abatement, could effectively minimize the impacts to vegetation.

Under the proposed project, there will be no direct disturbance to existing wetland ecological sites. Construction, operation, abandonment, and reclamation actions will avoid these isolated wetlands ecological sites. Potential surface runoff and sedimentation, topsoil loss and compaction, and disturbance of biological soil crusts from disturbed ecological sites will be minimized through the implementation of appropriate erosion control measures found in the project design features. Increased vehicle traffic on existing access routes, especially during dry periods, will be the primary source of fugitive dust settling on roadside vegetation. Project design features to minimize fugitive dust in the project area will be implemented.

Long-term disturbance associated with the wells and production facilities will be limited. After interim reclamation, the disturbance will be confined to the area that is needed for maintenance of the wells. No residual impacts are expected after the wells are plugged and abandoned, since all facilities will be removed at the end of the project.

Noxious/Invasive Plants: The Proposed Action will increase the likelihood of noxious and invasive weeds being introduced to the project area. The disturbance associated with construction of the well pads, access roads and pipeline/power line corridors provides a mode for transportation and an opportunity for weed establishment. These species are likely to become established within the project area, especially in disturbed soils or newly reclaimed areas. Potential sources of weed seed include vehicles traveling to and from well sites, dormant seeds on site, straw used for mulching, and commercial seeds for reclamation that may not be totally weed-free. Weed seed is also spread by birds, wind and water, and can become attached to the fur of grazing herbivores and transported as animals move.

Interim reclamation of surface disturbance will occur following the construction of well pads, access roads, pipeline/power line corridors, and well completions. Areas not needed for production operations will be re-contoured and scarified to break up any soil compaction. Afterwards, topsoil will be replaced and seeded with a seed mixture agreed to by the operator and the BLM. All seed will be weed-free and tested in accordance with applicable state law to eliminate the potential for introduction of weeds. The seed drilling method will be implemented with the contour of any slopes to reduce the risk of erosion. To provide further soil stabilization, any remaining topsoil and spoil material not used for interim reclamation should be seeded using a hydro-seed and/or hydro-mulch method. The operator will also fence the disturbed areas until successful rehabilitation has occurred to prevent additional surface disturbance. Prior to final reclamation, the operator will contact the BLM for a final approved seed mixture for the site.

A number of invasive, non-native and noxious species occur in the geographic region surrounding the project, and may already be established in the project area itself. Reclamation efforts may take several years to establish native plant species. With a lack of competition from native perennials, there is expected to be an increase in early seral stage plant species such as Halogeton, ensuring a seed source for invasive species to become established with each new disturbance. These early seral stage plants offer little in the way of palatability to livestock or wildlife, and without proper weed abatement action, can dominate the site of disturbance and spread to the surrounding rangelands.

BLM Wyoming Sensitive Species: The Proposed Action will increase the likelihood of adverse disturbance to BLM Wyoming Sensitive Species. The BLM Wildlife Biologist determined that proposed project area for North Bison Basin Federal Well No. 1-9 lies within potential habitat for BLM Wyoming Sensitive Species Cedar Rim Thistle and Beaver Rim Phlox. Habitat for these species shall be avoided and disturbance minimized where possible.

Direct impacts are damage to or loss of individual plants, loss of habitat or habitat quality, loss of pollinators and loss of seed banks. Direct plant mortality, habitat loss, and the spread of Invasive Non-Native Species (INSS) can result from surface disturbance associated with oil and gas development activities. Indirect impacts include the loss of suitable habitat for future colonization. Surface disturbing activities can also indirectly impact sensitive plant species by contributing to soil erosion and transporting INSS into sensitive plant habitat.

3.5.3.2 Cumulative Impacts

The Proposed Action will add incrementally to adverse cumulative impacts on vegetation. Most of the cumulative impacts to soils and vegetation are a result of the need for road running surfaces and producing well site activities, which compact the soils, making water infiltration low and plant establishment unlikely. The CIAA for vegetation resources is the project area. The CITB for vegetation resources is the duration of each well's operating life (20+ years).

It should also be realized that due to the low precipitation and soil types in this area, reclamation of disturbed areas to a pre-disturbance state may take greater than ten years (in the case of Big Sagebrush and other woody species) or never occur. Areas that will be reclaimed after drilling

activities have been completed will most likely be dominated by Halogeton and other early seral stage species. These species are capable of stabilizing the soil against wind erosion and small precipitation events. However, these species lack the root mass and depth to protect soils against heavy precipitation events, and thus these sites are open to blowouts in the event of heavy rain and strong gusting wind.

3.6 Wildlife Including Greater Sage-Grouse and BLM Wyoming Sensitive and Special Status Species:

3.6.1 Description of Wildlife Resources

3.6.1.1- General Wildlife: The project area is located in the Rolling Sagebrush Steppe of the Wyoming Basin Eco-region (Chapman et al., 2004). As such, it is typically inhabited primarily by small mammals such as ground squirrels, prairie dogs, and various other rodents, rabbits, and burrowing species. In addition, it may also include various small bird species. These lesser species are, in turn, preyed upon by larger carnivores such as fox, coyote, badger, and skunk and by raptor species such as Golden Eagles and various hawks. In addition, the project area may also be used by larger species such as Pronghorn Antelope and Mule Deer (Exhibit "D").

3.6.1.2- Special Status Species: Greater Sage-Grouse: The Bison Basin and West Bison Basin Units lie completely within contiguous Wyoming Greater Sage-Grouse Core Area. With some of the highest lek density in the state and with 1512 acres are federally owned land, the Bison Basin is an important area with regards to Greater Sage-Grouse conservation in Wyoming and the nation. It is the policy of Wyoming BLM (Instruction Memorandum No. WY-2012-019) to manage Greater Sage-Grouse seasonal habitats and maintain habitat connectivity to support population objectives set by the Wyoming Game and Fish Department.

Since the U.S. Fish and Wildlife Service now considers the Greater Sage-Grouse a “Warranted but Precluded” species under the auspices of the Endangered Species Act (ESA), the State of Wyoming has developed a “Core Population Area” strategy to conserve the Greater Sage-Grouse in Wyoming. This statewide strategy has gained recognition from the U.S. Fish and Wildlife Service as a sound framework for a policy by which to conserve Greater Sage-Grouse.

Both alternatives meet the requirements of the Greater Sage-Grouse strategy identified by the BLM as required to limit adverse impacts to Greater Sage-Grouse habitat. The strategy requires that it be implemented across BLM managed lands (and would be applied to state lands according to current guidance.) Therefore, this analysis does not have an alternative that does not support this strategy. The Lander Field Office will consider and evaluate the following Greater Sage-Grouse habitat conservation measures related to timing, distance, and density for all proposed projects within Wyoming Greater Sage-Grouse Core Area in the Bison Basin.

Management will focus on maintaining sagebrush and understory diversity in Greater Sage-Grouse and other sagebrush-obligate species' habitats unless vegetative treatments are needed to achieve habitat objectives. Because Greater Sage-Grouse is one of the largest and most visible special status bird species, it is typically used as an indicator species for other sagebrush-obligate birds and small mammals. Therefore, management actions that protect Greater Sage-Grouse habitat will generally have beneficial impacts on all sagebrush-obligate species.

Greater Sage-Grouse populations have been declining across the western United States, prompting several petitions to list them as threatened under the Endangered Species Act (ESA). In March, 2010, the U.S. Fish and Wildlife Service (USFWS) determined that the Greater Sage-Grouse warranted listing as a threatened species under the ESA, but precluded listing due to higher priority actions. Threats to Greater Sage-Grouse include degradation, loss, and fragmentation of habitat, predation, West Nile Virus, and human disturbance during sensitive periods. Energy exploration and development within the Bison Basin impact Greater Sage-Grouse habitat as a result of roads, well pads and construction related activities. The net result is that Greater Sage-Grouse habitat is fragmented by wells, facilities, roads, pipelines, and utilities associated with these new and existing developments.

The project area is located entirely within contiguous BLM Wyoming Greater Sage-Grouse Core Population Area (Core Area), and restrictions on surface disturbance and disruptive activities during certain times of the year have been in place since 2008. It is the policy of WY BLM (I.M. No. WY-2012-019) to manage Sage-Grouse seasonal habitats and maintain habitat connectivity to support population objectives set by the Wyoming Game and Fish Department. This guidance is consistent with guidelines provided in the Wyoming Governor's Sage-Grouse Implementation Team's Core Population Area strategy and the Governor's Executive Order (Order 2011-5). The Lander Field Office (LFO) will consider and evaluate the following Sage-Grouse habitat conservation measures related to timing, distance, and density for all proposed projects within Core Areas:

- A) Within Core Areas, surface disturbing activity or surface occupancy is prohibited or restricted on or within a six tenths (0.6) mile radius of the perimeter of occupied Sage-Grouse leks.
- B) Disruptive activity is restricted on or within six tenths (0.6) mile radius of the perimeter of occupied Sage-Grouse leks from 6 pm to 8 am from March 1st to May 15th.
- C) Surface disturbing and/or disruptive activities are prohibited from March 15th to June 30th to protect Sage-Grouse nesting/early brood-rearing habitat inside Core Area.

The Bison Basin area has some of the highest lek density in the state of Wyoming. There are currently 37 leks (34 on BLM surface) within the Green Mountain Common Allotment (GMCA) that includes the Bison Basin area and 20 leks located within 11 miles of the project area boundary. Map 2 shows the locations of these strutting/nesting complexes (leks). Analyses of male Greater Sage-Grouse populations counted on 25 leks in the GMCA over the past 20 years (Wyoming Game and Fish data) indicates that populations are cyclic (Figure 3-3). Because of inconsistencies in the number of times that leks were surveyed during any given year, it is not possible to determine trend data.

The State of Wyoming and the BLM are using the Density Disturbance Calculation Tool (DDCT) process to evaluate and manage the total disturbance within the Wyoming Greater Sage-Grouse Core Area. The DDCT evaluates the project area, and calculates the density of disruptions and disturbances within the evaluation area (See Exhibit B for Wyoming Game and Fish Department DDCT concurrence).

The Lander Field Office (LFO) conducted a DDCT for the Fathead No. 1822-01 facility expansion, Fathead Federal Injector Wells Nos. 1 through 5, Fathead Federal Well No. 11, North Bison Basin Well No. 1-9, and for Bison Basin Fatback Well Nos. 73, 78, and 80 in this area because the project occurs in Wyoming Greater Sage-Grouse Core Area. The area of analysis totaled 83,235 acres. Within this area, there are 571 acres (0.7 %) of disturbance and 82,664 acres (99.3 %) that remain undisturbed within the DDCT defined area of analysis. Approximately 46 disruptions were documented within this same area. This equates to one disturbance per 1809 acres, which is below the one disturbance per 640 acres threshold.

In accordance with BLM policy, the cumulative value of existing disturbance in the DDCT defined area will not exceed five percent of sagebrush habitat within the area. In addition, the number of anthropogenic disturbance activities (disruptions) within the DDCT defined area will not exceed one disruption per 640 acres. Timing limitations as identified in Chapter 3 for Greater Sage-Grouse protection will be required under the COA.

3.6.1.3- BLM Wyoming Sensitive Species: BLM Wyoming Sensitive Species that may occur in the project area include Raptors and Ferruginous Hawks. Potential habitat for Raptors and Ferruginous Hawks includes cliffs, bluffs, rock outcrops, shrubs and grassland, as well as large trees for nesting and roosting.

3.6.2 Impacts on Wildlife Species under Alternative A- No Action

3.6.2.1 Direct and Indirect Impacts

The No Action Alternative will result in existing wildlife resource conditions.

3.6.2.2 Cumulative Impacts

The No Action Alternative will result in existing wildlife resource conditions.

3.6.3 Impacts on Wildlife Species under Alternative B- Proposed Action

3.6.3.1 Direct and Indirect Impacts

Impacts to wildlife species are generally described as the loss, degradation or fragmentation of habitat or key habitat features; the disturbance/disruption of wildlife during sensitive time periods; or direct animal mortality. Adverse impacts from mineral exploration and development include the displacement of wildlife in developed areas, wildlife avoidance of areas around development from noise and human presence, the reduction in usable habitat, and the disruption of migration corridors that link seasonal ranges. Increases in vehicular traffic are expected to have temporary (approximately 30 to 45 days) impact on wildlife. To minimize the effects of habitat loss for some species, all areas will be reclaimed to BLM standards. If the wells are produced, interim reclamation will be required according to the design features discussed in Chapter 2.

The principal short-term direct impacts to wildlife likely to be associated with the proposed project will include the loss of certain wildlife habitats due to the development of drilling and production operations, habitat fragmentation, displacement of some wildlife species, and an increase in the potential for collisions between wildlife and motor vehicles. Project-related surface disturbance, facilities, and human activity will reduce available habitat both by loss and fragmentation. Temporary or construction-phase (30 to 45 days) surface disturbance associated with the proposed project will be approximately 12.3 acres. Direct impacts to wildlife will potentially include the loss of potential nesting, wintering, and foraging habitats. If construction, drilling, and completion were to occur during the spring/summer months, the proposed project could result in reproductive failure (nest/burrow abandonment, and/or mortality of eggs or young).

Long-term impacts will occur from habitat fragmentation associated with roads, utility corridors, construction, and long-term avoidance of development sites and facility locations. Potential impacts to wildlife include disturbance of localized areas, loss of habitat, long-term degradation of habitat, and direct mortality of small mammals or nesting birds. Surface disturbance that results in the loss of sagebrush habitat will have a long-term adverse impact because of the difficulty of establishing shrubs in reclamation areas due to the time it takes plants to establish and grow. Due to prolonged reclamation time, oil and gas development in low precipitation areas can result in long-term impacts from habitat loss and fragmentation.

The Proposed Action will allow the use of open reserve pits, which will be used to contain drilling fluids and other toxic substances. The potential will exist for wildlife, migratory birds, and other animals to enter and/or become entrapped in reserve pits, and ingest toxic substances. When the reserve pits contain fluids or toxic substances, the operator will provide effective and proven wildlife deterrents or exclusionary devices such as nets, to insure at all times that wildlife, migratory birds, and other animals are not adversely affected by open pits. Any open pits will be fenced to prevent and deter wildlife, migratory birds, and other animals from entering and/or ingesting substances.

BLM Wyoming Special Status Species: Greater Sage-Grouse: Direct impacts to Greater Sage-Grouse result from the direct loss of important sagebrush habitat or a key habitat feature such as a nest site or lek area, or from animal mortality. Surface disturbance that results in the loss of

sagebrush habitat will have a long-term adverse impact because of the difficulty of establishing shrubs in reclamation areas due to the time it takes plants to establish and grow. Greater Sage-Grouse can also be directly disturbed by human activities, potentially causing them to abandon a nest, lek or home range. Disturbance during sensitive periods (e.g. winter and breeding) leads to lower recruitment rates and higher mortalities, resulting in adverse impacts to the species. Direct impacts to Greater Sage-Grouse could also include mortality from vehicles, fence entanglements or drowning.

Indirect impacts to Greater Sage-Grouse occur by changing habitat characteristics or quality, which can ultimately result in changes in migrations patterns, habitat use, carrying capacity, and long-term population viability. Indirect impacts to Greater Sage-Grouse can also occur when specific actions change the habitat in a way that makes it unsuitable for future habitation. Disturbance impacts can range from short-term displacement and shifts in activities to long-term abandonment of home range.

Occupied or undetermined Greater Sage-Grouse leks are protected from surface disturbing activities year-round. In addition, suitable nesting and brood-rearing habitat areas for Greater Sage-Grouse are protected from surface disturbing and disruptive activities from **March 15th to June 30th**. Should an exception to this wildlife stipulation be requested, multiple surveys will be required to determine the presence or absence of Greater Sage-Grouse. Because the Bison Basin lies completely within contiguous Wyoming Greater Sage-Grouse Core Area, management actions that conserve, protect and maintain habitat for Greater Sage-Grouse are a priority in this area.

BLM Wyoming Sensitive Species: Raptors Including Ferruginous Hawks: Direct impacts to Raptors result from the direct loss of important habitat or a key habitat feature such as a nest site or from animal mortality. Raptors can also be directly disturbed by human activities, potentially causing them to abandon a nest or home range.

Indirect impacts to Raptors occur by changing habitat characteristics or quality, which can ultimately result in changes in migrations patterns, habitat use, carrying capacity, and long-term population viability. Disturbance impacts can range from short-term displacement and shifts in activities to long-term abandonment of home range

In regard to locations identified to be in potential Ferruginous Hawk and Raptor habitat, surface disturbing activities associated with this proposal occurring during the nesting period from **February 1st to July 31st** will be prohibited within 0.75 mile of raptor nests. Should an exception to this wildlife stipulation be requested, multiple surveys will be required to determine the presence or absence of raptors.

3.6.3.2 Cumulative Impacts

Greater Sage-Grouse: The project area lies completely within designated Wyoming Greater Sage-Grouse Core Area. Greater Sage-Grouse Habitat is found throughout most of Wyoming. Approximately 69 percent of the State has been mapped as historic range for the species, with most of the range still identified as having suitable habitat. As part of the 12-month finding in

response to petitions to list the Greater Sage-Grouse under the Endangered Species Act (ESA), the USFWS identified a list and ranking order of threats to Greater Sage-Grouse populations and habitat across the species' range. The top five threats identified for the eastern part of the range, which encompasses Wyoming, are oil and gas development, infrastructure, Invasive Non-Native Species (INSS), wildfire, and livestock grazing (Diebert, 2010). All of these primary threats occur on lands throughout the State, regardless of ownership. As a federal agency, the BLM is obligated to develop and implement a strategy to avoid having its management activities contribute to the need to list Greater Sage-Grouse under the ESA (BLM 2004a; BLM 2008e).

Restrictions that limit resource use in Greater Sage-Grouse Habitat on federal land will reduce habitat loss, but will not prevent further habitat destruction from occurring on non-BLM administered land. Consequently, Greater Sage-Grouse habitat on private land may not receive the same level of protection, and may result in greater habitat degradation on these lands. The majority of cumulative impacts on Greater Sage-Grouse habitat within the Greater Sage-Grouse CIAA will result from surface disturbing and disruptive activities, such as mineral development and associated wells, roads, pipelines, and facilities, as well as livestock grazing and rangeland improvements. Impacts will be in the form of habitat fragmentation and animal displacement (short or long-term). Greater Sage-Grouse avoidance of disturbed areas and human associated activities may extend beyond the areas of disturbance. These uses, along with other rangeland and recreational activities, contribute to the overall cumulative impacts observed in the area.

Overall, mineral and energy development will have the greatest impacts on Greater Sage-Grouse habitats within the Cumulative Impact Analysis Area (CIAA). Drilling of the wells and construction related activities for well pads, access roads and pipeline installation will impact the behavior, movements, survival and productivity of the Greater Sage-Grouse. The impacts of mineral and energy development located in areas of Greater Sage-Grouse lek concentration will likely cause long-term displacement of animals through habitat loss and lek abandonment, thus contributing to local population declines.

The CIAA for Greater Sage-Grouse is the project area plus a four-mile buffer. The CITB for Greater Sage-Grouse is the duration of each well's operating life (20+ years). Project activities will have the potential to directly and indirectly impact Core Area habitat. Cumulative impacts to Greater Sage-Grouse Habitat will result from surface-disturbing and other disruptive activities that result in the direct and indirect loss of habitat and bird displacement. Proposed and potential development activities within the Greater Sage-Grouse CIAA include oil and gas development and livestock grazing.

Raptors Including Ferruginous Hawks: The CIAA for Ferruginous Hawks and Raptors is the area within a 20-mile radius of the project area. Project The CITB for impacts to Ferruginous Hawks and Raptors is the duration of each well's operating life (20+ years). Project related activities have the potential to remove sagebrush, which could result in the loss of habitat and displacement of prey. When combined with past, present and reasonably foreseeable future actions, the project activities will cumulatively add to the impacts to Ferruginous Hawks and Raptors.

4.0 Consultation and Coordination:

4.1 Persons, Groups, and Agencies Consulted:

Table 1: List of all Persons and Agencies Consulted for the Purpose of this EA

Name	Agency
Jon Kaminsky	BLM
Andrew Gibbs	BLM
Curtis Bryan	BLM
Tim Vosburgh	BLM
Karina Bryan	BLM
Sydney Thielke	BLM
Stephen Coursey	BLM
Tom Sunderland	BLM
Josh Axelson	Richardson

4.2 Summary of Public Participation:

There was a scoping and public involvement process applied to this action in addition to posting the Notice of Staking at the BLM Lander Field Office for 30 days. On February 3rd, 2012, the Lander Field Office released the project proposal on its web site, and there was a 30 day public comment period. In addition, the project proposal was submitted to County10.com and several local newspapers, including the Lander Journal, Casper Star Tribune, Rawlins Times and Riverton Ranger.

5.0 References and Appendices:

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5.2 Appendices

Exhibit "A": Maps

Exhibit "B": Conditions of Approval

Exhibit "C": Cultural Resources Clearance

Exhibit "D": Wildlife/T&E Species Clearance

Exhibit "E": Range Evaluation