

DECISION RECORD
Petrox Resources Inc., Olmstead Federal 11-18
Environmental Assessment (EA), WY-070-EA14-323
Bureau of Land Management, Buffalo Field Office, Wyoming

DECISION. The BLM approves Petrox Resources Inc.: Olmstead Federal 11-18 oil and gas well application for permit to drill (APD) described in Alternative B of the environmental assessment (EA), WY-070-14-323. This approval includes the well’s support facilities.

Compliance. This decision complies with or supports:

- Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701); DOI Order 3310.
- Mineral Leasing Act of 1920 (MLA) (30 U.S.C. 181); including the Onshore Oil and Gas Orders.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- National Historic Preservation Act of 1966 (NHPA) (16 USC 470).
- Powder River Basin Oil and Gas Project Final Environmental Impact Statement (FEIS), (2003).
- Buffalo Resource Management Plan (RMP) 1985 and Amendments. 2003, 2011

BLM summarizes the details of the approval of Alternative B below. The EA includes the project description, including specific changes made at the onsite, and site-specific mitigation measures.

Well Site. BLM approves 1 APD and support facilities:

#	Well Name & #	Twn	Rng	Sec	Qtr	Surface Hole Lease
1	Olmstead Fed 11-18	57	71	18	NESW	FED

Limitations. There are no denials or deferrals. Also see the conditions of approval (COAs) and recommended mitigation measures (RMMS).

THE FINDING OF NO SIGNIFICANT IMPACT (FONSI). Analysis of Alternative B of the EA, WY-070-EA14-323, and the FONSI (incorporated here by reference) found Petrox Resources Inc. proposal for 1 well and associated infrastructure will have no significant impacts on the human environment, beyond those described in the PRB FEIS. There is no requirement for an EIS.

COMMENT OR NEW INFORMATION SUMMARY. BLM publically posted the APD for 30 days, received no comments, and then internally scoped it. Since receipt of this APD BLM received no updated or clarified policies relevant to the APD.

DECISION RATIONALE. BLM bases the decision authorizing the selected project on:

1. BLM and Petrox Resources Inc. included mitigation measures to reduce environmental impacts while meeting the BLM’s need. For a complete description of all site-specific COAs, see the COAs. The PRB FEIS analyzed and predicted that the PRB oil and gas development would have significant impacts to the region’s Greater Sage-Grouse (GSG) population. The impact of this development cumulatively contributes to the potential for local GSG extirpation yet its effect is acceptable because it is outside priority habitats and is within the parameters of the PRB FEIS and ROD and current BLM and Wyoming GSG conservation strategies.
2. Petrox Resources Inc. will conduct operations to minimize adverse effects to surface and subsurface resources, prevent unnecessary surface disturbance, and conform to currently available technology and practice.
3. The selected alternative will help meet the nation’s energy needs, and help stimulate local economies by maintaining workforce stability.

4. The operator committed to:
 - Comply with the approved APD, applicable laws, regulations, orders, and notices to lessees.
 - Obtain necessary permits from agencies.
 - Offer water well agreements to the owners of record for permitted wells.
 - Incorporate several measures to alleviate resource impacts into their submitted surface use plan and drilling plan.
5. The operator certified it has a surface access agreement.
6. The project is clearly lacking in wilderness characteristics as there is no federal surface.
7. This APD is pursuant to the Mineral Leasing Act for developing oil or gas and do not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390 because the site-specific analyses covering the project area required updating.

ADMINISTRATIVE REVIEW AND APPEAL. This decision is subject to administrative review according to 43 CFR 3165. 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. Parties 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: _____ /s/ Duane W. Spencer _____

Date: _____ 2/12/15 _____

FINDING OF NO SIGNIFICANT IMPACT
Petrox Resources Inc., Olmstead Federal 11-18
Environmental Assessment (EA), WY-070-EA14-323
Bureau of Land Management, Buffalo Field Office, Wyoming

FINDING OF NO SIGNIFICANT IMPACT (FONSI). Based on the information in the EA, WY-070-EA14-323, which BLM incorporates here by reference; I find that: (1) the implementation of Alternative B will not have significant environmental impacts beyond those addressed in the Powder River Basin (PRB) Oil and Gas Project Final Environmental Impact Statement (FEIS), 2003, to which the EA tiers; (2) Alternative B conforms to the Buffalo Field Office (BFO) Resource Management Plan (RMP) (1985) and amendments (2001, 2003, 2011); and (3) Alternative B does not constitute a major federal action having a significant effect on the human environment. Thus an EIS is not required. I base this finding on consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), with regard to the context and to the intensity of the impacts described in the EA, and Interior Department Order 3310.

CONTEXT. Mineral development is a common PRB land use, sourcing over 42% of the nation's coal. The PRB FEIS foreseeable development analyzed the development of 54,200 wells. The additional development analyzed in Alternative B is insignificant in the national, regional, and local context.

INTENSITY. The implementation of Alternative B will result in beneficial effects in the forms of energy and revenue production however; there will also be adverse effects to the environment. Design features and mitigation measures included in Alternative B will minimize adverse environmental effects. The preferred alternative does not pose a significant risk to public health and safety. The geographic area of project does not contain unique characteristics identified in the 1985 RMP, PRB FEIS, or other legislative or regulatory processes. BLM used relevant scientific literature and professional expertise in preparing the EA. The scientific community is reasonably consistent with their conclusions on environmental effects relative to oil and gas development. Research findings on the nature of the environmental effects have minor controversy, are not highly uncertain, or do not involve unique or proven risks. The PRB FEIS predicted and analyzed oil development of the nature proposed with this project and similar projects. The selected alternative does not establish a precedent for future actions with significant effects. The proposal may relate to the PRB Greater Sage-Grouse and its habitat decline having cumulative significant impacts; yet the size of this project is within the parameters of the impacts in the PRB FEIS. There are no cultural or historical resources present that will be adversely affected by the selected alternative. The project area is clearly lacking in wilderness characteristics as there is no federal surface. No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected. The selected alternative will not have any anticipated effects that would threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment.

ADMINISTRATIVE REVIEW AND APPEAL. This finding is subject to administrative review according to 43 CFR 3165. Request for administrative review of this finding 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 FONSI is received or considered to have been received. Parties adversely affected by the State Director's finding may appeal that finding to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Field Manager: /s/ Duane W. Spencer

Date: 2/12/15

ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA14-323
Petrox Resources Inc., Olmstead Federal 11-18
Bureau of Land Management, Buffalo Field Office, Wyoming

1. INTRODUCTION

BLM provides an environmental assessment (EA) for Petrox Resources Inc. (Petrox) 1 application for permit to drill (APD). This site-specific analysis tiers into the information and analysis in the Final Environmental Impact Statement and Proposed Plan Amendment for the Powder River Basin Oil and Gas Project (PRB FEIS), WY-070-02-065, 2003 and the PRB FEIS Record of Decision (ROD) pursuant to 40 CFR 1508.28 and 1502.21. One may review these documents at the BLM Buffalo Field Office (BFO) and on the website: http://www.blm.gov/wy/st/en/field_offices/Buffalo.html. This APD is pursuant to the Mineral Leasing Act for the purpose of exploring or developing oil or gas. The APD did not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390 because no site-specific analysis adequately covered the project area. BLM's jurisdiction is through spilt estate: fee surface over federal minerals.

1.1. Background

Petrox submitted the Notice of Staking (NOS) on March 11, 2014 to the BFO to produce oil and natural gas from federally managed fluid mineral bearing formations of the PRB, on fee surface.

- April 21, 2014- conducted onsite visit, evaluating and modifying the proposal to minimize environmental impacts.
- May 29, 2014- APD package received
- June 24, 2014- BLM sent Petrox deficiencies
- January 16, 2015- BFO received deficiencies

1.2. Need for the Proposed Project

The BLM's need for this project is to meet the management objectives of the Buffalo Resource Management Plan (RMP), 1985, and its amendments 2001, 2003, and 2011 (to which this EA tiers). BLM must determine how and under what conditions to balance natural resource conservation with allowing Petrox to exercise lease rights to develop fluid minerals, as described in their APD associated plans. Conditional fluid mineral development supports the RMP, the Mineral Leasing Act of 1920, the Federal Land Policy Management Act (FLPMA), and other laws and regulations.

1.3. Decision to be Made

The BLM will decide whether or not to approve the proposed development, and if so, under what terms and conditions agreeing with the Bureau's multiple use mandate, environmental protection, and RMP.

1.4. Scoping and Issues

BLM posted the proposed APD for 30 days and will timely publish the EA, any finding, and decision on the BFO website. This project is similar in scope to other fluid mineral development the BFO analyzed. External scoping is unlikely to identify new issues, as verified with recent fluid mineral EAs that BLM externally scoped. External scoping of the horizontal drilling in Crazy Cat East EA, WY-070-EA13-028, 2013, in the PRB area received 3 comments, revealing no new issues.

The BFO interdisciplinary team (ID team) conducted internal scoping by reviewing the proposal, its location, and a resource (issue) list (see the administrative record, AR) to identify potentially affected resources, land uses, resource issues, regulations, and site-specific circumstances not addressed in the tiered analysis or other analyses incorporated by reference. This EA will not discuss resources and land

uses that are not present, unlikely to receive material affects, or that the PRB FEIS or other analyses adequately addressed. This EA addresses the project’s site-specific impacts that were unknown and unavailable for review at the time of the PRB FEIS analysis to help the decision maker come to a reasoned decision. The project area is clearly lacking wilderness characteristics as there is no federal surface in the project area. Project issues include:

- Air quality
- Soils: site stability, reclamation potential, riparian and wetland communities, invasive species
- Water: ground water, quality, and quantity of produced water.
- Wildlife: raptor productivity, migratory birds, special status species
- Cultural Resources

BLM analyzed the following issues in the PRB FEIS and they do not present a substantial environmental question of material significance to this proposal and therefore are not discussed in this EA:

Geological Resources	Recreation	Wilderness Characteristics
Cave and Karst Resources	Heritage & Visual Resources	Livestock Grazing
Lands & Realty	Paleontological Resources	Areas of Critical Environmental Concern
Wilderness Characteristics	Transportation & Access	Socio-economic Resources
Forest Products	Tribal Treaty Rights	Environmental Justice
Mineral Resources: Locatable, Leasable-coal, Salable		Fire, Fuels Management, & Rehabilitation

2. PROPOSED PROJECT AND ALTERNATIVES

2.1. Alternative A – No Action

The no action alternative would deny this APD requiring the operator to resubmit an APD that complies with statutes and the reasonable measures in the PRB RMP Record of Decision (ROD) in order to lawfully exercise conditional lease rights. The PRB FEIS considered a no action alternative, pp. 2-54 to 2-62. The BLM keeps the no action alternative current using the aggregated effects analysis approach – tiering to or incorporating by reference the analyses and developments approved by the subsequent NEPA analyses for adjacent and intermingled developments to the proposal area.

2.2. Alternative B Proposed Action (Proposal)

Overview. Petrox proposes drilling and developing 1 vertical oil and gas well into federal mineral estate from fee surface overlaying fed minerals. The target formation is the Minnelusa with an approximate depth of 7,800 ft. The proposal is 50 miles North of Gillette, in Campbell County, Wyoming. The proposal requires the construction of 1 engineered (cut and fill) well pad. The total surface disturbance with this pad and access road is approximately 6 acres. Interim reclamation of the well pad will restore approximately 1 acre during the production phase. These figures include disturbance from the well pad, the spoil and topsoil storage areas, construction equipment, and vehicle disturbance. The access road will be constructed to meet the standards of the anticipated traffic flow and all-weather requirements. Road construction will include ditching, draining, graveling, and crowning of the roadbed. See the drilling program with the APD for details on targeted zone, legal description, surface, and bottom hole – summarized at Table 2.1, below.

Table 2.1. Well Name/Location:

#	Well Name & #	Twn	Rng	Sec	Qtr	Surface Hole Lease
1	Olmstead Fed 11-18	57	71	18	NESW	FED

The proposal involves (distances in feet, disturbances in acres):

Activity	Length	Width	Disturbance	Interim Disturbance
Olmstead Fed 11-18 constructed pad	375 ft.	250 ft.	2.2 ac.	1.3 ac.
Access Road (~3,800' to be improved, 1,400' to be constructed)	5,222 ft.	30 ft.	3.6 ac.	
Total Disturbance for this location			5.8 ac.	

NOTE: Length/Width represent working pad dimensions. Acres of disturbance represent the fenced in area of disturbance. Approximately 2,938 ft of temporary flowline (poly) will be put in place to deliver water for drilling and completion purposes. There is no surface disturbance associated with the temporary flowline.

Drilling, Construction and Production Design Features Include:

- Petrox anticipates completing construction, drilling and interim reclamation in 2 years. Drilling and construction is year-round in the PRB. Weather may cause delays that rarely last multiple weeks. Timing limitations in the form of conditions of approval (COAs) and/or agreements with surface owners may impose longer temporal restrictions.
- An access road consisting of existing primitive road (served a plugged and abandoned well) and construction of roads.
- Potential production facilities for this well will consist of 3-400 bbl tanks, a separator/heater treater, and a pumping unit powered by natural gas. All tanks will be 20 feet tall and 12 feet in diameter. An impermeable dike/berm will surround these facilities.
- Water for drilling operations will come from Olmstead Creek, located in NWSE Sec. 19 Township 57N, Range 71W. Completion operations will require approximately 9,000 bbls per well. Water will be transported via a temporary flowline and stored on location in 2- 400 bbl skid mounted water storage tanks. Flowback water will be disposed in a Wyoming approved disposal facility the Hamm #1 API No. 49-005-25286 or the Kuehne #31-25 API No. 49-005-29360.
- The estimated time to construct the well pad is 7-14 days, estimated time to drill the well is 10-20 days, and the estimated time for completion activities is 6-16 days.
- During the drilling phase of each well (10-20 days) the average daily traffic to and from the location is approximately 2 large trucks (water hauler, cement trucks, etc.) and 6 personal pickup trucks per day. During the well completion process (6-16 wells) the average daily traffic increases to 4 to 6 large trucks and 6 personal pickup trucks per day.
- If the well produces, produced water will be disposed of in permitted discharge facility via tanker trucks. Potential quantities of produced water are unknown at this time.
- The constructed well pad was designed to minimize cut and fill slopes. The project designed features as outlined in the MSUP, pad design drawings, and road designs will rectify impacted areas by repairing, rehabilitating and/or restoring the affected environment. The operator’s design features will reduce or eliminate impacts over time by preservation and maintenance operations during the project’s life.

For a detailed description of design features and construction practices associated with the proposed project, refer to the MSUP and drilling plan included with the APD. BLM incorporated and analyzed the implementation of committed mitigation measures in the MSUP and drilling plan, in addition to the COAs in the PRB FEIS ROD, as well as changes made at the onsite.

Additionally, the operator, in their APD, committed to:

- Comply with the approved APD, applicable laws, regulations, orders, and notices to lessees.
- Obtain necessary permits from agencies.
- Offer water well agreements to the owners of record for permitted wells.

- Incorporate measures to alleviate resource impacts in their submitted surface use and drilling plans.
- Certify it has a surface access agreement with the landowners.

2.3. Conformance to the Land Use Plan and Other Environmental Assessments

This proposal does not diverge from the goals and objectives in the Buffalo Resource Management Plan (RMP) (1985) and generally conforms to the terms and conditions of that land use plan, and its amendments(2001, 2003, 2011), and laws including the Clean Air Act, 42 USC 7401-7671q (2006), the Clean Water Act, 33 USC 1251 et seq. (1972), etc.

3. AFFECTED ENVIRONMENT

This section briefly describes the physical and regulatory environment that may be affected by the alternatives in Chapter 2. The PRB FEIS considered a no action alternative (pp. 2-54 to 2-62) in evaluating a development of up to 54,200 fluid mineral wells. There are 15,121 producing oil and gas wells in the Olmstead Federal 11-18 area, Wyoming Oil and Gas Conservation Commission (WOGCC) December, 2014. The total number of conventional wells in the Buffalo planning area is 2855, which includes 845 horizontal wells (federal, fee, and state) (as of December 2014). This represents 38% of the projected 3,200 in the 2003 PRB ROD. This agrees with the PRB FEIS which analyzed the reasonably foreseeable development of 51,000 CBNG and 3,200 natural gas and oil wells. In addition other operators are likely to continue seeking permits to develop unconnected leases in or in the affects analysis areas near the project area; decisions to approve or deny future proposals will occur following APD submittal.

3.1. Air Quality

Refer to the PRB FEIS pp. 3-291 to 3-299, for a 2003-era description of the air quality conditions. BLM incorporates by reference, Update of Task 3A Report for the Powder River Basin Coal Review Cumulative Air Quality Effects for 2020, BLM (AECOM), 2009, (Cumulative Air Quality Effects, 2009) as it captures the cumulative air quality effects of present and projected PRB fluid and solid mineral development. The Environmental Protection Agency (EPA) established ozone standards in 2008, finalizing them in 2011. Existing air quality in the PRB is “unclassified/attainment” with all ambient air quality standards. It is also in an area that is in prevention of significant deterioration zone. PRB air quality is a rising concern due to air quality alerts issued in 2011-2014 for particulate matter (PM), attributed to coal dust. Four sites monitor the air quality in the PRB: Cloud Peak in the Bighorn Mountains, Thunder Basin northeast of Gillette, Campbell County south of Gillette, and Gillette. In addition, the Wyoming Air Resource Monitoring System (WARMS) measures meteorological parameters from 9 sites throughout the State, and particulate concentrations from 5 of those sites, monitors speciated aerosol (3 locations), and evapotranspiration rates (1 location). The sites monitoring air quality for the Powder River Basin are located at Sheridan, South Coal Reservoir, Buffalo, Fortification Creek, and Newcastle. The northeast Wyoming visibility study is ongoing by the Wyoming Department of Environmental Quality (WDEQ). Sites adjacent to the Wyoming PRB-area are at Birney on the Tongue River 24 miles north of the Wyoming-Montana border, Broadus on the Powder River in Montana, and Devils Tower.

Existing air pollutant emission sources in the region include:

- Exhaust emissions (primarily CO and nitrogen oxides (NOx)) from existing natural gas fired compressor engines used in production of natural gas and CBNG; and, gasoline and diesel vehicle tailpipe emissions of combustion pollutants;
- PM (dust) generated by vehicle travel on unpaved roads, windblown dust from neighboring areas, road sanding during the winter months, coal mines, and trains;
- Transport of air pollutants from emission sources located outside the region;

- NO_x, PM, and other emissions from diesel trains and,
- SO₂ and NO_x from power plants.

3.2. Ecological Sites: Soils and Vegetation

Ecological site descriptions provide soils and vegetation data for resource identification, management, and reclamation recommendations. Using the Natural Resource Conservation Service, (NRCS, USDA), Technical Guides for the Major Land Resource Area 58B Northern Rolling High Plains, in the 10-14 inch Northern Plains precipitation zone, verified through onsite field reconnaissance, the project area primarily consists of loamy ecological site. Layers of the soil most influential to the plant community varies from 3 to 6 inches thick. These layers consist of the A horizon with very fine sandy loam, loam, or silt loam texture and may also include the upper few inches of the B horizon with sandy clay loam, silty clay loam or clay loam textures. Project area soils differ with topographic location, slope, and elevation. Erosion potential varies depending on the soil type, vegetative cover, and slope. Interpretations of soil modeling data show soils disturbed from construction of well pads, specifically cut and fill slopes, are highly susceptible to water and wind erosion. Reclamation potential of soils in the project area is fair. Refer to ecological site narrative section below for description of vegetation species observed during onsite field visits. Interpretations of soil modeling data show soils disturbed from construction of well pads, specifically cut and fill slopes, are highly susceptible to water and wind erosion. Reclamation potential of soils also varies in the project area. The area's main soil limitations include: depth to bedrock, low organic matter content, and high erosion potential especially in areas of steep slopes.

Loamy Sites: This site occurs on gently undulating to rolling land on landforms which include hill sides, alluvial fans, ridges and stream terraces, in the 10 to 14 inch precipitation zone. The soils of this site are moderately deep to deep (greater than 20 inches to bedrock), well drained soils that formed in alluvium and residuum derived from sandstone and shale. These soils have moderate permeability. Plant communities consisted of:

Rhizomatous Wheatgrasses, Needleandthread, Blue Grama Plant Community

This plant community is the interpretive plant community for this site and is considered to be the Historic Climax Plant Community (HCPC). This plant community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning, and sometimes on areas receiving occasional short periods of rest. The potential vegetation is about 75% grasses or grass-like plants, 15% forbs, and 10% woody plants. This state is dominated by cool season mid-grasses. The major grasses include western wheatgrass, needleandthread, and green needlegrass. Other grasses occurring in this state include Cusick's and Sandberg's bluegrass, bluebunch wheatgrass, and blue grama. A variety of forbs and half-shrubs also occur. Big sagebrush is a conspicuous element of this state, occurs in a mosaic pattern, and makes up 5 to 10% of the annual production. Plant diversity is high. This plant community is extremely stable and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought tolerance. This is a sustainable plant community (site/soil stability, watershed function, and biologic integrity).

Mixed Sagebrush/Grass Plant Community

Historically, this plant community evolved under grazing by bison and a low fire frequency. Currently, it is found under moderate, season-long grazing by livestock in the absence of fire or brush management. Wyoming big sagebrush is a significant component of this plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grasses, and miscellaneous forbs. Dominant grasses include needleandthread, western wheatgrass, and green needlegrass. Grasses of secondary importance include blue grama, prairie junegrass, and Sandberg bluegrass. Forbs commonly found in this plant community include plains wallflower, hairy goldaster, slimflower scurfpea, and scarlet globemallow. Sagebrush canopy ranges from 20% to 30%.

Fringed sagewort is commonly found. Plains pricklypear can also occur. When compared to the HCPC, sagebrush and blue grama have increased. Production of cool-season grasses, particularly green needlegrass, has been reduced. The sagebrush canopy protects the cool-season mid-grasses, but this protection makes them unavailable for grazing. Cheatgrass (downy brome) has invaded the site. The overstory of sagebrush and understory of grass and forbs provide a diverse plant community that will support domestic livestock and wildlife such as mule deer and antelope. This plant community is resistant to change. A significant reduction of big sagebrush can only be accomplished through fire or brush management. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

Western Wheatgrass/Cheatgrass Plant Community

This plant community is created when the Mixed Sagebrush/Grass Plant Community or the Heavy Sagebrush Plant Community is subjected to fire or brush management not followed by prescribed grazing. Rhizomatous wheatgrasses and annuals will eventually dominate the site. Compared to the HCPC, cheatgrass has invaded with western wheatgrass and thickspike wheatgrass maintaining at a similar or slightly higher level. Virtually all other cool-season mid-grasses are severely decreased. Blue grama is the same or slightly less than found in the HCPC. Plant diversity is low. This plant community is relatively stable with the rhizomatous wheatgrasses being somewhat resistant to overgrazing and the cheatgrass effectively competing against the establishment of perennial cool-season grasses. An increase in bare ground reduces water infiltration and increases soil erosion. The watershed is usually functioning. The biotic integrity is reduced by the lack of diversity in the plant community.

3.3. Water Resources

WDEQ regulates Wyoming's water quality with EPA oversight. The Wyoming State Engineer's Office (WSEO) has authority for regulating water rights issues and permitting impoundments for the containment of the State's surface waters. The WOGCC has authority for permitting and bonding off channel pits located over state and fee minerals.

3.3.1. Groundwater

A search of the WSEO Ground Water Rights Database showed 0 registered stock and 0 domestic water wells within 1 mile of the proposed well. See also, the PRB FEIS, pp. 3-1 to 3-36. The Fox Hills, the deepest penetrated fresh water zone in the PRB lies well above the target formation (7,800 ft.). Depth to the Fox Hills formation is approximately 1,900 ft. total vertical distance (TVD).

3.3.2. Surface Water

The project area lies in tributaries to the Little Powder River. Most of the drainages in the area are ephemeral (flowing only in response to a precipitation event or snow melt). Some of the drainages, Lower Olmstead Creek in particular, could be characterized as intermittent (flowing only at certain times of the year when it receives water from alluvial groundwater, springs, or other surface source – PRB FEIS Chapter 9 Glossary). The channels range from steep gullies to gentle, well vegetated grassy swales, without defined beds and banks. See the PRB FEIS for surface water quality, pp. 3-48 to 3-49, and for surface water, pp. 3-36 to 3-56. No further analysis of surface water will be discussed.

3.4. Wetlands/Riparian

There are no wetlands or riparian areas near the proposed well pad or infrastructure so the project should not impact wetlands or riparian areas.

3.5. Invasive or Noxious Species

The following state-listed noxious weed and/or weed species of concern infestations were discovered by a search of inventory databases on the Wyoming Energy Resource Information Clearinghouse (WERIC)

web site (www.weric.info): Leafy Spurge (*Euphorbia esula* L.) The WERIC database was created cooperatively by the University of Wyoming, BLM and county weed and pest offices. The operator inspected the project area and confirmed isolated patches within the project area. The following is a list of additional State and County Designated Noxious Weeds that were encountered within the project area: Canada thistle (*Cirsium arvense* L.), spotted knapweed (*Centaurea maculosa* Lam.), and Russian knapweed (*Centaurea repens*). In addition, Campbell County Weed and Pest declared the following 5 species as weeds of concern in the project area: black henbane (*Hyoscyarnus niger* L.), buffalobur (*Solanum rostratum* Dun.), common cocklebur (*Xanthium strumarium* L.), salt cedar (*Tamarix ramosissima* Ledeb.), and leafy spurge (*Euphorbia esula* L.). Cheatgrass is prevalent throughout the project area. The state-listed noxious weeds are in PRB FEIS, Table 3-21, p. 3-104; and the Weed Species of Concern are in Table 3-22, p. 3-105.

3.6. Wildlife

The PRB FEIS identified wildlife species occurring in the PRB, pp. 3-113 to 3-206. The biologist evaluated impacts to wildlife resources and recommended project modifications where wildlife issues arose. Zander Environmental LLC (Zander) performed a habitat assessment and a bald eagle winter roost survey during 2013 (see AR). BLM wildlife biologists used this information and the databases compiled and managed by BLM BFO wildlife staff, the PRB FEIS, WY Game and Fish Department (WGFD) datasets, and the Wyoming Natural Diversity Database (WYNDD) to evaluate the affected environment for wildlife species that may occur in the area. Site specific information is described below for known species suspected to occur and become impacted beyond the analysis of the PRB EIS 2003. Rationale for species not discussed in detail below can be referenced in the administrative record: Table W.1. Summary of Sensitive Species Habitat and Project Effects: and, Table W.2. Summary of Threatened and Endangered Species Habitat and Project Effects.

Land uses and other disturbances occurring within the proposed project area include wildlife habitat, livestock grazing, ranching, dryland agriculture, overhead power lines, conventional oil and gas production, and improved and unimproved roads. The vegetation is dominated by tall (greater than 12 inches) native grasslands (needleandthread, prairie junegrass, blue gramma, Sandberg bluegrass, and threadleaf sedge). Olmstead Creek drainage is located within one mile of the proposal. A mature gallery of cottonwood trees is located within the Olmstead Creek drainage.

3.6.1. Migratory birds

The PRB FEIS discussed the affected environment for migratory birds, pp. 3-150 to 3-153. The Lance Sahara POD EA, WY-070-EA13-72, Section 3.7.2.2, p.16 is incorporated here by reference due to similar habitats and proposed action. Site specific information follows: Nesting habitat occurring near the proposed well location is marginal to good (Zander 2013) for Brewer's sparrow, sage thrasher, and loggerhead shrike.

Most of the eagles occupying winter roost habitat within the Powder River Basin are migratory. A mature gallery of cottonwood trees is located along Olmstead Creek drainage within one mile of the proposal. Eagles are known to occupy cottonwood galleries during winter for winter roost. The operator had Zander survey galleries of cottonwoods along Olmstead creek during winter. Winter survey results for eagles where negative (Zander 2013).

3.7. Cultural Resources

In accordance with section 106 of the National Historic Preservation Act, BLM must consider impacts to historic properties (sites that are eligible for or listed on the National Register of Historic Places (NRHP)). For an overview of cultural resources that are generally found within BFO the reader is referred to the *Draft Cultural Class I Regional Overview, Buffalo Field Office* (BLM, 2010). A Class III (intensive) cultural resource inventory (BFO project no. 70140078) was performed in order to locate specific historic

properties which may be impacted by the proposed project. The following resources are located in or near the proposed project area.

Cultural Resources Located In or Near the Project Area

Site Number	Site Type	NRHP Eligibility
48CA7101	Historic	Not Eligible (NE)

4. ENVIRONMENTAL EFFECTS

No Action Alternative. BLM analyzed the no action alternative as Alternative 3 in the PRB FEIS and it subsequently received augmentation of the effects analysis in this EA through the analysis of mineral projects, their approval, and construction. This updated the no action alternative and cumulative effects. The project area has surface disturbance from existing roads, well pads, and oil and gas facilities. Most of the nearby wells have been plugged and abandoned. Under the no action alternative, on-going well field operations would continue as would the development of approved single and multi-well pads, potentially consisting of horizontal wells with approved APDs and other approved APDs. The production and the drilling and completion of these new wells would result in noise and human presence that could affect resources in the project area; these effects could include the disruption of wildlife, the dispersal of noxious and invasive weed species, and dust effects from traffic on unpaved roads. Present fluid mineral development in the PRB is under half of that envisioned and analyzed in the PRB FEIS. There is only a remote potential for effects above those identified in the PRB FEIS to resource issues as a result of implementing the no action alternative.

Alternative B, Proposed Action (Proposal)

4.1. Air Quality

In the project area, air quality impacts would occur during construction (due to surface disturbance by earth-moving equipment, vehicle traffic fugitive dust, well testing, as well as drilling rig and vehicle engine exhaust) and production (including well production equipment, booster and pipeline compression engine exhaust). The amount of air pollutant emissions during construction would be controlled by watering disturbed soils, and by air pollutant emission limitations imposed by applicable air quality regulatory agencies. BLM incorporates by reference the analysis found in the August 2012 Lease Sale EA, WY-070-EA12-44, pp. 45-51 (air quality, greenhouse gas emissions, and visibility). Air quality impacts modeled in the PRB FEIS and Cumulative Air Quality Effects, 2009 concluded that PRB projected fluid and solid development would not violate state, tribal, or federal air quality standards and this project is well within the projected development parameters.

4.2. Ecological Sites, Soils, and Vegetation

4.2.1. Direct and Indirect Effects

The effects to soils and vegetation resulting from well pad, road, and pipeline construction include:

- Mixing of horizons – occurs where construction on roads, or other activities take place. Mixing may result in removal or relocation of organic matter and nutrients to depths where it would be unavailable for vegetative use. Soils which are more susceptible to wind and water erosion may be moved to the surface. Soil structure may be destroyed, which may impact infiltration rates. Less desirable inorganic compounds such as carbonates, salts, or weathered materials may be relocated and have a negative impact on revegetation. This drastically disturbed site may change the ecological integrity of the site and the recommended seed mix.
- Loss of soil vegetation cover, biologic crusts, organic matter and productivity. With expedient reclamation, productivity and stability should be regained in the shortest time frame.

- Soil erosion would also affect soil health and productivity. Erosion rates are site specific and are dependent on soil, climate, topography, and cover.
- Soil compaction – the collapse of soil pores results in decreased infiltration and increased erosion potential. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery. Compaction may be remediated by plowing or ripping.
- Modification of hill slope hydrology.
- Direct effects (removal and/or compaction) to vegetation would occur from ground disturbance caused by drilling rig equipment and construction of a well pads, tank batteries, and roads. Short term effects would occur where vegetated areas are disturbed but later reclaimed within 1 to 3 years of the initial disturbance. Long-term effects would occur where well pads, roads, water-handling facilities or other semi-permanent facilities may result in loss of vegetation and affect reclamation success for the life of the project.
- Soils will be subjected to wind and water erosion.

The BLM will evaluate reclamation success using the requirements in the BLM State Wide Reclamation Policy found at: <http://www.blm.gov/wy/st/en/programs/reclamation>, incorporated here by reference.

4.2.2. Cumulative Effects

For details on expected cumulative impacts, refer to the PRB FEIS, pp. 4-151. The PRB FEIS defines the designation of the duration of disturbance (pp. 4-1 and 4-151). Most soil disturbances would be short term impacts with expedient interim reclamation and site stabilization. These impacts, singly or in combination, could increase the potential for valuable soil loss due to increased water and wind erosion, invasive/noxious/poisonous plant spread, invasion and establishment, and increased sedimentation and salt loads to the watershed system, if applicable mitigation measures are not used.

4.2.3. Mitigation Measures

The proponents operated committed measures and design features are sufficient to not warrant the application of site specific conditions of approval (COAs).

4.2.4. Residual Effects

Residual effects across the project area would include a long-term loss of soil productivity associated with well pad and roads. The PRB FEIS identified residual effects (p. 4-408) such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established. Due to the presence of erosive soils and the topography of the project area erosion will occur. Rilling and gully of cut and fill slopes on, access/utility corridors, will take place. Impacts from livestock to stabilized cut and fill slopes will limit soils becoming stable and getting vegetation establish. The PRB FEIS defined the designation of the duration of disturbance, pp. 4-1 and 4-15. “For this EIS, short-term effects are defined as occurring during the construction and drilling/completion phases. Long-term effects are caused by construction and operations that would remain longer”.

Impacts to vegetation and soils from surface disturbance will be reduced by following the operator’s plans and BLM applied mitigation. Construction of the new access road was reduced by placing the well where existing oil/gas access roads are used when possible (see Table 2.1). This results in less surface disturbance and environmental impacts. See Section 2.2 for a summary of the disturbance. All disturbances associated with the proposal are long term. With the reclamation status of the project area being rated as fair and field observations showing areas of reclamation success, expedient reclamation of disturbed land with stockpiled topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with utilization of erosion control measures (e.g., waterbars, water wings, culverts, rip-rap, etc.) would ensure land productivity/stability is regained and maximized. The BLM considers these residual effects from Alternative B with the proposed wells are likely within the parameters for acceptable

surface disturbance and surface disturbance reclamation in PRB FEIS ROD and Onshore Oil and Gas Order Number 1.

4.3. Water Resources

Adherence to the drilling COAs, the setting of casing at appropriate depths, following safe remedial procedures in the event of casing failure, and using proper cementing procedures should protect fresh water aquifers above the drilling target zone. Compliance with the drilling and completion plans and Onshore Oil and Gas Orders Nos. 2 and 7 minimize an adverse impact on ground water. The volume of water produced by this federal mineral development is unknowable at the time of permitting. “BLM may rely on the actions of state regulators. The IBLA and federal courts recognized it is appropriate for BLM to assume a proposed action complies with state permitting requirements, and rely on state analysis when evaluating the significance of effects. *Wyo. Outdoor Council v. U.S. Army Corps of Eng'rs*, 351 F. Supp. 2d 1232, 1244 (D. Wyo. 2005); PRBRC, 180 IBLA 32, 57 (2010); *Bristlecone Alliance*, 179 IBLA 51, 74-77 (2010).” In *Wyoming Outdoor Council*, the District Court held the Corps may rely on the WDEQ permitting process to “ameliorate any concerns that impacts to water quality will be significant.” Id.

4.3.1. Groundwater

4.3.1.1. Direct and Indirect Effects

The cumulative industry and regulatory experience shows that thousands of wells pierce the nation’s largest aquifer in western Texas, Oklahoma, and Kansas with essentially no direct or indirect impact to that groundwater, see, <http://www.spe.org/jpt/print/archives/2010/12/10Hydraulic.pdf>. Lastly, the EPA 2004 study and its on-going, detailed study of hydraulic fracturing yielded, thus far, no immediate cautions, concerns, or warnings that present industry and regulatory practices endanger ground water or require immediate changes.

At the time of permitting, the volume of water that will be produced in association with these federal minerals is unknown. The operator will have to produce the wells for a time to be able to estimate the water production. In order to comply with the requirements of Onshore Oil and Gas Order #7, Disposal of Produced Water, the operator will submit a Sundry to the BLM within 90 days of first production which includes a representative water analysis as well as the proposal for water management. Historically, the quality of water produced in association with conventional oil and gas has been such that surface discharge would not be possible without treatment. Initial water production is quite low in most cases. There are three common alternatives for water management: Re-injection, deep disposal or disposal into pits. All alternatives would be protective of groundwater resources when performed in compliance with state and federal regulations.

4.3.1.2. Cumulative Effects

BLM foresees minimal cumulative effects either to or from the use of ground water for the proposed well. BLM anticipates no need for mitigation measures beyond the design features and programmatic COAs. BLM anticipates no residual effects to ground water from this project.

4.3.1.3. Mitigation Measures

Adherence to the drilling COAs, the setting of casings at appropriate depths, following safe remedial procedures, and using proper cementing procedures should protect possible fresh water aquifers. The target formation is the Minnelusa Formation with total vertical depths approximately 7,800 feet. Specific to protection of the Fox Hills Formation as described in the drilling plan, the operator will run surface casing to 800 feet, total vertical depth and cement to surface to protect potential shallow aquifers. This will ensure that ground water will not be adversely impacted by well drilling and completion operations. A gamma ray log will be run from TVD to surface. The gamma ray log will be run either with a wire line or LWD (logging while drilling) tools. The gamma ray log will indicate the top and bottom of Fox Hills Formation. Also as described in Appendix 1 of the drilling plans the operator will utilize one of the

following techniques to properly identify that the cement top is above the Fox Hills Formation: a) radioactive cement tracer and associated tools, b) cement bond log, or C) temperature survey. This will help ensure that ground water of the Fox Hills Formation will not be adversely impacted by well drilling and completion operations.

4.4. Invasive Species

4.4.1. Direct and Indirect Effects

The surface disturbance associated with construction of the proposed access road, and related facilities would present opportunities for weed invasion and spread. The activities related to the performance of the proposed project would create a favorable environment for the establishment and spread of noxious weeds/invasive plants such as Canada thistle. However, applicant committed measures will reduce potential impacts from noxious weeds and invasive plants. The operator committed to the control of noxious weeds and species of concern using the following measures identified in their integrated pest management plan (IPMP): 1) control methods, including mowing and herbicide.

4.4.2. Cumulative Effects

Cumulative effects across the project area would include a long-term loss of soil productivity associated with well pad and road construction. The activities related to the performance of the proposed project would create a favorable environment for the establishment and spread of noxious weeds/invasive plants.

4.4.3. Mitigation Measures

The proponents operated committed measures and design features are sufficient to not warrant the application of site specific conditions of approval (COAs).

4.4.4. Residual Effects

The operator's control efforts are limited to the surface disturbance associated to the project's implementation. Cheatgrass and other invasive species that are present in non-physically disturbed project areas are anticipated to continue to spread unless control efforts are expanded. Cheatgrass and to a lesser extent, Japanese brome are found in such high densities throughout NE Wyoming that a control program is not considered feasible at this time; these annual bromes would continue to be found within the project area.

4.5. Wildlife

4.5.1. Migratory Birds

4.5.1.1. Direct and Indirect Effects

The PRB FEIS discussed direct and indirect effects to migratory birds on pp. 4-231 to 4-235. BLM analyzed the effects to migratory birds from surface disturbing and disruptive activities associated with development of horizontal oil wells in the Sahara POD EA, WY-070-EA13-72, 2013, Section 4.6.2.2, pp. 31-33, incorporated here by reference. Effects and mitigation associated with this project are similar in nature, with the following additional site-specific information. During the habitat assessment, Zander (2014) identified suitable nesting habitat present for several BLM sensitive sagebrush obligates. Construction of the well pad within the proposal and associated infrastructure will remove habitat and could kill BLM sensitive migratory birds, or destroy eggs, if the habitat is removed during the nesting season.

Heater treaters, and similar facilities with vertical open-topped stacks or pipes, can attract birds. Facilities without exclusionary devices pose a mortality risk. Once birds crawl into the stack, escape is difficult and the bird may become trapped (U.S. v. Apollo Energies Inc., 611 F.3d 679 (10th Cir. 2010); see also Colorado Oil and Gas Commission, Migratory Bird Policy, accessed February 13, 2012).

4.5.1.2. Cumulative Effects

The cumulative effects associated with alternative B are within the analysis parameters and impacts described in the PRB FEIS, p. 4-235.

4.5.1.3. Mitigation

BLM will prohibit removal of occupied sage-brush obligate migratory bird habitat during the breeding season (May 1- July 31). This restriction will apply to habitat removal, unless a pre-construction nest search (within approximately 10 days of construction planned May 1-July 31) is completed. If surveys will be conducted, the operator will follow “2012 Sage-brush BLM Sensitive Migratory Bird Nest Protocol” found at the following web address:

http://www.blm.gov/wy/st/en/field_offices/Buffalo/wildlife.html. To minimize entrapment effects, the operator will equip all open-top pits, tanks, and pipes containing hydrocarbons with nets, screens, or other avian exclusion devices to prevent injury or death to migratory birds.

4.5.1.4. Residual

Nests initiated after the first week in July may be destroyed by construction after August 1st. Migratory birds nesting adjacent to the well pad or road may be disturbed by construction and production activities. A timing limitation does nothing to mitigate loss and fragmentation of habitat. Suitability of the project area for migratory birds will be negatively affected due to habitat loss and fragmentation and proximity of human activities associated with oil and gas development.

4.6. Cultural Resources

BLM policy states that a decision maker’s first choice should be avoidance of historic properties (BLM Manual 8140.06(C)). If historic properties cannot be avoided, mitigation measures must be applied to resolve the adverse effect. No historic properties will be impacted by the proposed project. Following the *State Protocol Between the Wyoming Bureau of Land Management State Director and The Wyoming State Historic Preservation Officer*, Section VI(A)(1), the Bureau of Land Management electronically notified the Wyoming State Historic Preservation Officer (SHPO) on July 1, 2014 that no historic properties exist within the area of potential effect (APE). If any cultural values (sites, features or artifacts) are observed during operation, they will be left intact and the Buffalo Field Manager notified. If human remains are noted, the procedures described in Appendix L of the PRB FEIS must be followed. Further discovery procedures are explained in Standard COA (General)(A)(1).

4.6.1. Cumulative Effects

Construction and development of oil and gas resources impacts cultural resources through ground disturbance, unauthorized collection, and visual intrusion of the setting of historic properties. Destruction of any archeological resource results in fewer opportunities to study of past human life-ways, to study changes in human behavior through time, or to interpret the past to the public. Additionally, these impacts may compromise the aspects of integrity that make a historic property eligible for the National Register of Historic Places. Recording and archiving basic information about archaeological sites and the potential for subsurface cultural materials in the proposed project area may serve to partially mitigate potential cumulative effects to cultural resources.

Fee actions constructed in support of federal actions can result in impacts to historic properties. Oil and gas development on split estate often includes construction of infrastructure that does not require permitting by BLM. Project applicants may integrate infrastructure associated with wells draining fee minerals with wells that require federal approval. BLM has no authority over fee actions, which can impact historic properties. BLM has the authority to modify or deny approval of federal undertakings on private surface, but that authority is limited to the extent of the federal approval. Historic properties on private surface belong to the surface owner and they are not obligated to preserve or protect them. The BLM may go to great lengths to protect a site on private surface from a federal undertaking, but the same

site can be legally impacted by the landowner at any time. Archeological inventories reveal the location of sensitive sites and although the BLM is obligated to protect site location data, information can potentially get into the wrong hands resulting in unauthorized artifact collection or vandalism. BLM authorizations that result in new access can inadvertently lead to impacts to sites from increased visitation by the public.

4.6.2. Mitigation Measures

If any cultural values (sites, features or artifacts) are observed during operation, they will be left intact and the Buffalo Field Manager notified. If human remains are noted, the procedures described in Appendix L of the PRB FEIS must be followed. Further discovery procedures are explained in Standard COA (General)(A)(1).

4.6.3. Residual Effects

During the construction phase, there will be crews working across the project area using heavy construction equipment without the presence of archaeological monitors. Due to the extent of work and the surface disturbance caused by large vehicles, it is possible that unidentified cultural resources can be damaged by construction activities. The increased human presence associated with the construction phase can also lead to unauthorized collection of artifacts or vandalism of historic properties.

5. CONSULTATION/COORDINATION:

BLM Consulted or Coordinated with the Following on this Analysis; OSP (Onsite Presence):

Contact	Organization	OSP?	Contact	Organization	OSP?
Mary Hopkins	WY SHPO	No	Tate Smith	State of Wyoming	No

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