**DECISION RECORD**
**Ballard Petroleum Holdings, LLC, GDU Federal 1 Plan Of Development (POD)**
**Environmental Assessment (EA), WY-070-EA15-240**
**Bureau of Land Management, Buffalo Field Office, Wyoming**

**DECISION.** The BLM approves Ballard Petroleum Holdings, LLC, (Ballard) GDU Federal 1 POD oil and gas well applications for permit to drill (APDs) described in Alternative B of the environmental assessment (EA), WY-070-EA15-240, incorporated here by reference. This approval includes well support facilities.

**Compliance.** This decision complies with or supports:

- Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701).
- 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 (2001, 2003, 2011).
- Greater Sage-Grouse Habitat Management Policy on Wyoming BLM Administered Public Lands (WY-IM-2012-019) and Greater Sage-Grouse Interim Management Policies and Procedures (WO-IM-2012-043).

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

**Well Site.** BLM approves 2 APDs and support facilities at the following locations:

| Name and # | Twp | Rng | Sec | Qtr | Surface Hole Lease | Lateral Lease | Bottom Hole Lease |
|---|---|---|---|---|---|---|---|
| GDU Federal 12-8PH | 47N | 73W | 8 | SWNW | Federal | Federal/Fee | Fee |
| GDU Federal 14-8PH | 47N | 73W | 8 | SWSW | Federal | Federal/Fee | Fee |

**Limitations.** There are no denials or deferrals. Also see the conditions of approval (COAs).

**THE FINDING OF NO SIGNIFICANT IMPACT (FONSI).** Analysis of Alternative B of the EA, WY-070-EA15-240 and the FONSI (incorporated here by reference) found Ballard's proposal for the GDU Federal 1 POD oil wells 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 APDs for 30 days, received no comments, and then internally scoped them. There are no new policies or information received post analysis that affects this project.

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

1. BLM and Ballard included design features and mitigation measures (conditions of approval (COAs)) to reduce environmental impacts while meeting the BLM's need. For a complete description of all site-specific COAs, see the COAs.
   a. The impact of this development cumulatively contributes to the potential for local extirpation of the Greater Sage Grouse (GSG) yet its effect is acceptable because it is outside priority habitats and is within the parameters of the PRB FEIS/ROD and current BLM (WO-IM-2012-043) and Wyoming (WY-IM-2012-019) GSG conservation strategies.
   b. With application of Standard Operating Procedures (SOPs), applied mitigation, Required Design

Features, and COAs identified for Greater Sage-Grouse under the proposed action, impacts caused by surface-disturbing and disruptive activities would be minimized.

c. There are no conflicts anticipated or demonstrated with current uses in the area.

2. The Resource Management Plan (RMP) for the Buffalo Field Office is currently undergoing revision. The Proposed RMP and Environmental Impact Statement were released in May 2015. The proposed action was screened against the Proposed RMP to ensure that the proposed action would not preclude BLM's ability to select any alternative in a ROD. The proposed action was also determined to not be inconsistent with the direction outlined in the RMP's Proposed Alternative.
3. Ballard will conduct operations to minimize adverse effects to surface and subsurface resources, prevent unnecessary surface disturbance, and conform with currently available technology and practice.
4. The selected alternative will help meet the nation's energy needs and help stimulate local economies by maintaining workforce stability.
5. 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.
6. The operator certified it has a surface access agreement.
7. The project lacks wilderness characteristics. A wilderness characteristics inventory was completed in 2013; no lands with wilderness characteristics were identified outside the Big Horn Mountains. The inventory is available at: http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo/docs.html.
8. These APDs are 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.

**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: 7/6/2015

**FINDING OF NO SIGNIFICANT IMPACT**
**Environmental Assessment (EA), WY-070-EA15-240, Applications for Permit to Drill (APDs)**
**Ballard Petroleum Holdings, LLC, GDU Federal 1 Plan Of Development (POD)**
**Bureau of Land Management, Buffalo Field Office, Wyoming**

**FINDING OF NO SIGNIFICANT IMPACT (FONSI).** Based on the information in the EA, WY-070-EA15-240, 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) 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.

**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 the project does not contain unique characteristics identified in the 1985 RMP, 2003 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. 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.

Field Manager: /s/ Duane W. Spencer Date: 7/6/2015

**Environmental Assessment (EA), WY-070-EA15-240**
**Applications for Permit to Drill (APDs)**
**Ballard Petroleum Holdings, LLC, GDU Federal 1 Plan Of Development (POD)**
**Bureau of Land Management, Buffalo Field Office, Wyoming**

# 1. INTRODUCTION

BLM provides an EA for Ballard Petroleum Holdings, LLC, (Ballard) GDU Federal 1 Plan of Development (POD) oil and gas well applications for permit to drill (APDs). BLM's jurisdiction for this proposal is fee (non-federal) surface – overlying federal minerals, draining both federal and fee minerals in the horizontal. This site-specific analysis tiers into and incorporates by reference the information and analysis in the Final Environmental Impact Statement and 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) per 40 CFR 1508.28 and 1502.21. One may review these documents at the BLM Buffalo Field Office (BFO) and on our website:
http://www.blm.gov/wy/st/en/field_offices/Buffalo.html.

**Table 1.1. Proposed Wells**

| Name and # | Twp | Rng | Sec | Qtr | Surface Hole Lease | Lateral Lease | Bottom Hole Lease |
|---|---|---|---|---|---|---|---|
| GDU Federal 12-8PH | 47N | 73W | 8 | SWNW | Federal | Federal/Fee | Fee |
| GDU Federal 14-8PH | 47N | 73W | 8 | SWSW | Federal | Federal/Fee | Fee |

## 1.1. Background

BLM received the APDs on August 22, 2014 and conducted the on-sites on January 20, 2015. The project post onsite deficiency letter was sent out on May 19, 2015. Some deficiencies for the GDU Federal 1 POD were noted in that letter in the Legal Instrument Exam and the Master Surface Use Plan. Some responses to those deficiencies were received by the BLM on May 19, 2015 and May 28, 2015 that adequately addressed the deficiencies noted in the letter.

## 1.2. Need for the Proposed Project

BLM's need for this project is to determine whether, how, and under what conditions to support the Buffalo Resource Management Plan's (RMP) goals, objectives, and management actions with allowing the exercise of the operator's conditional lease rights to develop fluid minerals on federal leases. BLM incorporates by reference here, the APD information (40 CFR 1502.21). Conditional fluid mineral development supports the RMP and 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 APDs 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 to identify potentially affected resources, land uses, resource issues, regulations, and site-specific

circumstances. The APDs and associated plans as well as the administrative record (AR) are available for review at the BFO. 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.

## 2. PROPOSED PROJECT AND ALTERNATIVES

### 2.1. Alternative A – No Action

The no action alternative would deny these APDs requiring the operator to resubmit APDs that complied with statutes and the reasonable measures in the Powder River Basin Oil and Gas Project Final Environmental Impact Statement Record of Decision (PRB FEIS ROD) in order to lawfully exercise conditional lease rights. The PRB Final Environmental Impact Statement (FEIS) considered a no action alternative, pp. 2-54 to 2-62.

### 2.2. Alternative B Proposed Action (Proposal)

**Overview.** Ballard requests BLM's approval for 2 APDs from 2 pads and supporting infrastructure; see Table 1.1. The proposal is to explore for, and possibly develop oil and gas reserves in the Parkman Formation at 6,660 and 6,679 feet total vertical depth (TVD). These wells will run horizontally in the north-east direction for 4,513 feet from the 12-8PH pad and 4,286 feet from the 14-8PH pad. The project area is 16 miles southeast of Gillette, Campbell County, Wyoming. Project elevation is 4,894 feet at the 12-8PH pad and 4,904 feet at the 14-8PH pad. The topography has gently sloped draws rising to mixed sagebrush and grassland uplands. Ephemeral tributaries of the Upper Belle Fourche River drain the area. The area climate is semi-arid, averaging 10-14 inches annual precipitation, about 60% of which occurs between April and September.

**Drilling, Construction & Production design features include:**

**Access**

- Access is primarily via WY Hwy 50 and Hayden Road.
- Ballard proposes 0.77 miles of improved access road. The running surface will be 20 feet with a disturbance width of 44 feet. The access will be a template crown and ditch road with 3 cattle guards.
- All roads will be maintained to meet BLM standards during the entire life of the project area.
- During interim reclamation the ditches will be seeded with a BLM/landowner approved seed mix to prevent erosion and maintain topsoil viability.

**Well Locations**

- The pads will have 2:1 and 3:1 cut and fill slopes during drilling and production.
- These wells will use a lined pit closed loop system at the pads to hold the cuttings.
- Up to 8 x 400 bbl tanks for oil and water will be placed on these two locations.
- No staging areas, man camps/housing facilities are anticipated to be used off-site. Working trailers and sleeping trailers will be placed on the well pads during the drilling and completion of the wells.
- If the wells become producers, production facilities will be located at the well sites and will include pumping units, storage tanks, buildings, oil-water separators (heater-treaters). There will be no pits at these producing well locations.
- Dikes will be constructed completely around production facilities, i.e. production tanks, water tanks, and heater treaters. The dikes will be constructed of corrugated steel, approximately 3 feet high, and hold the capacity of the largest tank plus 10%. The load-out line will be outside of the dike areas. A drip barrel or "Getty-Box" will be installed under the end of all load-out lines.

**Drilling and Completion Operations**

- Hydraulic fracturing (HF) operations are planned as a 'plug and perf' operation done in stages. All fresh water will be contained in approximately 20 portable & horizontal frac tanks per pad. No additional well pad disturbance is anticipated for HF operations. Completion flow-back water will be held in tanks on location and trucked to a disposal facility permitted by Wyoming Department of Environmental Quality (WDEQ). See the AR for water sources.
- During drilling the average daily truck traffic is estimated to be 6 trucks per day.
- During production the average daily truck traffic is estimated to be 6 trucks per day.
- Well completion will be conducted within approximately 6 days including mobilization of rig, well completion fleet trucks carrying water and sand with peak truck traffic estimated to be 30 trucks per day.
- Drilling activities will require approximately 15,000 bbls water per well sourced from any of 4 privately permitted stock wells all within one township's distance from the drilling sites and described in detail in the administrative record.
- Completion activities will require approximately 1,700 bbls of water per stage (14-16 stages) per well (2) sourced as described above.
- A detailed completion operations plan is outlined in the surface use plan (SUP).

**Table 2.1. Anticipated Drilling and Completion Sequence and Timing (per well, per pad)**

| Drilling and Completion Step | Approximate Duration |
|---|---|
| Build Location (roads, pad, and other initial infrastructure) | 30 days |
| Mobilize Rig | 5 days [1] |
| Drilling (24/7) | 30 days |
| Schedule/logistics | 30 days |
| Completion (setup, completion, demobilization) | 6 days |
| [1] Depending on distance and need to add supplemental drilling equipment, such as skidding plates. | |

**Table 2.2. Disturbance Summary GDU Federal 1 POD:**

| Activity | Length (feet) | Width (feet) | Acres of Disturbance | Interim Disturbance |
|---|---|---|---|---|
| GDU Federal 1 POD constructed pads (x2) with cuts/fills and topsoil/spoil disturbances. | varies | varies | 12.78* | 9.44** |
| Proposed Improved Roads (20') | 4,066 | 44 | 4.11 | 1.15 |
| **Total Disturbance for this POD** | | | **16.89** | **10.59** |

* The pads are 370' x 425' with an average disturbance of 6.39 acres each.
** Interim disturbance is 9.44 acres averaging 4.72 acres each.

**Plan of Operations.**
The proposal conforms to all Bureau standards and incorporates appropriate best management practices, required and designed mitigation measures determined to reduce the effects on the environment. BLM reviewed and approved a surface use plan of operations describing all proposed surface-disturbing activities pursuant to Section 17 of the Mineral Leasing Act, as amended. This analysis also incorporates and analyzes the implementation of committed mitigation measures in the SUP, drilling plan, and the standard conditions of approval (COAs) found in the PRB FEIS ROD, Appendix A.

**Reasonably Foreseeable Activity.**
The reasonably foreseeable activity (RFA) for this and adjacent areas includes oil/gas exploration on 640 acre spacing and possible 320 acre spacing for horizontal wells and 80 acre spacing for vertical coal-bed natural gas (CBNG) wells. (This does not preclude the RFA spacing analysis in the PRB FEIS or applying to drill multiple wells from this pad further reducing the surface disturbance per well.) The RFA

in this project analysis area consists of 119 proposed notices of staking (NOSs) and APDs. The project analysis area is within 5 miles of these proposed wells. Potential APD submittals or reasonably foreseeable activity included in this analysis could consist of multiple wells on an existing pad or tie into existing supporting infrastructure; tank batteries, pipelines, power lines and transportation networks.

### 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, 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 Section 2, or where changes in circumstances or regulations occurred since adoption of analyses to which the EA tiers or incorporates by reference. 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 project area, Wyoming Oil and Gas Conservation Commission (WOGCC) December, 2014. The total number of conventional wells in the Buffalo planning area is 2,855, which includes 845 horizontal wells (federal, fee, and state) as of December 2014. This agrees with the PRB FEIS which analyzed the reasonably foreseeable development of 51,000 CBNG and 3,200 natural gas and oil wells. The State of Wyoming and BLM have also approved wells that operators may develop in the near future. In addition, Ballard and other operators are likely to continue seeking permits to develop unconnected leases within or near the project area.

**Table 3.1. NEPA Analyses Which BLM Incorporates by Reference either as similar drilling analyses or as substantially similar analyses in the semi-arid sage-brush, short grass prairie**

| # | POD / Well Name | Operator | NEPA Analysis # | # / Type Wells | Approved Mo/Yr/Update |
|---|---|---|---|---|---|
| 1[a] | Mufasa Fed 11-31H | Lance | WY-070-EA12-062 | 1 Oil | 3/2012 |
| 2[b] | Crazy Cat East | Anadarko | WY-070-EA13-028 | 24+/- Oil Pads | 2/2013 |
| 3 | Sahara POD | Lance | WY-070-EA13-072 | 21Oil | 3/2013 |

See also: SDR WY-2013-005, particularly noting pp. 2-3, incorporating the entirety here by reference.

a. Incorporate those sections describing and analyzing hydraulic fracturing, its supporting analysis, and the Greater Sage-grouse Section 3.7.12 and 4.8.2.

b. Incorporate those sections describing and analyzing hydraulic fracturing and its supporting analysis to include but not limited to traffic, water, and air quality.

### 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. PRB coal review documents are available at:
http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/prbdocs.html.

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. Adgate, et al. (2014) advanced a hypothesis that air and water quality effects from HF may negatively impact human health but concluded that there were "major uncertainties" and a "paucity of baseline data" after drilling 153,260 wells since 2004. They called for more research funding.
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;
- Particulate matter (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;
- NOx, PM, and other emissions from diesel trains and,
- SO2 and NOx from power plants.

### 3.2. Soils, Ecological Sites, and Vegetation

Project area soils developed in alluvium and residuum weathered from sandstone and shale. Lithology consists of light to dark yellow and tan siltstone, sandstones and shale with minor coal seams resulting in a wide variety of surface and subsurface textures. The project area average useable topsoil depths are approximately 10 to 20". Reclamation potential of soils also varies in the project area. The main soil limitations include: depth to bedrock, low organic matter content, and high erosion potential especially in areas of steep slopes.

The Campbell County Survey Area, Wyoming Soil Survey Geographic (SSURGO) Database WY605, provide detailed soils identification and data. NRCS performed the soil survey according to National Cooperative Soil Survey standards. The BLM uses county soil survey information to predict soil behavior, limitations, or suitability for a given activity or action. The agency's long term goal for soil resource management is to maintain, improve, or restore soil health and productivity, and to prevent or minimize soil erosion and compaction. Soil management objectives are to ensure that adequate soil protection is consistent with the resource capabilities. Soils and landforms of this area may present distinct challenges for development, and/or eventual site reclamation. Dominant/Important Soils/Ecological sites in the affected area are loamy soils. The major ecological sites for the project are loamy at both pads.

**Table 3.2. Dominant Soils by Map Unit Symbol (MUS) in the Proposal Area**

| Pad Location | MUS | Map Unit Name | Ecological Site |
|---|---|---|---|
| 12-8PH | 211 | Shingle-Worf loams, 3 to 30% slopes | Shallow Loamy |
| 14-8PH | 128 | Cushman-Worf loams, 3 to 15% slopes | Loamy |

NOTE: area of analysis includes access (proposed, new disturbance) to well location

#### 3.2.1. Ecological Sites and Vegetation

Livestock grazing is the predominant land use in the area as well as oil and gas development. The project area is comprised primarily of Sandy and Loamy ecological sites and the major plant community identified in the project area is Mixed Sagebrush/Grass Plant Community. These sites occur on uplands and hills on uplands and ridges and hills on sedimentary plains. The parent material consists of alluvium

over residuum deposits derived from sandstone and shale. Depth to a root restrictive layer is 20-40 inches. The natural drainage class is well drained. Shrink swell potential is moderate. The main soil limitations include: low organic matter (0 to 2%) content and soil droughtiness. The low annual precipitation should be considered when planning a seeding.

**Mixed Sagebrush/Grass Plant Community**

This mixed sagebrush/grass community is under moderate, season-long livestock grazing 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 may include needle-and-thread, 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 10% to 20%. Fringed sagewort is commonly found. Plains pricklypear also occurs.

When compared to the Historic Climax Plant Community, 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.

## 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 State's surface waters.

### 3.3.1. Groundwater

A search of the WSEO Ground Water Rights Database showed 3 registered stock water wells within 1 mile of the proposed wells with a depth range of 110 to 1,337 feet. Refer to the PRB FEIS for additional information on groundwater, pp. 3-1 to 3-36. In the PRB, the Fox Hills formation is the deepest freshwater aquifer which merits specific attention. In this area, the depth to the Fox Hills is 5,566 feet at the 12-8PH well and 5,584 feet at the 14-8PH well.

### 3.3.2. Surface Water

The project area is drained by tributaries to the Belle Fourche River. Most of the area drainages are ephemeral (flowing only in response to a precipitation event or snow melt) to intermittent (flowing only at certain times of the year when it receives water from alluvial groundwater, springs, or other surface source – PRB FEIS, Glossary). The channels are primarily well vegetated grassy swales, without defined bed and bank. See the PRB FEIS for a surface water quality discussion, pp. 3-48 to 3-49.

## 3.4. Wetlands/Riparian

GDU Federal 1 POD is located on an upland site and accessed by existing roads also located in uplands. No wetland or riparian habitats are impacted by this project.

## 3.5. Invasive or Noxious Species

Cheatgrass (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) exist in the affected environment. These species are found in high densities and numerous locations throughout NE Wyoming.

Balch, 2013, linked the proliferation of cheatgrass in semi-arid environments to the increased frequency and severity of wildfire. Both species were noted in the project area in low densities. A thorough records review and onsite inspection revealed no additional invasive or noxious weeds present in the project area.

## 3.6. Wildlife

The PRB FEIS identified wildlife species occurring in the PRB, pp. 3-113 to 3-206. BLM performed a habitat assessment in the project area on January 20, 2015. The biologist evaluated impacts to wildlife resources and recommended project modifications where wildlife issues arose. BLM wildlife biologists also consulted 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. A wildlife survey and habitat report was submitted by the operator which was performed by Western Land Services during the 2014 survey season (see AR). 2015 data has not been submitted to the BLM. The majority of the wildlife habitats has been fragmented by oil and gas development and it is unlikely biological conditions have changed since last year. Therefor the analysis and affected environment are likely the same for 2015 as in 2014. Site specific information is described below for known species suspected to occur and become impacted beyond the analysis of the PRD 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, livestock grazing, ranching operations, dry land agriculture, overhead power lines, conventional oil and gas, two track roads, an improved roads.

Habitats are comprised of sagebrush grassland and mixed-grass prairie. The dominant vegetation is Wyoming big sagebrush and the understory is a mix of pasture grasses (Crested wheatgrass, blue gramma, western wheatgrass, threadleaf sedge, and cheatgrass). The habitat is similar in nature to the habitats (sagebrush obligate migratory birds and Greater sage-grouse habitat) discussed in the Sahara POD EA, WY-070-EA13-72, incorporated here by reference.

### 3.6.1. Threatened, Endangered, Candidate, Special Status (Sensitive) Species (SSS)

#### 3.6.1.1. Candidate Species – Greater Sage-Grouse (GSG)

Nesting GSG habitat exists within the proposal area. The majority of the sagebrush stands have been fragmented by oil and gas development. No occupied leks have been documented within two miles of the proposal. The affected environment for this proposal is similar to a recent approved project (Sahara POD) BLM analyzed. Therefore, the Sahara POD EA, WY-070-EA13-72 analysis is incorporated here by reference: Affected Environment (Section 3.7.4.1, p.18-19). The BLM IM WY-2012-019 establishes interim management policies for proposed activities on BLM-administered lands, including federal mineral estate, until RMP updates are complete.

#### 3.6.1.2. Migratory Birds

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 onsites, the BLM biologist identified suitable nesting habitat present for several BLM sensitive sagebrush obligates. Construction of all of the well pads 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.

### 3.7. Cultural

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. 70130075) was performed in order to locate specific historic properties which may be impacted by the proposed project. No cultural resources are located in the proposed project area.

## 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; and through the analysis and approval of other projects. 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. Under the no action alternative, on-going well field operations would continue as would the development of fee wells. 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 significant 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 air quality direct, indirect, cumulative, and residual effects from the analyses in Table 3.1, above as they are materially similar to those for this proposal. 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, or federal air quality standards and this project is within the development parameters.

### 4.2. Soils, Ecological Sites, and Vegetation

#### 4.2.1. Soils and Vegetation

##### 4.2.1.1. Direct and Indirect Effects

The PRB FEIS analyzed direct and indirect impacts to soils associated with fluid mineral development. For these effects refer to p. 4-134-149 of the PRB EIS.

**Construction Activities**

The greatest impacts to the soil resources associated with this project would occur with the construction of the well pads and new roads. Construction of these requires grading and leveling, with the greatest level of effort required on more steeply sloping areas. These impacts would begin immediately as the soils would be subjected to grading and construction activities and impacts would continue for the term of

operations. The duration and intensity of these impacts would vary according to the type of construction activity to be completed and the inherent characteristics of the soils to be impacted.

The proposed APDs require 16.89 acres total disturbance to safely drill the proposed wells. During the construction and drilling phase of the project, the operator plans to maintain cut and fill slopes at 1½:1(67%), 2:1(50%) slopes. These constructed slopes will be bare ground void of vegetation thus identified as highly erosive due to water erosion, and the total 16.89 acres are classified as highly erosive for wind erosion. The predicted construction cut depth exceeds the identified soil depth, thus impacting soil horizons described as "little affected by pedogenic processes", or unaltered parent material. The physical and chemical properties of this material may be variable and limiting in its potential to support plant growth, variable in erosion potential and suitability for construction material. The 12.78 acres of engineered pad areas are defined as Low Reclamation Potential (LRP) areas per Wyoming Reclamation Policy, and p. 4-143 and 4-149 of the PRB-EIS.

The well pads will be reduced to 9.44 acres of total pad disturbance at interim reclamation for the production phase. See the Master Surface Use Plan (MSUP) in the AR for an illustration of the well pad reduction as per Onshore Oil and Gas Order Number 1 Surface Use Plan of Operations. Cut slopes and fill slopes will be maintained at 2:1 and 3:1 respectively as per standard conditions of approval. Road running surface is 20 feet with the remaining right-of-way (ROW) to be re-contoured and seeded. The operator committed measures and attached mitigation measures listed below this section reduce the potential impacts to the soil resource to levels described in the PRB-FEIS.

Changes in soil productivity would depend on the success of the stabilization and interim reclamation efforts. The replaced soil could support stable and productive vegetation adequate in quantity and kind to support the post disturbance land uses, wildlife habitat and rangeland. After reclamation (interim and final), the soils would be unlike the pre-disturbance soils in structure, horizon, bulk density, and chemical composition. The new soils would be more uniform in type, thickness and texture than the pre-disturbance soils. The soil-forming processes would be disturbed, resulting in the alteration of soil characteristics and, consequently, the taxonomic classification of the soils. Productivity capabilities, biologic activity, and nutrient content also would be affected.

#### 4.2.1.2. Cumulative Effects

The PRB FEIS defined the duration of disturbance, pp. 4-1 and 4-15. The impacts to the soil resource described in the direct and indirect effects section could be minimized by reducing initial surface disturbance, successful site stabilization and maximum interim reclamation, as committed to by the operator in their POD Surface Use Plan and as required by the BLM through COAs. Most of the disturbance associated with the construction of well pads would be short term. See Sheet 1 of 1 in the MSUP for production phase pad design (interim reclamation phase).

#### 4.2.1.3. Mitigation Measures

The operator will reduce impacts to vegetation and soils from surface disturbance by following its plans (MSUP, design features, engineered designs), Storm Water Pollution Prevention Plan (SWPPP) requirements, reclamation plan and the BLM Wyoming Reclamation Policy). These practices, as well as other approved mitigation measures will result in less surface disturbance and environmental impacts. In addition the following site specific COAs are added as mitigation.

1. The entire access road must be fully upgraded as described in the POD (including all water control structures such as wing ditches, culverts, relief ditches, turnouts, surfacing, etc.) and functional to BLM standards prior mobilizing the drilling equipment to the well location.
2. Re-contouring and interim reclamation will be initiated as soon as is practicable but not more than 6 months from the date of the well completion incorporating stored soil material into that portion of the well pad not needed for well production; exception(s) may be granted with sufficient justification.

3. Soil compaction will be remediated on all compacted surfaces and prior to the redistribution of topsoil on disturbed surfaces to the depth of compaction by methods that prevent mixing of the soil horizons. BLM's recommended methods are sub-soiling, para-plowing, or ripping with a winged shank. Scarification is acceptable on areas identified as very shallow or shallow soils.
4. A 30 day stabilization requirement from initial disturbance is applied to all wells and access/pipelines for the entire project. Stabilization BMPs include, but are not limited to; straw waddles, rock check dams, surface roughening, ditch and berms, erosion matting/blankets, seeding and mulching, and spraying tackifier on cut/fill slopes and topsoil/spoil piles.

#### 4.2.1.4. Residual Effects

The PRB FEIS identified residual effects (p. 4-408). Residual effects across the project area would include a long-term loss of soil productivity associated with well pads and roads. Alteration of soils would result in the formation of new soil with different properties. Post disturbance productivity should be simular to predisturbance. In spite of the above residual effects, the BLM considers that Alternative B is within the parameters for surface disturbance and surface disturbance reclamation in PRB FEIS ROD.

### 4.2.2. Vegetation and Ecological Sites

#### 4.2.2.1. Direct and Indirect Effects

The PRB FEIS discusses direct and indirect effects to ecological sites and vegetation (p. 4-153 to 4-164). The Sahara POD discusses direct and indirect effects to soils and vegetation (p. 23 to 25). The proposed action would impact the existing plant communities, species richness, diversity, and structure that occur on the site and the transition between the communities. Other impacts anticipated to occur include those in the direct and indirect effects listed above under the soils section. Direct effects to ecological sites would occur from ground disturbance caused by construction practices. Short term effects would occur where vegetated areas are disturbed but later reclaimed as soon as practical from initial disturbance. Long-term effects would occur where well pads, roads, and other semi-permanent facilities, result in loss of vegetation and prevent reclamation for the life of the project. Other impacts include a reduction in the utility of interim reclaimed areas because of reduced species and landscape diversity on reclaimed sites, increased soil erosion, and habitat loss for wildlife and livestock.

#### 4.2.2.2. Cumulative Effects

The PRB FEIS discusses the cumulative effects to ecological sites (pp. 4-153 to 4-172). Cumulative effects to ecological sites include the further alteration of disturbance regimes from the increased disturbance, increase in noxious weeds, and alterations in vegetation community's diversity and cover.

#### 4.2.2.3. Mitigation Measures

The proponent's operator committed measures and design features are sufficient to not warrant the application of site specific conditions of approval. (COAs)

#### 4.2.2.4. Residual Effects

Residual effects were also identified in the PRB FEIS, p. 4-408. Residual effects include short term loss of vegetative cover during construction and interim reclamation and long-term vegetation loss on well locations and access roads. The potential spread and establishment of weeds, and alteration of species biodiversity until successful final reclamation. Successful interim reclamation should create a stable functioning ecosystem that prepares the sites for eventual final reclamation, which would reduce the residual effects of the proposed action.

## 4.3. Water/Groundwater Resources

Ballard's drilling program provides protection for shallow groundwater sources as well as for the Fox Hills formation. The calculated cement volume and casing design includes centralizers on every joint of casing from 100 feet above to 100 feet below the Fox Hills aquifer to facilitate adequate cement coverage.

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 will protect fresh water aquifers above the drilling target zone. The operator will set surface casing at 2,200 feet for both wells to provide additional protection for shallow groundwater aquifers and coal zones. 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.

#### 4.3.1. Cumulative Effects

Ballard will have to produce the wells for a time to be able to estimate the volume and quantity of water production. To comply with Onshore Order Oil and Gas Order No. 7, Disposal of Produced Water, Ballard will submit a Sundry to the BLM within 90 days of first production which includes a representative water analysis and the final proposal for water management. The quality of water produced in association with conventional oil and gas historically was such that surface discharge would not be possible without treatment. Initial water production is quite low in most cases. There are 3 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.

#### 4.3.2. Mitigation Measures

Adherence to the drilling COAs, the setting of casing at appropriate depths, following safe remedial procedures in the event of casing failure, and utilizing proper cementing procedures would protect fresh water aquifers above the target zone. Adherence to WDEQ permits and regulations will also mitigate impacts from produced water. This will ensure that groundwater will not be adversely impacted by well drilling and completion operations.

### 4.4. Invasive Species

#### 4.4.1. Direct and Indirect Effects

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 frequency; 2) Preventive practices; and 3) Education. The use of existing facilities along with the surface disturbance associated with construction of proposed access roads, pipelines, 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. However, applicant committed measures will reduce potential impacts from noxious weeds and invasive plants.

#### 4.4.2. Cumulative Effects

Cumulative effects resulting from noxious and invasive weed species are discussed in the PRB FEIS, p. 4-171.

#### 4.4.3. Mitigation

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

Control efforts by the Operator would be limited to the surface disturbance associated the construction and operation of the project. Cheatgrass and other weed species that are present within non-physically disturbed areas of the project area are anticipated to continue to spread unless control efforts are expanded. Efforts to treat some infestation areas are being made by BLM, USDA, WGFD and other partners.

## 4.5. Wildlife

### 4.5.1. Greater Sage-Grouse

Effects (Direct and indirect, Cumulative, Mitigation, and Residual) to GSG from surface disturbing and disruptive activities associated with development of horizontal oil wells were analyzed in the Sahara POD EA, WY-070-EA13-72, 2013, Section 4.6.4.1, pp. 34-37, incorporated here by reference. Activities associated with development of this project are anticipated to be similar in nature, with the following additional site-specific information.

The proposal area contains suitable nesting habitat. Construction of the well pads and associated infrastructure will cause fragmentation of sagebrush stands and result in the direct loss of an estimated 16.89 acres of GSG habitat (see Table 2.2. Disturbance Summary). Noise and human disturbance associated with roads, construction, drilling, and completion will be disruptive to GSG. Implementation of the project will adversely impact nesting habitat, both through direct loss of suitable habitats and avoidance of the area by GSG due to fragmentation and anthropogenic activity. Because there are no documented leks with 2 miles of the proposed disturbance, no mitigation will be applied and residual impacts will be the same as the direct and indirect impacts described above.

### 4.5.2. Migratory Birds

#### 4.5.2.1. Direct and Indirect Effects

The PRB FEIS discussed direct and indirect effects to migratory birds on pp. 4-231 to 4-235. Construction of the well pads and associated infrastructure will cause fragmentation of sagebrush stands and result in the direct loss of an estimated 16.89 acres of migratory bird habitat. 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 onsites, the BLM biologist identified suitable nesting habitat present for several BLM sensitive sagebrush obligates. Construction of the well pads 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). To minimize these 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.

#### 4.5.2.2. Cumulative Effects

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

#### 4.5.2.3. Mitigation Measures

Construction of the proposal (vegetation removal) will occur outside of the sagebrush obligate migratory bird breeding season (May 1- July 31) since suitable nesting habitat for sagebrush obligates is present. This restriction will apply to habitat removal, unless a pre-construction nest search (within 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.

#### 4.5.2.4. Residual Effects

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 V(E)(iv), the Bureau of Land Management electronically notified the Wyoming State Historic Preservation Officer (SHPO) on June 22, 2015, 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) and in Appendix K of the Wyoming Protocol.

### 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 numerous 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. List of Preparers: Persons and Agencies Consulted (BFO unless otherwise noted)

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