DECISION RECORD
Petro-Hunt LLC., Cherokee Ridge Alpha Plan of Development (POD)
Environmental Assessment (EA), WY-070-EA12-070
Buffalo Field Office, Bureau of Land Management

DECISION. The BLM approves Petro-Hunt, LLC. (PH), Cherokee Ridge Alpha gas and oil well applications for permit to drill (APDs) as described in Alternative B of the EA, WY-070-EA12-070 incorporated here by reference. This approval includes the wells' support facilities.

Compliance. This decision complies with:
- 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); to include Onshore Order No. 1.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- National Historic Preservation Act of 1966 (NHPA) (16 USC 470).
- Buffalo Resource Management Plan (RMP) 1985, Amendments 2001, 2003, 2011.

Consultation. This decision considered:
- BLM Washington Office Instruction Memorandum No. 2009-078, Processing Oil and Gas Application for Permit to Drill for Directional Drilling into Federal Mineral Estate from Multiple-Well Pads on Non-Federal Surface and Mineral Locations, 2009.
- Wyoming BLM State Director Review, SDR No. WY-2011-010, EOG Resources, Inc. **v.** Pinedale Field Office, 2011.

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

Well Site. BLM approves the following APDs and support facilities:

#	Well Name	Well #	QTR	SEC	TWP	RNG	Lease
1	CHEROKEE RIDGE ALPHA USA	44-71-8A-1H	SESE	5	44N	71W	WYW140211
2	CHEROKEE RIDGE ALPHA USA	44-71-5D-1H	NENE	8	44N	71W	WYW135568
3	CHEROKEE RIDGE ALPHA USA	*44-71-34B-1H	SWSW	27	44N	71W	WYW132214
4	CHEROKEE RIDGE ALPHA USA	*44-71-31C-1H	SWSW	31	44N	71W	WYW118520
5	CHEROKEE RIDGE ALPHA USA	44-72-12A-1H	SESE	1	44N	72W	WYW124458
6	CHEROKEE RIDGE ALPHA USA	*44-72-25B-1H	SWSW	24	44N	72W	WYW99013

NOTE: * wells accessing fee/fee/fed mineral development

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-EA12-070, and the FONSI found PH's proposal for Cherokee Ridge Alpha will have no significant impacts on the human environment beyond those described in the PRB FEIS. There is no requirement for an EIS.

This project tiers to the following NEPA documents, in addition to the PRB FEIS.

POD Name	NEPA Document	Well Type & #	Approval
South Hay Creek	WY-070-EA02-010	CBNG 28	11/27/01

COMMENT OR NEW INFORMATION SUMMARY. BLM publically posted the proposed APDs for 30 days, received no comments, and then internally scoped them. BLM experience in the PRB (outside of the Fortification Creek Planning Area) revealed little public input or new issue discovery other than those

revealed after public scoping during development of the PRB FEIS. New information regarding sage-grouse includes the 2012 BLM-contracted population viability analysis for the Northeast Wyoming sage-grouse. That study found that there remains a viable population of sage-grouse in the PRB (Taylor et al. 2012); however threats from energy development and West Nile Virus (WNv) are impacting future viability (Taylor et al. 2012). The study indicated that effects from energy development, as measured by male lek attendance, are discernible out to a distance of 12.4 miles.

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

1. BLM and PH included mitigation measures to reduce environmental impacts while meeting the project's need. See the COAs for a description of all site-specific measures.
2. Petro-Hunt will conduct operations to minimize adverse effects to surface and subsurface resources, prevent unnecessary surface disturbance, and conform to currently available technology and practice. The selected alternative will not result in any undue or unnecessary environmental degradation. The PRB FEIS analyzed and predicted that the PRB oil and gas development would have significant impacts to the region's sage-grouse population. The impact of the Cherokee Ridge Alpha development cumulatively contributes to the potential for local extirpation yet its effect is acceptable because it is outside priority habitats and is within the parameters of the PRB FEIS/ROD and current BLM and Wyoming sage-grouse conservation strategies.
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 measures to alleviate resource impacts in their submitted surface use and drilling plans.
5. The Operator certified it has a surface access agreement or posted a 43 CFR 3814.1 bond.
6. The operator provided the BLM a true and complete copy of a document in which the owner of the surface authorizes the operator to drill a federal well from non-federal lands, and in which the surface owner or representative guarantees the Department of the Interior (Department), including BLM, access to the non-federal lands to perform all necessary surveys and inspections. (See BLM WO Instruction Memorandum No. 2009-078, p. 2, para 6).
7. The project is clearly lacking wilderness characteristics as there is no federal surface acreage.
8. These APD(s) are pursuant to the Mineral Leasing Act for the purpose of exploring or developing oil or gas and do not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390 because; one APD is in a developed field supported by a NEPA document older than 5 years. The other five APDs are proposed in a project area not analyzed by previous NEPA documentation.

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: _____ Date: 6/7/12

FINDING OF NO SIGNIFICANT IMPACT
Petro-Hunt LLC, Cherokee Ridge Alpha Plan of Development (POD)
Environmental Assessment (EA), WY-070-EA12-070
Buffalo Field Office, Bureau of Land Management

FINDING OF NO SIGNIFICANT IMPACT (FONSI). Based on the information in the EA, WY-070-EA12-070, 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 Buffalo Final Environmental Impact Statement (FEIS) 1985, and the Powder River Basin (PRB) FEIS, 2003, South Hay Creek EA, WY-070-EA02-010 to which the EA tiers; (2) Alternative B conforms to the Buffalo Field Office (BFO) Resource Management Plan (RMP) (1985, 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 reasonably foreseeable development analyzed the development of 54,200 wells. The additional development found 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, 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 are not highly controversial, highly uncertain, or involve unique or unknown 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 alternative relates to the PRB sage-grouse and its habitat decline having cumulative significant impacts, yet the small size of this project is within the parameters of the impacts denoted in the PRB FEIS. There are no cultural or historical resources present that will be adversely affected by the selected alternative. The project is clearly lacking in wilderness characteristics as there is no federal surface acreage. No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected. Alternative B 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.

For Field Manager: _____ Date: 6/7/12

ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA12-070
Petro-Hunt,LLC., Cherokee Ridge Alpha Plan of Development (POD)
Buffalo Field Office, Bureau of Land Management

1. INTRODUCTION

BLM provides an EA for Petro-Hunt, LLC, Cherokee Ridge Alpha oil well applications for permit to drill (APD). This site-specific analysis tiers into and incorporates by reference 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 South Hay Creek POD EA, WY-070-EA02-010 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 our website. These APD(s) are pursuant to the Mineral Leasing Act for the purpose of exploring or developing oil or gas and do not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390 because; 1 APD is in a developed field supported by a NEPA document older than 5 years. The other 5 proposed APDs are in a project area not analyzed by previous NEPA documentation.

Congress made a 4-part process for federal fluid mineral decisions under the long-term needs of multiple-use. First is the land use / resource management plan (RMP); here it is the PRB FEIS and ROD amendment to the BFO RMP. Second are the decisions of whether and, if so, under what conditions, to lease lands for fluid mineral development. Courts held leasing decisions are an almost irrevocable resource commitment. Third, (this phase) is deciding on the proposed POD or APD, or both: the site-specific analysis, and mitigation. Fourth is the monitoring and reclamation of wells and their features.

1.1. Background

Petro-Hunt submitted the Cherokee Ridge Alpha POD proposal on June 23, 2011 to the BFO to produce oil and natural gas from federally managed fluid mineral bearing formations of the PRB, on fee surface.

- June 23, 2011- November 2, 2011, BLM received 6 NOSs, posted, assigned, and conducted onsite visits, evaluating and modifying the proposal to minimize environmental impacts.
- January 19, 2012- Petro-Hunt submitted the Cherokee Ridge Alpha POD to the BFO with 6 APDs
- February 9, 2012- BFO sent Petro-Hunt deficiencies
- March 28, 2012- BFO received deficiencies

1.2. Need for the Proposed Project

The 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 (2003 Amendment) with allowing the exercise of the operator's conditional lease rights to develop fluid minerals on federal leases. APD information is an integral part of this EA, which BLM incorporates here by reference (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. BLM Instruction Memorandum (IM) No. 2009-078 established policy for processing APDs for horizontal drilling into federal mineral estate from multiple well pads on non-federal locations. Drilling and producing the subject wells is a federal action. Construction, operation, and reclamation of infrastructure on non-federal land are not federal actions. Drilling and producing mitigation is in the Conditions of Approval (COAs) for Conventional Application for Permit to Drill.

It is the BLM's responsibility and obligation to analyze the full effects of the federal action, and identify mitigation measures, regardless of the BLM's authority to enforce the mitigation. The BLM needs to identify mitigation measures that would reduce or eliminate the effects of a non-federal action when it is a connected action to the BLM proposed action (see Table 2.6, below, and the BLM NEPA Handbook, Section 6.8.2.1.1, Connected Non-federal Actions). Identifying mitigation outside of the BLM's jurisdiction alerts other agencies and landowners that can implement the mitigation. The probability of the other agencies implementing the mitigation measures is likely to occur, although these agencies may vary specific parameters recommended by the BLM. Full effects of the action and recommended mitigation measures are found in the Cherokee Ridge Alpha POD Surface Use Plan, WY-070-EA12-70, and BLM Recommended Conditions of Approval (COAs) for Conventional Application for Permit to Drill.

1.4. Scoping and Issues

BFO external scoping included a 30 day posting of proposed APDs and the EA's timely publication on the BFO website. Previously BFO conducted extensive external scoping for the PRB FEIS - discussed on p. 2-1 of the PRB FEIS and on p. 15 of the PRB ROD. 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 BLM recently externally scoped. External scoping of the horizontal drilling in Samson Resources EA, WY-060-EA11-181, 2011, in the PRB area received 2 comments, revealing no new issues. External scoping in 2010 and 2011 for a proposed RMP amendment revealed no new issues outside of geographically-specific ones.

The BFO interdisciplinary team (ID team) conducted internal scoping by reviewing the proposed development and project location to identify potentially affected resources and land uses. This EA will not discuss resources and land uses that are either not present, not affected, or that the PRB FEIS adequately addressed. The ID team identified important issues for the affected resources to focus the analysis. This EA addresses the project and its 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. Project issues include:

- Air quality
- Soils and vegetation: 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

These issues are not present, or minimally so. BLM analyzed them in the PRB FEIS and not in this EA:

Geological resources	Recreation	Wilderness characteristics
Cave and karst resources	Heritage & Visual Resources	Livestock & grazing
Mineral resources: locatable, leasable-coal, salable	Paleontological resources	Areas of critical environmental concern
Fire, fuels management, and rehabilitation	Transportation & Access	Socio-economic resources
Forest Products	Tribal Treaty Rights	Environmental justice
Lands & Realty	Wilderness characteristics	

2. PROPOSED PROJECT AND ALTERNATIVES

2.1. Alternative A – No Action

The PRB FEIS considered a No Action Alternative, pp. 2-54 to 2-62. This alternative must also consider and aggregate the effects in the PRB FEIS analysis with incorporating by reference the subsequent analysis and development from the adjacent and intermingled projects. The BLM permitted 2 coalbed

natural gas (CBNG) pods within and adjacent to this proposal; South Hay Creek, WY-070-EA02-010; Thrush WY-070-EA03-001 and within 1 mile of this proposal there are 12 oil wells and 106 CBNG wells. The total number of conventional wells approved by BFO is 359, which includes 193 horizontal wells (as of March 2012). The WOGCC permitted 103 wells. The total is 453, which represents 14% of the projected 3,200 in the 2003 PRB ROD. This agrees with the PRB FEIS which analyzed the reasonably foreseeable development rolling across the PRB of over 51,000 CBNG and 3,200 natural gas and oil wells. The no action alternative would consist of no new federal wells. This alternative would deny these APDs and /or POD requiring the operator to resubmit APDs or a POD that complies with statutes and the reasonable measures in the PRB RMP Record of Decision (ROD) in order to lawfully exercise conditional lease rights. This alternative could, through secretarial discretion suspend the senior leasehold, or could administratively cancel or withdraw the lease if improperly awarded, or seek to cancel the lease. It is not possible in the abstract to identify every interest and that is beyond the scope here.

2.2. Alternative B Proposed Action

Project Name: Cherokee Ridge Alpha

Well Name/#/Lease– all are about 2 miles Northeast and East of Wright, Campbell County, WY:

#	Well Name	Well #	Qtr	Sec	Twp	Rng	Lease
1	CHEROKEE RIDGE ALPHA USA	44-71-8A-1H	SESE	5	44N	71W	WYW140211
2	CHEROKEE RIDGE ALPHA USA	44-71-5D-1H	NENE	8	44N	71W	WYW135568
3	CHEROKEE RIDGE ALPHA USA	*44-71-34B-1H	SWSW	27	44N	71W	WYW132214
4	CHEROKEE RIDGE ALPHA USA	*44-71-31C-1H	SWSW	31	44N	71W	WYW118520
5	CHEROKEE RIDGE ALPHA USA	44-72-12A-1H	SESE	1	44N	72W	WYW124458
6	CHEROKEE RIDGE ALPHA USA	*44-72-25B-1H	SWSW	24	44N	72W	WYW99013

All proposed wells have or cross federal minerals. The * wells above have one jurisdictional scheme barring BLM's enforcing mitigation on private surface. The other wells have another jurisdictional scheme whereby BLM enforces mitigation of the "Federal Lands," 43.U.S.C. 1702(e), on private surface land. See, Section 1.3, above.

Operator/Applicant: Petro-Hunt (PH)

Surface Owners: Durham Ranches, Boller-Mills Ranch, Nancy Chapa, Robert Swingholm, William Chittenden, and Troy Stuart. All wells and associated infrastructure are on private surface. There are 2 state sections in the project area. There is no federal surface in the project area thus the proposal will not require analysis regarding wilderness characteristics.

Overview: PH proposes drilling and developing 6 horizontal oil well(s) into federal mineral estate from fee surface overlaying federal and/or fee mineral estate. The proposed wells require the construction of engineered (cut & fill) well pads. The total surface disturbance associated with the construction of these locations and access roads will be approximately 27.5 acres. Interim reclamation of well pads will restore 10.7 acres during the production phase (61.1% of the original surface disturbance remains). These figures include disturbance from the well pads, the spoil and topsoils storage areas, and the construction equipment and vehicle disturbance. The access roads 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. The primary objective is to drill to the Turner Formation at about 9000 ft. See the specific drilling program with each APD for details on other targeted zones, legal descriptions, surface and bottom holes. The proposal involves:

Activity	Length (feet)	Width (feet)	Acres of Disturbance	Interim Disturbance
44-71-5D-1H & 44-71-8A-1H constructed pad/tank battery	640'	360'	5.3	2.6
Cut/fills & Topsoil/spoil stockpiles	varies	varies	1.0	

Activity	Length (feet)	Width (feet)	Acres of Disturbance	Interim Disturbance
Access Road	1661’	40’	1.5	
Total Disturbance for this location			7.8	

NOTE: PH will build 2000 ft. of new road, while using about 2.6 miles of existing improved road. Of the 2.6 miles, PH will widen about 1 mile to a 24 foot running surface; all work will be in the existing footprint.

Activity	Length (feet)	Width (feet)	Acres of Disturbance	Interim Disturbance
44-72-12A-1H constructed pad/tank battery	440’	360’	3.6	2.5
Cut/fills & Topsoil/spoil stockpiles	varies	varies	1.0	
Access Road	500’	40’	.46	
Total Disturbance for this location			5.0	

NOTE: PH will build 500 ft. of new road, while using about 1.8 miles of existing improved road. PH will widen the existing road to a 24 foot running surface; all work will be in the existing footprint.

Activity	Length (feet)	Width (feet)	Acres of Disturbance	Interim Disturbance
*44-71-34B-1H constructed pad/tank battery	640’	360’	5.3	2.6
Cut/fills & Topsoil/spoil stockpiles	varies	varies	1.0	
Access Road	2500’	40’	2.3	
Total Disturbance for this location			8.6	

NOTE: * this is a fee/fee/fed well location. This location may be used for a fee/fee well in addition to this proposed fed well. Well pad dimensions are from submitted drawings for fee/fed wells.

Activity	Length (feet)	Width (feet)	Acres of Disturbance	Interim Disturbance
*44-71-31C-1H constructed pad/tank battery	440’	100’	1.0	.5
Cut/fills & Topsoil/spoil stockpiles	varies	varies	.5	
Total Disturbance for this location			1.5	

NOTE: * this is a fee/fee/fed well. PH will expand the existing fee well, requiring no access construction.

Activity	Length (feet)	Width (feet)	Acres of Disturbance	Interim Disturbance
*44-72-25B-1H constructed pad/tank battery	440’	360’	3.6	2.5
Cut/fills & Topsoil/spoil stockpiles	varies	varies	1.0	
Access Road, existing footprint, no new construction				
Total Disturbance for this location			4.6	

NOTE: * this is a fee/fee/fed well. Well pad dimensions are from submitted drawings for fee/fed wells. PH will use about 3/4 miles of existing improved road. PH will widen the existing road to a 24’ running surface, all work will be in the existing footprint.

Drilling, Construction and Production Design Features Include:

- PH will drill 44-71-8A-1H & 44-71-5D-1H on private surface over federal minerals, on 1 well pad.
- PH will drill 44-72-12A-1H on private surface over federal minerals on a proposed pad.
- PH will drill 44-72-25B-1H on private surface over fee minerals on a proposed pad.
- PH will drill 44-71-34B-1H on private surface over fee minerals on a proposed pad.
- PH will drill 44-71-31C-1H on private surface over fee minerals on an existing well pad constructed for fee development, Stuart 43-71-6B-1H. The pad expansion will result in approximately 1 acre of

new surface disturbance to the North side of the existing well pad.

- PH anticipates completing drilling and construction in 2 years. Drilling and construction is year-round in the region. Weather may cause delays but delays 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.
- It is PH's intention to use a closed loop system. However if a closed loop system is not available PH will build reserve pits, as shown on the location drawings.
- A road network consisting of existing improved roads.
- PH will contract with a 3rd party utility company to supply overhead power. If the power line is incomplete before the wells are in production then PH may use temporary power generation. PH may incorporate a fuel storage tank of up to 1000 gallon capacity on location with each generator. PH anticipates fuel deliveries 2 times per week. Decibel level will not exceed 70 decibels.
- Potential production facilities for each well will consist of 4-400 bbl welded steel oil tanks, 2-400 bbl fiberglass produced water tanks, a separator/heater treater, a pumping unit with electric motor and BOC combustor. All tanks will be 20 feet tall and 12 feet in diameter. An impermeable dike/berm will surround these facilities on all sides.
- PH will purchase water for drilling and completion operations from the City of Wright, WY and haul it to location with trucks. Drilling and cementing operations require approximately 2100 bbls per well Completion procedures will require approximately 15,484 bbls per well.
- PH will contract handling of waste disposal through a 3rd party service. Waste delivery will go to facilities with the following permit #'s; 81-470R and 86117R. Solid waste will go to a facility with permit #90986.
- If the wells are put in production, produced water will be stored in tanks on the location and trucked off. The produced water will be taken to a Wyoming Department of Environmental Quality (WDEQ) approved Class II disposal well. Specifics related to production will be addressed by sundry action. Potential quantities of produced water are unknown at this time.

For a detailed description of design features and construction practices associated with the proposed project, refer to the surface use plan (SUP) and drilling plan included with the APD. Also see the subject APD for maps showing the proposed well location and associated facilities described above. BLM incorporated and analyzed the implementation of committed mitigation measures in the SUP and drilling plan, in addition to the COAs in the PRB FEIS ROD, as well as changes made at the onsite.

Additionally, PH, in their APDs, committed to:

1. Comply with the approved APDs, applicable laws, regulations, orders, and notices to lessees.
2. Obtain necessary permits from agencies.
3. Offer water well agreements to the owners of record for permitted wells.
4. Incorporate measures to alleviate resource impacts into their submitted surface use and drilling plans.
5. Certify it has a surface access agreement with the landowner(s) or posted a 43 CFR 3814.1 bond. The operator provided the BLM a true and complete copy of a document in which the owner of the surface authorizes the operator to drill a federal well from non-federal lands, and in which the surface owner or representative guarantees the Department of the Interior (Department), including BLM, access to the non-federal lands to perform all necessary surveys and inspections, (see Instruction Memorandum No. 2009-078, p. 2, para 6).

The reasonably foreseeable development for this and adjacent areas includes oil/gas exploration using existing well pads and infrastructure put in place for fee and/or federal mineral development.. Future APD submittals could consist of multiple wells on an existing pad or tie into existing supporting infrastructure such as; tank batteries, pipelines, powerlines, and transportation networks. As well as new development taking place in the adjacent region to this project area, where existing oil/gas disturbance does not exist.

BLM will evaluate future development and resource parameters in light of its multiple use mandate – highlighting similarities and distinction between any proposals, this EA, other EAs and the RMP.

2.3. Conformance with 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, 2001, 2003, 2011, and generally conforms to the terms and conditions of that land use plan, its amendments, and supporting FEISs, 1985, 2003.

3. AFFECTED ENVIRONMENT

This section briefly describes the physical and regulatory environment affected by the alternatives in Section 2. Aspects of the affected environment focus on the major issues. Find a screening of all resources and land uses potentially affected in administrative record. Resources unaffected, or not affected beyond the level analyzed in the PRB FEIS, are outside this EA's scope**.** The Wyoming Game and Fish Department's (WGFD's) Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats (2009), make no distinction between surface disturbance impacts per well type or drilling technology. BLM's position is there is a rare lack of distinction in surface disturbance impacts attributable to well type, subject to showing a distinction, not a mere difference, and this tracks to surface disturbance issues as with soils, vegetation, invasive species, wetlands, cultural resources, etc. See, State Director Review, WY-2010-023, Part 2, p. 3, fn. 7. This supports national and congressional policy where no distinction exists in 43 CFR 3160 et. seq, leasing, and 2005's Energy Policy Act. BLM incorporates by reference the hydraulic fracturing analysis in Samson's Hornbuckle Field EA, WY-060-EA11-181, for that project uses similar operations and is in the PRB FEIS analysis area.

Project Area Description

Elevations in the area range from 4750 to 5100 feet above sea level. The topography throughout the area consists of semi flat ridges and deeply incised draws and occasional rock outcroppings. North Prong Little Thunder Creek is an ephemeral draw running from northwest to southeast. Other unnamed ephemeral drainages are also in the project area. The climate in the area is semi-arid, averaging 14-16 inches of precipitation annually, more that 60% of which occurs between May and September. CBNG development exists throughout the project area, as well as existing conventional oil well development. The majority of the surface ownership is private, with livestock grazing being the other land use in the general area. Currently the area is experiencing active oil field development of federal and fee minerals and the Black Thunder Coal Mine is east of the project area. At this time PH has future development aspirations for proposed wells and associated infrastructure on joining federal leases – which was predicted as the reasonably foreseeable development of up to 3,200 oil wells in the PRB.

Table 3.1. Adjacent or Overlapping Development

POD Name	NEPA Document	Well # / Type	Approval
South Hay Creek	WY-070-EA02-010	28/ CBNG	11/27/01

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 ozone in the oil and gas producing Upper Green River Basin that

became 1 of the nation's 40 "nonattainment" zones for ozone in 2012; in addition to PRB-area air quality alerts issued in 2011 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 6 sites, and particulate concentrations from 5 of those sites, monitors speciated aerosol (3 locations), and evapotranspiration rates (3 locations). These sites are at Sheridan, Taylor Reservoir, South Coal Reservoir, Buffalo, Juniper, 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, and coal mines;
- Transport of air pollutants from emission sources located outside the region;
- NOx, PM, and other emissions from diesel and coal trains and,
- SO2 and NOx from power plants.

3.2. Soils and Vegetation

In the project area soils differ with topographic location, slope, and elevation. Topsoil depths to be salvaged for reclamation range from 0 to 4 inches on ridges to 8+ inches in bottomland. 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. *NOTE: field of observations of constructed Petro-Hunt pads in same topography and soils verify these interpretations.* Reclamation potential of soils also varies throughout the project area. The main soil limitations in the project area include: depth to bedrock, low organic matter content, and high erosion potential especially in areas of steep slopes.

Detailed soils identification and data for the project area were obtained from the South Campbell County Survey Area, Wyoming Soil Survey Geographic (SSURGO) Database (WY605). The soil survey was performed by the Natural Resource Conservation Service (NRCS) 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. Many of the soils and landforms of this area present distinct challenges for development, and /or eventual site reclamation.

Soils developed in alluvium and residuum derived mainly from the Wasatch Formation. Lithology consists of light to dark yellow and tan siltstone and sandstones with minor coal seams resulting in a wide variety of surface and subsurface textures. Soil depths vary from deep on lesser slopes to shallow and very shallow on steeper slopes. Differences in lithology produced topographic and geomorphic variations in the area. Ridges and hills are often protected by an erosion resistant cap of clinker, terrace gravels, or sandstone. Parent material chemistry may result in local concentration of salts. Table 3.2 is a tabulated summary of the dominant soil map units, and associated ecological site that the proposal would impact.

Table 3.2. Dominant Soils

#	Well #	Map Unit	Map Unit Name	Ecological Site
1	44-71-8A-1H	240	Wibaux-Wibaux, thin solum complex, 6 to 40% slopes	Shallow Loamy
2	44-71-5D-1H	240	Wibaux-Wibaux, thin solum complex, 6 to 40% slopes	Shallow Loamy
3	44-71-34B-1H	109	Bidman loam, 0 to 6 % slopes	Loamy

#	Well #	Map Unit	Map Unit Name	Ecological Site
4	44-71-31C-1H	147	Forkwood-Cushman loams, 6 to 15% slopes	Loamy
5	44-72-12A-1H	200	Renohill-Savageton clay loams, 6 to 15% slopes	Clayey
6	44-72-25B-1H	240/146	Forkwood-Cushman loams, o to 6% slopes	Shallow Loamy

Ecological site descriptions provide soils and vegetation information needed 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 3 ecological sites (see Table 3.2 above). Dominant ecological sites and plant communities identified in the project area are shallow loamy (10-14NP), loamy (10-14NP), and clayey (10-14NP). Refer to ecological site narrative sections below for description of vegetation species observed during onsite field visits. See the NRCS Soil Survey Cambell County (SSURGO) data. The Ecological Site interpretations include additional site-specific soil information.

Dominate ecological sites and plant communities identified in this POD and its infrastructure are predominately loamy and shallow loamy sites.

Loamy/Shallow Loamy Site description and Plant community. This site occurs on steep slopes and ridge tops, but may occur on all slopes. Landform: hill sides, ridges, and escarpments. The soils of this site are shallow (less than 20 inches to bedrock) well-drained soils formed in alluvium over residuum or residuum. These soils have moderate permeability and may occur on all slopes. The bedrock may be any kind which is virtually impenetrable to plant roots, except igneous. The surface soil will have one or more of the following textures: very fine sandy loam, loam, silt loam, sandy clay loam, silty clay loam, and clay loam. Thin ineffectual layers of other textures are disregarded. Layers of the soil most influential to the plant community vary from 3 to 6 inches thick. The main soil limitations include the depth to lithologic discontinuity, and fragmental (90% coarse fragments). The present plant community is a mixed sagebrush/grass. Wyoming big sagebrush is a significant component of this mixed sagebrush/grass plant community. Cool-season mid-grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grass, and miscellaneous forbs. Dominate grasses include: bluebunch wheatgrass, rhizomatous wheatgrass, blue grama, and little bluestem. Other grasses occurring on the state include Cusick's and Sandberg bluegrass, and prairie junegrass. Cheatgrass has invaded the state. Other vegetative species identified at onsite include: pricklypear and fringed sagewort.

Clayey Site description and plant community. Clayey Sites occur on nearly level to steep slopes on landforms which include hill sides, alluvial fans and stream terraces in the 10-14 inch precipitation zone. The soils of this site are moderately deep to very deep (greater than 20 inches to bedrock), well-drained soils that formed in alluvium or alluvium over residuum. These soils have slow permeability. The bedrock is clay shale which is virtually impenetrable to plant roots. The present plant community is a mixed sagebrush/grass. Wyoming big sagebrush is a significant component of this plant community. 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 grass, and miscellaneous forbs. Dominant grasses include rhizomatous wheatgrasses, green needlegrass, blue grama, and prairie junegrass. Forbs include Louisiana sagewort (cudweed), plains wallflower, hairy goldaster, and scarlet globemallow. Fringed sagewort and plains pricklypear also occur.

Using the same NRCS dataset the reclamation potential for the project area has category of "fair". Field observations of reclaimed oil/gas infrastructure and interim reclamation of active oil/gas infrastructure showed well established vegetation with stable cut/fill slopes.

3.2.1. Reclamation Suitability (Source Material)

Oil and gas development and traditional activities including livestock grazing and wildlife use impact current soil conditions in the project area. Area soils are easily damaged by use or disturbance or are difficult to re-vegetate or otherwise reclaim. Soil impacts (e.g., roads, linear pipeline scars, and artificial wet areas) can be readily observed in the area. In the absence of recoverable topsoil as is common throughout the project area, the surface organic matter in the form of vegetation, litter are critical to maintaining the integrity and viability of the soil.

Reclamation potential of soils varies throughout the project area. The main project area soil limitations include: depth to bedrock, low organic matter content, and high erosion potential especially in areas of steep slopes. Many of the area soils and landforms present distinct challenges for development. Approximately 70% of the proposed project area contains soil mapping units having poor reclamation suitability. The remaining soils have slight or moderate reclamation suitability.

3.3. Water Resources

WDEQ assumed primacy from EPA for maintaining Wyoming's water quality. 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.

3.3.1. Groundwater

The historical use for groundwater in this area was for stock or domestic water. Data submitted from the operator shows 15 stock/domestic water wells within 1 mile of the spacing units of the proposed wells which range from 85 to 242 feet deep. Refer to the PRB FEIS for additional information on groundwater, pp. 3-1 to 3-36. The 2004 EPA study found it unlikely that hydraulically fractured CBNG wells would contaminate ground water. The EPA has an expansive, on-going study looking at more aspects of hydraulic fracturing and has yet to issue guidance from the study. Studies from the University of Texas, Massachusetts Institute of Technology, echo decades of industry and regulatory experience that good casing, cement plans, and execution are keys to protect groundwater from hydrocarbon communication.

3.3.2. Surface Water(use only if applies to this project area)

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 generally the PRB FEIS for a surface water quality discussion, pp. 3-48 to 3-49. For more information on surface water refer to the PRB FEIS, pp. 3-36 to 3-56.

3.4. Minerals – Leasables; Locatables; Salables

The PRB FEIS analysis revealed that short-term surface disturbances for well pads and associated improved access roads range from 0.5 acres for shallow gas wells to 5.5 acres for a typical deep oil well, pp. 4-312; 4-304 – 318. The area has conventional oil and gas, and CBNG development. PH submitted data showing 106 CBNG wells and 12 conventional oil wells in and adjacent to the project area.

3.5. Wetlands/Riparian

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

3.6. Invasive Species

The BLM's weed database showed the presence of Scotch thistle, Dalmatian toadflax, and skeletonleaf bursage in areas near this project. Subsequent field investigation by PH revealed none in the immediate project area. Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B.*

japonicus) are known to exist in the affected environment. These 2 species are found in high densities and numerous locations throughout NE Wyoming.

3.7. Fish and Wildlife

The PRB FEIS identified wildlife species occurring in the PRB, pp. 3-113 to 3-206. BLM wildlife biologists performed a habitat assessment in the project area during the onsite visit. 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, WGFD datasets, and the Wyoming Natural Diversity Database (WYNDD) to evaluate the affected environment for wildlife species that may occur in the area. This section describes the affected and regulatory environment and past impacts to wildlife known in the area of the proposal.

3.7.1. Big Game

The PRB FEIS discussed the affected environment for pronghorn, mule deer, and white-tailed deer on pp. 3-117 to 3-122, pp. 3-127 to 3-132, and 3-122 to 3-127, respectively. Big game species occurring in the project area are mule and white-tailed deer. There are no designated crucial ranges in the project area.

3.7.2. Game Birds (Sage-Grouse: see Candidate Species, below)

3.7.2.1. Sharp tailed Grouse

Sharp-tailed grouse habitat is absent in the project area.

3.7.3. Non-Game

3.7.3.1. Raptors

The PRB FEIS discussed the affected environment for raptors, pp. 3-141 to 3-148. According to the BLM raptor database and Wildlife Resources LLC's 2011 and May 11, 2012 report, there were 14 raptor nest sites within 0.5 miles of the project boundary. Biologists could not find 4 historic nests (BLM ID#s 13, 1068, 1110, 1111). 2012 active nests were golden eagle (BLM ID#1118) and 2 new ferruginous hawk nests (BLM ID #s 13109 and 13110). Newly found inactive nests were 2 ferruginous hawk nests (BLM ID#s 13111 and 13112). Suitable raptor nesting habitat is present in the project area.

3.7.3.2. Migratory Birds

The PRB FEIS discussed the affected environment for migratory birds on pp. 3-150 to 3-153. The BLM-Fish and Wildlife Service (FWS) Memorandum of Understanding (MOU) (2010) promotes the conservation of migratory birds, complying with Executive Order 13186 (Federal Register V. 66, No. 11). BLM must include migratory birds in every NEPA analysis of actions that have potential to affect migratory bird species of concern to fulfill obligations under the Migratory Bird Treaty Act (MBTA). The MBTA (and Bald and Golden Eagle Protection Act (BGEPA)) are strict liability statutes so require no intent to harm migratory birds through prosecuting a taking. Recent prosecutions or settlements in Wyoming and the West cost companies millions of dollars in fines and restitution (retrofitting powerlines to discourage perching to minimize electrocution or shielding ponds holding toxic substances). BLM encourages voluntary design features and conservation measures supporting migratory bird conservation.

A wide variety of migratory birds may be found in the proposed project area at some time throughout the year. Many species that are of high management concern use shrub-steppe and shortgrass prairie areas for their primary breeding habitats (Saab and Rich 1997). Nationally, grassland and shrubland birds declined more consistently than any other ecological association of birds over the last 30 years (WGFD 2009). The WGFD Wyoming Bird Conservation Plan (Nicholoff 2003) identified 3 groups of high-priority bird species in Wyoming: Level I – those that clearly need conservation action, Level II – species where the focus is on monitoring, rather than active conservation, and Level III – species that are not a high priority but are of local interest. (Shrub-steppe vegetation dominates the project area.(use or vary to fit the project area) Many species that are of high management concern use shrub-steppe areas for their primary

breeding habitats (Saab and Rich 1997). Nationally, grassland and shrubland birds declined more consistently in the last 30 years than any other ecological association of birds (WGFD 2009). Species that may occur in these vegetation types in northeast Wyoming, according to the Wyoming Bird Conservation Plan, appear Table 3.3, grouped by level as identified in the plan.

Several migratory species are also BLM special status (sensitive) species. Those suspected to occur in the project area including: *Baird's sparrow, Brewer's sparrow, loggerhead shrike, long-billed curlew, and sage thrasher*.

Table 3.3. Migratory Birds Occurring in Shrub-steppe Habitat, NE Wyoming (Nicholoff 2003)

Level	Species	Wyoming BLM Sensitive
Level I	Brewer's sparrow	Yes
	Ferruginous hawk	Yes
	McCown's longspur	No
	Sage sparrow	Yes
Level II	Lark bunting	No
	Lark sparrow	No
	Loggerhead shrike	Yes
	Sage thrasher	Yes
	Vesper sparrow	No
Level III	Common poorwill	No
	Say's phoebe	No

3.7.4. Threatened, Endangered, Candidate, Special Status (Sensitive) Species

The Buffalo BLM receives a species list periodically from the FWS concerning threatened, endangered and candidate species. The 2011 list included Ute Ladies'-tresses orchid (threatened), and Greater Sage-grouse (candidate).

3.7.4.1. Ute Ladies'-Tresses Orchid

The FWS lists the Ute ladies'-tresses orchid (ULT) as threatened. The PRB FEIS discussed the affected environment for ULT, p. 3-175. The Wyoming Natural Diversity Database model predicts undocumented populations may be present in southern Campbell and northern Converse Counties. Drainages with documented orchid populations include Antelope Creek in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County. The project area has suitable ULT habitat, along tributaries of the Upper Cheyenne and Belle Fourche watersheds. At the onsite, the BLM biologist assessed habitat suitability in association with proposed well pads and infrastructure. No suitable habitat was identified near well pads, proposed roads, or existing roads subject to upgrades.

3.7.5. Candidate Species

3.7.5.1. Greater Sage-Grouse (sage-grouse)

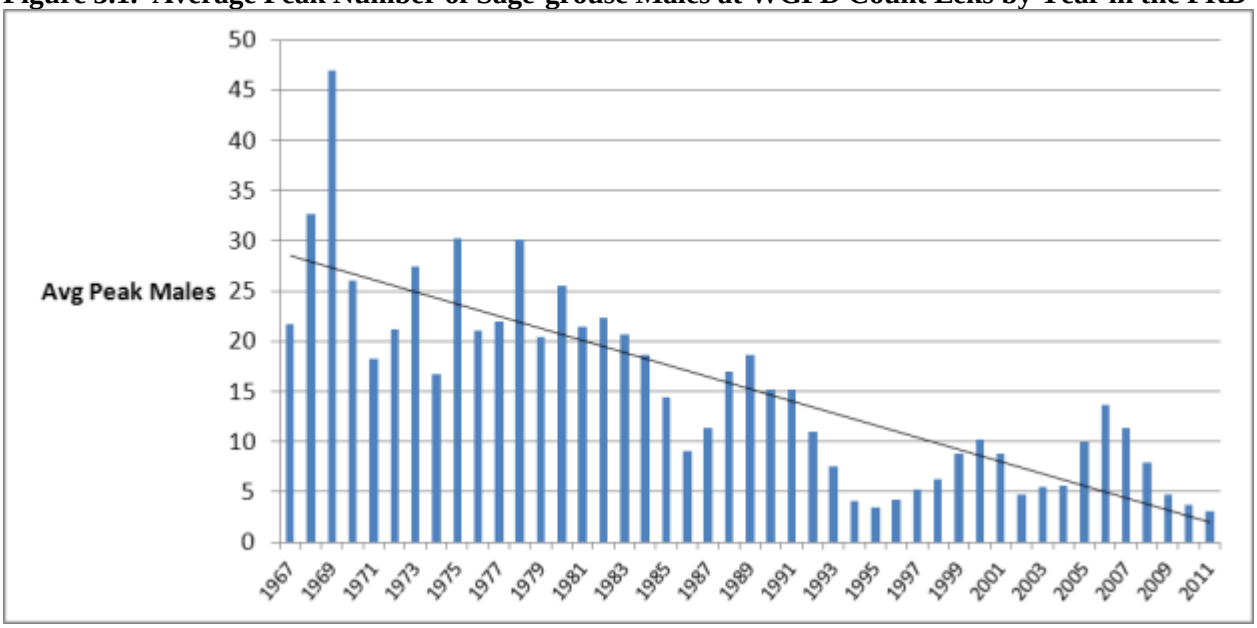
The PRB FEIS addressed the affected environment for sage-grouse, pp. 3-194 to 3-199. The sage-grouse's regulatory and biologic status changed since issuance of the FEIS:

1. 2005-2007: The PRB FEIS predicted that a ¼ mile year-round controlled surface use lek buffer, and timing limitations restricting surface disturbance within 2 miles of leks, would be sufficient for protection of sage-grouse populations. Several recent studies and literature reviews indicate that the restrictions' spatial scale, and timing limitations, may not be large enough to alleviate impacts to sage-grouse (Holleran 2005, Walker et al 2007, Taylor et al 2012).
2. January, 2005: FWS warranted that the sage-grouse was inappropriate for listing under the Endangered Species Act (ESA).

3. December, 2007: The U.S. District Court remanded the "not warranted" decision, finding a flawed decision-making process and ordered the FWS to conduct a new Status Review; Western Watersheds Project v. FWS, 535 F. Supp. 2d 1173 (D. Idaho 2007).
4. August, 2008: The WY BLM implemented management of identified connectivity habitats in support of the population management objectives set by the State of Wyoming (Wyoming Governor's Executive Order (EO) 2011-5), in accordance with the BLM Wyoming Instruction Memorandums (IM), most recently, IM- WY-2012-019.
5. January 2008: The State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat recommended land managers consider impacts on leks within 4 miles of oil and gas developments.
6. September, 2009: In its Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats, WGFD categorized impacts to sage-grouse by number of well pad locations per square mile within 2 miles of a lek.
7. November, 2010: FWS warranted that the sage-grouse justified listing across its range, but precluded listing due to higher priorities (FWS 2010). The sage-grouse is a listing candidate.
8. March, 2012: WY BLM released the report, "Viability analyses for conservation of sage-grouse populations: Buffalo Field Office, Wyoming," indicating that a viable population of sage-grouse remains in the PRB, but the combined impacts of multiple stressors, including West Nile virus (WNv) and energy development, threaten that viability (Taylor et al 20012).

The sage-grouse population in northeast Wyoming is exhibiting a steady long term downward trend, as measured by lek attendance (WGFD 2011b). Figure 3.1 illustrates a 10-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. Research suggests that the declines since 2001 are a result, in part, of energy development (FWS 2010, Taylor et. al. 2012).

Figure 3.1. Average Peak Number of Sage-grouse Males at WGFD Count Leks by Year in the PRB



WGFD records show the 36- Stewart I and II Leks occur within 2 miles of this proposed project. These leks are about 2 miles south of the 44-71-31C-1H well. Currently there are 284 existing (producing or approved) wells within a 4 mile radius of the 2 leks, (Automated Fluid Minerals Support System [AFMSS] and Wyoming Oil and Gas Conservation Commission [WOGCC], March 20, 2012). Both the 36-Stewart Leks are experiencing extreme impacts, according to parameters set by WGFD (2009).

Impacts from oil and gas development are most discernible at the spatial scale of 20 km (12.4 mi) (Taylor et al. 2012). These findings echo results from previous studies conducted in the basin, wherein biologists observed basin-wide population declines (Walker et al. 2007). There are 40 documented leks within 12.4 miles of the project, 8 are in a BFO focus habitat area, and 4 of those are in the Natrona core area.

Site Specific Habitat: The project area is on the eastern edge of Wyoming's sage-grouse range. There is an existing oil field in the area and a coal mine to the east. The closest core area is 10 miles to the east. Based on the onsite investigation, the project area has marginal sage-grouse nesting habitat that is functionally impaired by existing development.

3.7.6. Special Status (Sensitive) Species (SSS)

The PRB FEIS discussed the affected environment for SSS, p. 3-174 to 201. The authority for the SSS comes from the ESA, as amended; Title II of the Sikes Act, as amended; the FLPMA; Department Manual 235.1.1A and BLM Manual 6840. Table 1, Appendix A lists those SSS that may occur in the project area. The table also includes a brief description of the habitat requirements for each species and an assessment of potential impacts. Wyoming BLM updates its list of SSS to focus management to maintain habitats to preclude listing as a threatened or endangered species. The policy goals are:

- Maintaining vulnerable species and habitat components in functional BLM ecosystems;
- Ensuring sensitive species are considered in land management decisions;
- Preventing a need for species listing under the Endangered Species Act (ESA); and
- Prioritizing needed conservation work with an emphasis on habitat.

Wyoming BLM updates SSS on its website: http://www.blm.gov/wy/st/en/programs/Wildlife.html. BLM discusses those SSS impacted beyond the level analyzed in the PRB FEIS, below.

3.7.7. Bald Eagle The PRB FEIS discussed the affected environment for bald eagles, p. 3-175. The ESA listed the bald eagle as a threatened species when BLM approved the PRB FEIS. FWS removed the bald eagle from the ESA protection on August 8, 2007. The bald eagle has protection under the the Bald and Golden Eagle Protection Act and the MBTA. Mature cottonwoods scattered around the project area provide marginal nesting and suitable roosting habitat.

3.7.7.1. Ferruginous Hawk

The PRB FEIS discussed the affected environment for ferruginous hawk, p. 3-183. The species is widely distributed; its population status and trends are unknown but are suspected as stable. Populations are experiencing habitat loss, and they are sensitive to human disturbance. This hawk inhabits grasslands and sage shrublands in the PRB. They typically nest on the ground, increasing their exposure to ground predators. There are 7 ferruginous hawk nests identified on the BLM raptor database within 0.5 miles of the proposed wells. As of April 30, 2012, 2 nests were active.

3.7.8. Aquatics

3.7.8.1. West Nile Virus

West Nile virus (WNv) is a mosquito-borne disease that can cause encephalitis or brain infection. Mosquitoes spread this virus after feeding on infected birds and then bite people, other birds, and animals. WNv is not spread by person-to-person contact, and there is no evidence that people can get the virus by handling infected animals. Since its discovery in 1999 in New York, WNv established and spread across the United States. Birds are the natural vector host and serve not only to amplify the virus, but to spread it. *Culex tarsalis* appears to be the most common mosquito vector. Mosquitoes can hatch from standing water in as few as 4 days. BLM summarized USGS data found at www.westnilemaps.usgs.gov in Table 3.4. Reported data from the PRB includes Campbell, Sheridan, and Johnson Counties.

Table 3.4. Historical West Nile Virus Information

Year	Total WY Human Cases	Human Cases PRB	Equine Cases PRB	Bird Cases PRB
2001	0	0	0	0
2002	2	0	15	3
2003	392	85	46	25
2004	10	3	3	5
2005	12	4	6	3
2006	65	0	2	2
2007	155	22	Unknown	1
2008	10	0	0	0
2009	10	1	1	No record
2010	6	0	0	0
2011	3	0	Unknown	No record

Source: Wyoming Department of Health, http://diseasemaps.usgs.gov/wnv_wy_human.html

Human cases of WNv in Wyoming occur primarily in the late summer or early fall. Scientists found WNv in 157 bird species, horses, 16 other mammals, and alligators (Marra et al 2003). In the eastern US, avian populations incurred very high mortality, particularly corvids (crows, jays). Raptor species also appear to be highly susceptible to WNv. Wyoming scientists documented in 2003 that 36 raptors died from WNv in Wyoming, including golden eagle, red - tailed hawk, ferruginous hawk, American kestrel, Cooper's hawk, northern goshawk, great-horned owl, prairie falcon, and Swainson 's hawk (Cornish et al. 2003).

The Wyoming State Vet Lab determined 22 sage-grouse in one study project (90% of the study birds), succumbed to WNv in the PRB in 2003. While birds infected with WNv have many of the same symptoms as infected humans, they appear to be more sensitive to the virus (Rinkes 2003). Current science suggests a synergy between WNv and energy development amplifying the negative impact sage-grouse (FWS 2010 p. 13947). There is usually increased surface water in the PRB associated with mineral development. This increase in potential mosquito breeding habitat provides opportunities for mosquito populations to increase. Preliminary research conducted in the PRB indicates WNv mosquito vectors were notably more abundant on a developed CBNG site than 2 similar undeveloped sites (Walker et al. 2003). The WDEQ and the Wyoming Department of Health sent a letter to CBNG operators on June 30, 2004. The letter encouraged people employed in occupations that require extended periods of outdoor labor, be provided educational material by their employers about WNv to reduce the risk of WNv transmission.

3.8. Cultural Resources

BLM received a Class III cultural resource inventory for the project prior to the on-the-ground project work (BFO project no. 70120014). BLM received a combination block and linear Class III cultural resource inventory following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) and the *Wyoming State Historic Preservation Office Format, Guidelines, and Standards for Class II and III Reports*. Clint Crago, BLM Archaeologist, reviewed the report for technical adequacy with BLM standards and found it compliant. BLM found the following resources in or near the project area, see Table 3.5.

Table 3.5. Cultural Resources Inventory Results

Site Number	Site Type	National Register Eligibility
48CA2422	Prehistoric Stone Circle	Not Eligible
48CA3908	Prehistoric Lithic Scatter and Historic Depression and Artifact Scatter	Not Eligible
48CA5297	Historic Road	Not Eligible

4. ENVIRONMENTAL EFFECTS

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 and production traffic would be controlled by watering disturbed soils and/or roads, and by air pollutant emission limitations imposed by applicable air quality regulatory agencies. 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, in addition to the 2011 ozone standards.

4.2. Soils and Vegetation

4.2.1. Direct and Indirect Effects

The effects to soils resulting from well pad and access road 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, compressor stations, 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

The designation of the duration of disturbance is defined in the PRB FEIS, p. 4-1 and 4-15.Most soil disturbances would be short term impacts with expedient interim reclamation and site stabilization, as committed to by the operator in their POD Surface Use Plan and as required by the BLM in COAs. Geomorphic effects of roads and other surface disturbance range from chronic and long-term contributions of sediment into waters of the state to catastrophic effects associated with mass failures of road fill material during large storms. Roads can affect geomorphic processes primarily by: accelerating erosion from the road surface and prism itself through mass failures and surface erosion processes; directly affecting stream channel structure and geometry; altering surface flow paths, leading to diversion or extension of channels onto previously unchannelized portions of the landscape; and causing interactions among water, sediment, and debris at road-stream crossings.

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.

4.2.3. Mitigation Measures

The proponent planned their project to maximize the fluid mineral drainage while avoiding areas with soil limitation where possible. The proponent also designed the infrastructure such that no engineering roads will be required and existing oil/gas roads will be used to access the proposed well locations. The constructed well pads were placed and designed to minimize cut and fill slopes. BLM will consider applying the following mitigation:

- Provide a minimum average of 4 inches of aggregate where grades exceed 8% for stability and erosion prevention.
- All rills, gullies, and other surface defects shall be ripped to the full depth of erosion across the entire width of the roadway prior to final grading and surfacing.
- Reserve pit will be closed as soon as possible, but no later than 6 months from time of drilling/well completion, unless the BLM Authorized Officer gives an extension. Squeezing of pit fluids and cuttings is prohibited. Pits must be dry of fluids or they must be removed via vac-truck or other environmentally acceptable method prior to backfilling, re-contouring, and replacement of topsoil. Mud and cuttings left in pit must be buried at least 3-feet below re-contoured grade. The operator will be responsible for re-contouring any subsidence areas that develop from closing a pit before it is sufficiently dry.
- Adequate drainage control must be in place at all stages of construction and culverts installed as soon as feasible.
- If a dry hole, all rehabilitation work, including seeding, will be initiated within 30 days after plugging operations are completed (pending seasonal conditions).
- The operator will follow the guidance provided in the Wyoming Policy on Reclamation see http://www.blm.gov/wy/st/en/field_offices/Buffalo/minerals.html. The Wyoming Reclamation Policy applies to all surface disturbing activities. Authorizations for surface disturbing actions are based upon the assumptions that an area can and ultimately will be successfully reclaimed. BLM reclamation goals emphasize eventual ecosystem reconstruction, which means returning the land to a condition approximate to an approved “Reference Site” or NRCS Ecological Site Transition State. Final reclamation measures are used to achieve this goal. BLM reclamation goals also include the short-term goal of quickly stabilizing disturbed areas to protect both disturbed and adjacent undisturbed areas from unnecessary degradation. Interim reclamation measures are used to achieve this short-term goal.
- Compaction would be remediated by plowing or ripping.
- Stabilization efforts of disturbed areas shall be finished within 30 days of the initiation of construction activities.

4.2.4. Residual Effects

Residual effects across the POD would include a long-term loss of soil productivity associated with well pads 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 gullying 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 4-151. "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 new access roads has been reduced by placing the well locations such that existing oil/gas access roads are used and one existing fee mineral pad location is being used for federal mineral development. This practice results in less surface disturbance and overall environmental impacts. See Section 2.2 for summary of disturbance. All disturbances associated with the proposed action 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.

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 will ensure there is no adverse impact on ground water.

The WSEO, WDEQ, and WOGCC regulate waters and chemicals for drilling, "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

With applied mitigation measures there are no reasonable/forseeable direct/indirect/cumulative or residual effects with the drilling of the proposed wells. Additionally 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 generally, 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 no immediate cautions, concerns, or warnings that present industry and regulatory practices endanger ground water or require immediate changes.

4.3.1.2. Mitigation Measures

The volume of water produced by this mineral development is unknowable at the time of permitting. PH will have to produce the well(s) 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, PH

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.

4.4. Minerals – Leasables; Locatables; Salables

No potential conflicts/impacts are anticipated to leasable, locatable, or salable minerals with this proposal. Proposed surface disturbances average 4.58 acres per the 6 APDs which is almost 17% less surface disturbance than analyzed in the PRB FEIS. The surface disturbance remaining after interim reclamation (see Section 2.2, above) is over 25% less than that envisioned and analyzed in the PRB FEIS.

4.5. Wetland/Riparian

BLM anticipates no impacts to wetlands or riparian areas from the proposed actions.

4.6. Invasive Species

4.6.1. Direct and Indirect Effects

The operator committed to the control of noxious weeds and species of concern using the following measures identified in their MSUP:

1. Control methods include hand pulling and/or ground application of approved herbicides.
2. Preventive practices include keeping the area of operations bare of all living and/or dead vegetation.

Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) exist in the affected environment. These species are found in such high densities and numerous locations throughout NE Wyoming that a control program is not considered feasible at this time.

The use of existing facilities along with the surface disturbance associated with construction of proposed well locations, access roads, 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 salt cedar, Canada thistle, and perennial pepperweed. However, mitigation as required by BLM applied COAs will reduce potential impacts from noxious weeds and invasive plants.

4.7. Fish and Wildlife

4.7.1. Big Game

4.7.1.1. Direct and Indirect Effects

The PRB FEIS analyzed impacts to big game, pp. 4-181 to 4-210. Big Game impacts may occur through alterations in hunting and/or poaching, increased vehicle collisions, harassment and displacement, increased noise, increased dust, alterations in nutritional status and reproductive success, increased fragmentation, loss or degradation of habitats, reduction in habitat effectiveness, and declines in populations. The 44-71-8A-1H and 44-71-5D-1H wells are proposed in an area without existing wells.

4.7.1.2. Cumulative Effects

Refer to the PRB FEIS for big game cumulative impacts, p. 4-211.

4.7.1.3. Mitigation Measures

Speed limits on roads will minimize collisions.

4.7.1.4. Residual Effects

Big game numbers may be reduced in the area due to this development.

4.7.2. Non-Game

4.7.2.1. Raptors

4.7.2.1.1. Direct and Indirect Effects

The PRB FEIS analyzed direct and indirect effects to raptors, pp. 4-216 to 4-221. This project will result in disturbance in proximity of nesting raptors, including direct loss of foraging habitats and indirect losses associated with declines in habitat effectiveness. All raptors using nests in the vicinity of the project will likely be impacted to some extent by the human disturbance associated with operation and maintenance.

The known raptor nests in the area are all associated with oil and gas development. Human activities in close proximity to active raptor nests may interfere with nest productivity. Romin and Muck (1999) indicate that activities within 0.5 miles of a nest are prone to cause adverse impacts to nesting raptors. If disruptive activities occur during nesting, they could be sufficient to cause adult birds to remain away from eggs or chicks causing overheating or chilling. This can result in egg or chick death. Prolonged disturbance can also lead to the abandonment of the nest by the adults. Routine human activities near these nests can also draw increased predator activity to the area and resulting in increased nest predation.

To reduce the risk of decreased productivity or nest failure, the BLM BFO requires a 0.5 mile radius timing limitation during the breeding season around active raptor nests and recommends all infrastructures requiring human visitation be located to provide adequate biologic buffer for nesting raptors. A biologic buffer is a combination of distance and visual screening that provides nesting raptors with security such that they will not be flushed by routine activities. The USA 44-71-31C-1H well is within the 0.5 miles buffer of 2 ferruginous hawk nests, however those nests were not active in 2012, and no timing restriction will be in place (Wildlife Resources 2012).

4.7.2.1.2. Cumulative Effects

The cumulative effects associated with this alternative are within the analysis parameters and impacts described in the PRB FEIS. Refer to the PRB FEIS for details on expected cumulative impacts, p. 4-221.

4.7.2.1.3. Mitigation Measures

The BLM BFO requires a 0.5 mile radius timing limitation during the breeding season around active raptor nests to reduce the risk of decreased productivity or nest failure.

4.7.2.1.4. Residual Impacts

Even with timing restrictions, raptors may abandon nests due to foraging habitat alteration associated with development or sensitivity to well or infrastructure placement. Declines in breeding populations of some species that are more sensitive to human activities may occur.

4.7.2.2. Migratory Birds

4.7.2.2.1. Direct and Indirect Effects

The PRB FEIS discussed the direct and indirect effect to migratory birds, pp. 4-231 to 4-235. Disturbance of habitat in the project area is likely to impact migratory birds. Clearing vegetation and pad construction during the spring and summer can take migratory birds. Native habitats will be lost directly with the construction of wells, roads, and pipelines. Activities will likely displace migratory birds farther than the immediate area of physical disturbance. Ingelfinger (2004) identified that the density of breeding Brewer's sparrows declined by 36% and breeding sage sparrows declined by 57% within 100 m of dirt roads in a natural gas field. Effects occurred along roads with light traffic volume (less than 12 vehicles per day). The increasing density of roads constructed in developing natural gas fields exacerbated the problem creating substantial areas of impact where indirect habitat losses through displacement were much greater than the direct physical habitat losses.

Heater treaters, and similar facilities, having vertical open-topped stacks or pipes can attract birds. Those

facilities without exclusionary devices can pose a mortality risk. Once birds crawl into the stack, escape can be 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).

4.7.2.2.2. Cumulative Effects

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

4.7.2.2.3. Mitigation Measures

The PRB FEIS proposed no timing limitations on surface disturbing activities specifically for migratory birds. Where applied, timing restrictions for raptors and sage-grouse provide collateral protections. Covering open stacks and pipes will prevent migratory bird deaths.

4.7.2.2.4. Residual Effects

Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts. Reclamation and maintenance activities that occur in the spring may be detrimental to migratory bird survival.

4.7.3. Threatened, Endangered, Candidate, Special Status (Sensitive) Species

Based on the last species list for the Buffalo Field Office from FWS, July 22, 2011, the Ute Ladies'-tresses Orchid is the only ESA-listed species requiring an effects determination (ESA Section 7 (2)).

4.7.3.1. Ute Ladies'-Tresses Orchid

4.7.3.1.1. Direct and Indirect Effects

Suitable habitat is not present in the project area and implementation of the proposed project will have "***no effect***" on ULT.

4.7.3.1.2. Cumulative Effects

The PRB FEIS discussed the cumulative effects to ULT, pp. 4-253 to 4-254.

4.7.3.1.3. Mitigation Measures

BLM proposes no mitigation.

4.7.3.1.4. Residual Effects

BLM anticipates no residual effects.

4.7.4. Candidate Species

4.7.4.1. Greater Sage-grouse (sage-grouse)

4.7.4.1.1. Direct and Indirect Effects

The 2010 FWS listing decision discussed impacts to sage-grouse associated with energy development in detail. Impacts to sage-grouse are generally a result of loss and fragmentation of sagebrush habitats associated with roads and infrastructure. Research indicates that yearling sage-grouse hens also avoid nesting in developed areas, while older hens will continue nesting attempts in impacted habitats (Lyon and Anderson 2003, Holloran 2005, Holloran et al. 2010, FWS 2010).

The proposed action is in marginal to suitable nesting habitat. Construction of the well pads, access roads, utility corridors, will result in a direct loss of approximately 10 to 15 acres of suitable nesting habitat from the 44 -71-5D-1H and 44 -71-8A-1H wells.

4.7.4.1.2. Cumulative Effects

The PRB FEIS stated: "the synergistic effect of several impacts would likely result in a downward trend for the sage-grouse population, and may contribute to the array of cumulative effects that may lead to its

federal listing. Local populations may be extirpated in areas of concentrated development, but viability across the Project Area [PRB] or the entire range of the species is not likely to be compromised," p. 4-270. Based on the impacts described in the PRB FEIS and the findings of more recent research, the proposed action may contribute to extirpation of the local grouse population.

The 2012 BLM-contracted population viability analysis for the Northeast Wyoming sage-grouse found a viable population of sage-grouse remains in the PRB; however, threats from energy development and West Nile Virus (WNv) are impacting future viability (Taylor et al. 2012). The study indicated that effects from energy development, as measured by male lek attendance, are discernible out to a distance of 12.4 miles. There are 40 leks within 12.4 miles of the proposed action. Of those 40, 8 are within a BFO Focus area and 4 of those eight are within the Natrona core habitat area.

Studies document the additive impacts of energy development and WNv as a threat to sage-grouse persistence in the PRB (Taylor et al. 2012, Garton et al. 2011). The cumulative and synergistic effects of CBNG development and WNv in the PRB area will continue to impact the local sage-grouse population, causing further declines in lek attendance, and could result in local extirpation: "[f]indings reflect the status of a small remaining sage-grouse population that has already experienced an 82% decline within the expansive energy fields (Walker et al. 2007a), a level of impact that has severely reduced options for delineating core areas that are large enough and in high enough quality habitats to sustain populations." (Taylor et al. 2012).

Current well densities reduced the function of PRB core areas, affecting all of the remaining active leks within core (Taylor et al. 2012). Continued energy development around the core areas will continue to impact their remaining value. Declines in active leks and male attendance indicate that the WNv outbreaks and energy development reduce sage-grouse populations and that they interact to exacerbate population declines. The effects of one WNv outbreak year could cut a population in half. Absent a WNV outbreak, or another stochastic event of similar magnitude, immediate extirpation is unlikely. Results suggest that if current oil and gas development rates continue, they may compromise future viability of NE Wyoming sage-grouse, with an increased chance of extirpation with additional WNv outbreaks (Taylor et al. 2012).

4.7.4.1.3. Mitigation Measures

In order to reduce the likelihood that activities associated with noise, construction, and human disturbance, BLM will implement a timing limitation on all surface-disturbing activities in sage-grouse habitat. The intent of this timing restriction is to decrease the likelihood that grouse will avoid these areas and increase habitat quality by reducing noise and human activities during the breeding season.

Aggressive reclamation of plugged and abandoned well fields, combined with habitat enhancements in functional core and supporting areas, may provide a population of birds to re-populate areas that can be successfully reclaimed.

Sage-grouse habitat restoration efforts in the PRB are ongoing. The BLM identified historical sage-grouse population centers that are ready for oil and gas reclamation where stakeholders will apply enhanced reclamation techniques. The intent is maintaining and enhancing those areas with remaining sage-grouse and increase suitability of currently uninhabited areas that are important for connectivity. The WY BLM initiated the PRB Restoration Program to implement strategies for accelerated reclamation and sage-grouse habitat restoration in areas affected by federal oil and gas developments.

4.7.4.1.4. Residual Effects

A timing limitation does nothing to mitigate loss and fragmentation of habitat or changes in disease mechanisms. Suitability of the project area for sage-grouse will be negatively affected due to habitat loss and fragmentation and proximity of human activities associated with fluid mineral development.

4.8. Special Status (Sensitive) Species (SSS)

The PRB FEIS discussed impacts to SSS on pp. 4-257 to 4-265. BLM will take actions to meet the policies set forth in sensitive species policy (BLM Manual 6840). BLM Manual 6840.22A states that "The BLM should obtain and use the best available information deemed necessary to evaluate the status of special status species in areas affected by land use plans or other proposed actions and to develop sound conservation practices. Implementation-level planning should consider all site-specific methods and procedures which are needed to bring the species and their habitats to the condition under which the provisions of the ESA are not necessary, current listings under special status species categories are no longer necessary, and future listings under special status species categories would not be necessary."

4.8.1. Bald Eagle

4.8.1.1. Direct and Indirect Effects

The PRB FEIS discussed the impacts to bald eagles, pp. 4-251 to 4-253. The project may flush or displace foraging eagles in the project area. This level of disruption is not anticipated to harm individuals.

4.8.1.2. Cumulative Effects

The PRB FEIS discussed the cumulative effects for bald eagles, pp. 4-251 to 4-253. No additional impacts are anticipated.

4.8.1.3. Mitigation Measures

None.

4.8.1.4. Residual Effects

None anticipated.

4.8.2. Ferruginous Hawk

4.8.2.1. Direct and Indirect Effects

BLM anticipates no direct effect. One nest, BLM ID #13109 was active in 2012 and was 0.7 miles from the 44 -71-5D-1H and 44 -71-8A-1H wells. Hills screen the well locations from the nests. Noise from drilling activities at these wells may be disruptive to the hawks.

4.8.2.2. Cumulative Effects

The cumulative effects associated with this alternative are within the analysis parameters and impacts described in the PRB FEIS. Refer to the PRB FEIS p. 4-262 and 4-273.

4.8.2.3. Mitigation Measures

Sage-grouse timing restrictions through June will provide sufficient time to the hawk pair using nest BLM ID 13109 for hatching eggs and starting to raise chicks. There is little chance the pair will abandon the nest with young, and the distance to the wells (0.7 miles), combined with the topographical relief, should be sufficient protection to the 2012 nesting effort.

4.8.2.4. Residual Effects

The proposed wells will remove, or diminish the value of, potential nesting areas.

4.8.3. Mountain Plover

4.8.3.1. Direct and Indirect Effects

The PRB FEIS analyzed the direct and indirect impacts to mountain plover, pp. 4-254 to 4-255. BLM found no plover in 2011 or 2012 surveys and anticipates no impacts to the bird.

4.8.3.2. Cumulative Effects

The PRB FEIS analyzed the cumulative effects to mountain plovers, pp. 4-245 to 4-255.

4.8.3.3. Mitigation Measures

BFO will require a 0.25 mile timing limitation on surface-disturbing activities for potential nesting habitat during the nesting season to reduce impacts to nesting mountain plovers.

4.8.3.4. Residual Effects

Surface-disturbing activities may displace mountain plovers, even with timing limitations because of other activities associated with development. Traffic and construction activities that are not prohibited by the timing limitations may degrade habitat quality sufficiently to render the area unsuitable for some mountain plovers. Timing limitations do not reduce impacts to habitat: drilling and construction outside the nesting season will result in habitat loss for this species. Mortalities associated with maintenance and non-surface-disturbing activities will still occur.

4.9. West Nile Virus

4.9.1. Direct and Indirect Effects

This project is unlikely to increase standing surface water - which often contributes to increases mosquito breeding habitat. PH's use of a closed-loop system drilling and its planned storage and disposal of completion and produced water should lead to no new surface water.

4.9.2. Cumulative Effects

There are many sources of native standing water in the PRB that add mosquito habitat. Summer thunderstorms that pool water for more than 4 days in hot weather can result in large *Culex* mosquito hatches. Other sources of water include; natural flows, livestock watering facilities, coal mining operations, and human outdoor water use and features in and around communities.

4.9.3. Mitigation Measures

There is little evidence that treatment through the use of larvicides or malithion, on a site specific or basin-wide scale will have effect on the overall spread of the disease; yet, 1 study showed that landscape level larvacide applications can decrease the number of hatching mosquitoes in an area (BHEC 2008).

4.9.4. Residual Effects

BLM anticipates no residual effects.

4.10. Cultural Resources

4.10.1. Direct and Indirect Effects

This proposed project will impact non eligible site48CA2422. The proposed project will not impact any historic properties. Following the Wyoming State Protocol Section VI(A)(1) the BLM electronically notified the WSHPO on March17, 2012 that no historic properties exist in the area of potential effect (APE). If Operators observe any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS and ROD)] during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Standard COA (General)(A)(1) further explains discovery procedures.

4.10.2. 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. This results in fewer archaeological resources available for study of past human life-ways, changes in human behavior through time, and interpreting 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 information about archaeological sites and the potential for subsurface cultural materials in the area serves to partially mitigate potential cumulative effects to cultural resources.

Fee actions constructed in support of federal actions can result in impacts to historic properties. Construction of large plans of coalbed natural gas development on split estate often include associated infrastructure that is not permitted through BLM. Project applicants may connect wells draining fee minerals, or previously constructed pipelines on fee surface with a federal plan of development. BLM has no authority over such development 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. The cumulative effect of numerous federal approvals can result in impacts to historic properties.

Archeological inventories reveal the location of sites and although the BLM goes to great lengths to protect site location data, information can potentially get into the wrong hands. BLM authorizations that result in new access can inadvertently lead to impacts to sites from increased visitation by the public.

4.10.3. Mitigation Measures

If Operators observe any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS and ROD)] during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Standard COA (General)(A)(1) further explains discovery procedures.

4.10.4. 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. CONSULTATION/COORDINATION:

BLM consulted or coordinated with the following on this project:

Contact	Organization	Onsite Presence?
Pauline Schuette	US Fish & Wildlife Service	No
Mary Hopkins	WY SHPO	No

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Appendix A. Table 1. Summary of Special Status (Sensitive) Species Habitat and Project Effects Associated with Alternative B.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Amphibians				
Northern leopard frog (*Rana pipiens*)	Beaver ponds and cattail marshes from plains to montane zones.	NS	NI	Habitat is not present.
Columbia spotted frog (*R*anus pretiosa)	Ponds, sloughs, small streams, and cattails in foothills and montane zones. Confined to headwaters of the S Tongue R drainage and tributaries.	NP	NI	The project area is outside the species' range, and the species is not expected to occur .
Fish				
Yellowstone cutthroat trout (*Oncoryhynchus clarki bouvieri*)	Cold-water rivers, creeks, beaver ponds, and large lakes in the Upper Tongue sub-watershed	NP	NI	The project area is outside the species' range, and the species is not expected to occur.
Birds				
Baird's sparrow (*Ammodramus bairdii*)	Shortgrass prairie and basin-prairie shrubland habitats; plowed and stubble fields; grazed pastures; dry lakebeds; and other sparse, bare, dry ground.	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Bald eagle (*Haliaeetus leucocephalus*)	Mature forest cover often within one mile of large water body with reliable prey source nearby.	K	MIIH	Bald eagles are not likely to use the few mature trees in the project area for nesting or winter roosting. Surface disturbing and maintenance activities may impact foraging eagles and the species may avoid the area.
Brewer's sparrow (*Spizella breweri*)	Sagebrush shrubland	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	K	MIIH	Two documented nests occur within 0.5 miles of wells. Neither was active in 2012. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Mountain Plover	Short-grass prairie with slopes < 5%	NS	NI	Vegetation height and topography in the area preclude use by plovers.
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	NP	NI	Habitat not present.
Peregrine falcon (*Falco peregrinus*)	Cliffs	NP	NI	Habitat not present.
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	NS	NI	Species not known from this area.
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	NP	NI	Habitat not present.
Western Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	NP	NI	Habitat not present.
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	NP	NI	Habitat not present.
Mammals				
Black-tailed prairie dog (*Cynomys ludovicianus*)	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	NP	NI	No Prairie dog towns present.
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	NP	NI	Habitat not present.
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	NP	NI	Habitat not present.
Swift fox (*Vulpes velox*)	Grasslands	S	MIIH	Foxes may be killed on project roads.
Townsend's big-eared bat (*Corynorhinus townsendii*)	Caves and mines.	NP	NI	Habitat not present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Plants				
Limber Pine (*Pinus flexilis*)	Mountains, associated with high elevation conifer species	NP	NI	Habitat not present.
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5300-6500 ft.	NP	NI	Habitat not present.
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides, 6000-8300 ft.	NP	NI	Project area outside of species' range.

Presence

K - Known, documented observation within project area.
S - Habitat suitable and species suspected, to occur within the project area.
NS - Habitat suitable but species is not suspected to occur within the project area.
NP - Habitat not present and species unlikely to occur within the project area.

Project Effects

NI - No Impact.
MIIH - May Impact Individuals or Habitat, but will not likely contribute to a trend towards Federal listing or a loss of viability to the population or species.
WIPV - Will Impact Individuals or Habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
BI -Beneficial Impact