DECISION RECORD
ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA12-183
Summit Gas Resources, Inc., Cabin Creek Phase VII Federal Plan of Development (POD)
Coalbed Natural Gas (CBNG)
Buffalo Field Office, Bureau of Land Management

DECISION. The BLM approves Summit Gas Resources, Inc. (SGR or operator) Cabin Creek Phase VII Federal POD coalbed natural gas (CBNG) well applications for permit to drill (APDs) as described in Alternative B of the environmental assessment (EA) WY-070-EA12-183, which BLM incorporates 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 On Shore 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.

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

Well Site. BLM approves the following 74 APDs and support facilities:

	Well Name	Well #	Qtr/Qtr	Sec	Township	Range	Lease #
1	CABIN CREEK 7 CB	03-28	NENW	28	58N	76W	WYW149630
2	CABIN CREEK 7 CB	05-28	SWNW	28	58N	76W	WYW149630
3	CABIN CREEK 7 CB	01-28	NENE	28	58N	76W	WYW149629
4	CABIN CREEK 7 CB	09-28	NESE	28	58N	76W	WYW149629
5	CABIN CREEK 7 CB	16-28	SESE	28	58N	76W	WYW149629
6	CABIN CREEK 7 CB	11-28	NESW	28	58N	76W	WYW149630
7	CABIN CREEK 7 CB	01-29	NENE	29	58N	76W	WYW149630
8	CABIN CREEK 7 CB	03-29	NENW	29	58N	76W	WYW149630
9	CABIN CREEK 7 CB	07-29	SWNE	29	58N	76W	WYW149630
10	CABIN CREEK 7 CB	11-29	NESW	29	58N	76W	WYW48708
11	CABIN CREEK 7 CB	15-29	SWSE	29	58N	76W	WYW0313942
12	CABIN CREEK 7 CB	05-29	SWNW	29	58N	76W	WYW149630
13	CABIN CREEK 7 CB	01-30	NENE	30	58N	76W	WYW48708
14	CABIN CREEK 7 CB	07-30	SWNE	30	58N	76W	WYW48708
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19	CABIN CREEK 7 CB	23-30	NESW	30	58N	76W	WYW48708
20	CABIN CREEK 7 CB	27-30	SWSW	30	58N	76W	WYW48708
21	CABIN CREEK 7 CB	28-30	SESW	30	58N	76W	WYW48708
22	CABIN CREEK 7 CB	05-30	SWNW	30	58N	76W	WYW48708
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24	CABIN CREEK 7 CB	05-20	SWNW	20	58N	77W	WYW144224
25	CABIN CREEK 7 CB	07-20	SWNE	20	58N	77W	WYW144224
26	CABIN CREEK 7 CB	13-21	SWSW	21	58N	77W	WYW144224

27	CABIN CREEK 7 CB	05-21*	SWNW	21	58N	77W	WYW144224
28	CABIN CREEK 7 CB	07-21	SWNE	21	58N	77W	WYW144224
29	CABIN CREEK 7 CB	15-21	SWSE	21	58N	77W	WYW144224
30	CABIN CREEK 7 CB	09-22	NESE	22	58N	77W	WYW144224
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34	CABIN CREEK 7 CB	11-23	NESW	23	58N	77W	WYW144224
35	CABIN CREEK 7 CB	08-23	SENE	23	58N	77W	WYW147351
36	CABIN CREEK 7 CB	13-23	SWSW	23	58N	77W	WYW144224
37	CABIN CREEK 7 CB	16-23	SESE	23	58N	77W	WYW147351
38	CABIN CREEK 7 CB	15-24	SWSE	24	58N	77W	WYW147351
39	CABIN CREEK 7 CB	09-24	NESE	24	58N	77W	WYW147351
40	CABIN CREEK 7 CB	14-24	SESW	24	58N	77W	WYW147351
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42	CABIN CREEK 7 CB	03-25	NENW	25	58N	77W	WYW147351
43	CABIN CREEK 7 CB	05-27	SWNW	27	58N	77W	WYW144225
44	CABIN CREEK 7 CB	07-27	SWNE	27	58N	77W	WYW144225
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46	CABIN CREEK 7 CB	03-28	NENW	28	58N	77W	WYW144225
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52	CABIN CREEK 7 CB	15-28	SWSE	28	58N	77W	WYW144225
53	CABIN CREEK 7 CB	03-29	NENW	29	58N	77W	WYW144226
54	CABIN CREEK 7 CB	07-29	SWNE	29	58N	77W	WYW144226
55	CABIN CREEK 7 CB	09-29	NESE	29	58N	77W	WYW144226
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57	CABIN CREEK 7 CB	15-29	SWSE	29	58N	77W	WYW144226
58	CABIN CREEK 7 CB	09-31	NESE	31	58N	77W	WYW144226
59	CABIN CREEK 7 CB	11-31	NESW	31	58N	77W	WYW144226
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61	CABIN CREEK 7 CB	15-31	SWSE	31	58N	77W	WYW144226
62	CABIN CREEK 7 CB	01-32	NENE	32	58N	77W	WYW144227
63	CABIN CREEK 7 CB	03-32	NENW	32	58N	77W	WYW144227
64	CABIN CREEK 7 CB	05-32	SWNW	32	58N	77W	WYW144227
65	CABIN CREEK 7 CB	09-32	NESE	32	58N	77W	WYW144227
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69	CABIN CREEK 7 CB	13-32	NWSW	32	58N	77W	WYW144227
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72	CABIN CREEK 7 CB	05-33	SWNW	33	58N	77W	WYW144227
73	CABIN CREEK 7 CB	07-33	SWNE	33	58N	77W	WYW144227
74	CABIN CREEK 7 CB	11-33	NESW	33	58N	77W	WYW144227

Water Management: BLM approves the water injection APD and the use of following water management infrastructure:

Table 2.2. Proposed Water Management Facilities:

	FACILITY Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturbance	Lease #
1	Schauer #1 Pit	SWSE	22	58N	77W	50.2	#10.6acres	WYW144224

Realty. Rights-of-way were identified for existing and proposed roads, water pipelines, buried power lines, and gas pipelines on public lands for off-lease development. Use or construction of the existing and proposed roads, water pipelines, buried power lines, and gas pipelines on BLM lands may proceed only after issuance of separate right-of-way permits or grants.

Limitations. See realty, above, and the use of federal produced water in facilities may proceed only after BLM receives and approves written proof of bonding for secondary water storage facilities. 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-EA12-183, and the FONSI, incorporated here by reference, found the Cabin Creek VII Federal POD will have no significant impacts on the human environment, beyond those described in the PRB FEIS, thus there is no requirement for an environmental impact statement.

This Project Tiers to these NEPA Analysis, in Addition to the PRB FEIS.

Project Name	Company	NEPA Analysis	# of Wells	Approval
Cabin Creek Phase 3	Pinnacle Gas Resources, Inc.	WY-070-07-089	70	8/23/2007
Cabin Creek Phase IV	Pinnacle Gas Resources, Inc.	WY-070-09-005	31	1/28/2009
Cabin Creek Phase V	Pinnacle Gas Resources, Inc.	WY-070-08-176	50	9/22/2008
Cabin Creek Phase VI Federal POD	Pinnacle Gas Resources, Inc.	WY-070-10-094	40	3/11/2010

COMMENT OR NEW INFORMATION SUMMARY. Since development of the Cabin Creek VII Federal POD proposal BFO received a new policy on the management of Greater Sage-Grouse (GSG) populations and habitats and a, population viability analysis (see decision rationale, below).

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

1. BLM and SGR included mitigation measures to reduce environmental impacts while meeting the project's need. The PRB FEIS analyzed and predicted that the PRB oil and gas development would have significant impacts to the region's GSG population. The impact of this 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 and ROD and current BLM and Wyoming GSG conservation strategies. For a complete description of all site-specific COAs associated with this approval, see the project's COAs.

2. SGR will conduct operations to minimize adverse effects to surface and subsurface resources, prevent unnecessary surface disturbance, and conform to currently available technology and practice.

3. The selected alternative will help meet the nation's energy needs, and help stimulate local economies by maintaining workforce stability.

4. The operator committed to:
   - Comply with the approved APD, applicable laws, regulations, orders, and notices to lessees.
   - Obtain necessary permits from agencies.
   - Offer water well agreements to the owners of record for permitted wells.
   - Provide water well analysis from a known reference point.
   - Incorporate several measures to alleviate resource impacts into their submitted surface use plan and drilling plan.

5. The operator certified it has a surface access agreement with the landowner(s) or bonded.

6. The project is clearly lacking in wilderness characteristics as it is in the middle of oil and gas development and its infrastructure.

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. Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Field Manager: _____ Date: 8/8/12

FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA12-183
Summit Gas Resources, Inc., Cabin Creek Phase VII Federal Plan of Development (POD)
Coalbed Natural Gas (CBNG)
Buffalo Field Office, Bureau of Land Management

FINDING OF NO SIGNIFICANT IMPACT (FONSI). Based on the information in the EA, WY-070-EA12-183, which is incorporated here by reference; I find that: (1) the implementation of Alternative B will not have significant environmental impacts beyond those already addressed in the Buffalo Final Environmental Impact Statement (FEIS) 1985, and the Powder River Basin (PRB) FEIS, 2003, and adjacent or overlapping development to which the EA tiers to the following analysis:

Project Name	Company	NEPA Analysis	# of Wells	Approval
Cabin Creek Phase 3	Pinnacle Gas Resources, Inc.	WY-070-07-089	70	8/23/2007
Cabin Creek Phase IV	Pinnacle Gas Resources, Inc.	WY-070-09-005	31	1/28/2009
Cabin Creek Phase V	Pinnacle Gas Resources, Inc.	WY-070-08-176	50	9/22/2008
Cabin Creek Phase VI Federal POD	Pinnacle Gas Resources, Inc.	WY-070-10-094	40	3/11/2010

(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. There is no requirement for an EIS. 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 in consideration of Interior Department Order 3310.

CONTEXT. Mineral development is a common land use in the PRB, sourcing over 42% of the nation's coal. The PRB FEIS reasonably foreseeable development analyzed building of 54,200 fluid mineral wells. The additional development described in Alternative B is insignificant in the national 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 proposal may relate to the PRB Greater Sage-Grouse (GSG) and its habitat decline having cumulative significant impacts; yet the small size of this project is within the parameters of the impacts in the PRB FEIS. There are no cultural or historical resources present that will be adversely affected by the selected alternative. The project area is clearly lacking in wilderness characteristics as it is in the middle of oil and gas development. The project does not adversely affect any species listed under the Endangered Species Act or their designated critical

habitat. The selected alternative will not have any anticipated effects that would threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment.

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

Field Manager: _____ Date: 8/8/12

ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA12-183
Summit Gas Resources, Inc., Cabin Creek Phase VII Federal Plan of Development (POD)
Coalbed Natural Gas (CBNG)
Bureau of Land Management, Buffalo Field Office, Wyoming

1. INTRODUCTION

This is BLM's environmental assessment (EA) for Summit Gas Resources, Inc. (SGR or operator) Cabin Creek Phase VII Federal POD coalbed natural gas (CBNG) well applications for permit to drill (APD).

This site-specific analysis tiers into and incorporates by reference the information and analysis in the Powder River Basin (PRB) Oil and Gas Project Final Environmental Impact Statement (FEIS) (2003) and Resource Management Plan (RMP) Amendment, WY-070-02-065 (2003), pursuant to 40 CFR 1508.28 and 1502.21. This EA also tiers to the Buffalo RMP, 1985, and amendments, 2001, 2003, and 2011. These documents are available for review at the BLM Buffalo Field Office (BFO) and on our website. This project EA addresses site-specific resources and impacts that the PRB FEIS could not cover.

Congress made a 4-part process for federal land and 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

SGR submitted the Cabin Creek VII Federal POD proposal with 82 APDs on April 28, 2011 to the BFO to produce CBNG from federally managed fluid mineral bearing formations of the PRB, covered by privately owned terrain with relatively steep slopes.

- August 25, 2010: The Cabin Creek VII and Cabin Creek VII PODs were returned to the operator for failure to meet Onshore Oil and Gas Order #1. SGR filed an SDR and the project was remanded to continue processing.
- August 16, 2011: The Cabin Creek Phase VII POD was assigned and an Operator Information Meeting (OIM) was scheduled.
- August 25, 2011: The OIM was held with the BLM, operator, and associated landowners at the Buffalo BLM Field Office (BFO).
- October 27- 28, 2011, November 3, 9, 10, 15, & 16, 2011: The pre-approval onsites were conducted; which evaluated and modified APDs to minimize environmental impacts.
- November 30, 2011: BFO sent SGR Onshore Order #1 Deficiencies and project deficiencies needed to adequately analyze the NEPA.
- December 1, 2011: SGR received the BLM project Deficiency Letter; the deadline for deficiencies was 45 days (January 15, 2012).
- December 7, 2011: SGR requested to meet with the BLM in Buffalo to discuss the project deficiencies and had a meeting.
- December 22, 2011: BLM and SGR met again to discuss SGR's response letter to the deficiencies with the BLM management and NRSs.
- January 6, 2012: BLM received a letter from SGR requesting a 26 day extension for deficiencies sent on November 30, 2011.
- February 10, 2012: SGR turned in a portion of project deficiencies to the BLM.
- June 14, 2012: BLM and SGR had meeting to discuss outstanding deficiencies for the Cabin Creek Phase VII Federal POD.

- June 28, 2012: BFO received a remainder of deficiencies from SGR.
- July 11, 2013: BFO received the correct number of wells from the operator, SUDS, and a request by the operator to remove the CB FED 07-31-5877 well location from the Cabin Creek Phase VII POD and place it in the Cabin Creek Ph. VIII POD as well as defer the pipeline corridor connecting the CB FED 07-31-5877 to the CB FED 11-31-5877 to the Cabin Creek Phase VIII POD. SGR removed 8 APDs from their initial proposal for various reasons.
- July 2012: BFO BLM sent SGR COAs prior to approval for their review.

1.2. Need for the Proposed Project

The BLM's need for the action is how to support the goals of the Buffalo RMP and its 2003 Amendment to development an oil and gas lease through APDs on federal land under the Mineral Leasing Act (MLA), Onshore Order No. 1, the Federal Land Policy and Management Act (FLPMA), and other laws while complying with the BLM's mandates of multiple-use and natural resource conservation and support conditional leasehold rights.

1.3. Decision to be Made

The BLM will decide whether or not to, or how to, or how it may approve the proposed development of oil and gas minerals on the federal leasehold, and if so, under what terms and conditions.

1.4. Scoping and Issues

The BFO provided this project's external scoping to 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 analyzed by the BFO. External scoping would be unlikely to identify new issues, as verified by the few fluid mineral EAs that were recently externally scoped such as the Clabaugh (WY-070-EA08-134), and the Hollcroft/Stotts Draw (WY-070-EA07-021). Recent external scoping in 2010 and 2011 for a geographically-focused proposed RMP amendment revealed no new issues outside of the geographically-specific issues.

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:

- Soils and vegetation: site stability, reclamation potential, riparian and wetland communities, invasive species
- Water: ground water depletion, quality, and quantity of produced water.
- Wildlife: sage-grouse and raptor productivity, migratory birds, special status species
- Cultural: National Register eligible sites

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 analyzed in the PRB FEIS analysis with the subsequent analysis and development from the adjacent and intermingled PODs: see Table 3.1). (See Table 2.3 for an approximation of the disturbance in the current situation.) The PRB FEIS 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 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 FEIS 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

Proposed Action Title/Type: Cabin Creek Phase VII Federal POD, coalbed natural gas (CBNG)

Operator/Applicant: Summit Gas Resources, Inc. (SGR)

Proposed Well Information:
SGR proposed 74 CBNG wells in this POD. The proposed wells are vertical bores on an 80 acre spacing pattern with 1 well per location. Each CBNG well will produce from Canyon, Cook, Wall, and Pawnee coal seams which range in depth from 81 feet to 1,384 feet. Table 2.1 has a list of proposed wells.

Surface Owners: BLM, Schauer Enterprises, Bow & Arrow Ranch, Inc., Ford Ranch Trust, PeeGee Ranch and Sussex Cattle Company, Inc., Bales Ranch, and the Padlock Ranch, Inc.

Table 2.1. Proposed Wells (74 CBNG) – Alternative B

#	Well Name	Well #	Qtr/Qtr	Sec	Township	Range	Lease #
1	CABIN CREEK 7 CB	03-28	NENW	28	58N	76W	WYW149630
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36	CABIN CREEK 7 CB	13-23	SWSW	23	58N	77W	WYW144224
37	CABIN CREEK 7 CB	16-23	SESE	23	58N	77W	WYW147351
38	CABIN CREEK 7 CB	15-24	SWSE	24	58N	77W	WYW147351
39	CABIN CREEK 7 CB	09-24	NESE	24	58N	77W	WYW147351
40	CABIN CREEK 7 CB	14-24	SESW	24	58N	77W	WYW147351
41	CABIN CREEK 7 CB	01-25	NENE	25	58N	77W	WYW147351
42	CABIN CREEK 7 CB	03-25	NENW	25	58N	77W	WYW147351
43	CABIN CREEK 7 CB	05-27	SWNW	27	58N	77W	WYW144225
44	CABIN CREEK 7 CB	07-27	SWNE	27	58N	77W	WYW144225
45	CABIN CREEK 7 CB	01-28	NENE	28	58N	77W	WYW144225
46	CABIN CREEK 7 CB	03-28	NENW	28	58N	77W	WYW144225
47	CABIN CREEK 7 CB	05-28	SWNW	28	58N	77W	WYW144225
48	CABIN CREEK 7 CB	07-28	SWNE	28	58N	77W	WYW144225
49	CABIN CREEK 7 CB	09-28	NESE	28	58N	77W	WYW144225
50	CABIN CREEK 7 CB	11-28	NESW	28	58N	77W	WYW144225
51	CABIN CREEK 7 CB	13-28	SWSW	28	58N	77W	WYW144225
52	CABIN CREEK 7 CB	15-28	SWSE	28	58N	77W	WYW144225
53	CABIN CREEK 7 CB	03-29	NENW	29	58N	77W	WYW144226
54	CABIN CREEK 7 CB	07-29	SWNE	29	58N	77W	WYW144226
55	CABIN CREEK 7 CB	09-29	NESE	29	58N	77W	WYW144226
56	CABIN CREEK 7 CB	11-29	NESW	29	58N	77W	WYW144226
57	CABIN CREEK 7 CB	15-29	SWSE	29	58N	77W	WYW144226
58	CABIN CREEK 7 CB	09-31	NESE	31	58N	77W	WYW144226
59	CABIN CREEK 7 CB	11-31	NESW	31	58N	77W	WYW144226
60	CABIN CREEK 7 CB	13-31	SWSW	31	58N	77W	WYW144226
61	CABIN CREEK 7 CB	15-31	SWSE	31	58N	77W	WYW144226
62	CABIN CREEK 7 CB	01-32	NENE	32	58N	77W	WYW144227
63	CABIN CREEK 7 CB	03-32	NENW	32	58N	77W	WYW144227
64	CABIN CREEK 7 CB	05-32	SWNW	32	58N	77W	WYW144227
65	CABIN CREEK 7 CB	09-32	NESE	32	58N	77W	WYW144227
66	CABIN CREEK 7 CB	07-32	SWNE	32	58N	77W	WYW144227
67	CABIN CREEK 7 CB	15-32	SWSE	32	58N	77W	WYW144227
68	CABIN CREEK 7 CB	11-32	NESW	32	58N	77W	WYW144227
69	CABIN CREEK 7 CB	13-32	NWSW	32	58N	77W	WYW144227
70	CABIN CREEK 7 CB	01-33	NENE	33	58N	77W	WYW144227
71	CABIN CREEK 7 CB	03-33	NENW	33	58N	77W	WYW144227
72	CABIN CREEK 7 CB	05-33	SWNW	33	58N	77W	WYW144227
73	CABIN CREEK 7 CB	07-33	SWNE	33	58N	77W	WYW144227
74	CABIN CREEK 7 CB	11-33	NESW	33	58N	77W	WYW144227

Water Management Facilities:

Table 2.2. Proposed Water Management Facilities:

#	FACILITY Name / Number	Qtr/Qtr	Sec	Twp	Rng	Capacity (Acre Feet)	Surface Disturbance	Lease #
1	Schauer #1 Pit	SWSE	22	58N	77W	50.2	#10.6acres	WYW144224
2	Outfall 001	NENE	20	57N	76W	NA	0.01 Acres	None
3	Outfall 002	NENW	6	57N	75W	NA	0.01 Acres	None
4	Outfall 003	NWNE	20	57N	76W	NA	0.01 Acres	None
5	Outfall 004	SWNW	31	57N	76W	NA	0.01 Acres	None
6	Outfall 005	NWNW	31	57N	76W	NA	0.01 Acres	None
7	Outfall 006	NWSE	31	57N	75W	NA	0.01 Acres	None
8	Outfall 007	NENW	6	57N	75W	NA	0.01 Acres	None

The proposal is to drill and develop CBNG wells. The project would be subject to the conditions-of-approval (COAs) for drilling a CBNG well in the BFO jurisdiction. 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, in this alternative.

Drilling and Construction:

- The operator proposes to drill 74 wells to the following coal zone(s) at the approximated depths from ground surface:
  - Canyon, Cook, Wall, and Pawnee coal seams range in formation depth from 81 feet to 1,384 feet.

- Summit Gas Resources, Inc. (SGR) anticipates completing drilling and construction activities within 2 years, the term of an APD. Drilling and construction occurs year-round in the PRB. Weather may cause delays lasting several days but rarely do delays last multiple weeks. Timing limitations in the form of COAs and/or agreements with surface owners impose longer temporal restrictions on portions of this POD, but rarely do these restrictions affect an entire POD.

- The company's proposed wells are vertical bores on a generally 80 acre spacing pattern with 1 well per location. Proposed fenced well dimensions are 15 x 15 feet x 4 feet high. The company will cover the wellheads with an insulated well house, with proposed well house dimensions being 8.0 feet wide x 8.0 feet length x 8.0 feet height, colored Covert Green, selected to blend with the vegetation.

- SGR shall accomplish well metering by telemetry and well visitation. Metering would entail approximately 4 visits per month to each well for maintenance, calibration, sampling, etc. More frequent visits will likely occur during the first several months of operation.

- A water management plan (WMP) that involves the following infrastructure and strategy: 1 proposed full containment, lined, and fenced off-channel reservoir with an outfall incorporated into the facility, and 7 direct discharge outfalls to discharge produced water directly to the Powder River. The proposal includes a single off-channel, full containment reservoir that has been designated as secondary. Facilities identified as secondary under approval status have undergone an environmental review, however, the operator has chosen not to provide reclamation bonds, and will not construct them until proof of bonding is provided. If the operator chooses to develop the facility, they will submit a sundry notice to that effect with the relevant reclamation bonds.

- A road network consisting of existing and proposed improved (i.e., template or engineered) roads and primitive roads, including appropriately designed drainage. The project will have 1.2 miles of engineered road, 17.8 miles of improved road and 11.5 miles of primitive road, the remainder of the roads proposed for use is existing.

- Powder River Energy Corporation (PreCorp) will build an above ground powerline network. In the event the company alters the proposed route, then the company will apply for the new route via sundry application and BLM will analyze it in a separate NEPA document. The CBNG wells likely will produce before construction of the powerline. In that case the temporary diesel/gas generators shall be placed at 21 power drops.

- The operator is proposing to use portable generators: A storage tank of 1000 gallon capacity shall be located with each diesel/gas generator. Generators are projected to be in operation for about 12 months. Fuel deliveries are anticipated to be about 1-2 times per week.

- A buried gas, water, and power line network, metering facilities, and 1 water storage/injection facility. Rights-of-ways (ROWs) are on private and federal surface.

Table 2.3. Summary of Disturbance
Alternative A is represented below in Table 2.1 as existing, Alternative B is noted in Table 2.1 as all proposed disturbance. The total disturbance takes into account both proposed infrastructure as well as existing infrastructure that is to be used as part of the project and or upgraded.

Company Name: Summit Gas Resource, Inc. (SGR)				
Project Name: Cabin Creek VII Federal POD				
Number of Wells: 74 **Leases Involved:** WYW144224, WYW144225, WYW144226, WYW144227, WYW147351, WYW149629, WYW149630, WYW313942, WYW48708				
Township(s) Involved: **T** 58 **R** 77 **Sections:** 20, 21, 22, 23, 24, 25, 27, 28, 29, 31, 32, and 33				
Township(s) Involved: **T** 58 **R** 76 **Sections:** 28, 29, 30 and 33				
	#	**Length**	**Width (FT)**	**Acres of Disturbance**
Proposed Engineered Roads- Not within Corridor (Initial Construction):		420 LF 0.08 Miles	50	0.48
Proposed Engineered Roads- Not within Corridor (Interim):		420 LF 0.08 Miles	14	0.13
Proposed Engineered Roads- Within Corridor (Initial Construction):		5,905 LF 1.12 Miles	50	6.78
Proposed Engineered Roads- Within Corridor (Interim):		5,905 LF 1.12 Miles	14	1.90
Proposed Template A Roads- Not within Corridor (Initial Construction):		0 LF 0.00 Miles	50	0.00
Proposed Template A Roads- Not within Corridor (Interim):		0 LF 0.00 Miles	14	0.00
Proposed Template A Roads- Within Corridor (Initial Construction):		7,075 LF 1.34 Miles	50	8.12
Proposed Template A Roads- Within Corridor (Interim):		7,075 LF 1.34 Miles	14	2.27
Proposed Template B Roads- Not within Corridor (Initial Construction):		4,575 LF 0.87 Miles	50	5.25

Proposed Template B Roads- Not within Corridor (Interim):		4,575 LF 0.87 Miles	14	1.47
Proposed Template B Roads- Within Corridor (Initial Construction):		82,320 LF 15.59 Miles	50	94.49
Proposed Template B Roads- Within Corridor (Interim):		82,320 LF 15.59 Miles	14	26.46
Proposed Primitive Roads - Not within Corridor (Initial Construction):		5,655 LF 1.07 Miles	30	3.5
Proposed Primitive Roads - Not within Corridor (Interim):		5,655 LF 1.07 Miles	12	1.56
Proposed Primitive w/Utilities Corridor: (Initial Construction):		55,200 LF 10.45 Miles	50	63.36
Proposed Primitive w/Utilities Corridor (Interim):		55,200 LF 10.45 Miles	12	15.2
Existing Template Roads- Not within Corridor (No Disturbance Required):		2,200 LF .42 Miles	14	.7
Existing Template Roads/ Utilities Corridor (Initial Construction):		58,465 LF 11.07 Miles	50	67.11
Existing Template Roads/ Utilities Corridor (Interim):		58,465 LF 11.07 Miles	14	18.79
Existing Primitive Roads - Not within Corridor (No Disturbance Required):		NA	NA	NA
Existing Primitive Roads / Utilities Corridor: (Initial Construction):		13,670 FL 2.59 Miles	50	15.69
Existing Primitive Roads / Utilities Corridor: (Interim):		13,670 LF 2.59 Miles	12	3.77
Proposed Cross Country Utilities Corridor: (Initial Construction):		8,345 LF 1.58 Miles	50	9.58
Proposed Cross Country Utilities Corridor: (Interim):		8,345 LF 1.58 Miles	0	0
Proposed/Estimated Third Party Overhead Power (Initial Construction):		80,370 LF 15.22 Miles	30	55.35
Proposed/Estimated Third Party Overhead Power (Interim):		80,370 LF 15.22 Miles	15	27.68
Number of Wells with Pad Locations: (Initial Construction):	5	250LF	250LF	7.2
Number of Wells with Pad Locations: (Interim):	5	100LF	120LF	1.38
Number of Wells with Slot Locations: (Initial Construction):	20	208LF	208LF	20.0
Number of Wells with Slot Locations: (Interim):	20	50LF	50LF	1.17
Number of No Pad Well Location: (Initial Construction):	49	208LF	208LF	49.0
Number of Wells Location: (Interim):	49	50LF	50LF	2.92
Proposed/Estimated Third Party Power Drops	21	0	0	Included in ROW above
Number of Proposed Compressors:	0	NA	NA	

Number of Proposed Impoundments (Initial Construction):	1-Off Channel	723 LF	723 LF	12.0
Number of Proposed Impoundments (Interim):	1-Off Channel	467LF	467LF	5.0
Number of Staging Areas: (Initial Construction):	4	416LF	416LF	8.0
Number of Staging Areas: (Interim):	4	NA	NA	0
Total Disturbed Acreage for Initial Construction:				**417.91 acres**
Total Disturbed Acreage after Reclamation (Interim):				**109.70 acres**

Description of Proposed Design Features and Mitigation Measures:
Implementation of committed mitigation measures contained in the surface use plan of operations and drilling plan, in addition to the following COAs, would minimize adverse environmental impacts that may result from approval of the proposed action

- Low reclamation potential (LRPs) and 25% slopes and greater are present within the project. However, through BLM recommendations and operator committed measures the project infrastructure avoids these known areas.
  - This is represented in the low numbers of constructed locations.

For a detailed description of design features, construction practices and water management strategies associated with the proposal, refer to the Master Surface Use Plan (MSUP), Cabin Creek VII Federal POD: Appendix A (MSUP), Labrador POD: Construction Summary Table of Improved Roads and Well Locations, Drilling Plan and WMP in the POD and individual APDs. Also see the subject POD for maps showing the proposed well locations and associated facilities described above. More information on CBNG well drilling, production, and standard practices also is available in the PRB FEIS, pp. 2-9 to 2-40.

Implementation of committed mitigation measures in the MSUP, Drilling Program and WMP, in addition to the Standard COAs in the PRB FEIS ROD, are incorporated and analyzed in this alternative.

Additionally, the operator, in their APD, committed to:
1. Comply with an approved APD, applicable laws, regulations, orders, and notices to lessees.
2. Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, and relevant air quality permits.
3. The operator certified he has a surface use agreement with the landowners or bonded.
4. The operator certified that a copy of the SUP was provided to the relevant landowners.
5. Conform to the RMP and other program guidance

The proposed action generally conforms to the 1985 Buffalo RMP, the 2001 and 2011 amendments, and the 2003 PRB FEIS and RMP Amendment and ROD. The proposed project generally conforms to federal laws, regulations, and policies including FLPMA, the National Historic Preservation Act, the Endangered Species Act, the Migratory Bird Treaty Act, the Clean Water Act, the Clean Air Act, the National Environmental Policy Act, and DOI Order 3310.

3. AFFECTED ENVIRONMENT

Section 3 describes and analyzes the physical and regulatory environment existing and trends of issue-related items for the project area described in Section 2. Aspects of the affected environment described in this section focus on the relevant major issues. Find a screening of all resources and land uses potentially

affected in Appendix A. This EA does not discuss or analyze resources that would be unaffected, or not affected beyond the level analyzed in the PRB FEIS.

Project Area Description:
The Cabin Creek VII project is approximately 20 miles north of Leiter, Wyoming in all or portions of Sections 28 and 33 T57N, R77W in Campbell County, Wyoming and in Sections 20-25 and 27-32 T57N, R78W in Sheridan County, Wyoming. Elevations in the area range from 3,500 to 4,200 feet above sea level. Topography ranges from rolling hills to rugged and broken terrain, featuring several deep draws, steep hills, and escarpments. Several sandstone cliffs and rock outcrops are present throughout the area, especially along the rims of some ridges. The climate is semi-arid, averaging 15-19 inches of precipitation annually, about 75% of which occurs between the months of April and September. The 30-year mean maximum and minimum temperatures in July and January were 86F and 10F, respectively. The project area consists of approximately 60% sagebrush grasslands, 30% grasslands, and 10% other natural features (bare rock or soil, open water, woodlands, etc.). Several two-track and improved roads are present, primarily along ridge tops and drainage bottoms.

Trees are common within the project area, and were mainly in drainages and along hillsides. Junipers (*Juniperus* spp.) were the dominant species and were primarily associated with hillsides and draws, other tree species present are western cedar (*Thuja plicata*), ponderosa pine (*Pinus ponderosa*), and mature cottonwoods (*Popus* spp.) Land uses in the survey area include livestock grazing (cattle) and conventional oil wells in the Fence Creek Oil Field. The Cabin Creek VII project is adjacent to the boundaries of 4 approved CBNG projects, which the BLM incorporates by reference. These projects include the analysis for 191 wells, see Table 3.1. The Cabin Creek VII area is clearly lacking wilderness characteristics because of CBNG infrastructure development.

Table 3.1. Adjacent or Overlapping Development with NEPA Analysis.

Project Name	Company	NEPA Analysis	# of Wells	Approval
Cabin Creek Phase 3	Pinnacle Gas Resources, Inc.	WY-070-07-089	70	8/23/2007
Cabin Creek Phase IV	Pinnacle Gas Resources, Inc.	WY-070-09-005	31	1/28/2009
Cabin Creek Phase V	Pinnacle Gas Resources, Inc.	WY-070-08-176	50	9/22/2008
Cabin Creek Phase VI Federal POD	Pinnacle Gas Resources, Inc.	WY-070-10-094	40	3/11/2010

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;
- Particulate Matter (PM) generated by vehicle travel on unpaved roads, windblown dust from neighboring areas, road sanding during the winter months, and coal mines and trains;
- Transport of air pollutants from emission sources located outside the region;
- NOx, PM, and other emissions from diesel trains and,
- SO2 and NOx from power plants.

3.2. Soils, and Ecological Sites

3.2.1. Soils

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. 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. 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 are from the Sheridan County Survey Area, Wyoming Soil Survey Geographic (SSURGO) Database (WY633) and the North Campbell County Survey Area, Wyoming Soil Survey Geographic (SSURGO) Database (WY705). The Natural Resource Conservation Service (NRCS) performed the soil survey according to National Cooperative Soil Survey standards. The BLM uses county soil survey information to predict soil behavior, limitations, or suitability for a given activity or action. The agency's long term goal for soil resource management is to maintain, improve, or restore soil health and productivity, and to prevent or minimize soil erosion and compaction. Soil management objectives are to ensure that adequate soil protection is consistent with the resource capabilities. Many of the area's soils and landforms present distinct challenges for development, and /or eventual site reclamation. A tabulated summary of the dominant and important soil map units follows, Table 3.2, with their individual acreage and percentage of the area within the project boundary.

Table 3.2. Map Unit Symbol (MUS) of Dominant and Important Soils in the Proposal Area

MUS	Map Unit Name	Approximate Acres	Project Area
269	Shingle-Theedle-Kishona association, moist, 3 to 30% slopes	1658.8	22%
261	Shingle, moist-Rock outcrop complex, 30 to 50% slopes	1263.1	17%
319	Zigweid-Kishona-Cambria complex, moist, 3 to 6% slopes	459.4	6%
305	Worfka-Shingle-Samday complex, moist, 6 to 30% slopes	430.1	6%
263	Shingle-Samday clay loams, 3 to 55% slopes, moist	366.5	5%
148	Hargreave-Moskee sandy loams, 3 to 9% slopes	299.4	4%
234	Renohill-Savageton complex, 3 to 10%slopes, moist	286.9	4%
265	Shingle-Taluce complex, moist, 9 to 15% slopes	236.6	3%
268	Shingle-Theedle-Kishona association, 6 to 25%slopes	209.8	3%

MUS	Map Unit Name	Approximate Acres	Project Area
119	Cedak-Recluse association, 3 to 6%slopes	208.7	3%

Source: NRCS 2010.

See the NRCS Soil Survey WY633 – Sheridan County, and WY 705 North Campbell County (SSURGO) data for more detailed soil information. Ecological Site interpretations include additional site-specific soil information. The soils section of this EA addresses the site-specific impacts that were not analyzed in the PRB FEIS and identifies potentially significant effects of the proposed project to help the decision maker come to a reasoned decision. Project issues related to soils and vegetation are further refined to address: soils identified as having poor reclamation suitability, soils susceptible to sever erosion, LRP areas, and slopes in excess of 25%.

These and other important though less visible soil characteristics were identified in the project area using SSURGO Data and onsite investigation, are listed below. The operator planned there project to avoid these susceptible sites, and where impacts were significant and could not be avoided the proponent withdrew the APDs. The operators design feature and committed measures provided mitigation to areas of concern minimally impacted. The BLM made further recommendations to the project, and applied mitigation measures to further to reduce impacts.

3.2.2. Reclamation Suitability

Currently soil conditions in the project area are impacted by CBNG development as well as traditional activities, including livestock grazing and wildlife use. Much of the area is covered with soils that 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.

Reclamation potential of soils 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. Many of the soils and landforms of this area present distinct challenges for development. Approximately 52 % of the area within the boundary of the proposed action contains soil mapping units having poor reclamation suitability. The remaining soils have slight or moderate reclamation suitability.

A tabulated summary of the project areas reclamation suitability follows, along with their individual acreage and percentage of the area within the project boundary. As depicted in Table 3.3, and verified at the onsite 52% of the project area has poor reclamation suitability.

Table 3.3. Reclamation Suitability of Soils in Project Area

Reclamation Suitability Rating	Acres	Percent
Poor	3920	52%
Fair/Not Rated		48%

3.2.3. Soils Susceptible to Erosion

Productivity loss is likely to occur on most disturbed soils if erosion is not mitigated. The development of a favorable rooting zone by the weathering of parent rock is much slower than development of the surface horizon. One estimate of this renewal rate is 0.5 tons per acre per year for unconsolidated parent materials and much less for consolidated materials. This very slow renewal rate supports the philosophy that any soil erosion is too much. Loss of organic matter, resulting from erosion and tillage, is one of the primary causes for reduction in production yields. As organic matter decreases, soil aggregate stability, soil moisture holding capacity, and cation exchange capacity decline (USDA 1998). Table 3.3 and Figure 3.1 shows the relative erosion potential, based on the site-specific information discussed above.

The POD contains areas identified as having a Severe Water Erosion Hazard as determined by using the Natural Recourses and Conservation Service (NRCS) Order III Soil Survey. The PRBFEIS identifies soils with a high water erosion potential as having a soil erosion factor and representative slope value with the resulting erosion index determined to be highly erosive. (NRCS, MLRA Office 4, Northern Rocky Mountain Soil Survey Region, 2007)

Table 3.4. Water Erosion Potential in the Cabin Creek VII POD Project Area

Erosion Potential	Acres	% of Project Area
High	1,829	24%
Moderate		76%

Source: USDA 2010a.

Soils susceptible to wind erosion include soils that have surface-soil properties that affect their resistance to soil blowing, including texture, organic matter content, and aggregate stability. Fine sandy-textured and silty soils with poor aggregation are particularly susceptible to wind erosion. The soils in the project area generally have moderate wind erosion potential The activities associated with construction, and exposure of subsurface soils create conditions resulting in high wind erosion susceptibility.

3.2.4. Limited Reclamation Potential (LRP)

Scientists identify LRP soils using SSURGO Data and onsite investigation. The onsite investigation found the 4 prominent and visible LRP areas in the project boundary.

1) Miscellaneous areas: have essentially no soil and support little or no vegetation and include sand blowouts which have low potential for restoration, high susceptibility for site degradation, and poor reclamation suitability. They can result from active erosion, washing by water, unfavorable soil conditions, or human activities. Some miscellaneous areas can be made productive, but only after major reclamation efforts. (430-VI-NSSH, 1996)
2) Badlands: A landscape which is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes with narrow interfluves. Badlands develop on surfaces with little or no vegetative cover, overlying unconsolidated or poorly cemented materials (clays, silts, or in some cases sandstones) sometimes with soluble minerals such gypsum or halite. (430-VI-NSSH, 1996)
3) Rock outcrop: Consists of exposures of bare bedrock. Most rock outcrops are hard rock, but some are soft. (430-VI-NSSH, 1996)
4) Slopes in Excess of 25%: Greater slopes usually increase the potential for slumping, landslides and water erosion (see chapter heading below Slopes in Excess of 25% for complete description).

3.2.5. Slopes in Excess of 25%

A soil's stability is greatly affected by the slope on which it occurs. Greater slopes usually increase the potential for slumping, landslides, and water erosion. Approximately 860 acres (11%) in the project area have slopes of 25% or more.

Soils with slopes of less than 25% may also be prone to high erosion because of the soil type, particle size, texture, or amount of organic matter. Soil types in the project area with severe erosion potential and slopes 25% or greater, as defined by the NRCS; (USDA NRCS 2007), are in Table 3.5 along with the number of acres and percentage of the project area.

Other contributing factors to slope stability include slope length, slope aspect and colluvium. Slope length has considerable control over runoff and potential accelerated water erosion. Slope aspect is the direction which the surface of the soil faces. Slope aspect may affect soil temperature, evapotranspiration, wind contact and soil moisture. Colluvium is poorly sorted debris that has accumulated at the base of slopes, in depressions, or along small streams through gravity, soil creep, and local wash. It consists largely of

material that has rolled, slid or fallen down the slope under the influence of gravity. The rock fragments in colluvium are usually angular, in contrast to the rounded, water-worn cobbles and stones in alluvium and glacial outwash. These factors in combination with slope determine soil stability and the potential for mass soil movement. A tabulated summary of the project areas slopes follows, Table 3.5, along with their individual acreage and percentage of the area in the project boundary.

Table 3.5. Percent Slope of Soils in the Project Area

% Slope	Acres	% of Project Area
0-24%	6,593	89%
Greater than or Equal to 25%	860	11%

Source: NRCS 2010

3.2.6. Depth to Restrictive Feature

Approximately 40% (2,979 acres) of the project area has soils less than less than 20 inches deep. This soil property impacts construction practices and reclamation potential. This feature adds cost and may reduce success if not addressed in the design of the project.

3.3. Vegetation and Ecological Sites

BLM staff identified the dominant vegetation community types in the project area are mixed-grass prairie and sagebrush shrubland. Species typical of the mixed-grass prairie community type are western wheatgrass (*Pascopyrum smithii*), blue grama (*Bouteloua gracilis*), needle-and-thread (*Hesperostipa comata*), and Wyoming big sagebrush (*Artemisia tridentate* var. *wyomingensis*), while species typical of the sagebrush shrubland include Artemisia spp. (*Chrysothamnus* spp.), western wheatgrass, prairie junegrass (*Koeleria macrantha*), and plains pricklypear (*Opuntia* spp.). In addition, bluebunch wheatgrass (*Pseudoroegneria spicata*), green needlegrass (*Nassella viridula*) were identified in the project area. Additional forb and shrub species observed during the site visit included yucca (*Yucca glauca*), common yarrow (*Achillea millefolium*), penstemons (*penstemon* spp.), American vetch (*Vicia americana*), and milkvetch (*Astragalus* spp.). Non-native graminoids present included cheatgrass (*Bromus tectorum*), which is quite extensive in the project area. Cheatgrass is the dominant species present in some locations. The site visits confirmed the presence of tree species (juniper and pine species) in draws, North and East aspects, along drainages and in areas protected from fire.

Ecological site descriptions provide site and vegetation information needed for resource identification, management and reclamation recommendations. BLM specialists used NRCS published soil survey information, verified through onsite field reconnaissance, to determine the appropriate ecological sites for this POD area. Ecological sites varied throughout the project area depending on slope, aspect, and elevations which determine the effective precipitation. Dominant or important ecological sites and plant communities identified in the project area are in Table 3.6. Refer to ecological site narrative sections below for description of vegetation species observed during onsite field visits. Table 3.7 summarizes the project area's ecological sites.

Table 3.6. Summary of Ecological Sites

Ecological site	Approximate Acreage	Project Area (%)
Loamy (Ly) 15-19" ppt. Northern Plains	3007.2	40%
Not Rated	1329.6	18%
Shallow Loamy (SwLy) 15-19" ppt. Northern Plains	1232.1	17%
Loamy (Ly) 10-14" ppt. Northern Plains	566.9	8%
Clayey (Cy) 15-19" ppt. Northern Plains	502.1	7%
Sandy (Sy) 15-19" Northern Plains	329.5	4%

Source NRCS 2010

Dominant or important ecological sites and plant communities identified in the project area are Loamy (15-19NP), Clayey (15-19NP), and Sandy (15-19NP) and there shallow counterparts. Refer to ecological site narrative sections below for description of vegetation species observed during onsite field visits.

Loamy Sites occur on gently undulating to rolling land on landforms which include hill sides, alluvial fans, ridges and stream terraces, in the 15-19 inch precipitation zone. These soils are moderately deep to very deep (greater than 20 inches to bedrock), well drained soils that formed in alluvium and residuum derived from sandstone and shale. These soils have moderate permeability. 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. Dominant vegetation includes green needlegrass, western wheatgrass, Idaho fescue, prairie junegrass and Sandberg bluegrass.

Shallow Loamy Sites occur on gently undulating to rolling land on landforms which include hill sides and ridge tops. 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. Dominant vegetation includes bluebunch wheatgrass, western wheatgrass, green needlegrass, Idaho fescue, spike fescue, and little bluestem. Other grasses occurring on the state include Sandberg bluegrass, and prairie junegrass. Cheatgrass has invaded the state.

Clayey Sites occur on the same landforms as Loamy sites and are similar in depth. These soils have slow permeability. The bedrock is clay shale which is virtually impenetrable to plant roots.

Sandy Sites occur on the same landforms as Loamy sites and are similar in depth. The soils have formed in eolian deposits or residuum derived from unspecified sandstone. These soils have moderate, moderately rapid or rapid permeability. The main soil limitations include low available water holding capacity, and high wind erosion potential. The present plant community is the similar to the Loamy site listed above with the following exception: Wyoming big sagebrush not as dominant. Needle and thread and prairie sandreed along with silver sage occupy the site.

3.4. Water Resources

The Cabin Creek VII POD is in the Fence Creek drainage - a tributary of the Middle Powder River. Ephemeral drainages, which flow into Fence Creek, dissect the area. The ephemeral drainages have gentle slope with well vegetated bottoms with numerous small head-cut features. Wyoming Department of Environmental Quality (WDEQ) assumed primacy from U.S. Environmental Protection Agency for maintaining the State'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. The Wyoming Oil and Gas Conservation Commission (WYOGCC) has authority for permitting and bonding off channel pits located over state and fee minerals.

3.4.1. Groundwater

The historical use for groundwater in this project area was for stock water or domestic purposes. A search of the WSEO and Montana Bureau of Mines and Geology Ground Water Rights Databases for this area showed 23 registered stock and domestic water wells within 1 mile of a federal CBNG producing well in the POD with depths ranging from 10 to 400 feet. For additional information on water, refer to the PRB FEIS (2003), Chapter 3, Affected Environment pp. 3-1 to 3-36 (groundwater).

WDEQ water quality parameters for groundwater classifications (Chapter 8 – Quality Standards for Wyoming Groundwater) define the following general limits for total dissolved solids (TDS): 500 mg/l

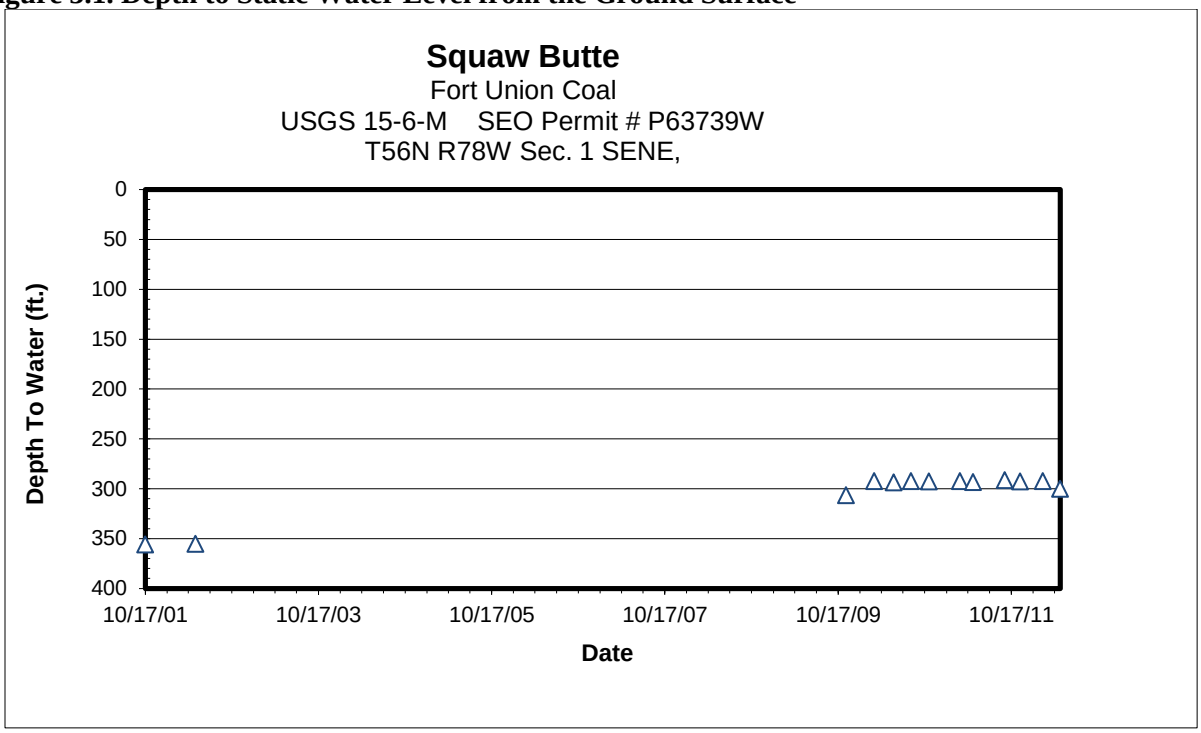
TDS for drinking water (Class I), 2000 mg/l for agricultural use (Class II) and 5000 mg/l for livestock use (Class III). For additional water quality limits for groundwater, please refer to the WDEQ web site.

The production of CBNG necessitates the removal of some degree of the water saturation in the coal zones to temporarily reduce the hydraulic head in the coal. BFO has been monitoring coal zone pressures and water levels since the early 1990s in the PRB.

The Cabin Creek VII POD is surrounded by many approved federal, fee, and state CBNG projects. The Squaw Butte groundwater monitoring well, found at T56N R78W Section 1, is within 6.5 miles of the Cabin Creek VII POD boundary and is a part of the BLM deep groundwater monitoring program. The initial water level of the Fort Union seam, measured in October of 2001, which is indicative of the pressure in the target coal zone, was recorded at 355 feet below ground level. The most recent measurement, from May, 2012, recorded the water level at 300 feet below ground level, for a rise of 55 feet since the well was completed.

This level of change is within the potential predicted in the PRB FEIS; determined through the regional groundwater model for that document. Refer to the PRB FEIS, Chapter 4, Groundwater for further information and to the Wyoming State Geological Survey's Open File Report 2009-10 titled, "1993-2006 CBNG Regional Groundwater Monitoring Report: Powder River Basin, Wyoming," which is available at: http://www.wsgs.uwyo.edu.

Figure 3.1. Depth to Static Water Level from the Ground Surface



3.4.2. Surface Water

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.

The PRB FEIS presents the historic mean electrical conductivity (EC, in µmhos/cm) and sodium adsorption ratio (SAR) by watershed at selected USGS Gauging Stations in Table 3-11 (PRB FEIS, p. 3-49). These water quality parameters "illustrate the variability in ambient EC and SAR in streams in the project area. The representative stream water quality is used in the impact analysis presented in Section 4 as the baseline for evaluating potential impacts to water quality and existing uses from future discharges of CBM [CBNG] produced water of varying chemical composition to surface drainages within the project area" (PRB FEIS, p. 3-48). For the Middle Powder River, the EC ranges from 1,421 at maximum monthly flow to 2,154 at low monthly flow; and the SAR ranges from 3.92 µS/cm at maximum monthly flow to 4.62 µS/cm at low monthly flow. The USGS station at Moorhead, MT determined these values (PRB FEIS, p. 3-49).

SGR identified 1 natural spring within a 1 mile radius of Cabin Creek POD. The spring is at NW¼SE¼ , Sec 35 T9S, R45E in Montana. The estimated flow of the spring is less than 1 gallon per minute (gpm) with a water quality of 2560 µmhos/ cm conductivity, 1840 mg/l TDS and 2.14 sodium adsorption ratio (SAR). For more information on surface water refer to the PRB FEIS, pp. 3-36 to 3-56.

3.5. Wetlands/Riparian

The National Wetland Inventory (NWI) identifies approximately 25.3 acres of sporadic, isolated wetlands in the POD. These wetlands have for the most part formed in low lying areas where surface water accumulates for extended periods of time. Some of the wetlands are adjacent to streams and others may be the result of leaking livestock water facilities.

3.6. Invasive Species

The Wyoming Energy Resource Information Clearinghouse (WERIC) maintains a database listing invasive species locations and other data. The University of Wyoming, BLM, and county Weed and Pest offices cooperatively created the WERIC database. BFO found the following state-listed noxious weeds and/or weed species of infestation concern for the project area in the WERIC database (www.weric.info):

- Leafy Spurge
- Canada Thistle
- Diffuse Knapweed
- Russian Knapweed
- Salt Cedar
- Scotch Thistle

The Operator or BLM confirmed the following infestations and/or documented additional weed species during field investigations: Cheatgrass

Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) are known to exist in the affected environment. These two species are found in high densities and numerous locations throughout NE Wyoming. The state-listed noxious weeds are in the PRB FEIS, Table 3-21 (p. 3-104); and the Weed Species of Concern are in Table 3-22 (p. 3-105).

3.7. Fish and Wildlife

Several resources were consulted to identify wildlife species that may occur in the proposed project area. Resources that were consulted include the wildlife database compiled and managed by the BFO wildlife biologists, the PRB FEIS, the Wyoming Game and Fish Department (WGFD) big game and sage-grouse maps, and the Wyoming Natural Diversity Database (WYNDD).

Habitat assessment and wildlife inventory surveys were performed by Grouse Mountain Environmental Consultants. Grouse Mountain performed surveys for mountain plover, sharp-tailed grouse, greater sage-grouse, raptor nests, bald eagles, and prairie dog colonies according to Powder River Basin Interagency Working Group (PRBIWG) accepted protocol in 2011. A habitat assessment was conducted for Ute ladies'-tresses orchid in 2011. PRBIWG accepted protocol is available on the BFO website at: http://www.blm.gov/wy/st/en/field_offices/Buffalo/wildlife.html.

WGFD is the agency responsible for management of wildlife populations in the state of Wyoming. WGFD has developed several guidance documents that BLM BFO wildlife staff relies upon in evaluating impacts to wildlife and wildlife habitats. WGFD documents used to analyze the proposed project under the current analysis are referenced in this section.

In its Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats (WGFD 2009), WGFD developed impact thresholds to evaluate impacts to wildlife from oil and gas development. For species or habitats discussed in this EA where impact thresholds have been developed, those thresholds will be disclosed and discussed both in relation to the current conditions (affected environment) and in relation to reasonable foreseeable development, including development associated with the proposed project (impacts analysis). Moderate impacts occur when impairment of habitat function becomes discernible. High impacts occur when impairment of habitat function increases. Extreme impacts occur where habitat function is substantially impaired. Mitigation for each level of impact is discussed in the guidelines. Thresholds for impacts are generally determined by well densities.

3.7.1. Threatened, Endangered, Proposed, Candidate, and BLM Sensitive Species

3.7.1.1. Threatened and Endangered Species - Ute ladies'-tresses orchid (ULT)

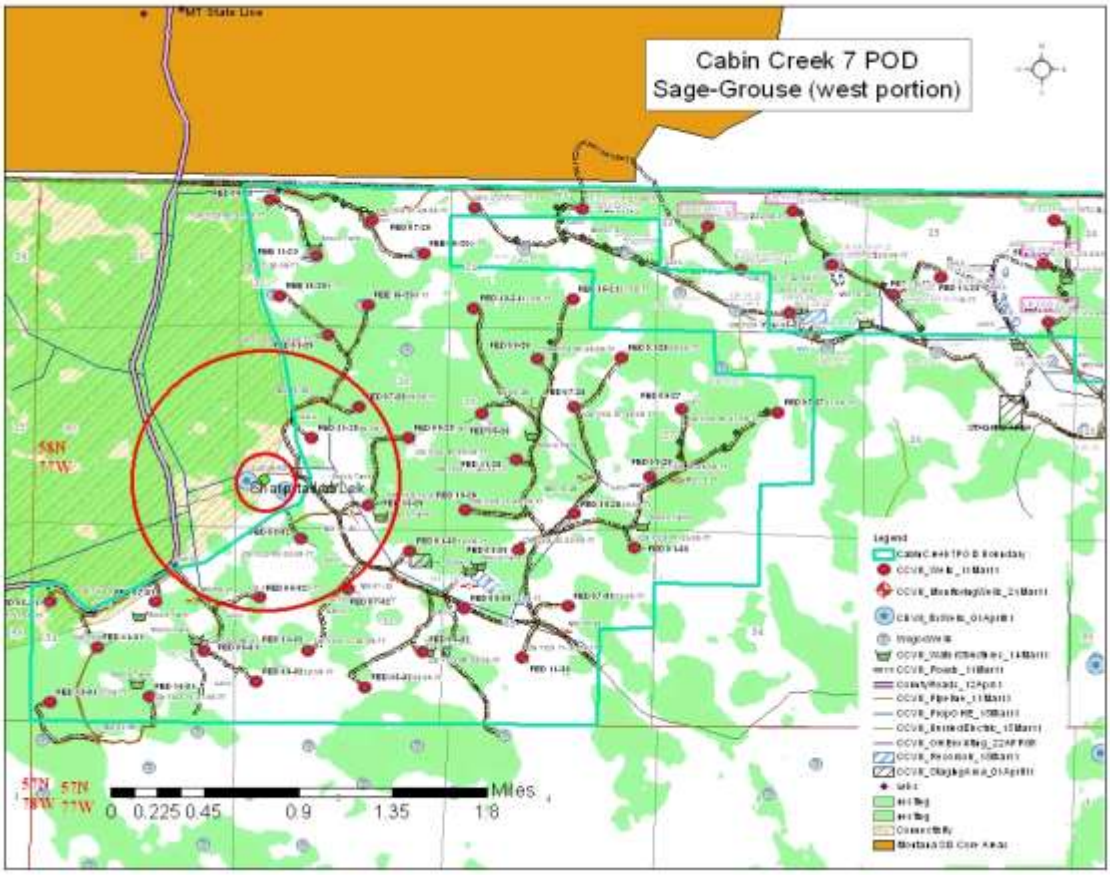
One species in this category, the Ute ladies'- tresses orchid (ULT), is listed as potentially occurring in the BFO. The Ute ladies'-tresses orchid (ULT) is listed as threatened under the ESA. The affected environment for ULT is discussed in the PRB FEIS on p. 3-175. Grouse Mountain surveyed the Cabin Creek 7 POD for suitable ULT habitat in 2011. Most of the POD consists of rugged upland habitat but portions of Fence Creek may be potentially suitable habitat for ULTs. Environmental assessments for Cabin Creek 4 and 5 state that Fence Creek is ephemeral and not likely to support ULTs (BLM 2008, 2009).

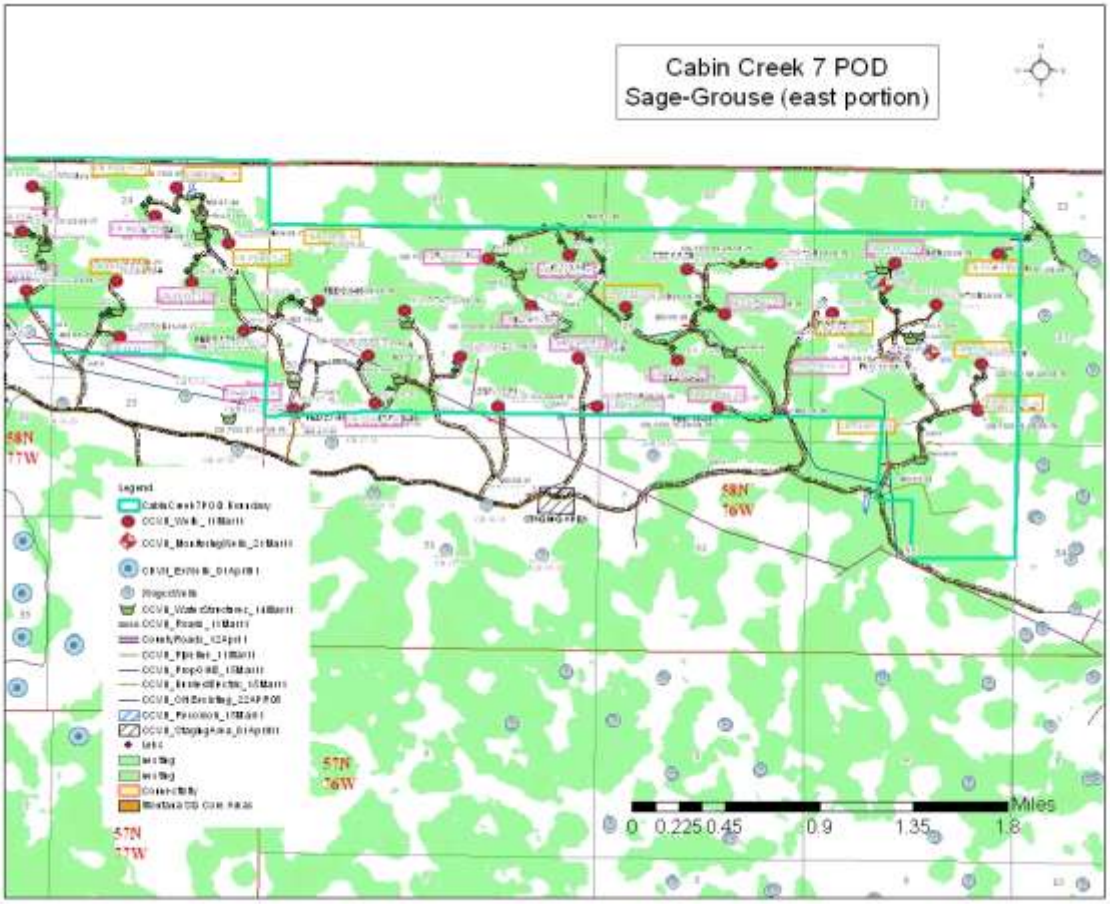
3.7.2. Candidate Species – Greater Sage-Grouse (GSG)

The PRB FEIS discussed the affected environment for GSG, pp. 3-194 to 3-199. GSG are found in prairie, sagebrush shrublands, other shrublands, wet meadows, and agricultural areas. They depend upon substantial sagebrush stands for nesting and winter survival (BLM 2003). The U.S. Fish and Wildlife Service (FWS) determined that the GSG is warranted for federal listing across its range, but listing is precluded by other higher priority listing actions. In addition to being listed as a Wyoming BLM sensitive species, GSG are listed as a WGFD species of greatest conservation need, because populations are declining and they are experiencing ongoing habitat loss. The Wyoming Bird Conservation Plan rates them as a Level I species, indicating they are clearly in need of conservation action. They are also listed by USFWS as a BCC for Region 17. March, 2012: WY BLM released the report, "Viability analyses for conservation of GSG populations: Buffalo Field Office, Wyoming," indicating that a viable population of GSG 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).

Suitable GSG habitat is present in the project area. GSG habitat models and field observation indicate that high quality GSG nesting and wintering habitat is scattered throughout the POD, with the most concentrated amount being in the northwestern corner of the POD, Approximately 53 percent of the project area contains high quality GSG nesting and wintering habitat (Walker et al. 2007).

Figure 3.1 and 2 Greater Sage-Grouse Core/Connectivity Areas, High Quality Nesting Habitat





The State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008) recommends that impacts be considered for leks within 4 miles of oil and gas developments. WGFD records indicate that 8 GSG leks occur within 4 miles of the project area. Of these, 6 are in Montana. The two leks in Wyoming are within designated GSG Connectivity Areas. The leks in Montana are all in a Montana state designated GSG Core Area. These 8 lek sites are identified in Table 3.7. The Cabin Creek 7 POD is bordered on the west by a Wyoming GSG Connectivity Area and to the north in T58N, R77W Sections 19, 20, 21 and T58N, R78W Sections 23 and 24 by a Montana designated GSG Core Area. No project components are proposed in either the connectivity or core areas.

Table 3.7. Occupied Greater Sage-Grouse Leks within 4 miles of the Cabin Creek 7 POD

Lek Name	Legal Location	Distance from Project Area (mi)	Management Status
Passaic	T58N, R78W Section 35 SWNW	1.7 west	occupied
Mt State Line	T9SR46ES34 NENW (Montana)	1.0 north	occupied
Iron Springs	T58N, R78W Section 35 NENW	1.5 west	occupied
PO-41	T9SR45ES34 SE (Montana)	0.9 north	occupied
PO-42	T9SR45ES36 SWNW (Montana)	1.0 north	occupied
PO-45	T9SR46ES20 SW (Montana)	2.6 north	occupied
PO-46	T9SR46ES29 E1/2 (Montana)	2.0 north	occupied
PO-46A	T9SR46ES30 SE (Montana)	1.7 north	undetermined

3.7.3. Special Status (Sensitive) Species (SSS)

Wyoming BLM prepared a list of SS on which management efforts should be focused towards maintaining habitats under a multiple use mandate. The goals of the policy are to:

- Maintain vulnerable species and habitat components in functional BLM ecosystems
- Ensure sensitive species are considered in land management decisions
- Prevent a need for species listing under the ESA
- Prioritize needed conservation work with an emphasis on habitat

The authority for the SSS policy comes from the Endangered Species Act of 1973, as amended; Title II of the Sikes Act, as amended; FLPMA; and the Department Manual 235.1.1A. Table 4.6 in Chapter 4 lists sensitive species presence in the project area, their habitat description, and impact of the project.

3.7.4. Big Game

The affected environment for pronghorn, mule deer, and elk is discussed in the PRB FEIS on pp. 3-117 to 3-122, pp. 3-127 to 3-132, and 3-132 to 3-140, respectively. The project contains yearlong range for pronghorn antelope, yearlong and winter yearlong range for mule deer. Yearlong use is when a population of animals make general use of habitat within the range on a year-round basis. Animals may leave the area under severe conditions. Winter-yearlong use occurs when animals make general use of habitat on a year-round basis. However, there is a significant influx of additional animals into the area from other seasonal ranges during the winter months.

Both antelope and mule deer were observed in the area by the BLM biologist during the onsite and it was noted that the area provides high quality habitat for mule deer. During the onsite visits, landowners indicated that elk did occur in the project area.

3.8. Aquatics

The Cabin Creek VII POD area is drained by Fence Creek, an ephemeral tributary to the Powder River which is 3 miles to the east. According to Peterson (1990), ephemeral stream communities are generally composed of taxa adapted to standing water. These communities are discussed further in the PRB FEIS, pp. 3-153 to 3-154. One natural spring exists in the POD area: in Montana to the north in Section 35 NWSE T9S, R45E Montana Principle Meridian.

3.9. Migratory Birds

The PRB FEIS discussed the affected environment for migratory birds, pp. 3-150 to 3-153. Migratory birds migrate for breeding and foraging at some point in the year. The BLM-FWS MOU (2010) promotes the conservation of migratory birds, as directed through Executive Order 13186 (Federal Register V. 66, No. 11). BLM includes migratory birds in every NEPA analysis of actions having potential to affect migratory bird species of concern to fulfill obligations under the Migratory Bird Treaty Act (MBTA). BLM encourages voluntary design features and conservation measures agreeing with those in the programmatic mitigation in Appendix A of the PRB ROD.

Habitat that occurs in the project area include rough to moderately rough terrain with numerous ridges and deep draws (75%) with the remaining consisting of rolling hills and flats cut by steep to moderately steep draws (25%). The primary vegetation throughout the project area is sagebrush grassland with scattered stands of cottonwoods in draws, ponderosa pine and juniper in steep draws, on ridge tops and on north facing slopes. Many species that are of high management concern use these 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 FWS's Birds of Conservation Concern (BCC 2008) report identifies species of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act. Species in this list that have the potential to occur in the project area are:

Brewer's sparrow, sage thrasher, loggerhead shrike, short-eared owl, and grasshopper sparrow. Of these, 3 species are identified on the BLM Wyoming Sensitive Species list.

The WGFD Wyoming Bird Conservation Plan (Nicholoff 2003) identified 3 groups of Wyoming's high-priority bird species: Level I – those that clearly need conservation action, Level II – species where the focus should be on monitoring, rather than active conservation, and Level III – species that are not of high priority but are of local interest. Species likely occurring in the project area are in Table 3.8.

Table 3.8. Priority Bird Species Possibly Occurring in the Cabin Creek 7 POD (Nicholoff 2003).

Level	Species	Wyoming BLM Sensitive
Level I	Brewer's sparrow	Yes
	Ferruginous hawk	Yes
	Greater sage-grouse	Yes
	Long-billed curlew	Yes
	Short-eared owl	
	Upland sandpiper	
Level II	Ash-throated Flycatcher	
	Black-chinned hummingbird	
	Bobolink	
	Bushtit	
	Cassin's Kingbird	
	Grasshopper sparrow	
	Lark bunting	
	Lark sparrow	
	Loggerhead shrike	Yes
	Sage thrasher	Yes
	Townsend's Solitaire	
	Vesper sparrow	
Level III	Bewick's Wren	
	Common poorwill	
	Virginia's Warbler	

3.10. Raptors

BLM documented 4 species of raptor nesting in the project area, Cooper's hawk, great-horned owl, long-eared owl, and red-tailed hawk. Grouse Mountain and BLM documented 58 raptor nests within 0.5 miles of the project boundary (Grouse Mountain 2012). These are in Appendix A. Of these, 5 red-tailed hawk nests and 1 long-eared owl nest were active in 2012.

Most raptor species nest in a variety of habitats including (but not limited to): native and non-native grasslands, agricultural lands, live and dead trees, cliff faces, rock outcrops, and tree cavities. Suitable nesting habitat is present throughout the project area. The PRB FEIS discussed the affected environment for raptors on pp. 3-141 to 3-148.

3.11. Plains Sharp-tailed Grouse

The PRB FEIS discussed the affected environment for plains sharp-tailed grouse on pp. 3-148 to 3-150. Two sharp-tailed grouse leks are within 2 miles of the Cabin Creek 7, the first at: SW Section 35 T 58N R78W, 1.6 miles west of the POD. The second lek is in SWSW Section 29 T58N R77W and is along the existing main entrance road to the project. Grouse Mountain surveyed the leks and determined them active in 2011. BLM observed sharp-tailed grouse at several locations throughout the POD.

3.12. West Nile Virus (WNv)

West Nile virus (WNv) is a mosquito-borne disease that can cause encephalitis or brain infection. Mosquitoes spread this virus after they feed 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 has become 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 four days. Data collected by the CDC and published by the USGS at www.westnilemaps.usgs.gov are summarized in Table 3.9. Reported data from the Powder River Basin (PRB) includes Campbell, Sheridan and Johnson counties.

Table 3.9. 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	Unk	1
2008	10	0	0	0
2009	10	1	1	No record
2010	6	0	0	0
2011	3	0	Unk	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 detected 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. Scientists documented 36 raptors died from WNv in Wyoming in 2003, 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 GSG 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 that amplifies the negative impact GSG (FWS 2010 p. 13947).

In the PRB, there may be increased surface water associated with CBNG 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.

3.13. Cultural Resources

A Class III cultural resource inventory was performed for the Cabin Creek VII project prior to on-the-

ground project work (BFO project no. 70080164). A 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* was provided to BFO by SGR. Clint Crago, BLM Archaeologist, reviewed the report for technical adequacy and compliance with BLM standards, and determined it to be adequate. The following resources are in or near the project area.

Table 3.10. Cultural Resources Inventory Results

Site Number	Site Type	Eligibility	Site Number	Site Type	Eligibility
48CA6881/48SH1681	Prehistoric Lithic Scatter	Eligible	48SH759	Prehistoric Habitation Hearths	Unevaluated
48CA6885/48SH1689	Prehistoric Lithic Scatter	Eligible	48SH1616	Historic Dugout	Not Eligible
48CA6886/48SH1692	Prehistoric Lithic Scatter	Not Eligible	48SH1683	Prehistoric Lithic Scatter	Not Eligible
48CA6887/48SH1696	Prehistoric Lithic Scatter	Not Eligible	48SH1684	Prehistoric Lithic Scatter	Not Eligible
48CA7114	Prehistoric Lithic Scatter	Not Eligible	48SH1685	Prehistoric Lithic Scatter	Not Eligible
48SH186	Prehistoric Open Camp	Not Eligible	48SH1686	Prehistoric Lithic Scatter	Not Eligible
48SH217	Prehistoric Lithic Scatter	Not Eligible	48SH1688	Prehistoric Lithic Scatter	Not Eligible
48SH222	Prehistoric Lithic Scatter	Not Eligible	48SH1690	Historic Trash Dump	Not Eligible
48SH225	Historic Cabin	Unevaluated	48SH1691	Prehistoric Lithic Scatter	Not Eligible
48SH226	Prehistoric Open Camp	Unevaluated	48SH1693	Prehistoric Lithic Scatter	Not Eligible
48SH227	Prehistoric Open Camp	Not Eligible	48SH1694	Prehistoric Lithic Scatter	Not Eligible
48SH275	Prehistoric Bone Bed/Scatter	Not Eligible	48SH1781	Historic Homestead	Not Eligible
48SH456	Prehistoric Open Camp	Eligible			

4. ENVIRONMENTAL EFFECTS

This section analyzes and describes the environmental effects of Alternatives B on the affected environment described in Section 3. This section analyzes Alternative B in total. The effects analysis addresses the direct and indirect effects of implementing the proposed action, the cumulative effects of the proposed action, combined with reasonably foreseeable federal and non-federal actions, identifies and analyzes mitigation measures (COAs), and discloses any residual effects remaining following mitigation.

4.1. Alternative A: No Action

The PRB FEIS analyzed the No Action Alternative as Alternative 3. Additionally the recent analyses and approved CBNG developments listed in Table 3.1, in and around this POD, updated the baseline present circumstances using the aggregate effects approach to collectively, cumulatively comprise the No Action Alternative. BLM incorporates by reference those analyses into this EA. Information specific to resources for this alternative is in the PRB FEIS on pages shown in Table 4.1 aggregated with the analysis in the EAs found in Table 3.1.

Table 4.1. Location of Discussion of the No Action Alternative in the PRB FEIS

Resource		Type of Effect	Page(s) of PRB FEIS
Project Area Description	Geologic Features and Mineral Resources	Direct and Indirect Effects	4-164 and 4-134
		Cumulative Effects	4-164 and 4-134
Soils, Vegetation, and Ecological Sites	Soils	Direct and Indirect Effects	4-150
		Cumulative Effects	4-152
	Vegetation	Direct and Indirect Effects	4-163
		Cumulative Effects	4-164
	Wetlands/Riparian	Direct and Indirect Effects	4-178
		Cumulative Effects	4-178

Resource		Type of Effect	Page(s) of PRB FEIS
Wildlife	Sensitive Species - Greater Sage-Grouse	Direct and Indirect Effects	4-271
		Cumulative Effects	4-271
	Aquatic Species	Direct and Indirect Effects	4-246
		Cumulative Effects	4-249
	Migratory Birds	Direct and Indirect Effects	4-234
		Cumulative Effects	4-235
	Waterfowl	Direct and Indirect Effects	4-230
		Cumulative Effects	4-230
	Big Game	Direct and Indirect Effects	4-186
		Cumulative Effects	4-211
	Raptors	Direct and Indirect Effects	4-224
		Cumulative Effects	4-225
Water	Ground Water	Direct and Indirect Effects	4-63
		Cumulative Effects	4-69
	Surface Water	Direct and Indirect Effects	4-77
		Cumulative Effects	4-69
Economics and Recovery of CBNG Resources		Direct and Indirect Effects	4-362
		Cumulative Effects	4-370
Cultural Resources		Direct and Indirect Effects	4-286
Air Quality		Direct and Indirect Effects	4-386
		Cumulative Effects	4-386

4.2. Alternative B: The Operator's Proposal

Alternative B contains 74 CBNG APDs and One (1) proposed off-channel reservoir with an outfall incorporated into the facility, and 7 direct discharge outfalls to discharge produced water to the Middle Powder River. This alternative is a result of SGR and BLM working to reduce many, but not all, environmental impacts.

4.3. 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 non-CBNG well production equipment, booster and pipeline compression engine exhaust). The amount of air pollutant emissions during construction would be controlled by watering disturbed soils, and by air pollutant emission limitations imposed by applicable air quality regulatory agencies. Air quality impacts modeled in the PRB FEIS concluded that projected oil or gas development would not violate any local, state, tribal, or federal air quality standards.

4.4. Soils, Vegetation, and Ecological Sites

4.4.1. Direct and Indirect Effects

The PRB FEIS analyzed direct and indirect impacts to soils associated with fluid mineral development. For these affects refer to p. 4-134 of the PRB FEIS. Impacts anticipated to occur include soil rutting and mixing, compaction, increased erosion potential, and loss of soil productivity. The most notable impacts to soils would occur in association with the construction of well pads, staging areas, and roads. Construction of these facilities requires grading and leveling, with the greatest level of effort required on more steeply sloping areas. Rutting affects the surface hydrology of a site as well as the rooting environment. The process of rutting physically severs roots and reduces the aeration and infiltration of the soil, thereby degrading the rooting environment. Rutting may result in mixing of topsoil and subsoil, thereby reducing soil productivity. Rutting also disrupts natural surface water hydrology by diverting and concentrating water flows creating accelerated erosion. During construction, the soil profiles would be

mixed, typically resulting in a decrease in soil fertility and a disruption of soil structure. Mixing may result in removal, dilution, or relocation of organic matter and nutrients to depths where it would be unavailable for vegetative use. Less desirable inorganic compounds such as carbonates, salts, or weathered materials could be relocated and have a negative impact on revegetation.

Soils would be compacted as a result of the construction of wells and associated facilities, with compaction maintained, at least in part, by continued vehicle and foot traffic as well as operational activities. 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 leads to a loss of soil structure; decreased infiltration, permeability, and soil aeration; as well as increased runoff and erosion.

The potential for erosion would increase through the loss of vegetation cover and soil structure as compared to an undisturbed state. Soil productivity would decrease, primarily as a result of profile mixing and compaction along with the loss in vegetative cover. These impacts would begin immediately as the soils would be subjected to grading and construction activities and impacts would continue for the term of operations. The impacts on soils would move to a steady state as construction activities were completed and well production/maintenance operations begin. Increased erosion can lead to a decrease in soil fertility and an increase in sedimentation. The duration and intensity of these impacts would vary according to the type of construction activity to be completed and the inherent characteristics of the soils to be impacted.

Construction of 5 well pads see Table 2.1. Proposed Wells – Alternative B, and Section 2.0, 49 will not require earth work preparation (no engineered pad/no slot) other than digging of drilling pits and digging in wheels to level the drilling rig. Drilling of these wells on the natural topography would result in less initial disturbance to the soil resource. No additional soil would be tilled, bladed, removed or graded. Actual turning of the soil will occur where the reserve pits are constructed; soil productivity and soil quality will be maintained when top soil is segregated and saved for distribution on pit disturbances. Exceptions for compaction reduction via deep ripping will be considered by the Authorized Officer.

Construction of wells with no pad and no slot would result in less soil disturbance to the soil resource. No soil would be removed or graded. Where reserve pits are constructed for these wells, soil productivity and soil quality would be altered if top soil is not salvaged and segregated or if subsoil is spread on the surface of the soil.

During initial site visits to the well sites, BLM staff observed site conditions for well pads and access roads. As stated below of this document many well sites were adjusted or moved to minimize siting on steep slopes, minimize soil erosion, and minimize facilities on soils with low reclamation potential. Of the original proposed wells:

- 49 wells proposed with no slot no pad.
- 20 well site locations proposed or redesigned to accommodate slot drill site locations.
- 5 well pads with accompanying engineer designs.
- 6 wells recommended by the BLM and agreed to by SGR to be removed from the project due to important soil or site limitation described in chapter 3 of this document.
- 2 wells recommended by the BLM and agreed to by SGR to be removed from the project due to wildlife concerns.

4.4.2. Mitigation Measures

BLM will consider the application of standard (i.e. industry accepted) COAs listed below:

1. A 30 day stabilization requirement is applied to wells, access roads, utility corridors and pipelines which will have impacts to sensitive areas identified in the field.
2. A sandy seed mix is applied to wells and access/pipelines which impact sands and sandy ecological sites; and
3. A shallow loamy seed mix is applied to wells and access/pipelines which impact shallow loamy ecological sites.
4. Pits shall be lined in sandy soils and where in pits are in close proximity to adjacent drainages as noted within the operators SUP of the Cabin Creek VII Federal POD.
5. Place a minimum average of 4 inches of aggregate on road segments where grades exceed 8%.
6. The BLM will evaluate reclamation success using the requirements set forth in the State Wide Reclamation Policy revised 2011, see Appendix B of this EA and incorporated herein.
7. The operator is responsible for having the licensed professional engineer(s) certify that the actual construction of the road meets the design criteria and is constructed to Bureau standards.

4.4.3. Residual Effects

Residual effects in the project area would include a long-term loss of soil productivity associated with well pads and roads. Residual effects were identified in the PRB FEIS (p. 4-408) such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established.

4.5. Vegetation and Ecological Sites

4.5.1. Direct and Indirect Effects

The PRB FEIS discussed most direct and indirect effects to ecological sites and vegetation, pp. 4-153 to 4-164. The proposed action would impact the common plant communities that occur on the site and the transition between the communities.

Other impacts anticipated to occur include those in the direct and indirect effects listed above under soils section. Direct effects to ecological sites would occur from ground disturbance caused by construction of well pads, compressor stations, ancillary facilities, associated pipelines, 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 would result in loss of vegetation and prevent reclamation for the life of the project.

Sagebrush does not regenerate easily after human disturbance such as urban or agricultural development, or even after natural occurrences such as wildfire. It takes years, even generations, for sagebrush to fully grow back. Sagebrush still has not returned to some areas of the Columbia Basin burned by a large fire 40 years ago (Pacific Northwest National Laboratory Shrub Steppe Ecology Series May 2010).

Vegetation impacted by the roads and well locations in many areas of the pod is thin and susceptible to wind and water erosion. This is primarily due to the map units 269 Shingle-Theedle-Kishona association, moist, 3 to 30% slopes, and 261 Shingle, moist-Rock outcrop complex, 30 to 50% slopes soil types. The map units comprise about 40% of the project area. This map unit description is has paralithic bedrock at 8 to 10 inches, is either well drained or excessively drained which results in low water holding capacity, and has low potential for restoration. These properties create unstable soils and physical and chemical properties that limit plant growth along the access routes. These locations have very thin fragile topsoil with fragile root systems used to stabilize the surface and allow plant growth. Authorizations for surface disturbing actions are based upon the assumptions that a disturbance can ultimately be reclaimed.

4.5.2. Cumulative Effects

The PRB FEIS discussed cumulative effects to ecological sites, including vegetation, pp. 4-153 to 4-172. Cumulative effects to ecological sites include the further alteration of disturbance regimes from the increased disturbance, increase in noxious weeds, and altering the vegetation diversity and cover.

4.5.3. Mitigation Measures

BLM will consider the application of standard (i.e. industry accepted) COAs listed below:

1. 30 day stabilization requirement is applied to wells and access/pipelines which impact sands and sandy ecological sites at locations identified during the onsite. This shortened time frame for application of stabilization measures must be applied 30 days from the start of construction. A sandy seed mix is applied to wells and access/pipelines which impact sands and sandy ecological sites; and
2. A shallow loamy seed mix is applied to wells and access/pipelines which impact shallow loamy ecological sites.
3. Impacts to soils and vegetation from surface disturbance will be reduced by following the BLM and SGRs applied design features. The seed mixes for re-vegetation in the Cabin Creek VII POD are determined based on soil map unit types, the dominant ecological sites found in the project area, and the mixing of soil horizons in disturbed areas. Loamy and Shallow Loamy seed mixes are recommended for a majority of the POD. The sandy seed mix is applied to wells and access/pipelines which impact sands and sandy ecological sites at the locations discussed and called out at the onsite; while the remainder of the project shall have the loamy and shallow loamy seed mix. SGR has 3 seed mixes for their POD, all three follow BLM recommendations for species type and suggest drill seeding ratios. For further detail please reference Section 4.3 Typical Diagrams and specifications for Cabin Creek VII Federal POD

If applied correctly, BLM selected seed mixes which contain native grasses and forbs could restore disturbed areas to properly functioning vegetation communities with the exception of sage-brush since it's not in the current seed mixes. These mitigation measures will be applied to sandy ecological sites (Sandy 15-19NP) or shallow loamy (Shallow Loamy 15-19NP) which will require expedient reclamation. BLM can only require their use on BLM surface. The seed mix for private land is selected by the surface owner and may be more beneficial to ranch operations.

BLM will recommend the SGR follow the reclamation requirements in Appendix B. See mitigation section in the soils section above for full description of the policy as it applies equally to ecological sites.

4.5.4. Residual Effects

Residual effects were also identified in the PRB FEIS, p. 4-408 such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established.

The alteration of biodiversity of ecological sites could result from changes in disturbance regimes, alterations in vegetation in reclaimed areas, and the spread and establishment of weed species.

4.6. Water Resources

The operator submitted a comprehensive WMP for this project. It is incorporated-by-reference into this EA pursuant to 40 CFR 1502.21. The WMP incorporates sound water management practices, monitoring of downstream impacts in the Middle Powder River watershed and commitment to comply with Wyoming State water laws/regulations. It also addresses potential impacts to the environment and landowner concerns. Adherence with the plan, in addition to BLM applied mitigation (in the form of COAs), would reduce project area and downstream impacts from proposed water management strategies.

The Cabin Creek VII POD will use direct discharge to the Middle Powder River and its tributaries to manage the produced water. Summit will use seven proposed outfall structures to discharge water directly

to the Middle Powder River. Additionally, Summit will use one proposed off channel pit to impound produced water. This pit is proposed as a secondary water handling option, and will only be constructed if direct discharge is insufficient to handle all the produced water within permit limitations.

The maximum water production is predicted to be 14.6 gpm per well or 1080 gpm (2.4 cubic feet per second (cfs) or 1,742 acre-feet per year) for this POD. The PRB FEIS projected the total amount of water that anticipated from CBNG development per year, (Table 2-8, p. 2-26). For the Middle Powder River drainage, the projected volume produced in the watershed area was 3,276 acre-feet in 2012 (maximum production is estimated in 2005 at 12,328 acre-feet). As such, the volume of water resulting from the production of these wells is 53% of the total volume projected for 2012. This volume of produced water is within the predicted parameters of the PRB FEIS.

4.6.1. Groundwater

4.6.1.1. Direct and Indirect Effects

The PRB FEIS predicts an infiltration rate of 37% to groundwater aquifers and coal zones in the Middle Powder River drainage area (PRB FEIS, p. 4-5). For this project BLM assumes that a maximum of 400 gpm will infiltrate at or near the discharge points and impoundments (645 acre feet per year). This water will saturate the near surface alluvium and deeper formations prior to mixing with the groundwater used for stock and domestic purposes. According to the PRB FEIS, "the increased volume of water recharging the underlying aquifers of the Wasatch and Fort Union Formations would be chemically similar to alluvial groundwater." (PRB FEIS, p. 4-54) Therefore, the chemical nature and the volume of the discharged water may not degrade the groundwater quality.

The PRB FEIS predicts that one of the environmental consequences of CBNG production is possible impacts to the groundwater. "The effects of development of CBM[NG] on groundwater resources would be seen as a drop in the water level (drawdown) in nearby wells completed in the developed coal aquifers and underlying or overlying sand aquifers." (PRB FEIS, p. 4-1) In the process of dewatering the coal zone to increase natural gas recovery rates, this project may have some effect on the static water level of wells in the area. The permitted CBNG wells produce from depths which range between 81 and 1384 feet compared to 10 to 400 feet deep Wasatch sands in the water wells. The operator committed to offer water well agreements to holders of properly permitted domestic and stock wells in the circle of influence (0.5 mile of a federal CBNG producing well) of the proposed wells.

The PRB FEIS anticipated that recovery of the coal bed aquifer as follows: ". . . storage areas outside the areas of CBM[NG] development would resaturate and repressurize the areas that were partially depressurized during operations. The amount of groundwater stored within the coals and sands units above and below the coals is enormous. Almost 750 million acre-feet of recoverable groundwater are stored within the Wasatch-Tongue River sands and coals (Table 3-5). Redistribution is projected to result in a rapid initial recovery of water levels in the coal. The model projects that this initial recovery period would occur over 25 years." (PRB FEIS, p. 4-38)

4.6.1.2. Cumulative Effects

As stated in the PRB FEIS, "The aerial extent and magnitude of drawdown effects on coal zone aquifers and overlying and underlying sand units in the Wasatch Formation also would be limited by the discontinuous nature of the different coal zones within the Fort Union Formation and sandstone layers within the Wasatch Formation." (PRB FEIS, p. 4-64). Development of CBNG through 2018 (and coal mining through 2033) would remove 4 million acre-feet of groundwater from the coal zone aquifer (PRB FEIS, p. 4-65). This volume of water ". . . cumulatively represents 0.5 percent of the recoverable groundwater stored in the Wasatch – Tongue River sands and coals (nearly 750 million acre-feet, from Table 3-5). All of the groundwater projected to be removed during reasonably foreseeable CBNG development and coal mining would represent less than 0.3 percent of the total recoverable groundwater

in the Wasatch and Fort Union Formations within the PRB (nearly 1.4 billion acre-feet, from Table 3-5)." (PRB FEIS, p. 4-65)

4.6.1.3. Mitigation Measures

Adherence to the requirement in Onshore Oil and Gas Order #2, the drilling COAs, setting casing at appropriate permitted depths, following safe remedial procedures in the event of casing failure, and using proper cementing procedures should protect any fresh water aquifers above the target coal zone. This will ensure that ground water will not be adversely impacted by well drilling and completion operations.

In order to address the potential impacts from infiltration on shallow ground water, the WDEQ has developed a guidance document, "Compliance Monitoring and Siting Requirements for Unlined Impoundments Receiving Coalbed Methane Produced Water" (November, 2008). For all new WYPDES permits, the WDEQ requires that the proponent investigate the shallow groundwater at the proposed impoundment locations. Drilling at proposed impoundments began in the spring of 2004. Based on information received from the WDEQ, as of December, 2011, over 2017 impoundment sites have been investigated with more than 2306 borings. Of these impoundments, 237 met the criteria to require "compliance monitoring" if constructed and used for CBNG water containment. Only 125 impoundments requiring monitoring are presently being used. As of the fourth quarter of 2011, only 26 of those monitored impoundments (20.8%) caused a change in the "Class of Use" of any parameter in the underlying aquifer water.

4.6.1.4. Residual Effects

As described in Section 3.4.1, the production of CBNG in this project area may cause groundwater levels to drop due to the CBNG dewatering. The PRB FEIS analyzed groundwater recharge post-CBNG development. An estimated 40% of the groundwater removed would infiltrate the surface and recharge the shallow aquifers above the coal, PRB FEIS, p. 4-68.

4.6.2. Surface Water

4.6.2.1. Direct and Indirect Effects

Produced Water Quality

Average values of EC and SAR as measured at selected USGS stream gauging stations at high and low monthly flows as well as the Wyoming groundwater quality standards for TDS and SAR for Class I to Class III water (there is no current standard for EC) are in Table 4.2. It also shows constituent limits for TDS, SAR, and EC detailed in the project area WYPDES permit, and the concentrations in the POD's representative water sample.

Table 4.2. Comparison of Regulated Water Quality Parameters to Predicted Water Quality

Sample location or Standard	TDS mg/l	SAR	EC µmhos/cm
Primary Watershed at Moorehead, MT Gauging Station			
Historic Data Average at Maximum Flow		3.92	1,421
Historic Data Average at Minimum Flow		4.62	2,154
WDEQ Quality Standards for WY Groundwater (Chapter 8)			
Drinking Water (Class I)	500		
Agricultural Use (Class II)	2,000	#	
Livestock Use (Class III)	5,000		
WDEQ Water Quality Requirement for WYPDES Permit # WY0056162			
At discharge point	AC	AC	AC

Sample location or Standard	TDS mg/l	SAR	EC µmhos/cm
Predicted Produced Water Quality from the comingled Canyon, Cook, Wall, and Pawnee coal zones	1600	48.6	2260

AC = Assimilative Capacity Requirements (values vary per month)

The total assimilative capacity allocated to the permittee is based on PRB lease holding information provided to the WYDEQ by the permittee. Ambient concentration values are set by the WDEQ using USGS data. It is expected TDS concentrations discharged to the Powder River be at their lowest in the months of May and June (956 mg/l, 860 mg/l respectively) and at their highest in August and September (1,524 mg/l). For complete description of the calculations and parameters set by WDEQ see the individual WYPDES permits in the WMP.

Based on the analysis in the PRB FEIS, the primary beneficial use of the surface water in the PRB is the irrigation of crops (p. 4-69). The water quality projected for this POD is within the WDEQ criteria for agricultural use (2,000 mg/l TDS). However, direct land application is not included in the WMP. If at any future rime the operator entertains the possibility of irrigation or land application with the water produced from these wells, the proposal must be submitted as a Sundry notice for separate environmental assessment and approval by the BLM.

BLM analyzed the results from a representative water sample from a well drilled to the same coal zone(s) near to the named POD. BLM predicts the water quality for the water produced from the named target coal zone from these wells to be similar to the sample water quality collected. For complete analysis and results see the company laboratory analytical report in the WMP's Attachment 6.1.

Surface discharge of the produced water provides passive treatment through the aeration supplied by the energy dissipation configuration at each discharge point outfall. Aeration adds dissolved oxygen to the produced water which can oxidize susceptible ions, which may then precipitate. This is particularly true for dissolved iron. Because iron is one of the key parameters for monitoring water quality, the precipitation of iron oxide near the discharge point will improve water quality at downstream locations.

The operator has obtained WYPDES permits (Permit WY0056162, WY0056537, WY0056332) from the WDEQ for the discharge of water produced from this project. Those permits' maximum effluent limits are described in Table 4.3.

Table 4.3. Applicable WYPDES Permit Limits

Effluent Characteristic	Daily Maximum Permit #
pH	6.5 to 9.0
Specific Conductance (µS/cm)	AC
Sulfates (mg/l)	3000
Radium 226 + 228 (pCi/l)	1
Dissolved Iron (µg/l)	300
Total Barium (µg/l)	1800
Total Arsenic (µg/l)	8.4
Chlorides (mg/l)	150

AC-Variable limit set by Assimilative Capacity Credits

In order to determine the actual water quality of the producing formations in this POD and to verify the water analysis submitted for the pre-approval evaluation, the operator committed to designate a reference well to each coal zone within the POD boundary. The operator is required to sample the reference well at

the wellhead for analysis within 60 days of initial production and submit a copy of the water analysis to the BLM Authorized Officer. For more information refer to this POD's WMP.

Produced Water Control

There are 7 new discharge points proposed for this project. They have been appropriately sited and use acceptable water energy dissipation measures. Existing and proposed water management facilities were evaluated for compliance with best management practices during the onsite.

The company would potentially build 1 off-channel impoundment (50.2 acre-ft) to manage the produced water. This impoundment will disturb approximately 10.6 acres including the dam structures. The off-channel impoundment would result in evaporation and infiltration of CBNG water. Criteria identified in "Off-Channel, Unlined CBNG Produced Water Pit Siting Guidelines for the Powder River Basin, Wyoming" (WDEQ, 2002) was used to locate these impoundments. Monitoring may be required based upon shallow groundwater investigations required for new impoundments by the WDEQ. Proposed impoundments will be built to meet the requirements of the WSEO, WDEQ and the needs of the operator and the landowner. BLM evaluated all water management facilities for compliance with best management practices during the onsite.

SGR designated the proposed off-channel impoundment as "secondary". Although the "secondary" impoundment meets environmental standards for BLM authorization, Summit will not construct it under this initial approval. The secondary designation allows them to forgo bonding of the impoundment until they are certain of their need for produced water management. If Summit determines that they need to construct the impoundment, they will submit sundry notices to that effect with the associated bonds.

Produced Water Quantity

SGR committed to monitor the condition of channels and address any problems resulting from discharge. Discharge from the impoundments will potentially allow for streambed enhancement through wetland-riparian species establishment. Sedimentation will occur in the impoundments, but would be controlled through a concerted monitoring and maintenance program. BFO recommends that SGR submit phased reclamation plans for the impoundments and that BFO approve these on a site-specific, case-by-case basis as the impoundment(s) are no longer needed for disposal of CBNG water, see BLM applied COAs.

Alternative (2A) of the approved alternative in the PRB FEIS Record of Decision, reads that the peak production of water discharged to the surface will occur in 2005 at a total contribution to the main-stem of the Middle Powder River of 86 cfs, p. 4-102). The predicted maximum discharge rate from these wells is anticipated to total 1080 gpm or 2.4 cfs. Since the produced water will discharge directly to the Middle Powder River this project may add a maximum 2.4 cfs to the Middle Powder River flows, or 2.8% of the predicted total CBNG produced water contribution. For more information on the maximum predicted water impacts resulting from the produced water discharge, see Table 4-11 (PRB-FEIS, p. 4-101).

SGR provided an analysis of the potential development in the watershed above the project area in the WMP, p. 8. Based on the area of the Fence Creek watershed above the POD (43.83 sq mi) and an assumed density of 1 well per location every 80 acres, the potential exists for the development of 350 wells which could produce a maximum flow rate of 5110 gpm (11.4 cfs) of water. The BLM agrees with the Operator that this is not expected to occur because:

1. Some of these wells are drilled and are producing.
2. The phasing in of new wells takes several years.
3. A decline in well water discharge generally occurs after several months of operation.

The potential maximum flow rate of produced water in the watershed upstream of the project area, 11.4 cfs, is much less than the volume of runoff estimated from the 2-year storm event 180 cfs of the drainage (WMP, p. 9).

The WMP for the Cabin Creek VII POD addressed in-channel downstream impacts. Potential downstream impacts are negligible because no water is proposed to be discharged to tributaries of the Middle Powder River, but directly to the river itself.

Springs

There is 1 natural springs identified by the operator within 1 mile radius of the Cabin creek VII POD boundary. The operator will monitor the spring for water quality and quantity for the life of the project.

4.6.2.2. Cumulative Effects

This analysis includes cumulative data from fee, state, and federal CBNG development in the Middle Powder River watershed. BLM obtained these data from the WYOGCC.

As of March, 2012, all producing CBNG wells in the Middle Powder River watershed discharged a cumulative volume of 53,605 acre-feet of water compared to the predicted 92,235 acre-feet disclosed in the PRB FEIS (Table 2-8, p. 2-26). The figures are in Table 4.4, below. This volume is 58.1% of the total predicted produced water analyzed in the PRB FEIS for the Middle Powder River watershed.

Table 4.4. Actual vs predicted water production in the Middle Powder River watershed 2011 Data Update 03-30-12

Year	Middle Powder River Predicted (Annual acre-feet)	Middle Powder River Predicted (Cumulative acre-feet from 2002)	Middle Powder River Actual (Annual acre-feet)		Middle Powder River Actual (Cumulative acre-feet from 2002)	
			Actual Ac-ft	% of Predicted	Cum Ac-ft	% of Predicted
2002	8,257	8,257	3,929	47.6	3,929	47.6
2003	10,421	18,678	3,860	37.0	7,789	41.7
2004	11,640	30,318	3,547	30.5	11,336	37.4
2005	12,328	42,646	4,588	37.2	15,924	37.3
2006	12,044	54,690	6,368	52.9	22,292	40.8
2007	9,897	64,587	7,020	70.9	29,312	45.4
2008	9,689	74,276	7,624	78.7	36,939	49.7
2009	6,030	80,306	6,253	103.7	43,192	53.8
2010	6,030	86,336	5,649	93.7	48,841	56.6
2011	5,899	92,235	4,764	81	53,605	58.1
2012	3,276	95,511				
2013	1,797	97,308				
2014	964	98,272				
2015	495	98,767				
2016	231	98,998				
2017	**82**	**99,080**				
Total	**99,080**		**53,605**			

The PRB FEIS identified downstream irrigation water quality as the primary issue for CBNG produced water. Electrical conductivity (EC) and SAR are the parameters of concern for suitability of irrigation water. The PRB FEIS water quality analysis used produced water quality data, where available, from existing wells within each of the 10 primary watersheds in the PRB. These predictions of EC and SAR can only be reevaluated when additional water quality sampling is available.

As referenced above, the PRB FEIS did disclose that cumulative impacts may occur as a result of discharged produced CBNG water. The cumulative effects relative to this project are within the analysis parameters and impacts described in the PRB FEIS for the following reasons:

1. They are proportional to the actual amount of cumulatively produced water in the Middle Powder River drainage, which is approximately 58% of the total predicted in the PRB FEIS.
2. The WDEQ enforcement of the WYPDES permit protects downstream irrigation.
3. The commitment by the operator to manage the volume of water discharged.

Refer to the PRB FEIS, pp. 4-115 – 117 and Table 4-13 for cumulative effects relative to the watershed and p. 117 for cumulative effects common to all sub-watersheds.

4.6.2.3. Mitigation Measures

Channel crossings by road and pipelines will be perpendicular to flow. Channel crossings by pipelines will be so that the pipe is buried at least 4 feet below the channel bottom.

The operator committed to monitor the water discharge points and the channels downstream for stability. If erosion is noted, the operator will be required to repair and stabilize the area using selected mitigation techniques. The operator also committed to expediently stabilize and revegetate disturbance within channel and floodplain associated with this project.

BLM require the operator to sample the active spring(s) listed below once each in the spring and fall for the duration of production to ascertain changes in water quality or quantity. Analysis will follow the WYPDES Permit initial quality criteria suite. The operator should send copies of water quality and quantity data to the BLM BFO.

List of Springs and locations.

Spring Name	Qtr/Qtr	Section	Township	Range
Unnamed Spring	NW¼SE¼	35	9S	45E

4.6.2.4. Residual Effects

"Streams enhanced by large volumes of CBNG produced water may begin to establish meander patterns on longer wavelengths in response to increased flows. Stream drainages would readjust to their existing natural flows at the end of the project's life. Down cutting (stream erosion) and sediment deposition (aggradation) are natural processes that occur as stream drainages age through time. Down cutting occurs within the upper reaches of a drainage system as the stream channel becomes incised through erosion, until the slope of the stream and its velocity are reduced and further erosion is limited. Sediment is deposited within the lower, slower reaches of a stream.

Surface drainages could be degraded from erosion caused by increased surface flow, unless rates of CBNG produced water discharge and outfall locations are carefully controlled. Increased flows could cause down cutting in fluvial environments, resulting in increased channel capacity over time within the upper and middle reaches of surface drainages." (PRB FEIS, p. 4-118)

The development of CBNG and the production and discharge of water in the area surrounding the existing natural springs may affect the flow rate or water quality of the spring.

4.7. Wetland/Riparian

The National Wetland Inventory identifies approximately 25.3 acres of sporadic isolated wetlands. None of the identified areas are near project facilities and it is unlikely that the project will affect the wetland in any way.

"Re-surfacing water from the impoundments will potentially allow for wetland-riparian species establishment. Continuous high stream flows into wetlands and riparian areas would change the composition of species and dynamics of the food web. The shallow groundwater table would rise closer to the surface with increased and continuous stream flows augmented by produced water discharges. Vegetation in riparian areas, such as cottonwood trees, that cannot tolerate year-round inundated root zones would die and would not be replaced. Other plant species in riparian areas and wetland edges that favor inundated root zones would flourish, thus changing the plant community composition and the associated animal species. A rise in the shallow ground groundwater table would also influence the hydrology of wetlands by reducing or eliminating the seasonal drying periods that affect recruitment of plant species and species composition of benthic and water column invertebrates. These changes to the aquatic food web base would affect the higher trophic levels of fish and waterfowl abundance and species richness for wetlands and riparian areas." (PRB FEIS, p. 4-175).

The cumulative impacts of the proposed action, when considered with other existing and proposed development in the project area are not expected to be significant. The application of mitigation measures will ensure that the incremental impacts of this well, when considered with any existing development are insignificant. For more information on cumulative impacts, please refer to the PRB FEIS.

4.8. Invasive Species

4.8.1. Direct and Indirect Effects

The use of existing facilities along with the surface disturbance associated with construction of proposed access roads, pipelines, water management infrastructure, and related facilities would present opportunities for weed invasion and spread. Leafy Spurge is abundant throughout the entire project; prior to construction there is a need for treatment/removal prior to construction activities to prevent further spread to adjacent lands. Cheatgrass is abundant at this location prior to construction there is a need for treatment/removal prior to construction activities to prevent further spread to adjacent lands.

4.8.2. Cumulative Effects

Cumulative effects related to the spread of noxious weeds/invasive plants are in the PRB FEIS 4-164.

4.8.3. Mitigation Measures

BLM will consider the application COAs listed below:

1. SGR shall consult with BLM for appropriate chemicals used to treat cheat grass on federal lands.

4.8.4. Residual Effects

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

4.9. Fish and Wildlife

4.9.1. Wildlife Threatened, Endangered, Proposed and Candidate Species

BLM summarized the effects to threatened, endangered, and candidate species in Table 4.5, below and described them in the PRB FEIS, pp. 4-250 to 4-257.

Table 4.5. Summary of Threatened and Endangered Species Habitat and Project Effects

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Threatened				
Ute ladies'-tresses orchid	Riparian areas with permanent water	NP	NE	Project components are planned in upland sites or in ephemeral drainages. Fence Creek is considered to be ephemeral and not likely to support ULTs (BLM 2008, 2009).
Candidate				
Greater Sage-grouse	Basin-prairie shrub, mountain-foothill shrub	K	WIPV	High quality nesting and winter habitat is present. The project is bordered Wyoming designated Connectivity area to the west and by Montana Designated Core to the north

Presence	Project Effects
K – Known, documented observation in project area. **NP** – Habitat not present and species unlikely to occur in project area.	**NE** – No Effect **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.

4.9.2. Threatened and Endangered Species - Ute Ladies'-Tresses Orchid (ULT)

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

4.9.2.1. Direct and Indirect Effects

No project actions will take place in suitable ULT habitat and implementation of the proposed project will have "***no effect***" on ULT.

4.9.2.2. Cumulative Effects

The cumulative effects to ULT are discussed in the PRD FEIS (p. 4-253 to 4-254).

4.9.2.3. Mitigation Measures

No mitigation is proposed with alternative B.

4.9.2.4. Residual Effects

No residual effects are anticipated.

4.9.3. Candidate Species - Greater Sage-Grouse – (GSG)

4.9.3.1. Direct and Indirect Effects

Implementation of the proposed project will impact GSG habitat and individuals. Impacts to GSG are generally a result of loss and fragmentation of sagebrush habitats associated with roads and infrastructure. Impacts to GSG associated with energy development are discussed in detail in the *12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered* (FWS 2010) and chapters 15-21 of Greater Sage-Grouse Ecology and Conservation of a Landscape Species and its Habitats (Knick and Connelly 2011).

Infrastructure occurring within GSG habitat …. During onsite visits, the BLM biologist made specific recommendations to avoid placement of facilities in sagebrush to reduce direct loss of GSG habitat.

Changes made during on sites are described in the Mitigation section that follows.

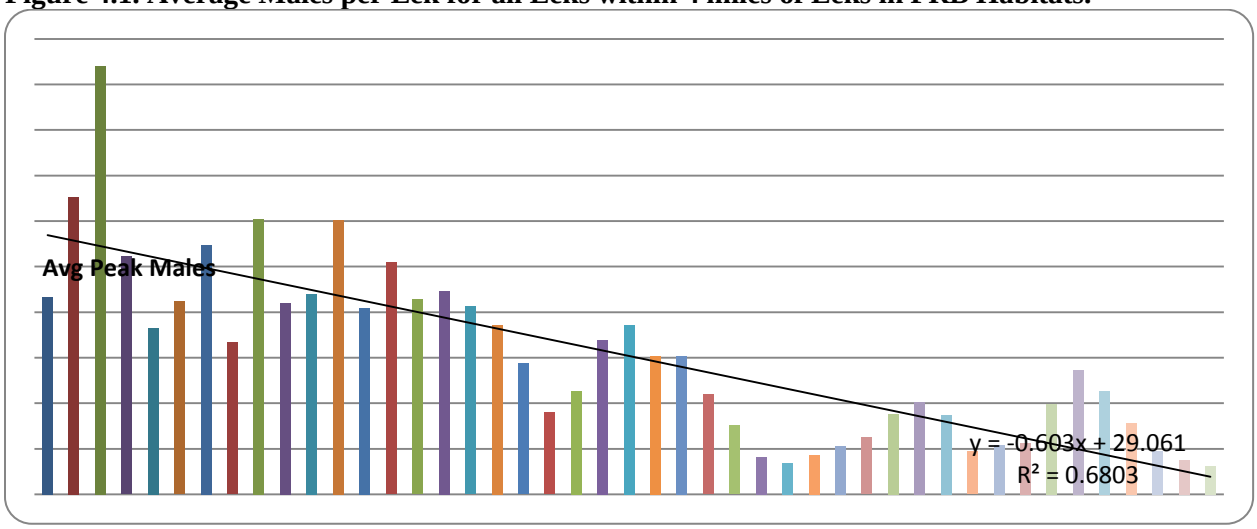
Implementation of the proposed project will cause sagebrush habitat removal and functional loss of habitat from fragmentation and anthropogenic activity.

4.9.3.2. Cumulative Effects

Recent research suggests that the cumulative and synergistic effects of current and foreseeable CBNG development within the vicinity of the project area are likely to impact the local GSG population, cause declines in lek attendance, and may result in local extirpation. The cumulative impact assessment area for this project encompasses the project area and the area that is encompassed by a 4 mile radius around the 8 GSG leks that occur within 4 miles of the project boundary. Analysis of impacts up to 4 miles was recommended by the State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008).

The GSG population in northeast Wyoming exhibited a steady long term downward trend, as measured by lek attendance (WGFD 2010). Figure 4.1 illustrates a 10-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. Research suggests that these declines may be a result, in part, of CBNG development, as discussed in detail in FWS (2010).

Figure 4.1. Average Males per Lek for all Leks within 4 miles of Leks in PRB Habitats.



The 2012 BLM-contracted population viability analysis for the Northeast Wyoming GSG found there remains a viable population of GSG in the PRB (Taylor et al. 2012). Threats from energy development and 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. For the Cabin Creek 7 POD there are 25 leks that are within 12.4 miles that will be affected. Seven of these leks are within a Montana Core Area and 9 are within Wyoming Connectivity/Focus Areas.

Studies document the additive impacts of energy development and WNv as a threat to GSG 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 will continue to impact the local GSG population, causing further declines in lek attendance, and could result in local extirpation: "[f]indings reflect the status of a small remaining GSG population that has already experienced an 82% decline in 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 GSG 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 GSG, with an increased chance of extirpation with additional WNv outbreaks (Taylor et al. 2012).

4.9.3.3. Mitigation Measures

SRG planned the Cabin Creek 7 and 8 projects to include CBNG development components within the Wyoming Sage-Grouse Connectivity Area to be deferred to Cabin Creek 8, leaving Cabin Creek 7 CBM development to be outside of the Connectivity Area.

During onsite visits, the SGR and BLM made the following moves to reduce direct loss and fragmentation of sage-grouse habitat:

Well # or Project Component	Changes to the project to minimize effects to high-quality sage-grouse habitat.
5-29-58-76	Moved closer to main road to avoid building a pad & road through good sage habitat.
5-30-58-76	Moved 140 yards to the south out of low reclamation potential soils & to reduce intrusion into good sage habitat.
11-30-5876	BLM recommended moving to existing pad to reduce GSG & sage disturbance.
15-24-58-77	BLM recommended moving 400 feet ENE & reducing access through sage habitat.
3-25-58-77	Moved from low reclamation potential soils & reducing intrusion in good sage habitat.
5-22-58-77	Recommend drop because access is through Montana Core Area.
1-33-58-77	Well moved 200 feet north to minimize sagebrush disturbance.
11-28-58-77	BLM recommended moving well closer to main road out of good sage habitat.
13-28-58-77	Wide of access corridor reduced to protect sage habitat.
Overhead power associated with well 5-28-58-77	Proposed route located by SGR to be out of GSR habitat.

4.9.3.4. 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 CBNG development.

4.9.4. Special Status (Sensitive) Species (SSS)

BLM supports the 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." The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-265. Project specific effects to sensitive species are described in Table 4.6 below.

Table 4.6. Summary of Sensitive Species Habitat and Project Effects.

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.	S	MIIH	Suitable habitat is 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.	NP	MIIH	Habitat not present.
Bald eagle (*Haliaeetus leucocephalus*)	Mature forest cover often within one mile of large water body with reliable prey source nearby.	K	MIIH	No known nests or winter roost concentration sites, but individuals have been known to forage and day roost in the project 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. Impacts will be mitigated by limitation on timing of activities.
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	NS	NI	Surveys have not recorded Ferruginous hawks. Project area is not habitat type preferred by ferruginous hawks.
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. Impacts will be mitigated by limitation on timing of activities.

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. Impacts will be mitigated by limitation on timing of activities.
Mountain Plover	Short-grass prairie with slopes < 5%	NP	NI	Terrain and vegetation height outside of mountain plover habitat parameters.
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	NS	NI	Suitable habitat is present but no goshawks were located during nesting surveys.
Peregrine falcon (*Falco peregrinus*)	Cliffs	NP	NI	Habitat not present.
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	NS	NI	Sage sparrows are thought to not occur in the project 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. Impacts will be mitigated by limitation on timing of activities.
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	NP	NI	Habitat is not present.
Western Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	S	MIIH	Nesting and foraging habitat may be impacted and human activities will increase.
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.	K	MIIH	Surface disturbing and maintenance activities will impact prairie dog colonies.
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	S	MIIH	Construction may impact foraging areas and alter habitat conditions.
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	S	MIIH	Construction may impact foraging areas and alter habitat conditions.
Swift fox (*Vulpes velox*)	Grasslands	NS	NI	Habitat not present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Townsend's big-eared bat (*Corynorhinus townsendii*)	Caves and mines.	S	MIIH	Construction may impact foraging areas and alter habitat conditions.
Plants				
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

4.9.5. Big Game

4.9.5.1. Direct and Indirect Effects

Under the environmentally preferred alternative, yearlong for pronghorn antelope, and winter-yearlong range for mule deer would be directly disturbed with the construction of wells, pipelines and roads. Habitat loss resulting from implementation of the project will also affect year-round use by elk. Habitat effectiveness for elk is discussed on p. 4-207 of the PRB FEIS. Long term disturbance would be direct habitat loss. Short-term disturbances also result in direct habitat loss; however, they should provide some habitat value as these areas are reclaimed and native vegetation becomes established.

In addition to the direct habitat loss, big game would likely be displaced from the project area during drilling and construction. A study in central Wyoming reported that mineral drilling activities displaced mule deer by more than 0.5 miles (Hiatt and Baker 1981). The WGFD indicates a well density of 8 wells per section creates a high level of impact for big game and that avoidance zones around mineral facilities overlap creating contiguous avoidance areas (WGFD 2004). A multi-year study on the Pinedale Anticline suggests not only do mule deer avoid mineral activities, but after 3 years of drilling activity the deer have not become accustomed to the disturbance (Madson 2005).

Big game animals are expected to return to the project area following construction; however, populations will likely be lower than prior to project implementation as the human activities associated with operation and maintenance continue to displace big game. Mule deer are more sensitive to operation and maintenance activities than pronghorn, and, as the Pinedale Anticline study suggests, mule deer do not readily habituate. A study in North Dakota stated, “although the population (mule deer) had over 7 years to habituate to oil and gas activities, avoidance of roads and facilities was determined to be long term and chronic” (Lustig 2003). Deer have even been documented to avoid dirt roads that were used only by 4-wheel drive vehicles, trail bikes, and hikers (Jalkotzy et al. 1997).

Winter big game diets are sub-maintenance, meaning they lose weight and body condition as the winter progresses. Survival below the maintenance level requires behavior that emphasizes energy conservation. Canfield et al. (1999) pointed out that forced activity caused by human disturbance exacts an energetic disadvantage, while inactivity provides an energetic advantage for animals. Geist (1978) further defined effects of human disturbance in terms of increased metabolism, which could result in illness, decreased reproduction, and even death.

CBNG activities that occur within big game habitats during the spring will likely displace adult females and juveniles due to the human presence in the area. This may cause reduced survival rate of individuals that must expend increased energies to avoid such activities.

4.9.5.2. Cumulative Effects

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, pp. 4-181 to 4-215.

4.9.5.3. Mitigation Measures

No mitigation is proposed with alternative B.

4.9.5.4. Residual Effects

No effects beyond those identified above are anticipated.

4.10. Aquatics

4.10.1. Direct and Indirect Effects

It is proposed that produced water from the Cabin Creek 7 POD is to be released to outflows into the

Powder River altering temperatures, flow (timing and volume), turbidity, and chemical composition of surface-discharged produced water could modify aquatic plant and animal. However, produced water is not anticipated to significantly affect natural surface water flow or quality. Impacts to aquatics are discussed further in the PRB FEIS on pp. 4-235 to 4-247.

4.10.2. Cumulative Effects

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, (pp. 4-247 to 4-249).

4.10.3. Mitigation Measures

No mitigation is proposed with alternative B.

4.10.4. Residual Effects

No residual effects are anticipated.

4.11. Migratory Birds

4.11.1. Direct and Indirect Effects

Direct and indirect effects to migratory birds are discussed in the PRB FEIS (pp. 4-231 to 4-235). In addition to other migratory bird species, several species that are classified as sensitive by the BLM are suspected to occur in the project area including: Brewer's sparrow, loggerhead shrike, long-billed curlew, and sage thrasher.

Disturbance of habitat within the project area is likely to impact migratory birds. Native habitats will be lost directly with the construction of wells, roads, and pipelines. Reclamation and other activities that occur in the spring may be detrimental to migratory bird survival. Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts. Activities will likely displace migratory birds farther than the immediate area of physical disturbance. Drilling and construction noise can be troublesome for songbirds by interfering with the males' ability to attract mates and defend territory, and the ability to recognize calls from conspecifics (BLM 2003).

Habitat fragmentation will result in more than just a quantitative loss in the total area of habitat available; the remaining habitat area will also be qualitatively altered (Temple and Wilcox 1986). 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 within a natural gas field. Effects occurred along roads with light traffic volume (<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.

Those species that are edge-sensitive will be displaced further away from vegetative edges due to increased human activity, causing otherwise suitable habitat to be abandoned. If the interior habitat is at carrying capacity, then birds displaced from the edges will have no place to relocate. One consequence of habitat fragmentation is a geometric increase in the proportion of the remaining habitat that is near edges (Temple 1986). In severely fragmented habitats, all of the remaining habitat may be so close to edges that no interior habitat remains (Temple and Cary 1988). Over time, this leads to a loss of interior habitat species in favor of edge habitat species. Other migratory bird species that utilize the disturbed areas for nesting may be disrupted by the human activity, and nests may be destroyed by equipment.

Migratory bird species within the PRB nest in the spring and early summer and are vulnerable to the same effects as GSG and raptor species. Though no timing restrictions are typically applied specifically to protect migratory bird breeding or nesting, where GSG or raptor nesting timing limitations are applied,

nesting migratory birds are also protected. Where these timing limitations are not applied and migratory bird species are nesting, migratory birds remain vulnerable.

4.11.2. Cumulative Effects

The cumulative effects associated with alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, p. 4-235. No additional mitigation measures are required.

4.11.3. Mitigation Measures

No timing limitations on surface disturbing activities are proposed specifically for migratory birds. However, raptor and GSG timing limitations on surface disturbing activities will also serve to mitigate impacts to nesting migratory birds.

4.11.4. Residual Effects

Though no timing restrictions are typically applied specifically to protect migratory bird breeding or nesting, where GSG or raptor nesting timing limitations are applied, nesting migratory birds are also protected. Where these timing limitations are not applied and migratory bird species are nesting, migratory birds remain vulnerable.

GSG timing limitations will apply to a portion of this POD. Those migratory bird species and individuals that are still nesting when the GSG timing limitations are over (June 30) may have nests destroyed, or be disturbed, by construction activities. Protections around active raptor nests (Feb 1- July 31) extend past most migratory bird nesting seasons. Only a percentage of known nests are active any given year, so the protections for migratory birds from June 30 - July 31 will depend on how many raptor nests are active.

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

4.12. Raptors

4.12.1. Direct and Indirect Effects

Direct and indirect effects to raptors are described in the PRB FEIS (pp. 4-216 to 4-220). 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 Cabin Creek 7 POD will likely be impacted to some extent by the human disturbance associated with operation and maintenance. Additional information and site-specific impacts are discussed here.

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 mineral activities occur during nesting, they could be sufficient to cause adult birds to remain away from the nest and their chicks for the duration of the activities. This absence can lead to overheating or chilling of eggs or chicks and can result in egg or chick mortality. 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 infrastructure requiring human visitation be located in such a way as 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. All proposed wells and associated infrastructure occurring within 0.5 miles of documented raptor nests are shown in Attachment 3 in the Appendix.

4.12.2. Cumulative Effects

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

4.12.3. Mitigation Measures

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.

4.12.4. Residual Impacts

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

4.13. Plains Sharp-tailed Grouse

4.13.1. Direct and Indirect Effects

The PRB FEIS described the direct and indirect effects to sharp-tailed grouse, pp. 4-221 to 4-226. The Fence Creek Road sharp-tailed grouse lek straddles the existing Fence Creek Oil Field Road. This road is the access for maintenance and production of the Fence Creek Oil Field wells. The road is improved and traffic increased over the last 2 years. SGR plans to continue using this road and use it as one of the main access ways into the northern portion of the Cabin Creek PODs as well as their non-federal development. During the construction phase of this POD, the traffic frequency will be as higher and could persist for 3 or more years before full field development is complete.

4.13.2. Cumulative Effects

The cumulative effects to sharp-tailed grouse are described in the PRB FEIS pp. 4-221 to 4-226.

4.13.3. Mitigation Measures

Seasonal timing restriction will be placed on surface disturbing activities in the protection buffer shown on COA Maps in the appendix.

4.13.4. Residual Impacts

No impacts beyond those identified above are anticipated.

4.14. West Nile Virus

4.14.1. Direct and Indirect Effects

This project is likely to result in standing surface water which may increase mosquito breeding habitat.

4.14.2. Cumulative Effects

There are many sources of native standing water throughout the PRB that add mosquito habitat. Summer thunderstorms, that pool water for more than four 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.

4.14.3. Mitigation Measures

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

4.15. Cultural Resources

4.15.1. Direct and Indirect Effects

Non eligible sites 48CA6886/48SH1692, 48CA6887/48SH1696, 48CA7114, 48SH1684, 48SH1687, 48SH1691, 48SH1693, and 48SH1781 may be impacted by the proposed project. No historic properties will be impacted by the proposed project. Following the Wyoming State Protocol Section VI(A)(1) the BLM electronically notified the Wyoming SHPO on July 23, 2012 that no historic properties exist within the area of potential effect. If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS and ROD)] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Further discovery procedures are explained in the Standard COA (General)(A)(1).

4.15.2. 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 basic information about archaeological sites in the proposed project areas serve to partially mitigate potential cumulative effects to cultural resources.

Fee actions built 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, which information can potentially get into the wrong hands. BLM authorizations that result in new access can inadvertently lead to site impacts from increased public visitation.

4.15.3. Mitigation Measures

If the SGR or its contractors 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. Further discovery procedures are explained in the Standard COA (General)(A)(1).

When a project is constructed in an area with a high potential for buried cultural material, archaeological monitoring is often included as a condition of approval. Construction monitoring is performed by a qualified archeologist working in unison with construction crews. If buried cultural resources are located by the archeologist, construction is halted and the BLM consults with the SHPO on mitigation or avoidance. Due to the high density of sites discovered along Fence Creek in the eastern portion of the project area and the presence of alluvial and/or aeolian deposits identified by the NRCS soil survey (NRCS n.d.), and areas of High to Very High Sensitivity Zones per the PUMP III Model (Eckerle 2005), the operator will be required to have an archeologist monitor all earth moving activities associated with certain construction, as described in the site specific COAs.

4.15.4. 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 in drafting this EA:

Contact	Organization	Onsite Presence?
Mary Hopkins	Wyoming SHPO	No

List of Preparers (BFO unless otherwise noted)

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Appendix A:

CONDITIONS OF APPROVAL FOR THE CBNG APPLICATION FOR PERMIT TO DRILL

POD Name: Cabin Creek VII Federal POD

Operator: Summit Gas Resources, Inc.

Field Office: Buffalo Field Office
Address: 1425 Fort Street
Buffalo, Wyoming 82834

Office Telephone Number: 307-684-1100

List of Wells:

	Well Name	Well #	Qtr/Qtr	Sec	Township	Range	Lease #
1	CABIN CREEK 7 CB	03-28	NENW	28	58N	76W	WYW149630
2	CABIN CREEK 7 CB	05-28	SWNW	28	58N	76W	WYW149630
3	CABIN CREEK 7 CB	01-28	NENE	28	58N	76W	WYW149629
4	CABIN CREEK 7 CB	09-28	NESE	28	58N	76W	WYW149629
5	CABIN CREEK 7 CB	16-28	SESE	28	58N	76W	WYW149629
6	CABIN CREEK 7 CB	11-28	NESW	28	58N	76W	WYW149630
7	CABIN CREEK 7 CB	01-29	NENE	29	58N	76W	WYW149630
8	CABIN CREEK 7 CB	03-29	NENW	29	58N	76W	WYW149630
9	CABIN CREEK 7 CB	07-29	SWNE	29	58N	76W	WYW149630
10	CABIN CREEK 7 CB	11-29	NESW	29	58N	76W	WYW48708
11	CABIN CREEK 7 CB	15-29	SWSE	29	58N	76W	WYW0313942
12	CABIN CREEK 7 CB	05-29	SWNW	29	58N	76W	WYW149630
13	CABIN CREEK 7 CB	01-30	NENE	30	58N	76W	WYW48708
14	CABIN CREEK 7 CB	07-30	SWNE	30	58N	76W	WYW48708
15	CABIN CREEK 7 CB	09-30	NESE	30	58N	76W	WYW48708
16	CABIN CREEK 7 CB	03-30	NENW	30	58N	76W	WYW48708
17	CABIN CREEK 7 CB	15-30	SWSE	30	58N	76W	WYW48708
18	CABIN CREEK 7 CB	16-30	SESE	30	58N	76W	WYW48708
19	CABIN CREEK 7 CB	23-30	NESW	30	58N	76W	WYW48708
20	CABIN CREEK 7 CB	27-30	SWSW	30	58N	76W	WYW48708
21	CABIN CREEK 7 CB	28-30	SESW	30	58N	76W	WYW48708
22	CABIN CREEK 7 CB	05-30	SWNW	30	58N	76W	WYW48708
23	CABIN CREEK 7 CB	11-30	NESW	30	58N	76W	WYW48708
24	CABIN CREEK 7 CB	05-20	SWNW	20	58N	77W	WYW144224
25	CABIN CREEK 7 CB	07-20	SWNE	20	58N	77W	WYW144224
26	CABIN CREEK 7 CB	13-21	SWSW	21	58N	77W	WYW144224
27	CABIN CREEK 7 CB	05-21*	SWNW	21	58N	77W	WYW144224

	Well Name	Well #	Qtr/Qtr	Sec	Township	Range	Lease #
28	CABIN CREEK 7 CB	07-21	SWNE	21	58N	77W	WYW144224
29	CABIN CREEK 7 CB	15-21	SWSE	21	58N	77W	WYW144224
30	CABIN CREEK 7 CB	09-22	NESE	22	58N	77W	WYW144224
31	CABIN CREEK 7 CB	15-22	SWSE	22	58N	77W	WYW144224
32	CABIN CREEK 7 CB	07-22	SWNE	22	58N	77W	WYW144224
33	CABIN CREEK 7 CB	09-23	NESE	23	58N	77W	WYW144224
34	CABIN CREEK 7 CB	11-23	NESW	23	58N	77W	WYW144224
35	CABIN CREEK 7 CB	08-23	SENE	23	58N	77W	WYW147351
36	CABIN CREEK 7 CB	13-23	SWSW	23	58N	77W	WYW144224
37	CABIN CREEK 7 CB	16-23	SESE	23	58N	77W	WYW147351
38	CABIN CREEK 7 CB	15-24	SWSE	24	58N	77W	WYW147351
39	CABIN CREEK 7 CB	09-24	NESE	24	58N	77W	WYW147351
40	CABIN CREEK 7 CB	14-24	SESW	24	58N	77W	WYW147351
41	CABIN CREEK 7 CB	01-25	NENE	25	58N	77W	WYW147351
42	CABIN CREEK 7 CB	03-25	NENW	25	58N	77W	WYW147351
43	CABIN CREEK 7 CB	05-27	SWNW	27	58N	77W	WYW144225
44	CABIN CREEK 7 CB	07-27	SWNE	27	58N	77W	WYW144225
45	CABIN CREEK 7 CB	01-28	NENE	28	58N	77W	WYW144225
46	CABIN CREEK 7 CB	03-28	NENW	28	58N	77W	WYW144225
47	CABIN CREEK 7 CB	05-28	SWNW	28	58N	77W	WYW144225
48	CABIN CREEK 7 CB	07-28	SWNE	28	58N	77W	WYW144225
49	CABIN CREEK 7 CB	09-28	NESE	28	58N	77W	WYW144225
50	CABIN CREEK 7 CB	11-28	NESW	28	58N	77W	WYW144225
51	CABIN CREEK 7 CB	13-28	SWSW	28	58N	77W	WYW144225
52	CABIN CREEK 7 CB	15-28	SWSE	28	58N	77W	WYW144225
53	CABIN CREEK 7 CB	03-29	NENW	29	58N	77W	WYW144226
54	CABIN CREEK 7 CB	07-29	SWNE	29	58N	77W	WYW144226
55	CABIN CREEK 7 CB	09-29	NESE	29	58N	77W	WYW144226
56	CABIN CREEK 7 CB	11-29	NESW	29	58N	77W	WYW144226
57	CABIN CREEK 7 CB	15-29	SWSE	29	58N	77W	WYW144226
58	CABIN CREEK 7 CB	09-31	NESE	31	58N	77W	WYW144226
59	CABIN CREEK 7 CB	11-31	NESW	31	58N	77W	WYW144226
60	CABIN CREEK 7 CB	13-31	SWSW	31	58N	77W	WYW144226
61	CABIN CREEK 7 CB	15-31	SWSE	31	58N	77W	WYW144226
62	CABIN CREEK 7 CB	01-32	NENE	32	58N	77W	WYW144227
63	CABIN CREEK 7 CB	03-32	NENW	32	58N	77W	WYW144227
64	CABIN CREEK 7 CB	05-32	SWNW	32	58N	77W	WYW144227
65	CABIN CREEK 7 CB	09-32	NESE	32	58N	77W	WYW144227
66	CABIN CREEK 7 CB	07-32	SWNE	32	58N	77W	WYW144227
67	CABIN CREEK 7 CB	15-32	SWSE	32	58N	77W	WYW144227
68	CABIN CREEK 7 CB	11-32	NESW	32	58N	77W	WYW144227
69	CABIN CREEK 7 CB	13-32	NWSW	32	58N	77W	WYW144227
70	CABIN CREEK 7 CB	01-33	NENE	33	58N	77W	WYW144227
71	CABIN CREEK 7 CB	03-33	NENW	33	58N	77W	WYW144227
72	CABIN CREEK 7 CB	05-33	SWNW	33	58N	77W	WYW144227
73	CABIN CREEK 7 CB	07-33	SWNE	33	58N	77W	WYW144227
74	CABIN CREEK 7 CB	11-33	NESW	33	58N	77W	WYW144227

List of Impoundment(s):

	FACILITY Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturbance	Lease #
1	Schauer #1 Pit (Secondary)	SWSE	22	58N	77W	50.2	10.6acres	WYW144224
2	Outfall 001	NENE	20	57N	76W	NA	0.01 Acres	None
3	Outfall 002	NENW	6	57N	75W	NA	0.01 Acres	None
4	Outfall 003	NWNE	20	57N	76W	NA	0.01 Acres	None
5	Outfall 004	SWNW	31	57N	76W	NA	0.01 Acres	None
6	Outfall 005	NWNW	31	57N	76W	NA	0.01 Acres	None
7	Outfall 006	NWSE	31	57N	75W	NA	0.01 Acres	None
8	Outfall 007	NENW	6	57N	75W	NA	0.01 Acres	None

The spud date will be reported electronically, (see website location below) to the Authorized Officer 24 HOURS BEFORE SPUDDING, unless otherwise required in site specific conditions of approval.

Spud Notice Site:
http://www.wy.blm.gov/minerals/og/og_notices/spud_notice.php

SITE SPECIFIC

Surface:

1. All Engineered Roads that are to be used in conjunction with accessing federal wells must be fully built (including all water control structures such as wingditches, culverts, relief ditches, low water crossings, surfacing etc.) and functional to BLM standards as outlined in the 9113 Manual prior to drilling of the wells.

2. All proposed wells, access roads, cross country utility corridors, and POD infrastructure that was changed or modified during the onsite will need to be staked prior to pre-construction meeting to reflect the changes that were made during the onsite for verification to the BLM Authorized Officer.
   a. All low water crossing's and culverts will be staked prior to the pre-construct for the entire POD.
   b. All engineered well pads and engineered roads will be fully slope staked prior to the pre-construction onsite.
      i. Complete slope staking shall be required prior to construction. Staking shall be completed on 100 foot intervals on tangent sections for through cuts and/or fills less than 5 feet. Staking shall be completed on 50 foot intervals for horizontal and vertical curves, balanced tangent sections, and road sections requiring more than 5 feet of cut and/or fill. This condition of approval will be implemented for the entire POD for all engineered roads and locations.

3. The operator will submit corrected maps, associated paperwork, and documentation to the BLM BFO Authorized Officer prior to the pre-construction meeting illustrating the changes made during the BLM/Operator/ Landowner onsites as well as the approval document EA WY-070-EA12-183.

4. All wells that were moved and access roads will need to be verified during the pre-construction meeting to insure that changes that were instituted during the BLM/Operator/ Landowner onsites are implemented.

5. For the following three landowners (Peegee Ranch, Bales Ranch, and Padlock Ranch), prior to the pre-construction meeting the operator will need to provide the BLM Authorized Officer with signed landowner documentation for the preference for access road surfacing (scoria or gravel) on their private surface.

6. Due to slopes, potential erosion, surface disturbance, and topography a 30-Day Stabilization COA will apply. Stabilization must be completed within 30 days of initiating construction for all well locations, access roads, cross country utility corridors.

7. Cross country pipeline routes will not become roads after construction is complete. All sections of pipeline will be fully reclaimed to blend with the surrounding topography. Pipeline inspections should be conducted by ATV, foot, or air.

8. Place a minimum average of 4 inches of aggregate on road segments where grades exceed 8%.

Water Management:

1. The operator will sample the springs located in QtrQtr Sec T R, twice each year (spring and fall) for the duration of production to determine any changes in water quality or quantity. Analysis will follow the WYPDES Permit initial quality criteria suite. Flow rate will also be determined. Copies of water quality and quantity data will be reported to the BLM BFO. If it is determined that either are changing as a result of CBNG production in the area, additional mitigation may be required.

2. The approved water management plan includes a single off-channel reservoir that has been designated as secondary. Facilities identified as secondary under approval status have undergone an environmental review, however, the operator has chosen not to provide reclamation bonds, and will not construct them until proof of bonding is provided. If the operator chooses to develop the facility, they will submit a sundry notice to that effect with the relevant reclamation bonds.

Wildlife:

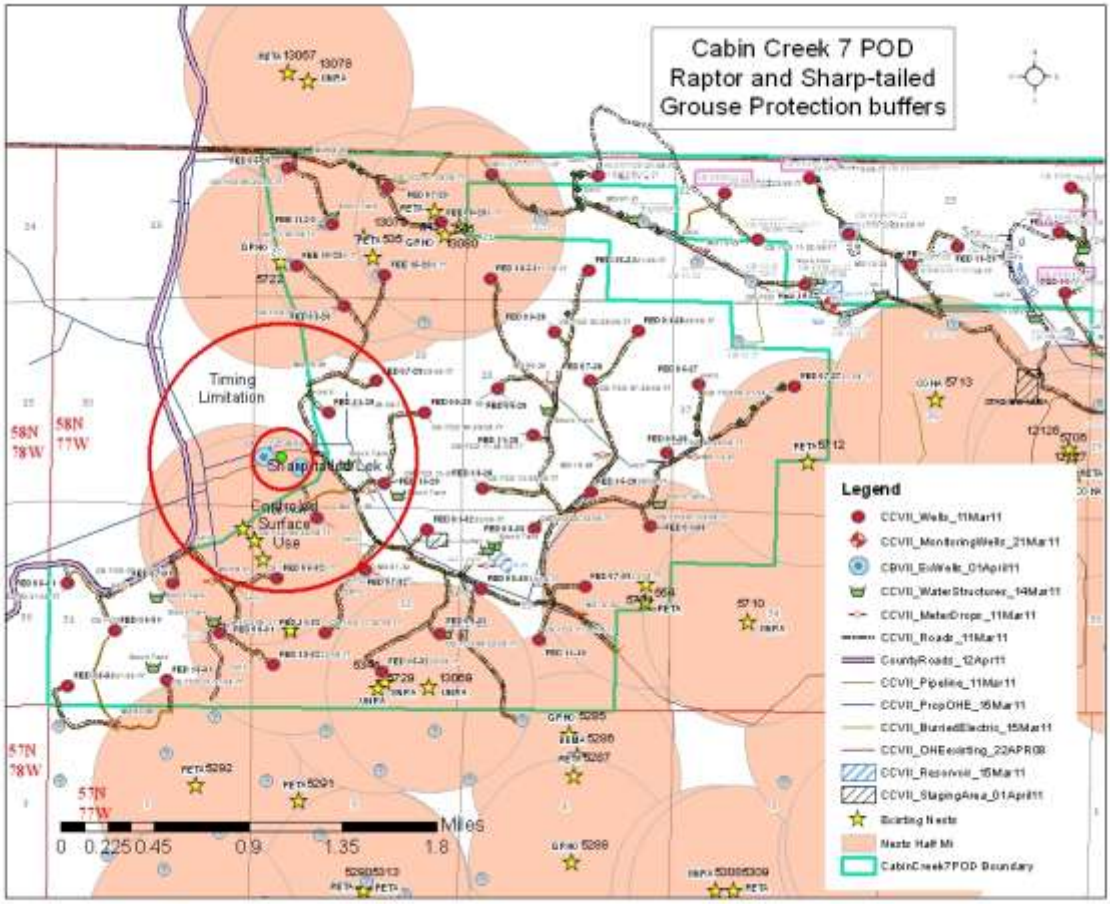
Raptors

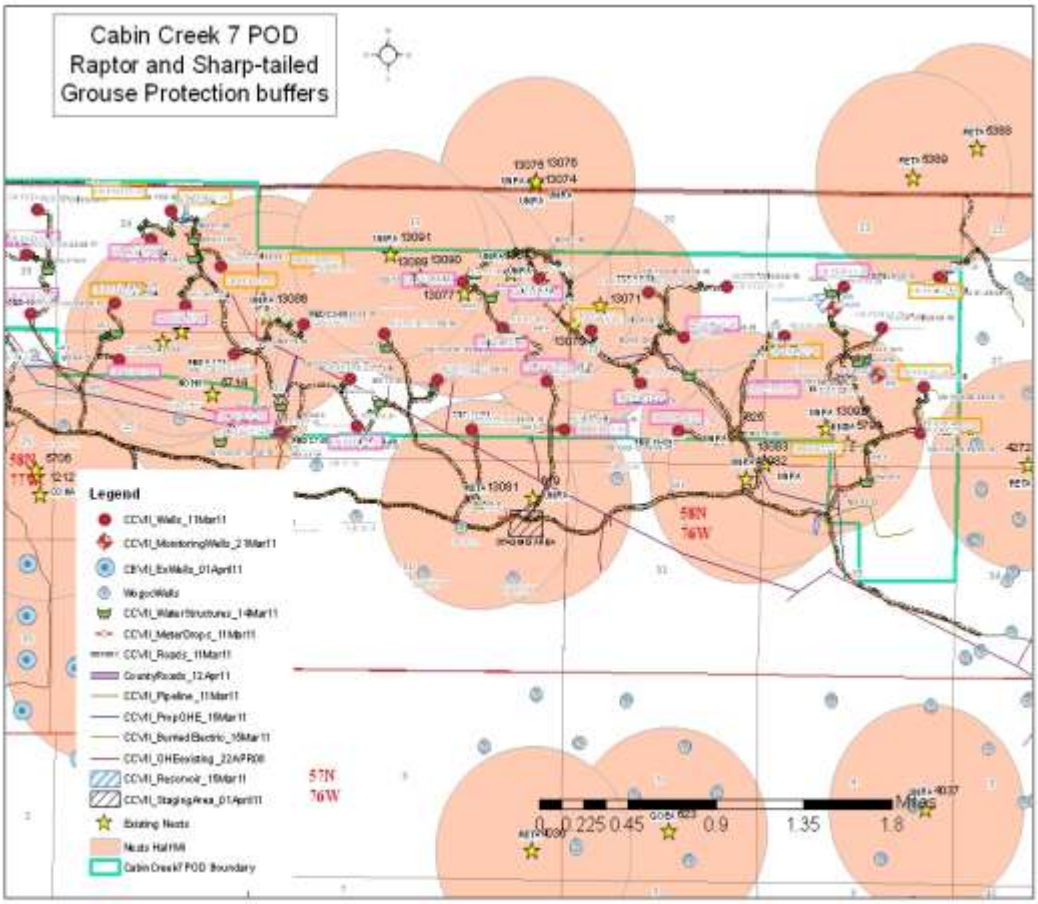
The following conditions will alleviate impacts to raptors:

1. No surface-disturbing activities shall occur within 0.5 mile of all identified raptor nests, from February 1 through July 31, annually, prior to a nest occupancy survey for the current breeding season. Refer to the attached map for affected wells and infrastructure for the 2012 year.

2. Surveys to document nest occupancy shall be conducted by a biologist following BLM protocol, between April 15 and June 30. All survey results shall be submitted in writing to a Buffalo BLM biologist and approved prior to surface disturbing activities. Surveys outside this window may not depict nesting activity. If a survey identifies active raptor nests, a ½ mile timing buffer will be implemented. The timing buffer restricts surface disturbing activities within ½ mile of occupied raptor nests from February 1 to July 31.

3. If an undocumented raptor nest is located during project construction or operation, the Buffalo Field Office (307-684-1100) shall be notified within 24 hours.


Cabin Creek 7 POD
Raptor and Sharp-tailed
Grouse Protection buffers
Timing
Limitation
Sharp-tailed Lek
Surface
Use
58N
78W
58N
77W
57N
78W
57N
77W
Legend
CCVII_Wells_11Mar11
CCVII_MonitoringWells_21Mar11
CBVII_EstWells_01April11
CCVII_WaterStructures_14Mar11
CCVII_MeterDrops_11Mar11
CCVII_Roads_11Mar11
CountyRoads_12April1
CCVII_Pipeline_11Mar11
CCVII_PropOHE_15Mar11
CCVII_BuriedElectric_15Mar11
CCVII_OHExisting_22APR08
CCVII_Reservoir_15Mar11
CCVII_StagingArea_01April11
Existing Nests
Nests Half Mi
CabinCreek7POD Boundary
0 0.225 0.45 0.9 1.35 1.8
Miles



Sharp-Tailed Grouse:

The following conditions will alleviate impacts to sharp-tailed grouse:

1. No surface disturbing activities are permitted during sharp-tailed grouse breeding and nesting periods (April 1 and May 31) within 0.64 mi. of the French Creek Road sharp-tailed grouse lek (NWSW Sec. 29, T58N:R77W), prior to completion of a grouse lek survey. This condition will be implemented on an annual basis for the life of the project. This timing limitation will affect the access road passing within 0.64 miles of the lek.

Sage-grouse

1. No surface disturbing activities are permitted during sage-grouse breeding and nesting periods (March 15 – June 30), for all federal wells and all associated infrastructure wells in the portions of the Cabin Creek 7 POD within T58N, R77W Sections 20, 21, 27, 28, 29, 31, 32, and 33.

2. For any surface-disturbing activities proposed in sagebrush shrublands, the operator will conduct clearance surveys for sage-grouse breeding activity during the sage-grouse's breeding season before initiating the activities. The surveys must encompass all sagebrush shrublands within 0.5 miles of the proposed activities. This will apply to all approved wells and infrastructure. All survey results shall be submitted in writing to a Buffalo BLM biologist no later than July 31of the current year. This condition will be implemented on an annual basis for the duration of surface disturbing activities. If a previously unknown lek is identified during surveys (April 1-May 7), a Buffalo BLM biologist shall be notified.

Cultural:
All surface disturbing activity in the following areas will be monitored by a BLM cultural resource use permit (CRUP) holder or permitted crew chief. The Bureau has identified these areas as having a high potential for buried cultural deposits (areas containing alluvial deposits along Fence Creek). Some portions of the monitoring areas as described may lie outside alluvial deposits and exact monitoring areas are left to the discretion of the archeological monitor. All monitored areas must be plotted on the map provided with the monitoring report. The submission of two copies of a monitoring report to BFO is required within 30 days of the completion of all monitoring work.

1. All surface disturbing activity associated with infrastructure and road construction crossing Fence Creek in T58N R76W Sections 31, 32, and 33.

Realty:
1. Rights-of-way were identified for existing and proposed roads, water pipelines, buried power lines, and gas pipelines on public lands for off-lease development. Use or construction of the existing and proposed roads, water pipelines, buried power lines, and gas pipelines on BLM lands would not be authorized until right-of-way grants are issued. Powder River Energy Corp. would file an overhead power line right-of-way application when they receive a work order from the operator. Construction of overhead power lines would not be authorized until a right-of-way grant is issued.

<u>STANDARD</u>

General

1. A pre-construction field meeting shall be conducted prior to beginning any dirt work approved under this POD. The operator shall contact the BLM Authorized Officer Andy Perez at NRS (307)-684-1166 at least 4-days prior to beginning operations so that the meeting can be scheduled. The operator is responsible for having all contractors present (dirt contractors, drilling contractor, pipeline contractor, project oversight personnel, etc.) including the overall field operations superintendent, and for providing all contractors copies of the approved POD, project map and BLM Conditions of Approval pertinent to the work that each will be doing.

2. If any cultural values [sites, artifacts, human remains (Appendix L FEIS and ROD)] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. The authorized officer will conduct an evaluation of the cultural values to establish appropriate mitigation, salvage or treatment. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials, and contact the authorized BLM officer (AO). Within five working days the AO will inform the operator as to:
   - whether the materials appear eligible for the National Register of Historic Places;
   - the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and,
   - a time-frame for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction measures.

3. If paleontological resources, either large or conspicuous, and/or a significant scientific value are discovered during construction, the find will be reported to the Authorized Officer immediately.

Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological values. Operations within 250 feet of such a discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The applicant will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operation.

4. Please contact (Andy Perez), Natural Resource Specialist, at (307) 684-1100, Bureau of Land Management, Buffalo, if there are any questions concerning the following surface use COAs.

5. The first well drilled to each targeted coal zone will be designated as the POD reference well. Designated reference wells must have the ability to be sampled at the wellhead. Water quality samples will be collected by the operator and submitted for analysis using WDEQ NPDES criteria within 30-60 days of initial water production. Results of the analysis will be submitted to the BFO-BLM Authorized Officer as soon as they become available.

DRILLING AND PRODUCTION OPERATIONS

1. The operator shall complete wells (case, cement and under ream) as soon as possible, but no later than 30 days after drilling operations, unless an extension is given by the BLM Authorized Officer.

2. If in the process of air drilling the wells there is a need to utilize mud, all circulating fluids will be contained either in an approved pit or in an aboveground containment tank. The pit or containment tank will be large enough to safely contain the capacity of all expected fluids without danger of overflow. Fluid and cuttings will not be squeezed out of the pit, and the pit will be reclaimed in an expedient manner.

Well Control Equipment

1. The flow line shall be a minimum of 30 feet from the well bore and securely anchored. The 30-foot length of line is a minimum and operators must make consideration for increasing this length for topography and/or wind direction.

2. The flow line shall be a straight run.

3. The flow line must be constructed from non-flammable material.

4. All cuttings and circulating medium shall be directed to and contained in a reserve pit.

5. The nearest edge of the pits shall be a minimum of 25’ from the rig.

6. A minimum of 2’ of freeboard shall be maintained in the pits at all times.

7. The authorized officer may modify these requirements at any time if it is determined that increased pressure control is deemed necessary.

8. Verbal notification shall be given to the Authorized Officer at least 24 hours before formation tests, BOP tests, running and cementing casing, and drilling over lease expiration dates.

Cement Program

1. If there are indications of inadequate primary cementing of the surface, intermediate, or production

casing strings; such as but not limited to no returns to surface, cement channeling, fallback or mechanical failure of equipment, the operator will evaluate the adequacy of the cementing operations. This evaluation will consist of running a cement bond log (CBL) or an alternate method approved by the Authorized Officer (AO) no sooner than 12 hours and no later than 24 hours from the time the cement was first pumped.

2. If the evaluation indicates inadequate cementing, the operator shall contact a BLM Buffalo Field Office Petroleum Engineer for approval of remedial cementing work.

3. The adequacy of the remedial cementing operations shall be verified by a cement bond log (CBL) or an alternate method approved by the Authorized Officer (AO). All remedial work shall be completed and verified prior to drilling out the casing shoe or perforating the casing for purposes other than remedial cementing.

4. The cement mix water used must be of adequate quality so as not to degrade the setting properties of the cement. Any water that does not meet municipal quality water standards shall be tested by mixing the water and cement in a lab and comparing the results to the municipal quality water mix results. If the results show that the cement qualities are not the same or greater, then the non-municipal water shall not be used for mixing cement in the well.

Production Equipment

1. Other actions such as off-lease measurement, commingling, allocation, etc. shall be approved via a Notice of Intent sundry (Form No. 3160-5). Submission of additional information in the POD shall not be construed as permission for these items. If the operator wishes to utilize off-lease gas measurement for wells approved in this POD, they are required to obtain approval via a Notice of Intent sundry (Form No. 3160-5) prior to any gas production.

Well and POD Building Identification

1. From the time a well pad is constructed or a well is spudded (if no well pad needed), until abandonment, all well locations must be properly identified with a legible sign. The sign will include the well name and number, operator name, lease number, and the surveyed location.

2. At each POD building site where federal wells are metered, the operator is required to maintain a legible sign displayed in a conspicuous place. This sign is required to be in place at the time metering goes online. The sign shall include: POD name, Operator, Federal well names and numbers, Federal lease numbers being metered at the POD building, and surveyed location of the building.

Protection of Fresh Water Resources

1. All oil and gas operations shall be conducted in a manner to prevent the pollution of all freshwater resources. All fresh waters and waters of present or probable future value for domestic, municipal, commercial, stock or agricultural purposes will be confined to their respective strata and shall be adequately protected. Special precautions will be taken to guard against any loss of artesian water from the strata in which it occurs and the contamination of fresh water by objectionable water, oil, condensate, gas or other deleterious substance to such fresh water.

Miscellaneous Conditions

1. Any changes to the approved drilling plan and/or these conditions of approval shall be approved by the BLM-Buffalo Field Office Petroleum Engineer prior to being implemented.

After hour's numbers:
Supervisory Petroleum Engineer: Matthew Warren Cell Telephone: 307-620-0103

2. If any cores are collected, a copy of all analysis performed shall be submitted to the BLM-Buffalo Field Office Petroleum Engineer.

SURFACE USE STANDARD

Construction

1. Construction and drilling activity will not be conducted using frozen or saturated soil material during periods when watershed damage or excessive rutting is likely to occur.

2. Remove all available topsoil from constructed well locations including areas of cut and fill, and stockpile at the site. Topsoil will also be salvaged for use in reclamation on all other areas of surface disturbance (roads, pipelines, etc.). Clearly segregate topsoil from excess spoil material. Any topsoil stockpiled for one year or longer will be signed and stabilized with annual ryegrass or other suitable cover crop.

3. The operator will not push soil material and overburden over side slopes or into drainages. All soil material disturbed will be placed in an area where it can be retrieved without creating additional undue surface disturbance and where it does not impede watershed and drainage flows.

4. Construct the backslope no steeper than 1 ½:1 , and construct the foreslope no steeper than 2:1, unless otherwise directed by the BLM Authorized Officer.

5. Maintain a minimum 20-foot undisturbed vegetative border between toe-of-fill of pad and/or pit areas and the edge of adjacent drainages, unless otherwise directed by the BLM Authorized Officer.

6. To minimize electrocution potential to birds of prey, all overhead electrical power lines will be constructed to standards identified by the Avian Power Line Interaction Committee (2006).

7. The reserve pit will be oriented to prevent collection of surface runoff. After the drilling rig is removed, the operator may need to construct a trench on the uphill side of the reserve pit to divert surface drainage around it. If constructed, the trench will be left intact until the pit is closed.

8. The reserve pit will be lined with an impermeable liner if permeable subsurface material is encountered. An impermeable liner is any liner having a permeability less than 10-7 cm/sec. The liner will be installed so that it will not leak and will be chemically compatible with all substances that may be put in the pit. Liners made of any man-made synthetic material will be of sufficient strength and thickness to withstand normal installation and pit use. In gravelly or rocky soils, a suitable bedding material such as sand will be used prior to installing the liner.

9. The reserve pit will be constructed so that at least half of its total volume is in solid cut material (below natural ground level).

10. Reserve pits will be adequately fenced during and after drilling operations until pit is reclaimed so as to effectively keep out wildlife and livestock. Adequate fencing, in lieu of more stringent requirements by the surface owner, is defined as follows:

    - Construction materials will consist of steel or wood posts. Three or four strand wire (smooth or barbed) fence or hog panel (16-foot length by 50-inch height) or plastic snow fence must be used with connectors such as fence staples, quick-connect clips, hog rings, hose clamps, twisted wire, etc. Electric fences will not be allowed.

- Construction standards: Posts shall be firmly set in ground. If wire is used it must be taut and evenly spaced, from ground level to top wire, to effectively keep out animals. Hog panels must be tied securely into posts and one another using fence staples, clamps, etc. Plastic snow fencing must be taut and sturdy. Fence must be at least 2-feet from edge of pit. 3 sides fenced before beginning drilling, the fourth side fenced immediately upon completion of drilling and prior to rig release. Fence must be left up and maintained in adequate condition until pit is closed.

11. Reserve pits will be closed as soon as possible, but no later than 90 days 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, recontouring and replacement of topsoil. Mud and cuttings left in pit must be buried at least 3-feet below recontoured grade. The operator will be responsible for recontouring any subsidence areas that develop from closing a pit before it is sufficiently dry.

12. Culverts will be placed on channel bottoms on firm, uniform beds, which have been shaped to accept them, and aligned parallel to the channel to minimize erosion. Backfill will be thoroughly compacted.

13. The minimum diameter for culverts will be 18 inches. However, all culverts will be appropriately sized in accordance with standards in BLM Manual 9113.

14. Construction and other project-related traffic will be restricted to approved routes. Cross-country vehicle travel will not be allowed.

15. Maximum design speed on all operator constructed and maintained roads will not exceed 25 miles per hour.

16. Pipeline construction shall not block nor change the natural course of any drainage. Pipelines shall cross perpendicular to drainages. Pipelines shall not be run parallel in drainage bottoms. Suspended pipelines shall provide adequate clearance for maximum runoff.

17. Pipeline trenches shall be compacted during backfilling. Pipeline trenches shall be routinely inspected and maintained to ensure proper settling, stabilization and reclamation.

18. During construction, emissions of particulate matter from well pad and road construction would be minimized by application of water or other non-saline dust suppressants with at least 50 percent control efficiency. Dust inhibitors (surfacing materials, non-saline dust suppressants, and water) will be used as necessary on unpaved roads that present a fugitive dust problem. The use of chemical dust suppressants on public surface will require prior approval from the BLM Authorized Officer.

19. Operators are required to obtain a National Pollution Discharge Elimination System (NPDES) Storm Water Permit from the Wyoming DEQ for any projects that disturb five or more acres (changing to one acre in March 2005). This general construction storm water permit must be obtained from WDEQ prior to any surface disturbing activities and can be obtained by following directions on the WDEQ website at http://deq.state.wy.us. Further information can be obtained by contacting Barb Sahl at (307) 777-7570.

20. The operator shall submit a Sundry Notice (Form 3160-5) to BLM for approval prior to construction of any new surface disturbing activities that are not specifically addressed in the approved APD or POD Surface Use Plan.

Operations/Maintenance

1. Confine all equipment and vehicles to the access road(s), pad(s), and area(s) specified in the approved APD or POD.

2. All waste, other than human waste and drilling fluids, will be contained in a portable trash cage. This waste will be transported to a State approved waste disposal site immediately upon completion of drilling operations. No trash or empty barrels will be placed in the reserve pit or buried on location. Operators and their contractors will comply with all state and local laws and regulations pertaining to disposal of human and solid waste will be complied with.

3. The operator will be responsible for prevention and control of noxious weeds and weeds of concern on all areas of surface disturbance associated with this project (well locations, roads, water management facilities, etc.) Use of pesticides shall comply with the applicable Federal and State laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of Interior. Prior to the use of pesticides on public land, the holder shall obtain from the BLM authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer to such use.

4. All permanent above-ground structures (e.g. , production equipment, tanks, etc.) not subject to safety requirements will be painted to blend with the natural color of the landscape. The paint used will be a color which simulates "Standard Environmental Colors." The color selected for this (site, project), is (Covert Green).

5. Sewage shall be placed in a self-contained, chemically treated porta-potty on location.

6. The operator and their contractors shall ensure that all use, production, storage, transport and disposal of hazardous and extremely hazardous materials associated with the drilling, completion and production of these wells will be in accordance with all applicable existing or hereafter promulgated federal, state and local government rules, regulations and guidelines. All project-related activities involving hazardous materials will be conducted in a manner to minimize potential environmental impacts. In accordance with OSHA requirements, a file will be maintained onsite containing current Material Safety Data Sheets (MSDS) for all chemicals, compounds and/or substances which are used in the course of construction, drilling, completion and production operations.

7. Produced fluids shall be put in test tanks on location during completion work. Produced water will be put in the reserve pit during completion work per Onshore Order #7.

8. The only fluids/waste materials which are authorized to go into the reserve pit are RCRA exempt exploration and production wastes. These include:
   - drilling muds & cuttings
   - rigwash
   - excess cement and certain completion & stimulation fluids defined by EPA as exempt

   It does not include drilling rig waste, such as:
   - spent hydraulic fluids
   - used engine oil
   - used oil filter
   - empty cement, drilling mud, or other product sacks
   - empty paint, pipe dope, chemical or other product containers
   - excess chemicals or chemical rinsate

Any evidence of non-exempt wastes being put into the reserve pit may result in the BLM Authorized Officer requiring specific testing and closure requirements.

9. The operator shall restrict travel on unimproved two-track roads during periods of inclement weather or spring thaw when the possibility exists for excessive surface resource damage (e.g., rutting in excess of 4-inches, travel outside two-track roadway, etc.).

Producing Well

1. Landscape those areas not required for production to the surrounding topography as soon as possible. The Fluids and mud must be dry in the reserve pit before re-contouring pit area. The operator will be responsible for re-contouring and reseeding of any subsidence areas that develop from closing a pit before it is completely dry.

2. Reduce the backslope to 2:1 and the foreslope to 3:1, unless otherwise directed by the BLM Authorized Officer. Reduce slopes by pulling fill material up from foreslope into the toe of cut slopes.

3. Any spilled or leaked oil, produced water or treatment chemicals must be reported in accordance with NTL-3A and immediately cleaned up in accordance with BLM requirements. This includes clean-up and proper disposition of soils contaminated as a result of such spills/leaks.

4. Distribute stockpiled topsoil evenly over those areas not required for production (ie.,cut/fill slopes, road ditches, pipelines, etc.) and reseed with approved seed mix.

5. Upgrade and maintain access roads and drainage control (e.g., culverts, drainage dips, ditching, crowning, surfacing, etc.) as necessary and as directed by the BLM Authorized Officer to prevent soil erosion and accommodate safe, environmentally-sound access.

6. Prior to construction of production facilities not specifically addressed in the APD/POD, the operator shall submit a Sundry Notice to the BLM Authorized Officer for approval.

Reclamation/Dry Hole

1. All disturbed lands associated with this project, including the pipelines, access roads, water management facilities, etc will be expediently reclaimed and reseeded in accordance with the surface use plan and any pertinent site-specific COAs.

2. Disturbed lands will be re-contoured back to conform with existing undisturbed topography. No depressions will be left that trap water or form ponds.

3. The fluids and mud must be dry in the reserve pit before re-contouring pit area. The operator will be responsible for re-contouring of any subsidence areas that develop from closing a pit before it is completely dry. The plastic pit liner (if any) will be cut off below grade and properly disposed of at a state authorized landfill before beginning to re-contour the site.

4. Before the location has been reshaped and prior to redistributing the topsoil, the operator will rip or scarify the drilling area and access road on the contour, to a depth of at least 12 inches. The rippers are to be no farther than 24 inches apart.

5. Distribute the topsoil evenly over the entire location and other disturbed areas. Prepare the seedbed by disking following the contour.

6. Waterbars are to be constructed at least one (1) foot deep, on the contour with approximately two (2)

feet of drop per 100 feet of waterbar to ensure drainage, and extended into established vegetation. All waterbars are to be constructed with the berm on the downhill side to prevent the soft material from silting in the trench. The initial waterbar should be constructed at the top of the backslope. Subsequent waterbars should follow the following general spacing guidelines:

Slope (percent)	Spacing Interval (feet)
< 2	200
2 - 4	100
4 - 5	75
> 5	50

7. The operator will drill seed on the contour no greater than 0.50 followed by cultipaction to compact the seedbed, preventing soil and seed losses. To maintain quality and purity, the current years tested, certified seed with a minimum germination rate of 80% and a minimum purity of 90% will be used. On BLM surface or in lieu of a different specific mix desired by the surface owner, use the following:

Loamy/Sandy Ecological Site Seed Mix		
Species	**% in Mix**	**Lbs PLS***
Western Wheatgrass (Pascopyrum smithii)/or ***Thickspike Wheatgrass*** (Elymus lanceolatus ssp. lanceolatus)	30	3.6
Bluebunch Wheatgrass (Pseudoroegneria spicata ssp. Spicata)	10	1.2
Green needlegrass (Nassella viridula)	25	3.0
Slender Wheatgrass (Elymus trachycaulus ssp. trachycaulus)	20	2.4
Prairie coneflower (Ratibida columnifera)	5	0.6
Indian ricegrass (Achnatherum hymenoides)	5	0.6
Blue flax(Linum lewisii)	5	0.6
Totals	**100%**	**12 lbs/acre**

Slopes too steep for machinery may be hand broadcast and raked with twice the specified amount of seed.

8. BLM will not release the performance bond until the area has been successfully revegetated (evaluation will be made after the second complete growing season) and has met all other reclamation goals of the surface owner and surface management agency.

9. A Notice of Intent to Abandon and a Subsequent Report of Abandonment must be submitted for abandonment approval.

10. For performance bond release approval, a Final Abandonment Notice (with a surface owner release letter on split-estate) must be submitted prior to a final abandonment evaluation by BLM.

11. Phased reclamation plans will be submitted to BLM for approval prior to individual POD facility abandonment via a Notice of Intent (NOI) Sundry Notice. Individual facilities, such as well locations, pipelines, discharge points, impoundments, etc. need to be addressed in these plans as they are no longer needed. Individual items that will need to be addressed in reclamation plans include:
    - Pit closure (Close ASAP after suitably dry, but no later than 90 days from time of drilling unless an extension is given by BLM Authorized Officer.) BLM may require closure prior to 90 days in some cases due to land use or environmental concerns.
    - Configuration of reshaped topography, drainage systems, and other surface manipulations
    - Waste disposal
    - Revegetation methods, including specific seed mix (pounds pure live seed/acre) and soil treatments (seedbed preparation, fertilization, mulching, etc.). On private surface, the landowner should be consulted for the specific seed mix.
    - Other practices that will be used to reclaim and stabilize all disturbed areas, such as water bars, erosion fabric, hydro-mulching, etc.
    - An estimate of the timetables for beginning and completing various reclamation operations relative to weather and local land uses.
    - Methods and measures that will be used to control noxious weeds, addressing both ingress and egress to the individual well or POD.
    - Decommissioning/removal of all surface facilities
    - Closure and reclamation of areas utilized or impacted by produced CBM water, including discharge points, reservoirs, off-channel pits, land application areas, livestock/wildlife watering facilities, surface discharge stream channels, etc.

12. Soil fertility testing and the addition of soil amendments may be required to stabilize some disturbed lands.

13. Any mulch utilized for reclamation needs to be certified weed free.