FINDING OF NO SIGNIFICANT IMPACT & DECISION RECORD
FOR
Coleman Oil & Gas
Stoddard POD
ENVIRONMENTAL ASSESSMENT –WY-070-07-010

DECISION: Is to approve Alternative C as described in the attached Environmental Assessment (EA) and authorize Coleman Oil & Gas's Stoddard Coal Bed Natural Gas (CBNG) POD comprised of the following 15 Applications for Permit to Drill (APDs), as follows:

Well name	Number	QTR	Section	Township	Range	Lease
STODDARD FEDERAL	12-21	SWNW	21	42N	72W	WYW134204
STODDARD FEDERAL	14-21	SWSW	21	42N	72W	WYW134204
STODDARD FEDERAL	21-21	NENW	21	42N	72W	WYW62351
STODDARD FEDERAL	23-21	NESW	21	42N	72W	WYW134204
STODDARD FEDERAL	32-21	SWNE	21	42N	72W	WYW134204
STODDARD FEDERAL	41-21	NENE	21	42N	72W	WYW134204
STODDARD BRIDLE BIT RANCH	32-20	SWNE	20	42N	72W	WYW134204
STODDARD BRIDLE BIT RANCH	34-20	SWSE	20	42N	72W	WYW134204
STODDARD BRIDLE BIT RANCH	41-20	NENE	20	42N	72W	WYW134204
STODDARD BRIDLE BIT RANCH	43-20	NESE	20	42N	72W	WYW134204
STODDARD LEAVITT	12-10*	SWNW	10	42N	72W	WYW72039
STODDARD LEAVITT	14-10	SWSW	10	42N	72W	WYW138126
STODDARD LEAVITT	23-10	NESW	10	42N	72W	WYW138126
STODDARD LEAVITT	33-10	NWSE	10	42N	72W	WYW72039
STODDARD LEAVITT	43-10	NESE	10	42N	72W	WYW72039

The following reservoirs were approved as part of this POD to receive CBNG water:

	IMPOUNDMENT Name / Number	Status	Qtr/Qtr	Section	TWP	RNG	Lease Number
1	Stoddard #1	Existing	NENE	28	42	72	Fee
2	10-1	Existing	SWNE	10	42	72	WYW62351
3	5-1	Existing	SESE	25	42	72	Fee
4	5-2	Existing	SESE	25	42	72	Fee
5	P9-1	New	NESW	9	42	72	Fee

This approval is subject to adherence with all of the operating plans and mitigation measures contained in the Master Surface Use Plan of Operations, Drilling Plan, Water Management Plan, and information in individual APDs. This approval is also subject to operator compliance with all mitigation and monitoring requirements contained within the Powder River Oil and Gas Project Environmental Impact Statement and Resource Management Plan Amendment (PRB FEIS) approved April 30, 2003.

RATIONALE: The decision to authorize Alternative C, as described in the attached Environmental Assessment (EA), is based on the following:

1. The Operator, in their POD, has committed to:
    - Comply with all applicable Federal, State and Local laws and regulations.
    - Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, the installation of

water management facilities, water discharge permits, and relevant air quality permits.
    - Provide water well agreements to the owners of record for permitted water wells within the area of influence of the action.
    - Provide water analysis from a designated reference well in each coal zone.
2. The Operator has certified that a Surface Use Agreement has been reached with the Landowner(s).
3. Alternative C will not result in any undue or unnecessary environmental degradation.
4. It is in the public interest to approve these wells, as the leases are being drained of federal gas, resulting in a loss of revenue for the government.
5. Mitigation measures applied by the BLM will alleviate or minimize environmental impacts.
6. Alternative C is the environmentally-preferred Alternative.
7. The proposed action is in conformance with the PRB FEIS and the Approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management (BLM), Buffalo Field Office, April 2001.
8. Based on current information, we determined that no significant impacts in the spread of WNV would occur from the implementation of this project.

FINDING OF NO SIGNIFICANT IMPACT: Based on the analysis of the potential environmental impacts, I have determined that NO significant impacts are expected from the implementation of Alternative C and, therefore, an environmental impact statement is not required.

ADMINISTRATIVE REVIEW AND APPEAL: Under BLM regulations, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, Wyoming 82003, no later than 20 business days after this Decision Record is received or considered to have been received.

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

Field Manager:_____ Date: _____

BUREAU OF LAND MANAGEMENT
BUFFALO FIELD OFFICE
ENVIRONMENTAL ASSESSMENT (EA)
FOR
Coleman Oil & Gas
Stoddard
PLAN OF DEVELOPMENT
WY-070-07-010

INTRODUCTION

This site-specific analysis tiers into and incorporates by reference the information and analysis contained in the Powder River Basin Oil and Gas Project Environmental Impact Statement and Resource Management Plan Amendment (PRB FEIS), #WY-070-02-065 (approved April 30, 2003), pursuant to 40 CFR 1508.28 and 1502.21. This document is available for review at the Buffalo Field Office. This project EA addresses site-specific resources and/or impacts that are not covered within the PRB FEIS.

1. PURPOSE AND NEED

The purpose for the proposal is to define and produce coal bed natural gas (CBNG) on one or more valid federal oil and gas mineral leases issued to the applicant by the BLM. Analysis has determined that federal CBNG is being drained from the federal leases by surrounding fee or state mineral well development. The need exists because without approval of the Applications for Permit to Drill (APDs), federal lease royalties will be lost and the lessee will be deprived of the federal gas they have the rights to develop.

1.1. Conformance with Applicable Land Use Plan and Other Environmental Assessments:

The proposed action is in conformance with the terms and the conditions of the Approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management, Buffalo Field Office (BFO), April 2001 and the PRB FEIS, as required by 43 CFR 1610.5

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Alternative A - No Action

A No Action Alternative was considered in the PRB FEIS, Volume 1, pages 2-54 through 2-62. This alternative would consist of no new federal wells. An oil and gas lease grants the lessee the "right and privilege to drill for, mine, extract, remove, and dispose of all oil and gas deposits" in the lease lands, "subject to the terms and conditions incorporated in the lease." Thus, under this alternative, the operator's proposal would be denied.

2.2. Alternative B Proposed Action

Proposed Action Title/Type: Coleman Oil & Gas's Stoddard Plan of Development (POD) for 15 coal bed natural gas well APD`s and associated infrastructure.

Proposed Well Information: There are 15 wells proposed within this POD, as follows:

Well name	Number	QTR	Section	Township	Range	Lease
STODDARD FEDERAL	12-21	SWNW	21	42N	72W	WYW134204
STODDARD FEDERAL	14-21	SWSW	21	42N	72W	WYW134204
STODDARD FEDERAL	21-21	NENW	21	42N	72W	WYW62351
STODDARD FEDERAL	23-21	NESW	21	42N	72W	WYW134204
STODDARD FEDERAL	32-21	SWNE	21	42N	72W	WYW134204
STODDARD FEDERAL	41-21	NENE	21	42N	72W	WYW134204
STODDARD BRIDLE BIT RANCH	32-20	SWNE	20	42N	72W	WYW134204
STODDARD BRIDLE BIT RANCH	34-20	SWSE	20	42N	72W	WYW134204
STODDARD BRIDLE BIT RANCH	41-20	NENE	20	42N	72W	WYW134204
STODDARD BRIDLE BIT RANCH	43-20	NESE	20	42N	72W	WYW134204
STODDARD LEAVITT	12-10*	SWNW	10	42N	72W	WYW72039
STODDARD LEAVITT	14-10	SWSW	10	42N	72W	WYW138126
STODDARD LEAVITT	23-10	NESW	10	42N	72W	WYW138126
STODDARD LEAVITT	33-10	NWSE	10	42N	72W	WYW72039
STODDARD LEAVITT	43-10	NESE	10	42N	72W	WYW72039

County: Campbell

Applicant: Coleman Oil & Gas

Surface Owners: Richard W. Leavitt Trust, Jerry Dilts, Bob Stoddard

- Coleman Oil & Gas proposes to develop 15 coal bed natural gas (CBNG) wells (one well per location) approximately 840 to 945 feet into the Wyodak coal using an 80 acre spacing pattern. The projected life of these wells is anticipated to range from five to 15 years (PRB FEIS).

- Included in the proposed action are 15 wells without engineered pads, a proposed unimproved road network with utilities in the roadbed when possible, and buried utilities in a common trench.

- Coleman Oil & Gas proposes both overhead and buried power for this POD to power the wells.

- The operator's Water Management Plan (WMP) involves 5 discharge points and new 1 stock water reservoir within the Antelope Creek watershed. No discharge points and stock water reservoirs are proposed within the secondary watershed.

For a detailed description of design features, construction practices and water management strategies associated with the proposed action, refer to the Master Surface Use Plan (MSUP), Drilling Plan and WMP(WMP) in the POD and individual APDs. Also see the subject POD and/or APDs for maps showing the proposed well locations and associated facilities described above. More information on CBNG well drilling, production and standard practices is also available in the PRB FEIS, Volume 1, pages 2-9 through 2-40 (January 2003).

Implementation of committed mitigation measures contained in the MSRP, Drilling Program and WMP, in addition to the Standard COA contained in the PRB FEIS Record of Decision Appendix A, are incorporated and analyzed in this alternative.

Additionally, the Operator, in their POD, has committed to:

1. Comply with all applicable Federal, State and Local laws and regulations.
2. Obtain the necessary permits for the drilling, completion and production of these wells including

water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
3. Provide water well agreements to the owners of record for permitted water wells within the area of influence of the action.
4. Provide water analysis from a designated reference well in each coal zone.

The Operator has certified that a Surface Use Agreement has been reached with the Landowners.

2.3. Alternative C – Environmentally Preferred

Modifications, or alternatives, to the original proposal received from the operator, were identified as the result of the pre-approval onsite inspection(s).

Implementation of committed mitigation measures contained in the Master Surface Use Plan, Drilling Program and Water Management Plan, in addition to the Standard COA contained in the PRB FEIS Record of Decision Appendix A, are incorporated and analyzed in this alternative.

At the on-sites, all areas of proposed surface disturbance were inspected to ensure that potential impacts to natural resources would be minimized. In some cases, access roads were re-routed, and well locations, pipelines, discharge points and other water management control structures were moved, modified, mitigated or dropped from further consideration to alleviate or minimize environmental impacts. Alternatives to the different aspects of the proposed action are always considered and applied as pre-approval changes, site specific mitigation and/or Conditions of Approval (COAs), if they will alleviate or minimize environmental effects of the operator's proposal. The specific changes identified for the Stoddard POD are listed below under 2.3.1:

2.3.1. Changes as a result of the on-sites

Well ID	Aliquot	Section	T/R	Notes
12-10	SWNW	10	42/72	Raptor nest located on top of rock crop at the edge of draw. Well location moved. New well location is 201ft North and 119ft West from the original location.
14-10	SWSW	10	42/72	Proposed corridor will follow access road into location. Operator will narrow access corridor to avoid sizeable disturbance of dense sage stand.
23-10	NESW	10	42/72	Rerouted proposed corridor to follow existing primitive road.
33-10	NWSE	10	42/72	Rerouted proposed corridor to follow existing primitive road.
43-10	NESE	10	42/72	Rerouted proposed corridor to follow existing primitive road.

Well ID	Aliquot	Section	T/R	Notes
32-20	SWNE	20	42/72	Proposed corridor will follow a straight horizontal line that connects with North-South corridor and primitive road between 41-20 and 43-20. Operator will narrow access corridor to avoid sizeable disturbance of dense sage stand.
34-20	SWSE	20	42/72	Rerouted proposed corridor to follow access route from the S into the location. Operator will narrow access corridor to avoid sizeable disturbance of dense sage stand.
41-20	NENE	20	42/72	Rerouted proposed utility corridor and access route to follow the N edge of playa adjacent to the well location.
43-20	NESE	20	42/72	Rerouted proposed utility corridor to follow existing primitive road east of well location.
23-21	NESW	21	42/72	Rerouted proposed corridor to follow existing primitive road. Drilling operation will use the area west of well location to minimize vegetation/surface disturbance.

2.3.2. Programmatic mitigation measures identified in the PRB FEIS ROD

Programmatic mitigation measures are those, determined through analysis, which may be appropriate to apply at the time of APD approval if site specific conditions warrant. These mitigation measures can be applied by BLM, as determined necessary at the site-specific NEPA APD stage, as COAs and will be in addition to stipulations applied at the time of lease issuance and any standard COA.

The above changes and mitigation measures to the proposed action resulting from the on-site will be analyzed in Alternative C.

2.3.2.1. Groundwater

1. In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed a guidance document, "Compliance Monitoring for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments" (June 14, 2004) which can be accessed on their website. This guidance document became effective August 1, 2004. For WYPDES permits received by DEQ after the August 1st effective date, the BLM will require that operators comply with the latest DEQ standards and monitoring guidance.

2.3.2.2. Surface Water

1. Channel Crossings:
   a) Minimize channel disturbance as much as possible by limiting pipeline and road crossings.
   b) Avoid running pipelines and access roads within floodplains or parallel to a stream channel.
   c) Channel crossings by road and pipelines will be constructed perpendicular to flow. Culverts will be installed at appropriate locations for streams and channels crossed by roads as specified in the BLM Manual 9112-Bridges and Major Culverts and Manual 9113-Roads. Streams will be crossed perpendicular to flow, where possible, and all stream crossing structures will be designed to carry the 25-year discharge event or other capacities as directed by the BLM.
   d) Channel crossings by pipelines will be constructed so that the pipe is buried at least four feet below the channel bottom.

2. Low water crossings will be constructed at original streambed elevation in a manner that will prevent any blockage or restriction of the existing channel. Material removed will be stockpiled for use in reclamation of the crossings.

3. Concerns regarding the quality of the discharged CBM water on downstream irrigation use may require operators to increase the amount of storage of CBM water during the irrigation months and allow more surface discharge during the non-irrigation months.

4. The operator will supply a copy of the complete approved SW-4, SW-3, or SW-CBNG permits to BLM as they are issued by WSEO for impoundments.

2.3.2.3. Soils

1. The Companies, on a case by case basis depending upon water and soil characteristics, will test sediments deposited in impoundments before reclaiming the impoundments. Tests will include the standard suite of cations, ions, and nutrients that will be monitored in surface water testing and any trace metals found in the CBM discharges at concentrations exceeding detectable limits.

2.3.2.4. Vegetation

1. Temporarily fence reseeded areas, if not already fenced, for at least two complete growing seasons to insure reclamation success on problematic sites (e.g. close to livestock watering source, erosive soils etc.).

2.3.2.5. Wetland/Riparian

1. Power line corridors will avoid wetlands, to the extent possible, in order to reduce the chance of waterfowl hitting the lines. Where avoidance can't occur, the minimum number of poles necessary to cross the area will be used.

2.3.2.6. Wildlife

1. For any surface-disturbing activities proposed in sagebrush shrublands, the Companies 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 mile of the proposed activities.

2. The Companies will locate facilities so that noise from the facilities at any nearby sage grouse or sharp-tailed grouse display grounds does not exceed 49 decibels (10 dBA above background noise) at the display ground.

3. The Companies will construct power lines to minimize the potential for raptor collisions with the lines. Potential modifications include burying the lines, avoiding areas of high avian use (for example, wetlands, prairie dog towns, and grouse leks), and increasing the visibility of the individual conductors.

4. The Companies will locate aboveground power lines, where practical, at least 0.5 mile from any sage grouse breeding or nesting grounds to prevent raptor predation and sage grouse collision with the conductors. Power poles within 0.5 mile of any sage grouse breeding ground will be raptor-proofed to prevent raptors from perching on the poles.

5. Containment impoundments will be fenced to exclude wildlife and livestock. If they are not fenced, they will be designed and constructed to prevent entrapment and drowning.

6. The Companies will limit the construction of aboveground power lines near streams, water bodies,

and wetlands to minimize the potential for waterfowl colliding with power lines.

7. All stock tanks shall include a ramp to enable trapped small birds and mammals to escape. See Idaho BLM Technical Bulletin 89-4 entitled Wildlife Watering and Escape Ramps on Livestock Water Developments: Suggestions and Recommendations.

2.3.2.7. Threatened, Endangered, or Sensitive Species

2.3.2.7.1. Bald Eagle

1. The BLM will monitor all take of bald eagle habitat associated with the preferred alternative. The actual measurement of disturbed habitat is the responsibility of BLM but can be delegated to BLM' agent (consultant, contractor, etc.) A written summary will be provided to the USFWS' Wyoming Field Office semi-annually. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the PRB FEIS and ROD. The semi-annual reports will include all actions completed up to 30 days prior to the reporting dates. The first report will be due 6 months after the signing of the ROD and on the anniversary date of the signing of the ROD. Reporting will continue for the life of the project.

2. The BLM will monitor all road-associated carcasses, jackrabbit sized and larger, along project (operator-maintained) roads.

3. Special habitats for raptors, including wintering bald eagles, will be identified and considered during the review of Sundry Notices.

4. Additional mitigation measures may be necessary if the site-specific project is determined by a BLM biologist to have adverse effects to bald eagles or their habitat.

2.3.2.7.2. Ute Ladies'-tresses Orchid

1. Suitable habitat will be avoided wherever possible.

2. If suitable habitat for Ute ladies'-tresses cannot be avoided, surveys will be conducted in compliance with USFWS standards (USFWS 1995) by a BLM approved biologist or botanist. Surveys can only be conducted between July 20 and August 31.

3. Moist soils near wetlands, streams, lakes, or springs in the project area will be promptly revegetated if construction activities impact the vegetation in these areas. Revegetation will be designed to avoid the establishment of noxious weeds.

2.3.2.8. Visual Resources

1. The Companies will mount lights at compressor stations on a pole or building and direct them downward to illuminate key areas within the facility while minimizing the amount of light projected outside the facility.

2.3.2.9. Noise

1. Noise mufflers will be installed on the exhaust of compressor engines to reduce the exhaust noise.

2. Where noise impacts to existing sensitive receptors are an issue, noise levels will be required to be no greater than 55 decibels measured at a distance of one-quarter mile from the appropriate booster (field) compressor. When background noise exceeds 55dBA, noise levels will be no greater than 5dBA above background. This may require the installation of electrical compressor motors at these locations.

2.3.2.10. Air Quality

1. During construction, emissions of particulate matter from well pad and resource road construction will be minimized by application of water, or other dust suppressants, with at least 50 percent control efficiency. Roads and well locations constructed on soils susceptible to wind erosion could be appropriately surfaced or otherwise stabilized to reduce the amount of fugitive dust generated by traffic or other activities, and dust inhibitors (surfacing materials, non-saline dust suppressants, and water) could be used as necessary on unpaved collector, local and resource roads that present a fugitive dust problem. The use of chemical dust suppressants on BLM surface will require prior approval form the BLM authorized officer.

2.3.3. Site specific mitigation measures

General

1. All changes made at the onsite will be followed. They have all been incorporated into the operator's POD.

2. Please contact Julian Serafin – Natural Resource Specialist, @ (307) 684-1043, Bureau of Land Management, Buffalo, if there are any questions concerning these surface use COAs.

Surface Use

1. All topsoil removed for the construction activity will be re-spread for interim reclamation success.

2. The proposed action will affect project areas that are susceptible to wind erosion, specifically well locations 12-10, 23-10, 43-10, and 14-21. As a result, these locations and associated infrastructure (e.g. pipelines, access roads) present moderate to poor reclamation success. Erosion potential varies from moderate to severe depending on the soil type, vegetative cover, slope, and exposure to strong winds. Expedient stabilization and additional reclamation efforts such as mulching, matting, soil amendments, etc should be applied. It is also recommended that seed rows be perpendicular to the prevailing wind direction. Stabilization efforts shall be completed within 30 days of the completion of construction activities.

3. Mowing and blade work in dense shrub vegetation (e.g. sage brush) should be minimized in the following well locations: 14-10, 32-20, 34-20, and 23-21. The operator will narrow access corridors, wherever possible, to avoid sizeable disturbance of dense sage stand.

4. The operator will follow the guidance provided in the Wyoming Policy on Reclamation (IM WY-90-231) specifically the following:
   Reclamation Standards:
   C. 3. The reclaimed area shall be stable and exhibit none of the following characteristics:
      a. Large rills or gullies.
      b. Perceptible soil movement or head cutting in drainages.
      c. Slope instability on, or adjacent to, the reclaimed area in question.

   C.4. The soil surface must be stable and have adequate surface roughness to reduce runoff and capture rainfall and snow melt. Additional short-term measures, such as the application of mulch, shall be used to reduce surface soil movement.

   C.5. Vegetation canopy cover (on unforested sites), production and species diversity (including shrubs) shall approximate the surrounding undisturbed area. The vegetation shall stabilize the site and support the planned post disturbance land use, provide for natural plant community succession and development, and be capable of renewing itself. This shall be demonstrated by:

a. Successful onsite establishment of species included in the planting mixture or other desirable species.
b. Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production.

C.6. The reclaimed landscape shall have characteristics that approximate the visual quality of the adjacent area with regard to location, scale, shape, color and orientation of major landscape features and meet the needs of the planned post disturbance land use.

5. 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 the Stoddard POD is Desert Brown, (Munsell standard color No. 10YR 6/3).

6. The operator will drill seed on the contour to a depth of 0.5 inch, 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:

SPECIES	LBS/ACRE
Thickspike Wheatgrass	2.4
Bluebunch Wheatgrass	1.8
Prairie Sandreed	3.6
Needleandthread	2.4
Prairie Coneflower	0.6
White or Purple Prairie Clover	0.6
Scarlet Globemellow or Blue Flax	0.6
Total	12

*PLS = pure live seed

Slopes too steep for machinery may be hand broadcast and raked with twice the specified amount of seed. Complete fall seeding after September 15 and prior to prolonged ground frost. To be effective, complete spring seeding after the frost has left the ground and prior to May 15.

Water Management

1. The operator will be required to provide a reclamation bond the impoundment over federal minerals in the amount specified by a qualified Professional Engineer for the impoundments to be used for the management of CBNG water from the Stoddard POD. The bond amount will be submitted within 90 days after POD approval and will be approved by the BLM prior to commencing construction. The operator should provide documentation that reclamation bonds are in place with OSLIC or WOGCC for reservoirs located over private or state minerals.

2. To control erosion, no water will be allowed to overflow the tire stock water tanks.

Wildlife

1. All conservation measures and terms and conditions identified in the Powder River Basin Oil and Gas Project Biological Opinion (WY6633) shall be complied with.

2. The Record of Decision for the Powder River Basin EIS includes a programmatic mitigation measure that states, "The companies will conduct clearance surveys for threatened and endangered or other special-concern species at the optimum time". The measure requires companies to coordinate with

the BLM before November 1 annually to review the potential for disturbance and to agree on inventory parameters. Should this project not be completed by November 1, Coleman Oil and Gas will coordinate with the BLM to determine if additional resurvey will be required.

3. The contract biologist shall contact the BLM prior to initiating any wildlife surveys.

4. No surface disturbing activity shall occur within ½ mile of all identified raptor nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey for the current breeding season.

This timing stipulation will affect the following:

Township/Range	*Section*	*Affected Wells and Infrastructure*
T42N,R72W	10	12-10, 33-10, 43-10 and infrastructure for all these wells
T42N,R72W	20	32-20, 34-20 and infrastructure for all these wells
T42N,R72W	21	14-21, 23-21 and infrastructure for all these wells

a. 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.
b. Nest productivity checks shall be completed for the first five years following project completion. The productivity checks shall be conducted no earlier than June 1 or later than June 30 and any evidence of nesting success or production shall be recorded. Survey results will be submitted to a Buffalo BLM biologist in writing no later than July 31 of each survey year.

This applies to the following nest(s):

BLM ID#	SPECIES	UTM (NAD 83)	LEGAL LOCATION	SUBSTRATE	STATUS
2990	FEHA	460003E 4831185 N	NENW Sec 10 T42N, R72W	ground/hillside	active
2985	GOEA	461772E 4830882N	SENW Sec 11 T42N, R72W	CTL	active
2488	SWHA	458365E 4826422N	NENW Sec 28 T42N, R72W	elm live	active
New	FEHA	456570E 4826406N	NENW Sec 29 T42N, R72W	creek bank	active

5. 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.

6. No surface disturbing activities are permitted within 2 miles of a sage grouse lek between March 1 and June 15, prior to completion of a greater sage-grouse lek survey. This condition will be implemented on an annual basis for the duration of the drilling and construction activities.

This timing stipulation will affect the following:

Township/Range	*Section*	*Affected Wells and Infrastructure*
T42N,R72W	21	41-21 and access road and pipeline.

a. If an active lek is identified during the survey, the 2 mile timing restriction (March 1-June 15) will be applied and surface disturbing activities will not be permitted until after the nesting season. If surveys indicate that the identified lek is inactive during the current breeding season, surface disturbing activities may be permitted within the 2 mile buffer until the following breeding season (March 1). The required sage grouse survey will be conducted by a biologist following the most current WGFD protocol. All survey results shall be submitted in writing to a Buffalo BLM biologist and approved prior to surface disturbing activities.
b. Creation of raptor hunting perches will be avoided within 0.5-mile of documented sage grouse lek sites. Perch inhibitors will be installed to deter avian predators from preying on sage grouse.
c. Well metering, maintenance and other site visits within 0.5 miles of documented sage grouse lek sites shall be minimized as much as possible during the breeding season (March 1– June 15), and restricted to between 0900 and 1500 hours.
d. The Companies will locate facilities so that noise from the facilities at any nearby sage grouse or sharp-tailed grouse display grounds does not exceed 49 decibels (10 dBA above background noise) at the display ground.

7. A mountain plover nesting survey is desired in suitable habitat prior to commencement of surface disturbing activities in the following areas: **The northern ½ of Section 21 and the NE ¼ of Section 20, T42N, R72W.** If the survey is not conducted prior to commencement of surface disturbing activities, it shall be conducted during the first breeding season following POD approval. No surface disturbing activities are permitted in the suitable habitat area listed above, from March 15-July 31, unless a mountain plover nesting survey has been conducted during the current breeding season.

    a. Mountain plover nesting surveys shall be conducted by a biologist following the most current U.S. Fish and Wildlife Service Mountain Plover Survey Guidelines (the survey period is May 1-June 15). All survey results must be submitted in writing to the BFO and approved prior to initiation of surface disturbing activities.
    b. If a mountain plover nest is identified, then a seasonal disturbance-free buffer of ¼ mile shall be maintained between March 15 and July 31. If no mountain plover nests are identified, then surface disturbing activities may be permitted within suitable habitat until the following breeding season (March 15).

3. DESCRIPTION OF AFFECTED ENVIRONMENT

Applications to drill were received on July 6, 2006. Field inspections of the proposed Stoddard CBNG project were conducted on 10/5/2006 by Kathy Brus, Natural Resource Specialist – BLM; Leigh Grench, Archeologist – BLM; Dave Lervick, Area Foreman – Coleman Oil & Gas, Inc; Brady Lewis, Consultant – WWC Engineering; Anna Morgan, Land/Operations – Coleman Oil & Gas, Inc; Julian Serafin, Natural Resource Specialist – BLM; and, Chris Williams, Hydrologist – BLM. A wildlife-specific onsite was conducted on 10/17/2006 by Guymen Easdale, Wildlife Biologist – BLM. The separate wildlife onsite was conducted to relocate well 12-10 to avoid potential disturbance of an identified raptor nest within the disturbance-free buffer zone of 0.5 mile(s).

This section describes the environment that would be affected by implementation of the Alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major issues. Certain critical environmental components require analysis under BLM policy. These items are presented below in Table 3.1.

Table 3.1 - Critical elements requiring mandatory evaluation are presented below.

Mandatory Item	Potentially Impacted	No Impact	Not Present On Site	BLM Evaluator
Threatened and Endangered Species	X			Guymen Easedale
Floodplains		X		Chris Williams
Wilderness Values			X	Julian Serafin
ACECs			X	Julian Serafin
Water Resources	X			Chris Williams
Air Quality		X		Julian Serafin
Cultural or Historical Values		X		Leigh Grench
Prime or Unique Farmlands			X	Julian Serafin
Wild & Scenic Rivers			X	Julian Serafin
Wetland/Riparian		X		Chris Williams
Native American Religious Concerns			X	Leigh Grench
Hazardous Wastes or Solids		X		Julian Serafin
Invasive, Nonnative Species	X			Julian Serafin
Environmental Justice			X	Julian Serafin

3.1. Topographic Characteristics of Project Area

The Stoddard POD is located in Campbell County, Township 42 North, Range 72 West, Sections 10, 20, and 21. The project area involves private lands of multiple land owners overlaying federal minerals. US Forest Service lands within the Thunder Basin National Grasslands border the project area in Section 10. The topography is flat to gently undulating rolling hills with dissecting drainages in some areas. Current land uses in the project area include livestock grazing, wildlife habitat, and oil and gas production. Proposed discharge points and impoundments are located in the Spring Creek drainage and in tributaries to Porcupine Creek, both tributaries to Antelope Creek, tributary to the Cheyenne River. Playas are also common in much of the project area.

3.2. Vegetation & Soils

Ecological Site Descriptions are used to provide soils and vegetation information needed for resource identification and management recommendations. To determine the appropriate Ecological Sites for this proposed action, BLM specialists analyzed data from onsite field reconnaissance and Natural Resource Conservation Service (NRCS, USDA) soil survey information.

Using the NRCS Technical Guides for the Major Land Resource Area 58B Northern Rolling High Plains, in the 10-14" Northern Plains precipitation zone, the landforms and the soils of this site have been identified as varying from shallow sandy-Needleandthread/Threadleaf sedge/Broom snakeweed to some sections of shallow loamy-sagebrush/grass. Shallow sandy soils (less than 20"to bedrock) are shallow well-drained soils formed in eolian deposits or alluvium over residuum or residuum. These soils have moderately rapid to rapid permeability and may occur on all slopes. The bedrock may be of any kind except igneous or volcanic and is virtually impenetrable to plant roots. The surface soil will be one or more of the following textures: fine sandy loam, sandy loam, loamy fine sand, loamy sand, or sand. Layers of the soil most influential to the plant community vary from 0 to 6 inches thick. The main soil limitations include: soil droughtiness, low water holding capacity, and high wind erosion potential.

The proposed action will affect areas of soils that are susceptible to wind erosion, and that present moderate to poor reclamation success. Erosion potential varies from moderate to severe depending on the soil type, vegetative cover, slope, and exposure to strong winds. An increase in bare ground reduces water infiltration and increases soil erosion, therefore rutting potential for these sites is generally severe. The disturbances are within areas identified as requiring expedient stabilization and additional reclamation measures.

Vegetation types within the POD consist of short-grass prairie grassland, with about 30% of the project area being fragmented sagebrush steppe. The dominant vegetation varies from needleandthread (*Stipa comata*) in the grasslands to Wyoming big sage (*Artemisia tridentata wyomingensis*) in the steppe community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grass, and miscellaneous forbs. Common plants identified during the onsite inspection include needleandthread (*Stipa comata*), western wheatgrass (*Agropyron smithii*), prairie junegrass (*Koeteria macrantha*), prickley pear cactus (*Opuntia*), and threadleaf sedge (*Carex filifolia*).

Although there are primarily loamy and sandy soils throughout the project area, the soils supporting the playas are derived from the Aeric Haplaquepts soils (WWC 2005). Soils typically are poorly drained silts and clays, and vegetation is minimal due to receding water and animal use.

Soil Units affected by the proposed action include:
112 – Bidman-Parmleed loams, 6 – 15 percent slopes
157 – Hiland-Bowbac fine sandy loams, 0 – 6 percent slopes
158 – Hiland Bowbac fine sandy loams, 6 – 15 percent slopes
171 – Keeline-Tullock-Niobrara, dry complex, 3 – 30 percent slopes
221 – Turnercrest-Keeline-Taluce fine sandy loams, 6 – 30 percent slopes

For more detailed soil information, see the NRCS Soil Survey WY605, Campbell County, WY.

3.2.1. Wetlands/Riparian

Wetlands within and near the POD area are limited to playas currently receiving CBNG discharge and small channel bottom areas near and within Spring Creek.

3.2.2. Invasive Species

After consultation with the University of Wyoming, Wyoming Geographic Science Center and the CBM Clearinghouse information website; and, the Campbell County Weed & Pest Control District, the operator has determined that the Stoddard POD falls within the boundary of the noxious weed area for Skeletonleaf Bursage. However, observations made during the onsite inspection did not identify the existence of this invasive species in the project area at this time.

3.3. Wildlife

The project area is located approximately 10 miles south of Wright, Wyoming in northwestern Campbell County, Township 42 North, Range 72 West; Sections 10, 20, and 21. The project area involves private surface overlying federal minerals.

Elevations within the project area range from 4950 to 5030 feet above sea level. The topography throughout most of the project area consists of ephemeral stream bottomlands rising to flat sage brush and grassland habitats. The northern portion of the project area, Section 10, is drained by ephemeral tributaries of Porcupine Creek. The southern portion of the project area, Sections 20 and 21, are drained by ephemeral tributaries of Spring Creek.

The climate in the area is semi-arid, averaging 12-14 inches of precipitation annually, more than 60% of which occurs between May and September. In addition to coalbed natural gas development, conventional oil production and livestock grazing are the major land uses within the general area.

General vegetation communities within and around the project area are comprised of sagebrush steep (65%), mixed grasslands (25%) and ephemeral stream bottomlands (10%). Big sagebrush (*Artemisia tridentate wyomingensis*) intermixed with various native bunch grasses dominate the vegetative composition within the project area. Silver sagebrush (*Artemisia cana*) is found intermixed with big sagebrush within the uplands and draw bottoms. Four small American elm (*Ulmus Americana*) trees occur in the NENW Section 28, Township 42 North, Range 72 West and cottonwood (Populus angustifolia) trees are scattered along Porcupine Creek. Stream bottoms are vegetated with a diverse mix of annual forbs and perennial grasses (Jansen 2006).

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 BLM Buffalo Field Office (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).

Arcadis conducted sage grouse and sharp-tailed grouse surveys on April 6, 12, 21, and 29, 2006. Raptor surveys were conducted on April 12, and 28, and June 12, and 30, 2006. During these surveys Acadis conducted a habitat assessment of the project area. On August 21, 2006, Arcadis conducted a survey for the Ute ladies'-tresses orchid. Winter roosting habitat for bald eagles does not exist within 1.5 miles of the project area. No bald eagle survey was required.

On October 17, 2006, a BLM natural resource specialist (NRS) conducted the onsite, during this time the NRS reviewed the wildlife survey information for accuracy, evaluated impacts to wildlife resources, and provided project adjustment recommendations where wildlife issues arose.

3.3.1. Big Game

Big game species expected to be within the Stoddard project area include mule deer and pronghorn antelope. The project area is part of the Pumpkin Buttes mule deer herd unit. The 2004 estimated herd population was 14,800 with a population objective of 11,000 (WGFD 2004).

The southwestern half of the southern portion of the project area is designated as yearlong range for mule deer. Mule deer populations have been increasing since 1998 with a 2004 population estimate of 27,109 animals, and a herd objective of 18,000 (WGFD 2004).

The entire project area is designated as yearlong range for pronghorn antelope. Pronghorn antelope within the project area belong to the Pumpkin Butte herd unit. The 2004 estimated herd population was 27,109 with a population of 18,000 (WGFD 2004).

Yearlong use is when a population of animals makes general use of suitable documented habitat sites within the range on a year round basis. Animals may leave the area under severe conditions. Big game range maps are available in the PRB FEIS (3-119-143), the project file, and from the WGFD.

3.3.2. Aquatics

The northern portion of the project area, Section 10, is drained by ephemeral tributaries of Porcupine Creek. Porcupine Creek is an ephemeral drainage that did not contain standing or flowing water between April and June 2006. The southern portion of the project area, Sections 20 and 21, is drained by ephemeral tributaries of Spring Creek which contained pools of standing water and sections contained

following water due to existing coalbed natural gas produced water discharges. Both Porcupine and Spring Creeks are tributaries to Antelope Creek.

Fish that have been identified in the Cheyenne River watersheds are listed in the PRB FEIS (3-156-159).

3.3.3. Migratory Birds

A wide variety of migratory birds may be found in the proposed project area at some point throughout the year. Migratory birds are those that migrate for the purpose of breeding and foraging at some point in the calendar year. Migratory bird species of management concern that may occur in the project area are listed in the PRB FEIS (3-151).

3.3.4. Raptors

Twenty five raptor nest sites were identified by Arcadis within 0.5 miles of the project area, four of which were active in 2006 (Table 3.2), fifteen were inactive and six were not found.

Table 3.2. Documented raptor nests within the and around the Stoddard project area in 2006.

BLM ID#	SPECIES	UTM	LEGAL LOCATION	SUBSTRATE	CONDITION	STATUS
New	unknown	459869 E 4831583 N	SESW Sec 3 T42N, R72W	CTL	good	inactive
2991	FEHA	459199 E 4831845N	SESE Sec 4 T42N, R72W	rock outcrop	poor	inactive
2995	FEHA	459564E 4831031	SWNW Sec 10 T42N, R72W	rock outcrop	good	inactive
2476	FEHA	460809 E 4830027N	SESE Sec 10 T42N, R72W	creek bank	excellent	inactive
2996	FEHA	459926E 4831542N	NENW Sec 10 T42N, R72W	gone	gone, could not find the nest	gone
2990	FEHA	460003E 4831185 N	NENW Sec 10 T42N, R72W	ground/hillside	fair	active
2997	FEHA	460329E 4831151N	NWNE Sec 10 T42N, R72W	ground/hillside	gone	gone
2477	FEHA	461204E 4830111N	SWSW Sec 11 T42N, R72W	ground/hillside	excellent	inactive
No BLM ID	FEHA	461206E 4830045N	SWSW Sec 11 T42N, R72W	creek bank	good	inactive
2985	GOEA	461772E 4830882N	SENW Sec 11 T42N, R72W	CTL	excellent	active
3000	GOEA	461546E 4831165N	NENW Sec 11 T42N, R72W	no cottonwood tree in area	gone	gone
2478	FEHA	461422E 4829761N	NWNE Sec 14 T42N, R72W	creek bank	good	inactive
1184	FEHA	456020E 4828470N	SESE Sec 18 T42N, R72W	ground/hillside	fair	inactive
2495	FEHA	456281E 4828467N	SWSW Sec 17 T42N, R72W	ground/hillside	poor	inactive
2496	FEHA	456233E 4828267N	SWSW Sec 17 T42N, R72W	ground	poor	inactive
2486	FEHA	456555E	NENW SEC 20	ground	remnant	inactive

BLM ID#	SPECIES	UTM	LEGAL LOCATION	SUBSTRATE	CONDITION	STATUS
		4828019N	T42N, R72W			
2522	FEHA	457818E 4826241N	NWNW Sec 28 T42N, R72W	creek bank	gone	gone
2488	SWHA	458365E 4826422N	NENW Sec 28 T42N, R72W	elm live	good	active
2487	Unknown	458271E 4826461N	NENW Sec 28 T42N, R72W	elm live	destroyed	inactive
New	FEHA	456570E 4826406N	NENW Sec 29 T42N, R72W	creek bank	excellent	active
2521	FEHA	457062E 4826363N	NWNE Sec 29 T42N, R72W	creek bank	remnant	inactive
2520	FEHA	457062E 482363N	NWNE Sec29 T42N, R72W	creek bank	poor	inactive
2497	FEHA	456996E 4826130N	SWNW Sec 29 T42N, R72W	ground	good	inactive
New	FEHA	457863E 4826590N	NWNW Sec 28 T42N, R72W	ground/hillside	fair	inactive

3.3.5. Threatened and Endangered and Sensitive Species

3.3.5.1. Threatened and Endangered Species

Within the BLM Buffalo Field Office there are three species that are Threatened or Endangered under the Endangered Species Act.

3.3.5.1.1. Black-footed ferret

The USFWS listed the black-footed ferret as Endangered on March 11, 1967. Active reintroduction efforts have reestablished populations in Mexico, Arizona, Colorado, Montana, South Dakota, Utah, and Wyoming. In 1988, the WGFD identified four prairie dog complexes (Arvada, Recluse, Thunder Basin National Grasslands, and Midwest) partially or wholly within the BLM Buffalo Field Office administrative area as potential black-footed ferret reintroduction sites (Oakleaf 1988).

This nocturnal predator is closely associated with prairie dogs, depending almost entirely upon them for its food. The ferret also uses old prairie dog burrows for dens. Current science indicates that a black-footed ferret population requires at least 1000 acres of black-tailed prairie dog colonies for survival (USFWS 1989).

The WGFD believes the combined effects of poisoning and Sylvatic plague on black-tailed prairie dogs have greatly reduced the likelihood of a black-footed ferret population persisting east of the Big Horn Mountains (Grenier 2003). The U.S. Fish and Wildlife Service has also concluded that black-tailed prairie dog colonies within Wyoming are unlikely to be inhabited by black-footed ferrets (Kelly 2004).

No black-tailed prairie dog colonies were found within the projects boundaries. Black-footed ferret habitat is not present within the Stoddard project area.

3.3.5.1.2. Bald eagle

On February 14, 1978, the bald eagle was federally listed as Endangered in all of the continental United States except for Minnesota, Wisconsin, Michigan, Oregon, and Washington. In these states the bald eagle was listed as Threatened. On July 12, 1995 the eagle's status was changed to Threatened throughout the United States. Species-wide populations are recovering from earlier declines, and the bald eagle was proposed for de-listing in 2000, but as yet no final decision has been made.

Bald eagle nesting habitat is generally found in areas that support large mature trees. Eagles typically will build their nests in the crown of mature trees that are close to a reliable prey source. This species feeds primarily on fish, waterfowl, and carrion. In more arid environments, such as the Powder River Basin, prairie dogs, ground squirrels, and lagomorphs (hares and rabbits) can make up the primary prey base. The diets of wintering bald eagles can be more varied. In addition to prairie dogs, ground squirrels, and lagomorphs, domestic sheep and big game carcasses may provide a significant food source in some areas. Historically, sheep carcasses from large domestic sheep ranches provided a reliable winter food source within the Powder River Basin (Patterson and Anderson 1985). Today, few large sheep operations remain in the Powder River Basin. Wintering bald eagles congregate in roosting areas generally made up of several large trees clumped together in stands of large ponderosa pine, along wooded riparian corridors, or in isolated groups. Bald eagles often share these roost sites with golden eagles as well.

No bald eagle winter roosting or nesting habitat exists within one mile of the of the project area. The small stand of cottonwood trees along Porcupine Creek within SENE of Section 11, Township 42 North, Range 72 West appears to provide the most suitable roosting habitat within the general area. This stand of trees is located approximately 1.5 miles from the Stoddard POD perimeter and just east of Highway 59 (Jansen 2006).

3.3.5.1.3. Ute's Ladies Tresses Orchid

This orchid is listed as Threatened under the Endangered Species Act. It is extremely rare and occurs in moist, sub-irrigated or seasonally flooded soils at elevations between 1,780 and 6,800 feet above sea level. Habitat includes wet meadows, abandoned stream channels, valley bottoms, gravel bars, and near lakes or perennial streams that become inundated during large precipitation events. Prior to 2005, only four orchid populations had been documented within Wyoming. Five additional sites were located in 2005 and one in 2006(Heidel pers. Comm.). The new locations were in the same drainages as the original populations, with two on the same tributary and within a few miles of an original location. Drainages with documented orchid populations include Antelope Creek in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County.

The northern portion of the project area, Section 10, is drained by ephemeral tributaries of Porcupine Creek. Porcupine Creek is an ephemeral drainage that did not contain standing or flowing water between April and June 2006. The southern portion of the project area, Sections 20 and 21, is drained by ephemeral tributaries of Spring Creek which contained pools of standing water and sections contained following water due to existing coalbed natural gas produced water discharges. Both Porcupine and Spring Creeks are tributaries to Antelope Creek.

The area downstream from Maycock Springs located within NWNW of Section 29, Township 42 North, Range 72 West, exhibited characteristics indicative of potential orchid habitat. These characteristics included wetland plant species such as *Scirpus americana* and *Juncus spp*., saturated soils and moderate slopes were present. However, the surface water originating from the spring only extended approximately 300 meters downstream of the source. No orchids were observed during the pedestrian survey. The area around the springs is grazed heavily by cows. The remaining downstream portions of Spring Creek in Section 29 and 33 Township 42 North, Range 72 West, contained grazed dry terrestrial vegetation such as wheat grasses (*Agropyron spp.*), grammas (*Boutelous spp.*) and invasive species such as downy brome (*Bromus tectorum*). Arcadis conducted surveys for the orchid on August 21, 2006, no Ute ladies'-tresses orchid was found within or near the project area.

3.3.5.2. Sensitive Species

The USDI Bureau of Land Management (BLM) Wyoming has prepared a list of sensitive species to focus species management efforts towards maintaining habitats under a multiple use mandate. The authority for

this policy and guidance comes from the Endangered Species Act of 1973, as amended; Title II of the Sikes Act, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; and the Department Manual 235.1.1A.

3.3.5.2.1. Black-tailed prairie dog

On August 12, 2004, the U.S. Fish and Wildlife Service removed the black-tailed prairie dog's Candidate status. The Buffalo Field Office however will consider prairie dogs as a sensitive species and continue to afford this species the protections described in the FEIS. The black-tailed prairie dog is a diurnal rodent inhabiting prairie and desert grasslands of the Great Plains. Their decline is related to multiple factors including, habitat destruction, poisoning, and Sylvatic plague.

No black-tailed prairie dog colonies are present within the project area.

3.3.5.2.2. Greater sage-grouse

Greater sage-grouse 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).

Suitable sage-grouse habitat is present within the project area. Two sage grouse leks occur within three miles of the project area, one is a 1.75 miles east of the project boundary and the other one is located 2.5 miles north and west of the project boundary (Table 3.3). Sage-grouse were observed by Arcadis and Big Horn Environmental Consultants while conducting sage grouse surveys for the general area (Heath 2006).

Table 3.3. Documented sage-grouse leks within three miles of the Stoddard project area in 2006.

LEK ID	UTM NAD83	LEGAL LOCATION	STATUS	PEAK COUNTS
59	462000E 4827100N	SE Sec. 23 T42N, R72W	Inactive	None
Spring Creek	454712E 4831604N	SWSW Sec 6 T42N, R72W	Active	16

It is BLM Wyoming policy to limit disruptive activities within a two mile radius of active lek sites during the nesting season. This radius may be expanded based on site-specific criteria (Bennet 2004). The Western Association of Fish and Wildlife Agencies (WAFWA) sage-grouse management guidelines (Connely et. al. 2004) recommend the protection of suitable habitats within 5 km of leks.

The Buffalo Field Office (BFO) Resources Management Plan (BLM 2001) and the Powder River Basin Oil and Gas Project Record of Decision (BLM 2003) include a two-mile timing limitation within sage-grouse nesting habitat. The two-mile measure originated with the Western Association of Fish and Wildlife Agencies (WAFWA), which includes the WGFD, 1977 sage-grouse guidelines (Bennett 2004). Under pressure for standardization BLM Wyoming adopted the two-mile recommendation in 1990, and instructed the field offices to incorporate the measure into their land use plans (Bennett 2004, Murkin 1990).

The Partners in Flight's Western Working Group recommend no net loss of sagebrush habitats (Paige and Ritter 1999). BLM Wyoming policy also states that rehabilitation activities will include sagebrush and appropriate forb species (Bennet 2004).

3.3.5.2.3. Mountain plover

Mountain plovers, which are a Buffalo Field Office sensitive species, are typically associated with high, dry, short grass prairies containing vegetation typically shorter than four inches tall, and slopes less than 5

degrees (BLM 2003). Mountain plovers are closely associated with heavily grazed areas such as prairie dog colonies and livestock pastures.

The project area is primarily a sagebrush/grass land ecological site. Much of the area is heavily grazed, the potential for mountain plover nesting habitat exists throughout the project area.

3.4. West Nile Virus

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 been firmly established in the United States and has continued to spread west. Birds are the natural vector host and serve not only to amplify the virus, but spread it rapidly throughout the country since they are the only known animal to infect mosquitoes. Though less than 1% of mosquitoes are infected with WNV, they still are very effective in transmitting the virus to humans, horses, and wildlife. The *Culex* genus appears to be the most important mosquito group that vector, WNV.

The human health issues related to WNV are well documented and may continue to escalate as the virus moves west. Historic data collected by the CDC and published by the USGS at www.westnilemaps.usgs.gov are summarized below. Reported data from the Powder River Basin (PRB) includes Campbell, Sheridan and Johnson counties.

Table 3.4 Historical West Nile Virus Information

Year	Total WY Human Cases	Human Cases PRB	Veterinary 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

Human cases of WNV in Wyoming occur primarily in the late summer or early fall. There is some evidence that the incidence of WNV tapers off over several years after a peak following initial outbreak (Litzel and Mooney, personal conversations). If this is the case, occurrences in Wyoming are likely to increase over the next few years, followed by a gradual decline in the number of reported cases.

Although most of the attention has been focused on human health issues, WNV has had an impact on vertebrate wildlife populations. At a recent conference at the Smithsonian Environmental Research Center, scientists disclosed WNV had been detected in 157 bird species, horses, 16 other mammals, and alligators (Marra et al 2003). In the eastern US, avian populations have incurred very high mortality, particularly crows, jays and related species. Raptor species also appear to be highly susceptible to WNV. During 2003, 36 raptors were documented to have died from WNV in Wyoming including Golden eagle, red-tailed hawk, ferruginous hawk, American kestrel, Cooper's hawk, northern Goshawk, great-horned owl, prairie falcon, and Swainson's hawk (Cornish et al. 2003). Actual mortality is likely to be greater. Population impacts of WNV on raptors are unknown at present. The Wyoming State Vet Lab determined 22 sage-grouse in one study project (90% of the study birds), succumbed to WNV in the PRB in 2003. While birds infected with WNV have many of the same symptoms as infected humans, they appear to be more sensitive to the virus (Rinkes 2003).

Mosquitoes can potentially breed in any standing water that lasts more than 4 days. In the Powder River Basin, there is generally increased surface water availability associated with CBNG development. This increase in potential mosquito breeding habitat provides opportunities for mosquito populations to increase. Preliminary research conducted in the Powder River Basin indicates WNV mosquito vectors were notably more abundant on a developed CBNG site than two similar undeveloped sites (Walker et al. 2003). Reducing the population of mosquitoes, especially species that are apparently involved with bird-to-bird transmission of WNV, such as some *Culex* species, can help to reduce or eliminate the presence of virus in a given geographical area (APHIS 2002). The most important step any property owner can take to control such mosquito populations is to remove all potential man-made sources of standing water in which mosquitoes might breed (APHIS 2002).

The most common pesticide treatment is to place larvicidal briquettes in small standing water pools along drainages or every 100 feet along the shoreline of reservoirs and ponds. It is generally accepted that it is not necessary to place the briquettes in the main water body because wave action prevents this environment from being optimum mosquito breeding habitat. Follow-up treatment of adult mosquitoes with malathion may be needed every 3 to 4 days to control adults following application of larvicide (Mooney, personal conversation). These treatment methods seem to be effective when focused on specific target areas, especially near communities, however they have not been applied over large areas nor have they been used to treat a wide range of potential mosquito breeding habitat such as that associated with CBNG development.

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. The letter encouraged companies to contact either local Weed and Pest Districts or the Wyoming Department of Health for surface water treatment options.

3.5. Water Resources

The project area is within the Antelope Creek drainage system. Proposed discharge points and impoundments are located in the Spring Creek drainage and in tributaries to Porcupine Creek, both tributaries to Antelope Creek which is a tributary of the Cheyenne River. Playas are common in the upland areas in and around the POD, one of which currently receives CBNG water and will receive water from this development action.

3.5.1. Groundwater

WDEQ water quality parameters for groundwater classifications (Chapter 8 – Quality Standards for Wyoming Groundwater) define the following limits for 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).

The ROD includes a Monitoring, Mitigation and Reporting Plan (MMRP). The objective of the plan is to monitor those elements of the analysis where there was limited information available during the preparation of the EIS. The MMRP called for the use of adaptive management where changes could be made based on monitoring data collected during implementation.

Specifically relative to groundwater, the plan identified the following (PRB FEIS ROD page E-4):

- The effects of infiltrated waters on the water quality of existing shallow groundwater aquifers are not well documented at this time;
- Potential impacts will be highly variable depending upon local geologic and hydrologic conditions;

- It may be necessary to conduct investigations at representative sites around the basin to quantify these impacts;
- Provide site specific guidance on the placement and design of CBM impoundments, and;
- Shallow groundwater wells would be installed and monitored where necessary.

The BLM has installed shallow groundwater monitoring wells at five impoundment locations throughout the PRB to assess ground-water quality changes due to infiltration of CBNG produced water. The most intensively monitored site has a battery of nineteen wells which have been installed and monitored jointly by the BLM and USGS since August, 2003. Water quality data has been sampled from these wells on a regular basis. That impoundment lies atop approximately 30 feet of unconsolidated deposits (silts and sands) which overlie non-uniform bedrock on a side ephemeral tributary to Beaver Creek and is approximately one and one-half miles from the Powder River. Baseline investigations showed water in two sand zones, the first was at a depth of 55 feet and the second was at a depth of 110 feet. The two water bearing zones were separated by a fifty-foot thick shale layer. The water quality of the two water bearing zones fell in the WDEQ Class III and Class I classifications respectively. Preliminary results from this sampling indicate increasing levels of TDS and other inorganic constituents over a six month period resulting in changes from the initial WDEQ classifications.

The on-going shallow groundwater impoundment monitoring at four other impoundment locations are less intensive and consist of batteries of between 4 and 6 wells. Preliminary data from two of these other sites also are showing an increasing TDS level as water infiltrates while two other sites are not.

A search of the Wyoming State Engineer Office (WSEO) Ground Water Rights Database for this area showed 11 registered stock and domestic water wells within the POD boundary with depths ranging from 126 to 960 feet. For additional information on water, please refer to the PRB FEIS (January 2003), Chapter 3, Affected Environment pages 3-1 through 3-36 (groundwater).

3.5.2. Surface Water

The project area is within the Spring Creek drainage which is tributary to the Antelope Creek primary watershed. Most of the drainages in the area 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 Chapter 9 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 United States Geological Survey (USGS) Gauging Stations in Table 3-11 (PRB FEIS page 3-49). These water quality parameters "illustrate the variability in ambient EC and SAR in streams within the Project Area. The representative stream water quality is used in the impact analysis presented in Chapter 4 as the baseline for evaluating potential impacts to water quality and existing uses from future discharges of CBM produced water of varying chemical composition to surface drainages within the Project Area" (PRB FEIS page 3-48). For the Antelope Creek, the EC ranges from 2,271 at Maximum monthly flow to 4,127 at Low monthly flow and the SAR ranges from 5.63 at Maximum monthly flow to 8.66 at Low monthly flow. These values were determined at the USGS station located at Riverview, WY(PRB FEIS page 3-49).

The operator has identified a natural spring labeled on the USGS quadrangle within this POD boundary at T72N, R42W, Sec 29. The estimated flow of the spring has not been determined because it was dry during POD planning phase. It will be inspected seasonally for flow and it will be sampled for water quality if flow is observed.

For more information regarding surface water, please refer to the PRB FEIS Chapter 3 Affected Environment pages 3-36 through 3-56.

3.6. Cultural Resources

Class III cultural resource inventories were conducted for the Stoddard project area of potential effect prior to on-the-ground project work (BFO project no. 70060247) Pronghorn Archaeology, Inc. conducted a block and linear Class III cultural resource inventory following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) for the project.

Leigh Grench, BLM Archaeologist, reviewed the report for technical adequacy and compliance with Bureau of Land Management (BLM) standards, and determined it to be adequate. The following cultural resources are located in or near the area of potential effect.

Table 3.5 Cultural Resources Inventory Results

Site Number	Site Type	Eligibility
48CA4583	Historic Debris	Not Eligible
48CA4586	Historic Debris	Not Eligible
48CA5296/48CO2894	Historic Road	Not Eligible
48CA5297	Historic Road	Eligible

4. ENVIRONMENTAL CONSEQUENCES

The changes to the proposed action POD, which resulted in development of Alternative C as the preferred alternative, have reduced the potential impact to the environment which will result from this action. The environmental consequences of Alternative C are described below.

4.1. Vegetation & Soils Direct and Indirect Effects

Surface disturbances, coupled with soils types susceptible to wind erosion in the project area, will present challenges to reclamation efforts. In order to deal with these limitations the operator will be required to expediently stabilize soils, and follow the guidance provided in the Wyoming Policy on Reclamation (IM WY-90-231). Overall impacts to vegetation and soils from surface disturbance should be minor, based on the operator's plans and BLM applied mitigation. Of the 15 proposed well locations, all can be drilled without a well pad being constructed. As such, minor surface disturbance would occur with the drilling of the wells. This disturbance would only involve minor digging-out of rig wheel wells (for leveling drill rig on minor slopes), reserve pit construction (estimated approximate size of 10 x 30 feet), and compaction (from vehicles driving/parking at the drill site). Estimated disturbance associated with these 15 wells would involve approximately 0.344 acre/well for 5.16 total acres. This would be a minor impact with expedient, successful reclamation and site-stabilization, as committed to by the operator in their POD MSUP and as required by BLM in COAs.

Approximately 7.06 miles of new and existing two-track trails would be utilized to access well sites. The majority of proposed pipelines (gas and water) have been located in "disturbance corridors." Disturbance corridors involve the combining of 2 or more utility lines (water, gas, power) in a common trench, usually along access routes. This practice results in less surface disturbance and overall environmental impacts. Approximately 2.59 miles of pipeline would be constructed outside of corridors. Expedient reclamation of disturbed land with stockpiled topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with utilization of erosion control measures (e.g., waterbars, water wings, culverts, rip-rap, gabions etc.) would ensure land productivity/stability is regained and maximized.

Proposed stream crossings, including culverts and fords (low water crossings) are shown on the MSUP

and the WMP maps (see the POD). These structures would be constructed in accordance with sound, engineering practices and BLM standards.

The PRB FEIS made predictions regarding the potential impact of produced water to the various soil types found throughout the Basin, in addition to physical disturbance effects. "Government soil experts state that SAR values of only 13 or more cause potentially irreversible changes to soil structure, especially in clayey soil types, that reduce permeability for infiltration of rainfall and surface water flows, restrict root growth, limit permeability of gases and moisture, and make tillage difficult." (PRB FEIS page 4-144).

Table 4.1 summarizes the proposed surface disturbance.

Table 4.1 - SUMMARY OF DISTURBANCE

Facility	Number or Miles	Factor in acres or acre/mile for linear features	Acreage of Disturbance	Duration of Disturbance
Wells	15	0.344 acres/well	5.16	Long Term
Gather/Metering Facilities	0	Site Specific	0.0	Long Term
Screw Compressors	0	Site Specific	0.0	Long Term
Monitor Wells	0	0.1/acre	0.0	Long Term
Impoundments	1			Long Term
On-channel	1	Site Specific	2.7	
Off-channel	0	Site Specific	0.0	
Water Discharge Points	2	Site Specific or 0.01 ac/WDP	0.08	
Improved Roads	0.0	40' Width or Site Specific	0.0	Long Term
2-Track Roads	7.06	12' Width and/or Site Specific		Long Term
No Corridor	3.84		6.82	
With Corridor	3.22	32' Width	12.51	
Pipelines	2.59	20' Width or Site Specific		Short Term
No Corridor	0.36		0.87	
With Corridor	2.23		5.42	
Buried Power Cable	0	12' Width or Site Specific	0	Short Term
Overhead Powerlines	1.51	35' Width	6.41	Long Term
Additional Disturbance		Site Specific	0	
Totals				
Short Term Disturbance			39.97	
Long Term Disturbance			33.68	

The designation of the duration of disturbance is defined in the PRB FEIS (pg 4-1 and 4-151). "For this EIS, short-term effects are defined as occurring during the construction and drilling/completion phases.

Long-term effects are caused by construction and operations that would remain longer".

RECLAMATION BONDING

One of the greatest potential impacts anticipated following the close of CBNG production will be the presence of all the water impoundments which were constructed specifically for the management of produced water. Most of these impoundments are located high in the drainages and therefore would not contain storm event water for any length of time. It is predicted that these impoundments would become weed pits rather than serve a useful purpose for stock or wildlife watering. In order to ensure expedient reclamation of these impoundments, as of September, 2005, the BLM in coordination with the WDEQ and WOGCC began bonding these structures for the cost of reclamation. These cost estimates are prepared by a licensed Professional Engineer experienced in reclamation. As these impoundments are no longer needed as a part of the water management strategy, the operator will submit a reclamation plan and satisfactorily reclaim each location prior to the release of the bond. This bonding insures that any adverse impacts which could result from these impoundments will be mitigated through final reclamation at no additional cost to the public.

4.1.1. Wetland/Riparian

No impacts to wetlands are projected as a result of this project. Riparian zones below direct discharge outfalls will experience saturated conditions due to continuous CBNG discharge, and moisture tolerant vegetation species may thrive in channel bottom areas that are continually saturated.

4.1.2. Invasive Species

The operator has committed to control weed growth through:

- Education of employees regarding recognition, prevention measures, management techniques and impacts of weed invasion.
- Eradication or controlling any weed growth with application of pesticides by a certified pesticide applicator.
- Agreements with all landowners that address the control of noxious weeds

Utilization of existing facilities and surface disturbance associated with construction of proposed access roads, pipelines, water management infrastructure, produced water discharge points and related facilities would present opportunities for weed invasion and spread. Produced CBNG water would likely continue to modify existing soil moisture and soil chemistry regimes in the areas of water release and storage. The activities related to the performance of the proposed project would create a favorable environment for the establishment and spread of noxious weeds/invasive plants such as salt cedar, Canada thistle and perennial pepperweed. However, mitigation as required by BLM applied COAs will ensure that potential impacts from noxious weeds and invasive plants will be minimal.

4.1.3. Cumulative Effects

The PRB FEIS stated that cumulative impacts to soils could occur due to sedimentation from water erosion that could change water quality and fluvial characteristics of streams and rivers in the sub-watersheds of the Project Area. SAR in water in the sub-watersheds could be altered by saline soils because disturbed soils with a conductivity of 16 mmhos/cm could release as much as 0.8 tons/acre/year of sodium (BLM 1999c). Soils in floodplains and streambeds may also be affected by produced water high in SAR and TDS. (PRB FEIS page 4-151).

As referenced above, the PRB FEIS did disclose that cumulative impacts may occur to soils and vegetation as a result of discharged produced CBNG water. The cumulative effects on vegetation and soils are anticipated to be minimal for the following reasons:

- They are proportional to the actual amount of cumulatively produced water in the Antelope Creek

drainage, which is approximately 25.2% of the total predicted in the PRB FEIS.

- The WDEQ enforcement of the terms and conditions of the WYPDES permit that are designed to protect irrigation downstream.
- The WMP for the Stoddard proposes that produced water will not contribute significantly to flows downstream.

No additional mitigation measures are required.

4.2. Wildlife

4.2.1. Big Game Direct and Indirect Effects

antelope would be directly disturbed with the construction of wells, reservoirs, pipelines and roads. Table 4.1 summarized the proposed activities; items identified as 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 feels a well density of eight 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 three years of drilling activity the deer have not accepted 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 seven 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. In order to survive 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.

4.2.1.1. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-211.

4.2.2. Aquatics Direct and Indirect Effects

Produced water will be discharged to 5 outfall locations (3 existing and 2 proposed) and 5 reservoirs (4 existing and 1 proposed).

4.2.2.1. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-247. No additional mitigation measures are required.

4.2.3. Migratory Birds Direct and Indirect Effects

Disturbance of the habitat types within the project area is likely to impact migratory birds. Native habitats are being lost directly with the construction of wells, roads, and pipelines. Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts. Human activities likely displace migratory birds farther than simply the physical habitat 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).

Overhead power lines may affect migratory birds in several ways. Power poles provide raptors with perch sites and may increase predation on migratory birds. Power lines placed in flight corridors may result in collision mortalities. Some species may avoid suitable habitat near power lines in an effort to avoid predation. Additional direct and indirect effects to migratory birds are discussed in the PRB FEIS (4-231-235).

4.2.3.1. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, Page 4-235.

4.2.4. Raptors Direct and Indirect Effects

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 over heating or chilling of eggs or chicks. The prolonged disturbance can also lead to the abandonment of the nest by the adults. Both actions can result in egg or chick mortality. In addition, routine human activities near these nests can draw increased predator activity to the area and increase nest predation. Additional direct and indirect impacts to raptors, from oil and gas development, are analyzed in the PRB FEIS (4-216-221).

To reduce the risk of decreased productivity or nest failure, the BLM BFO requires a one-half mile radius timing limitation during the breeding season around active raptor nests and recommends all infrastructure requiring human visitation to be located greater than one-quarter mile from occupied raptor nests.

Out of 25 raptor nests documented near the Stoddard project area, only one is within 0.3 miles of a well. The well 12-10 was relocated approximately 450 feet south to southwest, the new location puts the well 660 feet from FEHA nest (BLM ID 2995). The nest is out of sight of the well. Due to topography, project boundaries and other gas wells in the area, the well could not be moved outside the quarter-mile area. The nest was inactive in 2006.

4.2.4.1. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-221. No additional mitigation measures are required.

4.2.5. Threatened and Endangered and Sensitive Species

Within the BLM Buffalo Field Office there are three species that are Threatened or Endangered under the Endangered Species Act. Potential project effects on Threatened and Endangered Species were analyzed in a Biological Assessment and a summary is provided in Table 4.3. Threatened and Endangered Species potentially affected by the proposed project area are further discussed following the table.

4.2.5.1. Threatened and Endangered and Sensitive Species

Table 4.2 Summary of Threatened and Endangered Species Habitat and Project Effects.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Endangered				
Black-footed ferret (*Mustela nigripes*)	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NP	NE	No prairie dog colonies present.
Threatened				
Bald eagle (*Haliaeetus leucocephalus*)	Mature forest cover often within one mile of large water body.	S	LAA	Project includes overhead power and roads.
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	Riparian areas with permanent water	NP	NE	Suitable habitat will not be affected by project activities.

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.
Effect Determinations
Listed Species
LAA Likely to adversely affect
NE No Effect.
NLAA May Affect, not likely to adversely effect individuals or habitat.

4.2.5.1.1. Black-footed ferret

Because there are no black-tailed prairie dog colonies within the project area and it is isolated from any prairie dog complexes, implementation of the proposed development should have no effect on the black-footed ferret.

4.2.5.1.2. Bald eagle

Based on the raptor nesting and bald eagle winter roost surveys, it is unlikely bald eagles nest or roost within project area. The proposed project should not affect bald eagle nesting or winter roosting.

Surrounding the project area is extensive natural gas development and its associated infrastructure, i.e. improved roads, two-track roads and overhead powerlines. Existing overhead three phase powerlines in the area are likely to be in compliance with the Avian Power Line Interaction Committee's (1996) suggested practices and with the Service's standards (USFWS 2002). Within the project boundary Coleman Oil and Gas is proposing to construct 1.51 miles of overhead powerlines and 6.5 miles of overhead powerlines outside of the project area.

The presence of overhead power lines and roads may adversely affect foraging bald eagles. Bald eagles forage opportunistically throughout the Powder River Basin, particularly during the winter when migrant eagles join the small number of resident eagles. Twenty-two raptors, including sixteen golden eagles, were electrocuted within Wyoming's Powder River Basin in 2003. Twelve electrocutions were on recently constructed lines which did not fully meet APLIC standards (Rogers). Power lines not constructed to APLIC suggestions pose an electrocution hazard for eagles and other raptors perching on them. The Service has developed additional specifications, improving upon the APLIC suggestions. Constructing power lines to the APLIC suggestions and Service standards minimizes but does not eliminate electrocution risk.

Roads present a collision hazard, primarily from bald eagles scavenging on carcasses resulting from other road related wildlife mortalities. Collision risk increases with automobile travel speed. Typically, two-tracks and improved project roads pose minimal collision risk. In one year of monitoring road-side carcasses, the BLM BFO reported 439 carcasses; 226 along Interstates (51%), 193 along paved highways (44%), 19 along gravel county roads (4%), and 1 along an improved CBNG road (<1%) (Bills 2004). No road-killed eagles were reported. Eagles were observed feeding on 16 of the reported road-side carcasses (<4%).

Produced water will flow into 1 proposed reservoir and 4 existing reservoirs, which may attract eagles if reliable prey is present. The effect of the reservoirs on eagles is unknown. The reservoirs could prove to be a benefit (i.e. increased food supply) or an adverse effect (i.e. contaminants, proximity of powerlines and /or roads to water). Eagle use of reservoirs should be reported to determine the need for any future management.

The proposed project is "***likely to adversely affect***" bald eagles due to the presence and construction of existing roads and overhead electric lines.

4.2.5.1.3. Ute's Ladies Tresses Orchid

Implementation of the proposed coal bed natural gas project will have "***no effect***" on the Ute ladies'-tresses orchid as suitable habitat will not be affected by project activities. Reservoir seepage may create suitable habitat if historically ephemeral drainages become perennial, however no historic seed source is present within or upstream of the project area.

4.2.5.2. Sensitive Species Direct and Indirect Effects

Table 4.3 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, permanent water in plains and foothills	S	MIIH	Additional water will affect existing waterways.
Spotted frog (*Ranus pretiosa*)	Ponds, sloughs, small streams	NP	NI	Prairie not mountain habitat.
Birds				
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields	S	MIIH	Sagebrush cover will be affected.
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	K	MIIH	Sagebrush cover will be affected.
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	NP	NI	No prairie dog colonies present.
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	K	MIIH	Grassland and shrubland habitats will be affected.
Greater sage-grouse (*Centrocercus urophasianus*)	Basin-prairie shrub, mountain-foothill shrub	K	WIFV	Sagebrush cover will be affected.
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Sagebrush cover will be affected.
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	S	MIIH	Grasslands will be affected.
Mountain plover (*Charadrius montanus*)	Short-grass prairie with slopes < 5%	S	MIIH	Prairie will be affected.
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	NP	NI	No forest habitat present.
Peregrine falcon (*Falco peregrinus*)	cliffs	NP	NI	No nesting habitat present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Sagebrush cover will be affected.
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	K	MIIH	Sagebrush cover will be affected.
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	S	MIIH	Suitable habitat may become present.
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	NP	NI	Permanently wet meadows not present.
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	NP	NI	Streamside habitats not present
Fish				
Yellowstone cutthroat trout (*Oncoryhynchus clarki bouvieri*)	Mountain streams and rivers in Tongue River drainage	NP	NI	Outside species range.
Mammals				
Black-tailed prairie dog (*Cynomys ludovicianus*)	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	NP	NI	No prairie dog towns exist in the project area.
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	NP	NI	Habitat not present.
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	NP	NI	Habitat not present.
Spotted bat (*Euderma maculatum*)	Cliffs over perennial water.	NP	NI	Cliffs & perennial water not present.
Swift fox (*Vulpes velox*)	Grasslands	S	MIIH	Grassland habitat will be affected.
Townsend's big-eared bat (*Corynorhinus townsendii*)	Caves and mines.	NP	NI	Habitat not present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Plants				
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	Habitat not present.

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.
WIFV 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. (Trigger for a Significant Action as defined in NEPA)
BI Beneficial Impact

4.2.5.2.1. Black-tailed prairie dog

No black-tailed prairie dog colonies are present within the project areas.

4.2.5.2.2. Greater sage-grouse

Suitable sage-grouse habitat is present throughout the project area.

Greater sage-grouse habitat is being directly lost with the addition of well sites, roads, pipelines, power lines, reservoirs and other infrastructure (Theiele 2005, Oedekoven 2004). Sage grouse avoidance of CBNG infrastructure results in even greater indirect habitat loss. The Wyoming Game and Fish Department (WGFD) feels a well density of eight wells per section creates a high level of impact for sage grouse and that sage-grouse avoidance zones around mineral facilities overlap creating contiguous avoidance areas (WGFD 2004).

The presence of overhead power lines and roads within the project area may adversely affect sage grouse. Overhead power lines create hunting perches for raptors, thus increasing the potential for predation on sage grouse. Increased predation from overhead power near leks may cause a decrease in lek attendance and possibly lek abandonment. Overhead power lines are also a collision hazard for sage grouse flying through the area. Increased roads and mineral related traffic can affect grouse activity and reduce survival (Braun et al. 2002). Activity along roads may cause nearby leks to become inactive over time (WGFD 2003).

Noise can affect sage grouse by preventing vocalizations that influence reproduction and other behaviors (WGFD 2003). Sage grouse attendance on leks within one mile of compressors is lower than for sites farther from compressors locations (Braun et al. 2002).

Another concern with CBNG is that reservoirs created for water disposal provide habitat for mosquitoes associated with West Nile virus (Oedekoven 2004). West Nile virus represents a significant new stressor which in 2003 reduced late summer survival of sage-grouse an average of 25% within four populations including the Powder River Basin (Naugle et al. 2004). Powder River Basin grouse losses during 2004 and 2005 were not as severe. Summer 2003 was warm and dry, more conducive to West Nile virus replication and transmission than the cooler summers of 2004 and 2005 (Cornish pers. Comm..).

The Buffalo Field Office (BFO) Resources Management Plan (BLM 2001) and the Powder River Basin Oil and Gas Project Record of Decision (BLM 2003) include a two-mile timing limitation within sage-grouse nesting habitat. The two-mile measure originated with the Western Association of Fish and Wildlife Agencies (WAFWA), which includes the WGFD, 1977 sage-grouse guidelines (Bennett 2004). Under pressure for standardization BLM Wyoming adopted the two-mile recommendation in 1990, and instructed the field offices to incorporate the measure into their land use plans (Bennett 2004, Murkin 1990).

The two-mile recommendation was based on research which indicated between 59 and 87 percent of sage-grouse nests were located within two-miles of a lek (Bennett 2004). These studies were conducted within prime, contiguous sage-grouse habitat such as Idaho's Snake River plain.

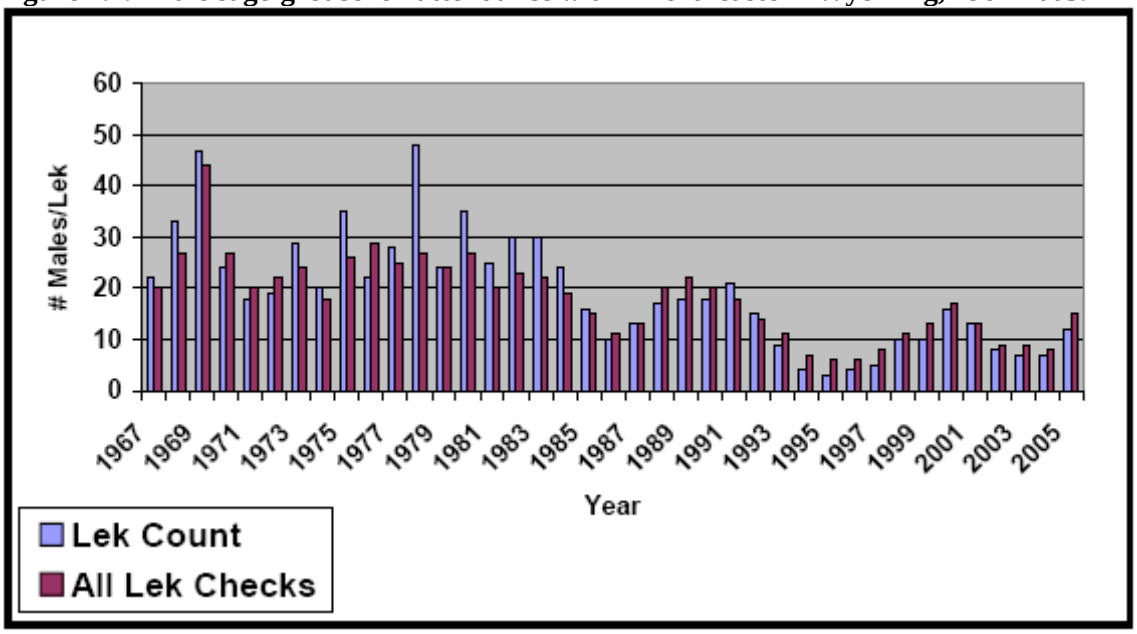
Additional studies, across more of the sage-grouse's range, indicate that many populations nest much farther than two miles from the lek of breeding (Bennett 2004). Holloran and Anderson (2005), in their Upper Green River Basin study area, reported only 45% of their sage grouse hens nested within 3 km (1.86 mi) of the capture lek. Moynahan and Lindberg (2004) found 36% of their grouse nesting within 3 km of the capture leks. Moynahan's study area was north-central Montana in an area of mixed-grass prairie and sagebrush steppe, with Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) being the dominant shrub species (Moynahan et al. In press).

Percentage of sage-grouse nesting within a certain distance from their breeding lek is unavailable for the Powder River Basin. The Buffalo and Miles City field offices through the University of Montana with assistance from other partners including the U.S. Department of Energy and industry are currently researching nest location and other sage-grouse questions and relationships between grouse and coalbed natural gas development. Habitat conditions and sage grouse biology within the Buffalo Field Office is probably most similar to Moynahan's north-central Montana study area.

Vegetation communities within the Powder River Basin are naturally fragmented as they represent a transition between the intermountain basin sagebrush communities to the west and the prairie communities to the east. The Powder River Basin is also near the eastern edge of greater sage-grouse range. Without contiguous habitat available to nesting grouse it is likely a smaller percentage of grouse nest within two-miles of a lek within the PRB than grouse within those areas studied in the development of the 1977 WAFWA recommendations and even the Holloran and Moynahan study areas. Holloran and Moynahan both studied grouse in areas of contiguous sagebrush habitats without large scale fragmentation and habitat conversion (Moynahan et al In press, Holloran and Anderson 2005). A recent sagebrush cover assessment within Wyoming basins estimated sagebrush coverage within Hollaran and Anderson's Upper Green River Basin study area to be 58% with an average patch size greater than 1200 acres; meanwhile Powder River Basin sagebrush coverage was estimated to be 35% with an average patch size less than 300 acres (Rowland et al. 2005). The Powder River Basin patch size decreased by more than 63% in forty years, from 820 acre patches and an overall coverage of 41% in 1964 (Rowland et al. 2005). Recognizing that many populations live within fragmented habitats and nest much farther than two miles from the lek of breeding WAFWA revised their sage grouse management guidelines (Connelly et. al. 2000) and now recommends the protection of suitable habitats within 5 km (3.1 mi) of leks where habitats are not distributed uniformly such as the Powder River Basin.

The sage grouse population within northeast Wyoming is exhibiting a steady long term downward trend (Figure 1) (Thiele 2005). The figure illustrates a ten year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak and each periodic low is lower than the previous population low. Long-term harvest trends are similar to that of lek attendance (Thiele 2005).

Figure 4.1. Male sage-grouse lek attendance within northeastern Wyoming, 1967-2005.



Sage-grouse populations within the PRB are declining independent of coalbed natural gas development. CBNG is a recent development, with the first well drilled in 1987 (Braun et al. 2002). In February 1998 there were 420 producing wells primarily restricted to eastern Campbell County (BFO 1999). By May 2003 there were 26,718 CBNG wells permitted within the BFO area (Oedekoven 2004). The Powder River Basin Oil and Gas Project Final Environmental Impact Statement estimated 51,000 additional CBNG wells to be drilled over a ten year period beginning in 2003 (BFO 2003). Impacts from CBNG development are likely to be significant and additive to the long-term impacts afflicting the sage-grouse population (Oedekoven 2004). In other terms, CBNG development is expected to accelerate the downward sage-grouse population trend.

A two-mile timing limitation given the long-term population decline and that less than 50% of grouse are expected to nest within the limitation area is likely insufficient to reverse the population decline. Moynahan and Lindberg (2004) like WAFWA (Connely et al. 2000) recommend increasing the protective distance around sage grouse leks. Even with a timing limitation on construction activities, sage-grouse may avoid nesting within CBNG fields because of the activities associated with operation and production. As stated earlier, a well density of eight wells per section creates sage-grouse avoidance zones which overlap creating contiguous avoidance areas (WGFD 2004).

An integrated approach including habitat restoration, grazing management, temporal and spatial mineral limitations etc. is necessary to reverse the population decline. The Wyoming Game and Fish Department (WGFD) has initiated such a program within the Buffalo Field Office area (Jellison 2005). The WGFD program is modeled after a successful program on the Deseret Ranch in southwestern Wyoming and northeastern Utah. The Deseret Ranch has demonstrated a six-fold increase in their sage-grouse population while surrounding areas exhibited decreasing populations (Danvir 2002).

4.2.5.2.3. Mountain plover

Mineral development may have mixed effects on mountain plovers. Disturbed ground such as buried pipe line corridors and roads may be attractive to plovers while human activities within one-quarter mile may be disruptive. Use of roads and pipe line corridors by mountain plovers may increase their vulnerability to vehicle collision. The existing overhead power lines provide perch sites for raptors potentially

resulting in increased mountain plover predation. CBNG infrastructure such as the well houses, roads, pipe line corridors, and nearby metering facilities may provide shelter and den sites for ground predators such as skunks and foxes. An analysis of direct and indirect impacts to mountain plover due to oil and gas development is included in the PRB FEIS (4-254-255).

The project area is primarily a sagebrush/grass land ecological site. The area is heavily grazed, potential mountain plover habitat exists throughout the project area.

4.2.5.3. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-271.

4.3. West Nile Virus

The PRB FEIS and ROD included a programmatic mitigation measure that states, "The BLM will consult with appropriate state agencies regarding WNV. If determined to be necessary, a COA will be applied at the time of APD approval to treat mosquitoes for any CBM discharge waters that become stagnant." This project is likely to result in standing surface water which may potentially increase mosquito breeding habitat. BLM has consulted with applicable state agencies, County Weed and Pest and the State Health Department, per above mitigation in the PRB ROD page 18, regarding the disease and the need to treat. BLM has also consulted with the researchers that are studying the dynamics of WNV species and its effects in Wyoming.

There is no 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. The State agencies have not instituted state-wide treatment for mosquitoes due to WNV, nor are they requiring any mitigation specific to permitting for CBM operations.

Cumulatively, there are many sources of standing water, beyond CBM discharge, throughout the PRB that would add to the potential for mosquito habitat. Sources include; natural flows, livestock watering facilities, coal mining operations, and outdoor water use and features in and around communities.

BLM will keep monitoring this issue by continuing to consult with the State agencies and the researchers working in the area in order to stay abreast of the most current developments and any need to apply mitigation. Based on current information, we determined that no significant impacts in the spread of WNV would occur from the implementation of this project.

4.4. Water Resources

The operator has 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 within the Antelope Creek watershed and commitment to comply with Wyoming State water laws/regulations. It also addresses potential impacts to the environment and landowner concerns. Qualified hydrologists, in consultation with the BLM, developed the water management plan. Adherence with the plan, in addition to BLM applied mitigation (in the form of COAs), should minimize project area and downstream potential impacts from proposed water management strategies. The WMP calls for storage of some discharged CBNG water to make it available for landowner use. Such storage will use 4 existing reservoirs, one of which is currently receiving CBNG water, and one playa that is also receiving CBNG water. Water may flow in unchannelized areas between reservoirs. Water may also overflow the most downstream reservoir; however, the operator estimates that this is unlikely due to the large amount of storage available in this draw and the high potential for water loss due to evapotranspiration, evaporation and infiltration. One new reservoir is proposed for

construction. Direct discharge to a tributary to Spring Creek will also occur at a discharge point that is currently discharging CBNG water from nearby state and fee wells.

The WDEQ has assumed primacy from United States Environmental Protection Agency for maintaining the water quality in the waters of the state. The WSEO has authority for regulating water rights issues and permitting impoundments for the containment of surface waters of the state.

The maximum water production is predicted to be 18.0 gpm per well or 414 gpm from 23 wells, 15 of which are part of this POD and 8 are state wells that were recently completed in the immediate area (0.92 cfs or 668 acre-feet per year). Hydrologic calculations in the WMP and for the EA were made based on these 23 wells. The PRB FEIS projected the total amount of water that was anticipated to be produced from CBNG development per year (Table 2-8 Projected Amount of Water Produced from CBM Wells Under Alternatives 1, 2A and 2B pg 2-26). For the Antelope Creek drainage, the projected volume produced within the watershed area was 17,385 acre-feet in 2006 (maximum production year 2004 with 17,685). As such, the volume of water resulting from the production of these wells is 0.04% of the total volume projected for 2006, which will result in an insignificant increase to the present volume of water produced from coal bed natural gas in the Powder River Basin. This volume of produced water is also within the predicted parameters of the PRB FEIS.

4.4.1. Groundwater

The PRB FEIS predicts an infiltration rate of 28% to groundwater aquifers and coal zones in the Antelope Creek drainage area (PRB FEIS pg 4-5). For this action, it may be assumed that a maximum of 116 gpm will infiltrate at or near the discharge points and impoundments (187 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 pg 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 coal bed natural gas production is possible impacts to the groundwater. "The effects of development of CBM 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 page 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 water wells produce from depths which range from 126 to 960 feet compared to 900 to 1200 feet to the Wyodak. As mitigation, the operator has committed to offer water well agreements to holders of properly permitted domestic and stock wells within the circle of influence of the proposed wells.

Recovery of the coal bed aquifer was predicted in the PRB FEIS to "…resaturate and repressurize the areas that were partially depressurized during operations. The amount of groundwater storage 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 sand and coals (PRB FEIS 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 page 4-38).

Adherence to the drilling plan, the setting of casing at appropriate depths, following safe remedial procedures in the event of casing failure, and utilizing proper cementing procedures will protect any potential 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 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 has committed to designate a reference well within the POD. The reference well will be sampled at the well head for analysis within sixty days of initial production and a copy of the water analysis will be submitted to the BLM Authorizing Officer.

Shallow ground water monitoring is ongoing at impoundment sites across the basin. Due to the limited data available from these sites, the still uncertain overall fate or extent of change that is occurring due to infiltration at those sites, and the extensive variable site characteristics both surface and subsurface, it is not reliable at this time to infer that findings from these monitoring wells should be directly applied to other impoundment locations across the basin.

In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed a guidance document, "Compliance Monitoring for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments" (June 14, 2004) which can be accessed on their website. This guidance document became effective August 1, 2004, and is currently being revised as the "Compliance Monitoring and Siting Requirements for Unlined Coalbed Methane Produced Water Impoundments" which should be approved by June, 2006. Approximately 800 new impoundments have been investigated to date with 102 impoundments in 52 permits that have gone into compliance monitoring. The Wyoming DEQ has established an Impoundment Task Force which is in the process of drafting an "Impoundment Monitoring Plan" to investigate the potential for existing impoundments to have impacted shallow groundwater. Drilling at selected existing impoundments should begin in the spring of 2006. For WYPDES permits received by DEQ after the August 1st effective date, the BLM will require that operators comply with the requirements outlined in the current approved DEQ compliance monitoring guidance document prior to discharge of federally-produced water into newly constructed or upgraded impoundments.

4.4.1.1. Groundwater 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 page 4-64).

Development of CBM through 2018 (and coal mining through 2033) would remove 4 million acre-feet of groundwater from the coal zone aquifer (PRB FEIS page 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 CBM 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 page 4-65). No additional mitigation is necessary.

4.4.2. Surface Water

The following table shows Wyoming proposed numeric limits for the watershed for SAR, and EC, the average value measured at selected USGS gauging stations at high and low monthly flows, and Wyoming groundwater quality standards for TDS and SAR for Class I to Class III water. It also shows pollutant limits for TDS, SAR and EC detailed in the WDEQ's WYPDES permit, and the levels found in the POD's representative water sample.

Table 4.4 Comparison of Regulated Water Quality Parameters to Predicted Water Quality

Predicted Values	**TDS,** mg/l	**SAR**	**EC,** μmhos/cm
Most Restrictive Proposed Limit –		10	2,000
Least Restrictive Proposed Limit		10	2,500
Antelope Creek near Teckla,, WY, USGS Gauging Station 06364700			
Historic Data Average at Maximum Flow		2.82	2,354
Historic Data Average at Minimum Flow		2.60	1,800
WDEQ Quality Standards for Wyoming Groundwater (Chapter 8)			
Drinking Water (Class I)	500		
Agricultural Use (Class II)	2,000	8	
Livestock Use (Class III)	5,000		
WDEQ Water Quality Requirement for WYPDES Permit # WY0053929			
At discharge point	5,000	10	2,000
Predicted Produced Water Quality			
Wyodak Coal Zone	456	7.1	759

Based on the analysis performed in the PRB FEIS, the primary beneficial use of the surface water in the Powder River Basin is the irrigation of crops (PRB FEIS pg 4-69). The water quality projected for this POD is 456.0 mg/l TDS which is within the WDEQ criteria for agricultural use (2000 mg/l TDS). However direct land application is not included in this proposal. If at any future time 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 analysis and approval by the BLM.

For more information, please refer to the WMP included in this POD.

There are 5 discharge points proposed for this project. They have been appropriately sited and utilize appropriate water erosion dissipation designs. Existing and proposed water management facilities were evaluated for compliance with best management practices during the onsite.

To manage the produced water, 1 off channel impoundment (6.82 acre-feet) would potentially be constructed within the project area. This impoundment will disturb approximately 2.27 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) will be used to locate these impoundments. Monitoring may be required based upon WYDEQ findings relative to "Compliance Monitoring for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments" (June 14, 2004). Existing impoundments will be upgraded and proposed impoundments will be constructed to meet the requirements of the WSEO, WDEQ and the needs of the operator and the landowner. All water management facilities were evaluated for compliance with best management practices during the onsite.

Water produced from these wells may result in a maximum of 0.5 cfs to Porcupine Creek and 0.4 cfs to Spring Creek because direct discharge is allowed by the WYPDES permit. Much of this water, however, will likely be lost to evaporation and infiltration because water storage will be maximized in proposed and existing reservoirs and one existing playa. The operator has 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. Phased reclamation plans for the impoundments will be submitted and approved on a site-specific, case-by-case basis as they are no longer needed for disposal of CBNG water, as required by BLM applied COAs.

Alternative (2A), the approved alternative in the Record of Decision for the PRB FEIS, states that the peak production of water discharged to the surface will occur in 2004 at a total contribution to the mainstem of the Antelope Creek of 12 cfs (PRB FEIS pg 4-86). The predicted maximum discharge rate from these 23 wells is anticipated to be a total of 414.0 gpm or 0.92 cfs to impoundments or direct discharge. The addition of the water produced from these wells will not significantly impact the water quantity in the mainstem of the Antelope Creek. For more information regarding the maximum predicted water impacts resulting from the discharge of produced water, see Table 4-6 (PRB-FEIS pg 4-85).

In the WMP portion of the POD, the operator provided an analysis of the potential development in the watershed above the project area (WMP page 3). The POD is located in headwater areas or an area of playas that have internally drained basins, therefore potential for upstream development is not applicable to portions of the POD.

Based on the area of the Spring Creek watershed above the POD (34.04 sq mi) and an assumed density of 1 wells per location every 80 acres, the potential exists for the development of 272 wells which could produce a maximum flow rate of 2,720 gpm (6.2 cfs) of water. The BLM agrees with the operator that this is not expected to occur because:

1. Some of these wells have already been drilled and are producing.
2. New wells will be phased in over several years, and
3. A decline in well discharge generally occurs after several months of operation.

The potential maximum flow rate of produced water within the watershed upstream of the project area, 6.2 cfs, is much less than the volume of runoff estimated from the 2-year storm event for Spring Creek estimated at 292 cfs . Therefore, the estimated flow rate of water produced from the full development in the watershed above the project area is significantly less than the natural runoff from the area.

The proposed method for surface discharge 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 a Wyoming Pollutant Discharge Elimination System (WYPDES) permit for the discharge of water produced from this project from the WDEQ.

Permit effluent limits were set at (WYPDES Permit #WY0053929 page 2):

Total Petroleum Hydrocarbons	10 mg/l max
pH	6.5 to 9.0
TDS	5000 mg/l max
Specific Conductance	2000 micromoh/cm
Sulfates	3000 mg/l max
Dissolved iron	1000 µg/l max
Dissolved manganese	910 µg/l max
Total Barium	1800 µg/l max
Total Arsenic	2.4 µg/l max
Chlorides	46 mg/l

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 has committed to designate a reference well to each coal zone within the POD boundary. The reference well will be sampled at the wellhead for analysis within sixty days of initial production. A copy of the water analysis will be submitted to the BLM Authorized Officer.

As stated previously, the operator has committed to offer water well agreements to properly permitted domestic and stock water wells within the circle of influence of the proposed CBNG wells.

One natural spring is identified on the USGS quadrangle in the area, however this spring was dry during but it will be monitored seasonally for flow and for water quality if flow is present. The development of coal bed natural gas 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.

In-channel downstream impacts are addressed in the WMP on page 25 for the Stoddard POD prepared by WWC Engineering for Coleman Oil and Gas Inc. Possible changes to channels resulting from continuous flow produced by direct discharge outfalls were included in the discussion.

4.4.2.1. Surface Water Cumulative Effects

The analysis in this section includes cumulative data from Fee, State and Federal CBNG development in the Antelope Creek watershed. These data were obtained from the Wyoming Oil and Gas Conservation Commission (WOGCC).

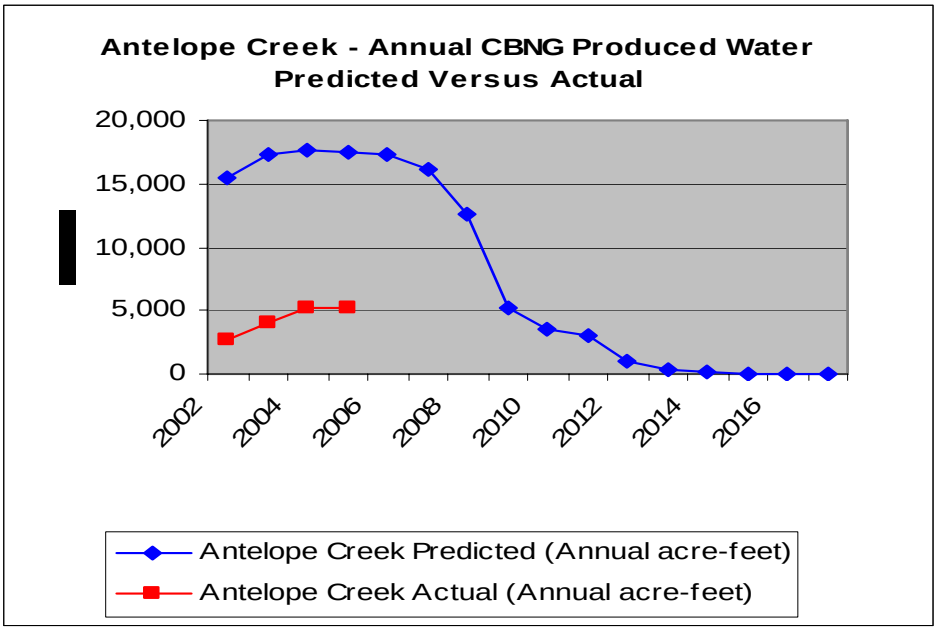
As of December 2005, all producing CBNG wells in the Antelope Creek watershed have discharged a cumulative volume of 17,125 acre-ft of water compared to the predicted 67,919 acre-ft disclosed in the PRB FEIS (Table 2-8 page 2-26). These figures are presented graphically in Table 4.6 and Figure 4.1 following. This volume is 25.2% of the total predicted produced water analyzed in the PRB FEIS for the Antelope Creek watershed.

Table 4.5 Actual vs predicted water production in the Antelope Creek watershed *2005 Data Updated 4-5-06*

Year	Antelope Creek Predicted (Annual acre-feet)	Antelope Creek Predicted (Cumulative acre-feet from 2002)	Antelope Creek Actual (Annual acre-feet)		Antelope Creek Actual (Cumulative acre-feet from 2002)	
			Actual Ac-ft	% of Predicted	Cum Ac-ft	% of Predicted
2002	15,460	15,460	2,668	17.3	2,668	17.3
2003	17,271	32,731	4,042	23.4	6,710	20.5
2004	17,685	50,416	5,181	29.3	11,891	23.6
2005	17,503	67,919	5,234	29.9	17,125	25.2
2006	17,385	85,304				
2007	16,180	101,484				
2008	12,613	114,097				
2009	5,226	119,323				
2010	3,574	122,897				
2011	2,956	125,853				
2012	1,041	126,894				

Year	Antelope Creek Predicted (Annual acre-feet)	Antelope Creek Predicted (Cumulative acre-feet from 2002)	Antelope Creek Actual (Annual acre-feet)		Antelope Creek Actual (Cumulative acre-feet from 2002)	
			Actual Ac-ft	% of Predicted	Cum Ac-ft	% of Predicted
2013	363	127,257				
2014	124	127,381				
2015	40	127,421				
2016	13	127,434				
2017	3	127,437				
Total	127,437		11,891			

Figure 4.2 Actual vs predicted water production in the Antelope Creek watershed



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

The PRB FEIS states, "Cumulative effects to the suitability for irrigation of the Powder River would be minimized through the interim Memorandum of Cooperation (MOC) that the Montana and Wyoming DEQ's (Departments of Environmental Quality) have signed. This MOC was developed to ensure that designated uses downstream in Montana would be protected while CBM development in both states continued. As the two states develop a better understanding of the effects of CBM discharges through the enhanced monitoring required by the MOC, they can adjust the permitting approaches to allow more or

less discharges to the Powder River drainage. Thus, through the implementation of in-stream monitoring and adaptive management, water quality standards and interstate agreements can be met." (PRB FEIS page 4-117)

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 anticipated to be minimal for the following reasons:

1. They are proportional to the actual amount of cumulatively produced water in the Antelope Creek drainage, which is approximately 25.2% of the total predicted in the PRB FEIS.
2. The WDEQ enforcement of the terms and conditions of the WYPDES permit that are designed to protect irrigation downstream.
3. The commitment by the operator to monitor the flow rate of water discharged.

No additional mitigation measures are required.

Refer to the PRB FEIS, Volume 2, page 4-115 – 117 and table 4-13 for cumulative effects relative to the Antelope Creek watershed and page 117 for cumulative effects common to all sub-watersheds.

4.5. Cultural Resources

The environmentally preferred alternative would affect no known cultural resources. The Bureau has electronically notified the Wyoming State Historic Preservation Officer (SHPO) following section V (B) of the Wyoming State Protocol on 10/21/06 that no historic properties were affected in the proposed project area.

Site 48CA5297, the historic Hay Creek-Porcupine Road, shows up on the General Land Office (GLO) map search as being present in Section 9 and 10 (T42NR72W) however, an on the ground search by Pronghorn Archaeologists and the BLM archaeologists (B. Damone, C. Crago, and L. Grench) resulted in no definitive remains of the historic road in these two sections. In Section 10 and the south east section of Section 9 (T42NR72W) roads walked by BLM archaeologists included the seismic, proposed POD, and developed roads, and the well pad (FED 12-10).Therefore, the segment of the eligible historic road was not located or evaluated for this project and the Bureau determined that there would be no effect to this site for this project.

If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS)] 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 Conditions of Approval*** (General)(A)(1).

5. CONSULTATION/COORDINATION

Contact	Title	Organization	Present at Onsite
Sara Needles	SHPO	SHPO	No
Jerry Dilts	Surface Owner	Bridle Bit Ranch Co.	No
Richard Leavitt	Surface Owner	Richard W. Leavitt Trust	No
Dave Lervick	Area Foreman	Coleman Oil & Gas Inc.	Yes
Brady Lewis	Consultant	WWC Engineering	Yes
Anna Morgan	Land/Operations	Coleman Oil & Gas Inc.	Yes
Bob Stoddard	Surface Owner	JRJ Ranch Inc.	No

6. OTHER PERMITS REQUIRED

A number of other permits are required from Wyoming State and other Federal agencies. These permits are identified in Table A-1 in the PRB FEIS Record of Decision.

7. REFERENCES AND AUTHORITIES

AHPIS, Animal and Plant Health Inspection Service. 2002. General information available online at http://www.aphis.usda.gov/lpa/issues/wnv/wnv.html.

Bennett, Robert A. and Dave Freudenthal 3/8/06. Wyoming State Protocol. Programmatic Agreement Among the Bureau of Land Management Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers.

Avian Power Line Interaction Committee. 1996. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. Edison Electric Institute. Washington, D.C. 125pp.

Bennett, Robert A. 2004. Instruction Memorandum No. WY-2005-057: Statement of Policy Regarding Sage-Grouse Management Definitions, and Use of Protective Stipulations, and Conditions of Approval. Bureau of Land Management, Wyoming State Office. Cheyenne, WY.

Bills, Thomas E. 2004. Powder River Basin Oil & Gas Project Semi-Annual Report: May 1, 2003 – October 31, 2003. BLM Buffalo Field Office. Buffalo, WY. 8pp.

Braun, C.E., O.O. Oedekoven, and C.L. Aldridge. 2002. Oil and Gas Development in Western North America: Effects on Sagebrush Steppe Avifauna with Particular Emphasis on Sage Grouse. In: Transactions of the 67th North American Wildlife and Natural Resources Conference. pp337-349.

Buffalo Field Office. 2003. Record of Decision and Resource Management Plan Amendments for the Powder River Oil and Gas Project. USDI Bureau of Land Management, Buffalo Field Office. Buffalo, WY.

Buffalo Field Office. 1999. Wyodak Coal Bed Methane Project: Final Environmental Impact Statement. USDI Bureau of Land Management, Buffalo Field Office. Buffalo, WY.

Code of Federal Regulations (CFR)

1. 40 CFR All Parts and Sections inclusive Protection of Environment Revised as of July 1, 2001.
2. 43 CFR All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2000.

Cornish, Todd; Terry Creekmore; Walter Cook; and Elizabeth Williams. 2003. "West Nile Virus - Wildlife Mortality in Wyoming 2002-2003". In: The Wildlife Society Wyoming Chapter Program and Abstracts for the Annual Meeting at the Inn in Lander, WY November 18-21, 2003. Wildlife Society Wyoming Chapter. 17pp.

Danvir, Rick E. 2002. Sage Grouse Ecology and Management in Northern Utah Sagebrush-Steppe: A Deseret Land and Livestock Wildlife Research Report. Deseret Land and Livestock Ranch and the Utah Foundation for Quality Resource Management. Woodruff, UT.

Grenier, Martin. 2003. An Evaluation of Black-footed Ferret Block Clearances in Wyoming: Completion Report. Wyoming Game and Fish Department. Lander, WY. 16pp

Hatcher, Julie 7/5/06. Cultural Report #70060247. Coleman Oil and Gas, Inc., Stoddard Federal Block Survey. Pronghorn Archaeology, Inc.

Heath, Brain. 2006. Habitat Assessment and Wildlife Report for the Stoddard Plan of Development. Arcadis G&M Inc. Buffalo, Wy. 10pp.

Holloran, Matthew J.; Brian J. Heath; Alison G. Lyon; Steven J. Slater; Jarren L. Kuppiers; and Stanley H. Anderson. 2005. Greater sage-grouse nesting habitat selection and success in Wyoming. J. Wildl. Manage. 69(2):638-649.

Jellison, Bert. 2005. Sage-Grouse Restoration Project: Lake DeSmet Conservation District. Wyoming Game and Fish Department. Sheridan, WY.

Kelly Brian T. 2004. Letter to interested parties: Black-footed ferret clearance surveys. U.S. Fish and Wildlife Service (February 2, 2004). Cheyenne, WY. 4pp.

Litzel, R. 2004. Personal communication [January 6 phone conversation with Jim Sparks]. Johnson County Weed and Pest District.

Lowham, H.W. Streamflows in Wyoming WRIR 88-4045 U.S. Geological Survey 1988

Marra PP, Griffing SM, McLean RG. West Nile virus and wildlife health. Emerg Infect Dis [serial online] 2003 Jul. Available from: URL: http://www.cdc.gov/ncidod/vol9no7/03-0277.htm.

Miller, K.A Peak-Flow Characteristics of Wyoming Streams WRIR 03-4107 U.S. Geological Survey 2003

Mooney, A. 2004. Personal Communication [January 6 phone conversation with Jim Sparks]. Campbell County Weed and Pest District.

Moynahan, Brendan J.; Mark S. Lindberg; Jay J. Rotella; and Jack Ward Thomas. In Press. Factors Affecting Nest Survival of Greater Sage-Grouse in North central Montana. J. Wildl. Manage.

Moynahan, Brendan J. and Mark S. Lindberg. 2004. Nest Locations of Greater Sage-Grouse in Relation to Leks in North-Central Montana. *Presented at* Montana Sage-Grouse Workshop, Montana Chapter of The Wildlife Society, Billings.

Murkin, James W. 1990. Instruction Memorandum No. WY-90-564: Resource Management Plan Action and Wyoming BLM Standard Mitigation Guidelines for Surface Disturbing Activities. Bureau of Land Management, Wyoming State Office. Cheyenne, WY.

Naugle, David E.; Cameron L. Aldridge; Brett L. Walker; Todd E. Cornish; Brendan J. Moynahan; Matt J. Holloran; Kimberly Brown; Gregory D. Johnson; Edward T. Schmidtmann; Richard T. Mayer; Cecilia Y. Kato; Marc R. Matchett; Thomas J. Christiansen; Walter E. Cook; Terry Creekmore; Roxanne D. Falise; E. Thomas Rinkes; and Mark S. Boyce. 2004. West Nile virus: Pending Crisis of Greater Sage-grouse. Ecology Letters. 7:704-713.

Oakleaf, Bob. January 13, 1988. Letter to BFAT: Preliminary BFF Reintroduction Site Analysis, Meeteetse Management Plan Assignments. Wyoming Game and Fish Department. Lander, WY. 10pp.

Oedekoven, Olin O. 2004. Sheridan Region Wyoming Game and Fish Department: Annual Sage-Grouse

Completion Report for 2004. Wyoming Game and Fish Department. Gillette, WY.

Patterson, Craig T. and Stanley H. Anderson. 1985. Distributions of Eagles and a Survey for Habitat Characteristics of Communal Roosts of Bald Eagles (Haliaeetus leucocephalus) Wintering in Northeastern Wyoming. Wyoming Cooperative Fishery and Wildlife Research Unit. University of Wyoming. Laramie, WY.

Rinkes, T. 2003. Personal communication [Draft notes from Annual Sage-Grouse and Sagebrush Species of Concern Meeting]. Bureau of land Management Wildlife Biologist/Sage Grouse Coordinator.

Rogers, Brad. Personal Communication. Fish and Wildlife Biologist. U.S. Fish and Wildlife Service, Cheyenne Field Office. Cheyenne, WY.

Romin, Laura A., and Muck, James A. May 1999. Utah Field Office Guidelines For Raptor Protection From Human And Land Use Disturbances, U.S. Fish and Wildlife Service, Salt Lake City, Utah

Rowland, M. M., M. Leu, , S. P. Finn, S. Hanser, L. H. Suring, J. M. Boyd, C. W. Meinke, S. T. Knick, and M. J. Wisdom. 2005. Assessment of threats to sagebrush habitats and associated species of concern in the Wyoming Basins. Version 1.1, June 2005, unpublished report on file at USGS Biological Resources Discipline, Snake River Field Station, 970 Lusk St., Boise, ID 83706.

Thiele, Dan. 2005. Northeast Wyoming Local Working Group Area: Annual Sage-Grouse Completion Report for 2005. Wyoming Game and Fish Department. Buffalo, WY. 42pp.

The National Environmental Policy Act of 1969 (NEPA), as amended (Pub. L. 91-90, 42 U.S.C. 4321 et seq.).

U.S. Department of the Interior, Bureau of Land Management and Office of the Solicitor (editors). 2001. The Federal Land Policy and Management Act, as amended. Public Law 94-579.

U.S. Department of the Interior, Bureau of Land Management, Buffalo Field Office, Approved Resource Management Plan for Public Lands Administered by the Bureau of Land Management Buffalo Field Office April 2001.

U.S. Department of the Interior, Bureau of Land Management, Powder River Oil and Gas Project Final Environmental Impact Statement (FEIS) and Resource Management Plan Amendment. April 30, 2003.

U.S. Department of the Interior, Bureau of Land Management. April 2003. Record of Decision (ROD) and Resource management Plan Amendments for the Powder River Basin and Gas Project. Wyoming State Office, Buffalo Field Office.

U.S. Fish and Wildlife Service (USFWS). 1989. Black-footed ferret Survey Guidelines for Compliance with the Endangered Species Act. Denver, CO and Albuquerque, NM.

U.S. Fish and Wildlife Service. 2002. Final Biological and Conference Opinion for the Powder River Oil and Gas Project, Campbell, Converse, Johnson, and Sheridan Counties (WY6633). U.S. Fish and Wildlife Service. December 17, 2002. Cheyenne, WY. 58pp

Walker B, Naugle D, Rinkes T. 2003. The Response of Sage Grouse to Coal-bed Methane Development and West Nile virus in the Powder River Basin: Is There a Link ? Page 6 in: Program and Abstracts for

the Annual Wildlife Society Meeting, Wyoming Chapter.

WDEQ, June 14, 2004. Compliance Monitoring for
Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments

WGFD. 2003. Wyoming Greater Sage-Grouse Conservation Plan. WGFD. Cheyenne, WY

Wyoming Game and Fish Department (WGFD). 2004. Minimum Recommendations for Development of Oil and Gas Resources within Crucial and Important Wildlife Habitats on BLM Lands. WGFD. Cheyenne, WY

8. LIST OF INTERDISCIPLINARY TEAM PREPARERS AND REVIEWERS

Julian Serafin, Natural Resource Specialist
Kathy Brus, Natural Resource Specialist
Randy Nordsven, Supervisory Natural Resource Specialist
Chris Williams, Hydrologist
Dane Geyer, Petroleum Engineer
Norma Cope, Legal Instruments Examiner
Leigh Grench, Archaeologist
Guymen Easdale, Wildlife Biologist
Gerald Queen, Geologist
Paul Beels, Associate Field Manager, Minerals & Lands
Chris E. Hanson, Field Manager

Interdisciplinary Team Lead: Julian Serafin