

United States Department of the Interior Bureau of Land Management

Environmental Assessment MT-92234-07-59

Finding of No Significant Impact and Decision Record

Fidelity Exploration & Production Company
Bowdoin Natural Gas Development Project
Phillips and Valley Counties, Montana

U.S. Department of the Interior
Bureau of Land Management
Malta Field Office and Great Falls Field Station

December, 2008





In Reply To:
1792 (MT92234)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Great Falls Oil and Gas Field Station
1101 15th Street North
Great Falls, Montana 59401
(406) 791-7700
<http://www.blm.gov/mt>



Re: Environmental Assessment for the
Bowdoin Natural Gas Development Project

December 5, 2008

Dear Reader:

We are providing you a copy of the enclosed Decision Record for your information and use. The Decision Record identifies BLM's decision, explains the rationale for reaching the decision, and includes the additional requirements for implementation of the Bowdoin Natural Gas Development Project.

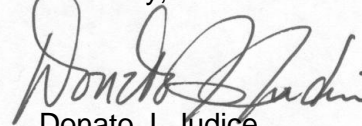
On July 7, 2008, the BLM released the Environmental Assessment for the Bowdoin Natural Gas Development Project. The environmental assessment (EA) was prepared pursuant to the National Environmental Policy Act and other regulations and statutes in order to fully disclose the potential environmental impacts of the alternatives (Proposed Action, No Action and Maximum Development alternatives). In addition, the release of the EA served to solicit public comment on the alternatives and analysis. The EA identifies mitigation measures incorporated into the Proposed Action to reduce potential impacts.

A notification of this decision and a link to this Decision Record has been sent to governmental entities, individuals, and organizations who commented on this project or who have expressed interest in mineral-related activities proposed on BLM-administered public lands.

The BLM wishes to thank those individuals and organizations who provided input during this process. Your input has been essential in considering issues important to you.

If you require additional information regarding this decision, please contact me, Donato J. Judice, Project Manager, at the address shown above or phone (406) 791-7789.

Sincerely,



Donato J. Judice
Field Station Supervisor

Enclosure

Finding of No Significant Impact / Decision Record

Malta Field Office and Great Falls Field Station

INTRODUCTION:

The Bureau of Land Management (BLM) completed an Environmental Assessment (EA), No. MT-92234-07-59, of the Bowdoin Natural Gas Development Project which was proposed by Fidelity Exploration & Production Company (Fidelity), representing itself and five other operators (Noble Energy, Inc.; Decker Operating, LLC; Omimex Canada, Ltd.; Athena Energy, LLC; and Bitter Creek Pipelines, LLC, collectively referred to as the Operators). The EA includes the drilling, completing, and producing of a total of 1,225 wells (635 federal) at individual locations in the Bowdoin Natural Gas Production Area (BNGPA). Construction and installation of the associated infrastructure, management of produced water, treatment of weeds, and reclamation of disturbed areas are included in the EA. The aforementioned wells would be drilled and completed in the Upper Cretaceous including, but not limited to, the Niobrara, Bowdoin (Carlile), Greenhorn, Mowry, Phillips, and Belle Fourche Formations (a/k/a the Colorado Group). Drilling is expected to last for approximately 10 to 15 years, with a life-of-project (LOP) of 30 to 50 years. This includes an expected average production life of the project wells of 10 to 20 years each, with final reclamation to be completed 2 to 3 years after plugging of the wells.

The EA analyzed three alternatives to the Proposed Action: (A) the No Action Alternative, (B) the Proposed Action with Additional Mitigation, and (C), the Maximum Development Alternative. The EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination.

PLAN CONFORMANCE AND CONSISTENCY:

The proposed project has been reviewed and found to be in conformance with prescribed management actions for protecting resources from surface-disturbing activity, as set forth in the following BLM plans and associated Record(s) of Decision:

1. *Judith Valley Phillips Resource Management Plan (JVPRMP)*, September 1994
2. *Environmental Assessment for Proposed FMP Operating Company Drilling Program in the Loring Unit, East Loring Field, West Loring Field, Whitewater Unit, East Whitewater Field, Swanson Creek Field, Ashfield Unit, Hinsdale Unit, and the Bowdoin Unit*, May 1989
3. *Fieldwide Drilling Operations Plan for Drilling and Surface Use for All Fields / Units / Leases (Federal) in Phillips County and All Fields / Units / Leases West of Hinsdale in Valley County*, March 2005

FINDING OF NO SIGNIFICANT IMPACT DETERMINATION:

Based upon a review of the EA and the supporting documents, I have determined that the project is not a major federal action significantly affecting the quality of the human environment individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity, as defined in 40 CFR 1508.27, or

exceed those effects described in the JVPRMP. Therefore, an environmental impact statement is not needed. This finding is based on the context and intensity of the project as described below.

Context: The proposed project is in the BNGPA located in Phillips and Valley counties in north-central Montana. The BNGPA is an active gas field that produces natural gas from federal, state, and private wells. The proposed project would add approximately 140 exploratory wells and 680 development wells, replace 435 non-producing wells at individual locations, and create a long-term disturbance to an additional 2,011 acres within the BNGPA. Gas from the BNGPA is transported to other states for commercial uses.

Intensity: The following discussion is organized around the 10 Significance Criteria described in 40 CFR 1508.27.

1. Impacts may be both beneficial and adverse.

The proposed project would impact resources as described in the EA. In addition to mitigation measures included in the project design, BLM developed additional mitigation measures to further minimize or eliminate adverse impacts to other resources and land uses. These additional mitigation measures are included in the Preferred Alternative. The EA also disclosed beneficial impacts from the proposed project to land owners, the local economy and to local, state, and federal governments from increased revenues. None of the environmental effects discussed in detail in the EA are considered significant, nor do the effects exceed those described in the JVPRMP.

2. The degree to which the selected alternative will affect public health or safety.

The selected alternative is designed to minimize impacts to other resources as well as to public health and safety. The project area currently contains active natural gas production fields, and surface ownership is split among private (61 percent), federal (33 percent), and state of Montana (6 percent) lands. Increased development activity will result in increased potential for interaction and conflict between recreationists, land owners, and development-related personnel, as well as increased traffic encounters. Existing procedures for emergency planning, employee training, and responder notification will continue to be implemented. Public exposure to hazardous materials will not change from the current condition. The mitigation measures in the selected alternative will minimize or eliminate adverse impacts to the public.

3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.

The historic and cultural resources of the area have been reviewed by an archeologist, the State Historic Preservation Office (SHPO), and affected Tribes. The potential impacts will be mitigated in the design of the preferred alternative. Impacts to wetlands are expected to be negligible. There are no effects on park lands, prime farm lands, wild and scenic rivers, or ecologically critical areas, because none of these are located within or adjacent to the project area.

4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.

A number of comments received from the public expressed support for the economic benefits of Alternatives B and C. Other members of the public expressed concerns regarding potential impacts to prairie pothole wetlands, recreation, socioeconomics, surface water, wildlife, and visual resources. A summary of public comments and responses is included as Appendix B to this Decision Record. The selected alternative includes mitigation measures that are designed to minimize or eliminate adverse impacts to resources and the quality of the human environment. The Operators are required to have all approved permits from local, state, and federal agencies with jurisdiction over components of the proposed project. Additionally, the project is located within current development.

5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The proposed project is not unique or unusual. The BLM and the State have approved similar projects, including the mitigation measures found in the selected alternative, for existing development within the project area. Monitoring inspections and data of these previously approved projects have shown minimal adverse impacts. There are no predicted effects on the human environment that are considered to be highly uncertain or involve unique or unknown risks.

6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

The actions considered in the selected alternative were considered by the interdisciplinary team within the context of past, present, and reasonably foreseeable future actions. Approval of the proposed project would not set a precedent because the proposed project would authorize the installation of additional wells and infrastructure in a producing gas field. The environmental analysis did not show significant effects from the proposed project by itself or in addition to past, present, and reasonably foreseeable future actions in the general area.

7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

The interdisciplinary team evaluated the proposed project in the context of past, present, and reasonably foreseeable actions. The environmental analysis did not show significant effects from the proposed project by itself or in addition to past, present, and reasonably foreseeable future actions in the general area.

8. The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

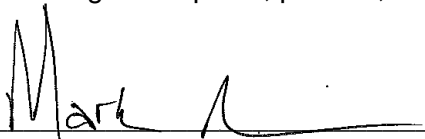
The project will not adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places, nor is it likely to cause loss or destruction of significant scientific, cultural, or historical resources. The historic and cultural resources of the area have been inventoried by BLM, the SHPO, and affected Tribes. Mitigation measures will be negotiated between the BLM, the SHPO and possibly the Tribes or local historical societies.

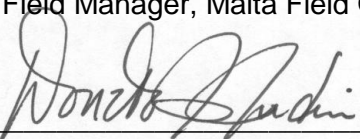
9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

No piping plover Critical Habitat was designated within the BNGPA. A portion of Bowdoin NWR in Phillips County was designated as piping plover Critical Habitat in 2002 and is closed to oil and gas leasing (USFWS 2002). Nelson Reservoir, which is within the BNGPA, was proposed as Critical Habitat but not designated due to current conservation agreements with Bureau of Reclamation (USFWS 2002a).

10. Whether the action threatens a violation of a Federal, State, Local, or Tribal law, regulation, or policy imposed for the protection of the environment, where non-Federal requirements are consistent with Federal requirements.

The project does not violate any federal, state, local or tribal law or requirement imposed for the protection of the environment. State, local, and tribal interests were given the opportunity to participate in the environmental analysis process. Furthermore, the project is consistent with applicable land management plans, policies, and programs.

Approved by: 
Field Manager, Malta Field Office

Approved by: 
Field Station Supervisor, Great Falls Field Station

Summary of the Proposal

The Operators propose to develop natural gas wells on federal, state, and private land in the Bowdoin Natural Gas Production Area. The project area is located in T. 30–37N, R. 29–36E, in Phillips and Valley counties, Montana, and is part of the Bowdoin Natural Gas Production Area. The Proposed Action requiring a decision includes the construction, drilling, and production of a total of 635 federal wells and installing the associated infrastructure serving federal leases within the project area, as well as reclaiming disturbed areas and plugging federal wells when they are no longer needed.

Decision

Based upon the analysis of potential environmental impacts described in the *Bowdoin Natural Gas Project Environmental Assessment (EA)*, it is my decision to select Alternative B from the EA and approve the Proposed Action with Additional Mitigation, submitted by the Operators and modified by conditions of approval.

Approved project components include:

- Construction, drilling, completion, production, routine operation, and reclamation of up to 635 federal wells on individual sites.

- Construction of new access roads and facilities associated with natural gas development, including gas-gathering pipelines, water-gathering pipelines, compressor stations, and production facilities.
- Upgrade, use, and maintenance of existing roads.
- Disposal of produced water using evaporation ponds constructed at each well site.
- Use of solar, wind, and natural gas-fired engines as external power sources, and installation of electrical power lines on a site-specific, case-by-case basis.
- Use of remote electrical devices to measure temperature, pressure, and well flow at individual well sites.

This decision is effective immediately. Actions may begin immediately in accordance with any restrictions or constraints imposed by lease stipulations, permit conditions of approval, or surface owner agreements.

Authorities: The authority for this decision is contained in 43 CFR 3162.3-1.

Rationale for Decision: Alternative B, the BLM's Preferred Alternative, is in conformance with the management actions for protecting resources from surface-disturbing activity sections of the Judith Valley RMP, September 1994. The best management practices identified in Appendix A of the JVPRMP are applicable to this proposal. These practices apply to all surface-disturbing activities. This decision is in conformance with the overall planning direction of BLM for the area. Standard and special protective measures were identified and incorporated into the BLM Preferred Alternative to reduce or eliminate impacts. The Preferred Alternative provides the opportunity to continue exploring for and developing natural gas resources that may be found on federal leases while providing for the protection of other resources.

Appeal: You have the right to request a State Director Review of this decision and these Conditions of Approval pursuant to 43 CFR 3165.3(b). An SDR request, including all supporting documentation, shall be filed with the Montana State Office, State Director (MT-920) at 5001 Southgate Drive, Billings, Montana 59101-4669, within 20 business days of your receipt of this decision. If adversely affected by the State Director's decision, it can be further appealed to the Interior Board of Land Appeals (IBLA) pursuant to 43 CFR 3165.4, 43 CFR 4.411, and 43 CFR 4.413. If a statement of reasons for the appeal is not included with the notice, it must be filed with the Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203, within 30 days after the notice of appeal is filed with the authorized officer.

If you wish to file a petition for stay pursuant to 43 CFR Part 4.21(b), the petition for stay should accompany your notice of appeal and shall show sufficient justification based on the following standards:

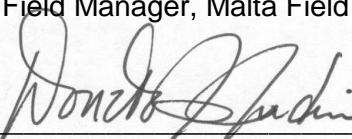
- (1) The relative harm to the parties if the stay is granted or denied,
- (2) The likelihood of the appellant's success on the merits,
- (3) The likelihood of irreparable harm to the appellant or resources if the stay is not granted, and
- (4) Whether the public interest favors granting the stay.

If a petition for stay is submitted with the notice of appeal, a copy of the notice of appeal and petition for stay must be served on each party named in the decision from which the appeal is taken, and with the IBLA at the same time it is filed with the authorized officer.

A copy of the notice of appeal, any statement of reasons, and all pertinent documents must be served on each adverse party named in the decision from which the appeal is taken and on the Office of the Regional Solicitor, U.S. Department of the Interior, P.O. Box 31394, Billings, Montana 59107-1394, not later than 15 days after filing the document with the authorized officer and/or IBLA.

Should you fail to timely request an SDR, or after receiving the State Director's decision, fail to timely file an appeal with IBLA, no further administrative review of this decision would be possible.

Approved by:  _____
Field Manager, Malta Field Office

Approved by:  _____
Field Station Supervisor, Great Falls Field Station

APPENDIX A: ERRATA

Appendix A to the Decision Record

ERRATA

Modifications and Corrections to the Bowdoin Natural Gas Project Environmental Assessment

Chapter 2—Alternatives Including the Proposed Action

Page 2-16, Table 2.2-6 and Table 2.2-4

Table 2.2-6 has been revised to reflect 365 units on federal surface and 185 on other surface for Decker. Table 2.2-4, showing Artificial Lift for All Operators, has been revised to reflect 575 units on federal surface and 415 units on other surface.

Page 2-25, Wildlife, immediately after bullet 6. The following bullets have been added:

- Manage produced water to reduce the spread of West Nile virus within sage-grouse habitat areas. Implement the following impoundment construction techniques and measures to eliminate water sources that support breeding mosquitoes:
 - Overbuild the size of ponds to accommodate a greater volume of water than is discharged. This will result in non-vegetated and muddy shorelines that breeding mosquitoes avoid.
 - Build steep shorelines to reduce shallow water and aquatic vegetation around the perimeter of impoundments. Construction of steep shorelines also will increase wave action that deters mosquito production.
 - Maintain the water level below rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Always avoid flooding terrestrial vegetation in flat terrain or low-lying areas.
 - Use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
 - Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure, and create hoof-print pockets of water that are attractive to breeding mosquitoes.
 - Use adulticides to target adult mosquito populations and larvicides to control the hatching of mosquito larvae, using approved pesticides and utilizing licensed applicators with a Pesticide Use Plan.

Page 2-25, Wildlife, immediately after bullet 14. The following bullet has been added:

- Implement reduced speed limits to reduce potential for vehicle/wildlife collisions.

APPENDIX A: ERRATA

Page 2-26, Transportation and Access, third bullet. The following mitigation measure was added:

- Provide all drivers with a training session describing the types of wildlife species in the area that are susceptible to vehicular collisions to reduce the potential for vehicle/big game collisions. The circumstances under which such collisions are likely to occur, and the measures that could be employed to minimize them, should be discussed. Reduced speed limits would be implemented to reduce potential for vehicle/wildlife collisions.

Page 2-43, Table 2.3-1, Affected Resource & Effect Indicators: Production traffic

In column 2, Existing Resource Conditions, the second sentence (beginning on line four) has been revised to read: “25 percent of wells require water hauling, requiring an average of two trips/ week to those wells.”

Column 3, Alternative A, has been revised to read: “Diminishing levels of well maintenance traffic resulting from reductions in total producing wells in the field. Early increases in produced water disposal-related trips as the 25 percent of wells requiring produced-water disposal age and produce less gas and more water and as new wells using artificial lift come online. Eventual reductions in total produced-water trips as wells requiring produced-water disposal cease production at higher rates than new wells requiring produced-water disposal, and wells using artificial lift come online.”

Column 4, Alternative B, has been revised to read: “Traffic related to well maintenance would diminish initially, then increase as total producing wells increase to 1,500 by 2022. Maintenance traffic would steadily decline thereafter. Produced-water disposal-related traffic would increase as the number of wells requiring produced-water disposal increase until these wells begin to cease production.”

Column 5, Alternative C, has been revised to read: “Well maintenance traffic would steadily increase as total wells increase to 2,084 by 2022 and steadily decline thereafter as wells cease production. Produced-water disposal-related traffic would continue to increase after 2022 as the estimated 25 percent of wells requiring produced-water disposal age and produce less gas and more water. This increase would continue until these wells begin to cease production.”

Page 2-43, Table 2.3-1, Affected Resource & Effect Indicators: Road maintenance

Column 3, Alternative A, has been revised to read: “Lower maintenance demand associated with lower drilling levels and fewer wells in production, with the exception of access roads for produced-water disposal facilities.”

Column 4, Alternative B, has been revised to read: “Higher drilling-related road maintenance demand during first 10 years of drilling. Similar higher levels of production and produced-water disposal-related demand.”

Column 5, Alternative C, has been revised to read: “Substantially higher levels of drilling, production and produced-water disposal -related road maintenance demand.”

APPENDIX A: ERRATA

Chapter 3—Affected Environment

Page 3-14, Oil and Gas. The text of the referenced section has been revised to read as follows:

“The oil and gas resources of the Bowdoin Dome have been known since before World War I. Natural gas was discovered in 1913 with production beginning the same year. Natural gas production was very limited until 1929, and by the end of 1930, there were approximately 25 producing natural gas wells that serviced Glasgow and Malta.”

Page 3-91, Wildlife, paragraph 2. The paragraph has been revised to read as follows:

“Mosquitoes can potentially breed in any standing water that lasts for more than four days. As the number of wells increases, the amount of produced surface water will increase. Unless measures are taken to make evaporation pits unattractive mosquito breeding habitat, an increase in surface water has the potential to increase mosquito breeding habitat, mosquitoes, and incidences of WNV.”

Page 3-127, Wildlife, Greater sage-grouse, paragraph 2, and Table 3.13-2. The entire paragraph beginning with the second sentence, and the subsequent table, have been revised to read as follows:

The majority of the BNGPA is comprised of vast grassland prairies and is considered sub-optimal habitat because it is fragmented and sagebrush-limited. Silver sage is the predominant sage species intermixed in the prairies in the northern portion of the BNGPA. The most variable and fragmented habitat is concentrated around the Milk River Valley and the U.S. Highway 2 corridor where the majority of human habitations are concentrated. Habitat with sagebrush-limited cover exists around several leks near the Milk River and Whitewater Creek in the western and central portions of the BNGPA, respectively, and in the northeastern part of the BNGPA around the Thoeny Hills area. Excellent habitat with adequate sagebrush and understory cover is located in the Saco Hills in the southern portion of the BNGPA. Some winter habitat in sagebrush exists along the Milk River on the western side of the BNGPA, although it may not be occupied by sage-grouse during mild winters. Only small numbers of birds have been observed in the area in recent years during winter (D. Prellwitz, BLM, unpublished data).

Table 3.13-2. Condition of Greater Sage-grouse Habitat Within the BNGPA

Habitat Condition	Acres of Habitat	Percentage of BNGPA
Excellent	59,673	7.3
Sagebrush limited	138,539	17.1
Fragmented/Variable	614,177	75.6

Page 3-127, Wildlife, Greater sage-grouse, last paragraph. The second sentence has been revised to read as follows:

“Eight active leks are located within the BNGPA.”

Page 3-129, Figure 3.13-2, ‘Habitat Condition Classes and Two-mile Buffers of Greater Sage-grouse within the BNGPA’ has been updated to correctly show sage-grouse habitat and one additional lek.

APPENDIX A: ERRATA

Chapter 4—Environmental Consequences

Page 4-1, paragraph 7, Cumulative Impacts. The text has been revised and augmented to read as follows:

“NEPA requires an assessment of potential cumulative impacts. Federal regulations (40 CFR 1508.7) define cumulative impacts as:

‘...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.’

Potential cumulative impacts are assessed at the resource level. The cumulative impact analysis area (CIAA) for past, present, and reasonably foreseeable future activities (RFFAs) that may generate cumulative impacts varies depending on the resource under consideration. For example, the CIAA for air quality effects is regional in nature; therefore, the scope of activities considered is necessarily broad. In contrast, the CIAA for geology and minerals considers the project area associated with the Proposed Action and alternatives; therefore, the scope of potential cumulative activities considered is much narrower. Cumulative impacts may result when the environmental impacts associated with a proposed project are added to temporary or permanent impacts associated with past, present, or reasonably foreseeable future projects. Although the individual impact of each separate project might not be significant, the additive impacts of multiple projects could be.

Existing environmental conditions in the project area reflect changes based on past projects and activities. The project area is located in an area in Montana with limited industrial activity other than ongoing natural gas exploration and production. All surface disturbances resulting from the Proposed Action would take place within areas leased for natural gas production. The primary human influences on the project area are natural gas development (including a number of pipelines and compressor stations; see Figure 2.2-1) and livestock grazing.

This discussion of potential cumulative impacts assumes the successful implementation of the environmental protection and mitigation measures discussed in chapters two and four of this EA as well as compliance with the JVRMP and all applicable federal, state, and local regulations and permit requirements.”

Page 4-12, Geology, Minerals, and Paleontology, Alternative B—Proposed Action with Additional Mitigation. The referenced text has been revised to read as follows:

“The Proposed Action includes drilling, completion, and production of 558 private wells, 635 federal wells, and 62 state wells; construction of associated infrastructure including access roads, flowlines, and power lines; reclamation of disturbed areas; application of existing water management options; and the use of meter and compressor facilities.”

Page 4-17, Wastes, Hazardous and Solid, Alternative B—Proposed Action with Additional Mitigation. A discussion of cumulative impacts has been added, as follows:

“Alternative B impacts would be greater and more widespread than those identified in Alternative A, resulting in an increased volume of hazardous materials being transported into the project area, as well as an increase in the volume of associated waste being disposed of in the area. Additional solid waste generated within the project area would be disposed of at off-

APPENDIX A: ERRATA

site permitted disposal facilities. Produced-water volumes would increase as a result of the increased number of wells operating and the increased number of wells on artificial lift systems. In Alternative B, increased on-site waste disposal would occur on private and BLM-managed lands while transportation of materials would occur throughout the project area.”

Page 4-14, Public Health and Safety, Alternative B—Proposed Action with Additional Mitigation. A discussion of cumulative impacts has been added, as follows:

“Alternative B impacts would result in an increased risk to public and worker safety in the project area when compared to Alternative A. This increased risk would be related to the increased level of development activity occurring in the project area on both private and BLM-managed lands. The potential for increased recreational use in the project area would enhance potential conflict, increase traffic-related hazards, and increase public exposure to development and production operations. Background levels of interface between the recreating public, agricultural operations, and existing gas production operations would continue.”

Page 4-15, Noise, Alternative B—Proposed Action with Additional Mitigation. A discussion of cumulative impacts has been added, as follows:

“Alternative B would result in increased noise levels across the project area as new and existing wells are placed on artificial lift systems and additional compression is put online throughout the gas-gathering system, when compared to Alternative A. There are no other known, planned or reasonably foreseeable developments within the project area that would further increase area noise levels. Ambient noise would continue to be impacted by recreational and agriculture-related traffic through the area, continued gas production operations, livestock grazing and wind.”

Page 4-64, Access and Transportation, Direct and Indirect Impacts, paragraph 1. The following text has been added at the end of the paragraph:

“Wells without artificial lift would produce increasing volumes of water as gas production declines increasing disposal trips for the estimated 25 percent of wells requiring produced-water disposal. Wells using artificial lift would produce higher volumes of water in the first year, and produce diminishing volumes of water each year thereafter requiring correspondingly fewer produced-water disposal trips each year. Overall produced-water disposal trips under Alternative A would diminish over time as existing wells cease production at higher rates than new wells are brought online.”

Page 4-64, Access and Transportation, County Roads. The sentence beginning on line 9 of the first paragraph has been revised to read as follows:

“The decline in traffic associated with producing wells would be offset by increased water production in some wells, which would increase as the gas pressure decreases and by increases in wells using artificial lift methods.”

Page 4-65, Access and Transportation, **BLM Roads**. The second sentence beginning on line 3 has been revised to read as follows:

“BLM roads to existing wells would also experience reductions in traffic as the number of operating wells diminishes, except for the estimated 25 percent of wells requiring produced-water disposal. Over time, reductions in BNGPA traffic associated with fewer producing wells,

APPENDIX A: ERRATA

including fewer wells requiring produced-water disposal, would correspondingly reduce BLM road maintenance requirements.”

Page 4-65, Access and Transportation, Section 4.10.2 Alternative B, Direct and Indirect Impacts, paragraph 2. The first sentence has been revised to read as follows:

“Alternative C further assumes that an average of two drilling and completion rigs and gathering system construction crews would be required to achieve the Alternative B drilling rate during the first 10 years...”

Page 4-65, Access and Transportation, Section 4.10.2 Alternative B, Direct and Indirect Impacts, paragraph 3. The following text has been added to the end of the paragraph:

“...with the exception of produced-water disposal-related traffic. Trips from the estimated 25 percent of wells requiring produced-water disposal would be anticipated to increase as gas production in these aging wells decreases. Wells using artificial lift would also produce higher volumes of produced water in earlier years, diminishing each year thereafter and requiring correspondingly fewer disposal-related trips each year. Trips associated with water collection at individual well pads would be relatively infrequent; traffic on access roads leading to produced-water disposal sites would increase.”

Page 4-66, Access and Transportation, Federal and State Highways, paragraph 2. The following text has been added to the end of the paragraph:

“...with the exception of produced-water disposal-related trips which would be anticipated to increase.”

Page 4-66, Access and Transportation, County Roads, paragraph 2. The paragraph has been revised to read as follows:

“Conversely, the number of producing wells in the BNGPA is anticipated to decrease in the near term under Alternative B, resulting in a corresponding decrease in well and pipeline maintenance trips, decreasing that aspect of county road maintenance demand. Water-hauling trips would increase as the 25 percent of wells that require produced-water disposal and the number of wells that use artificial lift would increase. This would result in higher road maintenance demands, particularly on those roads that provide access to produced-water disposal facilities.”

Page 4-66, Access and Transportation, BLM Roads, paragraph 1. The following sentence has been added to the end of the paragraph:

“As with county roads, produced-water disposal-related trips on BLM roads would increase under Alternative B.”

Page 4-67, Access and Transportation, Section 4.10.2 Alternative C, paragraph 2. The paragraph has been revised to read as follows:

“The use of an average of three drilling rigs and associated completion and gathering system construction crews under Alternative C would increase the BNGP-related drilling/field-development traffic during July through November by about 200 percent during the first 10 years of development.”

APPENDIX A: ERRATA

Page 4-67, Access and Transportation, Section 4.10.2 Alternative C, paragraph 3. The following text has been added to the end of the paragraph:

“...although the number of produced-water disposal trips would continue to increase as the estimated 25 percent of existing and new wells that would require produced-water disposal age and produce less gas and more water. The number of wells using artificial lift would also increase, producing more water in the earlier years, and producing lower volumes of water requiring diminishing numbers of disposal trips in subsequent years.”

Page 4-67, Access and Transportation, Direct and Indirect Impacts, Federal and State Highways, paragraph 1. The following text has been added to the end of the paragraph:

“Production-related well and pipeline maintenance and water-hauling trips would also increase under Alternative C, but the volume of these trips would similarly be unlikely to affect the level of service on these highways.”

Page 4-67, Access and Transportation, paragraph 1. The first complete sentence at the top of the page has been revised to read as follows:

“Similarly, the number of producing wells in the BNGPA would be substantially increased under Alternative C, resulting in a corresponding increase in well maintenance and water-hauling trips, further increasing county road maintenance demand, particularly on county roads providing access to water-disposal facilities.”

Page 4-72, Wildlife, paragraph 1. The following sentence has been inserted at line , immediately following the sentence that reads “The increase in vehicle traffic would result in an increase in collision-related mortalities to all wildlife species:”

“Road-kill rates are affected by species population densities, traffic volume and speed, and proximity of habitat cover and wildlife movement corridors.”

Page 4-73, Wildlife, Big Game Species, bullet 2. A third bullet has been added, as follows:

- Coordinate with MFWP to formulate and implement a removal program for wildlife carcasses along roadways to avoid further mortality of raptors attracted to carcasses.

Page 4-74, Wildlife, bullet 10. An additional bullet has been added, as follows:

- Avoid and minimize above-ground power lines in areas with sage-grouse habitat condition designated as Excellent and Sagebrush Limited, respectively.

Page 4-75, Wildlife, last bullet, fourth line. The text has been revised to read as follows:

“Construction activities would be prohibited within one mile of an active nest of listed or sensitive raptor species, and $\frac{3}{4}$ – $\frac{1}{2}$ mile (depending upon species or line of sight) of an active nest of other raptor species from March 1 – August 31 (depending on species), or until fledging and dispersal of the young. The nature of the restrictions and the protection radius would vary according to the raptor species involved and would be determined by the BLM.”

Page 4-79, Wildlife, Section 4.12.2 Alternative C—Proposed Action with Additional Mitigation, Direct and Indirect Impacts, line 10. The remainder of the paragraph beginning with “Due to limited information...” have been revised to read as follows:

APPENDIX A: ERRATA

“It is reasonable to consider that increases in energy development infrastructure and density could potentially cause an increase in negative effects to certain species, depending upon the scale at which the species respond. Negative effects may not be directly proportional to the increase in disturbance. Nevertheless, big game populations within the BNGPA currently do not appear at risk. Long-term trends in big game populations (i.e., pronghorn, mule deer, and white-tailed deer) monitored within and around the BNGPA demonstrate that populations of these species have remained stable or are on the increase despite oil and gas development within the BNGPA for approximately 70 years. Mule deer and white-tailed deer numbers in the region are described as exceeding population objectives (MFWP 2008), and pronghorn populations have increased dramatically recently and are at the highest levels in the last 10 years (MFWP 2007a, 2008a). Overall, the direct and indirect impacts are greater under the Proposed Action in comparison with Alternative A but less than impacts under Alternative C.”

Page 4-81, Wildlife, Cumulative Impacts. The section has been revised to read as follows:

“Past, present, and reasonably foreseeable future actions applicable to the proposed Bowdoin Natural Gas Project would include a number of activities associated with past and present mineral exploration and development in the region in addition to historic land uses, such as livestock grazing; specifically, these include past oil and gas exploration and development by operators (Fidelity Exploration, Noble Energy, Omimex Canada, Ltd, and Decker Operating Company) and associated reclamation, livestock grazing, road development, utility corridor placement, and some degree of increased recreational access and use (e.g., hunting).

“Various roadways are present within the area. The towns of Loring and Whitewater are located in the northern portion of the Cumulative Impact Assessment Area (CIAA) and include housing- and municipality-related surface disturbance. The impacts contributed from the towns of Loring and Whitewater are unknown.

“Past actions on or in the vicinity of the BNGPA include previous well exploration and development by various operators, existing water containment reservoirs, county and other ancillary access roads, livestock grazing, and a variety of operations on private land.

“Under the Proposed Action, Alternative B, total short-term disturbance for drill pads, access roads, and ancillary facilities would be approximately 2,638 acres (0.324 percent of the overall project area). Construction and drilling activities are proposed for a 20-year period from the start of the project. Approximately 53 percent of the initial disturbance (e.g., 50 percent of each well pad disturbance, and 100 percent of pipelines disturbance) would be reclaimed after construction; therefore, an estimated 1,248 acres (0.154 percent of the project area) would remain disturbed in the long term. This area would be reclaimed at the conclusion of the estimated 30 to 50-year project life.

“The CIAA or cumulative domains for terrestrial wildlife vary by wildlife group, based on the species’ relative mobility, home ranges, and habitat use. For most species, the CIAA encompasses the project area and most of the species’ home ranges. Specific to big game species and seasonal ranges, the deer CIAA encompasses MFWP Region 6 and includes Deer Herd Districts 600, 610, 611, 620, 621, 622, 630, 631, 632, 640, 650, 651, 652, 670, 680 and 690. The pronghorn CIAA also encompasses MFWP Region 6 and includes Antelope Herd Districts 600, 610, 620, 630, 640, 650, 651, 670, and 690. For most migratory birds, the CIAA includes the project area plus a one-mile buffer, and for smaller, less-mobile species (e.g., small mammal species), the area extends approximately 0.5-mile beyond the BNGPA boundary.

APPENDIX A: ERRATA

“Past, present, and reasonably foreseeable future actions applicable to terrestrial wildlife species would include a number of activities that have occurred across the landscape within these cumulative impact domains; specifically, these include past oil and gas exploration and development, subsequent reclamation, livestock grazing, road development, utility corridor placement, and some degree of increased recreational access and use (e.g., hunting). Associated facilities would include access roads, gas pipelines, compressor stations, water disposal systems, and a power supply system.

“Cumulative effects to regional terrestrial wildlife species would parallel those issues identified and discussed in **Section 4.12, Wildlife**. The past, present, and future activities combined with the proposed BNGP would incrementally contribute to overall habitat loss and fragmentation, short- and long-term animal displacement, increased vehicle mortalities, increased noise levels and human presence, and increased hunt and possible poaching.

“Anticipated cumulative effects to big game species is one of the more important terrestrial wildlife resource issues associated with the increased oil and gas development, including the cumulative effects issues examined for the Proposed Action. Crucial winter range is most important to pronghorn and mule deer during severe storm events, years of high snowpack, or during extended and extreme winter conditions. These environmental conditions force the pronghorn into the lower elevations that historically contained suitable forage and thermal cover necessary to support animals during periods of stress. Displacement of individual pronghorn and mule deer into adjacent areas of winter range that may or may not be characterized by plants of reduced vigor, productivity, and nutritional quality may contribute to a decline in the distribution and size of these populations.

“Animals may experience severe physiological stress during the winter period—particularly gestating does, which require higher levels of energy for survival and successful reproduction. Specific to mule deer, Hobbs (1989) determined that human-induced disturbances to mule deer (i.e., two disturbances per day, each disturbance causing the animals to move a minimum of 1,500 feet) during a severe winter period could double doe mortality. Mule deer in South Dakota require an average of 3.5 to 4 pounds of dry-weight daily forage per 100 pounds of body weight during the winter season (Richardson and Petersen 1974). Therefore, disturbances during the winter could prevent access to sufficient amounts of forage to sustain individual deer. A deer’s ability to survive the winter and a doe’s ability to produce viable offspring ultimately depend on their fat reserves, which are continuously used during the winter. Increased stress that causes these fat reserves to be used faster reduces survival for deer, as well as for intrauterine fawns. Therefore, increased human activity or harassment combined with a severe winter event could lower both deer survival rates (Richardson 1992; Yarmoloy et al. 1988) and doe fecundity. These factors would apply to the pronghorn and the mule deer winter ranges located within the CIAA.

“The established pronghorn CIAA encompasses 17,909,509 acres in MFWP Region 6. Available pronghorn winter range within this CIAA encompasses an estimated 4,095,150 acres, including 150,831 acres within the BNGPA. In the long term, the Proposed Action could affect approximately 3.7 percent of total pronghorn winter range within the CIAA. This assumes that well density, human presence, and ancillary facilities would affect all pronghorn winter range within the BNGPA, and likely displace animals along the edges of this winter range during the life of the project. Competition between pronghorn displaced from the BNGPA and pronghorn in adjacent areas potentially would increase, creating additional localized impacts in winter range

APPENDIX A: ERRATA

bordering the BNGPA. An estimate of past and present surface disturbances within this same CIAA has not been calculated.

“Under the Proposed Action, Alternative B, well density is projected to be four wells per one-mile-square section and cumulative disturbances of up to 8.4 acres per one-square-mile (640-acre) section. Assuming full-field development (1,255 wells) over a 10- to 15-year period, the total short-term disturbance for drill pads, access roads, and ancillary facilities would be approximately 2,638 acres (0.324 percent of the overall project area). Approximately 53 percent of the initial site disturbance would be reclaimed after construction; therefore, an estimated 1,236 acres (0.154 percent of the project area) would remain disturbed in the long term. This area would be reclaimed at the conclusion of the estimated 30 to 50-year project life.

“Existing access roads in the vicinity of the BNGPA increasingly fragment native habitats. Although the effects of this fragmentation are not quantified, roads can disrupt large mammal populations, even if they do not present a physical barrier (Andrews 1990; Richardson 1992), as typically exhibited in more open grassland and scattered shrubland habitats. As an example, roads resulting from energy development in the Book Cliffs of Utah were shown to result in a greater impact to mule deer than the direct habitat loss (Karpowitz 1984). The cumulative development of regional access roads could continue to increase overall habitat fragmentation and animal displacement, both from the presence of the roads and from a change to the vegetation composition in proximity to the road margins. This change to vegetation would be caused by a change in soil temperature, level of dust accumulation, and moisture content (Vaillancourt 1995). Based on applicable resource studies, the plant community composition would likely be altered within 165 to 200 feet from the road edge (Gelhard and Belnap 2003; Baker and Dillon 2000).

“Combining the degree of specific habitat loss, fragmentation, human activity, and increased noise from past and present activities, including the Proposed Action, the cumulative impacts to big game species would reduce the amount of and access to crucial winter range available for these species. As the densities of wells, roads, pipeline rights-of-way, compressor stations, and other facilities continue to increase and expand, habitat is not only lost in these specific areas, but the effectiveness of the adjacent habitats (i.e., zone of influence) also may decrease. Displacement of individuals forces animals into marginal habitats or requires them to compete with animals already occupying adjacent areas. Increased displacement and inter- and intra-species competition ultimately may lower survival rates during the winter and decrease reproductive success, population numbers, and the range’s carrying-capacity. In summary, the effects of the Proposed Action would incrementally add to the cumulative effects on big game species in this area. The limited amount of crucial winter range for both pronghorn and mule deer cumulatively affected within the established CIAA would aid in keeping these effects more isolated. It is possible that the project might have a minimal effect on the abundance and/or distribution of some wildlife species at the scale proposed; however, significant impacts are not expected due to abundant suitable habitat throughout the BNGPA.

“No potential water quality or water quantity effects were identified for terrestrial wildlife species for the proposed Bowdoin Natural Gas Project. Not all wildlife can be excluded from reserve pits; consequently, some cumulative impacts to wildlife may occur through their inadvertent access to pits during project operation.

“Cumulative issues for other wildlife groups (e.g., waterfowl, water birds, raptors, passerines small- and medium-sized mammals, reptiles) would parallel the overall discussion on the anticipated habitat loss, fragmentation, some direct mortality (e.g., vehicle collisions, interred

APPENDIX A: ERRATA

burrowing animals), and animal displacement in the short and long term. As discussed in **Section 4.12, Wildlife**, the BLM has developed applicable mitigation measures and successful applicants for past, present and reasonably foreseeable projects have committed, and would be required to commit, to specific protection measures to minimize these effects.

“Residual cumulative effects after these measures are applied would encompass a further incremental reduction in the amount of available cover, foraging opportunities, and breeding areas for a variety of small and large species throughout the food chain in both the short and long term. Additional development potentially could preclude animals from using areas of more intensive human activity. However, the severity of the cumulative effects generally would depend on factors such as species sensitivity, seasonal intensity of use, type and duration of project activities, and physical parameters (e.g., topography, forage, thermal cover, slope, aspect).

“Residual cumulative impacts from habitat loss and fragmentation would be important to certain bird species, such as neotropical migrants (e.g., Swainson’s hawk, songbird species) that currently are experiencing additional population pressures from external factors unrelated to mineral development outside of the project area. A combination of local, regional, and international issues is impacting these overall populations; however, the anticipated cumulative effects would once again be considered to be isolated, incremental impacts to overall habitat availability for these species.

“In summary, the overall cumulative effects identified within the CIAAs delineated for terrestrial wildlife species would continue to contribute incremental direct, indirect, short-term, and long-term impacts to both resident and migratory species. Both protection and mitigation measures developed for the resource area and cumulative components would aid in minimizing impacts. However, residual impacts would remain that encompass overall habitat loss and fragmentation, some direct mortality, and some animal displacement, depending on a number of factors, including species sensitivity, habitat availability, buffering factors, existing prey base, and type of project-related activities. Cumulative impacts would be minimized by co-locating reasonably foreseeable future projects in existing utility corridors to the extent feasible, implementing measures that prohibit construction activities during sensitive wildlife periods, and controlling non-native, noxious weed species through management and reclamation.”

Page 4-84, Wildlife, paragraph 3, line 17. The sentence has been amended to show eight, rather than seven Greater sage-grouse leks. In addition, the last sentence has been revised and six bullet items added, as follows:

“Loss of nesting and brood-rearing habitat from construction activities under Alternative A could potentially result in the direct loss of 96 acres of excellent habitat initially, and 46 acres for the life of the project. In addition, impacts to Greater sage-grouse due to West Nile virus would be minimized by implementing the following BLM mitigation measures:

- Overbuild the size of ponds to accommodate a greater volume of water than is discharged. This will result in non-vegetated and muddy shorelines that breeding mosquitoes avoid.
- Build steep shorelines to reduce shallow water and aquatic vegetation around the perimeter of impoundments. Construction of steep shorelines also will increase wave action that deters mosquito production.

APPENDIX A: ERRATA

- Maintain the water level below rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Always avoid flooding terrestrial vegetation in flat terrain or low-lying areas.
- Use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
- Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure, and create hoof-print pockets of water that are attractive to breeding mosquitoes.
- Use adulticides to target adult mosquito populations and larvicides to control the hatching of mosquito larvae, using approved pesticides and utilizing licensed applicators with a Pesticide Use Plan.”

Page 4-85, Special Status Species, Cumulative Impacts, line 12. The remainder of the paragraph beginning with “However, due to abundant...” has been revised to read as follows:

“It is possible that the project might have a minimal effect on the abundance and/or distribution of sensitive species at the scale proposed; however, significant impacts are not expected due to abundant suitable habitat throughout the BNGPA. As new development occurs, direct and indirect impacts would continue to stress wildlife populations, most likely displacing larger, mobile species into adjacent habitat and increasing competition with existing local populations. Non-mobile animals would be affected by increased habitat fragmentation, interruptions to preferred nesting or denning habitats, and increased potential for predation. Properly implemented BLM and resource-specific mitigation measures should reduce impacts associated with the development phase of the project when the effects to wildlife populations would be greatest. Once the Proposed Action enters the production phase and human activity decreases and reclamation restores habitat, wildlife populations negatively affected by the initial development phase should increase and displaced animals should return to suitable habitat areas. Cumulative impacts would be minimized by co-locating reasonably foreseeable future projects in existing utility corridors to the extent feasible, implementing measures that prohibit construction activities during sensitive wildlife periods, and controlling non-native, noxious weed species through management and reclamation. Because effects of this project should be minor, they should not contribute to the cumulative effects of other area projects on fisheries/aquatics.”

Page 4-86, Section 4.13.2 Alternative B—Proposed Action with Additional Mitigation, Bird Species. The following sentence has been added to the end of the paragraph:

“Loss of Greater sage-grouse nesting and brood-rearing habitat from construction activities under Alternative B could potentially result in the direct loss of 193 acres of excellent habitat initially, and 91 acres for the life of the project.”

Page 4-87, Section 4.13.3 Alternative C—Maximum Development Alternative, Bird Species. The following sentence has been added to the end of the paragraph:

“Loss of Greater sage-grouse nesting and brood-rearing habitat from construction activities under Alternative C could potentially result in the direct loss of 292 acres of excellent habitat initially, and 138 acres for the life of the project.”

APPENDIX A: ERRATA

References. The following references have been added to reflect updated information:

- Montana Fish, Wildlife, and Parks. 2007. Major Lakes Data. Online
<<http://maps2.nris.mt.gov/mapper/MapWindow.asp?Profile=2684245&Cmd=Build+Reports>>
- _____. 2007a. Antelope numbers up in Phillips County, flat elsewhere in Region 6. Online
<http://fwp.mt.gov/news/article_5966.aspx>
- _____. 2008. 2008 Deer Hunting Outlook. Online <http://fwp.mt.gov/news/article_7308.aspx>
- _____. 2008a. 2008 Antelope Season Update. Online <http://fwp.mt.gov/news/article_7252.aspx>
- Montana Natural Heritage Program. 2007. Plant Guide. Online <<http://www.mtnhp.org/plants/index.asp>>
7 Mar 2007.

End Errata

APPENDIX A: ERRATA

This page intentionally left blank.

Appendix B to the Decision Record

Summary of EA Comments and BLM Responses

This EA was released for a 30-day public review period on July 7, 2008. A total of 39 comment letters were received (one after the close of comment period but prior to decision). The letters were reviewed to determine whether the information they provided would warrant a determination other than a Finding of No Significant Impact (FONSI). Substantive comments are summarized below, with BLM responses to the comments in italics. The MFO and GFFS would like to thank all who commented for taking time to review the EA.

One state agency, one municipal government, 30 individuals, five organizations, one business, and the proponent commented on the EA. All comments were reviewed and considered in preparation of this Decision Record. Comments that addressed the adequacy of the EA received a response (see below).

Each comment letter was assigned a number. Within each comment letter, each individual comment was assigned an index number and a letter designation for the category that best represents the issue (e.g. cultural resources, wildlife, air quality, etc.). Letter designations are as follows:

ADM Administrative & Regulatory	SE Socioeconomics
CUM Cumulative Impacts	VRM Visual Resource Management
GEN General	TES Threatened, Endangered, and Sensitive Species
HY Hydrology	WL Wildlife
REC Recreation	

Table B-1. Response to Public Comment

Index No.	Comment	Response
ADMINISTRATIVE & REGULATORY		
ADM-1	<i>RE: Page 2-16, Table 2.2-6</i> While Noble projects a total of 550 artificial lift units operating at any one time, we believe this will break down to approximately 365 on federal surface (rather than 165) and 185 on other surface (rather than 85).	Table 2.2-6 has been revised to reflect 365 units on federal surface and 185 on other surface for Decker. Table 2.2-4, showing Artificial Lift for All Operators, has been revised to reflect 575 units on federal surface and 415 units on other surface.
ADM-2	<i>Page 2-16, Table 2.2-6</i> BLM's total water production analysis reflected in Chapter 4....both in Section 4.4, "Wastes, Hazardous or Solid" and Section 4.5, "Water Resources, Surface and Ground," account for the cumulative water production that incorporates estimations derived from the total artificial lift numbers for the BNGPA (990 units).	See ADM-1.

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
GENERAL		
GEN-1	<p><i>Page 3-14, Oil and Gas: “The oil and gas resources of the Bowdoin Dome...have been known since before World War I...”</i></p> <p>This statement implies that oil and gas resources have been produced in the Bowdoin Dome since 1917. It should be noted, however, that natural gas was discovered in 1913 with production beginning in 1913. Natural gas production was very limited until 1929, and by the end of 1930, there were approximately 25 producing natural gas wells that serviced Glasgow and Malta. As discussed on page 3-43 and reflected in Table 3.8-2, natural gas production in the BNGPA has been taking place for several decades. This point should be highlighted to the public as non-governmental organizations and politicians have demanded that oil and gas companies pursue development of already known producing areas. Alternative B is the alternative that provides for the continued development of a known producing area.</p>	<p>The BLM appreciates this clarification. The text of the referenced section has been changed to read as follows:</p> <p>“The oil and gas resources of the Bowdoin Dome have been known since before World War I. Natural gas was discovered in 1913 with production beginning the same year. Natural gas production was very limited until 1929, and by the end of 1930, there were approximately 25 producing natural gas wells that serviced Glasgow and Malta.”</p>
GEN-2	<p><i>Page 4-12, Geology, Minerals, and Paleontology, Alternative B – Proposed Action with Additional Mitigation: “The Proposed Action includes drilling, completion, and production of 558 private wells...”</i></p> <p>The EA inadvertently failed to mention the drilling, completion, and production of 635 federal wells in this section. However, further in the discussion, the 635 federal wells are accounted for. Fidelity notes this error for reader convenience.</p>	<p>The BLM appreciates this clarification. The referenced text has been revised to include the 635 federal wells in the section.</p>
GEN-3	<p>We...request that you extend the comment period on the Bowdoin Natural Gas Development Project EA [for at least an additional 30 days].</p>	<p>BLM understands that the review and comment to the EA is time-consuming, but believes that 30 days is an adequate amount of time.</p>
GEN-4	<p>Such an expansive project as the one contemplated in the Bowdoin Natural Gas Project EA is clearly significant enough to require an EIS.</p>	<p>Based upon the analysis of potential environmental impacts contained in the EA, the Authorized Officer has determined that the Proposed Action, with implementation of standard site-specific Conditions of Approval applied to each APD, would not cause a significant impact to the quality of the human environment. An Environmental Impact Statement is not necessary.</p>

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
GEN-5	It has come to our attention that several interested parties were not informed in a timely fashion when this EA was issued. An EA for such an expansive project must be sufficiently noticed in order to comply with NEPA.	The distribution of the EA involved a mailing list of 284 individuals, companies, organizations, environmental groups, and government officials. Included were two television stations, three radio stations, two libraries, and eight newspapers and journals. The EA was also posted on the internet at the BLM Montana home page.
GEN-6	Because FWP believes the JVPRMP is out-of-date with current knowledge, we request that the wildlife stipulations found in Alternative B of the Draft Malta RMP be used when developing the Final BNGP EA.	BLM agrees that new information that is relevant should be considered. The EA, mitigation measures and conditions of approval evaluated in the EA considered new information. The scope of the BNGP EA does not include development of new oil and gas lease stipulations. The following is a summary of BLM policy regarding the use of Conditions of Approval: "Unless negotiated with the operator, BLM must use APD Conditions of Approval to move the well location, restrict timing of the project, or require other reasonable measures to minimize adverse impacts (43 CFR 3101.1-2 Surface use rights; Lease Form 3100-11, Section 6) to protect sensitive resources, and to ensure compliance with laws, regulations, and land use plans."
HYDROLOGY		
HY-1	The diminishing amount of prairie potholes in eastern Montana and the surrounding region has made them a high priority for NWF, especially considering the value of the prairie potholes to our many members who hunt and fish....[T]he EA states impacts "include the loss of supporting hydrology via (1) the compaction of hydric soils during construction, and (2) increased runoff and sedimentation due to vegetation removal." The potential impact of these findings is significant and requires a thorough and detailed analysis best revealed through an EIS.	The BLM notes that there is potential for disturbance of prairie pothole wetlands. Potential disturbance of wetlands will be evaluated on a case-by-case basis. Per the applicant-committed mitigation measures, (the applicants will) "Evaluate all project facility sites for occurrence and distribution of waters of the U.S., special aquatic sites, and jurisdictional wetlands, (and) locate all project facilities out of these sensitive areas. If complete avoidance is not possible, minimize impacts through modification and minor relocations." No text was changed in response to this comment
RECREATION		
REC-1	FWP recommends that compressors be located at least 2 miles from existing recreation areas.	During onsite inspections for individual APDs located near existing recreation areas, BLM would make every effort to locate the well away from these areas. However, the EA on page 4-24 describes that when adding hospital-grade mufflers, there are no significant impacts when locating compressors ¼ mile from these sites.

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
SOCIOECONOMICS		
SE-3	The abundance of hunting and fishing opportunities on public land within the BNGP makes this area a destination for many sportsmen. Solitude and the opportunity to spend time in a classic western setting are also important factors, especially to nonresidents and those from more urban areas. Preserving these opportunities for current and future generations is a smart way of doing business and this needs to be recognized and given more importance in the EA.	Section 3.7 of the Draft EA describes recreation resources and use in the BNGPA and Section 4.7 describes potential impacts of the Proposed Action and alternatives on the recreational setting and use. The analysis concludes that for all alternatives, impacts to recreation resources and use include the potential for drilling and development activities to temporarily displace some recreationists; however, return to pre-disturbance activity patterns is expected to occur rapidly once construction is complete. Although there is potential for long-term facilities to have longer effects on the recreation setting, it is anticipated that these facilities would be located in areas of low recreation potential or areas already developed. Although any change in the recreation setting is likely to displease some recreation users of BLM lands within the BNGPA, there is already a modest level of human modification of these lands and the BLM will require visual and noise mitigation measures in areas that are sensitive to activity and modification.
SE-1	It is beneficial and necessary that the oil and gas companies come to agreement with surface right owners as to the payment and reclamation activities that will occur. When this does not happen to the surface owners' satisfaction, oil and gas companies can expect increased litigation, with increasingly positive results for surface owners. This is a significant impact which would be better addressed through the proper analysis of an EIS.	The discussion of split-estate issues in Section 3.8.6 and the assessment in Section 4.8 adequately discloses the potential for these issues to occur and the potential effects of split-estate conflicts.
THREATENED & ENDANGERED SPECIES		
TES-1	Critical habitat was designated for the piping plover in September, 2002....includes habitat in areas of the Bowdoin National Wildlife Refuge. It is imperative that these critical habitat areas, as well as critical habitat areas for other species, and related wildlife corridors are protected to the level required by the Endangered Species Act.	No piping plover Critical Habitat was designated within the BNGPA. A portion of Bowdoin NWR in Phillips County was designated as piping plover Critical Habitat in 2002 and is closed to oil and gas leasing (USFWS 2002). Nelson Reservoir, which is within the BNGPA, was proposed as Critical Habitat but not designated due to current conservation agreements with Bureau of Reclamation (USFWS 2002a).

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
TE-2	<p>These impacts [to sage grouse as described on page 4-73 of the EA] provide a bleak outlook for sage-grouse, even under the most restrictive terms of Alternative A. ... Significant impact is inevitable.</p>	<p>The BLM appreciates and shares the commenter's concern regarding impacts to the greater sage-grouse population within the BNGPA. Applicant-committed environmental protection measures such as resource-specific spatial buffers and timing stipulations are meant to guide development in a manner consistent with avoiding, minimizing, or mitigating potential impacts within the BNGPA in general. However, impacts to sage-grouse will be avoided by adoption of specific mitigation measures such as wildlife awareness driver training (pages 2-25, 2-27, and 4-75), lek and nest avoidance during the breeding season (pages 2-25 and 4-74), seasonal and daily timing restrictions during the breeding season (pages 2-25 and 4-74), minimizing aerial predator perching opportunities by deploying perch deterrents or burying power lines (pages 4-74 and 4-75), West Nile virus control measures (pages 2-25, 4-85, and 4-86), and avoidance and/or minimizing disturbance in severe winter habitat (page 2-25) and higher-quality habitat areas (page 4-74). In addition, site-specific conditions will be considered during the APD process when spatially explicit details such as well, road, and supporting infrastructure locations will be available. Approximately 7 percent of the BNGPA is considered excellent sage-grouse habitat with an additional 17 percent considered suitable. The majority of these excellent and suitable habitat areas (70 percent) are located in the Saco Hills area where measures contained in development COAs should be more stringent due to the quantity of leks and quality of habitat.</p> <p>Additional mitigation measures to control West Nile virus and avoid or minimize impacts in high quality sage-grouse habitat have been added on pages 2-25 and 4-74.</p>
WILDLIFE		
WL-1	<p><i>Page 3-91, Wildlife, West Nile Virus: "As well densities increase, the amount of produced surface water increases and, along with it, the incidence of mosquitoes and WNV."</i></p> <p>This statement is not applicable to the BNGPA and the operators' proposed action. The proposed action is not for increased well densities, it is for the continued development of the BNGPA based on 160-acre spacing. In</p>	<p>Mosquito breeding can occur anywhere where there is standing water available. The absence of vegetation does not preclude mosquito breeding. Nevertheless, by implementing BMPs for the control of West Nile virus (pages 2-25, and 4-85 – 4-86) production ponds should be unattractive mosquito-breeding locations.</p>

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
	<p>addition, the operators are not proposing surface discharge of produced water. As stated in the EA, the operators will be either managing produced water on-site in small evaporative pits or at larger central evaporation pits. Both types of pits in the BNGPA are steep-sided and do not accommodate vegetation growth, and therefore, do not crease mosquito habitat.</p>	<p>Wording in the document has been changed to read as follows: “As the number of wells increases, the amount of produced surface water will increase. Unless measures are taken to make evaporation pits unattractive mosquito breeding habitat, an increase in surface water has the potential to increase mosquito breeding habitat, mosquitoes, and incidences of WNV.”</p>
<p>WL-2</p>	<p>The draft EA is strikingly lacking in quantification and analysis of impacts on wildlife including sensitive species to the point of being practically non-existent. No details of any analyses are provided and no literature assessing impacts from similar development is cited. The findings and analysis are so vague we have no way to determine how one could conclude impacts are not significant.</p>	<p>Applicant-committed environmental protection measures such as resource-specific spatial buffers and timing stipulations are meant to guide development in a manner consistent with avoiding, minimizing, or mitigating potential impacts within the BNGPA. In general, based on the size of the project area and the proposed extent and scope of disturbance, potential impacts to important species (i.e., big game, sage-grouse, raptors) and their habitats (i.e., winter range, wetlands, mixed-grass prairie, and sagebrush vegetation communities) will be mitigated by site-specific conditions of approval employed during the APD process. A large portion of the key ranges and habitat for various important species (i.e., big game winter range, shorebird nesting habitat, prairie dog colonies) currently are fully developed (i.e., 160-acre spacing); therefore, additional impacts to many of these habitats and species are expected to be minimal.</p>
<p>WL-3</p>	<p>We recommend...that as a minimum for proceeding with development, long term monitoring of at least 1 surrogate species be required of the proponents....we believe pronghorn are a good candidate.</p>	<p>Currently, the MFWP conducts winter and spring aerial surveys for mule deer and white-tailed deer, and summer aerial surveys for pronghorn within and around the BNGPA on an annual basis. MFWP has been conducting surveys for over 20 years and uses the information as the basis for Adaptive Harvest Management. MFWP will continue to conduct big game surveys within and around the BNGPA and adjust management (i.e., hunting quotas) based on agency and region population objectives. In addition, MFWP, MNHP, BLM, and NWF conduct various surveys including but not limited to the following species: sage-grouse, waterfowl, wintering bald eagles, and nesting passerines and raptors. This information will be available to managing agencies (i.e., BLM, BOR, USFWS-NWR) to develop or modify or develop future habitat and refuge management objectives and strategies.</p>

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
		<p>In all likelihood, federal and state agencies would encourage initiating an independent, properly designed, large-scale, long-term pronghorn study with specific research questions. Such research, as proposed by the commenter, could allow a thorough test of potential population effects of energy development on the species.</p>
WL-4	<p>WWF believes the EA is inadequate in its treatment of species that are not Threatened and Endangered (T&E). Chapter 3 basically dismisses the need to address the project's impacts on non T&E species because they are not uncommon. Even though these species are not necessarily rare, if the project will have adverse impacts on them then these impacts should be recognized, the magnitude of the impacts assessed and processes should be identified to mitigate these losses.</p>	<p>CEQ regulations require that information be obtained if it is "relevant to reasonably foreseeable significant adverse impacts." Wildlife species without special status designation generally are considered common and widely distributed within the region. The incidental take of individual animals is not grounds for an extensive discussion because local impacts to individuals would not be considered "significant adverse impacts," and population-level effects would be minimal.</p>
WL-5	<p>...this EA...fails to recognize that climate change will affect the habitats of many of the species that reside in the area.... it is most likely that the proposed project will adversely affect the ability of most resident species to adapt to anticipated climate changes.</p>	<p>Estimates of regional-scale climate changes continue to have notable uncertainties. While there is some certainty about the rise in temperature and subsequent impacts on various ecosystems, there is much less certainty about future precipitation and its effects. The ability to link future conditions with future impacts is limited by the current understanding of the relationship between changes in the average climate and climate extremes (Field et al. 2007). The spatial and temporal adaptations necessary to cope with climate change are not necessarily concomitant with those needed for habituation to energy development.</p>
WL-6	<p>The impacts from the additional drilling on top of the existing activity will result in cumulative impacts that are inadequately addressed in this EA.</p>	<p>Long-term trends in big game populations (i.e., pronghorn, mule deer, and white-tailed deer) monitored within and around the BNGPA demonstrate that populations of these species have remained stable or are on the increase despite oil and gas development within the BNGPA for approximately 70 years. Mule deer and white-tailed deer numbers are described as "very high," having mostly recovered from the low levels earlier in the decade, and are exceeding population objectives in various hunting districts (MFWP 2008: http://fwp.mt.gov/news/article_7308.aspx). In addition, white-tailed deer numbers were characterized as "quite high" (Ibid.). Also, pronghorn numbers "increased dramatically" in 2007, up nearly twice as high as observed populations in 2006 (MFWP 2007:</p>

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
		<p>http://fwp.mt.gov/news/article_5966.aspx), and are at “10-year highs” in 2008 (MFWP 2008: http://fwp.mt.gov/news/article_7252.aspx).</p> <p>Please refer to the errata on this topic as a new section has been compiled. Future projects that have yet to be proposed are not deemed “reasonably foreseeable actions.”</p>
WL-7	<p>The EA inadequately addresses the quantitative or qualitative affects of the other alternatives beyond Alternative A. The EA only notes that progressively more development will have progressively higher impacts for the other alternatives.... These impacts must be quantified in order for decision makers to have a true idea of the relative magnitudes of impacts between the various alternatives.</p>	<p>This comment has been variously addressed in TE-2, WL-2, WL-4 and WL-6.</p>
WL-8	<p>On-site mitigation...is the best way to assure perpetuation of the habitats and species actually impacted by projects....We are concerned that the proposed drilling may eliminate or severely constrain the potential for on-site habitat mitigation....As far as we are able to determine, the potential that mitigation might need to move to off-site locations was not analyzed in the BNGPA EA.</p>	<p>The BLM’s policy is to mitigate impacts to an acceptable level onsite whenever possible through avoidance, minimization, remediation, or reduction of impacts over time. The analysis presented in Chapter 4 demonstrates that impacts can be mitigated.</p> <p>However, offsite mitigation may be offered voluntarily by a project proponent as part of an Application for Permit to Drill, and approved by the BLM as a condition of the permit authorization. In certain other cases, the BLM may find it necessary to advise the applicant that the project proposal cannot be approved without additional onsite modification or additional mitigation, including offsite mitigation. There may be a need for offsite mitigation when:</p> <ol style="list-style-type: none"> 1. Impacts of the proposal cannot be mitigated to an acceptable level onsite; and 2. It is expected that the proposed land use authorization as submitted would not be in compliance with law or regulations or consistent with land use plan decisions or other important resource objectives. <p>The BNGPA EA did not specifically analyze the potential need for offsite mitigation because it is already part of BLM’s existing policy. Please see BLM Washington Office Instruction Memorandum 2008-204.</p>

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
WL-10	FWP recommends that well spacing be limited to no more than 0.4 wells/km ² on big game winter range where intensive energy development has not already occurred within the BNGP. This includes Cottonwood Creek, Little Cottonwood Creek and Frenchman Creek. FWP would welcome the opportunity to work with the BLM on clearly defining those areas.	No unresolved resource conflicts were identified that require additional buffers, and so this alternative was not considered. Site-specific conditions of approval will be employed during the APD process to mitigate potential impacts. In addition, big game winter stipulations in the resource-specific and BLM mitigation measures (pages 2-25 and 4-73) clearly direct the operators to avoid disturbance in specific important vegetation communities and prevent disturbance between December 1 and May 15.
WL-11	FWP is also concerned about the added impacts Artificial Lift (AL) systems will have on wildlife resources and recreational users.	Impacts due to AL systems primarily are related to increased noise levels. Impacts due to noise would be mitigated by deployment of hospital-grade muffler systems on AL devices.
WL-12by not using the latest maps, this EA does not adequately depict existing sage grouse habitat. FWP recommends the following changes to maps in the EA. Figure 3.13-2 'Habitat Condition Classes and Two-mile Buffers of Greater Sage-grouse Within the BNGP' is incorrect. All sage grouse habitat south of Highway 2 within the BNGP is grouse...Most of the land south of Highway 2 within the BNGP should be labeled as "Sagebrush Limited" and the area within 3 miles of leks designated as "Excellent" habitat condition....Also another sage grouse lek was found in the SW corner of the BNGPA in recent years and needs to be included in this map (SW ¼ of Section 2, T30N, R32E). This brings the number of active sage grouse leks within the BNGPA to 8, rather than 7 as quoted in various parts of the EA. FWP would like the maps in the BNGP EA to be updated to include recent cooperative BLM and FWP changes for mule deer, pronghorn and sage grouse habitat.	The additional lek and revised sage-grouse habitat map have been incorporated into the document as requested on pages 3-127 and 3-129. Mule deer and pronghorn seasonal range maps have not changed sufficiently to warrant revision.
WL-13	FWP disagrees with many of the assessed impacts to wildlife in Chapter 4. These assessments assume that negative impacts of energy development on wildlife can be mitigated through small-scale stipulations that regulate the timing and duration of the activity, but not taking into account the amount of activity. They also assume that wildlife populations can withstand continued, incremental development. Neither of these assumptions is supported by scientific literature and again FWP feels these cumulative impacts are not adequately addressed.	Although current management policy assumes that negative impacts on wildlife due to energy development can be mitigated through small-scale stipulations regulating timing and duration of activity, and that wildlife populations can withstand incremental development, neither assumption is supported (as pointed out in the comment) or refuted by findings in the scientific literature (Hebblewhite 2008). The Proposed Action does not call for continual incremental development. The 1,255 new wells would be developed within 10–15 years, adhering to applicant-committed

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
		environmental protection measures and regulated by conditions of approval designed to avoid or minimize impacts to wildlife. Thereafter, the impacts associated with the development phase (i.e., drilling, higher-than-normal levels of human and vehicular activity) would cease and/or decrease during the production phase.
WL-14	The statement on 4-72 “Habitat loss could result in reduced productivity and, in rare cases, increased stress-related mortality within wildlife populations” is misleading...The stipulations to mitigate impacts to big game (4073) assume that timing of well development and driver education are all that is needed to minimize impacts to big game populations. FWP believes there is no scientific basis for this assumption and that current big game populations will not withstand continued development within this gas field.	FWP’s Region 6 supervisor states that the BNGPA supports “higher-than-average densities of pronghorn, mule deer and white-tailed deer” (Gunderson 2006). Apparently these high populations have been maintained despite the oil and gas development that has been ongoing within the BNGPA for approximately 70 years. It appears that even with this long-term development, moose are increasingly moving into the area and pronghorn have densities 40% higher than the regional average (Gunderson 2006). These data suggest that the big game populations in the area are quite resilient and thriving in the face of long-term and extensive energy development.
WL-15	Similar assumptions are made on 4-74 in regards to stipulations to mitigate impacts to upland game birds...At a minimum, FWP recommends the following stipulations: No Surface Occupancy (NSO) within ½ mile of sharp-tailed grouse leks, surface-disturbing or disruptive activities prohibited from March 15-June 30 within one mile of a sharp-tailed grouse lek, NSO within 2 miles of Greater sage-grouse leks, surface-disturbing or disruptive activities within Greater sage-grouse habitat would require a plan to maintain functionality of habitat, avoid or minimize habitat loss, and minimize disturbance to greater sage-grouse.	No unresolved resource conflicts were identified that require additional buffers, and so this alternative was not considered. In addition, the stipulations to sage-grouse leks and adjacent nesting habitat are stated in the resource-specific and BLM mitigation measures (pages 2-25 and 4-74), and are generally similar to those proposed by the commenter. Also, please see TE-2 for additional information on Greater sage-grouse mitigation measures.
WL-16	FWP recommends the following stipulations for raptors (4-74 and 75): NSO within ½ mile of bald eagle nest sites active within the last 7 years and NSO within ½ mile of ferruginous hawk nest sites, active within the last 7 years and NSO within ½ mile of ferruginous hawk nest sites, active within the last 7 years...further...that new power lines be buried to minimize impacts to raptors and other species, such as sage grouse.	No unresolved resource conflicts were identified that require additional buffers, and so this alternative was not considered. No bald eagle nests are known to exist within the BNGPA. In addition, the stipulations to protect raptors and their nest sites are stated in the resource-specific and BLM mitigation measures (pages 2-25 – 2-26 and 4-75) and are generally similar, and in some respects, more conservative than those proposed by the commenter. Impacts associated with power lines are addressed on page 4-75.

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
WL-17	FWP...recommends the following stipulation for colonial nesting birds (4-75 and 76): NSO within ½ mile of a water bird colony.	No unresolved resource conflicts were identified that require additional buffers, and so this alternative was not considered. The commenter's concerns regarding colonial nesting birds are addressed by various BLM mitigation measures on page 4-76.
WL-18	FWP...recommends the following stipulation for shorebirds and Other Waterfowl and for Migratory Birds (4-76 and 77): NSO within ¼ mile of lentic or lotic riparian areas.	No unresolved resource conflicts were identified that require additional buffers, and so this alternative was not considered. The commenter's concerns regarding shorebirds, waterfowl, and migratory birds are addressed by various BLM mitigation measures on pages 4-76 and 4-77.
WL-19	FWP requests additional information regarding well development on islands, with associated impacts an proposed mitigation of these actions This should also be addressed in relation to colonial nesting birds, shorebirds and other water birds.	These concerns are addressed by various BLM mitigation measures on 4-76 and discussion of island enhancement and habitat improvement projects on 4-83.
WL-20	FWP recommends the following stipulations for piping plovers (4-83) and mountain plovers (4-84): NSO within ½ mile and ¼ mile of piping plover and mountain plover habitat, respectively.	No unresolved resource conflicts were identified that require additional buffers, and so this alternative was not considered. The commenter's concerns regarding piping and mountain plover are addressed by various resource-specific and BLM mitigation measures on pages 2-26, 4-76, 4-77, and 4-83.
WL-21	FWP disagrees with the assessed impact to special status wildlife, fish and plant species (4-85 and 86). It is inadequate to state that this project "would have no measurable influence on the abundance or distribution of sensitive species at the scale proposed." Recent studies in Wyoming, SE Montana and Alberta documented that male sage grouse lek attendance declined as distance from leks to drilling rigs, producing wells and haul roads decreased and as densities of those infrastructure facilities increased.	This comment has been variously addressed in TE-2, WL-2, WL-4, WL-6, and WL-16. The BLM appreciates and shares the commenter's concern regarding impacts to special status wildlife; the referenced text has been revised on page 4-87.
WL-22	Natural gas development typically results in habitat fragmentation...Prior to further natural gas development, research should be conducted to determine the ongoing impacts to wildlife populations within the BNGP.	Wildlife monitoring, surveys, and research are discussed in WL-3 and WL-14.
WL-23	...the EA process does not allow conservation actions necessary to maintain populations of wildlife, especially sage grouse, other species of concern and valuable big game resources, to be adequately addressed.	Applicant-committed environmental protection measures such as resource-specific spatial buffers and timing stipulations are meant to guide development in a manner consistent with avoiding, minimizing, or mitigating potential impacts within the BNGPA in general. In addition, site-specific conditions of approval

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
		<p>will be employed during the APD process to mitigate potential impacts.</p> <p>The comment has been variously discussed in WL-4 for wildlife in general, TE-2 and WL-15 for sage-grouse, WL-6 and WL-14 for big game, and WL-16 for raptors.</p>
VISUAL RESOURCE MANAGEMENT		
VRM-1	<p>NWF and MWF object to the classification of 85% of the BNGPA into the lowest-ranked Visual Resource Class IV. In fact, many, including NWF, MWF, and our members, regard the remaining unbroken prairie landscapes to be of very high scenic value and protest a classification system that regulates to a category deemed to be relatively valueless.</p>	<p>The VRM classifications were determined for the current RMP, which is the governing plan for the EA and this analysis. The RMP and RMP EIS explain how the VRM classifications were determined.</p>
CUMULATIVE IMPACTS		
CUM-1	<p>NWF and MWR recommend that a Programmatic EIS be completed on all of eastern Montana oil and gas development before any more development occurs on the BNGPA. At a very minimum, an EIS should be conducted on the BNGPA and the alternatives set forth in this EA.</p>	<p>See GEN-4.</p>
CUM-2	<p>Chapter 4....completely ignores the cumulative impacts of development in an environment where habitats are changing because of climate change.</p>	<p>The comment has been address in WL-5.</p>
CUM-3	<p>A recurring comment from FWP is that we believe the cumulative effects are not adequately addressed in the EA.</p>	<p>WL-2 addresses the issue of quantification of impacts, WL-6 addresses concerns regarding additional impacts to big game, and WL-13 addresses the additional development and how the BLM plans to mitigate potential effects.</p>
CUM-4	<p>FWP strongly disagrees with the Cumulative Impact assessment on 4-81. It is irresponsible to call the affects of development...minor...To state that these developments would not join with other area projects to result in negative cumulative effects to fish and wildlife resources seems to minimize this potential.</p>	<p>Please refer to the errata, as a new section has been compiled. Future projects that have yet to be proposed are not deemed "reasonably foreseeable actions."</p> <p>WL-2 addresses the issue of quantification of impacts, WL-6 addresses concerns regarding additional impacts to big game, and WL-13 addresses the additional development and how the BLM plans to mitigate potential effects.</p>

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
CUM-5	<p>The EA states that only 0.0015 percent of the habitat and forage would be lost within the BNGP (4-81). This is very misleading because this only reflects the surface area under roads and well pads...At least eight studies have shown that the avoidance effect of roads was quantifiable and the average influence extends approximately 1,000 meters from both roads and wells...the Proposed Action...would alone result in impacts to approximately 170,000 acres... (19.5%) of the BNGPA.</p>	<p>Although there is evidence to suggest that indirect effects of roads and well pads extend beyond areas of direct habitat loss, no consistent accepted avoidance threshold distance has been determined in general or on a species-specific basis (<i>sensu</i> Hebblewhite 2008). Of the eight studies cited in the comment, only one studied the effects of development on mule deer. The remaining seven studies examined the effects of roads and/or wells on elk or caribou; neither of which is discussed in detail in the EA and neither of which species occur with any regularity within the BNGPA.</p> <p>In these studies alone, avoidance distances varied by at least one order of magnitude (i.e., 200–2,700 meters; Hebblewhite 2008). The assumption that 1,000 meters is a biologically relevant avoidance area around roads and wells is a somewhat manufactured metric of an aggregation of disparate studies. Although Sawyer et al.(2006) demonstrated an avoidance effect by mule deer in their study, the well spacing and development intensity scenario in their study area is an anomaly in comparison to typical development as proposed in the BNGPA (i.e., 5–40 acre versus 80–160 acre spacing, respectively). The management implications of the literature review admit that “scaling up from small-scale/short-term studies to population-level impacts will be difficult” (Hebblewhite 2008). Therefore, extrapolating results from different species and dissimilar development intensities to potential impacts to mule deer within the BNGPA is not prudent.</p>
CUM-6	<p>FWP disagrees with the cumulative impact assessment that “There are no known planned developments within the project area that would increase background noise levels.” The Proposed Action calls for the development of four new compression stations, the expansion of two existing compression stations, and the use of AL devices...This increase in noise will almost certainly have negative impacts to both wildlife and recreationists.</p>	<p>The discussion of cumulative impacts has been enhanced in section 4.15, Noise for each of the alternatives. The discussion now includes past, present, and future, as well as reasonably foreseeable development. Cumulative impacts discussion has also been enhanced in section 4.4, Wastes, Hazardous or Solid; and section 4.14, Public Health and Safety.</p>

APPENDIX B: SUMMARY OF COMMENTS AND RESPONSES

Index No.	Comment	Response
CUM-7	The EA...does not adequately address the impacts of increased traffic (i.e. water hauling trucks) or the cumulative impact of the proposed developments to wildlife populations. In addition, the cumulative impacts from other human activities affecting wildlife populations and habitat within and adjacent to the BNGP, such as transmission pipelines, sodbusting, CRP breaking, adjacent energy development in Saskatchewan and potential wind energy developments should be more fully considered with respect to the needs for fish, wildlife and recreational resources.	BLM and resource-specific mitigation measures designed to avoid or minimize potential impacts of increased traffic to wildlife are specifically addressed by reduced speed limits and driver wildlife-awareness training for big game, raptors, and wildlife in general (pages 2-26, 2-27 and 4-75), carcass removal from roads (pages 4-73 and 4-75), and daily timing stipulations limiting vehicular traffic for sage-grouse (page 4-74) and bald eagles (page 4-75).

APPENDIX C: CONDITIONS OF APPROVAL

Appendix C to the Decision Record

Conditions of Approval

COMPLIANCE AND MONITORING

The BLM and the Operators will provide qualified representatives during and following construction to validate construction, reclamation, and other approved actions commensurate with the provisions of this Decision Record.

The Operators have committed to monitoring activity in their proposal; including:

- All water quality measures identified per the MDEQ MPDES permits
- Streamflow to ensure adequate levels are maintained to support aquatic life
- Domestic water wells and springs included in the zone of influence to determine if impacts are occurring that require mitigation
- Erosion-control measures and return of soil productivity
- Existing and new disturbed areas for invasions of noxious weeds
- Success of reclamation measures
- Cooperation with Montana Fish, Wildlife and Parks and BLM biologists in their monitoring of the following wildlife and wildlife habitat:
 - Big game winter range
 - Raptor nest success and productivity
 - Bald eagle winter roosts
 - Greater sage-grouse and sharp-tailed grouse activity
 - Migratory bird breeding activity
 - Colonial bird breeding activity
- Air quality permit requirement compliance
- Livestock movement and other farm and ranch operations to minimize potential disturbance of large-scale livestock movements

Appropriate remedial action will be taken by the Operators in the event unacceptable impacts are identified during the life of the project.

TERMS / CONDITIONS / STIPULATIONS

The following mitigation measures were analyzed in the EA and are included as Conditions of Approval with each approved APD:

APPENDIX C: CONDITIONS OF APPROVAL

Geology/Minerals/Paleontology

Mitigation measures presented in the Soils and Water Resources sections would avoid or minimize many of the potential impacts to the surface mineral resources. Protection of subsurface mineral resources from adverse impacts would be provided by the BLM casing and cementing policy.

Paleontological resource values would be protected through the following mitigation measure:

- If recommended by the BLM, survey each proposed facility located in areas with known and potential vertebrate paleontological resource significance (Class II) using a BLM-approved paleontologist prior to surface disturbance (BLM 1987*b*; 1990*a*). If paleontological resources are discovered at any time during construction, halt all construction activities and immediately notify BLM personnel. Work would not proceed until paleontological materials are properly evaluated by a qualified paleontologist.

Climate and Air Quality

- Prohibit burning of garbage or refuse at the drill sites or other facilities.
- When an air quality, soil loss, or safety problem is identified as a result of fugitive dust, initiate immediate abatement. The BLM would approve the procedure (e.g., application of water and magnesium chloride) for dust abatement at facility construction sites as well as locations for use and application rates. Water, if approved for this purpose, must be obtained by the Operator from state-approved source(s).

Soils

- Reduce the area of disturbance to the absolute minimum necessary for construction and production operations while providing for the safety of personnel (see Table 2.3-1, page 2-39, Soils, Approximate Area of Disturbance). The Operators would restrict off-road vehicle activity.
- Where feasible, locate buried pipelines immediately adjacent to roads to avoid creating separate areas of disturbance and in order to reduce the total area of disturbance.
- Avoid using frozen or saturated soils as construction material.
- Minimize construction activities in areas with soils that have a severe erosion hazard, and apply special slope-stabilizing structures if construction cannot be avoided in these areas.
- Avoid development on areas where erosion cannot be effectively controlled/mitigated and reclamation to BLM standards is likely to be unsuccessful.
- Design cutslopes in a manner that would allow retention of topsoil, application of surface treatments, such as mulch, and subsequent revegetation.
- Selectively strip and salvage topsoil from all disturbed areas to an average depth of four to six inches at each location.
- Where possible, minimize disturbance to vegetated cut-and-fill areas on existing improved roads.
- Install runoff and erosion control measures such as water bars, berms, and silt fences if needed, as prescribed in **Appendix D to the EA—Reclamation Plan**.
- Inspect all runoff and erosion-control structures on a regular schedule, and after major runoff events. During inspection, clean and maintain the control structures in functional condition.

APPENDIX C: CONDITIONS OF APPROVAL

Conduct inspection and maintenance on schedule for the duration of construction, drilling, production, and final reclamation until successful revegetation and soil stability is attained.

- Complete interim reclamation to minimize the footprint of disturbance on all areas where final reclamation procedures cannot be promptly implemented. Interim reclamation measures include recontouring, spreading topsoil, and seeding and/or implementing erosion- and weed-control measures.
- Implement final reclamation measures when all disturbance and use of an area are finished. Final reclamation will serve to return the area to the approximate pre-disturbance condition and set the course for eventual ecosystem restoration. Final reclamation procedures may include recontouring, respreading topsoil, ripping, erosion and weed control, seeding, and grazing deferment.
- Conduct monitoring and maintenance of final reclamation, to include observing and measuring the success of final reclamation efforts, and determine if further reclamation efforts are needed.
- To prevent or minimize impacts caused by vehicle travel on wet roads, allow vehicle traffic on BNGPA roads only during dry or frozen conditions. Alternatively, improve roads in areas with high traffic-use patterns.

Water Resources

- Limit construction of drainage crossings to no-flow periods or low-flow periods.
- Minimize the area of disturbance within ephemeral and intermittent drainage channel environments.
- Prohibit construction of well sites, access roads, and pipelines within 500 feet of surface water and/or riparian areas. Exceptions would be granted by the BLM based on an environmental analysis and site-specific mitigation plans.
- Implement minor routing variations during access road layout to avoid steep slopes adjacent to ephemeral or intermittent drainage channels. Maintain a 100-foot-wide buffer strip of natural vegetation where possible (not including wetland vegetation) between all construction activities and ephemeral and intermittent drainage channels.
- Do not install culverts on ephemeral drainages. The use of culverts on intermittent drainage crossings would be analyzed on a case-by-case basis. Design all drainage-crossing structures to carry 25- to 50-year discharge events or as otherwise directed by the BLM.
- Design channel crossings to minimize changes in channel geometry and subsequent changes in flow hydraulics.
- Maintain vegetation barriers occurring between construction activities and ephemeral and intermittent channels.
- Minimize construction activities in areas of steep slopes and install special slope-stabilizing structures if construction cannot be avoided in these areas.
- Install runoff- and erosion-control measures such as water bars, berms, and interceptor ditches as needed.
- Include adequate drainage-control devices and measures in the road design (e.g., road berms and drainage ditches, diversion ditches, cross drains, culverts, out-sloping, and energy dissipaters) at sufficient intervals and intensities to adequately control and direct

APPENDIX C: CONDITIONS OF APPROVAL

surface runoff above, below, and within the road environment in order to avoid erosion-concentrated flows. Use erosion-control devices in conjunction with the surface runoff and drainage-control devices and measures such as temporary barriers, ditch blocks, erosion stops, mattes, mulches, and vegetative covers. Implement a revegetation program as soon as possible to re-establish the soil protection afforded by a vegetal cover.

- Design and construct interception ditches, sediment traps, water bars, and revegetation and soil stabilization measures if needed.
- Construct channel crossings for buried pipelines such that the pipe is buried a minimum of four feet below the channel bottom.
- Regrade disturbed channel beds to the original geometric configuration with the same or very similar bed material.
- Upon completion of construction activities, restore topography to near pre-existing contours at well sites, other facility sites, and along access roads and pipelines. Replace up to 12 inches of topsoil or suitable plant-growth material over all disturbed surfaces. Apply fertilizer, seed (specified in a reclamation plan), and mulch as required.
- Ensure that the project complies with EO 11990 (floodplains protection) and RMP management directives that relate to protection of water resources identified in Section 4.4.2. These regulations require avoidance of stream channels to the maximum practicable extent. Where total avoidance is not practicable, implement measures to minimize impacts to streams and associated floodplains/floodways. Where streams and floodplains cannot be avoided, the Operators would be required to show the BLM Authorized Officer why such resources cannot be totally avoided and how impacts would be minimized during the APD process.
- Case wells during drilling, and case and cement all wells in accordance with Onshore Order No. 2 to protect accessible high-quality aquifers. High-quality aquifers are those with known water quality of 10,000 ppm TDS or less. The protection of high-quality aquifers involves well casing and welding of sufficient integrity to contain all fluids under high pressure during drilling and well completion. Further, ensure that wells adhere to the appropriate BLM cementing policy.
- Construct reserve pits so that a minimum of one-half of the total depth is below the original ground surface on the lowest point within the pit. To prevent seepage of fluids, utilize drilling mud gel or poly liners to line reserve pits in areas where subsurface material would not contain fluids. Liners would be of sufficient strength and thickness to withstand normal installation and use. The liner would be impermeable (i.e., having a permeability of less than 10^{-7} cm/sec) and chemically compatible with all substances which may be put in the pit.
- Maintain two feet of freeboard on all reserve pits to ensure the reserve pits are not in danger of overflowing. Shut down drilling operations until the problem is corrected if leakage is found outside the pit.
- Extract hydrostatic test water used in conjunction with pipeline testing and all water used during construction activities from sources with sufficient quantities and through appropriation permits approved by the State of Montana.
- Discharge all concentrated water flows within access road rights-of-way onto or through an energy dissipater structure (e.g., rip-rapped aprons and discharge points) and discharge into undisturbed vegetation.

APPENDIX C: CONDITIONS OF APPROVAL

- Develop and implement a storm-water pollution plan for storm-water runoff at drill sites as required per MDEQ storm water MPDES permit requirements.
- Coordinate with the COE to determine the specific Clean Water Act (CWA) Section 404 Permit requirements and conditions (including the potential requirement of compensatory mitigation) for each facility that occurs in Waters of the U.S. to prevent the occurrence of significant impact to such waters.
- Ensure that the project must comply with all applicable requirements of the CWA, including the requirement to obtain an MPDES permit.

Vegetation and Wetlands

- Seed and stabilize disturbed areas with mixtures and treatment guidelines prescribed in the approved APD/right-of-way.
- Evaluate all project facility sites for occurrence and distribution of waters of the U.S., special aquatic sites, and jurisdictional wetlands. Locate all project facilities out of these sensitive areas. If complete avoidance is not possible, minimize impacts through modification and minor relocations. Coordinate activities that involve dredge or fill into wetlands with the COE.
- Conduct site-specific surveys for federally listed threatened and endangered, candidate, and proposed plant species, and plant species of special concern prior to any surface disturbance in areas determined by the BLM to contain potential habitat for such species. If any such plant species or its habitat is found during the surveys, minor adjustments to the location of project facilities would be made to avoid the plant species and/or habitat. Copies of these surveys would be provided to the BLM.

Range Resources and Other Land Uses

- Coordinate with the affected livestock operators to ensure that livestock control structures remain functional during drilling and production operations.

Wildlife

- Unless an exception is granted by the BLM, prevent disturbance in habitats designated as big game winter range between December 1 and May 15.
- Within big game winter ranges, locate disturbances so that specific important vegetation types, as identified by the BLM, would be avoided where possible.
- During reclamation, establish a variety of forage species that are useful to resident herbivores by specifying the seed mixes in the approved APD/right-of-way.
- Prohibit disturbance during the critical nesting season (March 1–August 31, depending on species) within one mile of an active nest of listed or sensitive raptor species, and 3/4–1/2 mile (depending upon species or line of sight) of an active nest of other raptor species. The nature of the restrictions and the protection radius would vary according to the raptor species involved and would be determined by the BLM.
- Prohibit disturbance of potential mountain plover nesting habitat in a given year from April 1–July 31 unless surveys are conducted to determine mountain plover presence/absence. Survey protocol would follow current BLM and FWS standards. If surveys of an area are conducted for three consecutive years and no mountain plovers are observed, the area may be cleared.

APPENDIX C: CONDITIONS OF APPROVAL

- Locate surface disturbance 50m or more from the edge of black-tailed prairie-dog colonies, where feasible.
- Conduct surveys for black-footed ferrets if a portion of a black-tailed prairie-dog colony that provides suitable black-footed ferret habitat is to be disturbed.
- Prohibit unnecessary off-site activities of operational personnel in the vicinity of the drill sites.
- Inform all project employees of applicable wildlife laws and penalties associated with unlawful take and harassment.
- Require that regular drivers undergo training to avoid vehicular collisions and the means that can be employed to minimize them.
- Implement reduced speed limits to reduce potential for vehicle/wildlife collisions.
- To protect migratory birds and wildlife in general, fence and net all reserve pits and other pits and areas that potentially contain hydrocarbon materials in accordance with BLM requirements.
- Minimize new road construction and maximize reclamation of disturbed areas.
- Gate roads as specified by BLM to discourage public use and reduce disturbance.
- Prevent vehicle use of pipeline rights-of-way.
- Locate pipelines adjacent to roads to the greatest extent possible.
- Design facilities with reclamation as an objective.
- Consolidate facilities whenever possible to minimize fragmentation of habitats.

Greater Sage-grouse

- Prohibit surface disturbance within 1/4 mile of Greater sage-grouse leks unless they are considered historic (have not been used in the past 7–10 years).
- Prohibit surface disturbance within two miles of an active or known Greater sage-grouse lek between March 1 and June 30, unless excepted.
- Prohibit surface disturbance within identified patches of Greater sage-grouse severe winter habitat.
- Manage produced water to reduce the spread of West Nile virus within sage-grouse habitat areas. Implement the following impoundment construction techniques and measures to eliminate water sources that support breeding mosquitoes:
 - Overbuild the size of ponds to accommodate a greater volume of water than is discharged. This will result in non-vegetated and muddy shorelines that breeding mosquitoes avoid.
 - Build steep shorelines to reduce shallow water and aquatic vegetation around the perimeter of impoundments. Construction of steep shorelines also will increase wave action that deters mosquito production.
 - Maintain the water level below rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Always avoid flooding terrestrial vegetation in flat terrain or low-lying areas.

APPENDIX C: CONDITIONS OF APPROVAL

- Use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
- Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure, and create hoof-print pockets of water that are attractive to breeding mosquitoes.
- Use adulticides to target adult mosquito populations and larvicides to control the hatching of mosquito larvae, using approved pesticides and utilizing licensed applicators with a Pesticide Use Plan.

Upland Game Birds

- Develop nest-avoidance, timing restrictions, and/or additional mitigation measures for nests located on or adjacent to project developments.
- Avoid important sharp-tailed grouse nesting habitat during the breeding season from March 15 – June 15.
- No surface disturbance within ¼ mile of sharp-tailed grouse leks from March 15 – June 15.
- Avoid important greater sage-grouse nesting habitat during the breeding season from March 1 – June 30
- No surface disturbance within ¼ mile of greater sage-grouse leks from March 1 – June 30.
- Require a one-day notice prior to any planned activity during March 1 – June 30 so that the pad site and any undeveloped access route or pipeline can be nest-dragged to determine the presence or absence of active nests.
- Require a second nest-drag survey if drilling activity begins more than two days after completion of pad construction.
- Prioritize pad development based on suitability of habitat; construct pads that are in less suitable habitat (i.e., along existing roadways or within degraded habitats) during the breeding season, and construct pads located in more suitable habitat prior to or after the critical breeding season.
- Limit vehicular traffic and human visitation to well sites and facilities within ¼ mile of lek sites until after 9:00 a.m. daily during the production phase.
- Avoid sagebrush, but if disturbance is necessary, interim reclamation should include sage plantings/seedings and/or the use of minimum disturbance practices to protect sage on well pads and pipelines.
- Avoid and minimize above-ground power lines in areas with sage-grouse habitat condition designated as Excellent and Sagebrush Limited, respectively.

Raptors

- In the event of a 'taking' of a raptor nest, acquire all appropriate permits.
- Provide all drivers with a training session describing the types of wildlife species in the area that are susceptible to vehicular collisions to reduce the potential for vehicle/raptor collisions. The circumstances under which such collisions are likely to occur, and the measures that could be employed to minimize them should be discussed. Reduced speed limits would be implemented to reduce potential for vehicle/wildlife collisions.

APPENDIX C: CONDITIONS OF APPROVAL

- Implement reduced speed limits to reduce potential for vehicle/wildlife collisions.
- Coordinate with MFWP to formulate and implement a removal program for wildlife carcasses along roadways to avoid further mortality of raptors attracted to carcasses.
- No surface disturbance within ½ mile of bald eagle winter roost sites from November 30–March 31.
- Limit vehicular traffic and human visitation to well sites and facilities within ½ mile of bald eagle winter roost sites until after 9:00 a.m. daily during the production phase.
- Install and maintain power line facilities to reduce raptor collisions and electrocutions, and discourage perching and nest-building on infrastructure.
- Conduct nesting raptor surveys in suitable nesting habitats within ½ mile of proposed disturbance. Surveys could be conducted throughout the year; however, any potential nest sites located must be resurveyed during the breeding season to determine activity. Construction activities would be prohibited within one mile of an active nest of listed or sensitive raptor species, and ¾ – ½ mile (depending upon species or line of sight) of an active nest of other raptor species from March 1 – August 31 (depending on species), or until fledging and dispersal of the young. The nature of the restrictions and the protection radius would vary according to the raptor species involved and would be determined by the BLM.

Colonial Nesting Waterbirds

- No surface disturbance within colonies from March 15–July 15.
- Minimize or avoid disturbance near important nesting and foraging areas such as Nelson Reservoir, Whitewater Lake, Pea Lake, Hewitt Lake, and other areas identified by the BLM based on the most current information available.

Shorebirds and Other Waterbirds

- Minimize or avoid disturbance near important nesting and foraging areas at Nelson Reservoir, Whitewater Lake, Pea Lake, and Hewitt.
- Require a one-day notice prior to any planned activity during April 15 – July 15 so that the pad site and any undeveloped access route or pipeline can be nest-dragged to determine the presence or absence of active nests.
- Require a second nest-drag survey if drilling activity begins more than two days after completion of pad construction.
- Prioritize pad development based on suitability of habitat; construct pads that are in less-suitable habitat (i.e., along existing roadways or within degraded habitats) during the breeding season, and construct pads located in more suitable habitat prior to or after the critical breeding season.

Migratory Birds

- Develop nest-avoidance, timing restrictions, and/or additional mitigation measures for nests located on or adjacent to project developments. In cases where development is allowed to continue provide special protection using panels or other markers if known nests are nearby.
- Avoid important nesting habitat during the breeding season from April 15th – July 15th.

APPENDIX C: CONDITIONS OF APPROVAL

- Minimize disturbance to intact grassland prairie to preserve grassland nesting habitat for endemic and specialist species.
- Minimize disturbance to intact sagebrush steppe to preserve sagebrush nesting habitat for obligate and specialist species.
- Require a one-day notice prior to any planned activity during April 15th – July 15th so that the pad site and any undeveloped access route or pipeline can be nest-dragged to determine the presence or absence of active nests.
- Require a second nest-drag survey if drilling begins more than two days after completion of pad construction. No surface disturbance at active nest sites between April 15th – July 15th (Migratory Bird Treaty Act; E.O. 13186).
- Prioritize pad development based on suitability of habitat; construct pads that are in less suitable habitat (e.g., along existing roadways or within degraded habitats) during the breeding season, and construct pads located in more suitable habitat prior to or after the critical breeding season.
- Eliminate migratory bird access to reserve pits that store or are expected to store fluids that pose a risk to these birds (e.g., waterfowl, shorebirds, raptors, and songbirds) during drilling and completion activities and until such pits are reclaimed. Exclusion methods could include netting, the use of “bird-balls” or other alternative methods that effectively eliminate migratory bird access to pit contents and meet with BLM approval. It would be the responsibility of the operator to notify the BLM of the proposed method two weeks before drilling activities are expected to begin. The BLM-approved method would be applied within 24 hours after drilling activities have begun. All lethal events and other significant information, such as discovery of a nesting attempt, involving migratory birds would be immediately reported to the appropriate personnel at the Malta Field Office.

Amphibians and Reptiles

- Develop breeding-site avoidance, timing restrictions, and/or additional mitigation measures for breeding areas located on or adjacent to project developments.
- Minimize or avoid disturbance in or near wetland areas.

Fish

- Install temporary equipment bridges across flowing waterbodies.
- Place topsoil and spoil at least 10 feet away from the water’s edge.
- Bury pipelines at least 5 feet below the bottom of each drainage.
- Cross streams during periods of low flow and complete the crossing within 24 hours, as feasible.
- Install erosion and sediment control measures, as discussed in the Soils section to prevent the flow of spoil into any waterbodies.
- Maintain erosion and sediment control measures until streambanks and adjacent upland areas are stabilized.
- Reestablish pre-construction bed and bank contours, revegetate streambanks, and install erosion control fabric to stabilize the streambanks.

APPENDIX C: CONDITIONS OF APPROVAL

- Limit construction equipment working in wetlands to that essential for clearing, trench excavation, pipe fabrication and installation, backfilling, and restoration.
- Cut shrubs flush with the surface of the ground.
- Limit stump removal, grading, topsoil segregation, and excavation in wetlands to the area immediately over the trenchline to avoid excessive disruption of soils and the native seed and rootstock within the soils.
- Prohibit storage of hazardous materials, chemicals, fuels, lubricating oils, and concrete coating and refueling activities within 200 feet of any waterbody or wetland.
- Minimize erosion from upland areas by restoring and seeding the project area as discussed in the Vegetation and Soils sections, and in Appendix D—Reclamation Plan.
- Withdraw and discharge hydrostatic test water in accordance with all applicable permits.
- Test water quality during withdrawal and discharge in accordance with permit stipulations and conditions. Discharges to any water body must meet all applicable permit limits and not cause exceedances of water quality standards.
- Utilize screens on the intake hoses at surface water sources to prevent the entrapment of fish or other aquatic species and monitor the appropriation rate to ensure that adequate downstream flow is maintained to support aquatic life.
- Install energy-dissipating devices and/or filter bags to prevent scour, erosion, suspension of sediment, and damage to vegetation. Monitor discharge rates to ensure effectiveness of the energy-dissipating device.

Special Status Wildlife, Fish, and Plant Species

- The FWS, in cooperation with the Bureau of Reclamation, conducts annual piping plover and least tern surveys on shorelines of Hewitt Lake NWR and Nelson Reservoir. BLM will be a partner in these surveys as needed when planned developments might impact plover and tern habitat.
- Potential piping plover nesting habitat near drilling and construction sites at Nelson Reservoir and Whitewater Lake will be identified and appropriate surveys will be conducted for this species prior to oil and gas activities. A timing stipulation during the nesting season would protect nesting piping plovers, but would not protect the function and utility of the site for subsequent nesting activity or occupancy. Therefore, a NSO stipulation will apply to all new developments as well as to modifications of existing developments within ¼ mile of piping plover nest sites, piping plover nesting habitat, and designated Critical Habitat (Critical Habitat is on Bowdoin NWR). This stipulation will minimize threats and disturbances to piping plovers, and prevent fragmentation and degradation of piping plover nesting habitat and Critical Habitat. Waivers, exceptions, and modifications may apply if it is determined that the factors leading to its inclusion have changed sufficiently to make the protection provided by the stipulation no longer justified, so long as the proposed operations would have “No Effect” on piping plovers and would not “Adversely Modify” piping plover Critical Habitat. Should least terns be found to nest at either location, the same ¼-mile NSO stipulation would apply to least tern habitat.
- The USFWS is particularly concerned about selenium concentrations greater than 2 ug/L, sodium concentrations over 17,000 mg/L and the presence of BTEX hydrocarbons (benzene, toluene, ethylbenzene and xylene) in production pits. The USFWS is also

APPENDIX C: CONDITIONS OF APPROVAL

concerned that concentrations of trace elements and salts in pits could increase through evaporative concentration and create a hazard for migratory aquatic birds such as the piping plover and least tern. Onshore Oil and Gas Order No. 7 (43 CFR 3160) ensures that a water analysis of toxic constituents that are reasonably believed to be present in production wells, are conducted prior to approval of lined and unlined pits (i.e., pH, hardness, sodium, magnesium, calcium, iron, chloride, bicarbonate, sulfate, carbonate and nitrate). Historically, water-quality testing has shown no problems and there have been no records of birds being trapped or found dead in oil or gas well disposal pits in the BNGPA. To determine if other toxic constituents are present or if, over time, concentrations of trace elements and salts increase to levels toxic to birds, BLM will test and analyze existing production pit wastewater within ¼ mile of existing piping plover habitat. A ¼-mile NSO stipulation will apply on all new developments within a ¼ mile of piping plover or least tern habitat and Critical Habitat. If at that time, water in gas well production pits is determined to be hazardous to birds, mitigation measures to exclude piping plovers and least terns from pits with toxic waters will be applied.

- Because gravel roads and well pads may attract piping plovers during the nesting season, BLM will apply COAs and ROW stipulations that prohibit the development of 'graveled' roads or well pads for oil and gas operations within ¼ mile of piping plover habitat. Additional COAs under which an APD or Sundry Notice is approved may be required on a case-by-case basis for new or existing leases. Application of the "200 meter/60-day rule" (allowable under standard lease terms) may be required to approve an APD or Sundry Notice, to protect areas temporarily used by piping plovers or least terns for activities other than nesting.

Recreation

- Minimize conflicts between project vehicles/equipment and recreation traffic by posting appropriate warning signs, implementing operator safety training, and requiring project vehicles to adhere to low speed limits.
- Incorporate appropriate environmental BMPs into APDs and associated rights-of-way to mitigate anticipated impacts to surface resources in and near the developed recreation sites and the cabin sites around Nelson Reservoir in accordance with BLM Instruction Memorandum No. 2007-021 and BOR regulations.
- To minimize the potential for noise impacts to recreational activity at developed recreation sites, Operators would use PC pumps with electrical power within 1/4 mile of developed recreation and cabin sites at Nelson Reservoir and would use one of the three types of noise reducing equipment from 1/4 to within 1/2 mile of these sites.

Visual Resources

- Minimizing potential visual impacts from pumpjack (PJ) units should include consideration of whether a well can be relocated to take advantage of distance, vegetation, or topography to reduce its visibility or contrast with the characteristic landscape from the point of view of recreational use of BLM land. When it can be used, site selection can be critical (as is color choice) in reducing the contrast of a PJ unit.
- Since the visual impact potential of a PJ unit depends on location, VRM land classification, and visibility from BLM land in and near recreation sites, a determination of impact would require analysis of the specific circumstances surrounding a well. This would occur when Operators submit an APD.

APPENDIX C: CONDITIONS OF APPROVAL

- Submit a visual impact analysis of a well location on VRM Class II and III land as part of an APD. The analysis would use BLM's VRM contrast rating system (BLM Manual Section 8431). BLM at its option would investigate and analyze well locations; at its discretion, BLM may require an Operator to move a facility up to 600 feet in order to reduce the impact to views of BNGP facilities from recreational sites on BLM land.
- Incorporate appropriate environmental BMPs into APDs and associated rights-of-way to mitigate anticipated impacts to surface resources on VRM Class II lands (approximately 31,535 acres) and VRM Class III lands (approximately 94,437 acres) (BLM 1994a; BLM 1994b) in accordance with BLM Instruction Memorandum No. 2007-021.

Cultural Resources

- If a site is determined eligible, or is listed on the National Register of Historic Places (NRHP), avoidance is the preferred alternative.
- If avoidance is not feasible, employ the plan developed by the BLM to mitigate the adverse effects associated with development.
- If cultural resources are discovered at any time during construction, cease all construction activities and immediately notify BLM personnel. Work shall not resume until a Notice to Proceed is issued by the BLM.

Socioeconomics

- Implement hiring policies that would encourage the use of local or regional workers who would not have to relocate to the area.
- Coordinate project activities with ranching and farming operations to minimize conflicts involving livestock movement and other farm and ranch operations. This would include scheduling project activities to minimize potential disturbance of large-scale livestock movements. Establish effective and frequent communication with affected ranchers and farmers to monitor and correct problems and coordinate scheduling.

Transportation and Access

Develop and maintain all roads in accordance with the Transportation Plan and Surface Operations Section of the Master APD for Phillips County and all fields/units/leases (federal) west of Hinsdale in Valley County (BLM undated). In addition:

- Use existing roads whenever possible.
- Block, reclaim, and revegetate roads on public lands that are not required for routine operation and maintenance of producing wells and ancillary facilities. Roads on private lands would be treated similarly depending on the desires of the land-owner.
- Provide all drivers with a training session describing the types of wildlife species in the area that are susceptible to vehicular collisions to reduce the potential for vehicle/big game collisions. The circumstances under which such collisions are likely to occur, and the measures that could be employed to minimize them, should be discussed. Reduced speed limits would be implemented to reduce potential for vehicle/wildlife collisions.
- Where possible, avoid areas with important resource values, steep slopes, and soils with a severe erosion hazard and low reclamation potential in planning for new roads.

APPENDIX C: CONDITIONS OF APPROVAL

- Employ preventive and corrective maintenance of non-county roads in the project area throughout the duration of the project. This may include blading, cleaning ditches and drainage facilities, dust abatement, noxious weed control, or other requirements as directed by the BLM or other land-owners.
- If desired by the BLM and Phillips and Valley counties, engage in a coordinated planning process for the development and maintenance of roads within the BNGPA.

Health and Safety

- Implement a “Good Neighbor” policy
- Remotely monitor well production where practical and technically feasible
- Conduct traffic safety training
- Install signage notifying the public of areas of increased activity
- Consider installing centrally located produced-water disposal facilities and a produced-water gathering system

Wastes, Hazardous and Solid

- Recycle drilling mud, to the extent feasible.
- Continue the practice of providing drilling mud to private land-owners for use as stock-pond sealant.
- For exotic drilling mud operations, use closed-loop systems with above-ground steel tankage.
- Recycle completion fluids, to the extent feasible.
- Provide receptacles for trash and construction debris generated during construction and operations prior to transport in closed containers to a county sanitarian-approved landfill for disposal.
- Provide toilet facilities for field operations.
- Recycle used oil and methanol, to the extent feasible.
- Investigate the feasibility of using produced water in well drilling and completion processes.
- Use lined produced-water evaporation pits at high-volume central facilities.
- To minimize undue exposure to hazardous situations, require measures that would preclude the public from entering hazardous areas and place warning signs alerting the public to truck traffic.
- Institute a Hazard Communication Program for all Operator employees and require subcontractor programs in accordance with OSHA 29 CFR 1910.1200. These programs are designed to educate and protect the employees and subcontractors with respect to any chemicals or hazardous substances that may be present in the work place. As every chemical or hazardous material is brought on location, require that a Material Safety Data Sheet accompany that material and become part of the file kept at the field office as required by 29 CFR 1910.1200. Ensure that all employees receive the proper training in storage, handling, and disposal of hazardous substances.

APPENDIX C: CONDITIONS OF APPROVAL

- Inventory and report chemical and hazardous materials in accordance with the Superfund Amendments and Reauthorization Act (SARA) Title III 40 CFR Part 335, if quantities exceeding 10,000 pounds or the threshold planning quantity (TPQ) are to be produced or stored in association with the Proposed Action. Submit the appropriate Section 311 and 312 forms at the required times to the state and county emergency management coordinators and the local fire departments.
- Transport and/or dispose of any hazardous wastes, as defined by the Resource Conservation and Recovery Act (RCRA), in accordance with all applicable federal, state, and local regulations.
- Design operations to severely limit or eliminate the need for extremely hazardous substances, and avoid the creation of hazardous wastes as defined by RCRA wherever possible.
- Appendix C to the EA—Hazardous Materials Management Plan, provides a summary of the hazardous chemicals that may be found on a drilling or production site with examples of representative chemicals and associated physical and health hazards. At this time it is impossible to determine if these items would be stored in sufficient quantities to require reporting under the Superfund Amendments and Reauthorization Act, Title III, and in some cases, the items may not be on site at all. However, all items would become part of the Hazard Communications Plan where required, and employee training would be completed as required.
- Write and implement Spill Prevention Control and Counter-Measures (SPCC) Plans as appropriate in accordance with 40 CFR Part 112 to prevent discharge of oil into navigable waters of the United States.
- Manage gas-transmission system equipment maintenance fluids such as used oil and antifreeze through third-party or in-house recyclers.
- Implement the system-wide SPCC, expanded when necessary to cover new facilities, as required by the Clean Water Act (40 CFR 112.7).
- Recycle methanol to minimize the need for disposal.
- Provide portable toilets for field operations.

Noise

- Install remote monitoring systems (i.e. SCADA; Computer Assisted Operations, or CAO's), where feasible, within the BNGPA to mitigate the noise and disruptions associated with increased field truck traffic. Limitations to the feasibility of implementing this recommendation may exist due to the age of the field, the lack of appropriate infrastructure, and the remote nature of the area.
- Muffle and maintain all motorized equipment according to manufacturers' specifications in an effort to achieve the recommended standard of 55 dBA (with an average day/night noise level of 49 dBA) for noise impacts to sensitive receptors at 1/4 mile from the source. When background noise exceeds 55 dBA, noise levels will be no greater than 5 dBA above background at 1/4 mile.
- To reduce the impact of noise generated by field traffic, install remote monitoring systems such as Supervisory Control and Data Acquisition (SCADA) or computer-assisted operations (CAOs), where feasible.

APPENDIX D: RECLAMATION PLAN

Appendix D to the Decision Record

Reclamation Plan

1.0 Introduction

This document establishes construction, erosion control, interim reclamation, final reclamation and monitoring procedures for the Bowdoin Natural Gas Development Project Area (BNGPA). These procedures are designed to facilitate successful reclamation of the area. The procedures were developed using the “Fieldwide Drilling Operations Plan for Drilling and Surface Use for All Fields/Units/Leases (Federal) in Phillips County and All Fields/Units/Leases (Federal) West of Hinsdale in Valley County” and “Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, The Gold Book” (BLM 2006).

The BNGPA is under the management of the Bureau of Land Management (BLM) Malta Field Office. Any Operator wishing to deviate from the guidelines set forth in this document shall receive prior approval from the Great Falls Oil and Gas Field Station and Malta Field Office. In this document, use of the terms *shall* or *will* denote practices that are required by BLM to be completed by the Operator. Use of the term *should* denote practices that are recommended by BLM to be completed by the Operator.

Possible disturbed areas include drill pads, access roads, pipelines, compressor sites, and other ancillary areas used during development. The reclamation procedures presented are designed to be completed either concurrently with, or at the cessation of, construction and production activities. The procedures will serve to minimize the impact of activities in the BNGPA on natural resources and facilitate successful reclamation of disturbed areas to approximate pre-disturbance conditions.

Erosion control is a major part of the reclamation plan as it is a continuous process from disturbance through final reclamation. Erosion control measures outlined in this document will be used to stabilize disturbed sites and reduce erosion, runoff and sedimentation in the entire BNGPA throughout the life of the project.

Interim reclamation will be completed on all areas where final reclamation procedures cannot be promptly implemented to minimize the footprint of disturbance. Interim reclamation measures include recontouring, respreading topsoil, and seeding and/or implementation of erosion and weed control measures.

Final reclamation measures will be implemented when all disturbance and use of an area are finished. Final reclamation will serve to return the area to the approximate pre-disturbance condition and set the course for eventual ecosystem restoration. Final reclamation procedures include all of the steps involved in recontouring, respreading topsoil, seeding, and ensuring natural vegetation establishment, such as ripping, erosion and weed control, and grazing deferment.

The last step in this reclamation plan is the monitoring and maintenance of final reclamation. This will include observing and measuring the success of final reclamation efforts, and determining if further reclamation efforts are needed.

APPENDIX D: RECLAMATION PLAN

2.0 Objectives

Natural-gas development is one of many uses of public lands and resources. While development may have a short- or long-term effect on the land, successful reclamation can ensure the effect is not permanent. The reclamation process involves restoring the original landform or creating a landform that approximates and blends in with the surrounding landform.

The objectives of reclamation during and after development of the BNGPA are to return the land to safe and undisturbed conditions, consistent with the establishment of productive post-development uses. The designated post-development uses for the project area are defined as wildlife habitat, livestock production, farming, recreational use, and ongoing operation of natural gas production activities.

This plan has been developed to meet the following objectives for interim reclamation during active operations and final reclamation of roadways, pipelines, compressor stations, drill locations, and ancillary facilities:

- During the life of the development, all disturbed areas not needed for active support of production operations will undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.
- At final abandonment, well locations, production facilities, and access roads will undergo final reclamation so that the character and productivity of the land and water are restored (BLM 2006).
- Establishment of long-term, self-sustaining vegetation communities by reseeding with native plants and promoting natural re-establishment and succession;
- Protection of surface water quality including compliance with all applicable water quality standards and storm water management requirements;
- Minimization of post-reclamation visual contacts with surrounding areas to the extent practical; and
- Minimization of long-term closure requirements, especially for ongoing care and maintenance.

These objectives shall be considered during all phases of reclamation including construction, interim reclamation, and final reclamation.

3.0 Performance Standards

Reclamation success will be evaluated using defined performance standards. Interim reclamation success will be measured by the following standards:

- Erosion control methods shall be in place to mitigate any highly erosive features, such as rills, gullies, or sheet erosion.

In rangeland areas:

The following criteria refer to desirable species. Desirable species are those species present in the seed mix of the surrounding undisturbed natural vegetation. Within two to three growing seasons of the initial seeding, a short-term evaluation of revegetation success should be completed to determine if the standards are met.

APPENDIX D: RECLAMATION PLAN

- Vegetative cover, measured as canopy cover using a BLM approved method, will be at least 50 percent of adjacent undisturbed area cover (BLM approved methods can be found in BLM (1996));
- Desirable species will comprise 85 percent of the total vegetative cover of the revegetated area;
- No single species will account for more than 50 percent of the total vegetative cover unless it comprises more than 50 percent of the vegetative cover on adjacent undisturbed areas;

In farmland areas:

- Crop production will be 85 percent of that in adjacent crop areas;
- Desirable species will comprise 85 percent of the species present.

If these standards are not met, additional reclamation measures such as reseeding, fencing, fertilizing or erosion control shall be implemented. When the short-term standards are not met, the likelihood of achieving the final reclamation standards presented below is very low unless mitigating measures are taken.

Final reclamation success will be measured by the following standards:

- Erosion susceptibility of the site shall be equal to or less than the reference site, i.e., no erosive features shall be present on the revegetated sites that are not also prevalent in the adjacent undisturbed areas.

In rangeland areas:

- Vegetative cover will be at least 80 percent of adjacent undisturbed area cover; or, potential vegetative cover is as defined in the NRCS Ecological Site guides for the area;
- Desirable species will comprise 90 percent of the revegetated area;
- No single species will account for more than 35 percent of the total vegetative cover unless it comprises more than 35 percent of the vegetative cover on adjacent undisturbed areas;
- No category 1, 2, or 3 invasive and non-native species will be present;

In farmland areas:

- Crop production will be 95 percent of that in adjacent crop areas;
- Desirable species will comprise 90 percent of the species present;
- No category 1, 2, or 3 invasive and non-native species will be present;
- The integrity of sub-irrigation, where present, will be re-established, i.e., disturbed sites will be returned to their original surface elevation, and fill will be of equal textural class of surrounding undisturbed areas.

4.0 Planning and Vegetation and Soil Inventories

4.1 Planning

Reclamation planning should be completed to define the scope for interim and final reclamation activities. Characterization of soil resources and vegetation reference sites should be completed to develop the reclamation and stabilization work plan. Physical and chemical soil characterization should be completed to support development of certified weed-free seed

APPENDIX D: RECLAMATION PLAN

mixtures, soil amendments, and fertilizer requirements. Vegetation reference sites should be identified to evaluate reclamation success.

Planning should consider the timing between initial construction and final reclamation for abandonment. The extent of stabilization and interim reclamation practices should be appropriate for the site conditions with respect to the duration between construction and final reclamation activities. When a short duration will occur before final reclamation, stabilization practices should focus on erosion and weed control.

The availability of topsoil for final reclamation shall be considered prior to construction. Topsoil shall be respread during interim reclamation; however, topsoil deficiencies at the time of final reclamation may result. Salvage of topsoil used for interim reclamation may result in a decrease in the overall quality and quantity of topsoil available for final reclamation. The suitability of seeding and establishing vegetation in subsoil should be considered for interim reclamation.

4.2 Vegetation

An adjacent undisturbed area reference site should be identified for each area to be or already disturbed. Each area marked for disturbance should be observed, and a representative reference site with similar aspect, soils, growing conditions, and vegetation cover identified. This undisturbed site should be used as a comparison for the revegetated area whenever any vegetation data is collected. Typical reference sites may be used for numerous locations having similar conditions. If a suitable reference site is not available, the site should be matched to the appropriate NRCS Ecological Site.

4.3 Soil Resource Inventory

Prior to disturbance, soil samples may be required to be collected in the areas to be disturbed. The soil samples should be analyzed at a soil testing laboratory to determine the texture and any limiting factors of the soil. The factors tested may include pH, lime, salts, sodium adsorption ratio (SAR), and soil nutrient availability. From these tests, those factors that may inhibit revegetation can be identified. This soil testing can be used to determine the depth of topsoil to be salvaged as well as rates and composition of any required soil amendments and fertilizers. The soil testing results would also aid in the prescription of the seed mix.

5.0 Construction

Drill pads, access roads, and pipelines will be designed and constructed to reduce erosion susceptibility and impacts to the landscape. Wetlands, areas with low reclamation potential, and important wildlife habitat areas should be avoided to the maximum extent possible.

5.1 Topsoil Salvage

To facilitate successful reclamation, topsoil salvage shall be completed on every area where the soil will be disturbed. Topsoil salvage entails removing suitable topsoil and handling and storing it separately from the subsoil. When final reclamation begins on a site, the topsoil will be applied as the top layer to provide the best medium for plant growth.

It is recommended that an average of four to six inches of topsoil be removed and stockpiled from each location prior to any construction. This depth may be modified based on conditions indicated during the soils resource inventory. Piling subsurface soil on top of topsoil shall be prohibited.

APPENDIX D: RECLAMATION PLAN

Soil disturbance during construction should be kept at a minimum. The surface should be minimally graded or cleared on drill pads which require less than one foot of cut and fill. Where possible, disturbance will be limited to the topping of shrubs and grasses. Grading should only be used when surface conditions are unsafe for drilling and completion equipment/vehicles. When grading is needed, topsoil will be windrowed along one side of the modified area and kept separate from the trench soil.

It is suggested that for sites with poor reclamation potential and sites that have severe erosion hazards, soil mapping be completed to identify representative soil groups, so that the best available topsoil can be removed and stockpiled to facilitate reclamation. Soil samples can then be obtained to characterize each soil group, and the samples analyzed for limiting factors such as salinity and percent rock content. The best depths and areas for topsoil salvage can be determined from the data. For example, one site may have four inches of topsoil and another may have 12 inches of topsoil.

6.0 Erosion Control

Erosion control is a continuous process that is completed by the Operator from construction through production and interim and final reclamation. Every disturbed area will be evaluated for erosion susceptibility and appropriate erosion control measures implemented when needed. The erosion control process will continue until the disturbed site has met final reclamation standards.

It is suggested that a science-based method to measure erosion susceptibility be used. The Erosion Condition Classification System (Clark, 1980) is one such widely accepted method. This system gives values to erosion features such as rills, pedestals, and surface litter to determine a soil surface factor and the associated erosion condition class. These condition classes range from stable to severe. Based on the condition class, it can be determined if erosion control is necessary, and if so, the type of control measure to be implemented.

Construction storm water discharge for oil and gas production is regulated under the Montana Pollution Discharge Elimination System (MPDES) Permit No. MTR 100000. Authorization for storm water discharge is required for disturbance areas exceeding one acre in size and for areas less than one acre in size but part of a larger (greater than one acre) common plan of development. Permits may be obtained for combined activities that may include numerous well locations, roads, pipelines, and other facilities being constructed within a common plan of development. Specific rules applicable for storm water related to construction activities are included in the Montana Water Quality Act, Title 75, Chapter 5, Montana Code Annotated (MCA) and the Federal Water Pollution Control Act (the "Clean Water Act"), 33 U.S.C. §1251.

All runoff and erosion control structures will be inspected on a regular schedule and after major runoff events. During inspection, the control structures will be cleaned out and maintained in functional condition. The inspection and maintenance schedule will be conducted throughout the duration of construction, drilling, production and final reclamation until successful revegetation and soil stability is attained.

Often a combination of temporary and permanent techniques is needed to adequately control sediment and erosion. The erosion-control method used shall be based on each site's stability characteristics and the duration required for erosion control. Several small structures may function more effectively than a single large structure. Measures useful during construction include straw mulch, straw wattles, and silt fence barriers. During interim reclamation, temporary seeding, straw mulch, erosion mats, berms, and water bars are often effective. For final reclamation, slope recontouring, straw mulch, and permanent seeding are often used.

APPENDIX D: RECLAMATION PLAN

6.1 *Straw Mulch*

Certified weed-free straw mulch application may be required on disturbed soils to provide temporary protection until permanent vegetation is established. Mulch application aids in preventing wind and water erosion and enhances plant establishment by retaining soil moisture and creating micro-habitats for seedling development. Following fertilizer application, if necessary, and seeding, mulch shall be applied at 1.5-2.0 tons per acre. Mulch should not be applied in the presence of free surface water, but may be applied upon damp ground. Mulch should not be applied to areas having substantial vegetative growth, such as grasses, weeds, and grains. Mulching shall not be performed during adverse weather conditions or when wind prevents uniform distribution. Application shall be in a manner that does not seriously disturb the seedbed surface.

Mulch shall be crimped into the soil using a disk crimper to prevent wind loss. The desired depth for crimping is three inches. Following crimping, the straw mulch should resemble stubble in a harvested wheat field.

6.2 *Straw Wattles*

Certified weed-free straw wattles may be placed on erosion-prone sites with the objective of preventing rill and gully development and capturing sediment. Straw wattles are burlap tubes filled with weed-free rice straw, varying in length and diameter. By placing several wattles perpendicular to the direction of water flow, surface runoff and sediment loss can be reduced in areas with steep slopes. The lifespan for burlap straw wattles ranges from one to five years, depending on placement and weather. Following placement, straw wattles shall be monitored and replaced as necessary until site stability is achieved.

6.3 *Silt Fences*

A silt fence is a barrier of geotextile fabric, or filter cloth, used to temporarily intercept sediment-laden runoff from small drainage areas. A silt fence can be used to promote sheet flow, to reduce runoff velocity, and to help retain transported sediment on the site, thus reducing erosion and enhancing water quality. Silt fences are very effective in sheet flow conditions and usually ineffective with concentrated flows. Silt fences are commonly placed at the bottom of a disturbed slope or adjacent to streams and ponds. They can be used for slope protection, in minor swales or ditches, and around storm drains. Silt fences are most effective when areas draining to the barrier are 2.5 acres or less. Silt fences should not be used where concentrated flows exceed 1cfs (Roberts, 1995) or where rocky soils prevent the full and uniform anchoring of the fence toe.

Life expectancy of a silt fence is dependent on the ultraviolet stability and type of fabric, but is usually six months to several years. Woven and nonwoven synthetic fabrics are available. Woven fabric is generally stronger than nonwoven fabric and usually does not require the additional support of a wire mesh.

6.4 *Erosion Mats*

Mats are used to prevent erosion on steep slopes or critical areas and to provide a stable seedbed for one or more growing seasons. The mat is laid parallel to the slope and staked down following contouring and seeding operations. Because numerous erosion control mat materials exist, the mat materials shall be installed according to the manufacturer's instructions.

APPENDIX D: RECLAMATION PLAN

6.5 Berms

Berms are used to control surface runoff at well sites. Berms are typically 18 inches high and are constructed around the fill portion of well sites to control and contain all surface runoff and/or fuel or petroleum product spills on the pad surface.

6.6 Water Bars

Water bars are used to divert water from an erosion-prone site to a vegetated and more stable area. A water bar consists of a trench and adjoining down slope embankment. Water bars should be constructed approximately one to two feet deep. Water bars are placed perpendicular to side slopes at appropriate intervals based on the slope gradient. The bars shall begin and end in undisturbed soils and be constructed generally parallel to the slope contour with a slight grade to facilitate water runoff.

Linear disturbances such as newly constructed or reclaimed pipelines or roads should be cross-drained by water bars. Any slope over 3:1 in steepness should have water bars installed to reduce the slope length. Water bars should be constructed in soils that normally do not support adequate vegetation to prevent erosion, or other sites at risk to excessive erosion.

7.0 Interim Reclamation

The intent of interim reclamation is to minimize the environmental impacts of the development on other resources and uses during the period between construction and final reclamation. Upon completion of construction, interim reclamation shall be completed in areas where final reclamation will not occur at the completion of construction. In locations that will not require recontouring and interim reclamation, final reclamation shall be completed at the end of construction as described in Section 8. Reclamation operations shall be conducted on all disturbed lands in accordance with MBOGC requirements and surface owner agreements.

7.1 Stabilization and Recontouring

Unused areas around well pads, unused pits, flowlines, pipelines, power lines to wells, cut-and-fill slopes of roads, and any other surfaces not required for field use will be graded to form stable, rounded slopes that blend with the natural terrain. Erosion control structures and/or sediment containment systems will be built or installed as needed, the areas will be ripped, and temporary seeding completed. Seeding will occur within three months of completing construction or during the next seeding window, whichever occurs first.

7.2 Noxious Weed Control

Noxious weeds will be controlled on disturbed areas in accordance with guidelines established by the EPA, BLM, State, and local pesticide authorities. Only BLM-approved chemicals will be used on public lands. Appropriate measures, chemical, biological or mechanical, will be followed to prevent the spread of weed infestations and reduce potential for spreading weed seed via equipment use. This may include, but not be limited to, washing rig frames and all drilling equipment prior to entry onto public lands.

APPENDIX D: RECLAMATION PLAN

8.0 Final Reclamation

8.1 Recontouring

All disturbed areas shall be graded to the approximate original contour or to blend with surrounding topography. In preparation for revegetation, extensive earthwork should be completed to help the location blend in with the adjacent rangeland.

Sites that have been recontoured and stabilized by revegetation and erosion control during the production phase may not need recontouring during final reclamation. Sites with revegetated and bare areas that already closely resemble the approximate original contour do not need to be recontoured. Also, if the disturbed area has stabilized and if restoring the original contour will cause additional disturbance, then recontouring may not be required.

Prior to recontouring, all wells will be completely plugged in accordance with the standards stated in the Conditions of Approval for the Notice of Intent to Abandon (NIA), all pipelines will be purged of all fluids as necessary, and the fluids will be disposed of in the proper manner. The topsoil and vegetative material will be scraped from cut-and-fill slopes of roads and pads where stable vegetation has occurred and stockpiled for final distribution after the area is recontoured. This is done so that topsoil that has been previously placed on pad edges or backslopes of roads will not be buried. Additional stockpiled topsoil is preferred for final cover.

Before well locations are recontoured, oily surface material, cuttings (provided they are not regulated under RCRA, CERCLA, or other applicable regulations), and severely compacted soils should be worked and broken into aggregates of one inch in diameter or smaller. If oily surface materials or cuttings are present, to facilitate the breakdown of the hydrocarbons, the broken soil aggregates should be treated with a nitrogen source to adjust the carbon to nitrogen ratio of the soil. The soil should be sampled and analyzed in a laboratory to determine the correct carbon to nitrogen ratio. This should occur before available topsoil and vegetation is spread on the surface for seed bed preparation.

Drainages will be reclaimed to approximate the original bank configuration, stream bottom width, and channel gradient. Any pilings, debris, or other obstructions will be removed from the drainage channels.

Burn pits, reserve pits, and any other pits that are no longer needed will be filled and leveled or sloped to resemble adjacent terrain. Cuttings and drilling mud will be allowed to dry and then all contents including liners will be covered and regraded to provide surface drainage from the filled area. Pit closure should be completed in accordance with BLM requirements. The concentration of nonexempt hazardous substances in the pit at the time of backfilling should not exceed standards set forth in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). Hazardous substances removed from the sites shall be disposed of in accordance with applicable standards.

Once the site has been recontoured, the stockpiled topsoil shall be spread evenly over the entire disturbed area.

8.2 Seeding and Soil Amendments

8.2.1 Seedbed Preparation

Seedbed preparation is critical to the success of revegetation projects. Soils are often compacted due to travel by heavy equipment, creating a less-than-ideal substrate for

APPENDIX D: RECLAMATION PLAN

germination. The objective of seedbed preparation is to reduce soil compaction and create a suitable seedbed for germination and plant growth.

Procedures for properly preparing the seedbed vary with each site and may include tilling, disking, and/or dragging. The objectives of reclamation are to re-establish a growing stand of vegetation similar to the adjacent undisturbed ground or as defined in the NRCS Ecological Site Guides. In all cases the following parameters will be achieved:

- a. The certified weed-free seed will be covered with $\frac{1}{4}$ to $\frac{1}{2}$ inch of soil.
- b. The ground will be scarified to allow the seed to establish roots, protect the surface from wind erosion and maximize rain and snowfall retention.

8.2.2 Compaction Reduction

Prior to contouring and topsoil application, sites should be ripped between two and four inches below the bottom of a compacted layer to decrease compaction. Sites may also be disked and floated with chain harrows to further reduce compacted layers, break up large clods, roughen the surface to increase seed-soil contact and create safe germination sites.

8.2.3 Seeding

All disturbed areas will be seeded with a drill seeder or by broadcast seeding when access does not allow drill seeding. As much seeding as possible will be conducted during the fall before the ground freezes. Occasional seeding may occur in the spring as long as favorable conditions exist. Seeding will not be allowed in frozen or saturated soil conditions except for winter seeding of sagebrush on snow. Reseeding will be required when a satisfactory stand is not obtained.

The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS) per acre. There shall be no invasive or non-native weed seeds in the mixture. Seed shall be tested and the viability testing shall be done in accordance with Montana State law(s). Viability testing results should be available for BLM review, if requested. Commercial seed shall be either State-certified or registered weed-free seed. The seed mixture container shall be tagged in accordance with State law(s) and available for inspection. The amount of seed planted will be enough so that upon germination, the soil is adequately covered.

8.2.4 Seed Mixtures

All disturbed areas will be seeded with an approved seed mixture. An approved standard seed mixture is provided in Table 1, and other approved species that could be included in a customized mix for a particular site, along with recommended seeding rates for a pure stand, are provided in Table 2. Approved species will be used on all BLM surface land and on private surface unless the landowner requests otherwise. Non-native yellow sweet clover will not be allowed as a component of any seed mix. The vegetation inventory described in 3.0 and 4.2 would be used to develop the species composition for the seed mixes. Using species that are already present in an area increases the probability that the area will be revegetated successfully. Soil sampling may also be necessary to ensure that the species in the seed mix will establish on the site. After the vegetation survey and/or soil sampling has been completed, a mix should be developed using species listed in Table 2; no monocultures will be allowed. The mixture should be diverse enough to show a variety of native desirable plants upon germination. The percentage of each species in the mixture will determine the percentage of that species' pure-stand seeding rate used. Forbs and shrubs may be included in the seed mixtures; however, they should not be included when herbicides are used to control invasive weeds.

APPENDIX D: RECLAMATION PLAN

8.2.5 Fertilizer and Soil Amendments

Fertilizer or other supplemental treatments may be necessary to establish a growing stand of vegetation. The soils in each area should be tested to determine the amounts of plant-available nutrients and any limiting soil factors. Based on this sampling, fertilizer should be applied as needed after seeding. Any soil amendments needed to remediate limiting factors, such as sodic and saline soils, should also be applied to the site.

8.2.6 Mulch

Straw mulch application during final reclamation shall be completed as described above for erosion control (**Section 6.1**).

8.2.7 Grazing

When possible, grazing by livestock should be deferred from sites recently seeded. Heavy grazing can significantly hinder revegetation success. Site conditions and reclamation success should be reviewed prior to initiation of grazing. Grazing should be deferred for one to two growing seasons after seeding takes place or until plants are sufficiently established. This may require construction of fences around sensitive seeded areas.

8.2.8 Weed Control

Seeded and bare areas should be monitored for weed infestations. All category 1, 2, and 3 invasive and non-native species will be controlled and eradicated if possible. Appropriate measures—chemical, biological, or mechanical—will be followed to prevent the spread of weed infestations. Only BLM-approved chemicals will be used on public lands. As indicated above, it may be necessary to plant forbs and shrubs after grasses in order to control weeds. Weed growth following the disturbance of recontouring can be controlled with a broadleaf herbicide; forbs and shrubs can be planted once the weed population is sufficiently diminished. Natural re-establishment and succession of forbs and shrubs will occur from surrounding areas.

9.0 Monitoring and Maintenance

Reclamation should be monitored to evaluate the success of both interim and final reclamation efforts and determine if the techniques used are effective or if additional measures are needed.

Monitoring of interim reclamation is integral to managing storm water discharges authorized under MPDES. Monitoring of interim reclamation success should include visual observations and measurements of the soil stability and the effectiveness of any erosion-control measures implemented. If any temporary revegetation has taken place, seedling emergence and density should be measured to determine if it is sufficient.

Final reclamation monitoring will be used to determine the effectiveness of the reclamation methods implemented and, in the long-run, determine if an area meets final requirements for reclamation success. After final reclamation has taken place, erosion-control measures and revegetation efforts shall be observed for effectiveness. This should include measuring site stability and seedling emergence and density. Invasive and non-native weeds should also be closely monitored during this period so that measures to stop their spread can be implemented immediately upon infestation.

After sufficient time has passed for vegetation to become established, each disturbed area and corresponding reference area shall be monitored for final reclamation success. Data collected should include site stability and acceptable and repeatable methods of collecting vegetation cover, ground cover, plant density, and species composition. This data can then be used to

APPENDIX D: RECLAMATION PLAN

determine if a site has met the final reclamation success goals listed in the objectives section of this document. If sites do not meet these goals, additional reclamation efforts may be needed. However, below-average precipitation for an extended time may prevent a site from meeting the objectives. A site may need more time for vegetation to establish and not require additional reclamation.

Water bars that are no longer needed to control runoff should be flattened to blend with the surrounding landform and vegetation.

Table 1. Standard seed mixture for the BNGPA

Species	% of Mix	PLS lbs/acre
Western Wheatgrass	40	3.2
Blue Grama	10	0.2
Needle and Thread	20	1.2
Prairie Junegrass	25	0.25
Purple Prairie Clover	5	0.15
Total	100	

APPENDIX D: RECLAMATION PLAN

Table 2. BNGPA recommended species, cultivars, and pure stand seeding rates

Plant Species	Scientific Name	Recommended Cultivar¹	Drill Seeding Rate^{2,3} PLS lbs/acre⁴
Grasses			
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i>	Goldar	6
Green Needlegrass	<i>Nassella viridula</i>	Lodorm	5
Sandberg Bluegrass	<i>Poa secunda</i>	High Plains	2
Prairie Junegrass	<i>Koeleria macrantha</i>	n/a	1
Blue Grama	<i>Bouteloua gracilis</i>	Bad River	2
Needle and Thread	<i>Hesperostipa comata</i>	n/a	6
Indian Ricegrass	<i>Achnatherum hymenoides</i>	Rimrock	6
Prairie Sandreed	<i>Calamovilfa longifolia</i>	Goshen	4
Inland Saltgrass	<i>Distichlis spicata</i>	n/a	5
Alkali Sacaton	<i>Sporobolus airoides</i>	n/a	1
Western Wheatgrass	<i>Pascopyrum smithii</i>	Rosana	8
Forbs			
Dotted Gayfeather	<i>Liatris punctata</i>	n/a	6.4
Western Yarrow	<i>Achillea millefolium</i>	Great Northern	0.5
Purple Prairie Clover or White Prairie Clover	<i>Dalea purpurea</i> <i>Dalea candida</i>	Bismark Antelope	3
Shrubs			
Fourwing Saltbush	<i>Atriplex canescens</i>	Wytana	0.5
Silver Buffaloberry	<i>Shepherdia argenta</i>	Sakakawea	0.5–1
Wyoming Big Sagebrush ⁶	<i>Artemisia tridentata</i>	n/a	3
Silver Sagebrush ⁶	<i>Artemisia cana</i>	n/a	2
Wood's Rose	<i>Rosa woodsii</i>	n/a	0.5–1
Winterfat ⁶	<i>Krascheninnikovia lanata</i>	Open Range	<.5

¹ Other cultivars adapted to the area are acceptable.

² Seeding rates are given for 12-inch drill rows.

³ When broadcast seeding, double the pounds per acre seeded.

⁴ Pure Live Seed

⁵ Lewis Blue Flax should not be seeded in a mix at rates higher than 0.15 lbs/acre.

⁶ These shrubs should always be broadcast seeded; seeding rates listed are for broadcast seeding.

Sources: NRCS Montana Technical Note, Plant Materials MT-46 (Rev. 1);

NRCS Montana Technical Note, Range MT-33

Granite Seed Company, Lehi, UT