



U.S. Department of the Interior
Bureau of Land Management
Wyoming State Office

Rawlins Field Office

December 2001

**DECISION RECORD and
FINDING OF NO SIGNIFICANT IMPACT for the
Atlantic Rim Coalbed Methane Project,
Sun Dog Pod, Carbon County, Wyoming**

MISSION STATEMENT

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

BLM/WY/PL-02/001+1310



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Rawlins Field Office
1300 North Third Street
Rawlins, Wyoming 82301-4376

In Reply Refer To:
1790

December 21, 2001

Re: Sun Dog Pod Coalbed Methane Project

Dear Reader:

We are providing you a copy of the enclosed Decision Record for your information and use. This document identifies our decision regarding the Sun Dog Pod Project and explains the rationale for reaching the decision. Included with this document are the applicant-committed environmental practices and protection measures and additional mitigation requirements for the implementation of this project.

On September 21, 2001, we released the *Environmental Assessment for the Atlantic Rim Coalbed Methane Project, Sun Dog Pod*. The environmental assessment was prepared in order to satisfy the requirements of the National Environmental Policy Act, other regulations, and statutes to fully disclose the potential environmental impacts of the alternatives (Proposed Action and No Action) and to solicit public comment on them. The assessment also identified additional mitigation measures to further reduce potential impacts.

A copy of this decision has been sent to all governmental entities, individuals, and organizations who are on our coalbed methane mailing list. In past correspondence to those interested in coalbed methane activities within the Atlantic Rim Coalbed Methane Project Area, we indicated that copies of environmental documents would be posted on the internet as our primary method of public notice. The Wyoming BLM website is currently unavailable to the public; in order to assure timely notification of this decision, we are sending the decision via regular mail. Once the internet is again available, we will return to our previously agreed-to protocol. We wish to thank the individuals and organizations who provided input throughout this analysis.

If you have any questions regarding this decision or need additional information, please contact Brenda Vosika Neuman, Project Lead, at the address shown above or phone (307) 328-4389.

Sincerely,

Field Manager

Enclosure

**DECISION RECORD AND
FINDING OF NO SIGNIFICANT IMPACT
FOR THE
ATLANTIC RIM COALBED METHANE PROJECT
SUN DOG POD ENVIRONMENTAL ASSESSMENT**

INTRODUCTION

Petroleum Development Corporation (PEDCO) of Gillette, Wyoming, notified the Bureau of Land Management (BLM), Rawlins Field Office, that the company proposes to explore and potentially develop coalbed methane (CBM) wells in the Sun Dog Pod Project Area (SDPA) of the Atlantic Rim Project Area (ARPA) in southcentral Wyoming. The Sun Dog proposal is part of the exploration drilling activities that will be considered for the acquisition of data necessary to prepare the Environmental Impact Statement (EIS) within the ARPA. Coalbed methane development is very new in the Green River Basin. Public concern has been brought forth regarding the unknowns about CBM development in this area. When asked by the operators to allow some limited exploration within the ARPA, the BLM agreed that some drilling would be advantageous and agreed to look at how much, and under what conditions, limited exploration activities would be considered.

On June 1, 2001, an Interim Drilling Policy (IDP) was sent to all operators participating in the proposal to develop CBM resources in the ARPA. The IDP was prepared by the Rawlins Field Office EIS Interdisciplinary Team (IDT), with recommendations from the BLM's Reservoir Management Group. The IDP was developed as a way to manage interim activities concurrently with EIS preparation. Prior to the development of any exploration activity, the IDP states that an environmental assessment will be prepared for all pods developed on federal acreage. Interim drilling activities will be monitored by the BLM to ensure such activities do not significantly affect the environment or prejudice decisions to be made as a result of the analysis to be conducted in the ARPA EIS.

This interim development project consists of drilling, completing, and producing a total of ten exploratory CBM wells, one injection well, and related production and water disposal facilities in the SDPA of the ARPA. Four of these CBM wells and one injection well were previously analyzed in an environmental assessment (EA) completed by the BLM Rawlins Field Office on October 12, 2000, and the Applications for Permit to Drill (APDs) were approved October 27, 2000. To date, two wells have been drilled; however, one of these wells has subsequently been plugged and abandoned. Further drilling operations are proposed to begin in late fall 2001. The total life of the project (LOP) is estimated at 10 to 15 years.

The SDPA is located within the administrative boundary of the BLM Rawlins Field Office in Township 16 North, Range 91 West, Carbon County, Wyoming. Access to the SDPA is by State Highway 789 north from Baggs for approximately 22 miles to the intersection with Carbon County Road 608 (Dad Road). The distance from State Highway 789 to the SDPA is approximately six miles.

The SDPA encompasses approximately 1,000 acres, all of which are federal surface and federal minerals.

ALTERNATIVES CONSIDERED

The Environmental Assessment for the Atlantic Rim CBM Project, Sun Dog Pod analyzed two alternatives. The Proposed Action considered CBM activities to occur on federal lands. Under the Proposed Action, six wells would be drilled on federal lands administered by the BLM. The proposed CBM development is based on a Wyoming Oil and Gas Conservation Commission (WOGCC) approved 80-acre well spacing pattern.

In addition to well sites, other facilities, such as access roads, gas gathering and water disposal pipelines, electrical utilities, and compressors, would be developed to facilitate natural gas (methane) production in the well fields. The interim project would develop over a 6 to 12 month period. The productive life of the project is estimated between 10 and 20 years. Each well would be production tested continuously for a period of six to twelve months to evaluate the commercial feasibility of producing CBM from coals in the Almond and Allen Ridge Formations of the Mesaverde Group.

Under the No Action Alternative, the BLM analyzed the impacts associated with the four approved federal wells, one injection well and associated facilities, and denial of any further development of federal lands associated with this project. This alternative provides a benchmark, enabling the decisionmaker to compare the magnitude of environmental effects of the alternatives.

No other alternatives were considered because, in order to prevent significant impacts to the environment, the IDP limits the placement of CBM exploratory activities outside of areas where sensitive resources exist. Exploration activity was centered where the best geologic and hydrologic information could be obtained outside of sensitive resource areas.

DECISION

Based upon the analysis of the potential environmental impacts described in the *Environmental Assessment for the Atlantic Rim Coalbed Methane Project, Sun Dog Pod* and in consideration of the public, industry, and governmental agency comments received during the environmental analysis process, the BLM approves the Proposed Action as described in Chapter 2 of the EA and associated errata (see Appendix A) for the exploration of six CBM wells and associated facilities within the SDPA. The decision incorporates the Applicant-Committed Environmental Practices and Protection Measures identified in Appendix C, as modified; BLM-required mitigation identified in Appendix D; and the Conditions of Approval (COAs) described in Appendices E, F, and G.

APPROVED PROJECT COMPONENTS

The decision authorizes the initiation of permit approvals for the following project components on BLM-administered federal lands and/or minerals within the SDPA, subject to the requirements identified in Appendices C, D, E, F, and G.

- Development of six CBM wells located on federal lands within the SDPA with an initial total disturbance of 5.5 acres and a LOP disturbance of less than 0.03 acres.
- Construction of new access roads and facilities associated with CBM development including gas gathering pipelines, water discharge lines, and power lines that will be buried parallel to road rights-of-way. Estimated initial disturbance of 11.0 acres, LOP disturbance of 11.0 acres.
- Construction of new gas lines to connect with existing sales line resulting in an initial disturbance of 2.5 acres. The line would be wholly reclaimed resulting in LOP disturbance of zero acres.
- Construction of a compressor site with an approximate disturbance area of 0.9 acre.
- Construction of four water transfer pumping facilities with an approximate total disturbance area of 1.3 acres.

Approval of the Proposed Action Is Conditional upon the Following:

- Implementation of the applicant-committed environmental practices and protection measures as described in Appendix C.
- Implementation of the mitigation measures described in Appendix D.
- Adherence to the COAs described in Appendices E, F, and G.
- Adherence to oil and gas lease and right-of-way (ROW) grant stipulations and APD COAs.

RATIONALE FOR THE DECISION

The decision to approve the operator's proposed development was based on the following factors: 1) consistency with the land use and resource management plans; 2) national policy; 3) agency statutory requirements; 4) relevant resource and economic considerations; 5) application of measures to avoid or minimize environmental harm; 6) finding of no significant impact; 7) public comments.

1. Consistency with Land Use and Resource Management Plans

The Proposed Action is in conformance with the overall planning direction for the area. The objective for oil and gas management decisions described in the Great Divide Resource Management Plan, 1990, is to "provide opportunity for leasing, exploration, and development of oil and gas while protecting other resource values." The project also meets the objectives of the Lands BLM Program which is to "support the goals and objectives of other resource programs for managing the BLM-administered public lands and respond to public demand for land use authorizations."

2. National Policy

Private exploration and development of federal oil and gas leases is an integral part of the BLM oil and gas leasing program under the authority of the *Mineral Leasing Act of 1920* and the *Federal Land Policy and Management Act of 1976*. The United States continues to rely heavily on foreign energy sources. Oil and gas leasing is needed to encourage development of domestic oil and gas reserves to reduce the United States' dependence on foreign energy supplies. Therefore, the decision is consistent with national policy.

3. Agency Statutory Requirements

The decision is consistent with all federal, state, and county authorizing actions required to implement the Proposed Action. All pertinent statutory requirements applicable to this proposal were considered including informal consultation and formal conferencing with the U.S. Fish and Wildlife Service (USFWS).

4. Relevant Resource and Economic Considerations

Environmental impacts from the pilot project to resources identified in the EA are minor and all deemed acceptable. The economic benefit is important due to the tax revenues generated from the development of natural gas.

5. Application of Measures to Avoid or Minimize Environmental Harm

Federal environmental protection laws, such as the *Clean Air Act*, the *Clean Water Act*, and the *Historic Preservation Act*, apply to all lands and are included as part of the standard oil and gas lease terms. The adoption of the mitigation and monitoring measures identified in Chapters 2.0 and 4.0 of the project EA and contained in this Decision Record in Appendix C and D, and the COAs found in Appendices E, F, and G, represent practicable means to avoid or minimize environmental impacts.

6. Finding of No Significant Impact

Based upon the review of the EA, the BLM has determined that the Proposed Action, with implementation of the protective measures identified in Appendices C, D, E, F, and G, herein, would not cause a significant impact to the quality of the human, natural, and physical environment. Therefore an EIS is not necessary.

7. Public Comments

Twelve comment letters were received on the EA during the 30-day comment period that ended October 22, 2001. The following is a list of those responding to the request for public comment.

- Ray and Kathleen Weber
- Neil O. and Jennifer S. Miller
- Double Eagle Petroleum and Mining Company
- State of Wyoming
 - Office of Federal Land Policy
 - Wyoming Game and Fish Department
 - Wyoming Business Council
 - State Historic Preservation Office
- Petroleum Association of Wyoming
- United States Fish and Wildlife Service
- National Wildlife Federation
- Rocky Mountain Energy (RME)
- Biodiversity Associates

A summary of the substantive comments and the BLM's responses are found in Appendix B.

APPEAL

This decision is subject to appeal. Under BLM regulation, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, WY, 82003, within 20 business days of the date this Decision Record is received or considered to have been received.



Field Manager



Date

APPENDIX A

**MODIFICATIONS AND CORRECTIONS
TO THE
SUN DOG POD PROJECT
ENVIRONMENTAL ASSESSMENT**

APPENDIX A

ERRATA MODIFICATIONS AND CORRECTIONS TO THE ATLANTIC RIM CBM PROJECT SUN DOG POD ENVIRONMENTAL ASSESSMENT

1.3.2 Conformance With Interim Drilling Guidelines

Change the paragraph under this title to read, "The SDPA is one of nine pods that are proposed for exploration and development within the ARPA. Drilling and development will be managed under the guidelines provided by the Interim Drilling Policy - Conditions and Criteria Under Which Development Activities May Occur Concurrent with the EIS Preparation for the Atlantic Rim CBM Project."

2.1.2.3 Drilling and Completion Operations

Change the first sentence of this title to read, "A truck-mounted drill rig would be utilized for CBM drilling, while a conventional rig will be used to drill the injection well."

2.1.3.3.2 Produced Water-Gathering System and Injection Facilities

On page 2-11, paragraph 1, line 3 under this title, remove the reference to the Wyoming State Engineers Office (WSEO).

2.1.8.1 Preconstruction Planning and Design Measures

On page 2-17, item number 6, line 1, change to read, "The BLM would require that culverts be covered with a minimum of 12 inches of fill or one-half the pipe diameter, whichever is greater."

2.1.8.2.4 Minerals/Paleontology

Under this heading, paragraph 1, sentence 2, add the Wyoming Oil and Gas Conservation Commission (WOGCC) to the list of references.

2.1.8.2.5 Soils

Under item number 9, change the second sentence to read, "Design all drainage crossings to carry the 25-year discharge event, or as otherwise directed by the BLM."

2.1.8.2.6 Water Resources

Under number 13, last line, change to read, "Coordinate all discharge of hydrostatic test water with the WDEQ/WQD and the BLM."

Under item 15, change the last line to read, "All required WDEQ permits will be in-place prior to discharge."

2.1.8.2.9 Wildlife

Under item 4, change “ARPA” to “SDPA.”

2.1.8.2.10 Special Status Species - Special Animals

Add the following sentence at the end of item 2, “Should this test indicate that no depletions of the Colorado River system will occur from the implementation of this project, discharge from CBM wells will not be allowed until concurrence with these results is received by the BLM from USFWS.”

2.1.8.2.12 Noise

Under measure 2, line 2, remove the reference to MSHA.

2.1.8.2.16 Health and Safety

To minimize undue exposure to hazardous situations, the operator will comply with all existing applicable rules and regulations (i.e., Onshore Orders, OSHA requirements, etc.) that would preclude the public from entering hazardous areas and place warning signs alerting the public of truck traffic.

2.3 Alternatives Considered But Not Analyzed in Detail

The Proposed Action was developed around measures provided in the Interim Drilling Policy - Conditions and Criteria Under Which Development Activities May Occur Concurrent with EIS Preparation for the Atlantic Rim Coalbed Methane Project. Only alternatives addressing allowable actions specified in the IDP are considered in this analysis. As a result, no other alternatives, other than the No Action Alternative, were considered in this analysis.

4.7.1.1.6 Species of Concern - Wildlife and Fish

Add the following sentence prior to the last sentence of the paragraph, “Two sagebrush obligate species, Brewer’s and sage sparrow, may be present within the SDPA. Because of the small amount of disturbance associated with the project, their inherent mobility, and the availability of suitable habitats on undisturbed land, the effects on these species should be minimal.”

4.7.1.1.2 Big Game

In line 6, change “important big game winter ranges” to “crucial big game winter ranges.”

4.7.1.1.3 Upland Game Birds

Change the last sentence in paragraph 3 to read, “If all avoidance and mitigation measures in this document, the RMP, and the guidance provided by the IDP are implemented, minimal impacts to the sage grouse population are expected.”

4.7.1.1.5 Threatened and Endangered Species - Wildlife and Fish

Under Threatened and Endangered Fish species, Razorback Sucker, paragraph line 5, change reference from Wyoming Water Quality Standards to Wyoming Surface Water Quality Standards (WDEQ 2001).

4.15 Cumulative Impacts

On page 4-30, after the first partial paragraph, add the following, "Within the entire 310,335-acre Atlantic Rim Project Area, a total of 165 wells have been drilled. Of these wells, 80 have been plugged and abandoned and are in various stages of reclamation. The 165 well total includes those wells described within the Muddy Creek watershed."

Table 4-3. Cumulative Impacts Analysis Matrix - Cumulative Impacts Associated with the Sun Dog Pod (Pod 6)

Remove the reference to crucial winter range as being discussed in these pods. The Sun Dog Pod project area contains no crucial big game winter range; therefore, cumulative impacts to this range would not result from the implementation of this project.

Table 5-1 List of BLM Interdisciplinary Reviewers

Add the names of John Ahlbrandt, Natural Resource Specialist, and Tim Bottomley, Environmental Protection Specialist, to this list.

Appendix A

Change the title of this section to read, "Interim Drilling Policy - Conditions and Criteria Under Which Development Activities May Occur Concurrent with EIS Preparation for the Atlantic Rim Coalbed Methane Project."

Page A-4, item 16, refer to "Design of Culvert Fishways" by F.J. Watts, Water Resources Research Institute, University of Idaho, Moscow, Idaho, May 1974.

Appendix D - Plant and Wildlife Species of Concern that May Potentially Occur on or Near the Sun Dog Pod

Add the species listed in the table on following page to this list.

Decision Record and FONSI - Atlantic Rim Coalbed Methane Project - Sun Dog Pod

SPECIES & STATUS	VEGETATION COMPOSITION	VEGETATION STRUCTURE	ABIOTIC FACTORS	LANDSCAPE FACTORS	SPECIAL FACTORS
<p>Brewer's Sparrow</p> <p>(BRSP) <i>Spizella breweri</i> Level I CA, M, R Score = 23 AI = 5 PT = 5</p>	<p>Sagebrush dominated habitats</p>	<p>Average nesting shrub height = 20 inches, range 12 to 26 inches in WY (average 27 inches, range 16.5 to 41 inches in ID; average 16.5 inches in MT)</p>	<p>Elevation is not a factor in WY; presence of sagebrush is a factor</p>	<p>Open shrubland habitat, especially sagebrush cover types</p> <p>Nests in shrubs that are entirely or mostly alive</p> <p>Nests are placed < 4 feet above ground</p> <p>Average territory size is 1.3 acres (ID)</p>	<p>Sagebrush obligate</p> <p>Nest concealment by sagebrush is very important</p> <p>Sensitive to fragmentation of shrub-steppe habitat and spraying or removal of sagebrush</p> <p>Common cowbird host</p> <p>Winters in Mexico</p>
<p>Sage Sparrow</p> <p>(SAGS) <i>Amphispiza belli</i> CA,M,R Score = 22 AI = 5 PT= 2</p>	<p>Big sagebrush</p> <p>Shadscale saltbush</p> <p>Antelope bitterbrush</p> <p>Rabittbrush</p>	<p>Nests in shrubs up to 3.3 feet high</p> <p>High shrub cover ($\geq 30\%$) and sagebrush height > 20 inches</p>	<p>Elevation \leq 6,500 feet where sagebrush is present</p>	<p>Tall shrubs, low grass cover, clumped/ patchy shrub landscape</p> <p>Large patch size, low disturbance, little fragmentation</p> <p>Average territory size ranges from 1.7 to 2 acres (ID)</p>	<p>Sagebrush obligate and area-sensitive</p> <p>Sensitive to fragmentation of shrub-steppe habitat and the removal of sagebrush</p> <p>5 to 10 acre territory depending on habitat configuration (southern ID)</p> <p>Males return to the same territory</p> <p>Occasional cow bird host</p> <p>Winters in Mexico</p>

APPENDIX B

**SUMMARY OF EA COMMENTS AND
BLM RESPONSES**

APPENDIX B

SUMMARY OF EA COMMENTS AND BLM RESPONSES

The EA was released for a 30-day public review period on September 21, 2001. Twelve comment letters were received. The letters have been reviewed to determine whether the information they provided would warrant a determination other than a Finding of No Significant Impact (FONSI). Substantive comments with responses are summarized below (*in italics*) with BLM responses to each immediately following the comment. The BLM would like to thank all commentors for taking time to review the EA and provide comments.

1. Wyoming Game and Fish Department (WGFD)

- a. *Sage grouse crucial winter habitat is shown in this document as small areas of undefined size on the project map. Winter home range size can vary from 11 to 31 km² and researchers in Idaho found severe winter weather did not result in sage grouse reducing its seasonal range. Specific sage grouse winter distribution in a given area is more accurately determined through repeated samples over successive winters.*

Sage grouse winter habitat as discussed in the Sun Dog Pod EA was from data collected during the winter of 2000-2001 when snow-free vegetation in the entire Atlantic Rim Coalbed Methane Project Area was sparse. The BLM agrees that the best data on wintering areas will be obtained by survey over successive winters. It is the BLM's intent to continue to gather information on wintering sage grouse. This is an ongoing project and we hope to continue our research efforts through our EIS monitoring plan.

- b. *The document states that, considering the vast amount of potential nesting habitat, the 112 acre loss would be minimal. Because there is no estimate of the total available number of acres of nesting habitat in this document, the conclusion that 112 acres is minimal is not supported. The loss of nesting habitat is significant if it is used by nesting females. The inability to define actual impacts to sage grouse should be included in the EA.*

On page 4-34 of the Sun Dog Pod EA, it states that approximately 11,005 acres of sage grouse habitat occur within the nine potential areas where CBM drilling is likely to occur. This would mean that about 1% of the available sage grouse habitat located within the pods identified for drilling during the interim program may be disturbed. We have no exact figures as to the amount of habitat available within the larger Atlantic Rim Coalbed Methane Project Area, but the RMP identifies the area as lying within the area in which the Baggs Habitat Management Plan was prepared. Within this larger area, 160,500 acres of sage grouse nesting habitat was identified.

We do not know the use patterns of available habitat by females, or for that matter, the location of all occupied habitat. However, even when the disturbance from the Sun Dog Pod project is added to disturbance from other uses, it is unlikely that a significant portion of available habitat is being utilized.

- c. *Cumulative impacts should include all habitat disturbances in the area, including proposed and completed shrub treatments in and around the project area such as wildfires, prescribed fire, and chemical treatment.*

The dominant shrub type utilized by sage grouse is Wyoming big sagebrush; however, 95% of BLM prescribed burns occur in mountain big sagebrush and basin big sagebrush. Generally this discounts impacts to sage grouse habitat. It should also be noted that the height and density of shrubs treated by prescribed fires are outside of the range typically used by sage grouse for nesting and brooding habitat.

Impacts to big game as a result of burns are also expected to be minimal, generally because of the vegetation is restricted to mountain and basin big sagebrush types, which is not the dominant forage utilized by big game animals, but is generally utilized as hiding cover. We are unaware of any research that defines the number of acres or spatial distribution of vegetation that would be utilized by deer and pronghorn. For elk, typical hiding cover would be aspen or other timber types which would not be included in prescribed burn areas.

Within the BLM prescribed burn program, the objective is not to burn all vegetation, but to try to leave mosaics of burned and unburned vegetation. Over the last 15 years, approximately 20,000 acres have been burned as a result of BLM prescribed burns and 4,000 acres have been burned due to wildfire, within a roughly 500,000-acre habitat area. The burned acreage is in various stages of successional recovery.

2. **Rocky Mountain Energy (RME)**

- a. *The first paragraph in Section 2.1.3.3.2 states that, "Prior to drilling injection wells, a permit will be submitted to and received from the WSEO and the WDEQ/WQD." For clarity RME, recommends that the sentence be reworded to remove the reference to the State Engineers Office, since there is no requirement that injection wells be permitted through that agency.*

The change has been made and is noted in Appendix A of this Decision Record.

- b. *In Section 2.1.8, Project-Wide Mitigation Measures and Procedures, it is unclear which elements of mitigation in this extensive section are either "measures" or "procedures" committed to by PEDCO" or are actually "BLM-required management practices." Without this distinction, it is unclear if certain mitigation measures that are unenforceable or unsupported are the BLM-required management practices or whether PEDCO proposed them.*

The measures identified in Section 2.1.8 of the Sun Dog Pod EA are actions or features which are included as part of the Proposed Action that could be taken to avoid or reduce projected impacts or reflect standard operating procedures. Once the measures, as described in Chapter 2, become part of the decision, they are considered enforceable actions that will be implemented, if applicable, to reduce impacts to the environment resulting from the project. So, regardless if these measures are proposed by the BLM or the applicant, they will be applied if necessary.

- c. *Under Section 2.1.8.2.2, Air Quality, it states that, "PEDCO would initiate immediate abatement of fugitive dust (by application of water, chemical dust suppressants, or other measures) when air quality, soil loss, or safety concerns are identified by the BLM or WDEQ/AQD." WDEQ air quality standards contain specific numeric limits at which compliance measures can be initiated. The same cannot be said for soil loss or safety concerns. What measurement or standard will BLM use to identify when unacceptable levels for soil loss and safety have been encountered?*

The BLM expects the operator to not only adhere to applicable federal, state, and local laws and regulations and appropriate measures and mitigation proposed in Chapters 2 and 4, if carried forward in the decision, but to act responsibly, use common sense, and take the initiative to avoid or respond to correct situations where air quality, safety, soil loss, and other resource protection measures may be required on the public lands without first being informed by the BLM.

- d. *Number 6 under 2.1.8.2.3, Transportation, states that, except in emergency situations, access would be limited to drier conditions to prevent severe rutting of the road surface. It is unclear how the BLM will define severe rutting.*

The COAs attached to the Sun Dog Pod project (Appendix E) states, "No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of 4 inches deep, the soil shall be deemed too wet to adequately support construction equipment." In addition, the BLM would expect the operator to take the responsibility to avoid traveling on roads that appear too wet to travel, especially when utilizing heavy equipment.

- e. *In Section 2.1.8.1, insert the words "covered with" after the word "be." Also, the reference to WDEQ as the authority for setting casing and cementing policies is incorrect, it should be the Wyoming Oil and Gas Conservation Commission (WOGCC).*

The changes have been made and can be viewed in Appendix A.

- f. *In Section 2.1.8.2.5, PEDCO is asked to install runoff and erosion control measures such as water bars, berms, and interceptor ditches, if needed. In 2.1.8.2.6, Water Resources, it states that, if needed, PEDCO is to design and construct interception ditches, sediment traps, etc. The term "if needed" does not provide an adequate performance standard or enforceable limit. This standard does not make it clear to PEDCO when the BLM may require such measures. Providing clear direction to the operator in this document would allow PEDCO to identify and correct problems of concern to the BLM prior to BLM inspections.*

Although not all situations can be predicted, COAs have been prepared for this project based on the operations described in the Master Surface Use Plan and recommendations from the BLM interdisciplinary group that participated in the initial project onsite inspection. These COAs describe limits and standards that are enforced on this project, but because not every possible situation can be identified, the proposed mitigation is used as a tool for dealing with situations as they arise. These measures, described in Chapter 2, may need to be employed, either when identified by the operator, or required by the BLM or other agencies, should the situation warrant.

- g. *A statement is made that the casing of wells would adhere to the appropriate BLM cementing policy. Is there adequate information in PEDCO's drilling plan to determine which cementing policy would be imposed?*

On federal lands, casing and cementing requirements must meet the minimum requirements of Onshore Order No. 2. PEDCO has provided adequate information in the Master Drilling Plan to develop a cementing program, and this program has been approved by the BLM. See the Master Drilling Plan, Item Number 7, in Appendix E.

- h. *The coordination of discharging hydrostatic test water should occur through the WSEO. RME is uncertain why this is suggested because there is no citation of a regulation.*

The coordination of discharging hydrostatic test water actually occurs under the Wyoming Environmental Quality Act, Article 3, Water Quality, as amended (W.S. 35-11-301 through 35-11-212), and is administered by the WDEQ/WQD. The text in the document has been changed to reflect this, please see Appendix A.

- i. *Under 2.1.8.2.6, Water Resources, the EA states that WDEQ requires operators to obtain a NPDES Storm Water permit for fields of 20 wells or more. This requirement does not exist in either the WDEQ General Storm Water Permit for Construction or Industrial Activities Permit. Oil and gas operations of exploration, production, processing, treatment, and transmission are largely exempt from the industrial permit. Construction of drill sites, pipelines, and compressor stations are subject only if five or more acres will be disturbed.*

The wording will be changed that all appropriate WDEQ permits will be in-place prior to operations. See Appendix A.

- j. *Under Section 2.1.8.2.9, Wildlife, the document requires PEDCO to "establish a variety of forage species that are useful to resident herbivores" during reclamation. How is PEDCO to know what an adequate "variety" would be?*

As in processing all APD, the activities conducted within the Sun Dog Pod are subject to COAs which describe specific requirements for such things as road construction, well site lay-out, wildlife stipulations, and reclamation. The COAs state the type of seed mix the operator will be required to use (see Appendix E).

- k. *The EA asks PEDCO to complete a raptor survey for the Atlantic Rim Project Area; this seems overly broad and unnecessary.*

This was a typographical error and only the area affected by the Sun Dog Pod exploration project activities will require these surveys. This change has been made in Appendix A.

- l. *The EA requires PEDCO to utilize existing topography to screen roads, pipeline corridors, drill rigs, well heads, and production facilities from view. This requirement is inconsistent with the analysis which states that the SDPA area is not pristine.*

Section 3.8 states that, although there are no developed recreation sites or facilities, the area is used extensively by big game and small game hunters. Section 3.9 of the Sun Dog Pod EA states, "the quality of the visual resource is an important part of the recreational experience" for many users. By implementing this mitigation, it would lessen the impact to recreational users and would be also be consistent

with the goals of visual resource management in Class III areas which states changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but that the changes should remain subordinate to the visual strength of the existing character.

- m. *References are made regarding compliance with OSHA and MSHA safe limits for noise. MSHA does not regulate the oil and gas industry and RME recommends that the reference to MSHA be eliminated.*

The reference to MSHA has been eliminated. See Appendix A.

- n. *Reference in Section 2.1.8.2.13, recommends low speed limits within the SDPA. RME recommends that "low speed limits" in relation to various BLM road classification be defined, such as 30 mph on resource roads.*

Although construction of new and upgrading of existing roads may be done with an anticipated vehicle speed, it would generally be the operators' responsibility to inform employees of expected safe speed limits on roads in the project area. This could be implemented as be part of a company safety program. It would not be the BLM's intent, or responsibility, to police company personnel to determine if they are using appropriate speed limits for road conditions. Only under special circumstances (e.g., a tight or dangerous curve) would the BLM require the placement of speed limit signs.

- o. *At Section 2.1.8.2.14 there is a requirement for PEDCO to "implement hiring policies that would encourage the use of local or regional workers who would not have to relocate to the area." In reality, PEDCO would likely hire very few direct employees but would obtain them by contract. PEDCO has no authority over the hiring practices of its contractors, nor should it. Additionally, the document fails to justify how this requirement would mitigate any impacts. Often the specialized workers and equipment required by oil and gas industry are not available either locally or regionally.*

The analysis presented in Chapter 4 (Section 4.11.1.1.1) does support your statement that activity proposed in the SDPA would not result in a substantial increase in drilling employment in Carbon County. The measure was suggested by the company, and it is hoped that skilled workers available in Carbon County and surrounding counties will be utilized as much as possible by PEDCO during CBM exploration. Because oil and gas development has been a large part of southern Wyoming's economy for decades, it is anticipated that qualified workers may be present in the communities surrounding proposed CBM activities and that their services may be utilized.

- p. *The operator is asked to "establish effective and frequent communication with affected ranchers to monitor and coordinate scheduling." RME encourages dialogue regarding resource use among affected parties; however, what determines "frequent" and "effective"?*

Again, this is a measure proposed to avoid or reduce potential impacts and is an effective way to do business. The ability of the operator to know when and where ranching, calving, and grazing activities are occurring is vital to reducing the potential for impacts to livestock and the ranching operation from the CBM project. Effective and frequent communications can improve relations among the various users of the public lands.

- q. *The operator is required to minimize undue exposure to hazardous situations which may require measures that would preclude the public from entering hazardous areas and place warning signs alerting the public of truck traffic. The requirement is extremely vague as to what measures are deemed appropriate and by whom. Furthermore, this requirement is not supported by the analysis which states that the area is remote in nature with low use, primarily by grazing permittees and hunters.*

The operator will be required to comply with all existing, applicable rules and regulations (e.g., Onshore Orders, OSHA requirements, WDOT) designed to both alert and protect workers and the public from any danger associated with oil and gas operation and facilities. Clarification of this measure has been added to the document as shown in Appendix A.

- r. *Reference is made in Section 4.7.1.1.5, Threatened and Endangered Species, to the Wyoming Water Quality Standards, but should actually read, Wyoming Surface Water Quality Standards (WDEQ 2001).*

The text has been updated as described in Appendix A.

- s. *In Section 3.4.2.2, Quality (Groundwater), the text says that the calculated SAR of 47.3 and the residual sodium carbonate of 41 meg/l exceed the agricultural suitability of 8 and 1.25 respectively. The relation between irrigation of various crops to SAR is site-specific based on type of soil, type of crop, and irrigation practices. RME suggests that the document clarify this point.*

Information as presented in this section is for information purposes only and is not intended as an analysis of the potential impacts to soils from the discharge of groundwater containing a high SAR value. The document correctly states that the calculated SAR and residual sodium carbonate exceeds the Wyoming Department of Environmental Quality standards as described under the *Water Quality Rules and Regulations: Chapter VIII: Quality Standards for Wyoming Groundwater*. High sodium water may produce harmful levels of exchangeable sodium in most soils and will require special management; however, because the groundwater will be re-injected and, due to the lack of irrigated lands in the area, the significance of elevated SAR values in this project area is minimal.

- t. *In the introduction to Chapter 4.0 of the analysis, it states that the document provides an analysis of six well locations. Later in the introduction section it states that the environmental analysis addresses cumulative impacts associated with the development of 200 interim CBM wells. The document should be reviewed for consistency and changes made where appropriate. RME also requests that this document be expanded so that subsequent interim development pods can be tiered to this document.*

The information provided in the introduction was intended to let the reader know that project impacts and cumulative impacts would be discussed in separate sections.

Tiering is the incorporation, by reference, of relevant portions from a general discussion in a NEPA document with broad coverage, often an EIS, when preparing a project or site-specific NEPA document. In this case, tiering would not be appropriate because all of the pod EAs are site-specific documents.

3. United States Fish and Wildlife Service (USFWS)

- a. *We understand that this EA is specific to one interim development project for the larger Atlantic Rim Coalbed Methane Project. While these assessments may form the basis of environmental impact statement for the Atlantic Rim project, they should not be substituted as the analysis for the larger project.*

The interim drilling project was specifically designed to gather data to be used in the EIS that will be prepared for the Atlantic Rim Coalbed Methane Project and will allow for better analysis and informed decisionmaking.

- b. *The Interim Drilling Policy states that existing CBM wells will count toward the maximum number of wells permitted in the area, but that the one well drilled, plugged, and abandoned will not contribute to this number. However, there may be impacts to wildlife resources from initial development of these wells and they should be included in any analysis of project effects.*

Disturbance from all oil and gas wells, including those that have been plugged and abandoned as identified in the Wyoming Oil and Gas Conservation Commission database, were included in the cumulative impact assessment analysis in Section 4.15.

- c. *The determination on page 3-22 of the EA that, due to its size (less than 5 hectares), prairie dog town #2 would not require a black-footed ferret survey is erroneous, because this town is obviously part of a larger complex. If prairie dog town #2 will be disturbed by any activity associated with CBM development, black-footed ferret surveys must be conducted for the purpose of consultation under the Endangered Species Act of 1973, as amended.*

No drilling- or CBM-related activity is proposed for the area where prairie dog town #2 is located. A letter discussing the location and method of black-footed ferret surveys within this pod was sent to your office from the BLM Rawlins Field Office on October 30, 2001.

- d. *The USFWS has determined that any water removed from the Colorado River System, or any of the surface or subsurface tributaries thereof constitutes a depletion. The USFWS has consistently taken the position in its Section 7 consultations that federal agency actions resulting in water depletions to the Colorado River System are likely to jeopardize the continued existence of one or more fish species and adversely modify or destroy designated critical habitat.*

A depletion analysis was completed for three of the exploratory pods within the Atlantic Rim Coalbed Methane area. On October 22, 2001, the BLM Rawlins Field Office received a letter from Western Water Consultants, Inc., with the results of an isotopic analysis of groundwater sampled within this pod area. The analysis determined that the last time surface water entered the coal seam was over 10,000 years ago. A letter interpreting the results and the analysis data was sent to the USFWS from the BLM Rawlins Field Office on October 30, 2001. No wells in the Sun Dog Pod will be allowed to be discharged until the USFWS has reviewed the data and made a determination in that no depletion to the Colorado River System will result from the implementation of this project.

- e. *Use of a helicopter survey to locate nesting raptors may not be effective in detecting all active nests if the observers do not have extensive experience in identifying nests of all species potentially present from the air.*

Prior to the helicopter survey, a review was made of all available BLM and USFWS historical raptor nesting data. All of this data was compiled, and appropriate information was included in the Sun Dog Pod EA.

- f. *On page 2-10, it states that temporary power generation will be provided with generators until electrical distribution lines are constructed. There is no further discussion regarding the construction of electrical distribution lines.*

Per the IDP, all electrical lines associated with the project are required to be buried (page A-4, #15 of the EA).

- g. *Impacts to wildlife from providing temporary housing near the project area should be thoroughly analyzed and discussed.*

Self-contained travel-type trailers may be used on-site during drilling operations. These trailers are generally confined to the drilling pad perimeter. Because drill pad disturbance is accounted for in the EA, no further analysis will be conducted. Sections 2.1.8.2.16 discusses health and safety measures relating to sanitation and/or garbage handling and facilities that will be in-place during operations.

4. Petroleum Association of Wyoming (PAW)

- a. *At Section 2.1.2.3, Drilling and Completion Operation, it is stated that drilling of the CBM and injection wells would utilize a truck-mounted rig. PAW does not believe this is an accurate statement and that the injection well was drilled with a conventional drilling rig.*

The text has been changed as noted in Appendix A.

- b. *The BLM is requiring that water from individual wells be collected and injected at disposal wells located in each pod. PAW encourages the consideration of alternative water disposal methods such as reservoir and aquifer recharge wells. These types of facilities have beneficial uses for wildlife and agriculture.*

The requirement for reinjection is a criteria described in the IDP and only applies to those pods located within the Colorado River Basin System. One exception under the interim drilling program is that surface water discharge in the Colorado River system will be considered for Double Eagle Petroleum's Cow Creek Pod (the other half of pod #6). The reasoning behind considering surface discharge for this project was that Double Eagle had already applied for a National Pollutant Discharge Elimination System (NPDES) permit and was working with the WDEQ/WQD to get that permit approved. Alternative water disposal methods will be explored in that project, including aquifer recharge wells. The reason for limiting surface water discharge in this basin was to avoid significant impacts that could result from exceeding the limit of 350 tons of salt per year, per operator, adopted by the Colorado River Basin Salinity Forum and state requirements. The operators do have the option to explore alternative methods of water disposal when the interim projects are located within the Great Divide and North Platte River Basins.

- c. *In the exploratory phase of development, it is not yet determined that complete road construction is necessary and, therefore, may not be environmentally prudent. PAW recommends that, to minimize surface disturbance, roads and locations constructed during the exploratory phase of the project should be crowned and ditched but left unimproved until either the pod had demonstrated economic viability or the entire project is economically feasible.*

The requirement to gravel, or have an appropriate surface, is a standard operating procedure for road construction within the BLM Rawlins Field Office area based on past experience and is more important within the Sun Dog Pod because of the highly erosive soils in the project area. The requirement to apply appropriate surfacing assists in erosion control, including reducing sediment release into the Muddy Creek watershed. Placing an adequate surface on the roads where the soils are poor, provides a better, safer, and less environmental destructive type of access, especially for projects where heavy equipment is used. This is especially true in wetter seasons.

- d. *PAW questions the need to design all drainage crossing structures to carry the 50-year discharge event. The 25-year figure should be used for the intermittent streams and drainage structure.*

BLM Manual 9113, Road Standards, agrees with this and the language in the document has been revised (see Appendix A).

- e. *PAW questions the requirement to prepare a cultural resources mitigation plan to determine mitigation of adverse effects regarding cultural properties.*

A Cultural Resource Mitigation Plan is prepared if adverse effects to cultural/historical properties cannot be avoided. A Cultural Resource Mitigation Plan can address site-specific issues such as the number of test units required to effectively evaluate a site and the appropriate dating methods to be used. This plan does not duplicate work conducted during a Class III Cultural Resource Survey.

- f. *Section 4.7.1.1.2, Big Game, states that important big game winter ranges will be closed from November 15 through April 30. The use of the word "important" creates some confusion. Please replace "important" with "crucial."*

The change has been made in Appendix A..

- g. *The document states that contributing segments of historic trails would be avoided by a ¼-mile buffer zone or outside of the visual horizon, whichever is less. Because all historic trails do not warrant the protection of the ¼-mile stipulation, it is recommended that this section include a list of trails and their contributing segments that require the protection measure.*

The only two trails that require the ¼-mile protection occurring within the entire Atlantic Rim Coalbed Methane Project Area are the Overland and Cherokee Trails. These trails are not present in the Sun Dog Pod project area.

- h. *In Section 4.14.2 of the EA it states that, "the BLM may require noise levels be limited to no more than 10 dBA above background levels at sage grouse leks." PAW does not believe there is enough collective research to determine the definitive effects of noise from oil and gas development as it pertains to sage grouse behavior during certain times of the year.*

Research on noise levels affecting sage grouse is ongoing. The 10 dBA standard was established as mitigation in the Pinedale Anticline EIS. The analysis presented in the noise technical analysis report prepared for the EIS indicated that an oil and gas rig would have to be located a minimum of 800 feet away from a sage grouse lek, and a typical-sized (26,000 horsepower) compressor station would have to be located approximately 2,500 feet away from the lek, unless mitigation is applied. We are currently trying to obtain the latest research information available but, until further studies are complete, we will use the results from the studies conducted for the Pinedale EIS as a guide and will mitigate noise levels of authorized actions to increases of no more than 10 dBA above background levels at the edge of sage grouse leks.

- i. *The Interim Drilling Policy requires that a ¼-mile buffer between surface-disturbing activities and the Overland Trail. The original language in the RMP should be included in this mitigation measure which states, "There will be a ¼-mile protective area on each side of the trail or visual horizon, whichever is less."*

The ¼-mile requirement was proposed by the BLM IDT when developing the conditions and criteria that would be used for interim drilling activities. At times, the proposed conditions are more restrictive than those described in the RMP in order to protect sensitive resource values. The requirement, as stated, will remain as part of the IDP.

- j. *PAW questions the need for block surveys for cultural resources required in the Interim Drilling Policy.*

Due to the density of well sites and the associated extensive ground disturbance, a Class III Cultural Resource Survey in block areas, rather than well-specific areas, is required for CBM pods. For cultural and other resources, block survey of CBM pods has proven to be more time and cost-effective and often avoids delays to the project if changes occur to the proposal. Duplicate survey of well/pipeline/access road sites is not required if a block survey has already been completed in the same area.

- k. *The Interim Drilling Policy requires that no drilling or disturbance be allowed in those areas determined to be critical winter habitat for sage grouse. This requirement is extremely concerning to PAW, particularly since the BLM stated on page 3-21 of the EA that the sage grouse receives special consideration because of population declines over much of its range and its importance as an upland game bird in Wyoming. The BLM cannot ignore that the single most quantifiable action resulting in the loss of individual sage grouse is hunting. If the sage grouse is in jeopardy and it is so critical to protect critical winter habitat by restricting oil and gas activity, the BLM should be compelled to conduct NEPA analysis on the impact of hunting to sage grouse conservation since the majority of sage grouse hunting in Wyoming occurs on BLM-administered lands.*

BLM Manual 6840 describes Special Status Species Management. The BLM is to ensure that actions requiring authorization or approval by the BLM are consistent with the conservation needs of special status species (which includes sage grouse) and do not contribute to the need to list (under the ESA) any special

status species. The IDP requirement of no drilling or disturbance in these areas applies only to the interim activities and were suggested to ensure that no significant impacts to sage grouse would result from the implementation of these projects. The authority to allow sage grouse hunting does not belong with the BLM, but with the Wyoming Game and Fish Department.

- I. *The Interim Drilling Policy allows no drilling or disturbance in areas where any two or more big game crucial winter ranges overlap. PAW opposes this extreme mitigation measure and does not believe that it is justified.*

The authority for restricting drilling activity in overlapping crucial winter ranges comes from the RMP. The RMP affords a greater degree of management in these areas by stating under the section pertaining to Wildlife Habitat and Fisheries Management Decisions that, "In areas where crucial winter ranges for more than one species of big game overlap (approximately 122,880 acres of BLM-administered public land), habitat quality will be maintained." The requirement as part of the IDP would ensure that no significant impact results in the implementation of the CBM exploration project.

5. National Wildlife Federation (NWF)

- a. *Actions contemplated by the Sun Dog Project Environmental Assessment (SDPEA) are inconsistent with the Great Divide Resource Management Plan. Although the Great Divide Resource Management Plan (RMP) discusses the Atlantic Rim area, it does not discuss CBM extraction or its environmental impacts, instead considering only conventional oil and gas development. The unique effects of CBM drilling contradict the SDPEA's assertion that, "existing RMP oil and gas decisions are adequate for CBM and allow for exploration and testing to determine the viability of CBM development." Coalbed methane extraction has impacts which are substantially distinct from oil and gas development and represents an expansion of the scope of resource use not contemplated in the RMP.*

The RMP decision that the entire planning area is open to oil and gas leasing does not make a distinction whether oil and gas development is "conventional" or otherwise. The minerals management program policy and goals described in the RMP are to provide the opportunity for leasing, exploration, and development of oil and gas while protecting other resource values. The RMP does not specifically mention CBM; however, this does not mean the activity is not allowed. "Methane" and "natural gas" are used interchangeably regardless of the source. No specific formation, bed, or seam was identified in the RMP as being suitable or unsuitable. One respondent, RME, agrees with the assessment in the Sun Dog Pod EA that it conforms with the GDRA RMP and provided the following information: "It is a well-settled scientific principal that CBM gas exists in coal in three basic states: as free gas, as gas dissolved in the water in coal, and as gas adsorbed on the solid surface of the coal. See *Amoco Production Co. v. Southern Ute Indian Tribe*, 199 S. Ct. 1719, 1724 (1999)." In fact, these are the same three states or conditions in which natural gas is stored in other geological formations, including coal seams, sandstones, and shales. See *Amoco*."

The general analysis presented in the RMP was based on the amount of disturbance associated with oil and gas development. The amount of long-term disturbance associated with the implementation of this project (13.2 acres) is within the Reasonably Foreseeable Development Scenario described in the RMP.

- b. *The SDPEA heavily relies on the BLM's Interim Drilling Policy, but that policy was never analyzed under the National Environmental Policy Act (NEPA), as it should have been.*

The IDP is a document that provides guidance in managing exploration activities while the EIS is being completed. The intent of this document is to establish conditions and criteria to keep all activity at an insignificant and a reasonable level and allow consideration of limited drilling activity for acquisition of additional data needed for completion of the EIS. After review, we find that the word "authorized" in the title of the policy is confusing and inaccurate, because this document does not authorize any action or activity on its own. Under the conditions and criteria of this policy, no activity is authorized until the completion of a NEPA document and a Finding of No Significant Impact (FONSI) has been made. Therefore, the word authorized will be removed from the title of this policy and will be hereafter referred to as "Interim Drilling Policy - Conditions and Criteria Under Which Development Activities May Occur Concurrent with the EIS Preparation for the Atlantic Rim Coalbed Methane Project."

- c. *The SDPEA failed to consider a reasonable range of alternatives, as required by NEPA. The Interim Drilling Policy was used to limit the number of alternatives the SDPEA could consider. While the SDPEA claims to analyze the "no action" alternative, in fact, there is no alternative that considers not developing these federal lands for CBM production. The BLM argues that it is precluded from considering a no development alternative because it has already issued the leases and conveyed a property right to develop which now binds the agency.*

The decision to include a description of other alternatives, if any, that were considered but dismissed after preliminary investigation is optional in an EA format (BLM Handbook H-1790-1). In this case, the IDP does limit the range of reasonable alternatives considered, because its goal is to limit activity to only those areas where it is believed that significant adverse environmental impacts would not occur. The policy provides the sideboards that preclude the need for other development alternatives.

The CEQ states in its Forty Questions and Answers about NEPA Regulations (1981) that there are two distinct interpretations of the No Action Alternative. The first is that there is no change from the existing situation. This interpretation generally applies to planning decisions. The second interpretation is that the proposed activity (i.e., as described under the Proposed Action) would not take place. This does not mean, however, that activity associated with oil and gas development would never be allowed to occur in this area. Under the Mineral Leasing Act of 1920, as amended, the BLM cannot deny the lessee the right to develop somewhere within the leasehold. This is supported by national mineral leasing policies, and the regulations by which they are enforced recognize the statutory rights of lease holders to develop federal mineral resources to meet continuing national needs and economic demands as long as undue environmental degradation is not incurred.

- d. *The SDPEA fails to consider connected, similar, and cumulative impacts as required by NEPA. It appears that the analysis of cumulative impacts inappropriately narrows the assessment in two ways. The first is that the area only includes pods 5, 6, 7, and 8 of the 200-well interim drilling program. There is no other reason to exclude the other five pods from the analysis. Second, the cumulative impact analysis in the SDPEA makes no assessment of the environmental consequences which accompany the proposal to permit drilling up to 3,880 CBM wells.*

The matrix provided in the cumulative impact discussion presents the cumulative impact areas for each resource impacted by the Sun Dog Pod. In general, two main factors determine whether other actions should be included as part of the cumulative impact analysis, location and timing of actions. The cumulative impact analysis must take into account the past, present, and future actions that overlap in time and location with the Proposed Action. For example, in the case of the Sun Dog Pod, the project area does not contain, and no project component would disturb, any crucial winter range for elk. So, in the case of implementing the Sun Dog Pod project, the assumption is that no impacts will occur to crucial elk winter range and, therefore, implementation of this project would not effect crucial elk winter range. This being the case, a cumulative impact discussion for this resource is not required. We agree that development of the pods in the 200-well program may impact the elk crucial winter range, but impacts on crucial winter range for elk will not be addressed until a development of a proposed pod impacts this range. Table 4-3, located on page 431 of the EA, takes this approach by breaking down what resources may be cumulatively affected by the implementation of the Sun Dog Pod project. For example, the Laramie Air Basin is impacted by the Sun Dog Pod project and is common to all pods, while water resources impacted by the Sun Dog Pod would occur only in the Muddy Creek watershed, pods 5, 6, 7, and 8.

At this point, the proposal to develop a 3,880 well field is not reasonably foreseeable. At this time there is no data available to confirm that CBM resources can be developed and produced in the Atlantic Rim CBM area. Implementation of the 200-well, interim drilling program was designed to identify areas where CBM drilling may be economic and the number of wells at which the program becomes economic. The response to CBM drilling is likely to be much different throughout the 310,335-acre project area. It could be that only a small number of wells would be needed for full field development, that additional wells over and above the 3,880 well proposal would be required to economically develop the area, or that much of the area cannot be economically developed. The only reasonably foreseeable activity at this time other than conventional uses, oil and gas drilling and ranching, is the 200-well proposal.

- e. *The SDPEA fails to adequately disclose and mitigate impacts to wildlife for the Sun Dog Pod.*
- i. *Reclamation - Section 2.1.8.2.9, describes forage species useful for "resident" herbivores as part of the reclamation plan. The SDPEA should not reference "resident" herbivores, but rather native herbivores. Some non-native forage used in reclamation is beneficial to cattle or sheep, but not to wildlife. We can find no commitment to restore the shrub component to disturbed areas.*

According to the Wyoming BLM Policy on Reclamation, the BLM's long-term goal for reclamation is ecosystem reconstruction. This means to return the land to a condition approximate or equal to that which existed

prior to disturbance or to a stable and productive condition compatible with the land use plan. The Master Surface Use Plan in Appendix E describes the required seed mix to be used in the reclamation of disturbance in the Sun Dog Pod. While there is no requirement to reestablish shrubs, it is generally found that over time, the shrubs tend to reintroduce themselves into reclaimed areas.

- ii. *Sage Grouse - It appears that this assessment was written without referring to the recently-published guidelines. Specifically, the size of the crucial winter range described in the SDPEA is too small. The SDPEA commits to assuring that all motorized equipment will be muffled and maintained to the manufacturer's specifications; however, this commitment does not factor in the liability of noise to sage grouse and that it be reduced to a level that does not interfere with sage grouse courtship, nesting, or brooding. The BLM misapplies the concept of potential habitat by diluting the impacts to sage grouse by comparing habitat loss within two miles of an occupied lek. This potential nesting habitat is never identified nor is it characterized regarding the ability to meet nesting requirements for sage grouse. When the impacts are assessed, it is only the impacts of the nine proposed pods. Nowhere has the BLM included impacts on sage grouse habitat from grazing, gas recovery, or other activities.*

Although draft sage grouse guidelines exist, they have not yet been accepted by the BLM as policy. Once they have been accepted, they will be implemented. The determination of sage grouse crucial winter habitat is based on the data collected during the winter of 2000-2001 and is an ongoing project. Please refer to the response to Letter 1a regarding the size of the sage grouse crucial winter ranges. Current policy is to use the two-mile buffer surrounding sage grouse leks until the sage grouse guidelines are accepted.

Application of the sage grouse timing stipulation which requires that no activity occur within two miles of active lek, should adequately protect sage grouse during the times you described in your comment.

The habitat loss resulting from other activities is discussed under the cumulative impact section of the EA, 4.15. For response to the noise issue, please refer to letter 4h above.

- iii. *Raptors - The SDPEA describes impacts of the project on existing raptor nests and winter roost sites, but no effort was made to evaluate the impacts of the development on raptor prey. Is it reasonable to assume raptor populations will be as successful if there is a reduction in the number, kind, and density of prey? Does the BLM intend to monitor raptor nesting or overwinter success?*

The BLM believes that the impact to raptor prey within the SDPEA would be minimal. The vegetation disturbance may actually increase prey populations and, therefore, raptor success. Prey populations fluctuate dramatically from year to year depending on climatic changes, disease transmission, other predator population fluctuations, etc. There is likely more loss of raptor habitat as a result of these other factors than the implementation of this project.

- iv. *Big Game. The cumulative impact analysis area for mule deer should be the entire Mule Deer Herd Unit as defined by the Wyoming Game and Fish Department. Similar impact analyses should apply for elk and pronghorn. The analysis described in the Sun Dog Pod EA only evaluates the amount of crucial winter ranges affected by the development of the nine pods. This process significantly dilutes the percentage of habitat affected by the current proposal, while ignoring the impacts of other gas developments, grazing allotments, and water and road development.*

The discussion relating to any of the crucial winter ranges regarding cumulative impacts is inappropriate if we use the analysis criteria described in the response to 5b above, because no crucial winter range would be affected by implementation of the Sun Dog Pod EA (i.e., no surface-disturbing activity would occur). Page 4-10 indicates the areas where crucial winter ranges exist in relation to the Sun Dog Pod project area.

As described on page 3-21 of the EA, the SDPA is located within the Sierra Madre Herd Unit (elk) which encompasses 2,425 square miles (1,576,250 acres), the 1,394-square mile (906,100 acres) Baggs Herd Unit (pronghorn antelope), and the 3,440-square mile (2,201,600 acres) Baggs Herd Unit for mule deer.

6. Biodiversity Associates

- a. *The Sun Dog Pod proposal would violate NEPA because the Interim Drilling Policy and associated activities will adversely affect the environment and are inseparably linked to the Atlantic Rim Coalbed Methane proposal. For example, the No Action Alternative for the EIS would not be available if 200 wells were already drilled under the interim policy. Moreover, the proposal violates NEPA because the BLM is segmenting the proposed projects.*

The purpose of preparing the Sun Dog Pod EA is to allow for exploration drilling to gather data for the preparation of the Atlantic Rim Coalbed Methane EIS. Part of the exploration project will determine if and where commercial quantities of gas exist within the 310,335-acre area. The 3,880-well Atlantic Rim Coalbed Methane proposal is not reasonably foreseeable at this time because not enough data exists to determine the feasibility of the project. See response to letter 5a.

The No Action Alternative means that a particular project would not take place. However, the No Action Alternative does not necessarily mean that no activity would occur on these lands leased for oil and gas development. The RMP does allow for a level of development for oil and gas resources within this area, regardless if the 3,880-well program is implemented or not. Additionally, some level of activity is likely to occur within the project area because of the occurrence of private lands and minerals. See response to letter 5c.

- b. *The Sun Dog Pod Proposal violates the Federal Land Policy and Management Act (FLPMA) because CBM is not mentioned in the Great Divide RMP. The Proposed Action is outside of the reasonably foreseeable development scenario of the Great Divide Resource Management Plan. The EA states that the BLM considers existing RMP oil and gas decisions to be adequate for CBM. However, CBM development and production have dissimilar impacts to conventional drilling.*

Please see response to letter 5a.

- c. *The Atlantic Rim Coalbed Methane Area contains undeveloped lands of roadless and undeveloped qualities. However, the BLM has never performed an adequate wilderness inventory. This is a violation of FLPMA and other laws and regulations. The BLM must conduct an adequate inventory of the entire area, before the project is considered.*

The BLM wilderness review program stems from Section 603 of FLPMA. The BLM was directed to prepare an inventory of public lands and their resources, including the identification of areas having wilderness characteristics. Per Section 2(c) of the Wilderness Act of 1964, the BLM Rawlins District inventoried areas of at least 5,000 acres for potential wilderness character. Within the Atlantic Rim Coalbed Methane Project Area, the northern portion dropped out due to the existence of the checkerboard land pattern. To be considered for a wilderness inventory unit the area must contain 5,000 acres of contiguous public lands. South of this checkerboard to an existing road north of Muddy Mountain in Township 13 was included in the Wild Horse Basin Initial Wilderness Inventory Unit. The conclusion from this inventory was that human activity and permanent manmade improvements throughout the area precluded it from having wilderness quality. The land pattern changes to the south of this road and, although some federal lands exist, the majority of the land is privately- or state-owned.

- d. *The Interim Drilling Policy is a violation of the Administrative Procedures Act. The policy constitutes a rule under 5 USC 551(4). The agency has the obligation to not only notify the public in the Federal Register of the a proposal to create a rule such as the Interim Drilling Policy, but also to solicit public comment under NEPA on the proposed rule.*

The definition of a rule according to the Administrative Procedures Act means, “the whole or a part of an agency statement of general or particular applicability and future effect designed to implement, interpret, or prescribe **law or policy or describing the organization, procedure, or practice requirements, of an agency** [emphasis added] and includes the approval or prescription for the future of rates, wages, corporate or financial structures or reorganizations thereof, prices, facilities, appliances, services or allowances therefor or of valuations, cost, or accounting, or practices bearing on any of the foregoing.”

We do not feel that the IDP meets any part of this definition. The IDP was developed to provide guidance in managing exploration activities while the EIS is being prepared. See response to 5b.

- e. *The EA violated NEPA by failing to evaluate a range of alternatives as required by 40 CFR Sections 1502.14(a) and 1508.25(c). However, the Sun Dog Pod EA states that authorizations provided in the Interim Drilling Policy limit the selection of other alternatives. As a result, no other alternatives to the Proposed Action were considered.*

Please see response to 5c.

- f. *The EA is inadequate in several regards.*
- i. *While the EA does address some of the cumulative impacts of all 200 interim wells, it fails to address impacts from existing CBM development in the area. By failing to consider the effects of the Sun Dog Pod in conjunction with the effects of other proposed CBM projects that are reasonably foreseeable in light of the Atlantic Rim Coalbed Methane Proposal, the BLM has violated NEPA.*

Again, the purpose of preparing the Sun Dog Pod EA was to allow exploration drilling necessary to prepare the Atlantic Rim Coalbed Methane project. Please refer to 5d.

- ii. *The BLM admits that sage grouse are likely to nest within the pod. Page 4-12 of the EA states that, "no impacts to the sage grouse populations are expected." Any impact to individuals should be considered an impact to a population and, therefore, must be considered unacceptable.*

The Sun Dog Pod EA is located within an area described as sage grouse nesting habitat, although no known sage grouse leks occur within the project area. The statement you described is inaccurate, and has been corrected, see Appendix A.

- iii. *The same argument applies to burrowing owls and Wyoming pocket gophers. The BLM did not collect population data on these species. Without accurate information, the EA cannot determine that the proposed development would not impact these two species. A complete Biological Assessment is needed to address this shortcoming.*

Wyoming pocket gophers are found in meadows with loose soil. The type of vegetation in this pod is dominated by sagebrush and saltbush. Therefore, there is no potential habitat located within the pod, even though the EA mentions the possibility of occurrence. Burrowing owls do have the potential to occur within the project area; however, during prairie dog mapping, no burrowing owls were observed. BLM raptor timing stipulations would also protect areas where burrowing owls are observed. At this time, the USFWS has not indicated that a Biological Assessment for the Sun Dog project is required.

- iv. *This project area includes important winter range for elk, mule deer, and antelope. Elk and deer are particularly sensitive to disturbance during winter; special provisions should be made to close roads and cease all activities associated with the Sun Dog Pod between November 15 and April 30.*

While the area supports all three big game species all year round, no crucial (important) winter range exists in the Sun Dog Pod project area, so the timing stipulation would not be applicable within the project area.

- v. *The EA states that produced water will be discharged for a "very short period of time" during testing to determine if wells are productive. Given that the EA states that one well can discharge up to 11,500 gallons a day, this period of time must be defined more accurately to allow the agency and the public to determine the potential impacts. It would certainly affect flow levels in the discharge area and impacts to fish, amphibians, and vertebrates could be significant.*

A tank will be constructed to contain produced water for testing as per the COA, Appendix E. All other produced water will be reinjected into the 8I Injection Well as required by the COAs. No other disposal is allowed without prior authorization and no other type of disposal other than reinjection is allowed in the Colorado River Basin System per the IDP. Because no uncontained surface discharge will be allowed, no impacts to downstream T&E species are anticipated from the minimal water discharge.

- vi. *Moreover, we would like to point out that in our previous comments we stated that the bonytail chub is found in Muddy Creek according to Deputy Director of the Wyoming Game and Fish Department Bill Wichers, and the species was blatantly ignored in preparing this EA. In addition, the BLM tries to shirk its responsibilities to protect T&E species by stating if there are any detected downstream, the USFWS will be consulted and a protection plan developed. The BLM must inventory for sensitive and T&E fish species downstream from the project, and develop a monitoring plan, prior to issuing the Decision Record.*

The citation you refer to was from the April 22, 2001, edition of the Casper Star Tribune. This was a misquote and the species does not exist in the Muddy Creek drainage.

The USFWS's concerns regarding endangered fish in the Colorado River system stem from activities likely to restrict flows in the system as a result of water depletions. A depletion analysis was completed for the Sun Dog Pod project and the results sent to the USFWS on October 30, 2001. The analysis completed by Western Water Consultants indicated that the groundwater within the coal seam, where water would be withdrawn during CBM production, is over 10,000 years old and does not supply surface water resources and the groundwater is not currently being recharged by surface water. The BLM has asked the USFWS to review the data supplied and for its concurrence that the development of the Sun Dog Pod would have no effect with regard to Colorado River depletions.

The BLM initiated informal consultation on August 7, 2001, regarding the activities proposed under the IDP. Again, the policy was formulated with the purpose of avoiding impacts to sensitive resources, including T&E species. The USFWS was asked to review the policy and provide any changes or suggestion regarding this policy. The BLM continues to contact the USFWS regarding all activities which might have an affect on T&E species within the project areas.

Inventorying and monitoring data will be important in the preparation of the Atlantic Rim Coalbed Methane EIS, should interim drilling prove the potential for CBM development in this area.

- vii. *The plant species of concern and reptile species of concern that may occur within the Sun Dog Pod project area were not addressed in the body of the EA. The same is true for some of the mammal and bird species as well.*

Two species were inadvertently omitted from the list of sensitive species, the sage sparrow and the Brewer's sparrow, which are both sage brush-obligate species that could occur in the area. Because of the inherent mobility and continued availability of suitable habitat on undisturbed lands, the impacts to these species would be minimal. All other species anticipated to be in the project area were discussed on page 4-15 of the EA.

The concerns you brought up regarding sensitive species you feel should also be on the BLM sensitive species list is outside of the scope of this project.

- viii. *In addition, the EA fails to mention anything about the BLM Wyoming Sensitive Species Policy and List. The BLM cannot exclude its own list of sensitive species when evaluating potential impacts of the Sun Dog Pod project. In our previous comments, we requested that impacts to these species be specifically addressed.*

Because of the decline in population of many wildlife and plant species, the Wyoming BLM developed a list to better manage these species and habitats. The BLM sensitive species management ensures that sensitive species are considered during NEPA analysis.

- ix. *Disturbance estimates presented in the EA are misleading. The total acreage disturbed is actually much greater because roads and pipeline are crisscrossed throughout the pod. The total effects of fragmentation and other indirect effects of this road/pipeline system must be included in the disturbance estimates. In particular the effects of roads on wintering ungulates have been understated. Researchers have found that effects of roads on elk in similar habitats extend 2.5 km from each road.*

Our estimates are based on actual disturbance to the surface of the land from the project components. The EA describes on page 4-11 that the project will result in some direct loss of habitat and that disturbance of big game species during the parturition period and on winter range can increase stress and may influence species distribution. The actual acreage of habitat that becomes unusable to big game animals as a result of this project could only be determined after site-specific research has been conducted over a period of several years. These types of wildlife studies would be part of the NEPA analysis should full-field development prove feasible. Impacts to elk from roads associated with the Sun Dog project are expected to be minimal given the small amount of disturbance and that undisturbed habitats are available.

- x. *The EA states on page 2-18 that, "areas with important resource values" should be avoided when planning new roads. Who decides what is important?*

The locations of new roads are shown on the Master Surface Use Plan. The development of this plan begins with the operator staking areas it intends to use in its project. A BLM IDT, which generally consists of a natural resource specialist, an engineer, a realty specialist, and a wildlife biologist, but could include others depending on resources involved, participate in these on-site inspections. During this on-site, the specialists review the locations of proposed activities and, if any of the project components are found to overlap sensitive resource areas, the operator will be asked to move this element of the project to a new location.

- xi. *The EA should include all possible measures to prevent adverse environmental impacts. For example, all reserve pits should be lined, regardless of soil permeability, and no construction should take place within 500 feet of surface water or riparian areas.*

Whether or not to line a reserve pit is examined on a case-by-case basis. If soils are gravelly or sandy, the pit will likely be lined; however, in clayey soils, pit lining may not be required. Soils in the Sun Dog Pod project area tend to be clayey, and no recommendation was made to line these pits.

The requirement you cite to limit construction activities within 500 feet of surface water or riparian areas is found in Appendix A, Standard Mitigation Guidelines for Surface Disturbing Activities, Great Divide RMP. However, the BLM realizes that some linear project components such as roads and pipelines may not be able to avoid all of these surface water features. Within the Sun Dog Pod project area, the access road through the project area will cross two ephemeral streams. The COAs (see Appendix E) for the Sun Dog Pod project explain the culvert design that will be required for these crossings in order to protect stream values.

- xii. *The EA fails to identify specific locations of reinjections wells. Considering that disturbance will occur on these sites, their locations must be determined and disclosed, and impacts resulting from the construction of these sites must be included in the EA.*

The location of the water injection well is shown on Figure 2-1, page 2-2 of the Sun Dog Pod EA.

- xiii. *The EA does not provide adequate analysis of the possibility of subsidence and earthquakes due to ground water drawdown and degasification at the coal seam.*

Due to the lack of active faults within the SDPA, it is highly unlikely that a CBM program would result in enough change to trigger the tectonic stresses required to create an earthquake. In CBM, the seam is not totally de-watered, enough water is removed to reduce the pressures in the coal to allow gas to flow. Complete aquifer dewatering, not simply a reduction in the static water level, would be necessary to allow aquifer media compression to create subsidence.

- xiv. *The BLM failed to address several issues of concern we raised in our April 5, 2000, comments on the Atlantic Rim Coalbed Methane Project.*

We have reviewed the April 5, 2000, letter and feel that comments you made specific to resource issues that exist in the Sun Dog Pod project area have been adequately addressed in the environmental assessment based on the anticipated level of impacts .

- g. *The No Action Alternative may violate NEPA. Under the No Action Alternative, four CBM wells would still be drilled. We are unsure if an EA was even written, and if so, we do not know if it was ever made available to the public for comment. The BLM must clarify this issue before proceeding with either alternative.*

The second paragraph on page 1-1 of the EA states that the authorization to drill these four CBM wells was previously analyzed in an EA completed by the BLM Rawlins Field Office on October 12, 2000. Although this EA was not released to the public, the public was notified of its existence by placement on the BLM Rawlins Field Office EA register, when the project was initiated. Anyone requesting the opportunity to review and comment on an EA will be provided that opportunity. The BLM manager responsible for authorizing the action must make the determination how, where, and to what extent the EA and FONSI should be made available for public review.

- h. *The BLM needs to evaluate a minimum footprint alternative that would require wells to be clustered and employ directional drilling techniques to minimize the creation of new roads, well pads, and other surface disturbances. Ecological advantages of clustered horizontal wells are well-documented. By requiring cluster development, the BLM can minimize the environmental damage that will occur if CBM development is allowed to proceed. The economic feasibility of directional drilling is also well documented.*

There are several reasons why horizontal/directional drilling would be difficult to utilize for the Sun Dog Pod project.

First we need to look at the seams that will be produced. There are three major groups of coal being targeted for methane production in the project area. The Garden Gulch coals are quite thin and discontinuous. These consist of eight to twelve coal seams per well ranging in thickness of one to four feet. These seams do not correlate over long distances. The Almond coals are made up of three subgroups of coals, with eight to twelve seams ranging in thickness from one to ten feet. Some Almond coal seams correlated between wells over long distances, but there are still a high number of seams or riders that do not correlate from well to well. Finally the Allen Ridge coals are quite thin and discontinuous, with six to ten seams per well, averaging two feet in thickness. Thin or discontinuous target zones are poor prospects for horizontal drilling.

In addition, horizontal drilling technology requires precise control of target locations in all three dimensions. Even the thickest coal seams in the project area are below the vertical resolution of current seismic technology; therefore, yields lack the target control required for lateral drilling. This being the case, without the knowledge of where the coal seams pinch out or end, horizontal drilling would not produce the desired results. In addition, it would be impossible to stay in coal seams during lateral drilling due to the limited control and limited thickness of the coal seams.

It would not be economical to drill laterals in thinner seam coals. Potentially, up to 24 coal seams would have to be developed per well; i.e., 24 laterals would need to be drilled to develop all seams. Also, horizontal laterals would not be economical in thin seams, even if adequate control was available, as cost of each lateral would exceed the return on ultimate gas recovery. Thin, uneconomic zones would not be produced if horizontal techniques were required; this could lead to economic failure of the entire project because of the gas contribution available in the thin seams. In conventional drilling, these seams would contribute to overall production, therefore maximizing the recovery of the gas resource.

The coal seams are quite shallow in most of this project area and this would limit the distance that could be drilled from the surface location. Also, there would not be adequate forces in a shallow well to drill the necessary lateral distance to gain desired advantage of increased drainage area. Short horizontal laterals would not significantly increase the drainage area compared to vertical well bores; horizontal drainage patterns would be on the order of only a quarter section or so.

The only economic horizontal coal programs currently active are used to vent methane in front of coal mining operations where it is required to drain coal seams of significant thickness (greater than six feet) as quickly as possible for the safety of miners.

The advantages in using vertical wells include maximizing the production of gas resources from all coal seams present in the well bore, regardless of the thickness or seam discontinuity of the coals. Vertical well bores may ultimately have the same drainage areas due to the true vertical depth of the coal seams.

APPENDIX C

PROJECT-WIDE MITIGATION MEASURES AND PROCEDURES

APPENDIX C

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2.1.8 Project-Wide Mitigation Measures and Procedures

PEDCO proposes to implement the following mitigation measures, procedures, and BLM-required management practices on public lands to avoid or mitigate resource or other land use impacts. These mitigation measures and procedures will be applied on privately-owned surface unless alternate actions are specifically required by the involved private surface owners. An exception to a mitigation measure and/or design feature may be approved on public land on a case-by-case basis, when deemed appropriate by the BLM. An exception would be approved only after a thorough, site-specific analysis determined that the resource or land use for which the measure was put in place is not present or would not be significantly impacted.

2.1.8.1 Preconstruction Planning and Design Measures

1. PEDCO and the BLM will make on-site inspections of each proposed and staked facility site (e.g., well sites), new access road, access road reconstruction, and pipeline alignment projects so that site-specific recommendations and mitigation measures can be developed.
2. New road construction and maintenance of existing roads in the SDPA and ARPA will be accomplished in accordance with BLM Manual 9113 standards, unless private landowners or the State of Wyoming specify otherwise.
3. Prior to construction, PEDCO will submit a Master Surface Use Plan (MSUP) for each pod. This plan will contain individual APDs for each drill site and Sundry Notices and/or ROW applications for pipeline and access roads. APDs submitted by PEDCO will show the layout of the drill pad over the existing topography, dimensions of the pad, volumes and cross-sections of the cut and fill (when required), location and dimensions of reserve pit(s), and access road egress and ingress. The MSUP will include itemization of project administration, time frame, and responsible parties.
4. PEDCO will slope-stake construction activities when required by the BLM (e.g., steep and/or unstable slopes) and receive approval from the BLM prior to start of construction.
5. The BLM will require the road to be crowned and ditched with a 0.03 to 0.05 foot crown, and the topsoil will be pulled back down on the cut slope so there is no berm left at the top of the cut slope.
6. The BLM will require that culverts be covered with a minimum of 12 inches of fill or one-half the pipe diameter, whichever is greater. The inlet and outlet will be set flush with existing ground and lined up in the center of the draw. The bottom of the pipe will be bedded on good material before backfilling. Backfill will be done with unfrozen material and no rocks larger than two inches in diameter. Care will be exercised to thoroughly compact the backfill under the haunches of the conduit. The backfill will be brought up evenly in six-inch layers on both sides of the conduit.
7. Additional culverts will be placed in the existing access road as needed or directed by the BLM.

8. The BLM will require surfacing of the access road prior to moving the drilling equipment/rig onto the pad, with an appropriate grade of gravel to a depth of four inches.
9. The BLM will require that access roads be maintained in a safe and usable condition. A regular maintenance program will include, but is not limited to, blading, ditching, culvert installation, and surfacing.
10. If snow removal is required outside new and existing roadways, the BLM will require that snow removal equipment be equipped with shoes to keep the blade off the ground surface. If the surface of the ground is uneven, the BLM will require special precautions be taken to ensure that equipment blades do not destroy vegetation.
11. The BLM will require wing ditches be constructed, as necessary, to divert water from road ditches.

2.1.8.2 Resource-Specific Requirements

PEDCO proposes to implement the following resource-specific mitigation measures, procedures, and BLM management requirements on public lands.

2.1.8.2.1 Range Resources and Other Land Uses

Mitigation requirements listed under Soils, Vegetation and Wetlands, and Wildlife, also apply to Range Resources and Other Land Uses.

1. PEDCO will coordinate with the affected livestock operators to ensure that livestock control structures remain functional during drilling and production operations.

2.1.8.2.2 Air Quality

1. All BLM conducted or authorized activities must comply with applicable local, state, tribal and federal air quality regulations and standards. PEDCO will adhere to all applicable ambient air quality standards, permit requirements (including preconstruction, testing, and operating permits), motorized equipment and other regulations, as required by the State of Wyoming, Department of Environmental Quality, Air Quality Division (WDEQ-AQD).
2. PEDCO will not allow burning garbage or refuse at well locations or other facilities. Any other open burning will be conducted under the permitting provisions of Section 13 of the Wyoming Air Quality Standards and Regulations.
3. On federal land, PEDCO will initiate immediate abatement of fugitive dust (by application of water, chemical dust suppressants, or other measures) when air quality, soil loss, or safety concerns are identified by the BLM or the WDEQ-AQD. These concerns include, but are not limited to, potential exceedances of applicable air quality standards. The BLM will approve the control measure, location, and application rates. If watering is the approved control measure, the operator must obtain the water from a state-approved source(s).

2.1.8.2.3 Transportation

1. Existing roads will be used as collectors and local roads, whenever possible. Standards for road design will be consistent with BLM Road Standards Manual Section 9113.
2. Roads not required for routine operation and maintenance of producing wells and ancillary facilities will be permanently blocked, reclaimed, and revegetated.
3. Areas with important resource values, steep slopes, and fragile soils should be avoided where possible in planning for new roads.
4. Permits are required from Carbon County for any road access to or across a county road or for any pipeline crossing of a county road. These permits should be acquired prior to construction of additional roads. All roads on public lands which are not required for operation and maintenance of field production should be permanently blocked, recontoured, and reseeded. Roads on private lands should be treated similarly depending on the desires of the land owner.
5. The Proponent will be responsible for preventive and corrective maintenance of 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 the Carbon County Road and Bridge Department.
6. Except in emergency situations, access will be limited to drier conditions to prevent severe rutting of the road surface. Culverts will be installed, where needed, to allow drainage in all draws and natural drainage areas. Low water crossings will be utilized where applicable. On-site reviews will be conducted with BLM personnel for approval of proposed access prior to any construction.

2.1.8.2.4 Minerals/Paleontology

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

Potential scientifically-significant paleontological resources within the Lewis Shale, the only geologic formation of concern which underlies the SDPA, will be protected through the following mitigation measures:

1. If recommended by the BLM, each proposed facility located in areas with known and potential vertebrate paleontological resource significance) will be surveyed by a BLM-approved paleontologist prior to surface disturbance (USDI-BLM 1987, 1990).

2. Discovery Contingency. Contingency should be made for the accidental discovery of significant fossils by project personnel. If fossils are discovered by construction personnel during implementation of the project the BLM will be notified immediately. If the fossils could be adversely affected by construction, construction activities will be redirected until a qualified paleontologist has determined the importance of the uncovered fossils and the extent of the fossiliferous deposits and made and implemented recommendations regarding further mitigation.

3. Field Survey. No specific data currently exists on deposits of high and undetermined paleontologic potential in SDPA. For that reason, field survey for paleontologic resources will be conducted on a case-by-case basis, as directed by the BLM, in areas in which surface exposures of the Browns Park, Green River, and Wasatch formations crop out. Field survey may result in the identification of additional mitigation measures to lessen adverse impacts to fossil resources. This mitigation may include collection of additional data and fossil material, obtaining representative samples of fossil material, by monitoring excavation or avoidance. In some cases no action beyond that conducted during the field survey may be necessary.

A report will be submitted to the BLM following the completion of each field survey. That report will detail the results of the survey, including a list of fossils collected, if any were, and may include recommendations for, or detail the results of, additional mitigation. If significant fossils are collected, the report must document the curation of specimens along with associated geologic records into the collections of an acceptable museum repository.

2.1.8.2.5 Soils

1. Reduce the area of disturbance to the absolute minimum necessary for construction and production operations while providing for the safety of the operation.
2. Where feasible, locate pipelines immediately adjacent to roads to avoid creating separate areas of disturbance and in order to reduce the total area of disturbance.
3. Avoid using frozen or saturated soils as construction material.
4. Minimize construction activities in areas of steep slopes.
5. Design cutslopes in a manner that will allow retention of topsoil, surface treatment such as mulch, and subsequent revegetation.
6. Selectively strip and salvage topsoil or the best suitable medium for plant growth from all disturbed areas to a minimum depth of six inches on all well pads.
7. Where possible, minimize disturbance to vegetated cuts and fills on existing roads that are improved.
8. Install runoff and erosion control measures such as water bars, berms, and interceptor ditches if needed.

9. Install culverts for ephemeral and intermittent drainage crossings. Design all drainage crossing structures to carry the 25-year discharge event, or as otherwise directed by the BLM.
10. 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.
11. 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 dissipators) at sufficient intervals and intensities to adequately control and direct surface runoff above, below, and within the road environment to avoid erosive concentrated flows. In conjunction with surface runoff or drainage control measures, use erosion 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.
12. Upon completion of construction activities, restore topography to near pre-existing contours at the well sites, along access roads and pipelines, and other facilities sites; replace up to six inches of topsoil or suitable plant growth material over all disturbed surfaces; apply fertilizer, as required; seed; and mulch.

2.1.8.2.6 Water Resources

Other mitigation measures listed in the Soils and Vegetation and Wetlands sections of this EA will also apply to Water Resources.

1. Limit construction of drainage crossings to no-flow periods or low-flow periods.
2. Minimize the area of disturbance within perennial, ephemeral, and intermittent drainage channel environments.
3. Prohibit construction of well sites, access roads, and pipelines within 500 feet of surface water and/or riparian areas. Possible exceptions to this would be granted by the BLM based on an environmental analysis and site-specific mitigation plans.
4. Design channel crossings to minimize changes in channel geometry and subsequent changes in flow hydraulics.
5. Maintain vegetation barriers occurring between construction activities and ephemeral and intermittent channels.
6. Design and construct interception ditches, sediment traps/silt fences, water bars, silt fences, and revegetation and soil stabilization measures if needed.

7. Construct channel crossings by pipelines such that the pipe is buried a minimum of four feet below the channel bottom.
8. Regrade disturbed channel beds to the original geometric configuration and the same or very similar bed material replaced.
9. Case wells during drilling and case and cement all wells in accordance with Onshore Order No. 2 to protect all high quality water aquifers. High quality water aquifers are aquifers with known water quality of 10,000 TDS or less. Include well casing and welding of sufficient integrity to contain all fluids under high pressure during drilling and well completion. Further, wells will adhere to the appropriate BLM cementing policy.
10. Construct the reserve pits in cut rather than fill materials or compact and stabilize fill. Inspect the subsoil material of the pit to be constructed in order to assess soil stability and permeability and whether reinforcement and/or lining are required. If lining is required, line the reserve pit with a reinforced synthetic liner at least 12 mils in thickness and a bursting strength of 175 x 175 pounds per inch (ASTMD 75179). Consideration should be given for use of closed or semi-closed drilling systems in situations where a liner may be required.
11. 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.
12. 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 Wyoming.
13. Discharge hydrostatic test water in a controlled manner onto an energy dissipater. The water is to be discharged onto undisturbed land that has vegetative cover, if possible, or into an established drainage channel. Prior to discharge, treat or filter the water to reduce pollutant levels or to settle out suspended particles, if necessary. If discharged into an established drainage channel, the rate of discharge will not exceed the capacity of the channel to safely convey the increased flow. Coordinate all discharge of test water with the WDEQ/WQD and the BLM.
14. Discharge all concentrated water flows within access road ROWs onto or through an energy dissipator structure (e.g., riprapped aprons and discharge points) and discharge into undisturbed vegetation.
15. Develop and implement a pollution prevention plan (PPP) for storm water runoff at drill sites as required per WDEQ storm water National Pollution Discharge Elimination System (NPDES) permit requirements. All required WDEQ permits will be in-place prior to discharge.

16. Exercise stringent precautions against pipeline breaks and other potential accidental discharges of toxic chemicals into adjacent streams. If liquid petroleum products are stored on site in sufficient quantities (per criteria contained in 40 CFR Part 112), a Spill Prevention Control and Countermeasures (SPCC) plan will be developed in accordance with 40 CFR Part 112, dated December 1973.
17. Coordinate all crossings or encroachments of waters of the U.S. with the U.S. Army Corps of Engineers (COE).
18. Any changes in the produced water disposal method or location must have written approval from the BLM before the changes take place.

2.1.8.2.7 Fisheries

1. No fisheries mitigation is needed beyond that indicated under Water Resources and Special Status Species Fish.

2.1.8.2.8 Vegetation and Wetlands

Other mitigation measures under Soils and Water Resources will also apply to vegetation and wetlands.

1. File noxious weed monitoring forms with the BLM and implement, if necessary, a weed control and eradication program.
2. Evaluate all project facility sites for occurrence and distribution of waters of the U.S., special aquatic sites, and jurisdictional wetlands. All project facilities will be located 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.
3. On BLM lands, an approved Pesticide Use Proposal will be obtained before the application of herbicides or other pesticides for the control of noxious weeds.
4. Disturbed areas will be seeded and stabilized in accordance with BLM-approved reclamation guidelines.

2.1.8.2.9 Wildlife

1. During reclamation, establish a variety of forage species that are useful to resident herbivores.
2. 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.
3. Limit construction activities per BLM authorizations within big game crucial winter range from November 15 to April 30.

4. Complete a raptor survey of the SDPA prior to construction to ensure that well sites are located away from potential conflict areas.
5. Survey and clear well sites within one mile of raptor nests identified in the raptor survey prior to the commencement of drilling and construction during the raptor nesting period (February 1 through July 31).
6. When an "active" raptor nest is within 0.75 to 1 mile (depending on species and line of sight) of a proposed well site, restrict construction during the critical nesting season for that species.
7. Do not perform construction activities within 0.25 mile of existing sage grouse leks at any time.
8. Provide for sage grouse lek protection during the breeding, egg-laying, and incubation period (March 1 through June 30) by restricting construction activities within a two-mile radius of active sage grouse leks. Exceptions may be granted if the activity will occur in unsuitable nesting habitat.
9. To eliminate any hazard to migratory birds or other wildlife, the BLM will require netting (maximum two inch mesh) be installed over any pits identified as containing oil or toxic substances.

2.1.8.2.10 Special Status Species

Special Status Plants

1. Employ site-specific recommendations developed by the BLM IDT for staked facilities.
2. Minimize impacts due to clearing and soil handling.
3. Monitor and control noxious weeds.
4. Comply with Section 404(b)(1) guidelines of the federal Clean Water Act (CWA).
5. Perform clearance surveys for plant species of concern.

Special Status Animals

1. Implement measures discussed in Chapter 4 of the EA in compliance with the Endangered Species Act (ESA).
2. Prior to production of waters associated with CBM production in the SDPA, the proponent agrees to collect water data to determine if water from the Mesaverde Formation is connected to surface waters associated with the Colorado River System. Results of this analysis will be submitted to the USFWS and the BLM. If data indicates that there is a connectivity between the waters produced concurrent with CBM production and the Colorado River Basin system and the project will result in depletions, formal consultation will be initiated with USFWS. If, as a result of water testing that no depletions of the Colorado River System will

occur as a result of this project, discharge of CBM wells will only occur after the concurrence of USFWS is received by the BLM. Should this test indicate that no depletions of the Colorado River system will occur from the implementation of this project, discharge from CBM wells will not be allowed until concurrence with these results is received by the BLM from USFWS

2.1.8.2.11 Visual Resources

1. Utilize existing topography to screen roads, pipeline corridors, drill rigs, well heads, and production facilities from view.
2. Paint well and central facilities site structures with flat colors (e.g., Carlsbad Canyon or Desert Brown) that blend with the adjacent surrounding undisturbed terrain, except for structures that require safety coloration in accordance with Occupational Safety and Health Administration (OSHA) requirements.

2.1.8.2.12 Noise

1. Muffle and maintain all motorized equipment according to manufacturers' specifications.
2. In any area of operations (e.g., drill site, compressor site, etc.) where noise levels may exceed federal OSHA safe limits, PEDCO will provide for and require the use of proper personnel protective equipment by employees.

2.1.8.2.13 Recreation

Measures under Wildlife, Transportation, Soils, Health and Safety, and Water Resources also apply to Recreation.

1. Minimize conflicts between project vehicles and equipment and recreation traffic by posting appropriate warning signs, implementing operator safety training, and requiring project vehicles to adhere to low speed limits.

2.1.8.2.14 Socioeconomics

1. Implement hiring policies that will encourage the use of local or regional workers who will not have to relocate to the area.
2. Coordinate project activities with ranching operations to minimize conflicts involving livestock movement or other ranch operations. This will include scheduling of project activities to minimize potential disturbance of large-scale livestock movements. Establish effective and frequent communication with affected ranchers to monitor and correct problems and coordinate scheduling.
3. PEDCO and its subcontractors will obtain Carbon County sales and use tax licenses for purchases made in conjunction with the project so that project-related sales and use tax revenues will be distributed to Carbon County.

2.1.8.2.15 Cultural Resources

1. If a site is considered eligible for, or is already on the National Register of Historic Places (NRHP), avoidance is the preferred method for mitigating adverse effects to that property.
2. Mitigation of adverse effects to cultural/historical properties that cannot be avoided will be accomplished by the preparation of a cultural resources mitigation plan.
3. If cultural resources are discovered at any time during construction, all construction activities will halt and the BLM Authorized Officer (AO) will be immediately notified. Work will not resume until a Notice to Proceed is issued by the BLM AO.

2.1.8.2.16 Health and Safety

Measures listed under Air Quality and Water Quality also apply to Health and Safety.

1. Sanitation facilities installed on the drill sites and any resident camp site locations will be approved by the WDEQ.
2. To minimize undue exposure to hazardous situations, the operator will comply with all existing applicable rules and regulations (i.e., Onshore Orders, OSHA requirements, etc.) that will preclude the public from entering hazardous areas and place warning signs alerting the public of truck traffic.
3. Haul all garbage and rubbish from the drill site to a state-approved sanitary landfill for disposal. Collect and store any garbage or refuse materials on location prior to transport in containers approved by the BLM.
4. During construction and upon commencement of production operations, PEDCO will have a chemical or hazardous substance inventory for all such items that may be at the site. PEDCO will institute a Hazard Communication Program for its employees and will 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. It will be required that as every chemical or hazardous material is brought on location, a Material Safety Data Sheet (MSDS) will accompany that material and will become part of the file kept at the field office as required by 29 CFR 1910.1200. All employees will receive the proper training in storage, handling, and disposal of hazardous substances.
5. Spill Prevention Control and Countermeasure Plans will be written and implemented as necessary in accordance with 40 CFR Part 112 to prevent discharge into navigable waters of the United States.

6. Chemical and hazardous materials will be inventoried and reported 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. The appropriate Section 311 and 312 forms will be submitted at the required times to the state and county emergency management coordinators and the local fire departments.
7. Any hazardous wastes, as defined by the Resource Conservation and Recovery Act (RCRA), will be transported and/or disposed of in accordance with all applicable federal, state, and local regulations.

APPENDIX D
ADDITIONAL
BLM-REQUIRED MITIGATION

APPENDIX D

ADDITIONAL BLM-REQUIRED MITIGATION

4.2 Air Quality

If air quality analyses indicate exceedances in NO_x, the following types of control measures could be implemented: the reduction of compression requirements, electric compression or the use of nonselective catalytic reduction (NCR), lean combustion, or selective catalytic reduction (SCR) control technologies. Currently, these levels are below required levels and the likelihood of requiring these measures is small.

4.6 Range Resources and Other Land Uses

The BLM will recommend that the operator establish speed limits in the SDPA.

The proponent should coordinate with affected livestock operators to minimize disruption during livestock operations, including calving season.

4.9 Visual Resources

The BLM will recommend that facilities be sited below ridge lines and screened from known vantage points.

4.14 Noise

The BLM may require that noise levels be limited to no more than 10 dBA above background levels at sage grouse leks.

APPENDIX E

MASTER SURFACE USE PLAN
INCLUDING
CONDITIONS OF APPROVAL

APPENDIX E

**MASTER SURFACE USE PLAN
INCLUDING
CONDITIONS OF APPROVAL
Petroleum Development Corporation (PEDCO)**

**Sun Dog Pod
Carbon County, Wyoming
Plan of Development - Interim Coalbed Methane Wells**

The Petroleum Development Corporation (PEDCO) Sun Dog Interim Development Coalbed Methane Project is located in Carbon County, Wyoming. The Sun Dog Pod is one of nine pods that comprise the Atlantic Rim Coalbed Methane Interim Drilling Project.

Access to the Sun Dog Pod is by State Highway (SH) 789, north from Baggs, Wyoming, for approximately 22 miles to its intersection with Carbon County Road 608 (Dad Road). The distance from SH 789 to the proposed pod is approximately six miles. The total Sun Dog Pod interim development proposal consists of +/-10 wells with attendant developments and facilities as shown on the Sun Dog Project Plan Overview, as shown in Appendix C of the EA. This Plan Of Development will address six of the +/-10 planned interim development wells in the Sun Dog Pod. These six wells, identified below, are CBM exploration/development wells. The proposed well sites are staked. The remaining four CBM wells and one injection well, all located in T.16N., R.91W., section 8, S $\frac{1}{2}$, were previously addressed under the Dry Cow Creek Pod Master Surface Use Plan.

The following wells and corresponding leases are located within the Sun Dog Pod Interim Development Project Area.

Well Name	Federal Lease No.	Location
<u>Sun Dog Pod Interim Wells</u>		
Federal 1691-2-17	WYW-126439	sec. 17, T16N, R91W
Federal 1691-6-17	WYW-126439	sec. 17, T16N, R91W
Federal 1691-8-17	WYW-126439	sec. 17, T16N, R91W
Federal 1691-10-17	WYW-131778	sec. 17, T16N, R91W
Federal 1691-14-17	WYW-131778	sec. 17, T16N, R91W
Federal 1691-16-17	WYW-131778	sec. 17, T16N, R91W

Lease WYW-126439 contains a special timing stipulation that affects raptor and/or sage and sharp-tailed grouse nesting habitat. This stipulation provides that drilling and surface-disturbing activity will not be allowed during the period from February 1 to July 31 within certain areas of the lease.

Lease WYW-131778 contains special timing stipulations that affect big game crucial winter range and sage grouse and raptor nesting habitat as mapped on the Great Divide RMP Wildlife Distribution Overlays. The period from February 1 to July 31 is affected by sage grouse and raptor nesting and the period from November 15 to April 30 is affected by big game crucial winter range.

All well sites are located on lands administered by the BLM Rawlins Field Office.

The primary targeted reservoir in the Sun Dog Area is CBM from the coal seams within the Mesaverde Group. Drill site locations will be on approved 80-acre spacing. All unproductive wells will be plugged and abandoned as soon as practical after the conclusion of production testing. Productive wells may be shut-in temporarily for gas pipeline connections and/or Sundry Notices by the BLM for production activities and facilities.

This Master Surface Use Program shall serve as ROW application for water lines, gas lines, electrical lines, access roads to well locations, compressor station, water injection wells, and water transfer facilities.

A 30-foot wide ROW is requested for gas lines, a 20-foot wide ROW for water lines, and a 10-foot wide ROW is requested for electrical lines. Where possible, a single trench will be co-located with the access road to contain gas, water, and electrical lines.

1. EXISTING ROADS

Access to the SDPA is provided by SH 789 south from Interstate 80 (I-80) from Creston Junction to the intersection with Carbon County Road 608 (Dad Road), or north from Baggs, Wyoming, for approximately 22 miles to its intersection with Carbon County Road 608. The distance from SH 789 to the proposed pod and the interim exploration and production wells is approximately six miles as shown on the Sun Dog Project Plan Overview (Attachment C of the EA).

All existing and proposed BLM roads shall be brought up to minimum standards for a "resource road" as found in BLM Manual 9113.

The existing roads will be maintained in the same or better condition as existed prior to the start of operations. Maintenance of existing roads used to access the drill locations will continue until final abandonment and reclamation of the well locations occurs. A regular maintenance program will include, but is not limited to, blading, ditching, culvert installation, and gravel surfacing where excessive rutting may occur. Roads will not be flat bladed. Excessive rutting or other surface disturbance will be avoided. Operations will be suspended temporarily during adverse weather conditions if excessive rutting is occurring when access routes are wet, soft, or partially frozen.

Culverts will be placed in the existing BLM access road as the need arises or as directed by BLM's Authorized Officer.

The holder shall share maintenance costs in dollars, equipment, materials, or labor proportionate to holder's use with other authorized users. Upon request, the Authorized Officer shall be provided with copies of any maintenance agreement entered into.

Refer to the area and topographic maps in the individual well APDs for the location of the well, access route, and for the location of existing roads nearby.

2. ACCESS ROADS TO BE CONSTRUCTED

a. Well Access

Access to the individual well sites will be provided by crowned and ditched roads surfaced with an appropriate grade of gravel. Surfacing of the access roads will be completed prior to moving the drilling equipment/rig onto the pad. The access roads will follow existing terrain and the travelway will be approximately 14-foot wide.

Certain access roads, or portions thereof, may not need to be surfaced prior to moving the drilling equipment/rig onto the well pad. Factors to be considered here are soil types, grade, and weather conditions that suggest excessive rutting or erosion may not occur without gravel. These access roads, or portions thereof, will be identified during the on-site inspection.

Access to individual well sites will be constructed to minimum standards for a BLM "resource road" as outlined in BLM Manual section 9113 and Map B in the APD. The minimum travelway width of the road will be 14 feet with turnouts. No structure will be allowed to narrow the road top. The inside slope will be 4:1. The bottom of the ditch will be a smooth V with no vertical cut in the bottom. The outside slope will be 2:1 or shallower. Turnouts will be spaced at a maximum distance of 1,000 feet and will be intervisible.

Topsoil and vegetation will be windrowed to the side of the road. After the road is crowned and ditched with a 0.03 -0.05 ft/ft crown, the topsoil will be pulled back onto the cut slopes of the road ROW so there is no berm left at the top of the cut slope.

Drainage crossings on the access routes within the project area would either be low water crossings or crossings using culverts. Low water crossings would be utilized in shallow channel crossings and at crossings of the main channel. Culverts would be installed on smaller, steeper channel crossings. Topsoil would be saved before channel crossing construction occurs. Additional culverts will be placed as the need arises or as directed by the BLM's Authorized Officer. The total area to be disturbed would be flagged on the ground before construction begins.

Culverts will require a minimum of 12 inches of fill or one-half the pipe diameter, whichever is greater. The inlet and outlet will be set flush with existing ground and lined up in the center of the draw. The bottom of the pipe will be bedded on good material before backfilling. Backfill with unfrozen material and no rocks larger than two inches in diameter. Care shall be exercised to thoroughly compact the backfill under the haunches of the conduit. The backfill shall be brought up evenly in six inches layers on both sides of the conduit and thoroughly compacted. A permanent marker will be installed at both ends of the culvert to help keep traffic from running over the ends. Culverts will be installed in a manner which minimizes erosion or head-cutting. This may include riprapping or other measures as required.

Where low water crossings are required, a 30-inch deep rock fill over geotextile through the drainage will be required. The rock fill will consist of 75%, 3 inches-10 inches diameter rough rock and 25% Wyoming Grading "W" Material to fill the voids. The geotextile shall be overlapping at all joints and extend beyond the rock fill. The top of the rock fill in the drainage bottom shall match the elevation of the natural drainage to allow for smooth flow with no unnatural scouring or water backup. Four inches of coarse gravel over the rock will be used for the surface.

The access roads will be winterized by providing a well-drained travelway to minimize erosion and other damage to the roadway or the surrounding public land.

Wing ditches will be constructed as deemed necessary to divert water from the road ditches. Wing ditches will be constructed at a slope of ½%-1%.

Where needed, a PEDCO representative will conduct a "Plans in Hand" review with contractors to review the access routes to well locations. Where needed, directional markers will be temporarily placed to mark access routes. All markers will be removed as soon as they are no longer needed.

No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of four inches deep, the soil shall be deemed too wet to adequately support construction equipment.

Construction activity or routine maintenance will not be conducted using frozen or saturated soil material or during periods when watershed damage is likely to occur.

If snow removal outside the new and existing roadways is undertaken, equipment used for snow removal operations will be equipped with shoes to keep the blade off the ground surface. Special precautions will be taken where the surface of the ground is uneven to ensure that equipment blades do not destroy the vegetation.

Unless otherwise exempted, free and unrestricted public access will be maintained on the access road.

After wells are completed and equipment is installed, travel to wells generally would be limited to one visit every other day. A light truck or utility vehicle would be used to check on operations, read meters, and provide light service during the life of the project.

All equipment and vehicles will be confined to this travel corridor and other areas specified in the plan of development. All disturbances related to the access routes will be confined within the travel corridor.

b. Compressor Site and Water Injection Well Access

If wells are productive, crowned, ditched, and graveled roads will provide access to the compressor site and water injection facilities. These new access roads will be surfaced with a gravel material acceptable to the BLM. Topsoil and vegetation will be windrowed to the side of the road. After the road is crowned and ditched, the topsoil will be pulled back onto the cut slopes of the road ROW so there is no berm left at the top of the cut slope.

All construction work will be accomplished as specified by the BLM. If no specific BLM field survey requirements are provided, the design, field survey, and construction requirement for BLM "resource roads" that are described in BLM 9113 Manual will be followed. Design drawings and templates will be submitted only if specifically required by the BLM.

The all-weather roads to the compressor site and water injection facilities will have a travelway approximately 16 feet wide. All equipment and vehicles will be confined to these travel corridors and other areas specified in the plan of development. All disturbances related to these access roads will be confined within the travel corridor.

Culverts and other road drainage control structures, such as drainage dips, ditches, or water bars, will be installed at specific locations as specified by the BLM and the landowner. Drainage structures will be designed to pass all naturally occurring mean flows and flows from certain storm events, as specified by the BLM. Where needed, riprap will be placed at the outlets of culverts to minimize erosion. Refer to the area and topographic maps in the individual well APD for the location of

proposed access roads and site-specific road information.

3. LOCATION OF EXISTING WELLS

A listing of permitted water wells and their locations, within one mile of the Sun Dog Interim Development CBM Project, is located in Appendix C of the EA. This listing was obtained from the WSEO.

Also included in Appendix C of the EA is a map showing the locations of disposal, drilling, producing, injection, and abandoned oil and gas wells within one mile of the Sun Dog Interim Development CBM Project.

4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES IF WELL IS PRODUCTIVE

a. On the Well Pad

At each drill location, surface disturbance will be kept to a minimum. The areal extent of each drill pad is approximately 200 feet by 200 feet. Each drill pad will be leveled using cut and fill construction techniques where needed. Should drilling result in established commercial production, the wellhead area will require an area of approximately 15 feet by 15 feet. The surface equipment at each well will consist of the wellhead and an insulated wellhead cover. Each productive well is expected to require the installation of an electric pump, which will be used to produce water necessary to lower pressure within the coal seams. The lowered pressure will permit methane to be recovered. See the Appendix C of the EA for a diagram of a typical wellhead configuration in the Master Drilling Plan. If different production facilities are required, a Sundry Notice will be submitted.

At each well site, water encountered or used during drilling will be placed in a temporary working pit. Any water that is encountered during drilling is expected to be of higher quality than natural occurring surface waters. The pit will be monitored to ensure that no overflow or subsequent discharge of these waters occurs.

Typically, wells will be shut-in until pipelines and discharge facilities are authorized and constructed. Working pits will be closed once the contents have dried. Once wells become operational, produced water will be separated from the gas and collected in a buried polyethylene flowline for transportation to an approved produced water disposal location.

The primary injection objectives are the Deep Creek and/or Cherokee Creek Sandstone. The Deep Creek and/or Cherokee Creek Formations are isolated above and below by competent shale barriers that will prevent the initiation and propagation of fractures through overlying strata to any fresh water zones. Where possible, produced water flowlines and gas flowlines will be co-located with the access road. Areas have been identified where it is uneconomical to co-locate water and/or gas lines with the access roads.

The surface equipment at the well will consist of the wellhead and an insulated wellhead cover. Appendix C of the EA shows a schematic diagram of typical CBM well site. Depending on site-specific conditions, the housing will be painted either Carlsbad Canyon tan, color 2.5Y 6/2, or Desert Brown, color 10YR 6/3, of the Standard Environment Colors, unless otherwise specified by the BLM.

During drilling and testing of each well, a temporary generator may be used at the well site. If the well is productive, it would be shut-in until production facilities are constructed. After construction of the production facilities, a temporary generator would be centrally located and used until permanent electrical services are installed.

The operator shall submit a Sundry Notice for approval prior to construction of any new surface-disturbing activities on-lease that are not specifically addressed in the Master Surface Use Plan or individual APDs.

In order to minimize surface disturbance, where possible, the operator shall utilize wheel trenchers or ditch witches to construct all pipeline trenches associated with this project. Track hoes or other equipment will be used where topographic or other factors require their use.

Approval of the APD includes approval for Onshore Order #7 to dispose of produced water. All produced water will be reinjected into the Federal 1691-81 injection well unless otherwise authorized. Any changes in the produced water disposal method or location must have written approval from the BLM's Authorized Officer before the changes take place.

All above-ground structures, production equipment, tanks, transformers, and insulators not subject to safety requirements shall be painted to blend with the natural color of the landscape. The paint used shall be a color which simulates Standard Environmental Colors. The color selected is Carlsbad Canyon (2.5Y 6/2).

b. Off the Well Pad

The compressor site facility is expected to be constructed within an approximate area of 200 feet by 200 feet. A drawing of a typical compression site is shown in Appendix C of the EA. About one-half of the compressor site will be affected by the construction, maintenance, and operation of the facility. The compressor site facility will be of all-weather construction having a thick layer of gravel over the pad site. If feasible, topsoil will be removed and conserved for later reclamation activities.

The compressor site will consist of an insulated header building containing allocation meters for each well and a single sales meter. The header building will also contain a dehydrator that will remove water from the wet gas stream. If different production facilities are required, plans will be submitted in a Sundry Notice.

Water injection facilities are expected to be constructed within an approximate area of 150 feet by 150 feet. A drawing of a typical injection facility is included in Appendix C of the EA. The injection facility will be of all-weather construction having a thick layer of gravel over the pad site. Topsoil will be removed and conserved for later reclamation activities.

Approximately four water transfer pumping facilities would be utilized during production operations to transfer produced water from the CBM well(s) to the injection well in areas where elevation differences require supplemental pumping to transfer the produced water. Each pumping station would be constructed within an approximate area of 120 feet by 120 feet. A berm would be constructed around the perimeter of the pumping station area to contain any potential spills. Water transfer facilities would be located near proposed areas of disturbance and would not be located within known cultural resource sites or sensitive wildlife areas. Water transfer facilities would be located away from the established drainage patterns in the area and be constructed to prevent the entrance of surface water. Locations of water transfer facilities would be submitted via Sundry Notice.

A typical pumping station would consist of a 400-barrel water tank and a small centrifugal water pump. A small pump house would be constructed immediately outside of the bermed area to house the centrifugal pump.

The water tank(s) will be constructed, maintained, and operated to prevent unauthorized surface or subsurface discharges of water.

The water tank(s) will be fenced or capped to prevent livestock or wildlife entry.

The water tank(s) will be kept reasonably free from surface accumulations of liquid hydrocarbons and is not to be used for disposal of water from other sources without the prior approval of the BLM. Any discharge from the tank(s) will be reported to the BLM as required by NTL-3A.

All storage tanks and compressor facilities, designed to contain oil, glycol, produced water, or other fluid which may constitute a hazard to public health or safety, shall be surrounded by a secondary means of containment for the entire contents of the largest single tank in use, plus one foot of freeboard. The containment or diversionary structure shall be impervious to any oil, glycol, produced water, or other toxic fluid for 72 hours and would be constructed so that any discharge from a primary containment system would not drain, infiltrate, or otherwise escape to ground water, surface water, or navigable waters before cleanup is completed.

Within 90 days of initial production start-up, the operator will submit to the BLM Authorized Officer an analysis of the produced water.

5. LOCATION & TYPE OF DRILLING WATER SUPPLY

Water for drilling the wells will be provided by a nearby existing CBM well and transported to the drill site by truck. Water volume used in drilling operations is dependent upon the depth of the well and any losses that might occur during drilling.

Any changes in the water source or method of transportation must have written approval from the BLM's Authorized Officer before the changes take place.

6. CONSTRUCTION MATERIALS

Gravel and/or rock will be purchased from a local supplier having a permitted source of materials for the area. This material will be used for road construction to access wells, compressor, and injection facilities.

7. METHODS FOR HANDLING WASTE DISPOSAL

No hazardous substance as defined by CERCLA will be used in the drilling of the wells and/or construction of the well sites and access roads. Commercial preparations, which may contain hazardous substances, may be used in testing and production operations and will be transported over the ROW and within the project area. These materials will be handled in the appropriate manner to minimize potential for leaks or spills to the environment. No RCRA hazardous wastes will be generated in well drilling or production operations. Exempt reserve pit contents will be buried on-site. The operator will be required to provide a referenced list of hazardous materials that could potentially be used, produced, transported, disposed of, or stored on the well location, including a discussion on the management of the hazardous material.

The term "hazardous materials" as used here means: 1) Any substance, pollutant, or contaminant (regardless of quantity) listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended 42 U.S.C. 9601 et seq., and the regulations issued under CERCLA; 2) Any hazardous waste as defined in the Resource Conservation and Recovery Act (RCRA) of 1976, as amended; and 3) Any nuclear or nuclear byproduct as defined by the Atomic Energy Act of 1954, as amended, 42 U.D.C. 2001 et seq.

Drilled cuttings and drilling fluids will be deposited in the reserve mud pit. The reserve pit would be fenced around three sides during drilling. A sheep-tight woven wire would be used on the bottom with two strands of barbed wire above it. The fourth side of the reserve pit will be fenced as soon as the rig leaves the location. The pit will be backfilled within two to three weeks following completion of drilling or when sufficient drying has occurred and topsoil replaced.

There will be no oil, salt water, or other noxious fluids produced during drilling and completion operations.

A portable, self-contained chemical toilet will be provided on location during drilling and completion operations. Upon completion of operations, or as required, the contents of toilet holding tanks will be disposed of at an authorized sewage treatment and disposal facility. Disposal will be in accordance with State of Wyoming, Carbon County, and BLM requirements regarding sewage treatment and disposal.

The operator will comply with all state and local laws and regulations pertaining to disposal of human and solid wastes.

Garbage and nonflammable waste materials will be contained in a portable dumpster or similar unit. Upon completion of operations, or as needed, the accumulated trash will be hauled off-site to an approved sanitary landfill. No trash will be placed in the reserve pit.

Immediately after removal of the drilling rig, all debris and other waste materials not contained will be cleaned up and removed from the well location. No potentially adverse materials or substances will be left on the location.

Any spills of oil, gas, salt water, or any other potentially-hazardous substances will be reported immediately to the BLM and other responsible parties, and will be mitigated immediately, as appropriate, through cleanup or removal to an approved disposal site.

8. ANCILLARY FACILITIES

Self-contained travel-type trailers may be used on-site during drilling operations. No facilities other than those described in this SUP will be constructed to support the operations associated with the wells.

9. WELL SITE LAYOUT

Drilling operations would disturb an area approximately 200 feet by 200 feet at each well site (see drawing in Appendix C of the EA). Prior to constructing the well pad, the top six to eight inches (more if available) of soil and associated vegetative material will be removed and stockpiled. A temporary mud pit 15 feet wide by 10 feet deep by 35 feet long would be excavated at each well and reclaimed after completion operations. PEDCO estimates the reserve pit would be open from two to three weeks to allow for evaporation of pit fluids.

The reserve pit shall be constructed in a manner which minimizes the accumulation of surface precipitation runoff into the pit. This can be accomplished by appropriate placement of subsoil/topsoil storage areas and/or construction of berms or ditches.

For the protection of livestock and wildlife, all pits and open cellars shall be fenced. Fencing shall be in accordance with BLM specifications. Netting shall be placed over all open production pits to eliminate any hazard to migratory birds or other wildlife. Netting will also be placed over any pits that have been identified as containing oil or toxic substances as determined by visual observation or testing. The mesh diameter shall be no larger than one inch.

Ditches will be constructed, where necessary, around the well pads to divert water away from the pad.

Water discharged during testing/production will go into the water discharge line and will be transported to the disposal well.

Where needed, cut and fill construction techniques will be used to level the drill pads. All surface disturbance related to drilling will be confined to each drill site.

Plans for removal and storage of topsoil are presented in Item 10 below.

All equipment and vehicles will be confined to the access road, pad, and area specified in the individual APDs.

10. PLANS FOR RECLAMATION OF THE SURFACE

a. Well Site and Newly-Constructed Access Road

Prior to constructing the well pad, the top six to eight inches (more if available) of soil and associated vegetative material will be removed and stockpiled. A temporary mud pit 15 feet wide by 10 feet deep by 35 feet long would be excavated at each well and reclaimed after completion operations. The reserve pit will be allowed to dry prior to the commencement of backfilling work. No attempts will be made to backfill the reserve pit until the pit is free of standing water.

- i. Dry Hole - In the event of a dry hole, all equipment and debris will be removed from the location. Any improvements to the access road, such as culverts and gravel, will be removed. The drainages will be restored to their approximate original bank configuration and depth. Topsoil will be replaced over all cut areas. All disturbed areas will be seeded as indicated below.
- ii. Seeding - All disturbed areas will be reclaimed by replacing topsoil, grading, and seeding with a mixture agreed upon by the BLM and PEDCO. Seeding would occur during the spring months after ground frost or in the fall prior to ground frost. Seed would be applied as directed by the surface owner, either drilled, broadcast, or a combination thereof. Mulching may be required to insure seedling establishment.

The seed mix will be planted (subject to approval by the surface owner) with a drill equipped with a depth regulator. The seed mix will be uniformly planted over the disturbed areas. Where drilling is not possible, seed will be broadcast and the area will be raked or chained to cover the seed. Seeding will be repeated until a satisfactory stand is established as determined by the surface owner.

The following seed mixture will be used:

Species of seed	Variety Lbs.* PLS**
<u>Grasses</u>	
Slender wheatgrass (<i>Agropyron techycaulum</i>)	2
Thickspike wheatgrass (<i>Agropyron dasystachyum</i>) (Critana)	4
Western wheatgrass (<i>Agropyron smithii</i>)	2
Indian ricegrass (<i>Oryzopsis hymenoides</i>)	2
Sandberg bluegrass (<i>Poa sandbergii</i>)	0.5
Bottlebrush squirreltail (<i>Sitanion hystrix</i>)	1
<u>Shrubs</u>	
Gardner's saltbush (<i>Atriplex gardnerii</i>)	$\frac{1}{12.5}$
Total	$\frac{1}{12.5}$

* These seed rates are for drill seeding. If broadcast seeding, double the rates provided.

** Pure Live Seed

11. SURFACE OWNERSHIP

The surface of the interim development project area is entirely under federal ownership.

12. OTHER INFORMATION

A Class III Cultural Resource Inventory of the proposed drill sites and access roads and other facilities has been completed by Western Archaeological Services. Reports have been filed with the BLM Rawlins Field Office.

A comprehensive water disposal plan is included in Appendix C of the EA. It addresses how produced water will be handled during the testing and production of the CBM wells.

If archaeological, historical, or vertebrate fossil materials are discovered during the course of any construction activities, PEDCO will suspend all operations that further disturb such materials and immediately contact the BLM Rawlins Field Office (307-328-4200). Operations in the area of discovery will not resume until written authorization to proceed has been issued by the BLM Authorized Officer.

The operator will have a qualified individual to serve as a compliance coordinator. This individual will be responsible for assuring that all requirements of the Surface Use Plan and appropriate COAs are followed.

The operator will be responsible for the prevention and suppression of fires on public lands caused by its employees, contractors, or subcontractors. During conditions of extreme fire danger, surface use operations may be either limited or suspended in specific areas, or additional measures may be required by the authorized officer.

Weeds will be controlled on disturbed areas within the exterior limits of the access road ROW and well pad. The control methods will be in accordance with guidelines established by the EPA, the BLM, and state/local agencies.

PEDCO will be fully responsible for the actions of its subcontractors. A copy of the approved APD and the COAs will be on location during drilling and completion operations.

13. SITE-SPECIFIC CONDITIONS OF APPROVAL

a. Wildlife Stipulations

i. For All Wells

Construction, drilling, and other activities potentially disruptive to strutting and nesting greater sage-grouse, are prohibited during the period of March 1 to June 30 for the protection of greater sage-grouse nesting areas.

ii. For All Wells Except 16-17

Potential mountain plover habitat exists at the proposed project location(s). Additional protection measures may be applied if this area is later determined to be part of a mountain plover aggregation area.

Ground-disturbing activities, including construction, drilling, and reclamation, are prohibited during the mountain plover reproduction period of April 10 to July 10, unless surveys consistent with the Plover Guidelines or other USFWS-approved methods find that no plovers are nesting in the area.

b. Road and Well Pad Minimum Requirements

i. Well 2-17: Access will come onto the pad from the northeast side.

ii. Well 6-17: Two 18-inch culverts will be installed. Topsoil will be moved to the west side of the pad.

iii. Well 8-17: Access will come onto the pad from the northeast side.

iv. Well 10-17: Topsoil will be moved to the east side of the pad.

v. Well 14-17: Access will come onto the pad from the southeast edge and topsoil will go on the northwest side.

vi. Well 16-17: One 18-inch culvert and one 24-inch culvert will be installed between this well and the compressor station.

c. Cultural Resources

i. For All Wells

A BLM-permitted archaeologist will monitor construction of all well pads and access roads.

A BLM-permitted archaeologist will conduct an open trench inspection of all pipelines.

If sites 48CR7373 and 48CR7374 fall within 150 feet of the road/pipeline centerline, barrier fences must be erected to protect the sites. A BLM-permitted archaeologist must be present during fence construction.

- ii. Well 10-17: Site 48CR7377 is adjacent to the well pad and must be evaluated by a BLM-permitted archaeologist prior to any well construction activities.
- iii. Well 16-17: Site 48CR7382 must be evaluated by a BLM-permitted archeologist prior to any construction activities.

The pipeline must be re-routed to avoid **all** cultural sites including sites 48CR7377 and 48CR7378. If the re-route centerline falls within 150 feet of site 48CR7378, a barrier fence must be erected to protect the site. A BLM-permitted archaeologist must be present during fence construction.

14. CERTIFICATION

I hereby certify that I, or persons under my direct supervision, have inspected the proposed drill site and access route; that I am familiar with the conditions which currently exist; that the statements made in this plan are, to the best of my knowledge, true and correct; and that the work associated with operations proposed herein will be performed by PEDCO and its contractors and subcontractors in conformity with this plan and the terms and conditions under which it is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.

I also certify that PEDCO will comply with the provisions of the law or the regulations governing the Federal or Indian right of reentry to the surface under 43 CFR 3814.

I also certify that PEDCO shall use its best efforts to conduct its approved operations in a manner that avoids adverse effects on any properties which are listed, or may be eligible for listing, in the National Register of Historic Places (NRHP). If historic or archaeological materials are uncovered during construction, the operator will immediately stop work that might further disturb such materials and contact the Authorized Officer (or his/her representative) at the BLM Rawlins Field Office. Any paleontological resources or fossils discovered as a result of operations associated with these wells will be brought to the attention of the Authorized Officer or his/her representative immediately. All activities in the vicinity of such discoveries will be suspended until notified to proceed by the Authorized Officer.

PEDCO hereby certifies that:

1. All potentially affected landowners having properly permitted water wells with the WSEO within each proposed well's Circle of Influence (one-half mile radius) were offered a Water Well Agreement; and
2. If a Water Well Agreement is not reached with the landowner, PEDCO agrees to mitigate the impacts of its CBM wells in accordance with State of Wyoming water laws; and
3. PEDCO has applied for a Permit to Appropriate Groundwater from the Wyoming State Engineers Office, concurrently with the APDs.

APPENDIX F
MASTER DRILLING PLAN

APPENDIX F

MASTER DRILLING PROGRAM
OPERATOR: Petroleum Development Corporation (PEDCO)
Carbon County, Wyoming
Section 17, T.16N., R.91W., 6th PM

Drilling Program for the subject wells listed below:

- Federal 1691-2-17
- Federal 1691-6-17
- Federal 1691-8-17
- Federal 1691-10-17
- Federal 1691-14-17
- Federal 1691-16-17

1. AVERAGE ESTIMATED TOPS OF IMPORTANT GEOLOGIC MARKERS

<u>Formation</u>	<u>Depth (1400 ft.)</u>	<u>Depth (1700 ft)</u>	
Lewis Shale			Surface Surface
Almond		+/- 540 feet	+/- 586
Pine Ridge		+/- 970 feet	+/- 1019
Allen Ridge		+/- 1090 feet	+/- 1137
TD		+/- 1400 feet	+/-
		1700	

2. ESTIMATED DEPTH OF ANTICIPATED WATER, OIL, GAS OR MINERAL FORMATIONS

Almond Methane gas
Allen Ridge Methane gas

The Lewis Shale is not anticipated to contain any zones capable of producing water. There are several zones within the Mesaverde capable of producing fresh water, including the coal seams. Several coal seams may be tested for gas producing formations to total depth. All shallow water zones will be protected with casing and cement. Cement will be brought to surface to isolate all formations in the Mesaverde Group.

Planned Objective: Mesaverde

3. MINIMUM BOP REQUIREMENTS (refer to BOP schematics shown in Appendix C of the EA)

- The BOPE shall be closed whenever the well is unattended.
- The BOPE shall be pressure tested when initially installed, whenever any seal subject to pressure testing is broken, after repairs, or every 30 days.
- PEDCO shall notify the BLM Rawlins Field Office 24 hours prior to the BOPE test.

4. SUPPLEMENTARY INFORMATION

The primary objective of this project is to drill, stimulate, and produce CBM gas from the coal seams of the Mesaverde Formation.

PEDCO proposes to test the Mesaverde coals between 580 feet and 1,700 feet. Stimulation of the perforated coal seams will be done by hydraulic fracturing. Fresh water, gelled water, and/or foam fracturing techniques will be used.

Please see the schematics shown in Appendix C of the EA for Typical CBM Drill Site Layout, Configuration Options, Typical CBM Completed Well, and Typical CBM Well Site.

5. CASING PROGRAM

<u>Hole Size</u>	<u>Casing Size</u>	<u>Casing Wt.</u>	<u>Grade</u>	<u>Joint</u>	<u>Depth Set</u>	<u>New/Used</u>	<u>Rng</u>
13 1/2"	10 3/4"	32.75#	H-40	ST&C	0-140	New	3
9 7/8"	7"	17#	H-40	ST&C	0-1400	New	3
or							
97/8"	7"	23#	MC-40	ST&C	0-1600-1700	New	3

Surface Casing:	10 3/4"	32.75 ppf.	H-40	STC	Collaps e	Burst	Tension
					Ratings:	880	1820 205M

A. Burst = $[0.052 * MW * TVD(\text{shoe})] - [\text{Gas Gradient} * TVD]$
 = $[0.052 * 9.3\text{ppg} * 170'] - [0.1\text{psi/ft} * 170']$
 = 65.21 psi
 Safety Factor = Rating/Burst
 = $1820/65.21$
 = 27.91

B. Collapse = $0.052 * MW * TVD(\text{shoe})$
 = $0.052 * 8.8\text{ppg} * 170'$
 = 77.79 psi
 Safety Factor = Rating/Collapse
 = $880/77.79$
 = 11.31

C. Tension = $\text{Weight} * MD * [1 - (MW/65.5\text{ppg})]$
 = $32.75\text{ppf} * 170' * [1 - (8.8\text{ppg}/65.5\text{ppg})]$
 = 4819.50 lbs.
 Safety Factor = Rating/Tension
 = $205,000/4819.50$
 = 42.54

Surface casing shall have centralizers on the bottom three joints of the casing, starting with the shoe joint.

Production Casing:	7"	17 ppf.	H-40	STC	Collaps e	Burst	Tension
					Ratings:	1450	2310 122M

A. Burst = $[0.052 * 13.0 \text{ ppg} * 1400'] - [0.1\text{psi/ft} * 1400']$
 = 806.40 psi
 Safety Factor = Rating/Burst
 = $2310/806.40$
 = 2.86

B. Collapse = $0.052 * 13.0 \text{ ppg} * 1400'$
= 946.40 psi
Safety Factor = Rating/Collapse
= $1450/946.40$
= 1.53

C. Tension weight = $17\text{lbs./ft} * 1400' * [1 - (13.0 \text{ ppg}/65.5\text{ppg})]$
= $17\text{lbs./ft} * 1400' * .8015$
= 19,076 lbs.
Safety Factor = Rating/Tension
= $122,000/19,076$
= 6.39

Production Casing:	7"	23 ppf.	MC-40	STC	Collapse	Burst	Tension
				Ratings:	1450	2310	122M

A. Burst = $[0.052 * 13.0 \text{ ppg} * 1700'] - [0.1\text{psi/ft} * 1700']$
= 979.20 psi
Safety Factor = Rating/Burst
= $3960/979.20$
= 3.77

B. Collapse = $0.052 * 13.0 \text{ ppg} * 1700'$
= 1149.20 psi
Safety Factor = Rating/Collapse
= $3110/1149.20$
= 2.71

C. Tension weight = $23\text{lbs./ft} * 1700' * [1 - (13.0 \text{ ppg}/65.5\text{ppg})]$
= $23\text{lbs./ft} * 1700' * .8015$
= 31,338 lbs.
Safety Factor = Rating/Tension
= $273,000/31,338$
= 8.71

6. MUD PROGRAM

Drilling mud will be used by the circulation medium. A fresh water, polymer, gel drilling mud will be used, and visual monitoring will be done from spud to total depth. The anticipated mud weight will be between 8.5–13 ppg. Sufficient quantities of lost circulation material and barite will be available at the well site at all times for the purpose of assuring well control.

7. CEMENTING PROGRAM

The following is the proposed procedure for cementing the 10³/₄-inch surface pipe and 7-inch long string:

a. Surface Casing

Lead: Class "C" Type III, 14.4 ppg., yield 1.44ft³/sk @ 101% excess. Compressive strength in 24 hours at 80°F 3100 psi.

71 sx 140 ft.

81 sx 160 ft.

85 sx 170 ft.

The surface casing shall be cemented back to surface. In the event cement does not circulate to surface or fall back of the cement column occurs, remedial cementing shall be done to cement the casing back to surface.

b. Long String

Lead: Class "C" Type III, 14.4 ppg., yield 1.44ft³/sk @ 35% excess. Compressive strength in 24 hours at 95°F 3200 psi.

347 sx 1400 ft.

397 sx 1600 ft.

422 sx 1700 ft.

Estimated top of cement back to surface.

8. LOGGING PROGRAM

Cores: Rotary cores will be taken as needed to evaluate the coal seams.

DSTs: None planned

Logs: Induction, GR, SP, Density, Neutron and Caliper – From surface to TD
Cement Bond Log – From 10¾-inch casing shoe TD
Mud Logger – As Needed.

9. PRESSURE DATA, POTENTIAL HAZARDS

Bottom hole pressures anticipated @ 1000 – 1100 psi.

There is no history of hydrogen sulfide gas in the area and none is anticipated.

10. ANTICIPATED STARTING DATES AND NOTIFICATION OF OPERATIONS

a. Anticipated Starting Dates

Anticipated Commencement Date	- Fall 2001, or upon approval
Drilling Days	- Approximately 7 Days/Per Well
Completion Days	- Approximately 2 Days/Per Well
Testing Days	- Approximately 7-14 Days/Per Well

Note: Drilling operations will commence as soon as practical after approval of all necessary permits including the APDs.

b. Notification of Operations

Bureau of Land Management
Rawlins Field Office
P.O. Box 2407
1300 North Third
Rawlins, Wyoming 82301
(307) 328-4200

APPENDIX G

**CONDITIONS FOR APPROVAL FOR APPLICATIONS
FOR PERMIT TO DRILL**

APPENDIX G

CONDITIONS FOR APPROVAL FOR APPLICATIONS FOR PERMIT TO DRILL

CONDITIONS OF APPROVAL

Operator: Petroleum Development Corporation Pod Name: Sun Dog Pod

Legal Description: Sec.17, T16N, R91W Lease Nos: WYW-126439 and WYW-131778

GENERAL PERMITTING REQUIREMENTS

1. All lease operations are subject to the terms of the lease and the lease stipulations, the regulations of 43 CFR Part 3100, Onshore Oil and Gas Orders, Notices to Lessees (NTL's), the approved APD and any written instructions or orders of the authorized officer. The following requirements are emphasized.
 - a. Abandonment: In the event abandonment of the hole is desired oral approval may be granted by this office but must be followed within 5 days with a **Notice of Intention to Abandon (Form 3160-5)**. Unless the plugging is to take place immediately upon receipt of oral approval, the BLM Branch of Minerals must be notified at least 24 hours in advance of the plugging of the well in order that a representative can witness the plugging operation. The **Subsequent Report of Abandonment (Form 3160-5)** must be submitted within 30 days after the actual plugging of the wellbore, reporting where the plugs were placed and volumes of cement used, along with copies of the service company invoice and job log.

The operator shall promptly plug and abandon each newly completed, recompleted or producing well which is not capable of producing in paying quantities. No well may be temporarily abandoned for more than 30 days without prior approval of the authorized officer. When justified by the operator, the authorized officer may authorize additional delays, no one of which may exceed an additional 12 months. Upon removal of drilling or producing equipment from the site of a well, which is to be permanently abandoned, the surface of the lands disturbed shall be reclaimed in accordance with a plan first approved or prescribed by the authorized officer.
 - b. Completion Report: If the well is completed as a dryhole or as a producer, **Well Completion or Recompletion Report and Log (Form 3160-4)** must be submitted within 30 days after completion of the well or after completion of operations being performed, in accordance with **43 CFR 3160**. Copies of all logs, core descriptions, core analyses, well test data, geologic summaries, sample descriptions, daily drilling reports, daily completion reports, and all other surveys or data obtained and compiled during the drilling, completion, and/or workover operations, will be filed with **Form 3160-4**.
2. Approval of this APD does not warrant that any party holds equitable or legal lease title.
3. This permit is valid for a period of one year from the day of approval or until lease expiration/termination, whichever is shorter. If the permit terminates, any surface disturbance created under the application shall be reclaimed in accordance with the approved plan.

ADDITIONAL PERMITTING REQUIREMENTS

DRILLING PLAN

BOP:

1. All BOPE shall meet minimum standards for well control requirements as set forth in Onshore Order No. 2.
2. The BOPE approved for this Pod shall be tested to a minimum of 1000 psi.
3. A Sundry Notice (Form 3160-5), along with a copy of the BOP test report, shall be submitted to this office within 5 working days following the test.
4. If the bleed line is connected into the buffer tank (header), all BOP equipment including the buffer tank and associated valves will be rated at the required BOP pressure.

Casing and Cementing:

1. The surface casing shall be cemented back to surface. In the event cement does not circulate to surface or fall back of the cement column occurs, remedial cementing shall be done to cement the casing back to surface.
2. Pea gravel or other similar materials shall not be used to fill up around the surface casing in the event cement falls back.
3. A Sundry Notice (Form 3160-5), along with a copy of the service company's materials ticket and job log, shall be submitted to this office within 5 working days following the running and cementing of all casing strings.
4. All casing strings shall be tested, prior to drilling out the casing shoe, to 0.22 psi/ft of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the internal yield pressure of the casing.
5. Any change in the casing and cement design will be approved by the Authorized Officer prior to running casing and cementing.
6. No freshly hard banded pipe/collars will be rotated in the surface casing.
7. All surface casing will be blocked and centered prior to cut off and installation of the wellhead.

Mud Programs:

1. Sufficient quantities of mud materials shall be maintained at the well site, at all times, for the purpose of assuring well control.

Other:

1. A summary of the drilling operation and/or completion operation shall be submitted on Sundry Notice (Form 3160-5), to this office, along with copies of the daily drilling reports and/or daily completion reports, on a weekly basis.