900 Werner Court, Ste 200
Casper, Wyoming 82601

January 9, 2008

Ms. Michele Easley
United States Bureau of Land Management
Kemmerer Field Office
312 Highway 189 North
Kemmerer, Wyoming 83101

RE: Moxa Arch Area Infill Gas Development Project – Draft Environmental Impact Statement

Dear Ms. Easley:

Anadarko Petroleum Corporation (Anadarko) submits these comments for the Bureau of Land Management's (BLM) consideration as it finalizes the Moxa Arch Infill Gas Development Project environmental impact statement (EIS). BLM released the draft EIS for public comment in October of 2007. Anadarko is one of the largest independent oil and gas exploration and production companies in the United States and holds oil and gas interests within the management boundaries of the Kemmerer Field Office of the BLM. Because of its interests, Anadarko will be affected by the management decisions made by BLM in regard to this project. Anadarko's status as a fee mineral and surface owner is also noted herein, since BLM management decisions made on federal lands can and do impact activities on fee lands. This is especially true in those areas commonly referred to as the "checkerboard lands" that comprise a significant portion of the Moxa Arch Area (MAA).

General Comments on the Moxa Arch draft EIS

Anadarko requests that BLM eliminate Alternative B from further consideration since this alternative does not meet the purpose and need of the project to "allow Operators to exercise their rights to drill for, extract, remove, and market natural gas under valid existing oil and gas leases granted by the BLM, State of Wyoming, and private owners and to increase the daily gas delivery from the MAA to help meet the growing demand for clean burning energy sources." (Draft EIS at page 1.7)

Alternative B is inconsistent with the purpose and need of the project for the following reasons:

- This alternative is in effect a "No Action" alternative in that it arguably will not allow surface disturbance greater than that allowed under the 1997 ROD for the Expanded Moxa Arch Area Natural Gas Development Project Environmental Impact Statement (1997 ROD).
- A baseline calculation using geospatial techniques is required to determine existing disturbance in the MAA. The result of this analysis could result in a dramatic decrease the pace of development allowed by BLM if this analysis indicated existing disturbance greater than the 10,921 acres authorized under the 1997 ROD. Additionally, Anadarko is concerned that BLM may illegally attempt to stop all development should the disturbance acreage cap be exceeded.
- Because of the proposed unreasonable surface disturbance limitations, the only means open to operators to drill would be to drill from lands that are presently disturbed, thus requiring directional drilling. However, the BLM has not yet demonstrated that directional drilling is economically feasible in the MAA.
- The disturbance cap for Alternative B is coupled to unreasonable reclamation standards in Appendix E. The requirement for 80% of pre-disturbance ground cover is unrealistic in a five year timeframe. (Draft EIS at page E-21) BLM acknowledges that reclamation efforts have been hampered over the last decade by conditions outside Operator control such as extended drought in southwest Wyoming but BLM has failed to account for this issue in setting the proposed reclamation standards. The EIS fails to present any evidence regarding how BLM determine such standards are necessary and whether it is even feasible to reach them in the proposed time frames given the existing conditions in southwest Wyoming? Nor does the EIS contain any discussion regarding what methods will be used to measure this metric and what statistical reliability is associated with this determination? The Rawlins BLM recently imposed a similar reclamation standard in the Atlantic Rim Natural Gas Field Development Project ROD (2007) and is currently investigating a modification to the vegetative cover standard. Reclamation success should be based instead on a trajectory approach where success is determine based on whether vegetative cover is trending upward, not numerical standards that have no historical application and limited scientific justification.

As stated above, Anadarko believes BLM should discontinue any further consideration of Alternative B. In the event BLM finds it necessary to develop an additional alternative for consideration, Anadarko respectfully recommends that the BLM include operators in the development of any such alternatives in the Moxa Arch final EIS and in other oil and gas development EISs that are conducted in the Kemmerer Field Office.

Alternative B in the Moxa Arch draft EIS is flawed in its conception because it fails to account for the complexities, challenges, and economies inherent to the development of natural gas resources, and it would not meet the purpose and need for the project. Therefore, under the National Environmental Policy Act (NEPA), BLM is only required to analyze reasonable alternatives that meet the purpose and need for the project. As clearly demonstrated above, Alternative B fails to meet these criteria.

Anadarko recommends that BLM adopt the Proposed Action as the Preferred Alternative in the final EIS. The proposed action will allow the mineral resource to be economically recovered, thereby promoting US energy security. BLM's concerns regarding reclamation success have been suitably addressed by the Operators who have committed to development of a site-specific Reclamation Plan for the MAA as part of the proposed action. The Reclamation Plan as proposed requires the Operators to hire an independent third party contractor to inspect reclamation operations.

The following conclusions from the Draft EIS also support selection of the Proposed Action as the Preferred Alternative:

- The environmental analysis indicates that the Proposed Action is not expected to cause an exceedance of Near-Field air standards for construction emissions (Draft EIS at page 4-10), project emissions (Draft EIS at page 4-10), or hazardous air pollutants (Draft EIS at page 4-10). The Proposed Action does not exceed Far-field air standards for criteria pollutants (Draft EIS at page 4-11, Sulfur and Nitrogen Deposition (Draft EIS at page 4-11) or ozone (Draft EIS a page 4-12).

- The environmental analysis indicates that no residual impacts are expected from the Proposed Action on surface geology and topography (Draft EIS at page 4-15) or geohazards. (Draft EIS at page 4-16).

- The environmental analysis notes that the disturbance to sensitive and non-sensitive soils would be less under the Proposed Action than alternatives B and C. (Draft EIS at page 2-21, Table 2-6).

- The environmental analysis notes for Surface Water Use under the Proposed Action that "This level of water removal from the three river systems is not likely to have a noticeable or measurable impact to stream flows" (Draft EIS at page 4-25).

- The environmental analysis notes for Groundwater that "With implementation of mitigation measures and casing standards, no significant residual impacts to groundwater resources are expected." (Draft EIS at page 4-29).

- The environmental analysis for the Proposed Action indicates for Wetland and riparian vegetation types that "Impacts would not be significant" (Draft EIS at page 2-22, Table 2-6) and that "No significant increases in noxious weeds expected because of BLM stipulations and current operator practices." (Draft EIS at page 2-22, Table 2-6).

- The environmental analysis indicates for Fisheries and Aquatic Ecosystems that impacts would not be significant from the Proposed Action. (Draft EIS at page 2-22, Table 2-6).

- The environmental analysis indicates that "Impacts to pronghorn under the Proposed Action are not anticipated to be significant." (Draft EIS at page 4-46).

- The environmental analysis notes that "No crucial mule deer ranges (winter or yearlong) or migration routes were identified within the MAA. Significant impacts to mule deer habitat would not be expected under the Proposed Action." (Draft EIS at page 4-46).

- The environmental analysis notes that "Disturbance to elk crucial severe winter relief habitat that would result from the Proposed Action would not exceed the 5% significance threshold." (Draft EIS at page 4-46).

- Although some impacts are expected to Sage Grouse, the Controlled Surface Use within ¼ miles of leks and the Timing Limitations Stipulations for nesting and brood rearing habitat would be implemented under all alternatives to mitigate these impacts. Furthermore, the impacts from the Proposed Action are expected to be less than those from Alternatives B and C due to the increased number of wells drilled under those two alternatives (Draft EIS at page 2-24, Table 2-6)

- The environmental analysis indicates no significant impacts to ESA protected species such as the Ute ladies'-tresses orchid, Bald Eagle, Black-footed ferret and Yellow-billed cuckoo are expected from implementation of the Proposed Action. (Draft EIS at page 2-24, Table 2-6).

- The environmental analysis indicates that the "reduction in animal units months (AUMs) from the Proposed Action would not be a significant loss." (Draft EIS at page 26, Table 2-6).

- The environmental analysis indicates that the socioeconomic benefits from the project are significant and notes "$1.17 billion in revenue for county, state, and federal governments" and "up to 7, 894 workers in new employment including 22,993 jobs during drilling and construction and 4,872 jobs during production." as

a result of implementing the Proposed Action. (Draft EIS at page 2-25, Table 2-6).

- The gas resource is needed to meet the American people's demand for energy. "Natural gas consumption in the United States has grown considerably since 1990 when the US consumed approximately 19.0 trillion cubic feet. Demand for natural gas continues to grow and is projected to increase from 22.0 trillion cubic feet in 2005 to 26.1 trillion cubic feet in 2030 depending on market conditions." (Draft EIS at page 4-65). The Proposed Action is expected to meet 1.8 trillion cubic feet of this demand.

Specific Comments on the Moxa Arch DEIS

Chapter 3 Affected Environment

1) In Section *3.1.1 Climate*. The document utilizes the Jonah Field wind rose for representative meteorological data. However this project is located along the south west corridor of the State. The wind rose for Rock Springs shows a much more dominate westerly wind. BLM should revise the final document and utilize the information from the Rock Springs wind rose instead.

2) In *Table 3-3*. The background ambient concentrations for $PM_{2.5}$ are identified as 15 µg/m³ (24-hr average) and 7.8 µg/m³ (annual average) (based on a ratio of $PM_{2.5}$ / PM_{10}). This is not consistent with the data listed in Table 4-5 of Appendix C (the Technical Support Document) that shows 22 µg/m³ (24-hr average) and 11 µg/m³ (annual average). A third set of data appear in Table 3-1 of the document - 15 µg/m³ (24-hr average) and 11 µg/m³ (annual average).

Chapter 4 Environmental Consequences

1) In Section *4.2.1.1 Emissions*. "Production emissions were calculated based on the total number of producing wells in the field." Flashing emissions are the primary source of VOC emissions. Anadarko does not see an outline for the way these emissions were estimated for the field. The emission break down in Table 2-2 of Appendix C is skewed heavily to HAP emissions and raises a flag on whether VOC emissions were calculated correctly.

2) In Section *4.2.3.1.1 Criteria Pollutants***.** The total 24-hr $PM_{2.5}$ value for all alternatives was 34 µg/m³, only slightly below the NAAQS standard of 35 µg/m³. The results of the modeling seem anomalous in the area of $PM_{2.5}$. The draft EIS text states that the predicted impact for all alternatives was 34 µg/m³; however, there is a minimum of 30% change in the $PM_{2.5}$ emission rates estimated between the alternatives.

3) In Section *4.2.3.3 Ozone*. This analysis shows the 8-hr ozone NAAQS as 85 ppb. The actual standard is 0.08 ppm so this translates to 80-84 ppb. A measured concentration of 85 ppb would be rounded up to show an exceedance. The background concentration utilized was 75 ppb with a predicted impact from the proposed action of 2.8 for a maximum concentration of 80.8 ppb.

Appendix A. BLM Standard Stipulations, Best Management Practices, and Mitigation Requirements

1) In Section *4.3 Additional BMPs.* One of the proposed BMPs would require locating wellheads below ground surface. Were BLM to impose this BMP, it could create a confined space that would pose safety concerns for employees who have to work in the area. Because of this, Anadarko suggests that this BMP be removed from the document or if BLM decides to retain this BLM it must fully disclose the EIS associated safety issues and potential impacts to employees.

2) In Section *5.0 Mitigation Measures*. The provision for seeding well pads with a sterile cover crop immediately after construction is an area of concern for Anadarko. In order for seeding to be effective, the location needs to be left scarified with a rough surface to create pockets for seedling growth. However, such a provision fails to account for the fact that drilling locations need to be left completely flat to make the safest possible work area for employees during drilling operations. Thus, Anadarko believes BLM should revise this measure to require seeding only after construction has been completed.

4) In Section *5.0 Mitigation Measures*. The Operators are required to use misters to disperse water from pits or reuse the produced water at the next drilling location, however, a third alternative not mentioned is disposal of the water down an approved disposal well with authorization from the WOGCC/WDEQ. Anadarko suggests that this third alternative be added to the document.

5) In *Table A-1*. What is the basis for the noise reaching sensitive habitats to be less than 49 dBA? Please provide the scientific justification for this noise threshold.

6) In *Table A-1*. Anadarko believes BLM should remove the requirement for development of a supplemental Wildlife and Livestock Mitigation document as unnecessary. A similar document has already been developed, and the then existing Operators were required to contribute to a fund to pay for mitigation measures to be carried out on federal lands to benefit antelope. APC understands that approximately $20,000 remains in that fund. BLM has failed to present any information in this document justifying the need for such a measure in this document, especially in light of the existing surplus of funds

7) In *Table A-1*. BLM has also included a provision encouraging operators to donate lands. Anadarko believes this provision should also be removed as unnecessary and unjustified by the information presented in the EIS.

Appendix B. Development and Operation Procedures Technical Support Document

1) In Section *3.4 Well Pads*. The provision for not lining reserve pits pending completion of a soil survey is onerous. Anadarko believes the need for the soil survey will cause Operators to shy away from not lining pits which ultimately inhibits reclamation efforts.

Appendix C. Air Quality Technical Support Document

1) In Section *2.1.1 Construction Processing*. The model has grossly over-estimated the amount of sulfur in drill rig fuel as 5000 ppm. The actual value ranges from 100 to 200 ppm. Please refer to comments submitted by BP.

2) In Section *4.4.4 Emission Processing*. Column one in Table 4-3 and Table 4-4 should read Stack Diameter instead of Stack Height.

3) In Section *4.4.4 Emission Processing*. The model has grossly over-estimated the amount of compression needed on the project. Please refer to comments submitted by BP.

Appendix D. Biological Assessment

1) In Section *5.0 Recommended Conservation and Mitigation Measures*. The document states that "Should black-footed ferrets be documented in a prairie dog complex located within the MAA, impacts to the species or its habitat would be suspended immediately;" BLM needs to clarify what is means by impacts would be "suspended immediately". Does this suspension apply to future approvals? What would the effect be on ongoing operations?

Appendix E. Reclamation Procedures Plan

1) In Section *3.0 Methods*. Topsoil stockpiles are required to not exceed a depth of 2 feet. This will require more area to stock topsoil, extending the disturbance outside the well location itself. This does not seem reasonable. Is this what BLM intends?

2) In Section *3.2 Construction*. This section indicates that a berm is required around the fill portions of the well pads. This is a new requirement, and is not necessary. Well location drilling sites are designed to be flat, inhibiting migration of fluids off the

location. The requirement for a detention pond is confusing. Is BLM referring to the drilling pit or another pond on location?

3) This plan should be revised to require that culverts be rip-rapped only when necessary.

4) In *Tables E-2 through E-8*. The seed mixtures delineated in several cases use excessive pounds of seeds. Normal seed mixtures are within the 12-15 pound range. Furthermore, many of the species noted are dependent on availability and cost. Flexibility on seed mixtures needs to be indicated in the text.

5) In Section *11.1 Specific Performance Standards*. The provision that all locations left bare for more than 1 month, have at least 50% cover of protective material does not allow for completion operations which may be delayed for a month after drilling as rigs make their way through the field. All disturbed areas are required to have at least 50% cover of protective material within 6 months after reclamation should occur after the closure of the reserve pit.

6) In Section *11.1 Specific Performance Standards*. The requirement of 80% of predisturbance vegetation cover has not been justified by the analysis in the document and should be revised using scientifically defensible methods.

7) In Section *11.4 Reporting Requirements*. The requirement to have a third party provide reclamation documentation on a quarterly basis is excessive. This will not be cost effective and will likely provide information that is of limited value to BLM. BLM has not collected or managed reclamation information effectively in the past but now expects to review it quarterly? This should be an annual requirement.

Sincerely,

Tom Clayson
Regulatory Analyst