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Anadarko

February, 16, 2006

Mr. Dave Simons
Rawlins Field Office Manager
Bureau of Land Management
Rawlins, Wyoming

RE: Atlantic Rim Project Area Draft Environmental Impact Statement

Dear Mr. Simons:

Anadarko Petroleum Corporation (Anadarko) submits the following comments on the above-captioned project. Anadarko, along with its partner, Warren Resources, Inc. is the proponent of the Atlantic Rim project, which is the subject of the above-captioned environmental review. As such, Anadarko will be directly affected by the Bureau of Land Management's (BLM or Agency) decision. Pursuant to the requirements of the National Environmental Policy Act (NEPA), the BLM initiated the environmental review for this project in late 2001. Over four years later, the BLM released the draft environmental impact (DEIS) for public comment on December 12, 2005, with a sixty (60) day comment period (Notice). 70 Fed. Reg. 73481 (December 12, 2005).

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The Notice published by BLM is emblematic of the numerous deficiencies of the DEIS. In the Notice, BLM incorrectly identifies not only the alternatives, but also the Agency's preferred alternative. The Notice states BLM analyzed four alternatives: the proposed action, a no action alternative, Alternative A (Phased development), and Alternative B (special protection of sensitive resources). 70 Fed. Reg. 73481, 73882 (December 12, 2005). However, the DEIS describes the alternatives as follows: Alternative A – no action, Alternative B – phased development, and Alternative C – development protection measures. The Notice then identified the Agency's preferred alternative as Alternative B, which as described therein is the special protection of sensitive resources. The DEIS, on the other hand, identifies the BLM's preferred alternative as "…a combination of alternatives B and C." DEIS at S-7. In addition, the Environmental Protection Agency's notice of availability of the DEIS incorrectly stated the comment period would close on January 30, 2006. 70 Fed. Reg. 74810 (December 16, 2005).

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This inattention to detail and poor drafting is carried through in the DEIS, which is replete with unfinished sentences, misplaced figures and references and conflicting statements. For example, on page S-1 BLM states that project area encompasses 270,035 acres. Yet, despite the fact that the federal, state and privately held acreage remains the

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same, on page 1-3, the total acreage is 270,080[1]. Although not a large difference, it is indicative of the apparent carelessness with which this document was written. Another example is BLM's inconsistent reference to the project as both the Atlantic Rim Natural Gas Project and the area as the Atlantic Rim Project Area. See DEIS at 1-1. Again, although not a substantive issue, it serves to highlight the poor drafting in the document that does raise substantive issues when BLM fails to provide objective scientific information to support its statements and conclusions.

607-3-1 607-3-2 607-3

An example of conflicting references that does raise substantive issues is illustrated by BLM's proposed measure to address surface disturbing activities on slopes greater than 8%. The development protection measure BLM has proposed to address potential impacts in this case is first described on page 2-5 of the DEIS where BLM states: "In vegetation communities that would be difficult to reclaim and are in country [sic] with greater than 8% slopes, surface disturbance would be limited to less than 20 acres and 4 locations per section." It appears BLM has proposed this measure in this instance to address the difficulty of reclaiming the lands where the vegetation communities are located on slopes greater than 8%. BLM again proposes this measure on page 4-53 of the DEIS in connection with its discussion on impacts to Vegetation and Wetlands. However, BLM's justification for it in this context is not clear, and it does not appear to be tied to reclamation issues as it was earlier in the DEIS. Moreover, BLM has failed to provide any justification for imposing this limit with respect to slopes greater than 8%. Nor has BLM provided any analysis of this measure in the context of existing lease stipulations. Although we have not reviewed all of the subject leases, we note the lease language in those we did review which states that stipulations may be applied to address certain areas, in this case, slopes in excess of 25%.

GENERAL COMMENTS

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The draft environmental impact statement does not, as required by NEPA, "...provide full and fair discussion of significant environmental impacts and [ ] inform the decision makers and the public of the reasonable alternatives..." 40 C.F.R. § 1502.1. Not only does the document fail to present a "full and fair" discussion of the impacts, the two alternatives analyzed by BLM fail to meet the requirements of NEPA and its implementing regulations. The applicable regulations require BLM to "rigorously explore and objectively evaluate all *reasonable* alternatives." 40 C.F.R. § 1502.14(a) (emphasis added). In addition to this regulatory requirement, under applicable case law, BLM must consider alternatives that accomplish the intended purpose of the proposed action and are technically and economically feasible. *Southern Utah Wilderness Alliance*, 157 IBLA 150 (2002). BLM's own guidance document also directs BLM to analyze alternatives that meet the purpose and need for the proposed action; reduce the adverse environmental effects of the proposed action; are feasible; have effects that can be analyzed and which are not substantially similar in effects to an alternative that is analyzed. See Attachment 1-1 to Instruction Memorandum 2005-247 "National Environmental Policy Act (NEPA) Compliance for Oil, Gas, and Geothermal Development." In this DEIS BLM has analyzed two alternatives to the proposed action

[1] According to our calculations, the correct acreage amount is 270,080.

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and the no action alternative. The two alternatives analyzed are a phased drilling alternative (Alternative B) and what BLM has termed a "spatial alternative" (Alternative C) which is little more than a compilation of mitigation measures. However, both of these alternatives fail to meet the requirements of NEPA, case law and BLM guidance.

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Although Alternative B may be technically feasible, it is questionable as to whether it is economically feasible, and BLM's analysis fails to analyze this issue. More importantly, we question whether BLM has the authority to suspend the subject leases for such lengthy periods, at least without potentially raising a takings claim or a breach of contract claim. Alternative B is not reasonable in that a key term for this alternative is not defined or analyzed in the document. Specifically, operators will not be allowed to move from one phase to the next until the completion of interim reclamation; however, this term is not defined in the document. Appendix B contains the reclamation plan for the Project, and it defines Short-Term (Temporary) Reclamation and Long-Term (Final) Reclamation, but it does not define interim reclamation. Appendix B at B-3. In the absence of a definition for this key term, the document lacks a thorough discussion of the potential impacts relative to this alternative.

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In addition, BLM has failed to address the fact that the Proposed Action is a phased approach and that the effects from both the Proposed Action and Alternative B are substantially similar. The operators proposed drilling approximately 200 wells per year. The wells would be drilled in essentially a concentric pattern as depicted in the figures attached as Exhibit A and hereby incorporated. Moreover, drilling would be naturally phased given both the standard seasonal timing mitigation measures that would be applied to the project and the availability of sufficient drill rigs and attendant services and supplies. Although the operators have proposed drilling 200 wells per year, it may not be feasible to achieve such levels, and the drilling would certainly not occur all at once. For example, the average drilling window during any given year is approximately 105 days as depicted on the map attached as Exhibit B. A rig can be used to drill approximately 20 wells during this 105 day window. To drill 200 wells per year, 10 rigs would be required along with the necessary support services such as cementing, casing crews, mud loggers, open-hole loggers, etc. In addition, the gas and water gathering systems, electrical distribution systems and compressor all need to be installed during this 105 day period. Given these constraints, it's obvious the Proposed Action will be phased in over time instead of geographically as proposed by BLM. The effects will therefore be similar to those under the Proposed Action, and under BLM's own guidance should not be analyzed as a separate alternative. IM 2005-247. BLM itself recognizes the effects will be substantially similar. See for example, DEIS at 4-22.

607-7-1

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Alternative C in reality is equivalent to the No Action alternative. BLM characterizes this alternative as one in which drilling would occur as in the Proposed Action but would be subject to all of the development protection measures set out in Appendix L DEIS at 2-4. Given all of the limitations in Appendix L, it is unclear how BLM determined drilling would occur as in the Proposed Action. Based on our analysis of Alternative C, it would likely reduce those wells that could be drilled by as much as 50% given that it would impose 160-acre well spacing across 95% of the study area. See Anadarko's map

607-7-1

attached as Exhibit C which depicts all areas in which BLM proposes to eliminate 80 acre spacing. This, combined with the fact that reservoir characteristics identified to date from exploratory drilling demonstrate that development under this scenario would be uneconomic renders Alternative C the functional equivalent of the No Action alternative.

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Even if one were to accept that Alternative C is not the functional equivalent of the no action alternative, it is neither technically nor economically feasible. Under this alternative, BLM would impose 160 acre spacing across ninety-five percent of the project area, DEIS at 4-51, – this despite the fact that the BLM's own Reservoir Management Group (RMG) prepared a memorandum analyzing the economic and technical viability of 160 acre spacing and concluded that it would not be technologically viable given the resource being developed nor would it be economically viable (June 16, 2005) (A copy of the memorandum is attached as Exhibit D). The RMG concludes that: "160-acre well spacing for [coalbed natural gas] development in the Atlantic Rim Area (AR Area) is possible only under very special geologic conditions. As a general rule, existing production data suggests that 80-acre well spacing is the best standard well spacing. It is the local geologic setting that must be considered." The DEIS remarkably does not discuss the RMG's conclusions with respect to 160 acre spacing, although BLM does cite the memorandum to support its elimination of directional drilling as an analyzed alternative. DEIS at 2-8.

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Although BLM notes in the DEIS that drilling took place while the EIS was being prepared to meet the objectives of the Interim Exploration Drilling Program, DEIS at 1-2, BLM has inexplicable failed to consider the results of this drilling in its analysis. For example, one of the objectives of the interim drilling program was to determine "what density of wells is needed to effectively dewater coal formations and produce natural gas." As a matter of fact, the information gathered by the operators from wells drilled during the pendency of the EIS demonstrates that 160 acre spacing does not allow for the production of the gas reserves. Anadarko tested the viability of 160 acre spacing at both the Blue Sky and Red Rim Pods. Neither of these pilot operations produced salable amounts of gas. When compared with the results from both the Sun Dog and Doty Mountain Pods, both of which were drilled on 80 acre spacing, the results are clear – 80 acre spacing results in salable amounts of gas production while 160 acre spacing does not. The graph attached to these comments as Exhibit E depicts the production differential between 80 acre spacing and 160 acre spacing.

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Finally, BLM's analysis of Alternative C does not take into account the directives of the Great Divide Resource Management Plan (Great Divide RMP) which provides as follows:

> In cases where federal oil and gas leases are or have been issued (1) without stipulated restrictions or requirements that are later found to be necessary; or (2) with stipulated restrictions or requirements that are later found to be insufficient, the needed restrictions or requirements may be included in approving subsequent exploration and development activities. These restrictions or requirements may *only be included as reasonable*

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> *measures* or as conditions of approval (COA) in the authorizing applications for permits to drill (APD), sundry notices, or plans of development (POD).

Great Divide RMP record of decision at page 30 (emphasis added). Again, BLM has failed in this document to provide any discussion regarding the reasonableness of the measures listed in Alternative C.

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Alternative C fails to accomplish the intend purpose and need of the proposed action. The purpose and needs section states that the purpose of the "...proposal is to drill for, remove and sell natural gas resources." Alternative C does not meet this objective. . Under this Alternative, it appears BLM would impose all of the listed measures, which would so severely limit the available acreage it is uncertain whether Anadarko would even be able to drill, let alone remove and sell the natural gas. Moreover, should BLM finally issue a record of decision (ROD) adopting its preferred alternative, the project would likely be rendered uneconomic by the combination of phased drilling in this manner and imposition of all of the measures enumerated in Alternative C.

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There are several other general issues with respect to both alternatives. For Alternative B, the DEIS, as currently drafted, is lacking in the following respects: 1) BLM has failed to account for the economic impact on lessees both from the perspective that some of the subject leases could be suspended for over fourteen years and that those with interests in the second and third phases will be deprived of revenues for seven to fourteen years; 2) BLM has failed to address the potential economic impact to the federal government both from the perspective of a loss of revenues and from potential liability for takings claims; and, 3) BLM has failed to address the issue of correlative rights both from the perspective of adjacent landowners and drainage of federal resources. For Alternative C, 1) BLM has failed to address its authority to impose non-surface occupancy (NSO) in the absence of a stipulation in the lease designating all or a portion of the lease as an area of NSO; 2) the DEIS assumes that all 1800 of the proposed coalbed natural gas (CBNG) wells would be drilled in the same 20 year period, while in others it assumes less than the full 1800 wells would be drilled.

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Despite the fact that the stated purpose of this project is to drill for, extract, remove and market gas products, the document lacks an analysis the amount of gas that will be generated by the development, and the magnitude of this production in understandable terms, such as how many homes could be heated and for how long. Nor is there any analysis that compares how these figures would be affected by each alternative.

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Finally, we note that in numerous instances in the DEIS, BLM has referenced the draft Rawlins Resource Management Plan. Therefore, we hereby incorporate by reference a copy of Anadarko's March 17, 2005, comments on the draft Rawlins Resource Management Plan. In particular, Anadarko incorporates its comments on the application and definition of "disruptive activities," the Rawlins to Bagss Geographic Area, historic trials, management of setting under the National Historic Preservation Act and winter greater sage-grouse concentration areas.

Executive Summary

Although Anadarko would not normally provide comments on an executive summary in a DEIS, we feel compelled to do so in this instance because we believe the summary highlights several of the issues that will be discussed in more detail in the sections addressing each chapter.

Introduction

607-11 In the first paragraph the BLM correctly identifies Anadarko E & P Company, LP as the project proponent; however, BLM has incorrectly identified Anadarko Petroleum Corporation as the project proponent both later on this same page and in Chapter 1 of the DEIS. Compare DEIS at S-1 (Paragraph 1 with Paragraph 3) with DEIS at 1-1.

607-12 We note the lack of discussion of air quality impacts in the Executive Summary. The final document should include a brief discussion of these impacts. We offer the following language for BLM's consideration: For the Proposed Action and all considered alternatives, there are no significant impacts to ambient air quality, far-field visibility (regional haze), far-field atmospheric deposition (acid rain), and in-field (within the study area) concentrations.

1.1.2 Alternative A – No Action

607-13 The description of this alternative fails to include any reference to the fact that drilling would occur on both state and fee lands. Although BLM may choose not to authorize drilling on its lands, it has no authority to prohibit drilling on either fee or state lands. Therefore, the no action alternative should recognize this possibility and address the potential impacts to federal lands from any such drilling.

1.1.4 Alternative C

607-14-1 607-14 In describing the parameters of Alternative C, BLM states: "Development for natural gas would occur as in the proposed action." DEIS at S-3. Given the number and scope of measures provided in this alternative, development would not occur as in the Proposed Action. Notably, the proposed action contemplates development of the project area on the basis of 80-acre spacing. As noted above, and elsewhere in these comments, under Alternative C, BLM would impose 160-acre spacing across most of the project area. This will severely limit the number of wells that can be drilled. In addition, many of the proposed protection measures identified for this alternative cover significant portions of the project area thereby severely restricting drilling opportunities.

607-14-2 607-14-3 Recommendation: Because Alternative C fails to meet the requirements of NEPA, case law and BLM's internal guidance, this alternative should be eliminated from the analysis. If BLM retains the alternative and the listed mitigation measures, it should first clearly define the parameters of the alternative in terms of the number of wells that would likely

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be drilled in light of required, not optional, application of the proposed development protection measures. BLM should then analyze these measures in the context of whether existing science supports their imposition; whether they are technically and economically feasible; and, whether they are the least restrictive necessary to address the specific resource concern. Finally, BLM should also include a discussion of any such measures in light of both the existing lease terms and the necessity of such measures to address unnecessary and undue degradation. As BLM itself has recognized, this standard has as its premise an understanding that a certain amount of disturbance constitutes necessary and due degradation.

BLM also asserts, in its description of Alternative C, that "These types of areas are unique enough to require additional protective measures beyond what is already provided . . ." This subjective conclusion is unsupported by any of the analysis in the DEIS. Many of the areas in which BLM proposes to apply "development protection measures" (DMPs) to protect the asserted "unique nature" of the area are in fact no different than other areas in the Rocky Mountain states where best management practices (BMPs), condition of approval (COAs), and lease stipulations have proven effective in protecting sensitive resources.

Recommendation: As noted above, Anadarko believes BLM should eliminate Alternative C as an alternative in the final document. If the alternative remains in the document, BLM should 1) clearly define which of the measures it intends to support and then determine a realistic number of wells that could be drilled, and 2) provide support, with citations to appropriate scientific documents, substantiating its assertion that the resources in this area are so unique as to require protection above and beyond the standard measures. Further, BLM must fully document in its analysis why standard BMPs, COAs and lease stipulations fail to protect such resources.

1.2 Environmental Analysis

1.2.1 – 2.6 Soils, Water Resources, Vegetation and Wildlife

In the description for each of these resources, BLM asserts the impacts from the Proposed Action are significant, while the impacts to these resources under Alternative C would be insignificant. DEIS at S-4 and 5. However, BLM has failed to support this conclusion in the document. BLM's conclusions with respect to significance appear to be subjective statements lacking any foundation in scientific fact.

Recommendation: BLM should revise the document to support, with objective analysis, its conclusions with respect to the relative significance of the impacts from each alternative, especially in light of the fact that the Proposed Action would impact in the short term less than 7% of the total area analyzed in the DEIS and 2.3% in the long-term. DEIS at 2-2.

1.2.7 Recreation

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In this section, BLM states: "Under all the action alternatives displacement of wildlife and the loss of a natural appearing setting would make the ARPA undesirable for hunting or wildlife viewing. These visitors would be displaced and impacts would be significant." DEIS at S-6. Again, BLM has made a subjective determination that is wholly unsubstantiated by any objective analysis. It is even more difficult to accept BLM's determination of a significant impact in this situation when the BLM notes the presence of an "extensive road network" for both the Sand Hills Special Management Area (SMA), DEIS at 2-5, and the Cow Butte/Wild Cow SMA, *Id.*, and yet both of these areas are called "popular hunting spot (s)". *Id.* BLM has failed to document that the mere presence of roads associated with natural gas production will significantly impact hunting and wildlife viewing. In addition, BLM states in this paragraph that "Impacts to scenery, noise, dust and human activity would reduce the ARPA's desirability as a place to camp significantly under all the action alternatives." *Id.* Ignoring for a moment the imprecise language, this statement is directly contradicted in Chapter 3 where BLM states: "Although there are no counts of recreational visits to the ARPA, overall use is believed to be low." DEIS at 3-87. In addition, BLM states that the area is "...primarily used for hunting and secondarily for pleasure driving and wildlife viewing." DEIS at 3-87. Anadarko has been unable to find any reference at all in the document to use of the area for camping contrary to BLM's apparent assertion here that this area is used for camping.

Recommendation: BLM should either delete these unfounded and subjective statements from the DEIS or provide objective evidence substantiating its claims with respect to the "displacement" of hunters and wildlife viewers and significant impacts on campers.

1.2.8 Visual Resources

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BLM states impacts would be significant for pleasure driving and mountain biking under the Proposed Action and Alternative B. These statements are not supported in the analysis in the DEIS. We also note that pleasure driving and mountain biking are not even mentioned in the body of the document. BLM also states management objectives would not be met under the Proposed Action and Alternative B. It is unclear how BLM reached this conclusion.

Recommendation: BLM should revise this summary to delete the first statement and clarify the second.

1.2.10 Socioeconomics

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This section is prefaced with the statement that: "Alternative C would likely result in less than 2,000 wells, depending on the specific sites proposed for development." DEIS at S-6 and 7. This misleading statement sets the tone for the entire section, which is a disjointed presentation of the potential economic impacts that could result under each of the alternatives. Compounding the problems in this section is BLM's misuse of the word "impact" when describing the economic effects of each alternative. For example, BLM states "6.4 billion in total economic impacts related to production are expected for

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alternative B and the proposed action." DEIS at S-6. As drafted, the statement has a negative connotation that is difficult to reconcile with the fact that BLM has just stated the Proposed Action and Alternative B could generate in $6.4 billion dollars – a decidedly positive outcome. The sub-section summarizing the effects on federal, state and local revenues merely refers the reader to Chapter 4. Although we recognize that this section is a summary of the document itself, it seems that BLM should provide a minimal discussion of the socioeconomic effects rather than referring the reader to Chapter 4.

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Recommendation: BLM should revise this section to present a short and objective summary of the potential economic impacts of each of the alternatives. In addition, as previously noted, BLM needs to clearly define the parameters of Alternative C.

1.3 Agency Preferred Alternative

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Although BLM has identified a preferred alternative, it has failed to clearly define the parameters of its preferred alternative. BLM's merely states its preferred alternative "…is a combination of alternatives B and C."

Recommendation: BLM should clearly define this alternative in terms of the number of wells that would be drilled in light of the limits proposed under Alternative C to permit a reasoned analysis of the potential impacts from this alternative. As noted in our general comments, Anadarko believes this combination could render the project uneconomic.

SPECIFIC COMMENTS

The remainder of Anadarko's comments will address specific concerns with the analysis.

Chapter 1 PURPOSE AND NEED

1.2.1 Purpose and Need for the Proposed Development

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After reciting a number of facts regarding the growing demand for natural gas resources to support economic growth of the nation, BLM unaccountably fails to include this concept in the stated purpose and need of the project.

Recommendation: The first sentence of the final paragraph in this section should be revised to read: "The purpose of and need for this natural gas development project is to exercise the lessee's rights to economically drill for, extract, remove and market natural gas products in order to increase the domestic supply of natural gas."

1.3.1.2 Management Actions

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In this section, BLM states: "…the entire area is open to oil and gas leasing, subject to restrictions needed to protect resources." DEIS at 1-6. BLM fails to discuss the fact that any such restrictions, in addition to being technically and economically feasible should

also be consistent with and not exceed attainment of the management objectives identified in the Great Divide Resource Management Plan.

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Recommendation: As further explained in Anadarko's comments on the significance criteria set out in Chapter 4 of the DEIS, BLM should include a discussion of the management objectives as set forth in the Great Divide Resource Management Plan for each resource.

Chapter 2 PROPOSED ACTION AND ALTERNATIVES

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The first paragraph on page 2-1 should be deleted as unnecessary and self-serving. The second paragraph on this same page ends with the following statement: "When the Rawlins RMP is approved the ARPA must and would comply fully with that plan." DEIS at 2-1. BLM seems to be implying that it has the authority, by virtue of any amendments to the existing resource management plan to impose additional mitigation measures or take action of a similar nature. As BLM moves forward with its analysis of this project, BLM should be cognizant of the limitations on its authority, such as existing lease stipulations. Although future actions authorized after approval of the Rawlins Resource Management Plan (Rawlins RMP) must conform to the Rawlins RMP, BLM here fails to recognize valid existing lease rights. Absent the concurrence of a lessee, BLM has no authority to modify lease terms or stipulations. Additionally, existing regulatory authority limits the agency's authority to impose conditions of approval on a proposed project. 43 CFR 3101.1-2.

BLM must be cognizant of valid existing rights. Not only must BLM incorporate this concept into Chapter 1 of the DEIS outlining Management Common to All Alternatives, but throughout the DEIS, including the Glossary.

Recommendation: BLM should revise the last sentence of the first paragraph on page 2-1 to read as follows: Upon approval of the Rawlins RMP, any actions approved by the BLM within the Atlantic Rim Area would comply with applicable provisions of the Plan, consistent with valid existing rights.

2.2.1 The Proposed Action

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In the first bulleted section BLM states: "Under the proposed action, there would be approximately 4,500 acres of new short term disturbance (initial, <3 years) surface disturbance from well pads;… The total new short-term (initial) disturbance resulting from the proposed action would be about 15,800 acres." DEIS at 2-2. This statement is confusing and conflicts with the previous bullet point. As written, it appears to state that "initial" disturbance would occur in less than 3 years, which would require 666 wells, on average, to be drilled per year. This is not consistent with the previous bullet point which states that development and drilling would occur over a 20 year period.

Recommendation: BLM should revise the first sentence of this section by deleting "(initial <3 years)."

2.2.2 Alternative A – No Action

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The two sentences in this section are grammatically incorrect and do not correctly portray the no action alternative. As noted in the comments on the Executive Summary, the no action alternative fails to take into account the fact that drilling is likely to occur on both fee and state acreage, even if BLM disallows any further drilling on its lands. Moreover, it conflicts with statements made later in the document which do recognize and even quantify the number of wells that would be drilled on fee and state lands. For example, in the discussion of air quality impacts, BLM states: "Air quality impacts would occur within the ARPA under the No Action Alternative due to the development of 720 wells on private and state lands." DEIS at 4-12.

Recommendation: This section should be revised to read as follows: Under the applicable NEPA regulations, BLM is required to include a "no action" alternative. 40 C.F.R. § 1502.14(d). For purposes of this analysis, under this alternative, BLM would deny the Proposed Action and no wells would be drilled on federal lands within the Atlantic Rim Area, except in limited circumstances such as to provide protection against drainage. However, development would likely occur on both state and private lands and, especially in the checkerboard area, would require access across federal lands.

As noted above, the document does contain some analysis of the potential impacts from drilling on private and fee lands, but BLM fails to do so consistently throughout the document. As BLM prepares the final document, it should ensure such analysis is clearly and consistently presented.

2.2.3 Alternative B

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BLM's description of this alternative includes the following statement: "During the first phase of development approximately 925 well locations would be developed. Once completed and in production the second phase of development is proposed to occur in the northern third of the project area… Active status would last from 6-7 years and would include completion of interim reclamation." DEIS at 2-2. In addition to the general issues noted in our general comments, Anadarko has the following concerns with this alternative. Without explanation, BLM anticipates that 925 wells (over ½ of the proposed CBNG wells) would occur in the first phase, yet BLM still assumes this drilling could occur over within a 6-7 year period. Anadarko does not believe that this scenario is realistic, especially in light of the seasonal wildlife timing stipulations and the resultant increased seasonal demand for drill rig and construction equipment availability and attendant crews and services. There are a number of issues BLM needs to address with respect to this option: 1) How did it determine 925 wells would be drilled in this area? 2) What process will be used should operators need to return to a previous phase to drill in-fill wells, construct additional facilities or pipelines? 3) How will BLM determine when "interim" reclamation has been successful? Because the area will already have been reclaimed, operators will be required to reclaim the area again, adding needless costs and arguably needless additional affects to natural resources.

607-24-4

In addition, BLM's description of the phased approach fails to account for the increased environmental risks that could result from concentrating activity in one area which would limit the operators' ability to obtain geological and performance data needed to properly plan for optimal development. BLM's phased plan, as currently drafted, arguably restricts operators from returning to a previous phase to drill in-fill wells, and construct any associated facilities or pipelines should drilling data dictate the need for such wells to optimize recovery of the gas resources and prevent waste. BLM also needs to consider in its analysis that under its phased approach, the concentrated use of roads will likely cause them to deteriorate more quickly than they otherwise would thereby potentially requiring higher maintenance costs than would otherwise be incurred. In addition, based on the information Anadarko has and in consideration of appropriate safety standards, we believe the roads will need to be wider to accommodate the concentrated traffic. BLM has not clearly addressed this issue in the DEIS, and this could result in additional impacts that would not result from the Proposed Action. Finally, concentrating activity in one area will increase safety concerns in terms of potential for accidents due to increased traffic density.

Recommendation: BLM should clarify the parameters of this option, if BLM retains it in the final document. As noted above, Anadarko believes the alternative should more specifically address the drilling limitations, concentration of activity, ability to return to an area and required reclamation.

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607-24-5

One of the underpinnings of this alternative is suspension of leases in the non-active phases. BLM states: "BLM would authorize suspensions of operations and production for all leases within the no-activity areas except for where existing oil and gas development has already occurred." There are a number of issues with this underlying premise. First, although BLM does have authority to control the timing of lease actions, this authority is not unfettered. BLM's grant of a lease conveys certain rights. In particular, a lessee is granted:

> … the right to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource in a leasehold subject to: Stipulations attached to the lease; restrictions deriving from specific, nondiscretionary statutes; and such *reasonable measures* as may be required by the authorized officer to minimize adverse impacts to other resource values, land uses or users not addressed in the lease stipulations at the time operations are proposed. To the extent consistent with lease rights granted, such reasonable measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures. At a minimum, measures shall be deemed consistent with lease rights granted provided that they *do not*: require relocation of proposed operations by more than 200 meters; require that operations be sited off the leasehold; *or prohibit new surface disturbing operations for a period in excess of 60 days in any lease year*."

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43 C.F.R. § 3101.1-2. (emphasis added).

607-24-6 607-24

Requiring suspension of leases for a minimum of seven – fourteen years obviously runs afoul of this provision and likely impermissibly interferes with the contract rights granted to the lessees. BLM has failed in the DEIS to address this issue and its potential economic impact both from the perspective of the lessee and the government.

2.2.4 Alternative [sic]

607-25-1 607-25-2 607-25-3 607-25-4 607-25-5 607-25-6 607-25

First, the caption for this alternative fails to designate it as Alternative C. Second, the description begins with the following statement: "Development for natural gas would occur as in the proposed action…" DEIS at 2-4. As has been described above, because of the nature of the measures BLM proposes to impose under this option, it is doubtful that drilling would even occur, let alone, drilling as outlined in the Proposed Action. The description of the alternative also contains the following statement: "These types of areas are unique enough to require additional protective measures beyond what is already provided. . ." Again, as noted above, the DEIS is bereft of any factual scientific evidence supporting this claim. Moreover, BLM has not clearly delineated why existing protection measures fail to address the resource concerns such that additional measures are warranted. In addition, BLM's discussion of Alternative C fails to consider its own guidance regarding application of best management practices (BMP). See Instruction Memorandum 2004-194 entitled "Integration of Best Management Practices into Applications for Permit to Drill." (IM 2004-194). IM 2004-194 states that consideration of BMPs should occur "on a case-by-case basis depending on their effectiveness, the balancing of increased operating costs vs. the benefit to the public and resource values, the availability of less restrictive mitigation alternatives, and other site specific factors." BLM has failed to take these factors into consideration with respect to the development protection measures proposed for Alternative C.

Recommendation: If BLM retains this alternative in its final document, the alternative must be re-drafted to clearly and objectively describe the alternative. Further, BLM should incorporate the provisions of IM 2004-194 into any such alternative and only impose BMPs or any additional mitigation measures after considering the factors set forth in IM 2004-194.

Following this general discussion of the alternative, BLM summarizes the development protection measures that would be imposed. In addition to 160 acre spacing, BLM also proposes to impose no surface disturbance in a number of areas. BLM's ability to impose no surface occupancy (NSO) restrictions is limited by the lease terms and the rights granted therein to the lessees. Some of the leases within the Atlantic Rim Area do contain limited provision under which BLM may prohibit surface occupancy, but according to Anadarko's calculations based on the information presented in the DEIS, 25% percent of the DEIS area would have NSO restrictions. See map attached as Exhibit F and hereby incorporated. Prohibiting surface occupancy over such a wide swath of acreage, almost a third, in Anadarko's opinion exceeds that contemplated by the lease provisions. Beyond the issues with respect to BLM's authority to impose such

607-25-6

restrictions, the NSO restrictions in combination with the proposed spacing restrictions would severely curtail the operators' ability to develop the CBNG resources on certain leases – a further infringement on the lease rights granted. Such drastic curtailments of the acreage available for development can hardly be said to meet the purpose and need of the project which is to develop the underlying gas resources.

607-25-7

607-25

Additionally, BLM fails to recognize that a limit of 20 acres of allowable surface disturbance per section will reduce by 50% the number of wells that can be drilled. Anadarko arrived at this conclusion based on the following methodology. Using the anticipated pad size and the disturbance lengths for an 80' wide road corridor, along with gas/water gathering lines and buried electrical lines, Anadarko determined each well would require five acres. If only 20 acres can be disturbed in a section, this would result in only four wells, thereby reducing the number of wells by 50%.

607-25-8

In the subsection on Wildlife Resource Management, BLM proposes to limit surface disturbance to "...less than 20 acres, 4 locations per section and roads would be limited to <3 miles/mi2." DEIS at 2-5. BLM's asserted justification for this measure is to protect brood rearing habitat for sage-grouse and crucial winter range for big game. However, BLM has failed to take into consideration that the Proposed Action includes 1000 miles of new roads over an area of approximately 420 square miles, which is equivalent to an average of 2.38 miles of new road per square mile. Therefore, this measure is unjustified.

Recommendation: If BLM retains this alternative in the final analysis, this measure should be deleted from the alternative.

Sand Hills SMA

607-26

The paragraph in this subsection is not only internally inconsistent but also unjustified. In this paragraph BLM initially states there is "an extensive road network in this area." DEIS at 2-5. Despite this existing network, and without any justification, BLM then states: "This road area would need reduced road densities and restrict some public access conditions..."

Recommendation: If BLM maintains this provision in the final document, it must provide objective support for any such provision. As noted above, even under the Proposed Action, new roads would disturb approximately 2.38 miles per square mile.

607-27

In addition to all of the other restrictions to be imposed in this area, BLM has also proposed requiring operators to convert all fences to BLM standards for improved wildlife passage. DEIS at 2-5. In Anadarko's opinion, this requirement constitutes compensatory mitigation as it is not directly tied to oil and gas operations, and BLM must obtain the voluntary agreement of an operator. See IM 2005-069, Interim Offsite Compensatory Mitigation for Oil, Gas, Geothermal and Energy Rights-of-Way Authorizations.

607-27 Recommendation: If BLM retains this alternative in the final document, this provision should be eliminated as a requirement. BLM may, of course, request that an operator implement such measures. BLM includes this requirement in numerous other places in the document, and it should be corrected throughout the document.

2.3 FEATURES COMMON TO ALL ALTERNATIVES

607-28 In the first paragraph of this section BLM states: "While Alternative C also analyzes up to 2000 wells, the precise number that can be approved under the Alternative may be less depending on the specific location at which development is proposed." As noted above, based on Anadarko's analysis of the measures BLM has proposed under this alternative, the vast majority of the project area would be removed from development potential. It is disingenuous, at best, of BLM to state that anywhere close to 2,000 wells could be drilled under this scenario.

2.5.3 Produced Water Disposal and Treatment Options

607-29 The fourth paragraph in this section is wholly duplicative of the third paragraph and should be deleted.

Untitled and Unnamed Table summarizing impacts

607-30-1 607-30-2 607-30-3 607-30-4 607-30 The placement of this table in a section of the document, which is supposed to detail impacts of alternatives as compared to the proposed action is puzzling in that the table contains conclusions regarding potential impacts to resources that have not yet been thoroughly identified. Although we recognize the lack of any regulation prescribing a specific format for an EIS, it is difficult to understand how BLM developed this alternative prior to the preparation of the analysis in the DEIS. In addition to this general concern, BLM has failed to provide sufficient justification for assigning significant impacts to resources either here or in Chapter 4. BLM fails to provide sufficient documentation as to how the incremental decrease in long term surface disturbance (as a percent of the total ARPA) crosses thresholds whereby the majority of impacts become insignificant under BLM's Preferred Alternative. Second, Anadarko believes BLM may have overestimated the reduction in long term surface disturbance that would occur under the Preferred Alternative if development were indeed possible at 160 acre spacing.

The potential inaccuracy of BLM's disturbance estimates is most obvious when reviewing the following: BLM asserts Alternative C would "…reduce the total surface disturbance by approximately 10,000 acres, or 64 percent less than the proposed action, and long-term disturbance would be reduced by approximately 3,600 acres, or 77 percent less than the proposed action." DEIS at 4-57. It is unclear whether BLM's calculations are based on limiting surface disturbance to essentially 160-acre spacing across fee, federal and state lands or federal lands only. Further confusing the issue is the fact that Table K-3 in Appendix K indicates there are 10,114 acres of initial disturbance that would occur on federal lands. If there are 10,114 acres of initial disturbance and Alternative C would reduce this disturbance by 10,000 acres, this would result in initial

607-30-4

disturbance of only 114 acres. It is unclear how this acreage could support the number of wells contemplated in this document.

607-30-5

607-30-6

607-30

Further confusion regarding BLM's calculation of surface disturbances is highlighted by the following statement: "Because of these sensitive issues, there would be less surface disturbance allowed per section ***on BLM lands***. This would reduce the total surface disturbance by approximately 64 percent less than the proposed action. Long-term disturbance would be reduced by approximately 77 percent less than the proposed action." DEIS at 4-71. Again, it's not clear from the information presented how BLM concluded there would be a 64% reduction. The document fails to disclose the assumptions made by BLM to reach this conclusion. Without further information regarding the assumptions made, Anadarko is unable to determine whether BLM took certain factors, such as the fact that a significant portion of the roads would be utilized under either the Proposed Action or Alternative C, assuming all of the wells were drilled. Using road density as an example, Anadarko has prepared the attached Exhibits G and H, which depict a number of access road scenarios with either 160 acre or 80 acres spacing. Of note is the fact that certain roads will be utilized whether development occurs under either spacing scenario. If the spacing is 160 acres, the average road density is 2.69 miles/square mile, while on 80 acre spacing it is 1.92 miles/square mile This is hardly a significant difference.

Chapter 3 AFFECTED ENVIRONMENT

607-31-1

Overall, BLM's discussion of issues related to soils is problematic in that it appears BLM has based its analysis and conclusions regarding potential impacts on Third Order soil surveys. This type of survey is generally used for planning purposes, and do not translate easily into an analysis of more site specific concerns. Anadarko contracted with a soil specialist from PBS&J to review BLM's analysis of potential impacts to soils. PBS&J's comments are hereby incorporated and attached as Exhibit I.

3.2.1 Climate

607-31

607-31-2

BLM is addressing climatology and meteorological measurements collected at Baggs, Wyoming from 1979-2000. A Wind Rose is provided in Figure 3-1 reflecting wind direction and speed class at Baggs, Wyoming from 1994-1995. BLM provides this data as representative for the Atlantic Rim Project Area. However, all ambient air quality modeling and visibility impacts were estimated with meteorological data collected from Rawlins, Wyoming, October 2000-September 2003. Section 3.2.1 should be revised to reflect the meteorological data used for the air quality impact analyses.

Page 3-18: Table 3-6.

Particulate Matter (PM_{10}), 24-hour, Measured Background Concentration is listed as 47 $\mu g/m^3$. Particulate Matter ($PM_{2.5}$), 24-hour, Measured Background Concentration is listed as 15 $\mu g/m^3$. Both are footnoted as representative data collected by WDEQ-AQD at Emerson Building, Cheyenne, Wyoming, Year 2002. Table 4-2, pg. 4-14 utilizes the

607-31-2

607-31-3

607-31

background data for PM_{10} and $PM_{2.5}$ collected from the same location in Year 2001. The *Air Quality Technical Support Document, Atlantic Rim Natural Gas Project and the Seminoe Road Gas Development Project, Wyom*ing, Table 3.12, pg. 54 also sites the Year 2001 background data and is used for air quality impact analyses.

Recommendation: BLM should correct Table 3-6 to be consistent with the same year as the air quality impact analyses. Particulate Matter (PM_{10}), 24-hour, Measured Background Concentration should be 33 $\mu g/m^3$. Particulate Matter ($PM_{2.5}$), 24-hour, Measured Background Concentration is listed as 13 $\mu g/m^3$.

3.3.3 Project Area Soil Limitations

607-32-1

607-32-2

This section is characterized by statements lacking in foundation as BLM has not provided any citations to supporting literature or explanations. For example, at the bottom of page 3-22, BLM states: "The topsoil category of poor and fair with 'excess salt' as rationale (41,215 acres) provides good indication where potential reclamation problems may occur." Again, setting aside the obvious grammatical problems with this statement, BLM provides no explanation supporting this statement and merely cites "Appendix M: Topsoils with Excess Salts." One might believe the reference is to a document substantiating BLM's conclusion, but it is only a map. Compounding the problem is the fact that BLM includes no discussion as to whether treatment methods are available to offset the soil conditions such that BLM's reclamation standards would be achievable.

3.3.5 Existing Soil Disturbances

607-32-3

607-32

On page 3-24, BLM states: "Chapter 2 discusses the amount and nature of existing disturbances within the ARPA. . . . Existing roads account for about 247 acres; compressor stations, 13 acres; transfer pumping stations, 1.0 acre; containment ponds, 25 acres; and deep injection well sites, 4 acres." First, we could find no discussion in Chapter 2, which describes existing disturbances resulting from interim activities. It appears the reference should be to Chapter 1 which contains a brief summary of the Proposed Action; however, Anadarko was unable to find such a discussion in Chapter 1 either. Second, the brief description here appears to be limited to existing soil disturbances related to oil and gas activities. BLM has completely failed to address other existing disturbances, thereby failing to provide an objective description of existing disturbances.

607-32-4

Recommendation: BLM must revise this section to include a discussion of disturbances created by other resource management activities such as access roads, grazing, land treatments, wildfire suppression, and controlled burning activities.

Page 3-25: Table 3-10

607-32-5

The information in the table indicates that 105,156 acres or 40.2% of the lands within the study area fall within the Category of "High" with respect to runoff potential. This is inconsistent with the Appendix M map on page M-13 labeled "High Runoff Potential"

607-32-5

607-32-6

607-32

where a much larger area within the Atlantic Rim study area is included within the area designated as "high runoff potential." It appears soils with "Low to High" and "Moderate to High" runoff potential have mistakenly been added to the map included in Appendix M.

Recommendation: If these areas were meant to be included on the map, the map title should be changed to clarify that moderate and moderate-to-high categories are included. Of more concern, however, than the potential mistakes in the map, is BLM's rationale for proposing to limit drilling to 4 well pads per section under Alternative C on soils that have less than a high runoff potential. Even if the soils have a high run off potential, BLM has failed to discuss what measures, short of limiting drill pad sites, could be utilized to minimize the potential impacts of drilling on soils of these types with respect to erosion.

607-33

On page 3-28, BLM states: "Mean annual precipitation is about 9-12 inches in the project area depending on elevation. . . . Although no long-term data is available for precipitation along the topographically higher Atlantic Rim in the northern part of the project area, precipitation can be assumed to increase with elevation and has been estimated in the past as 12 inches." Attached as Exhibit Jand hereby incorporated is a map from the United States Department of Agriculture/Natural Resource Conservation Service (USDA/NRCS) which depicts precipitation amounts from 1961 to 1990. It is clear from this map that certain portions of the ARPA receive more than 12 inches of precipitation per year.

Recommendation: BLM should use the USDA/NRCS data and revise the document to clearly state what percentages of the ARPA are in various precipitation zones.

607-34

On page 3-29, BLM states: "The average flow conditions presented in Table 3-12 therefore do not necessarily represent current flow conditions." BLM then proceeds to conclude that "...sufficient data are available to compare flows streams [sic] relative to each other." BLM fails to provide any explanation as to why this is true.

Recommendation: BLM should revise this discussion to either present updated information or explain why this data can be used to support its conclusions with respect to flow and surface water quantity.

3.4.2.1 Colorado River Basin

607-35-1

607-35

On page 3-31 in the fourth paragraph, BLM states: "The watershed [Muddy Creek] encompasses approximately 182 square miles . . ." In the first paragraph on this page, BLM stated that "approximately 75 percent of the ARPA is drained by Muddy Creek." In Chapter 1 of the DEIS, BLM states that the total study area contains 270,080 acres which equates to 422 square miles. Seventy-five percent of 422 equals 316 square miles. Either BLM is mistaken in the percentage of the study area that is drained by Muddy Creek or it has mistakenly stated the acreage of the Muddy Creek watershed.

607-35-1

Recommendation: BLM needs to review its figures and provide accurate information regarding both the size of the Muddy Creek watershed and the percentage of the study area that is drained by Muddy Creek.

607-35-2

607-35

On page 3-32 in the last paragraph, BLM states it has, in the past, managed the Muddy Creek watershed area for its range resources. It also notes that it has also been managed for "...wildlife habitat, energy exploration, development, and transportation, and recreational uses." This statement seems to contradict later statements in the document where BLM asserts this area has been virtually untouched.

3.4.2.2 Great Divide Basin

In this section, BLM states: "Separation Creek is classified by the WDEQW as a Class 4C stream (WDEQ 200) . . ." DEIS at 3-33. Chapter 1 of the WDEQ-Water Quality Rules and Regulations defines Class 4C streams as Class 4C effluent-dominated streams. What discharges occur in Separation Creek that would make it a 4C?

Recommendation: BLM should disclose if other activities of man such as surface discharges create pre-existing conditions.

3.4.4 Waters of the United States

607-36

In this discussion, BLM asserts the majority of the waters within the EIS boundaries are waters of the states. DEIS at 3-39. This statement is overly broad and is not supported by fact. Further, BLM states: "All channels that carry surface flows and that show signs of active water movement are Waters of the U.S. Similarly, all open bodies of water (except ponds and lakes created on upland sites and used exclusively for agricultural and industrial activities or aesthetic amenities) are Waters of the U.S." *Id.* We disagree with this characterization of Waters of the United States and note that this issue is currently before the United States Supreme Court for resolution.

Recommendation: Because this discussion is not germane to the issues analyzed in this document, Anadarko believes BLM should delete this discussion from the final document. Should BLM decide to retain the discussion, BLM should revise this paragraph to either delete the first sentence or provide sufficient qualifiers. Further, BLM should either revise the statement regarding what constitutes Waters of the United States or at a minimum note that this issue is currently before the Supreme Court.

3.4.5 Surface water quality

607-37

BLM states on page 3-39 that: "It is important to emphasize that the values in Table 3-17 do not necessarily represent the surface water quality at any particular location within the Muddy Creek drainage basin during any particular season of year, but rather, are the composite representation of Muddy Creek water quality." DEIS at 3-41. It's not clear what BLM means by this statement.

Recommendation: BLM should revise the sentence to clarify BLM's intent in making this statement.

3.4.5.2 Waterbodies with Impairments or Threats

On page 3-43 BLM states: "According to the 2004 305(b) report, unstable stream channels and loss of riparian functions threaten aquatic life uses in Muddy Creek and McKinney Creek." BLM has failed to explain this statement or its significance. Later in this section, BLM concludes: "The habitat degradation is likely caused by season long riparian grazing, exacerbated by accelerated erosion associated with oil and gas activities." BLM has failed to document the existence of any oil and gas activities in this area that support its assertion regarding the effect of such activities.

Recommendation: BLM should revise this discussion to provide additional information from the 2004 305(b) report regarding the cause of the unstable stream channels. In addition, BLM should either provide factual support for its assertion regarding the impact of oil and gas activities or remove this statement from this section.

Table 3-20: 2004 303(d) Waterbodies with Impairments or Threats

607-38-1

Page 3-47: Muddy Creek west of Highway 789 is listed as being impaired or threatened for salinity. Anadarko has reviewed the State of Wyoming's 2004 303(d) as published in the 2004 303d list (http://deq.state.wy.us/wqd/watershed/index.asp), and from our review of the data presented it does not appear that Muddy Creek west of Highway 789 currently has salinity issues. In addition, this representation seems to be contrary to the findings in the 2005 Review of the Water Quality Standards for Salinity conducted by the Colorado River Basin Salinity Control Forum (http://www.coloradoriversalinity.org). In this document it states:

607-38-2

607-38

> In general, water quality in the Wyoming portion of the Colorado Basin is good to very good. There are currently only 15 stream segments listed in the state's 2004 Section 303 (d) report as either impaired or threatened (7 - Green River; 8 - Little Snake). The primary sources of impairment are habitat degradation, pathogens and trace metals. No waters are currently listed for salinity related impacts. Most of the water quality issues mentioned above are currently being addressed through locally-led watershed management plans funded through Wyoming's 319 grant program. In addition, the Wyoming Water Development Commission is engaged in a statewide water planning process and has completed a planning document for the Green and Little Snake drainages. This planning document presents current and proposed (estimated) future uses of water in Wyoming's Green River and Little Snake Basins. Products in the Plan include irrigated lands delineation, hydrologic modeling of major streams, current use determinations for all water use categories, future use projections, water development opportunities identification, and related activities.

607-38-2

Recommendation: BLM should carefully review the data presented in the table to ensure its accuracy. At a minimum, BLM must correct the table with respect to the statement discussed here.

3.4.5.3 Salinity Issues in the Colorado River Basin

607-38-3

607-38

On page 3-48, BLM states: "In a study of mechanisms affecting salt pickup and transport in surface runoff . . . Bently and others (1978) determined that properly implemented control measures may be able to reduce erosion and salinity (Lowham et al. 1982).

Recommendation: BLM should revise this discussion to enumerate the control measures identified in these studies and discuss how such measures could be applied to the proposed action and whether such measures have been identified in Alternative C.

3.4.5.5 Surface Discharge of Produced Water at the Cow Creek POD

607-39-1

The second paragraph in this section appears to be missing language as it does not make sense as currently drafted. BLM should review this paragraph and revise accordingly.

3.4.6.2 Quality

607-39-2

607-39

In the description of groundwater on page 3-53, BLM states that "TDS, an indicator of salinity, is generally less than 2,000mg/L (slightly saline to saline) in the ARPA, with occasional local concentrations of less than 500 mg/L (considered fresh)." The BLM needs to reference the zone from which this water originated. Based on information obtained by Anadarko during its operations in this area, some zones have TDS levels as high as 7610mg/L.

607-39-3

In the second paragraph on this page, BLM, after discussing groundwater quality degradation issues with respect to other oil and gas operations, concludes as follows: "Data Suggesting this is a current problem in the ARPA are not available." Does this mean BLM has data demonstrating that it's not an issue or that data is simply not available to either confirm or refute this conclusion?

607-39-4

Recommendation: BLM should revise this section to provide more specific information regarding the water zones, and BLM should review this section and clarify its conclusion with respect to groundwater quality degradation. If data does exist, BLM should provide the appropriate citation to such data. If no such data exists, BLM should either remove the statement or explain the basis for its conclusion.

3.4.6.3 Springs and Flowing Wells

607-40-1

607-40

The first paragraph in this section has two statements that are unsupported by fact. First, BLM states: "This area has had extensive exploratory development for natural gas and oil." There are less than 200 exploratory wells in the 270,080 acre study area. This can

607-40-1

607-40-2

hardly be characterized as extensive. Second, BLM states: "Some of these wells have developed casing leaks, were not plugged properly, or can be used still for monitoring." This statement is unsupported by any reference to objective data, and its purpose is unclear.

607-40-3

607-40

In the discussion of flowing wells within the project area, the BLM states "the water type of these wells is of the sodium-bicarbonate type, which indicates water from the coal seam aquifers." The generalization at the end of this statement is not entirely correct. While the coal seams may produce sodium-bicarbonate type water, there are sand intervals that produce a very similar water quality type within the project area. Therefore, the generalization that the flowing wells must be producing from a coal seam in unfounded.

Recommendation: BLM should carefully review this paragraph and remove those statements which are unsupported by objective factual evidence or have no relevance to the issue being analyzed. BLM should also remove the phrase "which indicates water from coal seam aquifers."

3.5 Vegetation

3.5.1 Introduction

607-41

In the second paragraph of this section, BLM states: "Annual average precipitation ranges from 8 inches in the middle of the project area to around 12 inches at higher elevations at the north and south ends." As noted previously, the USDA/NRCS map clearly shows that portions of the study area receive more than 12 inches of precipitation per year. Anadarko used the information from the USDA/NRCS and prepared an overlay of the study area depicting the precipitation amounts. The map is attached and hereby incorporated as Exhibit K.

Recommendation: BLM should use the data from the USDA/NRCS and revise this discussion to state what percentages of the study area are in the various precipitation zones.

3.5.2.1 Primary Vegetation Cover Types

607-42

On page 3-58, BLM states mountain big sagebrush is found on about 50% of the project area. On the following page, it states that moisture found on these sites make them very productive and further concludes that their response to reclamation should be good. Then, on page 3-59, BLM states that Wyoming big sagebrush occupies 34% of the study area and that reclamation rates for the Wyoming big sagebrush, while unknown, are expected to take several years. BLM characterizes Alkali sagebrush's reclamation potential if planted as a seed as medium and from transplants as very good. BLM makes similar conclusions with respect to the reclamation potential for basin big sagebrush. DEIS at 3-60. These statements seem to contradict other statements made by BLM in the document regarding viability of reclamation efforts (See for example statements made by

607-42 BLM on pages 3-22 and 3-23) in the project area and, in particular, seem to undercut any concerns for reclamation BLM has identified in Alternative C.

Recommendation: BLM should review the statements here and reconcile these statements with its assertions regarding reclamation potential under Alternative C.

3.7 Wildlife and Fisheries

3.7.1.4 Big Game

607-43 On page 3-69, BLM states:

> Using [Wyoming Game and Fish Department] information that was averaged from 1997-2001, comparisons can be made about the species richness and productivity across Wyoming. When numbers for antelope, mule deer, and elk are combined for similar-sized geographic units, the harvest data for the Sierra Madre/Snowy Range area within the RFO are similar to the Sublette region around Pinedale, which is considered the most productive big game region in the state. In addition, recreation days and the economic benefits associated with hunting were 50 percent higher for the Sierra Madre/Snowy Range area when compared to the Sublette region. (Rawlins Draft RMP 2004).

607-43-1 BLM apparently makes these statements to provide context for the importance of wildlife resources within the study area. Anadarko does not believe these statements can be used to conclude that the wildlife resources within the study area have the same import as those in the Sierra Madre/Snowy Range area. The Sierra Madre/Snowy Range area is not defined in either the DEIS or the Draft Rawlins RMP, so it is impossible to ascertain the area encompassed by the Sierra Madre/Snowy Range area, let alone whether and how much of the study area is included within the Sierra Madre/Snowy Range area.

Recommendation: BLM should clarify this discussion by defining the relative contribution of the wildlife resources dependant on the study area to those within the Sierra Madre/Snowy Range area.

607-43-2 In the paragraph discussing pronghorn antelope on page 3-69, BLM states: "The Upper Colorado River Basin Standards and Guidelines Assessment 2002 (Guidelines Assessment) failed Standard #4, Wildlife Habitat Health, and addressed pronghorn range as follows." First, there are the obvious grammatical problems with this statement. Second, BLM should provide further explanation regarding standard number 4, which is not explained in the document. Moreover, if BLM is citing to data collected in 2002, it should provide an explanation as to the status of any more recent reviews or explain the continued validity of this data.

607-43-3 In the paragraphs discussing mule deer, BLM fails to note that Anadarko, along with other operators, has funded a study of mule deer. In addition, BLM makes the same

607-43-4

607-43-4

statement it made with respect to pronghorn in the third full paragraph of this section. DEIS at 3-71. Anadarko has the same concerns with this statement regarding the Guidelines Assessment in the context of the mule deer as it did in the context of the pronghorn antelope.

607-43-5

607-43

Without any reference to scientific studies, BLM states on page 3-72 that "The impacts of loss within overlapping crucial winter ranges would be greater than in non-overlapping areas."

Recommendation: BLM should review these sections and clarify the references to the Assessment. If the document is not readily available to the public, BLM should include a copy in the DEIS. In addition, any relevant research or data that supports BLM's statements regarding the effects of habitat loss on overlapping crucial winter range habitats should be cited.

3.7.1.5 Upland Game Birds

607-44-1

In the section on greater sage-grouse in the sixth full paragraph, BLM states: "It is likely that hens from the active leks use most of the project area for nesting and brood-rearing, which in terms of suitable habitat amounts to 92% of the ARPA." DEIS at 3-73. This statement is not supported by citations to any objective, scientific evidence.

Recommendation: BLM should remove this statement from the final document as it is not supported by information contained in the DEIS. If BLM retains the statement, BLM must provide objective support for this assertion. In the absence of any such references, we question whether BLM has provided sufficient objective data supporting the need for the mitigation measures enumerated in Alternative C to address potential impacts to sage-grouse.

607-44-2

607-44

In this section BLM asserts that in order to protect winter concentration areas for sage-grouse "there would be a timing restriction applied to surface disturbing ...activities to reduce stress to wintering birds from November 15 to March 14." Anadarko does not believe BLM has provided any objective, scientific justification for imposition of this measure. In particular, BLM has failed to cite to any relevant research indicating that construction or other disruptive activities stress wintering birds such that the proposed measure would be justified. BLM's assertion here regarding the need to protect the sage-grouse during the winter stands in stark contrast to the following: "Although winter conditions generally have little effect on sage-grouse populations...the protection of those habitats used the most during severe winters would greatly facilitate the survival of greater sage-grouse during extreme winters." DEIS at 4-73.

607-44-3

Furthermore, BLM has failed to identify what types of habitat would qualify as a winter concentration area. Depending on how BLM defines the wintering concentration area, it could cover a large portion of the study area. The restrictions BLM proposes to impose to protect these areas when combined with the seasonal restriction to protect greater sage-grouse nesting and brood rearing habitats, which already covers 92% of the study area

607-44-3

607-44

(DEIS at 3-73), would result in activities being prevented from November 14th to July 15th thereby allowing only four months for drilling.

Recommendation: BLM should revise the document to either provide justification for this stipulation or remove it from the final document.

3.8 SPECIAL STATUS PLANT, WILDLIFE AND FISH SPECIES

607-45-1

This whole section needs to be completely revised to accurately reflect information on species that actually occur within the project area. BLM devotes a considerable amount of time discussing species that do not exist or that would not be impacted by the Proposed Action. For example, BLM states there are ten species found downstream of the RFO "...in the Platte River and Colorado Rivers systems [that] may potentially be impacted if water depletions occur." DEIS at 3-75. However, on the very next page in the discussion on Western Prairie Fringed Orchids, BLM states: "...no depeletions would occur as a result of this project." DEIS at 3-77.

607-45-2

607-45

In discussing plant species, BLM wholly contradicts itself in the space of two sentences. First, BLM states: "No federally listed threatened, endangered, or candidate plant species are known to occur on the ARPA." In the very next sentence, BLM then states: "However, four listed plants that may be potentially affected by the proposed action include...." Even more troubling than these contradictory statements is BLM's discussion of each of the four plants that could supposedly be affected by the Proposed Action. In each section, BLM either notes the plant was not found within the project area during surveys or does not even occur in the project area. DEIS at 3-75 – 3-76. For example, after noting the counties in which the Ute Ladies-'tresses is known to occur, which does not include Carbon County, BLM states: "This species is not known to occur within the ARPA..."

607-45-3

These same failings are found in BLM's discussion of wildlife species. Of the nine species discussed, none occur in the project area. We have the same concerns with respect to BLM's discussion of fish species in section 3.8.1.4. Although we agree BLM should provide an overview of these issues, given the lack of occurrence of any of these species in the project area, BLM could easily simplify this document and place this discussion in an appendix to the document.

607-45-4

Recommendation: BLM should revise the document to include a statement noting the occurrence potential of these species on the lands managed by the Rawlins Field Office. BLM should then note that none occur within the project area and refer the reader to an appendix that would contain the remainder of the discussion. Such a change would be wholly in keeping with NEPA and its implementing regulations.

3.8.2.1 Sensitive plant species

607-45-5

We have the same concerns with this discussion as noted above and make the same recommendation.

3.9.2 Recreation Resources and Use

607-46 In the section discussing hunting, BLM includes a table setting forth hunting activity in the project area. The source of the data is noted as the Wyoming Game and Fish Department and the date is 2002. BLM should provide updated information from 2003, 2004 and 2005. This would provide a more accurate picture of the status of these activities. This is especially important given the potential mitigation measures BLM has proposed under Alternative C based on the asserted impacts to hunting.

3.10 VISUAL RESOURCES

607-47-2 607-47-1 607-47-3 607-47-4 607-47 On page 3-91, BLM states: "Evidence of human modification in the ARPA includes . . . and oil and gas production facilities." The description appears to focus on changes related to oil and gas activity and ignores evidence of other modification such as those related to grazing, recreation or other land uses. In addition, BLM then states existing disturbance from oil and gas activities totals approximately 604 acres out of the total 270,080, which BLM equates to 0.2% of the total. BLM has miscalculated the acreage percentage – it should be 0.002%. BLM should also provide a calculation of acres disturb by other activities, such a grazing, to provide a more balanced discussion.

Recommendation: BLM should correct the mistaken percentage figure and revise the discussion to include a complete list of all activities in the area thereby presenting a more objective and balanced description of the visual resources.

3.12 SOCIOECONOMICS

607-48 In section 3.12.6, BLM discusses local attitudes and opinions. BLM cites a 1996 study conduction by the Carbon County Board of Commissioners and Carbon County Planning Commission as support for its assertion that "54.9 percent of survey respondents…indicated that conservation of land, water and wildlife resources was more important than increased oil and gas production…" DEIS at 3-114. First, we note that this data is over ten years old. Second, Anadarko hired Public Opinion Strategies to conduct a telephone survey of 300 adult residents of Carbon County. Public Opinion Strategies conducted the survey from January 10-12, 2006. According to the results of this study, over three quarters of the Carbon County residents surveyed (78 %) indicated support for increased natural gas production. A summary of the study results is included as Exhibit L. We believe these survey results accurately reflect the input BLM received during the public meeting on this project held on February 2, 2006.

3.17 Special Management Areas

3.17.1 Rawlins to Baggs Geographic Area

607-49-1 607-49 BLM includes here a discussion of an area it has designated as the "Rawlins to Baggs Geographic Area." DEIS at 3-119. First, we note that this area has not been designated

607-49-1

as a special management area in the Great Divide RMP nor is there a proposal to establish it as part of the revision of the Great Divide RMP. See Rawlins RMP DEIS. 43 CFR 1610.5-3 states that "All future resource management authorizations and actions . . . and subsequent more detailed or specific planning shall conform to the approved plan." Because this area has not been formally designated by BLM as a special management area (SMA) through the applicable land management process, BLM should remove all discussion of this area from this section. Furthermore, any such designation here does not provide support for imposition of mitigation measures to protect the area as a special management area.

607-49-2

607-49

The discussion regarding this area continues later on the page with the following statements regarding trout found in this general area: "These trout [Colorado River cutthroat] were recently reintroduced into the upper watershed and will soon expand to much of their former habitat." BLM has provided no scientific or factual support for this assertion. Additionally, this statement fails to recognize the fact that Muddy Creek is currently listed as threatened for habitat degradation above Alamosa Gulch to Littlefield Creek and threatened for habitat degradation/salinity west of State Highway 789, which would seem to undercut BLM's argument that the trout will expand to much of their former habitat. Obviously, the fact that Muddy Creek is listed as threatened for habitat degradation may impact the ability of the trout to survive, let alone expand their habitat.

607-49-3

The discussion of this area continues on the next page with the following statements regarding plant and wildlife values: "These plant and wildlife values are reflected in several smaller portions being proposed as SMAs including . . . However, piece-meal protection of the higher value areas would not adequately protect all wildlife species that use and depend on this area." DEIS at 3-120. Anadarko has carefully reviewed the document, and we have been able to find any justification for this statement. Absent objective data, it is merely a subjective statement that has no place in a document of this nature.

607-49-4

607-49-5

Recommendation: BLM should revise this section to remove the discussion of the Rawlins to Baggs Geographic Area. Additionally, BLM should address the current status of the Muddy Creek with respect to the ability of the trout to expand further in the area and either provide support for the statement on page 120 or remove the statement as unfounded. BLM should also remove the statements regarding plant and wildlife values or provide objective support for these statements. Moreover, BLM should not apply any mitigation measures based on the status of the area as an SMA.

3-17-2 Cow Butte/Wild Cow Area

607-50

On page 3-120, BLM states: "The Cow Butte/Wild Cow area encompasses 40,144 acres of mostly public land within the ARPA. . . . Recreation use primarily occurs during hunting seasons when this general region is one of the most heavily hunted areas in the state of Wyoming." Although the underlying factual information may be correct (We note BLM has not provide any citations with respect to its assertion that this area is one of the most heavily hunted.), this area was not designated in the Great Divide RMP as a

607-50

special management area nor was it proposed as such in the draft Rawlins RMP. As noted above, because this area is neither an existing SMA nor a proposed SMA, BLM should not include it here as if it is. If BLM intends, through this document, to propose an amendment of the applicable resource management plan to include such a designation, it should so note in this discussion.

Recommendation: As with the previous section, BLM should remove this discussion from the SMA section. In addition, BLM should not impose any mitigation measures based on the area's asserted status as an SMA.

CHAPTER 4 ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

607-51-1

607-51

We note at the outset of our specific comments on this Chapter that although BLM has identified a preferred alternative, it has not provided any analysis in this Chapter of the potential effects attendant with its preferred alternative. In our opinion, BLM should include a discussion of those potential impacts in the final document to provide a clear picture of the potential positive and negative impacts of all alternatives. Only with this information will a decision maker be able to truly make an informed choice.

607-51-2

BLM's introductory paragraph for this section mistakenly notes the federal action that is the subject of this DEIS as "...an alternative plan on which future land use actions would be based." DEIS at 4-1. The subject action of this DEIS is Anadarko's proposed plan for development of the CBNG resources in the Atlantic Rim Area.

4.0.1 Impact Analysis

607-52-1

607-52-2

607-52

In Anadarko's opinion, BLM has set inappropriate significance criteria by failing to consider the land use decisions set out in the Great Divide Resource Management Plan. The significance criteria should reflect the goals and objectives of the Great Divide RMP, which currently governs BLM's activities within this area, along with the Wyoming State Land Use Commission and/or any local land use plans. These plans were generated to manage the lands in a manner that provides multiple benefits to the public. Instead of this approach, in this DEIS, BLM has unduly emphasized the Wyoming Game and Fish Department's Recommendations for Development of Oil and Gas within Crucial and Important Wildlife Habitats as a basis for development of significance criteria. Although the Wyoming Game and Fish's policies should obviously be taken into consideration, it should not, as it appears BLM has done here, form the sole basis for the determination of significance, because it fails to take into account land use decisions made both by the BLM and by other relevant state agencies.

Specifically, the Great Divide RMP contains the following objectives for soil, water and wildlife:

- To maintain soil cover and productivity where they are adequate and to increase soil cover and productivity where they are in a downward trend.

607-52

- To maintain or improve soil stability, within the potential of the ecological site, to insure adequate water infiltration, optimal plant growth, and minimal surface runoff.
- To maintain riparian areas in good or excellent condition and to improve riparian areas that are in fair or poor condition.
- To control flood and sediment damage from natural or human-induced causes.
- To reduce salt loading in watersheds that lie within the Colorado River Basin.
- To meet or exceed established standards for quality of surface water and groundwater where water quality has been lowered by human-induced causes.
- To provide for physical and legal availability of water for use by the public and by federal, state, and local agencies for fisheries and wildlife and for livestock, recreational, municipal, and industrial uses.
- To provide habitat quality (food, cover, space, and water) adequate to support a natural diversity of wildlife and fisheries, including big game, upland game, waterfowl, non-game species, game fish, sensitive, threatened, and endangered species, species of special management interest in Wyoming, as well as to assist in meeting goals of recovery plans.
- To maintain or improve vegetation condition and/or avoid long-term disturbance in high priority standard habitat sites and fisheries areas.
- To maintain or improve overall ecological quality, thus providing good wildlife habitat, within the constraints of multiple-use management in moderate and low priority standard habitat sites

607-52-3

Rather than measuring significance solely with respect to a policy document prepared by a single, non-federal agency such as the Wyoming Game and Fish Department, BLM should evaluate the potential significance of impacts with respect to whether approval of the action with appropriate mitigation measures would be in conformance with the objectives contained in the Great Divide Resource Management Plan.

Assignment of Significance to Impacts

607-53-1

607-53

Overall, Anadarko believes BLM's assessment of significance to impacts is deficient. Rather than objectively analyzing potential impacts, BLM arrives at conclusions that are unsupported by sufficient factual or technical support. In too many instances, this lack of technical or scientific support creates questions as to how significance was determined or whether it is justifiable.

For instance, one of the criteria provides that impacts to surface water resources would be considered significant if "accelerated erosion and runoff alters the physical characteristics of streams or drainages…" DEIS at 4-24. However, the document is devoid of any factual evidence of the potential amount of increased runoff such that it could be determined that alteration of physical characteristics of streams and drainages could occur. Despite this lack of analysis, BLM then proposes a mitigation measure to address this unsupported significance criteria which BLM concludes has been exceeded.

607-53-2

607-53

A second example is the no surface occupancy mitigation requirement associated with Alternative C for the Muddy Creek Special Management Area (SMA) as reflected on the figure labeled "Alternative C – Muddy Creek SMA" on page M-51 (Appendix M). BLM apparently cites this figure in Appendix L as support for the no surface occupancy measure. Appendix L at L-6. Again, the requirement to eliminate surface occupancy appears to be based on the potential to mitigate effects to "*the physical characteristics of streams of drainages.*" However, the DEIS is devoid of any technical information supporting imposition of a no surface occupancy requirement to mitigate potential impacts to streams or drainages in light of the Proposed Action.

4.0.1 Impact Analysis

607-54

On page 4-1, in the last paragraph on this page, BLM states: "Where there are conflicts between resource uses, or a land use activity may result in irreversible or irretrievable impacts to the environment, BLM may restrict or prohibit some land uses in specific areas." Anadarko disputes the validity of this statement. Although we do agree BLM has a general authority to prohibit certain activities on federal lands, we do not agree such decisions are made in terms of whether the land use activity may result in an irreversible or irretrievable impact to the environment.

Recommendation: BLM should revise this sentence to note both that BLM's ability to prohibit certain activities, at least with respect to previously granted lease rights, is constrained by valid existing rights and that the correct standard for any decision to prohibit activities on public lands is the unnecessary and undue degradation standard.

4.1.1 Geology (Surface Environmental/Geologic Hazards)

607-55

On page 4-2 at the bottom, BLM states: "The magnitude of impacts to geology and geologic hazards . . . would be reduced by . . . adherence to the Great Divide RMP and draft Rawlins RMP." The draft Rawlins RMP is just that – a draft. BLM should not be citing to that document as support for any actions in this document. Obviously, as noted earlier in our comments, once the Rawlins RMP is finalized, approval of any actions by BLM will need to be in conformance with the Rawlins RMP.

Recommendation: Because this language serves no real purpose here, BLM should revise the sentence by deleting "and draft Rawlins RMP."

4.1.1.2 Mineral Resources

607-56

In the first paragraph of this section BLM incorrectly cites to 43 C.F.R. § 3162.1(a), which describes general requirements for operators. BLM should revise this sentence to remove the incorrect citation.

4.1.3.2.2 Minerals

607-57

In this discussion of direct and indirect impacts, BLM states: "No documented mineral resources other than oil and gas and CBNG would be affected by implementation of Alternative A." DEIS at 4-5. Although this statement is generally true, as noted above, in its description of the no action alternative BLM has failed to account for drilling that would most certainly occur on private and state lands. Because of this, BLM here has failed to account for the fact that the no action alternative could result in drainage of federal mineral resources.

4.2 Air Quality

4.2.2 Direct and Indirect Impacts

607-58

In this section, BLM states: "The amount of air pollutant emissions during construction and production may be controlled in part by BACT requirements implemented by WDEQ-AQD and using mitigation methods outlined in this document." Mitigation methods are not specifically summarized in this document.

Recommendation: Because there would not be any significant air quality impacts, mitigation methods beyond those required by the WDEQ-AQD are unnecessary. Therefore, the reference to mitigation methods should be removed.

4.3 Soils

4.3.2 Impact Significance Criteria

607-59-1 607-59-2 607-59-3 607-59

The impact significance criteria for soils contain the following criterion: "Soil erosion is increased beyond two tons per acre per year within five years of disturbance." DEIS at 4-17. BLM has not provided any basis for this statement in this document either directly or by reference to appropriate scientific studies. BLM also states that impacts will be significant if interim reclamation is not successful within three years of implementation. One of the more obvious deficiencies of this statement is BLM's failure to define interim reclamation. In the absence of such a definition, it is difficult to understand how BLM determined that failure to meet this undefined standard within the specified time frames could be significant. Finally, BLM includes the following as a measure of significance: "Soil productivity is reduced to a level that prevents the disturbed area from recovering to pre-disturbance soil/vegetation productivity levels." BLM has failed to disclose what standard or measure would be used to evaluate whether this criteria has been exceeded. For instance, would it be on an annual forage production/acre basis? Or would it be based on species compositions and seral stage equal to adjacent non-disturbed areas? Or would it be measured by the percentage of ground cover such that it would be equal to adjacent, non-disturbed acreage? Without defining what BLM will employ as pre-disturbance productivity levels, we are at a loss as to how BLM determined whether this criterion would be exceeded such that impacts might be deemed significant.

Recommendation: BLM should revise this section to fully disclose the basis for its conclusion that two tons per acre per year constitutes a significant impact. BLM should

607-59-3

607-59

include any analysis it has comparing differences in soil erosion between the alternatives presented in the DEIS. With respect to the provision regarding interim reclamation, BLM must define the term "interim reclamation" and present its analysis of potential impacts in light of any such definition. Finally, BLM must clarify how pre-disturbance productivity levels will be objectively measured such that this criterion would serve as a measure of significance.

4.3.3.1 Proposed Action

607-60-1

607-60

607-60-2

At the bottom of page 4-17, BLM asserts: "Strict adherence to Best Management Practices/Conditions of Approval . . . would be necessary to minimize adverse impacts. With these measures implemented, and"

It appears that additional language should ensue describing the effects of implementing these measures and their possible effect on whether the significance criteria have been exceeded. BLM has another unfinished sentence on the next page in the third paragraph. It states: "The reclaimed areas within the interim drilling PODs have not shown success to date, however."

Recommendation: BLM needs to revise the section to complete both of these incomplete sentences and to provide supporting data.

607-61

At the top of page 4-18, BLM makes a number of statements with respect to well counts, acreage amounts and duration of the project. First, BLM states that approximately 1,050 wells would be developed within the first six years. This conflicts with the 925 wells noted in Chapters 1 and 2. Second, although BLM converts the short-term disturbance figure into a percentage, it fails to do so for the long-term disturbance.

Recommendation: BLM must revise this section and reconcile its well count figures with those presented elsewhere in the document. BLM should also convert the long-term disturbance figure to a percentage to provide a complete picture of the potential effects of the Proposed Action.

607-62-1

607-62-2

607-62

607-62-3

On page 4-18 BLM asserts that "Despite the difficulty of establishing vegetation on sites with <10 inches average annual precipitation current technology exists to stabilize these areas and minimize soil erosion as natural succession returns the site to pre-existing conditions." The USDA/NRCS map clearly depicts the fact that much of the study area is not within the <10 precipitation zone described here. It appears that BLM has extrapolated data obtained from Baggs, Wyoming, for use in this document, and such data is not representative of the entire study area. Moreover, if, as BLM asserts here, technologies exist to address the concerns identified by BLM, BLM should discuss them and whether they are part of lease stipulations, BMPs or COAs.

Recommendation: As noted earlier, BLM should use the USDA/NRCS data and state the percentages of the study area that lie within the various precipitation zones. Additionally, BLM should re-characterize its discussion of establishing vegetation in precipitation

607-62-3

607-62

zones that have higher than 10 inches of rain per year. BLM must also provide further information regarding the technologies and their ability to minimize impacts.

607-63-1

607-63-2

607-63

The last sentence of the fourth paragraph on page 4-18 concludes with the following statement: "Many areas would exceed the significance criteria for soils; therefore the project would exceed the significance criteria." BLM makes this statement without providing a basis from which to determine if the significance criteria will actually be exceeded. The extent of erosion under any of the alternatives remains undefined. Therefore, there is no quantitative assessment available to compare potential impacts of each of the alternatives to any of the significance criteria; rather there is only supposition and speculation as to the significance of impacts for any of the alternatives. Additionally, BLM has failed to address the degree to which the Proposed Action would increase soil erosion beyond that which is naturally occurring on these soils. BLM should also include in this section a discussion comparing the rates of erosion and surface runoff between short and long term. These rates will be affected after a certain period of time due to natural stabilization through particle aggregation, soil structure development and armoring.

Recommendation: BLM should revise the paragraph to either remove this conclusion or substantiate its conclusions. The section and paragraph should also be revised as noted above.

4.3.3.3 Alternative B

607-64-1

607-64

On page 4-19 BLM states: "This concentration of development would likely increase runoff and sediment/salt yields beyond the water resources significance criteria." Anadarko agrees that there could be an increase in runoff and sediment/salt yield but disagrees with the conclusion that it would be significant. If surface disturbance is concentrated in any one watershed or area, as Alternative B would require, there will be an even greater potential for erosion and run-off related concerns. Nevertheless, the degree of difference between the Proposed Action's potential effects and those of Alternative B or C cannot be quantified without further analyses that could be gained through use of soil loss modeling; therefore, it is all but impossible to assign significance absent a quantitative comparison.

Recommendation: BLM should revise this section to remove its conclusion that impacts would exceed the significance criteria, because it is not supported by the analysis in the DEIS. Instead, BLM should note that such a determination could only be made after soil loss modeling is completed.

607-64-2

In the second paragraph in this section BLM asserts that ". . . developing all wells, roads, pipelines and facilities at the same time may result in better planning and reduced well pad locations and acreage of disturbance." Nothing in the document supports this

607-64-2

607-64

subjective conclusion, and BLM makes no attempt to quantify or support it here. BLM should remove the statement as unfounded[2].

4.3.3.4 Alternative C

607-65-1

607-65-2

607-65-3

607-65

In the first paragraph of this section, BLM states: "The Spatial Development alternative would proceed with development across the ARPA . . . but additional mitigation . . . would limit the initial disturbance acres on sensitive sites to less than 20 acres per section. . . . This would reduce the total acres disturbed by 64 percent compared to the proposed action." DEIS at 4-19. We have been unable, after reviewing the information in the DEIS, to determine how BLM calculated these figures. BLM has failed to include any support for this statement either in this section or elsewhere in the document. BLM then concludes this section with the following statement: "This reduction in disturbance acres and application of erosion control techniques would directly reduce the acreage which would exceed the significance criteria as a result of the project. Although some small, localized areas would exceed the criteria, overall, the project would not exceed the significance criteria." Again, neither the preceding discussions in the DEIS nor any discussion in this Chapter support BLM's assertions. Moreover, if BLM's calculations are correct, this would result in only 5, 537 acres of disturbance (64% of 15,380). It is unclear how, based on this acreage figure, BLM determined the same number of wells as proposed by the operators could be drilled in the same period of time.

Recommendation: BLM must revise this section to either remove these unfounded statements or provide specific support for them.

4.3.5 Additional Mitigation Measures

607-66-1

607-66-2

607-66-3

607-66-4

607-66

Although BLM has previously noted the potential for impacts to soils from both the Proposed Action and Alternative B, it provides no suggestion here for mitigation measures. Nor does BLM provide any analysis with respect to whether standard BMPs, COAs and other measure do address the concerns noted. BLM then includes a list of four measures under the heading "Additional mitigation proposed under Alternative C." This statement is confusing. Is BLM saying these are the only measures under Alternative C that it proposes to utilize to address soil issues or are these, as would be the normal implication, measures in addition to those previously proposed by BLM in Alternative C? We note that two of the measures would require reclamation within one year of spud date on soils with poor/fair topsoil ratings and would require the application of soil amendments to improve reclamation success on soils with poor/fair topsoil ratings. DEIS at 4-20. Because of standard wildlife timing restrictions, it will likely be impossible to mobilize equipment with sufficient time to complete all reclamation within one year of spud date. Anadarko recognizes the importance of timely and successful reclamation; however, the effect of wildlife seasonal stipulations is an operational constraint that BLM must take into account before imposing any such conditions.

[2] This statement is made in a number of places in the document with respect to Alternative B. BLM should remove it entirely from the document or, as noted above, substantiate its statement by providing an explanation as to how BLM reached this conclusion.

607-66-5

607-66

Recommendation: BLM should revise and clarify this section in accordance with the comments noted above.

4.4 Water Resources

4.4.1.3 Assumptions for Analysis

607-67-1

607-67-2

607-67-3

607-67-4

607-67

In the third paragraph of this section, BLM states: "As of 2005, there have been approximately 210 existing wells and 200 wells allotted for the interim drilling period. The proposed new well pad locations are 2,000 (CBNG and Conventional), this means there are about 1,000 well pad locations that would not be used in the modified EIS boundary under all of the action alternatives." DEIS at 4-22. This statement appears to be tied to the original proposal under which Anadarko and the other operators proposed to drill approximately 3,800 wells over the life of the project. However, this is the first time in this DEIS that BLM has made reference to the original proposal other than on page 1-1 of the DEIS, and we are uncertain of BLM's reason for including it here. The discussion is confusing and seems pointless. Moreover, the reference to both 210 existing wells[3] and 200 wells under the interim drilling proposal is confusing.

In the fourth paragraph of this section, BLM states: "Impacts of individual well pads, roads . . . would have the same impacts as the proposed action, their location and timing however would allow for economies of scale and potentially better planning." DEIS at 4-22. Anadarko disagrees with BLM's assertion that Alternative B would allow for better planning and economies of scale. BLM has provided no evidence to support this claim. Moreover, this seems to have become a rote statement with respect to this alternative in this chapter. It is not clear how this statement ties to the resource being addressed in this section, which is groundwater.

Recommendation: BLM should reconcile the number of existing wells in the study area and ensure a consistent presentation of the number throughout the document. In addition, BLM should revise the statement in the third paragraph to clarify the reference to the 1,000 wells pads that will not be utilized. BLM should provide factual support for the statement regarding economies of scale and better planning and provide a description of its relevance to the issue of impacts to groundwater or, as noted previously, delete it as unsupported.

4.4.1.3.1 Surface Water Assumptions

607-68-1

607-68

It appears the first two assumptions in this section are the same, although expressed in slightly different terms. DEIS at 4-23. The fourth assumption states: "BLM would continue to develop and maintain water sources in the uplands as a critical tool for managing grazing animals to reduce impacts on wetland/riparian areas." *Id.* This statement makes no sense, especially in relation to an analysis of the Proposed Action

[3] This number seems to conflict with other statements regarding well counts made by BLM in the DEIS. For example, in the Executive Summary, BLM states there are 116 natural gas wells. DEIS at S-1.

607-68-1 607-68-2 607-68-3 607-68

and the alternatives proposed by BLM. In the final paragraph BLM states that the "surface water analysis would look at 3,000 potential new well pad locations within the proposed action boundary, with only 2,000 constructed under all action alternatives." *Id.* Again, this appears to be a holdover from several years ago when the operators proposed to drill in excess of 3,000 wells. However, BLM provides no explanation for having chosen 3,000 over the 2,000 wells now proposed.

Recommendation: BLM should clarify the first two assumptions. BLM should either remove the fourth assumption or provide information regarding its relevance to the issues being analyzed in this document. BLM should provide its rationale for the statement in the final paragraph.

4.4.2 Impact Significance Criteria

607-69-1 607-69-2 607-69-3 607-69-4 607-69-5 607-69

In the first paragraph of this section BLM states: "An adverse impact on water resources as a result of human activities would be considered potentially significant if its magnitude was such that special mitigation is warranted or it persists indefinitely." DEIS at 4-24. BLM then states in the second paragraph that "Significance can be real and supported by fact, or perceived and perhaps not fully supportable even with rigorous study." These two statements are problematic for a number of reasons. With respect to the first, significance should not be tied to "special mitigation." Significance should be tied to an action that can not be mitigated or one which even with mitigation results in long-term adverse impacts. The CEQ's regulation found at 40 C.F.R. 1508.27 defines significance, and BLM should refer to this regulation. Perception, because of its highly subjective nature, should play no part in an objective analysis of impacts.

Recommendation: BLM needs to revise this section to address these issues.

4.4.2.1 Surface Water Significance Criteria

In this section, BLM includes the following: "Streamflow characteristics of intermittent or perennial streams are altered such that established users are affected." BLM provides no benchmark for determining the nature and extent to which this impact could occur before it becomes significant. As written it could mean that any alteration, no matter how large or small, would be determined to be significant. Moreover, "established user" is not an accepted regulatory term with respect to surface water use. Another criterion is: "Increasing salt loading to the Colorado River System above background conditions." Anadarko believes that zero increase of salt loading into the Colorado River System is neither reasonable as a significance criterion nor is it consistent with either the objectives of the Great Divide RMP nor the more specific goals of the Colorado River Salinity Control Forum. The Great Divide RMP contains the following management goal for salinity: "To reduce salt loading in watersheds that lie within the Colorado River Basin." This objective is consistent with congressional objectives contained within Public Law 98-569, which amended the Colorado River Basin Salinity Control Act and directed the Secretary to develop a comprehensive program for minimizing salt contributions from lands administered by the BLM. Anadarko believes that BLM's criterion, as currently

607-69-5

drafted, is geared more towards eliminating, not reducing, salt loading. Because of this, Anadarko believes BLM, if it retains the criterion, must analyze potential effects with respect to whether mitigation measures can reduce or eliminate salt loading and if so, to what degree.

607-69-6

607-69

The Colorado Salinity Control Forum (2002) recommended no change in the numeric salinity standards below Hoover Dam (723 mg/l). In Anadarko's opinion, BLM should be employing this standard to determine significance and not its proposed measure of determining salt loading above background levels. Utilizing the numeric limit set by law is consistent with other criteria BLM has adopted, such as violations of federal or state water quality standards.

Recommendation: BLM needs to clarify the criteria to define the extent to which an alteration could occur, and BLM should either utilize an accepted regulatory term or better define who would qualify as established users. BLM should either delete the criterion on salt loadings or revise it to address the issues raised above.

4.4.2.2 Ground Water Significance Criteria

607-70-1

607-70

In this section, BLM sets for the following criterion, which if met or exceeded, would indicate a significant impact: "The natural flow of groundwater to existing local springs, seeps and flowing artesian wells is interrupted, regardless of use or non-use." Anadarko does not agree with this criterion. As set forth here, an interruption, no matter how small and of what duration, would constitute a significant impact. Such a standard is unsupportable factually or scientifically, in part because it fails to take into consideration the fact that such flows are often interrupted due to natural events, such as droughts.

Recommendation: BLM needs to eliminate this from its list of significance criteria.

4.4.3.1 Direct and Indirect Impacts Common to All Alternatives

607-70-2

The first paragraph in this section contains the same confusing language as found in Section 4.4.1.3. The same concerns noted above apply to its inclusion here.

Recommendation: Clarify this language consistent with noted revisions to Section 4.4.1.3.

4.4.3.1.1 Surface Water Impacts Common to All

607-71-1

607-71

607-71-2

The second sentence in this paragraph reads as follows: "Therefore, the primary impact of the proposed project on surface water resources is increased surface runoff, erosion and off-site sedimentation that would cause channel instability and degradation of surface water quality in some locations." BLM has failed to provide any supporting factual basis for this statement. We agree that surface disturbance has the potential to increase runoff, erosion and offsite sedimentation; however, BLM fails to quantify these potential effects with respect to background conditions. In Section 3.4.5.1 Baseline Water Quality Data,

607-71-2

607-71

BLM states: "As the name Muddy Creek implies the suspended solids concentration is typically high. . . The ephemeral and intermittent channels, as well as the basin's surface, that have periods of no flow accumulate loose material due to weathering, bank caving, livestock and wildlife movement, and wind deposits." To provide an objective analysis, BLM must clearly state how it has determined that a development project that would, in the long term, disturb *less than 3% of the total surface area* could result in sedimentation that is significantly more that background in an area already known for its heavy sediment loads (i.e. Muddy Creek).

Recommendation: BLM must provide a quantitative analysis of the degree to which it expects these impacts to occur over natural background conditions that are specific to the study area.

4.4.3.1.1.1 Surface Hydrology Related to Soils Data and Topography

607-72-1

607-72-2

607-72-3

607-72

On page 4-26, in the first paragraph, BLM states: "Since so much of the ARPA has the potential for severe water erosion, soil disturbance both during construction and during production can be expected to result in hill slope and channel erosion under each alternative above background conditions. . . These catastrophic failures can produce very high quantities of sediment and can appear to be random and unpredictable." Again, BLM has drawn a conclusion regarding impacts above background levels, but has failed to set forth those background levels. Further, BLM seems to be implying in this statement that these potential impacts can not be addressed by mitigation measures. In addition, BLM must account for the natural flow conditions that ephemeral/intermittent streams exhibit on an annual basis (i.e. Muddy Creek can range in suspended solids from 7 mg/l to 3191 mg/l).

Recommendation: BLM must provide a quantitative analysis of the degree to which it expects these impacts to occur over natural background conditions with specific references to the conditions that exist in the study area. BLM should also include a discussion of standard mitigation measures and the effectiveness of any of those measures in addressing the concerns identified by BLM.

607-73-1

607-73-2

607-73

In the second paragraph on page 4-26, BLM states: "In addition, low annual precipitation and wind and water erosion could make successful reclamation in the ARPA difficult to obtain. . . Therefore, the overall potential for successfully stabilizing disturbed soils is poor to fair." Again, Anadarko refers BLM to the attached USDA/NRCS map. This map depicts the precipitation zones for Wyoming. It is apparent from the map that much of the study area is not within the <10 inch precipitation zone as asserted by BLM in this DEIS. It appears BLM has extrapolated data from precipitation measurements taken at Baggs, Wyoming, which given the availability of data specific to the DEIS area is not warranted. Additionally, BLM fails to discuss in this section the fact that successful reclamation will serve to reduce the susceptibility of disturbed areas to soil erosion during both the short-term and long-term.

Recommendation: BLM should revise this section in light of the USDA/NRCS data specifying which portions of the study area fall within which specific zones.

607-73-2

Additionally, BLM should re-characterize its discussion of reclamation success in precipitation zones that have higher than 10 inches of rain per year.

607-73-3

In the third paragraph on page 4-26 BLM states: "Slopes rated strong (15%) or greater occupy at least 21 percent (65,000 acres) and a much smaller percent of residual slopes . . . and/or high sand content may be anticipated as a further complication." BLM has failed to provide a scientific basis for this statement. This is the first mention of slope rating in the DEIS. Moreover, the statement is confusing as BLM's reference to "further complication" is not clear. Is BLM referring to erosion potential or reclamation potential or some other issue?

Recommendation: BLM must provide a basis for its discussion of slope ratings and clarify how such ratings are factored into the analysis. BLM then must discuss whether and to what extent standard mitigation measures can be used to minimize any impacts that may be tied to such slope ratings.

4.4.3.1.1.2 Reclamation Success and Roads

607-73

607-73-4

In the first paragraph of this section, BLM states: "Anderson (1975) in a study of 23 watersheds found that conversion of a steep forest and brush lands to a grassland had multiplied sediment yields by 5 times." DEIS at 4-26. Anadarko believes the comparison made in this study is scientifically unsound, and BLM should not present it in a document of this nature, even for illustrative purposes. First, it is not clear if Anderson's study researched watersheds where only a portion or the entire watershed was converted from forest/brush land to grassland. Second, even with this information, there is no justification to make the assumption that conversion of forest lands correlates to rangeland disturbance and reclamation. Finally, the Proposed Action will only disturb approximately 6% of the total study area surface in the short term, and such disturbance will not occur all at once. Moreover, reclamation will reduce total surface disturbance to less than 3% for the long term.

Recommendation: BLM should delete this reference or clarify the parameters of Anderson's study such that an analysis of the information can be made with the information presented in the DEIS regarding the potential impacts to the study area.

607-73-5

We note the fourth paragraph has a reference to a "Table K-11." We were unable to find such a table in either the document or the appendices. BLM should review and clarify the reference as appropriate.

4.4.3.1.2 Groundwater Impacts Common to All

607-74

In the third paragraph of this section, BLM states: "If accidental spills occur they would be addressed with the Hazardous Materials Management and Release Contingency Plans for the Atlantic Rim Project Area (Appendix C)." BLM has failed here to account for the role Spill Prevention Control and Countermeasures Plan (SPCCP) play in prevention and response to spills.

607-74 Recommendation: The role of SPCCP should be addressed in prevention and spill response.

4.4.3.2.1 Proposed Action Impacts to Surface Waters

607-75 In the second paragraph, BLM states: "Currently, there are approximately 1,000 miles of existing primary, secondary and 2-track roads within the ARPA (about 2.5 mi/mi^2)." DEIS at 4-38. Although BLM makes this statement, its analysis of impacts to surface waters fails to account for the fact that operators will use a certain portion of these existing roads. Anadarko understands that decisions to use existing roads are not made until onsite inspections are conducted; however, existing roads are used, where feasible, to minimize surface disturbance and other environmental impacts.

607-76-1 607-76-2 607-76-3 607-76-4 607-76-5

607-76 In the first paragraph on page 4-39, BLM states: "Increasing sediment delivery to watersheds above the 303d section of Muddy Creek (Section 3.4) would lead to habitat degradation in pools and riffles and increase salinity of these waters, resulting in significant effects. . . The proposed action with 8 wells/section in this watershed would lead to increases in surface runoff and sedimentation into the watershed and would result in significant impacts." Neither here nor elsewhere in the DEIS has BLM provided any quantitative analysis to support this determination. Even based on the significance criteria set out by BLM, BLM has no basis for this statement. Arguably, the criteria supposedly exceeded in this instance would be the following: "*Accelerated erosion and runoff alters the physical characteristics of streams or drainages, beyond what is expected with natural processes.*" However, this significance criterion requires an objective finding of "alteration of the physical characteristics or streams or drainages, beyond what is expected with natural processes." BLM has not provided a quantitative analysis, such as modeling, from which one could determine the extent to which alterations have occurred beyond those "expected with natural processes." Even more problematic is the fact that given BLM's assertions regarding erosion from disturbed lands (Soils with severe water erosion comprise about 85% of the study area; page 4-26), BLM cannot and should not suggest that its preferred alternative would not also result in accelerated erosion "*beyond what is expected with natural processes*."

The DEIS contains no clear description of how BLM determined that a long-term increase of surface disturbance of up to 2.3% of the total acreage within the study area would have a measurable, predictable, or noticeable effect on the "*physical characteristics of streams or drainages*" beyond what would be expected under normal conditions. Finally, BLM has failed to include in this section a discussion of the effect that storm water control measures and other regulatory reclamation procedures would have with respect to mitigation of erosion and the resultant quantitative change in sediment loading over that which would occur if the mitigation were not applied.

607-77-1

607-77 In the second paragraph on page 4-39, BLM states: ". . . there are many topsoils that are saline or sodic in the ARPA, these soils when eroded as a result of project activities can make this salt available to surface waters. This would contribute to the non-point source

607-77-1 607-77-2 607-77-3 607-77-4 607-77

of salt in the Colorado River Basin and can be expected to be a significant impact to this system since these rates would be above background conditions." BLM's significance determination and analysis of this issue are flawed. The DEIS does not contain any analysis that quantifies the degree to which new well pads and roads will necessarily lead to a *measurable increase* above background in salt loading to the Colorado River system. Additionally, storm water control measures and required reclamation practices associated with the Proposed Action will mitigate erosion from areas disturbed during the life of the project. In addition, BLM's conclusions in this section with respect to the potential effects of the Proposed Action are difficult to reconcile with its statements regarding the potential effects and significance under Alternative C. The applicable significance criterion states that *any* increased salt loading above background is significant. DEIS at 4-24. Inexplicably, in the Executive Summary BLM asserts: *"Under alternative C salt loads would be measurably higher but are not significant"*. DEIS at S-4. Again in the Table on page 2-11, BLM states under the Alternative C column *"Salt Loads would be measurably higher, but are **not** likely to be significant"*. Although as noted above Anadarko disagrees with this significance criteria, BLM should apply it consistently when evaluating the potential impacts from each of the alternatives.

Recommendation: This section needs to be revised to address the issues set forth above.

4.4.3.4.1 Surface water impacts Alternative B

607-78

In the first paragraph in this section BLM states: "The most beneficial feature of this alternative is that it would give more definition to the development periods. Due to the temporal development, there would be feedback in the form of monitoring to better plan future development in subsequent phases. Individual watersheds would receive more initial disturbance for construction under this alternative, but would also improve the success of reclamation. Interim reclamation would be more successful due to the economies of scale in terms of planting, treating for weeds, travel planning and other tasks. When these activities occur in only a portion of the project area at a time and we can assume these economies of scale would be realized." This whole paragraph lacks a scientific and objective foundation. These statements are little more than subjective suppositions made to justify any decision by BLM with respect to this alternative. Please refer to our earlier comments regarding the asserted economies of scale that are supposedly unique to this alternative.

Recommendation: Because this discussion is wholly subjective and lacks any factual basis, it should be deleted from the document.

4.4.6 Residual Impacts

In this section, BLM states: "Significant impacts to surface hydrology would occur under the proposed alternative and Alternative B (Temporal Alternative). These impact including negatively impacting a waterbody (Muddy Creek West of 789) listed on the State 303d list, changing streamflow characteristics in stream channels, alteration of stream geometry and increasing sediment to the point of degrading a streams designated

use (Muddy Creek, from the eastern project boundary to the confluence with the Little Snake. No significant impacts are expected to occur under Alternative A (No Action) or Alternative C (Spatial Alternative). "

607-79-1 607-79-2 607-79-3 607-79-4 607-79-5 607-79-6

607-79

These statements are problematic for a number of reasons. First, BLM asserts that under the Proposed Action and Alternative B, a 303(d) listed water would be impacted. BLM ignores the fact that current laws, both federal and state, would preclude this effect from occurring. Although these statements are made under the heading of "residual impacts," BLM has failed to recognize that residual impacts are those that remain after the project has been mitigated. BLM has not addressed in the analysis presented in Chapter 4 the effect of standard mitigation practices, such as NSOs within 500 feet of stream channels. BLM's assertion that changes to Muddy Creek will be so great as to degrade Muddy Creek's designated use is wholly unsupported by any analysis in the DEIS. Moreover, BLM has failed to clearly explain how it reached its conclusion that no significant impacts would be expected under either Alternative A or C.

Recommendation: Based on the comments set out above regarding potential impacts to surface water and soils, Anadarko believes BLM should revise its analysis of the potential impacts to surface water and soils, including its analysis and conclusions with respect to residual impacts.

4.5.3.1 Direct and Indirect Impacts Common to All Alternatives

607-80

In the first paragraph of this section, BLM states: "Monitoring sites for documenting long-term trend of vegetation cover types would be avoided so that disturbance from permitted commercial activities would not occur." DEIS at 4-46. It appears BLM is asserting that monitoring sites would be avoided, but it is not completely clear from the language as drafted.

607-81

The seventh paragraph of this section contains the following statement: "Although most natural gas would be collected as water is removed from the coal aquifers, some gases would move upslope through the formation and escape through surface soil. Where this occurs the vegetation would die back, resulting in dominance of herbaceous species and increased bare ground. The locations would generally be small and scattered along the outcrops of the coal formations, probably affecting less than ten acres altogether."

Again, the DEIS is devoid of any factual or technical basis for these statements. Moreover, BLM has failed to disclose, whether given the natural geologic conditions, this effect would occur even in the absence of any development at all. Finally, we are at a loss as to how BLM calculated the acreage supposedly affected.

Recommendation: BLM must provide factual and technical support for these assertions or delete them.

4.5.3.2 Proposed Action

607-82-1 607-82-2 607-82-3 607-82-4 607-82

In the first paragraph of this section BLM states: "Indirect impacts due to dust from roads is expected to affect vegetation . . . (based on estimate of 300 feet width impacted along roads)." DEIS at 4-48. Impacts from dust are common to all alternatives; therefore, this statement is inappropriate in this section, which supposedly addresses impacts that are unique to the Proposed Action. Impacts described for the other alternatives do not even address dust. Additionally, the DEIS lacks an analysis of the effects of standard mitigation measures, such as the application of water or other chemicals, to control dust and thereby reduce the potential impacts.

Recommendation: If BLM retains this statement in the DEIS, it should be moved to section 4.5.3.1. Direct and Indirect Impacts Common to All Alternative. In addition, BLM should address the ability of mitigation measures to reduce the potential impact.

In the fourth paragraph of this section, BLM states: " . . . approximately eight percent of this cover type occurs on moderate to steep slopes that would be affected by increased gully erosion and desertification due to the influence of overland hydrology." This is yet another instance where BLM has made a statement that is unsupported by the analysis in the document.

607-83

In the fifth paragraph of this section BLM states: "In allotments where grazing reduction or suspension of use is made by the livestock permitee due to the rate of scale of field development, there would be affects to the vegetative resource." Here and in subsequent discussions (See the discussions in the DEIS on pages 4- 51, 52, 70, 73 and 5-13), BLM states the need for either reductions or suspension in grazing due to the pace and intensity of development. BLM doe not, however, quantify to what degree suspensions would be granted (e.g. based on direct loss of AUMs based on disturbed acres). Any such suspensions would have a direct bearing on the number of livestock removed from allotments and the length of such removal. This information has a substantial bearing on the ability to achieve some of the benefits describe by BLM such as residual forage, increased litter, soil protection, and reduced runoff.

Recommendation: BLM should revise the discussion in this section to address the issues noted above.

4.5.3.4 Alternative B

607-84-1 607-84-2 607-84

The second paragraph in this section again makes unsubstantiated statements regarding benefits to vegetation from this alternative. For example, BLM does not explain how the Proposed Action with its inherent phased drilling would not allow for the same results. Additionally, as shown on page M-20, alkali sagebrush communities occur primarily in BLM's proposed third phase. Therefore any determination of reclamation techniques for clay soils with alkali sagebrush and/or juniper woodland and true mountain mahogany/mountain shrub communities would not occur until the final phase.

Recommendation: BLM should revise this section to either provide support for its statements or delete them.

4.5.3.5 Alternative C

607-85 In the final paragraph of this section, BLM states: "This alternative would continue the likelihood of suspension of all grazing use by the livestock permittee due to the rate and scale of field development, but on a pasture or regional scale . . . Weeds would not exceed the significance criteria." BLM fails to recognize the fact that due to seasonal stipulations, oil and gas development operations in many areas will be severely restricted on a seasonal basis often only providing a 3-4 month drilling and construction window. If a grazing permittee's use of pastures does not coincide with this same period, they will likely not be affected or at least not in the manner described here.

Recommendation: The analysis needs to address the likelihood that the seasonal nature of drilling/construction activities would not overlap with seasonal use of grazing pastures.

4.5.5 Additional Mitigation Measures

607-86-1 607-86-2 607-86 In this section, BLM states: "Additional mitigation measures for Alternative C: Restricting surface disturbance to less than 20 acres and four pad locations per section on slopes over 8%." Again, the DEIS does not provide any technical or scientific support for this measure. Additionally, it is not clear how BLM intends to apply this measure when a particular section may contain only a small portion of slopes in excess of 8%. If the section only contains a small percentage of land with slopes of this nature, these areas could be avoided, thereby negating any potential impacts, without restricting surface disturbance in the remainder of the section with such drastic measures.

Recommendation: BLM should either provide technical or scientific support for this measure or delete it from the DEIS.

4.6 Rangeland Resources

4.6.3.1 Direct and Indirect Impacts Common to All Alternatives

607-87-1 607-87-2 607-87-3 607-87 In the second paragraph of this section, BLM states: "Control of halogeton in 2004 was inadequate, forcing one operation trailing sheep to go many miles out of their normal trail route to avoid this poisonous plant." DEIS at 4-54. BLM must provide more information regarding this statement. In particular, to assess the relevance of this statement to oil and gas activities, especially given its context here which implies a tie to oil and gas operations, BLM must state where this took place. Due to the very limited oil and gas operations in the area, spread of the halogeton could easily be attributable to other activities in the area, such as the ranchers and grazing lessees.

In the third paragraph, BLM asserts: "Additional forage would not be usable due to dust from roads settling on adjacent vegetation reducing palatability." *Id.* BLM again has failed to account for a reduction of impacts from use of standard mitigation measures, such as road watering.

607-87-3

607-87-4

607-87

Recommendation: BLM should evaluate the degree to which dust suppression activities could mitigate this impact.

4.6.3.4 Alternative B

The last sentence in the first paragraph reads as follows: "However, the short-term impact of the length of time and intensity that impacts occur would vary by region." This sentence makes no sense and should be revised to clarify BLM's intent.

4.7 WILDLIFE

GENERAL

607-88-1

607-88-2

607-88

As noted previously, Anadarko believes BLM has placed undue emphasis on the Wyoming Game & Fish Department's document entitled "Recommendations for Development of Oil and Gas Resources within Crucial and Important Wildlife Habitats (WGFD Recommendations), as support for its wildlife significance criteria and for imposing limitations on well pad density and allowable surface disturbance per section. BLM's significance criteria should be based on the Agency's objectives for management of wildlife resources as contained in the Great Divide Resource Management Plan and not those of the WGFD. Additionally, Anadarko believes BLM has incorrectly applied the WGFD Recommendations.

The Great Divide RMP objectives for wildlife management are:

- To provide habitat quality (food, cover, space, and water) adequate to support a natural diversity of wildlife and fisheries, including big game, upland game, waterfowl, non-game species, game fish, sensitive, threatened, and endangered species, species of special management interest in Wyoming, as well as to assist in meeting goals of recovery plans.
- To maintain or improve vegetation condition and/or avoid long-term disturbance in **high priority** standard habitat sites and fisheries areas.
- To maintain or improve overall ecological quality, thus providing good wildlife habitat, within the constraints of multiple-use management in **moderate and low priority** standard habitat sites

Anadarko notes that the Great Divide RMP also defines specific high, moderate and low priority standard habitat types. The Great Divide RMP defines each of these as follows: "High priority habitats are those that require intensive-management actions (data collection, enhancement, protection) to maintain their productivity as diverse wildlife communities; moderate-priority habitats are those that require less intensive management to maintain their productivity as wildlife communities; low-priority habitats are those that can be more heavily used by conflicting resources so that the higher priority wildlife habitats can be maintained." These definitions differ from those used by the WGFD.

607-89

The WGFD Recommendation is based on mitigating impacts to "important wildlife habitats" which include habitats as defined by the WGF Commission's Mitigation Policy as "irreplaceable", "vital", "or "high value." The WGF Commission's goals are to "recommend no net loss of habitat function within the biologic community that encompasses a project site." While it may be appropriate for the WGFD to "recommend" management goals to BLM it is not appropriate for BLM to establish significance criteria based on that agency's habitat types and management goals without also being consistent with BLM's management goals. BLM cannot allow, in direct conflict with the Great Divide RMP, the WGFD to redefine habitat management goals.

607-90-1

The WGFD Recommendations commonly utilize the phrase "to the extent reasonable" or "reasonable" when making management suggestions. "Reasonable" is defined by the WGFD Recommendations as being used "in the same context as 43 CFR 3162.5-1(a)" and that "we presume the basis for this determination includes technological feasibility, applicability, and economic considerations." In this case, the DEIS fails to analyze the technological feasibility, applicability and economic considerations of development of 4 wells and 20 acres of surface disturbance per section. Thus, even when employing the WGFD Recommendations, BLM has failed to include a key component – reasonableness – in its decisions regarding whether a given mitigation measure is warranted.

607-90

In addition, BLM's application of the WGFD Recommendations fails to recognize that "ranges" of development intensity (i.e., moderate, high and extreme) should be considered when evaluating the potential impacts prior to applying the WGFD Recommendations. The WGFD Recommendations are based on two quantitative thresholds. The first threshold is the density of well locations and cumulative acres of surface disturbance. The second is characterized as follows: "In addition to well pads, a typical oil and gas field includes many other facilities and activities that can affect wildlife – roads, tanks, equipment staging area, compressor stations, shops, power supplies, traffic, human activity, etc." and therefore, "The density of wells pads is a ***general index*** to well field development and activities" (emphasis added). Given these factors, one only has to compare the intensity of development activities at a natural gas field like Jonah (Sublette County) to that of the Proposed Action to realize that development in a field like Jonah is vastly different than that proposed for Atlantic Rim. For instance, the Jonah Infill Development DEIS states that round trips per well for construction and development would reach 810 trips. Anadarko estimates that figure for Atlantic Rim at 189 trips. For new production activities there would be 2,806 trips per well over 30,500 acres for the life of the project [The life of the project is estimated to vary from 63 to 105 years, depending on the alternative and pace of development.] compared to 2,310 trips per well over 270,080 acres for the Atlantic Rim project, which has a 30 – 50 year projected life of project

607-90-2

Finally, the WGFD Recommendations state that "The Working Group adopted this approach [use of well pad density] "because it would be exceedingly difficult, based on available literature, to factor every aspect of development into a set of disturbance criteria." Therefore, in Anadarko's opinion, if BLM is going to employ the WGFD Recommendation, the DEIS must contain an analysis of the relative intensity of

607-90-2

development as proposed by the operators. Although BLM appears to agree with Anadarko's conclusion in this respect (See page 4-60 where BLM states: "The extent of displacement would be related to the duration, magnitude and visual prominence of the activity, as well as the extent of construction and operational noise levels above existing background levels."), BLM has failed to follow through and actually conduct the analysis.

607-90

607-90-3

While Alternative C would limit development to only 4 wells per section in areas of critical winter range, the WGFD Recommendations does not recommend this type of mitigation. In fact, the WGFD Recommendation specifically uses the phrase "Avoid when reasonable" for 16 or more wells per section for Mule Deer and Antelope crucial winter range. Therefore, BLM's proposal under Alternative C to reduce well count to 4 wells per section is inconsistent with and arbitrarily more restrictive that the WGFD Recommendations. The WGFD Recommendation does suggest that with 5 to 16 wells per section or 20 to 80 acres of surface disturbance, impacts are "increasingly difficult to mitigate." However, it should be noted that well counts and surface disturbance as contemplated under the Proposed Action would be at the lower range, especially when interim reclamation is included.

Lastly, Anadarko does not agree with BLM's conclusion that to properly implement the WGFD Recommendations it must restrict well densities or surface disturbance. We believe the WGFD Recommendation is more properly read to support a conclusion that once a certain level of well density or surface disturbance is reached, additional mitigation measures *may be* warranted.

Section 4.7.3 Direct and Indirect Impacts - Common to All Alternatives

607-91

On page 4-61 in the third full paragraph, BLM states: "Grasses and forbs are expected to become established . . . however shrub reestablishment to pre-disturbance levels would not be achieved during the life of the project. Consequently, the total acres disturbed would constitute a long-term loss of shrubs and would not be usable by species dependent upon the shrub component for forage or shelter." The expected life of the project is 30-50 years. DEIS at 1-2. Thus, the document's statement regarding shrub reestablishment does not match information in Chapter 3 which indicates the shrubs *would* recover during the life of the project. Specifically, in Chapter 3 BLM discusses shrub recovery in response to fire apparently in an attempt to shed light on potential reclamation timeframes resulting from surface disturbing activity associated with oil and gas activity and makes the following statements:

> ATV cover type: Without rest or post-burn grazing management, sagebrush cover may recover to pre-treatment levels in *twenty years* (Page 3-59).
>
> ATW cover type: Recover time for ATW to reoccupy a site after fire occurrence is estimated at 75 to 150 years. Reclamation rates for ATW are also expected to take many years, but are currently unknown (Page 3-60).

607-91

Alkali Sagebrush Cover Type: Establishment from seed has been rated at "medium", and establishment from transplants as "very good". Seed production and handling are rated as "medium" because the seeds are small. Natural spread by seed and vegetatively is "good" (Page 3-60).

ATT cover type: Where other species are uncommon or without post-burn grazing management, sagebrush cover may return to pre-treatment levels in fifteen to twenty years. However, monitoring of prescribed burns with rest or deferment after treatment indicates . . . recovery may take up to 50 years to reach pretreatment levels. The higher amount of moisture on these sites makes them very productive and response to reclamation should be good (Page 3-61).

Recommendation: BLM should revise this statement to reconcile it with the information contained in Chapter 3. In particular, successful reclamation of some species can be achieved during the life of the project especially in areas with higher precipitation.

607-92

On page 4-60 in the second to last and last paragraphs, BLM makes two statements for which it provides no supporting data. The first one is: "Acclimation to activity may increase predation on some species." The second one is: "In addition, there is an area surrounding these sites that tends not to be utilized due to the increased human activity. This "zone" can extend up to a half mile from the developed area."

Recommendation: BLM should either provide support for these statements or delete them and any mitigation measures based on them.

607-93-1 607-93-2 607-93-3 607-93

In the first paragraph on page 4-61 BLM states: "Direct habitat loss from construction would equal approximately 6% of the project area. In addition, dust would directly and indirectly impact 15-30% more acreage." The paragraph that follows this statement does not address standard mitigation measures such as road watering, chemical and speed limits that could reduce both the aerial extent and severity of the dust impacts. Additionally, BLM has failed to cite any scientific literature addressing the impacts of dust to habitat usage by wildlife species, whether such impacts might vary depending on the species and how it was determined that 15-30% of the area would be affected.

Recommendation: BLM should revise this paragraph to address standard mitigation measures' ability to reduce potential impacts and provide citations to scientific literature regarding affects of dust on wildlife usage of habitat.

4.7.3.1.2 Big Game

607-94-1 607-94

In the second paragraph which addresses impacts to pronghorn antelope, BLM states: "During the production phase, there is no equivalent mitigation and animals may be displaced up to 0.25 miles from the source (RFO RMP DEIS 2004)." BLM has failed to account for the differing traffic volumes and associated activity that would occur between the drilling phase and the production phase. These numbers are significantly less during

607-94-1

the production phase of operations; therefore, the potential impacts to pronghorn antelope would also be lessened.

Recommendation: BLM needs to revise the discussion to account for this difference.

607-94-2

607-94

In the fourth paragraph, BLM states: "...pronghorn have been found to habituate to increased traffic volumes and heavy machinery...they would likely habituate to activities along roads...The magnitude of displacement would decrease over time as: (1) the animals have more time to adjust to the circumstance, and (2) the extent of the intensive activities such as drilling and road building diminishes and more wells are put into production." These statements do not support BLM's conclusion in both the Executive Summary and on page 2-15 of the DEIS that the Proposed Action has a significant impact on pronghorn. BLM has concluded that "significant impacts" for the purposes of this analysis are identical to the WGFD category of "High Impact" as outlined in the WGFD Recommendations. Assuming these categories are equal fails to account for the following:

607-94-3

1. Given that 73% of the crucial winter range for the Baggs mule deer herd unit is outside the project area, no evidence is presented to suggest that this external area cannot assimilate the migration of those mule deer that might be displaced by the Proposed Action.
2. Finally, the mule deer migration study currently underway should provide the data necessary to develop reasonable mitigation measures and should be used in lieu of the more arbitrary well count mitigation associated with Alternative C. BLM, for the most part, fails to take this study into account in its analysis and discussion of potential mitigation measures.

607-95

On page 4-64, BLM discusses potential impacts to mule deer and states in the fourth paragraph of that section: During a three-year study of response of pronghorn and mule deer to petroleum development on crucial winter range in central Wyoming, Easterly...found that mule deer 'did not avoid oil fields' and that 'deer did not move significant distances from the well site after the start of drilling activity.' However, in the Sublette mule Deer Study...Sawyer states that these studies 'are limited and largely observational in nature' and that his study using GPS collars suggests that winter mule deer habitat selection and distribution patterns have been affected by natural gas development, specifically road networks and well pads." On the next page, BLM then seems to lend more credence to this second study without any real explanation or analysis.

607-96

In the discussion on potential impacts to elk found on page 4-65, BLM fails to account for the fact that 80% of the crucial winter range for the Sierra Madre elk herd unit is outside the project area. BLM has not presented any evidence suggesting that this external area cannot assimilate the migration of those elk that might be displaced by the Proposed Action. Hence, the conclusion that the impacts from all action alternatives are significant does not appear to be justified.

4.7.3.4 Alternative B

607-97-1 As an initial matter, we note an apparent discrepancy in the number of wells that would be drilled. In the first paragraph in this section BLM states 950 CBNG wells would be drilled and "approximately 100 additional wells, within previously analyzed PODs…" DEIS at 4-69. Given that only 200 wells were contemplated on the interim drilling, and 116 of those have been drilled, an additional 100 wells would be beyond the amount previously analyzed. Moreover, this contradicts earlier statements made in this DEIS by BLM regarding activity under this alternative.

607-97-2 607-97-3 607-97-4 607-97 Further on in the paragraph, BLM states: "In terms of disturbance to wildlife and their habitats, this phased approach would be beneficial by providing "safe-haven" areas in two thirds of the project area during the development phases of the APRA." DEIS at 4-70. BLM has failed to provide any objective information supporting this assertion. Nor has it been shown that by concentrating development and thus intensity under the phased approach that negative impacts would not occur to adjacent habitats. BLM should also note that under Anadarko's conceptual phased development (i.e. proposed action) safe-haven areas, if indeed this is a valid wildlife management principle, would occur adjacent to that development as well.

607-97-5 Recommendation: BLM should revise its analysis and consider the following:

What is the probability of species leaving the development area and moving to adjacent habitats outside study area instead of utilizing adjacent non-development areas?

607-97-6 607-97-8 Will the concentration of development in one third of the project area cause more wildlife to be displaced and at greater distances thus creating increased impact to adjacent habitats? For instance, since most of the mule deer habitat is located in either the northern or southern section is it reasonable to assume that they would seek out the "safe haven" crucial winter range in the southern portion.

607-97-9 Will those species that cannot leave (e.g. prairie dogs or sage-grouse) be more affected by the concentrated activity in a phased approach versus a relative reduction in relative intensity as would be exhibited for the area under the Proposed Action?

4.7.3.4.3 Upland Game Birds

607-98-1 607-98-2 607-98-3 607-98 In this section, BLM asserts this alternative would benefit greater sage-grouse by concentrating development within one third of the project area over the first six to seven years. DEIS at 4-70. Again, BLM has failed to provide any support for this statement. BLM must analyze the effect on sage-grouse from the increased intensity of development that would result from the phased alternative. Given application of the multitude of seasonal restrictions drilling activities will generally occur in the August to mid-November time frame. BLM must take this into account in its analysis.

4.8 Special Status Plant, Wildlife and Fish Species

4.8.2 Significance Criteria

607-99-1

607-99-2

607-99

In the first paragraph in this section, BLM that the "criteria were considered in the assessment of impact associated with the Proposed and All Alternatives and are the same as those contained in the Draft Rawlins RMP (BLM 2004)." DEIS at 4-77. As noted earlier in our comments, BLM should not be applying criteria set forth in the Rawlins RMP. A final EIS has not been issued, let alone a record of decision embodying BLM's final management decisions.

Recommendation: BLM should revise the significance criteria such that it reflects those contained in the Great Divide Resource Management Plan. If BLM believes the criteria are the same, it should provide appropriate citations to each document supporting its assertions.

607-100-1

607-100-2

607-100

BLM again cites the WGFD Recommendations in its significance criteria. In particular, BLM states: "Management actions that result in substantial disruption or irreplaceable loss of vital and high value habitats as defined in the Wyoming Game and Fish Department Mitigation Policy (WGFD 2004)." DEIS at 4-77. Anadarko does not believe that BLM has properly developed wildlife significance for criteria for special status plant, wildlife, and fish species. Rather than relying upon the Wyoming Game and Fish Department (an agency with a non-multiple use mission) management objectives the BLM must utilize its own resource management goals as stated in the Great Divide Resource Management Plan, BLM internal guidance or similar county or state plans. Furthermore, as noted above, Anadarko believes BLM has misapplied those management criteria.

4.8.3.2 Proposed Action

Sensitive Fish Species

607-101-1

607-101-2

607-101

In the first paragraph of this section, BLM asserts the primary impacts to rock substrates and deep pools, both habitats for sensitive fish species, are (1) sedimentation from new construction and project-related land disturbance resulting in decreased availability of rock substrates, and (2) alteration of local hydrologic conditions by new road construction that could lead to sedimentation and channel adjustments resulting in a loss of deep pool habitats. DEIS at 4-81. Anadarko believes these potential impacts would occur under any of the action alternatives and are not unique to the Proposed Action. BLM has provided no support for its assertions that such impacts would occur only under the Proposed Action. Moreover, BLM has failed to address mitigation measures that could minimize these impacts.

Recommendation: BLM should move this discussion to section 4.8.3.1 – Direct and Indirect Impacts Common to All Alternatives.

607-101-3

607-101-4

607-101-5

607-101-6

607-101-7

607-101-8

607-101

BLM addresses impacts to Sensitive Fish Species by stating: "...if any project-related road crossings of Muddy Creek are constructed, could [sic] limit access to required habitats that block fish migration." DEIS at 4-81. BLM has failed to address whether road crossings can be constructed that would protect the fish. BLM's own guidance document, the 2006 Gold Book affirms that it is possible to cross drainages while allowing for fish passage by making it a design requirement for operation on federal lands. Moreover, given this design requirement, we fail to see how BLM concluded that such construction would block fish migration.

In the second paragraph of this section, BLM states: "During the construction phase, prior to interim reclamation, erosion of soils exposed during earth-moving activities accelerates fine-sediment loading in stream channels." DEIS at 4-81. The discussion following this statement addresses research on sedimentation impacts, but it fails to recognize that construction is a temporary activity, and it fails to disclose the expected amount of sedimentation that would exceed background conditions.

Recommendation: BLM should revise these two paragraphs to address the issues noted above.

BLM then quotes a study by Angermeyer which concludes that: "The impact of new roads and other facilities on fish habitats can be divided into three categories: construction, presence, and urbanization (Angermeyer et. al. 2004)...During the presence phase, impacts are primarily associated with the interception of shallow groundwater flow paths by roads." DEIS at 4-81. It is impossible to place Angermeyer's study in the context of the Proposed Action or any of the alternatives. Did Angermeyer's study occur in arid areas or areas of high precipitation? What type of vegetation community was present? What percentage of surface was disturbed or density of roads were present? Were stormwater prevention practices put in place? How does urbanization relate to oil and gas field development?

Recommendation: BLM must place this study in the context of the area being analyzed.

607-102

Despite evidence to the contrary on page 3-17 which states "Groundwater resources include deep and shallow, confined (artesian) and unconfined (water table) aquifers. The unconfined aquifers are generally shallow, "blanket" type deposits of Quaternary or Tertiary age and are generally found 400-600 ft. below the ground surface." BLM concludes on page 4-82 that that; "During the presence phase, impacts are primarily associated with the interception of shallow groundwater flow paths by roads." It appears that the Angermeyer's research and statement are not applicable to the ARPA.

Recommendation: BLM needs to clarify this inconsistency.

607-103

On the next page BLM states: "Tamarisk is currently known to exist in portions of the ARPA and its spread is likely as a result of dispersal via new road construction and utilization." DEIS at 4-82. BLM is improperly assessing the role new road construction and use play in the spread of tamarisk. According to the National Invasive Species

607-103

Council, "Tamarisk spreads vegetatively – by adventitious roots or submerged stems, and sexually. Each flower can produce thousands of tiny seeds that are contained in small capsule usually adorned with a tuft of hair that aids in wind dispersal. Seeds can also be dispersed by water." Therefore, BLM's assertion that it is spread by new road construction is scientifically unsupportable.

Recommendation: If this statement is not eliminated it must be supported with fact such as historical documentation of the juxtaposition of increases in road density and tamarisk infestations.

607-104-1

607-104

607-104-2

Further on, BLM discusses erosions studies specific to oil and gas development and concludes: "Research within the Little Robbers Gulch . . . has demonstrated the effects of roads, natural gas drillpads, and pipelines on sediment production and runoff (Wollmer 1994). . . A net increase of 1% in local sediment production and 0.3% in local runoff was found when compared to unaltered sites." DEIS at 4-85. However, in the very next sentence the results of this research are marginalized by BLM's statement that: "Though this work helps to identify the potentially limited extent of local erosion . . . the study did not address the effects of flow interception which can lead to altered runoff timing, routes and magnitudes." While BLM's statement may be accurate, the degree to which altered runoff timing, routes and magnitudes could occur has not been quantified. Additionally, without a quantitative analysis, it is impossible to compare this impact under any of the alternatives.

Recommendation: BLM must provide quantitative analyses by which comparisons among alternatives can be made.

607-105

4.8.4.3 Alternative C

In determining impact significance to special status plant, wildlife and plants species BLM states that; "Impacts would not exceed the significance criteria for sagebrush obligate species under this alternative." DEIS at 4-90. The significance criteria (Section 4.8.2) for special status species addresses species eligible for listing under the Endangered Species Act, Threatened & Endangered and/or candidate species, loss of vital and high value habitats as defined by WGFD mitigation policy and Special Status Species; however, the general category of "sagebrush obligate" species is not listed.

Recommendation: BLM needs to clarify which sagebrush obligate species are special status species.

607-106

4.9 RECREATION

4.9.3.1 Proposed Action

On page 4-94 in discussing the impacts to hunting from the Proposed Action, BLM begins its discussion by noting the acreage amount that would be affected and does so in terms of acres. BLM fails to convert these figures into a percentage of the total project area. When these conversions are made, using the acreage figures provided by BLM, the total unreclaimed area would never be greater than 7 percent of the total area.

607-107-1

607-107-2

607-107-3

607-107-4

607-107-5

607-107-6

607-107

In the second paragraph in this section, BLM states: "As noted in Section 4.7 (Wildlife), this displacement effect has the potential to have a great impact on wildlife not only due to displacement, but also due to wildlife concentration beyond carrying capacity in alternative habitats." BLM has provided no information supporting this conclusion. In particular, BLM has failed to quantify the carrying capacity of the adjacent habitat. Even though wildlife populations may be at or above WGFD objectives, this does not necessarily mean that the adjacent habitats are at capacity. Factors that could affect the WGFD determinations for herd objectives include allocation of forage to wildlife by BLM, landowner's concerns, and public concerns, among others. BLM has not taken any of these factors, such as herd objectives versus carrying capacity, into consideration in its analysis.

In the third paragraph, BLM makes the following subjective statement: "Despite acclimation and re-occupation, it is generally assumed that overall the increased human footprint on a previously lightly developed area is detrimental to big game species." DEIS at 4-94. BLM should either provide objective support for this statement or remove it from the DEIS.

The final paragraph in this subheading (Impacts to Hunting) concludes with general statements regarding impacts to hunters. BLM has wholly failed to address what impacts, if any, have occurred to date as a result of the drilling conducted during the preparation of the EIS.

BLM's discussion of the impacts to hunting and recreation from the Proposed Action concludes with the statement that the "impacts would be significant." Again, given that the unreclaimed acreage would never be greater than 7% of the total area, it is difficult to understand how BLM reached this conclusion.

Recommendation: BLM should revise this discussion to address the issues noted above.

4.9.3.3 Alternative B

In assessing the potential impacts to hunting and recreation, BLM makes a number of statements that are unsupported by any analysis in the document. For example, in the third paragraph, BLM asserts the impacts to hunting and wildlife viewing would be significant. DEIS at 4-97. In addition to failing to provide any quantitative analysis to support this assertion, BLM has failed to account for the acreage amounts that would be affected, which as previously noted would be less than 7% of the total area. BLM's statement in the fourth paragraph is wholly unsupported by any analysis.

Recommendation: BLM should revise this discussion to address the issues noted above.

4.9.3.4 Alternative C – Spatial or "Layer" Alternative

BLM again asserts that a total of 2,000 new natural gas wells would be drilled and developed under this alternative during the next 20 years. DEIS at 4-97. BLM does note

that "...development would be constrained in areas that have critical resource concerns," but fails to make any attempt to quantify the effect on drilling.

607-108-1 607-108-2 607-108-3 607-108-4 607-108-5

607-108

In the third paragraph in this section, BLM states: "As the figure shows [Appendix M: Locations of Successful Hunts], the hunter success is concentrated in five general areas, all of which fall within the boundaries of WGFD game management unit (GMU) 82, one of the most heavily hunted areas in the state." There are a number of issues with respect to this statement. First, the figure in Appendix M does not provide the boundaries of GMU 82 – it instead depicts successful hunts on an overlay of the Atlantic Rim EIS area. The aerial extent of GMU-82 is not depicted. We note that according to this figure, a number of the successful hunts occurred on the western edge or outside of the study area. Finally, as noted previously, BLM has failed to provide any objective evidence to support its claim that this area is one of the most heavily hunted in the state.

Recommendation: First, BLM needs to revise this section to explain how the surface use restrictions proposed such as, surface disturbance limits (20 acres/square mile) and slope restrictions (Muddy Creek/Grizzly SMA 8% slope restriction), would still allow for 2,000 wells to be developed over the next 20 years. As noted previously, according to Anadarko's calculations, the number of wells would be diminished by at least 50%. Second, BLM should revise the third paragraph to either remove the subjective statements or provide citations to objective sources to support such conclusions.

607-109

4.9.4 Mitigation Measures

In this section, BLM states: "The mitigations may include habitat enhancements in nearby undeveloped areas to compensate for degradation of habitat in the ARPA, and other measures as discussed in Section 4.7 Wildlife." DEIS at 4-99. It appears BLM intends to require off-site mitigation. However, we note that under BLM's guidance, it can not do so. See IM 2005-069 "Interim Offsite Compensatory Mitigation for Oil, Gas, Geothermal and Energy Rights-of-Way Authorizations." In this policy document, BLM states; "*The BLM will approach compensatory mitigation on an "as appropriate" basis where it can be performed onsite and on a voluntary basis where it is performed offsite. Further, this IM is not intended to establish an equivalency of mitigation policy by the BLM (i.e. acre for acre).*" Based on our reading of this policy, Anadarko believes any decision with respect to off-site mitigation rests with the operator and would be included as part of a proposed action.

Recommendation: BLM should revise this discussion in light of the applicable policy document.

4.10 VISUAL RESOURCES

607-110

4.10.1 Introduction

We note that in the first paragraph of this section, it appears BLM has miscalculated the percentage of the total area covered by existing disturbance. BLM states 604 out of a

607-110 total of 270,000[4] total acres are unreclaimed and equates this to 0.2% of the total area – it should be 0.002%. DEIS at 4-99.

4.10.3.1 Direct and Indirect Impacts – Proposed Action

Again, we note BLM has failed to put these acreage figures in the context of the percentage of the total area that would be affected. If it did so, it would be clear that less than 3% (6,000 acres out of a total of 270,080 acres) of the total area would remain disturbed throughout the life of the project. DEIS at 4-101.

607-111-1 607-111 607-111-2 In discussing the potential impacts of the Proposed Action on visual resources, BLM makes the following statements: "The adverse effects of visual contrast introduced by the Proposed Action are somewhat moderated by the VRM Class III rating of the viewshed, which allows for development so long as it does not dominate the view of the casual observer. Among users of the ARPA, hunters, sightseers and wildlife observers would likely be sensitive to the visual impacts of development." DEIS at 4-103. The second sentence does not follow from the first, and the second sentence is not supported by any objective information.

On page 4-104, BLM makes a number of conclusions with respect to the impacts on visual resources from the Proposed Action. From our review of the information presented in the DEIS, none of the statements are supportable. It appears BLM is judging potential impacts based on a category of individuals BLM has classified as "sensitive."

Recommendation: BLM should revise this section to address the concerns noted above.

4.10.4 Monitoring and Mitigation Measures

607-112 In the second paragraph in this section, BLM asserts that "operator-committed mitigation measures would not be sufficient to prevent the Proposed Action or alternative B from exceeding VRM Class III management objectives." DEIS at 4-106. BLM has failed to identify what those measures are and why they would not be sufficient.

Recommendation: BLM should either remove this statement or provide an explanation for its conclusion.

4.11 Cultural Resources

607-113 4.11.1 Introduction

In the third paragraph in this subsection BLM states the Rawlins to Bagg road is a historic trail. DEIS at 4-108. We note that neither this road nor the Cherokee Trail is a congressionally designated historic trail. We also note the last paragraph in this

[4] We note that this number should be 270,080.

607-113

subsection contains an unfinished sentence: "The acres surrounding trails and associated Trail for the purpose of view shed consideration…." DEIS at 4-108-109.

Recommendation: BLM should revise this discussion to note the identified roads are not congressionally designated historic trails. In addition, BLM should complete the unfinished sentence.

607-114-2 607-114-1 607-114-3 607-114

4.11.3.1 Direct and Indirect Impacts Proposed Action

In the first paragraph in this subsection BLM asserts 32% of the 126 historic sites "could be expected to be eligible for the [National Register of Historic Places]." DEIS at 4-110. However, BLM has failed to explain how it reached the 32% figure. This discussion also fails to take into account the possible beneficial effects to cultural resources that in a similar fashion to fossils, an important archeological discovery could be brought to light.

Recommendation: BLM should provide an explanation as to how it determined 32% of the sites might be eligible and should also revise the discussion to address potential beneficial impacts.

607-115

4.11.5 Additional Mitigation Measures

We note that the measures listed under the Proposed Action are identical to those listed under those common to all alternatives. DEIS at 4-111. Besides being confusing, it appears to be unnecessarily duplicative. BLM could simply state there are no additional measures beyond those that would be applied under all alternatives.

Recommendation: BLM should review this section in light of these comments and revise appropriately.

607-116

Further on in this section, BLM proposes to: "Limit trail crossings to existing disturbance corridors." DEIS at 4-111. Under the Rawlins RMP a trail management objective is stated as; "To stabilize and protect **significant sites and segments** along the Overland Trail, the Cherokee Trail, and the Rawlins-Fort Washakie Trail." (emphasis added). Limiting trail crossings to existing disturbance corridors fails to consider the fact that not all sections of the trails are significant (i.e. contributing to trail eligibility as defined by the National Historic Preservation Act); therefore, additional trail crossing should be allowed in those area that are not eligible for protection under the National Historic Preservation Act.

Recommendation: Additional trail crossings should be allowed along those segments that have been determined to be non-contributing.

607-117-1 607-117 607-117-2

Anadarko is also concerned with BLM's proposed mitigation that would require the operator to: "Surface all roads with gravel compatible with the local environment." DEIS at 4-112. This requirement does not appear to be well thought out or researched. Anadarko is unable to identify in the document BLM's analysis addressing the availability of gravel resources that may or may not be "compatible" in color with the local environment. Depending on where gravel of this nature is available, it could result

607-117-2 607-117-3 607-117

in increased traffic throughout the project area. Moreover, BLM needs to assess the potential economic impacts associated with this requirement.

Recommendation: BLM needs to address the availability of gravel to meet this requirement, and whether a lack of locally available sources would increase traffic, costs and manpower.

4.12 SOCIOECONOMICS

4.12.3 Direct and Indirect Impacts

4.12.3.1 Proposed Action

607-118

In the Socioeconomic discussion regarding drilling and field development BLM states that: "These rigs would be operating more or less continuously during the six-month drilling season." DEIS at 4-114. This is not an accurate statement given the overlapping seasonal wildlife restrictions that will be applied under any of the alternatives. Imposition of timing stipulations on federal land authorization to access fee minerals will also restrict access to fee minerals that would otherwise be available for year-round drilling. Anadarko's Exhibit B depicts the drilling windows and the percentage of land affect by such timing stipulations. There are virtually no lands within the study area on which there would be a six month drilling season.

Recommendation: BLM must clarify that industry will not be provided a 6 month drilling window.

607-119

4.12.3.1.1 Economic Effects

The last sentence in the second paragraph in this subsection asserts that the potentially positive economic benefits of the Proposed Action "could be reduced in magnitude by the Proposed Action-related reductions in other economic sectors." First, we are not clear as to the intent of this statement, and second, BLM has failed to provide any information substantiating this claim. DEIS at 4-115.

607-120

4.12.3.1.7 Local Attitudes, Opinion and Lifestyles

In this discussion, BLM again cites to the 1996 resident survey. As noted in our comments on this topic in Chapter 3, we believe BLM's reliance on this 1996 survey is misplaced. Anadarko's survey, completed this year, paints a vastly different picture. In addition, it appears BLM is citing conversations with three ranchers as the sole support for the statements in the sixth paragraph in this subsection. DEIS at 4-135. Although the opinions of these three may support BLM's statements, BLM should also provide the opinions of others to present a balanced and objective analysis.

Recommendation: BLM should revise this section as noted above.

4.12.3.2.1 Alternative A – No Action Economic Effects

607-121

The whole discussion comprises one sentence and states: "Implementation of this alternative would not generate incremental economic benefits to leaseholders, area residents, governmental agencies, or surface or sub-surface mineral owners." DEIS at 4-137. BLM has failed to even minimally quantify the potential economic effects of this alternative in terms of loss revenues to both federal and state governments and mineral owners, let alone others who would potentially benefit economically were the Proposed Action implemented and who would be detrimentally affected by the no action alternative.

Recommendation: BLM should revise this section to quantify the potentially negative economic effects of this alternative.

4.12.3.3 Alternative B

4.12.3.3.1 Impacts to Leaseholders

607-122-3 607-122-2 607-122-1

607-122

This discussion fails to consider the possibility of takings arguments based on a denial of lease rights and any of the financial impacts of this option on the lessees in terms of delayed revenues. In the third paragraph, it states: "Delayed revenue from the inactive area could possibly be off-set by increased revenue from the actively developed areas for royalties and taxes for governmental authorities, and possibly by leaseholders who have leases in both zones." BLM has provided no justification for this statement, and we are at a loss as to how BLM reached this conclusion. Anadarko's delayed revenue is not going to be offset by royalties – Anadarko does not receive royalties as the lessee. BLM then proceeds to state that drainage in the inactive zones would be viewed as lost revenue to the lessees and BLM, however; BLM fails to quantify these amounts in any manner.

4.12.3.4 Alternative C

607-123

We again note BLM asserts the pace and level of drilling would be the same as under the Proposed Action. As discussed previously, we fail to understand how BLM reached this conclusion in light of the numerous timing and spatial restrictions BLM proposes to implement under this alternative. DEIS at 4-141.

4.12.3.4.1.1 Impacts to Leaseholders

607-124

Again, BLM has wholly failed to assess the potential financial impact to lessees in terms of their ability to develop the resources and the increased costs associated with the proposed mitigation measures.

Recommendation: BLM should revise this discussion to quantify the effects to both operators (in terms of increased operating costs and loss revenues) and federal and state governments (in terms of loss revenues).

Chapter 5 Cumulative Impact Analysis

5.2 Past, Existing and Reasonably Foreseeable Future Activity

5.2.1.1 Disturbance within the Atlantic Rim Project Area

607-125

In this subsection, BLM makes a number of assertions with respect to the disturbance associated with Alternative C; however, BLM fails to explain how it reached the figures presented. For example, BLM states: "Under Alternative C construction disturbance would be approximately half of the proposed action or 7,900 acres for 2.9% of the Project area." DEIS at 5-2. BLM makes this statement despite its numerous previous statements that the pace and level of drilling under this alternative would be the same as the Proposed Action. In addition, BLM states reclamation would reduce disturbance under Alternative C to about 3,900 acres or 1.4 percent of the study area. *Id.* Again, we are unable to determine how BLM calculated these figures.

Recommendation: BLM should revise this discussion to clearly explain the assumptions it used to reach these figures.

5.3.7.1 Big Game

607-126

In the subparagraph discussing pronghorn antelope, BLM states that is has assumed "most if not all of the Baggs herd transition range is located within the ARPA." DEIS at 5-15. We are unclear why BLM has made this assumption. It would seem that BLM could affirmatively determine this information by reference to the Wyoming Game and Fish Department. If the information is truly unascertainable, BLM should so state and then provide its reasoning for any assumptions made.

Recommendation: Revise this subparagraph to address the issue noted above.

Appendix B Atlantic Rim Natural Gas Project Reclamation Plan

607-127-1

607-127-2

607-127-3

607-127

In general, Anadarko believes many of the provisions in the Reclamation Plan are either too restrictive, unnecessary or overly protective given the natural conditions, such as droughts, that could affect reclamation. In addition, many of the measures are so prescriptive as to leave little room for use of innovative reclamation and restoration practices. This is especially problematic in light of BLM's numerous statements in the body of the DEIS asserting that lessons learned in previous phases would be employed in subsequent phases. Rather than setting forth prescriptive measures, Anadarko believes BLM should set performance based reclamation measures and thereby allow the operators to determine how best to achieve the stated goals.

1.0 Introduction

On page B-1: BLM cites the "Wyoming Department of Environmental Quality, Land Quality Division (WDEQ-LQD) reclamation guidelines" as one of the elements on which it based the reclamation plan. Although Anadarko supports effective reclamation

practices, no aspects of the proposed action would be governed by the WDEQ-LQD. Therefore, Anadarko questions the applicability of the guidelines in this context. For the most part, the WDEQ-LQD guidelines are designed to address mining reclamation issues which are commonly characterized by extensive disturbances covering a multitude of vegetative and soil type. This is in contrast to oil and gas disturbance activities that are in some respects localized in nature. Therefore, native seed sources and vegetation references are often found in close proximity to the area disturbed.

607-128-1

Recommendation: BLM should review and eliminate those portions of the reclamation plan that are based on the WDEQ-LQD guidelines which are more suitable for large scale mining type reclamation activities.

607-128

607-128-2

On page B-1: BLM states that the content of activity plans should include; "monitoring for salt and sediment loading . . ." Although this requirement is consistent with the Great Divide RMP management direction, it is unclear who is responsible for design and funding of the monitoring program.

Recommendation: BLM must clarify the extent, design and responsible party for the monitoring program.

3.0 Performance Standards

On page B-4: The fifth year reclamation standard states that the "total vegetative cover will be at least 80 percent of predisturbance vegetal cover as measured along the reference transect for establishing baseline conditions." Anadarko would like to bring to BLM's attention inconsistencies among BLM offices regarding this provision. For instance, the Jonah Infill Drilling Project (JIDP) requires 80 percent cover after an eight year time period. Additionally, the JIDP relies upon a more cost efficient monitoring plan which employs field notes and color photographs. The reclamation plan for the JIDP states: "Monitoring would be largely qualitative because it is reasonably accurate to document the condition of a site in the field with a few basic notes and color photographs."

607-129-1

Recommendation: BLM's reliance upon extensive baseline monitoring via use of establishing transects should be eliminated in favor of a more efficient and effective approach similar to that in the JIDP FEIS. Moreover, this would provide for consistency among the BLM offices.

607-129

607-129-2

On page B-2 in the fifth paragraph, BLM prioritizes mitigation measures with regard to effects on wetlands; however, BLM has failed to include the State of Wyoming (Title 35-11-308) requirements for wetland mitigation.

Recommendation: Mitigation of wetlands must be consistent with the Wyoming Wetlands Act.

Appendix E - Wildlife and Monitoring Protection Plan

607-130-2 607-130-1 607-130-3

Anadarko is concerned with the open-ended nature of Plan. For instance, there is no definitive timeframe at which the operators the elements of the plan would expire. Additionally, further clarity is needed on what share of the cost each party would be responsible for and what entities will participate in the meetings to identify future needs. Finally, the mitigation measures identified in the Plan must be consistent those identified in Chapter 4.

607-130-4 607-130-5 607-130-6 607-130

Page E-8; In order to protect raptors BLM states that; "All surface-disturbing activities will be restricted from February 1 through September 15 within a .75 to 1.0 mile radius of raptor nests, depending upon species." The Rawlins RMP states: "To protect important raptor and/or sage and sharp-tailed grouse nesting habitat, activities or surface use will not be allowed from February 1 to July 31 within certain areas encompassed by the authorization. The same criteria apply to defined raptor and game bird winter concentration areas from November 15 to April 30. Application of this limitation to operations and maintenance of a developed project must be based on environmental analysis of the operational or production aspects." BLM's proposal to lengthen the raptor seasonal stipulation is not consistent with the approved RMP and therefore should not be included in this document.

Recommendation: Replace the verbiage regarding seasonal raptor restrictions with that from the Rawlins RMP. Furthermore, BLM elects to impose the February 1 through September 15 seasonal restriction sufficient scientific data must be presented to justify the need.

2.1.1 Annual Reports and Meetings

607-131

In this section, BLM states that reports will be issued to all potentially affected individuals and groups. Appendix E at E-2. We are unsure as to which "groups" BLM would include. BLM should clarify the distribution list for such reports in the final document.

Appendix G - Biological Assessment

8.0 Determination of Effects for Listed Species

607-132

In the second paragraph of this subsection, there appear to be some mistakes regarding the potential effect. The second paragraph states: "The Colorado pikeminnow, bonytail, humpback chub, and razorback sucker do not occur on the ARPA and the minimal water depletions to the Colorado River system that may occur would impact these species. Therefore, it is concluded that implementation of the action alternatives is **likely to adversely affect** these fish species." DEIS at G-19 (emphasis in the original). Given that these species do not occur in the study area and the water depletions would be minimal, it is difficult to understand how these species would be adversely affected.

Recommendation: BLM should review this paragraph to determine whether the word "not" should be inserted between the words "would" and "impact" in the first sentence,

607-132 and whether the word "not" should be inserted between "is" and "likely" in the second sentence. If BLM does not believe these changes should be made, it should explain its rationale.

Appendix L – Resource Concerns and Associated Protection Meausres [sic] Proposed Under Alternative C

607-133 Anadarko has reviewed this table and has provided its comments on each of the proposed mitigation measures in the table attached and hereby incorporated as Exhibit M.

We also note that Anadarko actively participates in the South Central Greater Sage-Grouse Local Working Group and the Western Association of Fish and Wildlife Agencies (WAFWA) forum for developing a local and range-wide conservation groups that are dedicated to conservation efforts for sage-grouse. Anadarko will continue to participate in these and other similar efforts and believes such groups will be better able to address the resources of concern, such as the sage-grouse.

Appendix M

607-134 Page M-48; This map is entitled "Grouse Critical Wintering Area". In Chapter 2 (page 3-73) two types of winter related habitat for sage-grouse are referenced (i.e. "winter concentration areas" and "severe winter relief habitat").

Recommendation: BLM should revise the map title to achieve consistency with text in document.

Air Quality Technical Support Document

2.0 Emissions Inventory

2.1 Atlantic Rim Project Emissions

607-135 The first sentence states: "The Proposed Action includes the development of up to 2,000 gas wells spaced at approximately 1 well pad site every 160 acres." The air quality modeling was conducted by developing a series of area sources representing the potential emissions of 2,000 wells and these wells were spread equally across the modeling domain. This method effectively estimates far field impacts without a designated well spacing.

Recommendation: The reference to 160 acre spacing should be removed.

Table 2.2

The table on page 18 represents the emissions associated with a traditional gas well as 10.3 tons per year toluene as well as total hazardous air pollutant (HAP) emissions in

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excess of 25 tons per year. Conventional wells rarely have this level of potential emissions, and this level would trigger additional controls by the WDEQ-AQD.

Recommendation: The table should be revised to more adequately describe the fact that these numbers represent a "worst-case" scenario.

Conclusion

Anadarko believes the above comments demonstrate the only reasonable alternative that meets the purpose and need of the project is the Proposed Action. Therefore, Anadarko strongly urges BLM to adopt the Proposed Action instead of its Preferred Alternative, which is not feasible and wholly fails to meet the purpose and need of the project.

Should you have any questions regarding Anadarko's comments, please call the undersigned.

Sincerely,

Tom Clayson

cc: Mark Storzer