November 15, 2013

VIA EMAIL AND UPS OVERNIGHT

Ms. Erin Jones
Bureau of Land Management
BLM Northwest District Office
2815 H Road
Grand Junction, CO 81506

RE: *Notice of Availability of the Northwest Colorado Greater Sage-Grouse Draft Resource Management Plan Amendment and Draft Environmental Impact Statement for the Northwest Colorado District*, 78 Fed. Reg. 50088 (August 16, 2013)

Dear Ms. Jones:

Anadarko Petroleum Corporation ("Anadarko") appreciates the opportunity to submit these comments on the Bureau of Land Management's ("BLM's") Amendment to the Draft Resource Management Plan and Environmental Impact Statement ("Amendment") for the Northwest Colorado District ("NWCOD") planning area, issued for public comment on August 16, 2013.[1] Anadarko respectfully requests the commercial, factual, and scientific information in this letter be considered by the BLM, included in the BLM administrative record, and utilized to revise the proposed Amendment.

Anadarko is among the world's largest independent oil and natural gas exploration and production companies. With nearly 25,000 wells operated in the U.S., Anadarko holds fee ownership of mineral rights under nearly eight million net leasehold acres, with holdings within the BLM's NWCOD planning area. Anadarko is especially interested in and affected by additional restrictions, stipulations, or prescriptive management actions adopted through the NWCOD Amendment that may affect Anadarko's ability to develop current and future mineral and lease interests.

With the objective of providing pertinent information to aid the BLM in its development of a Final RMP, Anadarko analyzed the best available scientific, commercial, and factual information that directly relates to the proposal included in the Amendment. This analysis is presented below in general comments, followed by specific comments.

I. INTRODUCTION

Anadarko supports sustainable development and Best Management Practices ("BMPs") to insure long-term viability of cultural, wildlife, visual, and other important resources. Anadarko does not however support the development of unnecessary mitigation measures for

[1] 78 Fed. Reg. 50088 (August 16, 2013).

the greater sage-grouse (*Centrocercus urophasianus*) that are not based on the best scientific information available and are impracticable and unworkable.

Current scientific information discussed herein establishes that sage-grouse populations in the NWCOD planning area are not at as great a risk as once considered to be. This updated and crucial information must be incorporated in to the planning decisions and proposed mitigation of the Amendment.

The BLM is obligated to manage lands for multi-use. 43 C.F.R. § 1732(a)-(b). This obligation must be reflected in the Amendment. In balancing multiple uses, the BLM should not require conservation measures that are unsupported by science and that unnecessarily infringe on leaseholder rights. Anadarko requests that the BLM reconsider the sage-grouse measures set out in the Amendment at Appendix E (page E-1), among others, in light of the scientific information contained in these comments and the practical and economic implications of imposing mitigation measures not supported by scientific data.[2]

As currently drafted, the conservation and mitigation measures proposed in the Amendment are overly prescriptive and are not supported by science. Specifically, Anadarko offers the following comments, discussed in greater detail throughout this document:

1. The BLM must consider data that shows sage-grouse populations are no longer declining as suggested by earlier literature;
2. Oil and gas impacts to sage-grouse range-wide are over-estimated in the Amendment which does not adequately account for the shift in oil and gas technology and the corresponding reduction in impacts afforded by those changes to sage-grouse;
3. Anadarko requests that the BLM amend the exception-request process to expressly allow for a programmatic process for reasonable access.

II. GENERAL COMMENTS

A. General Comment 1: The BLM Must Consider Data That Demonstrate Sage-Grouse Populations Are No Longer Declining As Suggested By Earlier Literature.

Review of available lek count data and historical hunting harvest rates indicate sage-grouse populations are stabilizing and, in fact, are likely to increase in the future without further restriction on oil and gas activity and development. This is due to a combination of factors including: (1) BMPs used by the oil and gas industry and (2) changes in the management of hunter harvest rates as implemented since the mid-1990s. Studies[3] predicting future decreasing population trends are demonstrably flawed and fail to account for historical hunting harvest data. The BLM must recommend land management practices not on past flawed data, but on current more accurate data as presented herein.

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[2] Increased costs and reduced access to oil and gas resources result in reduced tax revenue to state and Federal governments.
[3] Garton et al. (2011).

1. Reduced Hunting Harvest Rates Correlate with Increasing Sage-Grouse Populations

Historical sage-grouse populations have been affected by a number of factors, including hunting. A reduction in hunting pressure in the mid-1990s correlates with stable to increasing sage-grouse populations since that time. **Figure 1** shows historical population trends within the Wyoming Basin Management Zone (SMZ), which encompasses the majority of the NWCOD. The "rate of population change" fundamentally shifted around 1995 for not only the Wyoming Basin SMZ but also for each of the six additional SMZs that encompass the entire range of the sage-grouse. Of note, hunting regulations also changed in 1995 for some portions of the range, including Wyoming, which limited hunter harvest rates, altered season dates, and lowered overall hunter participation.

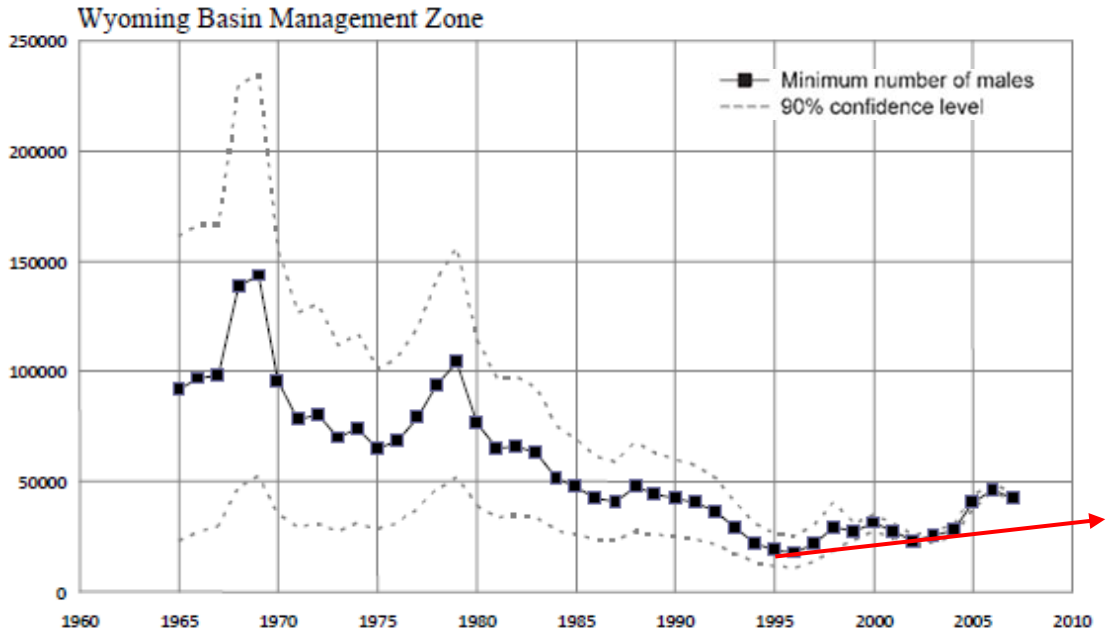

FIGURE 1. Wyoming Basin SMZ Population estimates (minimum number of males) (from Garton et al. 2011)

Historical sage-grouse data identified that decline rates correlate with periods of potential overhunting as shown in **Figure 2.** Unfortunately upon a survey of scientific literature on sage-grouse populations this information appears to have been overlooked and not taken into consideration in projecting future populations. **Figure 2** represents the U.S. Fish and Wildlife Services (FWS) hunting harvest data and breeding population estimates as derived from Garton et al. (2011). Harvest as a percentage of reconstructed population estimates is also shown on the secondary y-axis.

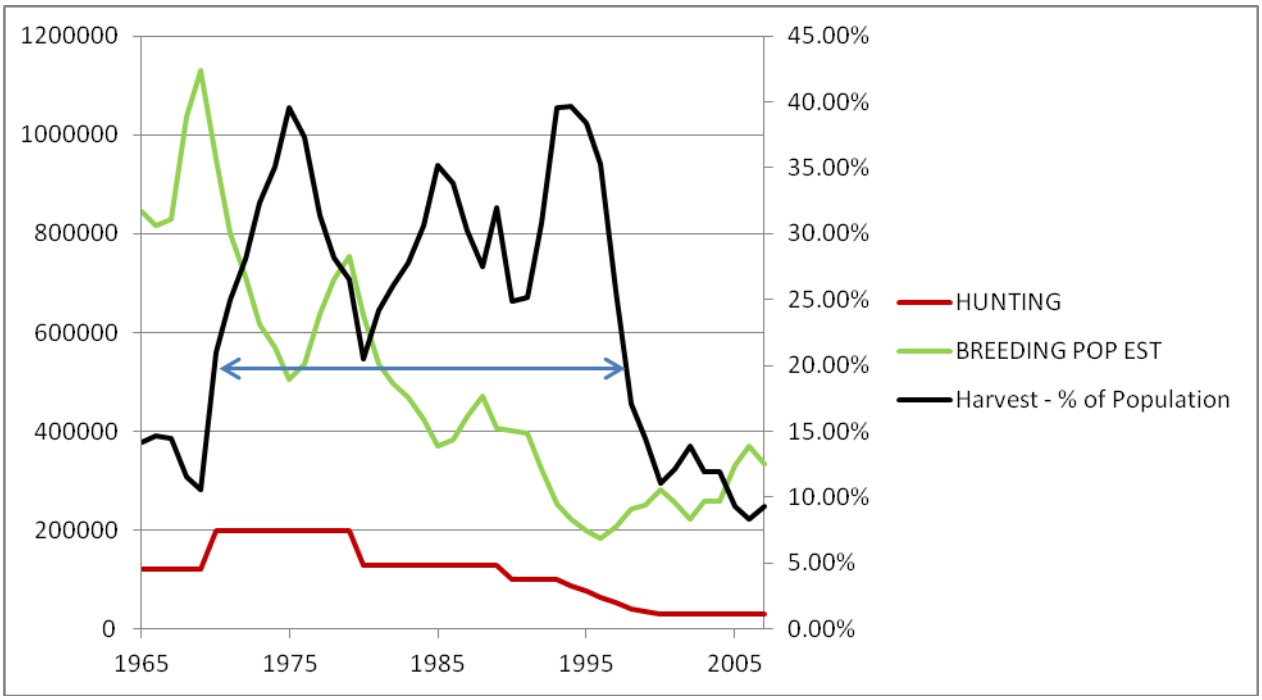

FIGURE 2 – Sage-Grouse Populations Versus Hunting Harvests Rates (Developed by inspection and compilation of graphical data presented by Garton et al. (2011) in combination with their assumption of 2.5 female sage-grouse per male)

This information shows that fall harvest rates appear to have exceeded 20 percent of the overall spring population for approximately 25 years from 1970 thru 1995. Since the late 1990s, fall harvest rates as a percentage of the overall spring population have fallen below 15 percent for the first time since 1970, indicating an upward trend in population from reduction in hunting. Best available scientific data suggests an ongoing decrease in the harvest rate that is deemed acceptable from 30 percent in 1981 to 20 to 25 percent in 1987 to five to ten percent in 2000. (Reese and Connelly within Knick and Connelly, 2011, p. 110-111).[4]

Recent scientific data, as noted above, suggest that a harvest percentage of "perhaps five percent" <u>of the spring population</u> may be appropriate if state wildlife agencies "devise and implement survey protocols" to "be assured that hunter harvest would not likely exceed the threshold to become additive." This new information sharply contrasts the USFWS 2010 Listing Decision conclusions (which relied heavily on Garton et al. 2011 data) relied upon in the Amendment at 946 to identify future population projections. The Amendment at page 946

[4] "An appropriate harvest rate has not been determined for Greater Sage-Grouse populations. Harvest equal to 5-10% of the fall population may be appropriate but assumes detailed and specific knowledge of population size in September or October. Given the uncertainty in abundance estimates for breeding season population, expecting any state to adequately determine the size of any population of Greater Sage-grouse in fall is not realistic…Thus, harvest management should be based on spring populations size. Managers could propose harvest of a percentage of the spring breeding population estimate, perhaps 5%; devise and implement survey protocols to obtain breeding season population size (Reese and Bowyer 2007); and subsequently be assured that hunter harvest would not likely exceed the threshold to become additive."

notes that populations in the southern portions of Management Zones II and VII are less robust, with low lek connectivity and a 96 percent chance of declining below 200 males by 2037 (Garton et al. 2011; Knick and Hanser 2011)."

Anadarko comments that the BLM must consider the more recent scientific data as provided herein and not solely rely on Garton's conclusions when making management decisions. Forward looking projections based on this modeling are predicated upon an assumption of constancy and in review of the significant pressures of past overharvest and more recent temporal changes in species management, the ability to project forward population parameters is burdened by an inappropriate analysis that in its current form biases the foreseeable future to provide for a negative outcome. The fundamental nature of the modeling exercise and assumptions it is built upon demand caution in its utilization as a tool by which management decisions should be based.

Finally, taking historical hunting harvest rates into account, the trends forward from 1995 may represent the best scientifically available data from which to make persistence projections and encompass modern temporal changes in species management that promote more appropriate management of sage-grouse populations. As indicated above on **Figure 1** and **Figure 2**, this more recent data suggest that sage-grouse populations overall are relatively stable to increasing over this time period in the Wyoming Basin SMZ.

2. Historical Rate of Decline Modeling Is Inaccurate

Sage-grouse population modeling data relied upon in the Amendment is inaccurate, raising concerns that the management decisions based on the modeling is overly burdensome and unreasonable given the actual facts. For example the Amendment references USFWS conclusions based on modeled population estimates prepared by Garton et al. (2011) that directly contradict actual data. The Amendment further suggests that sage-grouse are threatened in some areas by wildfire, encroachment of native conifers, overstocking of domestic livestock, and both renewable and non-renewable energy development. *See* Amendment at 188. No data is provided to indicate that these threats - present in some parts of the overall sage-grouse range - are present and to what degree they are present in the NWCOD planning area. Such generalizations about threats do not meet the "hard look" requirements of NEPA. A geographical analysis of renewable energy footprints and other data should be added to the Amendment to support the conclusions therein. Connection of these data to population trends would indicate whether BLM assertions have merit. The BLM should use the most accurate and current data when developing mitigation measures that have significant impacts restricting other uses of public lands.

Table 1 below indicates r^2 values and annual time trends reported by Garton et al. (2011) for each of the seven SMZs. One important observation from the reported data is the low r^2 values for best-fit models selected by Garton. Each of the selected models has an r^2 value less than 0.5, indicating per the authors that *"Even the best stochastic growth models in our analyses did not explain 50% of the variation in annual rates of change."* The best stochastic model for the annual rates of change of the Colorado Plateau SMZ was a

Gompertz model, with an r^2 value of 0.298. The Gompertz model implies that sage-grouse populations in the Colorado Plateau SMZ will fluctuate around a carrying capacity of 244 males with ***no change through time*** (emphasis added) (Garton et al., 2011).

Table 1 – Garton et al. (2011) Modeling Results

Sage-grouse Management Zone	Gompertz Model r^2 value	Declining time trend per year	2007 Lek count data	2007 modeled lek count	2037 modeled lek count	2107 modeled lek count
Great Plains	0.203-0.315[a]	-2.9%	14, 814	9,579	3,974	510
Wyoming Basin	0.192	-3.5%	42,429	21,954	7,452	600
Southern Great Basin	0.333	-2.6%	6,851	12,165[c]	5,517[c]	872[c]
Snake River Plain	0.413	-2.6%	15,761	12,165	5,517	872
Northern Great Basin	0.240	-2.7%	6,925	5,529	2,413	349
Columbia Basin	0.193	See note[d]	315	192	103	9
Colorado Plateau	0.0246-0.298[b]	0%	241	244	244	244
		totals	87,336[e]	61,828	25,220	3,456

a - Both values are reported by Garton et al., one in the text and one in Table 15.12
b - Both values are reported by Garton et al., one in the text and one in Table 15.70
c - Page 340 of Knick and Connelly – values appear to have been incorrectly reported as they are identical to the Snake River Plain values. Supporting this assertion is the observation that this is the only SMZ where the modeled lek count value in 2007 is greater than the actual lek count value.
d - not reported but estimated as -3.5% based on 2037 and 2107 modeled lek values
e – totaled value does not match the value reported in the Garton et al. text of 88,816 males

Table 2 further demonstrates that sage-grouse population changes are not well-represented over the last two decades by a constant rate of decline curve. **Table 2** compares sage-grouse males counted at leks in 2007 versus the estimated number of males as predicted by the statistical modeling exercise.

Table 2 – Comparison of Actual versus Modeled Lek Counts

Sage-grouse Management Zone	2007 Actual Lek count data	2007 modeled lek count
Great Plains	14, 814	9,579
Wyoming Basin	42,429	21,954
Snake River Plain	15,761	12,165
Northern Great Basin	6,925	5,529
Columbia Basin	315	192
Colorado Plateau	241	244
Totals	80,405	49,663

a – the southern Great Basin is excluded from this analyses as the reported model value for 2007 is identical to the Snake River Plains value and appears to be a reporting error by Garton et al., 2011.

Illustrating the flaws of the Garton modeling that has been used to predict sage-grouse population viability, **Table 2** shows that the modeled lek count value for the Wyoming Basin SMZ is 21,954 male sage-grouse in 2007, when in reality the actual counted value in 2007 was 42,429 sage-grouse males – nearly twice as high as modeled.

Figure 3 illustrates actual data and modeled data for the Wyoming Basin breeding population (Note: the Wyoming Basin breeding population is a subset of the Wyoming Basin SMZ population and is highlighted in this analysis as it contains approximately 40 to 50 percent of the entire sage-grouse population range-wide). In this example, on the left, population projections are depicted from 2007 forward per Garton et al. (2011) assuming a starting population of approximately 21,000 male sage-grouse (approximately 73,500 total sage-grouse assuming 2.5 females per male bird counted) rather than an estimated population of nearly 40,000 male sage-grouse (or approximately 140,000 total grouse) based on lek count data as highlighted in the graphic on the right.

In summary, earlier scientific information based population predictions on a constant rate of decline that in retrospect is flawed. This constancy is represented in **Figure 3** above, where the log linear decline curve of negative 3.4 percent as suggested by Garton et al (2011) is employed to project forward populations, hardwiring the population to go to extinction levels in the future. If historical decline rates have not been constant, then future rates of annual decline cannot be based on an assumption of a constant rate of decline over the previous 42-year period. Garton et al. (2011) recognized this limitation when they noted "Forecasting future viability requires the assumption that future conditions will continue the same trajectory or trend observed in the past. We reiterated this assumption repeatedly in our presentation of results." The BLM has incorrectly relied on Garton et al. (2011) for modeled future population trends and fashioned mitigation measures to address supposed downward trends. With the information presented herein, the BLM should re-examine the necessary mitigation measures based on the updated information on sage-grouse populations.

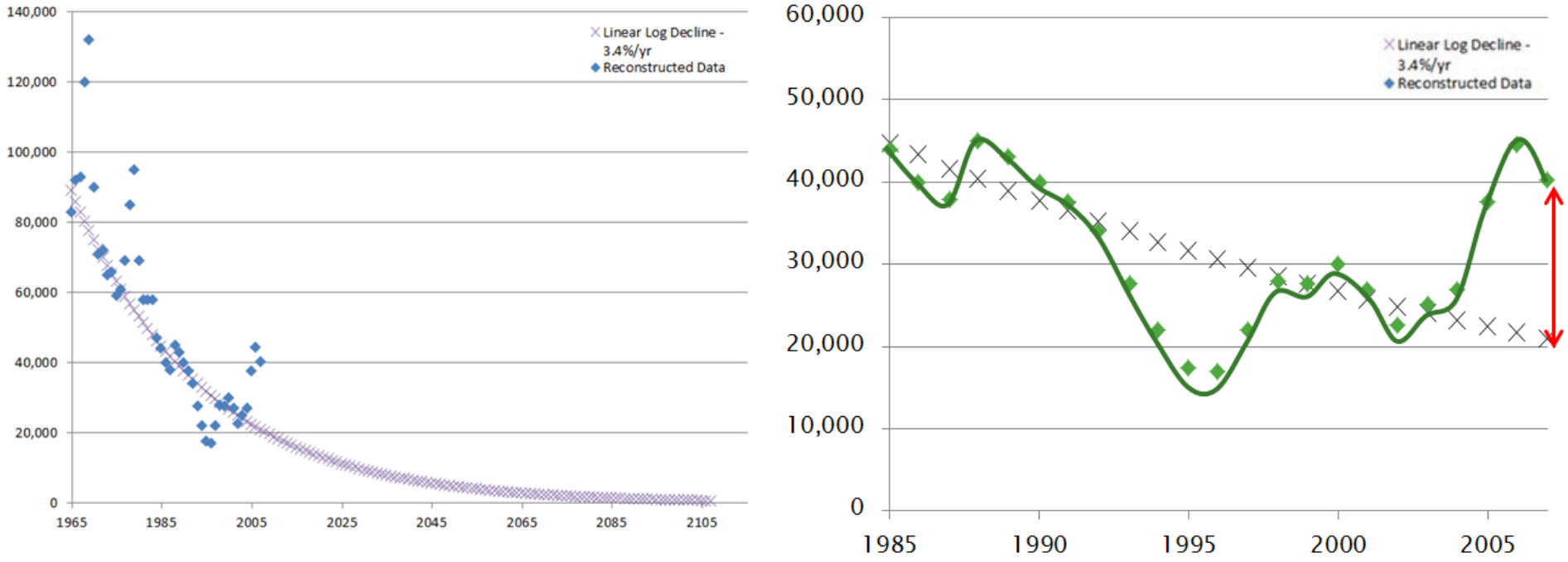

FIGURE 3 – Wyoming Basin Breeding Population (Minimum number of male sage-grouse by year). Left figure, Garton et al. 2011 modeled population projections forward in time; right figure, a zoomed in view of the time period 1985-2007.

B. General Comment 2: Oil and Gas Activities Must Be Considered Under the Lens of Today's Technologies in Use and Actual Development

1. Impacts to Sage-Grouse Will Be Reduced During Future Development Due To Technological Changes In How Reservoirs Are Targeted, Wells Are Drilled, And Field Operations Are Conducted.

Technological changes over the past ten years have dramatically shifted drilling technology from vertical well bores to directional and horizontal well bores, with the consequence that disturbance and fragmentation levels are declining at the same time that reservoir recovery rates are increasing.

This technological shift is reflected in **Figure 4** where oil and gas drilling permits issued in the State of Wyoming over the last decade are shown. **Figure 4** indicates that horizontal drilling permits have increased 40-fold over the last decade, while directional drilling permits have increased by a factor of eight. On the other hand, vertical well permits and completions have decreased by approximately 50 percent over that same time period. This step change although depicted for the State of Wyoming is directly applicable to Colorado and the rest of the United States.

Horizontal and directional drilling change the disturbance, fragmentation, and activity profiles associated with oil and gas development. A single horizontal well takes the place of eight to 16 vertical wells depending on spacing. Horizontal drilling requires an average initial disturbance of ten to 12 acres for the well pad and takes three to four months to construct, drill and complete. Conversely, each vertical well pad (deep drilling not coal bed natural gas (CBNG)) averages four to five acres and a vertical well takes one to two months to construct, drill and complete. A full section development with horizontal wells could be developed by one to two wells on one to two pads over the course of six to eight months with a total of ten to 24 acres of disturbance whereas vertical development of a section would require eight to 16 wells on eight to 16 pads over the course of eight to 32 months with a total disturbance of 32 to 80 acres. **Figure 5** conceptually displays the change in surface foot-print associated with directional/horizontal drilling.

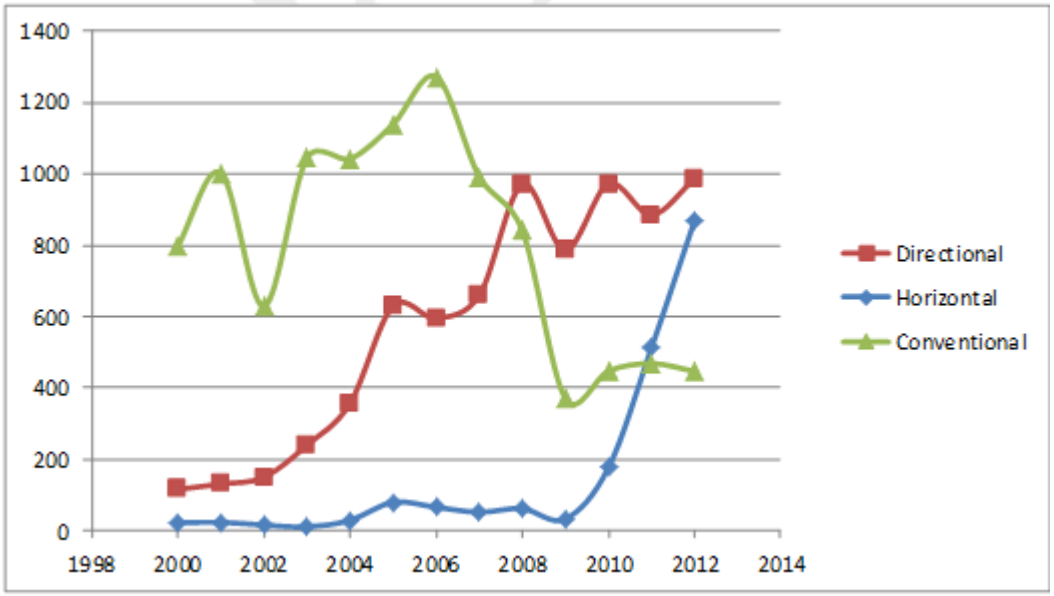

FIGURE 4. Wyoming Oil and Gas Conservation Commission Permits Issued

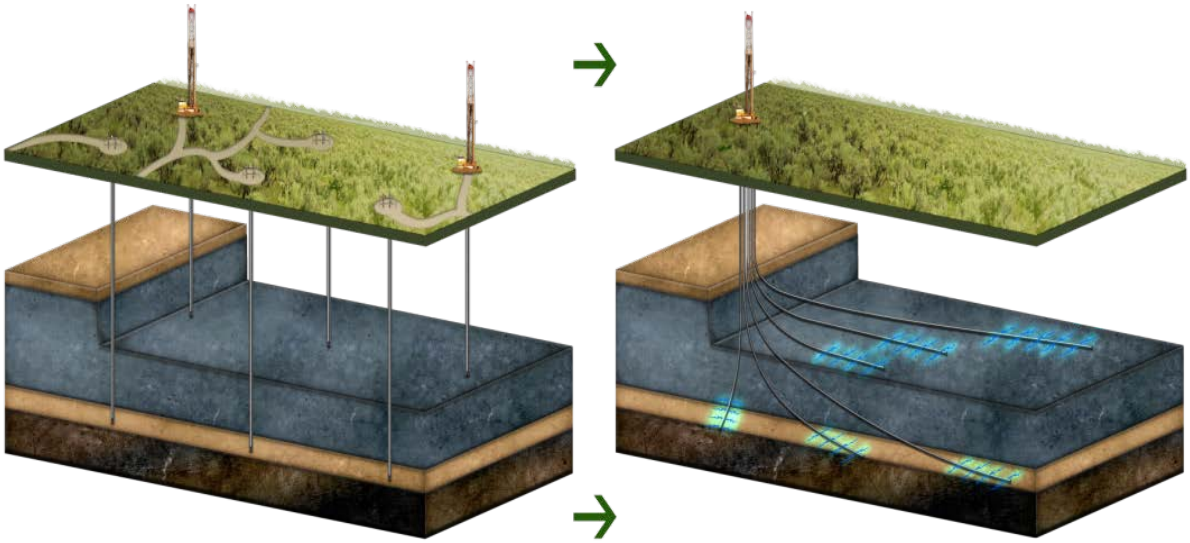

Figure 5 – Surface Footprint Comparison Vertical (left) versus Directional/Horizontal (right) Drilling (Not to scale)

More and more wells are now drilled directionally and horizontally, significantly decreasing surface use and associated impacts due to the ability to consolidate wells and associated infrastructure. Additionally, improved reclamation practices and reduction in oil and gas field traffic due to remote monitoring have also reduced oil and gas field impacts to wildlife but are not addressed herein. Future reasonable foreseeable development (RFD) forecasts and management decisions should recognize this step change in technology, and the lower impact afforded to species such as sage-grouse.

New directional drilling technologies are on the rise in Wyoming , suggesting that impacts to sage-grouse habitat can be reduced through partnering with oil and gas developers on

placement and timing of development. The increasing use of new technologies should be accounted for in the Amendment and mitigation measures should reflect its availability for deep oil and gas drilling.

C. General Comment 3: The RMP Must Maintain Management Flexibility to Continue to Utilize Exceptions for Seasonal and Other Restrictions and to Allow for Development of a Reasonable Access Program Combined with Enhanced Mitigation

The Amendment is a high level planning document that must maintain management flexibility to address multi-use of public lands. Anadarko recommends the Amendment incorporate the concept of and programmatic flexibility to develop enhanced sage-grouse mitigation coupled with expanded use authorizations ("Enhanced Mitigation/Expanded Use Authorizations"). Anadarko encourages the BLM to utilize the concepts provided in the recent draft BLM Regional Mitigation Policy in conjunction with ensuring reasonable access for energy development. *See* DRAFT - REGIONAL MITIGATION MANUAL SECTION – 1794 (IM No. 2013-142).[5]

Anadarko strongly encourages the BLM to incorporate in the RMP management objectives and directive that permit development of an Enhanced Mitigation/Expanded Use Authorizations Program. Such a program should be developed in coordination with the State of Colorado, promote the policy objective in the IM-2013-142, and seek input from stakeholders including industry. Tools that could be utilized in such a program could include:

- A biologically-based framework for mitigating impacts associated with a reasonable-access mitigation program that includes exceptions to wildlife timing stipulations.
- Allowance for the prioritization of potential mitigations sites. IM 2013-142. For example one idea could be to utilize a two-mile buffers within core areas
- Possibly structure mitigatory efforts within two-mile buffers around sage-grouse leks, consistent with the work by Doherty *et al*. (2010). This possible approach would provide tangible benefits to sagebrush steppe species at a regional landscape level.
- Possibly target restoration of habitats within the two-mile buffer around sage-grouse leks. Within these two-mile lek buffers, existing disturbance and fragmentation profiles could be mapped so that reclamation and enhancement efforts can be focused, monitored, and assessed. Consider case-by-case focused habitat improvements within two-mile lek buffers. This mitigation could be exchanged for timing stipulation exceptions granted by the BLM.

[5] The draft Manual provides: ***1.2 Objective.*** *The objectives of this policy are to provide guidance to the BLM on how to (1) develop Regional Mitigation Strategies, (2) incorporate regional mitigation into the land use planning process, and (3) identify and implement appropriate mitigation measures for particular land-use authorizations.*

- Areas targeted for habitat enhancement could include the two-mile lek buffers both in-and-outside of sage-grouse priority habitats.

- Possibly cover both federal and non-federal lands in accordance with the draft guidance to evaluate mitigation opportunities on both BLM and non-BLM-managed lands. IM 2013-142.

An Enhanced Mitigation/Expanded Use Authorizations Program would serve many benefits to both the sage grouse population while also ensuring reasonable access and multi-use activities. It could allow for a reduced need for non-priority sage-grouse timing stipulations which are often extremely costly and difficult for energy projects to effectively work around.[6] Therefore timing stipulations should not be applied as a default requirement, but considered in light of a program balancing both wildlife protections and industrial activities.

As it relates to the oil and gas industry, the ability to conduct coordinated and well planned operations during wildlife timing stipulations makes for faster, safer, less impactful and more efficient operations. An Enhanced Mitigation/Expanded Use Authorizations Program could allow operators to consistently apply techniques and practices, and to immediately implement lessons learned reducing cycle times and decreasing temporal impacts for the overall operation.

Anadarko welcomes the opportunity to meet with the BLM to further discuss and contribute to the development of such a program.

III. CONCLUSION

Thank you for the opportunity to comment on the NWCOD Draft RMP. Anadarko welcomes the opportunity to discuss the information presented herein in more detail as Anadarko believes such information is critical to making management decisions pertaining to oil and gas operations on federal land and the protection of sage-grouse. If you have any questions regarding these comments, please feel free to contact us.

[6] Wildlife stipulations present expansive challenges to the oil and gas industry such as: limited to drilling less than all of the wells on a multiple-well pad and has to return to the pad at a later date or construct additional pads; extended period of land disturbance; repeated movement of equipment on and off sites; reduced land use efficiency (additional pads are constructed rather than drilling on the same pad); limit of the economic viability of installing long-term infrastructure; and piecemeal infrastructure construction.

Best regards,

ANADARKO PETROLEUM CORPORATION

David Applegate
Regulatory Advisor

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Senior Regulatory Analyst

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