



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8**

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January 8, 2016

Ref: 8EPR-N

Karl Mendonca
BLM Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652

Re: Previously Issued Oil and Gas Leases in the White River National Forest Draft EIS
#20150326

Dear Mr. Mendonca:

The U.S. Environmental Protection Agency Region 8 has reviewed the Previously Issued Oil and Gas Leases in the White River National Forest (WRNF) Draft Environmental Impact Statement (Draft EIS) prepared by the Bureau of Land Management (BLM) Colorado River Valley Field Office (CRVFO). Our comments are provided for your consideration in accordance with our responsibilities under Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act (CAA).

Project Description

The Draft EIS has been prepared to document and disclose the environmental impacts of reaffirming, modifying, or cancelling 65 previously issued federal fluid mineral leases underlying WRNF lands. These leases were issued between 1995 and 2012, and are located in Mesa, Garfield, Pitkin, and Rio Blanco counties. The FS decision that made the 65 parcels considered in this Draft EIS available for oil and gas leasing was documented through the 1993 WRNF Oil and Gas Leasing Record of Decision and reaffirmed in the 2002 WRNF Plan. In 2007, in a challenge brought against the issuance of some of the 65 leases, the Interior Board of Land Appeals (IBLA) held that before including FS parcels in an oil and gas lease sale, the BLM must either formally adopt NEPA analysis completed by the FS or conduct a NEPA analysis of its own. In response, the BLM produced this EIS to reflect changes in laws, regulations, policies, and conditions since the 1993 EIS was finalized.

The Draft EIS analyzes the potential impacts of five alternatives using adjusted reasonably foreseeable development scenario estimates, including:

1. Alternative 1: Reaffirm all 65 leases (No Action)
2. Alternative 2: Reaffirm 57 leases and address lease inconsistencies on 8 leases
3. Alternative 3: Modify leases to match stipulations identified in the Proposed Action for the Final EIS for Future Oil and Gas Leasing on the WRNF (2014)
4. Alternative 4: Modify or cancel leases to match the stipulations and availability decisions of the Draft Record of Decision (ROD) for Future Oil and Gas Leasing on the WRNF (2014) (Proposed Action)
5. Alternative 5: Cancels all leases and plugs and abandons all existing wells

EPA's Comments and Recommendations

As a cooperating agency for this project, we've appreciated the opportunity to work closely with the BLM prior to the public release of the Draft EIS. Our comments on the Draft EIS focus on water resources, air resources, and greenhouse gas (GHG) emissions and climate change.

1) Water Resources

Identifying Underground Sources of Drinking or Usable Water

Figure 3.5-7 identifies the locations of existing groundwater wells. The document notes that the most productive aquifers in the leased zones are alluvial (valley) aquifers and that "bedrock aquifers are used less for water supply" (p. 3.5-17). It also identifies that "most, if not all, of the aquifers supplying drinking water are alluvial aquifers" (p. 4.5-13). It is not clear whether the Draft EIS is saying the few drinking water wells within the leased zones are primarily alluvial, or that wells in the entire basin are primarily alluvial. We note that URS (2006)¹ demonstrates a majority of domestic wells in the region at the time of publication were non-alluvial Wasatch formation wells (48 alluvial; 388 Wasatch). Additionally, Papadopulos (2008)¹ states that a "large majority of water supply wells are completed in the Lower Tertiary Wasatch Formation." With these studies in mind, regionally, it appears that a significant portion of domestic wells rely on bedrock aquifers. Please provide clarification regarding groundwater sources for wells within the leased zones.

The Draft EIS Chapter 3.5 (p. 3.5-21) states that for total dissolved solids (TDS), "Seventy percent of the samples [in the Thomas and McMahon 2012 report¹] exceeded the USEPA secondary drinking water standard of 500 mg/L." However, it is not the secondary drinking water standard that defines the TDS threshold for identifying potentially usable aquifers. The Safe Water Drinking Act (SWDA) identifies Underground Sources of Drinking Water (USDWs) as those aquifers with TDS concentrations below 10,000 mg/L. Only nine of the groundwater samples included in the Thomas and McMahon 2012^[1] compilation exceeded 10,000 mg/L, and therefore the vast majority of the sampled wells appear to meet the TDS portion of the SDWA definition as potential USDWs. USDWs are subject to protection under the SDWA unless an aquifer exemption has been granted. Consistent with the SDWA, usable waters are defined by Onshore Order No. 2 as "those waters containing up to 10,000 ppm [mg/L] of total dissolved solids," which must be reported, protected and/or isolated under Onshore Order No. 2. Usable waters and geothermal resources need to be known to determine casing and plugging and abandonment (P&A) requirements. Table 3.5-3 (p. 3.5-18) identifies formations, geologic composition, hydrologic unit, and well yield of hydrologic units in the Piceance Basin. We recommend including water quality data (TDS range, at a minimum) in this table for each aquifer, identifying which aquifers qualify as potential USDWs under the Safe Water Drinking Act (i.e. those with TDS \leq 10,000 mg/L).

The Draft EIS quotes the 2014 WRNF Oil and Gas Leasing Final EIS/Draft ROD, identifying that "Where specific groundwater resources exist... Disposal of wastewater into the subsurface will not be allowed." We recommend including a map identifying the location of known groundwater resources in the Final EIS.

^[1] http://www.blm.gov/style/medialib/blm/co/field_offices/crvfo/white_river_eis/draft_eis.Par.66643.File.dat/6.0_References.pdf

Identifying Potential Geologic Structural Influence

Understanding the geologic setting is important because geologic structures and active faults may be more likely to lead to groundwater communication with deeper fluids. This is especially true if an active fault is oblique to existing natural fractures/structures, conjugate fracture sets exist, or a high fracture density exists. Thyne (2008)¹, McMahon and others (2010)¹, and the Draft EIS (p. 3.5-18) correlate potential for groundwater communication through natural fractures, even when a confining unit (i.e. Mahogany Oil Shale) exists. Thyne (2008) states “The locations of the most affected [wells] are near structural features where the faults and fractures maximize the vertical mobility of the gas,” and that “the trend and location of chloride, which is derived from Williams Fork production water shows similar trends of increasing concentration and locations near structural features.” Thyne further states that “most problem wells... [are] coincident with the Divide Creek Anticline” and that “increased fracturing near the anticline... may affect water resources.” Divide Creek and Wolf Creek Anticlines are underlain by deep-seated thrust faults that extend beneath the Grand Hogback, and the “Divide Creek Anticline is cut by several normal faults transverse to the fold trend” (Tyler, 1996)¹.

We recommend including a geologic structural map scaled to the area of the leased zones showing geologic structures (not just active faults and landslides) in the Final EIS. See for instance, Grout and Verbeek, 1992¹, and Tyler 1996 (basin-wide Tyler map included in the Draft EIS; details scaled to Zones 1 through 4 would help). These detailed map(s) could include:

- Fault/fracture density and orientation to help determine zones of increased potential for groundwater communication; location of bimodal or conjugate fracture sets; geometric relationships between active faults and fracture sets.
- Major structure map to identify folds on a local scale, where fracture orientation can vary and be complicated; especially near structural noses and domed features.

If active geologic structures or areas of high geothermal gradient and/or high fracture density exist, we recommend including a discussion of current Colorado Oil and Gas Conservation Commission (COGCC) well construction regulations, to assure they are sufficient to protect groundwater sources in these areas.

Discussion of Existing Ground Water Impacts Related to Industry Activities

The Draft EIS points out that “some of the domestic wells [from the Mamm Creek area] showed elevated levels of nitrate, selenium, and fluoride, but Thyne (2008) concluded that these constituents were not related to oil and gas activities in the area.” In the same report, Thyne demonstrates that increased solute concentrations in groundwater samples were delineated by increasing thermogenic methane and chloride. Thyne concludes that “drilling and production activities are the cause,” explicitly correlating impacts with oil and gas operations in the Mamm Creek area. In another study, Albrecht (2007)¹ notes increased benzene, thermogenic methane, iron and manganese indicate impact from drilling fluids and methane gas. McMahon and others (2010) also demonstrate direct correlations between oil and gas operations and groundwater contamination in the Mamm Creek area.

Understanding known impacts within existing lease zones would help identify how, specifically, risks to groundwater can be minimized. The Draft EIS states “potential impacts to groundwater resources from the proposed development would include contamination of the groundwater with produced water,

drilling mud, and petroleum constituents. With proper construction practices, drilling practices, and BMPs, no significant adverse impact to groundwater aquifers is anticipated to result from future oil and gas development” (p. 4.5-16). We recommend clarifying what the existing federal and state regulations are, and if they are sufficient to protect groundwater resources within these specific lease zones.

The following are additional recommendations on ways to ensure groundwater protection:

- Include a detailed wellbore diagram demonstrating construction requirements.
- Include a discussion of any requirements for disposal or recycling of produced water. The Draft EIS notes that produced water is “generally” disposed of off-site (p. 4.5-20), and that “up to” 100% hydraulic fracturing fluids were recycled in 2013 (p. 4.5-14). Are there any requirements or incentives to continue these practices?
- Include a discussion regarding any limits on groundwater use. The Draft EIS states “acquisition of fresh water from commercial sources for hydraulic fracturing and other drilling and completion stages would supplement local groundwater sources to minimize consumptive use and the resulting groundwater depletion (USFS 2014a, p. 144)¹” (p. 4.5-16).
- Require additional dedicated water quality monitoring wells up and down gradient of production and disposal wells, particularly in areas supporting municipal water supplies.
- Provide a discussion outlining production and disposal well P&A requirements.

Identify potential cumulative impacts related to groundwater drawdown

The Draft EIS states that “there is a low risk of depletion of groundwater resources by oil and gas drilling because fresh water for drilling is obtained primarily from surface water sources” (p. 4.5-14) implying that some freshwater comes from elsewhere (e.g. groundwater, or trucked in from offsite). In regard to cumulative impacts to groundwater, we recommend adding the following to the Draft EIS:

- The document reports 46,000 acre-feet of groundwater use from Piceance Basin aquifers in 1995 (p. 3.5-21). If the information is available, we recommend identifying how many wells are associated with this estimate, and how it scales up or down for present-day well volume and water use per well or pad. Additionally, we recommend the Final EIS include groundwater withdraw projections for each alternative, and how cumulatively that can affect the groundwater table locally and regionally.
- Since wetlands act as water purifiers, groundwater could be degraded as a result of drawdown. We recommend including in the Final EIS a discussion on how cumulative groundwater drawdown may affect wetlands, and what volume of water could be extracted before wetlands are impacted.

Surface Water Resources

As outlined in our scoping letter dated May 15, 2014 we continue to recommend consideration of a No Surface Occupancy (NSO) setback of 500 feet from private wells. This setback is an effective health and environmental protection tool because it provides an opportunity for released contaminants to attenuate prior to reaching a water supply well. It may also afford an opportunity for a release to be remediated before it can impact a well, or for an alternate water supply source to be secured. We note that a number of states including Colorado and North Dakota have adopted a 500 foot setback from occupied dwellings (and by default, the associated domestic well). Table 3.5-1 in the Draft EIS does not include the Colorado Department of Public Health and Environment (CDPHE) waterbody segment identification

numbers. These numbers directly link CDPHE water quality and impairment status to the waterbody segments. We recommend including the identification numbers, impairment status, and cause of impairment (if known) in Table 3.5-1. Additionally, in Section 3.5.3 of the Draft EIS, it is unclear if there are any impaired waterbody segments in Zone 3. Please clarify the status of impaired segments in this area. Similarly, we recommend the waterbody segment identification numbers be added to Appendix A, Table A-1, as well as a link to the most recent CDPHE Integrated Report (2012).

Within the discussion regarding the analysis of potential anthropogenic changes to watersheds, the Draft EIS briefly mentions “ecological clusters”, specifically M5R and M6R (p. 4.5-5). There are no other locations in the document where these are discussed. Please define what ecological clusters are and describe their relationship to the analysis in the Final EIS.

The document states that “The effects of sedimentation on aquatic species would range from adverse effects on species behavior and physiological functions or important activities such as spawning and reproduction” (Waters 1995)¹. It is unclear if a sediment load analysis has been completed for the Draft EIS. Please clarify. If a sediment load analysis has not been done, we recommend completing one and including in the Final EIS applying any necessary BMPs or mitigation measures that will be used to reduce sediment transport. A sediment load analysis would be a valuable addition to the analysis because there is considerable surface disturbance associated with oil and gas development and erodible soils can represent a significant nonpoint source which can impact water quality. Runoff can introduce sediments, as well as salts, heavy metals and other pollutants into surface waters. To ensure sufficient information is included about the potential impacts of soil disturbance, the EPA recommends including an estimate of erosion rates for each alternative in tons per year based on amount of surface disturbance, soil types, topography and slope. This information will allow an evaluation of the sufficiency of mitigation to avoid significant sedimentation.

2) Air Resources

Air Quality Protection

We recommend that the Final EIS identify a Preferred Alternative that includes the management actions necessary to protect air quality identified in applicable recent NEPA decisions that are relevant to the White River National Forest Previously Issued Leases. These recent decisions include: the WRNF’s Oil and Gas Leasing Final EIS/Draft ROD (2014); the BLM’s White River Field Office (WRFO) Resource Management Plan Amendment (RMPA) for Oil and Gas Development approved in August 2015; and the CRVFO RMP approved in June 2015. The EPA worked with the BLM during the development of the CRVFO RMP and specific management actions were found to be appropriate and necessary to incorporate in that RMP/EIS to reduce air quality impacts. In addition to the analysis conducted for the CRVFO RMP, the WRNF Final EIS/Draft ROD air quality analysis was closely tied to, and coordinated with, that done for the BLM WRFO RMPA.

The CRVFO and WRNF (in conjunction with the analysis prepared for the WRFO) EIS’s have identified air quality concerns and incorporated mitigation measures to minimize or avoid air quality impacts associated with oil and gas development in and around the PIL. To sustain the protections provided in these previous air quality management decisions, the decision for this EIS should be consistent with the WRNF Final EIS/Draft ROD and CRVFO RMP. Sustaining those air quality protection measures is important to minimizing or avoiding impacts that have been identified by this

analysis, as well as impacts that have been identified, or reiterated, in the other recent NEPA documents. The Draft EIS identifies impacts to ozone, visibility and nitrogen deposition and in each case, we recommend the application of further mitigation to reduce those impacts as follows:

Ozone: This region of Colorado has elevated background ozone resulting from the high altitude, the I-70 corridor and population centers, as well as surrounding oil and gas development. Generally the design values presented for background ozone near the analysis area would be classified as Moderate under the Air Quality Index (AQI), rather than Healthy. The EIS projects that the development of these leases could contribute 1.5 ppb to 2.6 ppb to total ozone concentrations. Considering the existing air quality, the proximity and effects of ozone concerns in the Uinta Basin and Rangely, and the new lower ozone standard, it is prudent to minimize ozone generated from sources in and around the planning area and the PIL's.

Visibility and Nitrogen Deposition: The Draft EIS analysis also identifies impacts of concern to air quality related values (AQRVs) including visibility impacts and nitrogen deposition. Although the Draft EIS projects as an overall improvement in visibility from modeled 2008 conditions, the cumulative visibility analysis identifies many days above both the 0.5 delta deciview (dv) and 1.0 delta dv thresholds at Flat Tops Wilderness and Maroon Bells-Snowmass for the "FLAG" methodology resulting from source groups R and S. This is an indication these source groups have the potential to impair visibility. We also note that the method for cumulative visibility analysis should actually compare the best and worst future days to natural conditions, rather than 2008 modeled conditions. The analysis also indicates that 10 of the 15 modeled scenarios exceed the deposition analysis threshold (DAT). Although the analysis does not report the total nitrogen impact associated with the contribution from this action, we believe the areas analyzed are projected to be experiencing cumulative nitrogen deposition at or above critical load thresholds. If the contributions of the project, above the DAT, are contributing to cumulative impacts above the critical load for nitrogen deposition, then the contribution from the PIL is of concern.

Recommendation: Existing conditions for ozone, visibility and nitrogen deposition in the analysis area are currently degraded. Although the project's contribution to these issues may not be major, we recommend that any contribution to an existing air quality or deposition problem be minimized, and to the extent possible, avoided. Measures taken to address and minimize regional ozone formation will also have the added benefit of reducing nitrogen deposition and visibility degrading pollutants. We welcome the opportunity as a cooperating agency to discuss this in more detail to assure that agreement is reached on the stipulations that will be included for this EIS.

Ozone/Cumulative Modeling Analysis

Section 4.2.3.2 Protection/Mitigation Measures (page 4.2-56) states that "the CARMMS regional analysis does not predict any significant air quality impact contributions associated with the new CRVFO (outside the Roan Plateau Planning Area) federal oil and gas development, even under the high-development scenario, indicating that additional stipulations containing mitigation measures beyond the applicable state and federal requirements are not warranted under any of the alternatives." From our review of the model results, there appear to be impacts that may warrant consideration of mitigation. For example, based on Table 4.2-5, it appears that there are ozone impacts of concern. There also appears to be AQRV impacts of concern. Further, it is possible that the predicted impacts are under-estimated given the uncertainties in the model performance. For instance, the CARMMS Model Performance

Evaluation (MPE) results indicated that the model was biased low for ozone and its precursors. The MPE also indicated that the wet sulfur and nitrogen deposition was underestimated. Therefore, it is possible that the predicted impacts are under-estimated given these results.

We recommend including a section that discusses the strengths and weaknesses of the modeling platform based on the results of the CARMMS MPE. We also recommend that this section explain how these uncertainties found in the MPE should be used to interpret the model results. Further, we recommend that consideration be given to mitigation measures from Table VI-I Best Management Practices and Air Emission Reduction Strategies for Oil and Gas Development in the BLM's CARPP that may be necessary.

Near-Field Modeling Analysis

Section 4.2.3 Project-Level Analysis and Near-Field Modeling Methodology (page 4.2-54) states that a project-specific, near-field impact analysis was not performed because the scope of analysis for this EIS is regional and cumulative, and project-specific, near-field analyses will be completed when detailed information for future proposed actions is known. This section also discusses the development of an Instruction Memorandum (IM) to guide the adequacy, consistency, and efficiency of these analyses. We recommend that this important commitment be carried through to the Final EIS and ROD, along with a commitment to mitigate adverse air quality impacts identified through the future project-level, near-field analyses. In addition, we recommend the Final EIS clarify that these future analyses will be made available to air quality stakeholder work groups and the public. We also recommend providing the IM to the air quality stakeholder work groups for review and comments to assist in ensuring that the approach aligns with air quality modeling guidelines from the various agencies.

3) Greenhouse Gas Emissions and Climate Change

The Draft EIS quantifies annual greenhouse gas emission estimates for Federal oil and gas activities within the entire CRVFO planning area (not including the Roan Plateau planning area) including end-use energy consumption emissions. While we appreciate BLM's efforts of including end-use calculations, providing planning level emissions in a project-level EIS does not provide meaningful information for the analysis. Instead, we recommend that the Final EIS estimate the GHG emissions associated with each of the alternatives including emissions associated with the end use to allow for a comparison of alternatives with respect to GHG impacts.

Multiple discussions included in the Draft EIS compare total expected CRVFO planning area GHG emissions with projected Colorado, U.S. and global GHG emissions. We do not recommend comparing GHG emissions to total State, U.S., or global emissions, as the comparison is not meaningful. Climate change is a global problem resulting from the emissions of many individual sources whose impacts are cumulative. The environmental impacts are best described by using emissions as a proxy when comparing the proposal, alternatives and potential mitigation. We recommend that BLM consider providing a frame of reference, such as an applicable Federal, state, tribal or local goal for GHG emission reductions, in the Final EIS, and discuss whether the emission levels are consistent with such goals. Similarly, it is not meaningful to compare CRVFO planning area GHG emissions to the 2008 USEPA modeled source. We also note that, given the substantial advancements in climate science and associated models since 2008, we do not recommend using the 2008 model in general.

The Draft EIS considers potential changes to the affected environment that may occur due to climate change (Section 4.2.4). We recommend considering climate change adaptation measures where appropriate.

The Draft EIS acknowledges BLM's decision not to include monetary estimates of the Social Cost of Carbon (SCC) in the NEPA analysis for this proposed action. The Draft EIS contains a general discussion regarding the challenges of applying the SCC. The global nature of climate change, inherent uncertainty in the estimation of the SCC, and the inability to monetize all categories of benefits and costs in a benefit –cost analysis do not necessarily preclude considering SCC in a project level analysis.^[2] Although the Interagency Working Group (IWG) on SCC estimates pertain only to CO₂ emission changes, there are methods available for monetizing some non-CO₂ GHG impacts. BLM may consider using newly published and peer reviewed estimates of the social cost of methane and social cost of nitrous oxide that are consistent with the IWG SCC estimates (Marten et al. 2014).^[3]

More broadly though, the discussion in the Draft EIS about SCC makes inaccurate statements which mischaracterize SCC. Rather than describe these in detail, we recommend that BLM remove the discussion on SCC in the Final EIS as the discussion, as currently drafted, does not appear to be relevant or necessary to BLM's analysis. If BLM would prefer to retain a discussion on SCC in the FEIS, EPA would be pleased to consult with BLM to discuss this tool and its application.

The EPA's Rating

In accordance with our responsibilities under the CAA Section 309, it is the EPA's responsibility to provide an independent review and evaluation of the potential environmental impacts of this project. In situations where a Draft EIS does not identify a preferred alternative, the EPA reviews and rates each action alternative. Based on our review, the EPA is rating Alternative 5 as "Lack of Objections – Adequate" (LO). The "LO" rating is based on the lack of potential environmental impacts associated with the cancellation of all 65 previously issued leases. The EPA is rating Alternative 3 and Alternative 4 as "Environmental Concerns – Insufficient Information" (EC-2). The "EC" rating is based on the identification of environmental impacts that should be avoided in order to fully protect the environment. The "2" rating means additional information is needed to more fully characterize impacts. Additional information is also needed on proposed mitigation measures. Finally, the EPA is rating Alternative 2 as "Environmental Objections – Insufficient Information" (EO-2). The "EO" rating is based on significant environmental impacts associated with relying on protections established in the 1993 WRNF Oil and Gas Leasing Final EIS/ROD, without taking into consideration changes in laws, regulations, policies, and conditions since 1993. A full description of the EPA's rating system can be found at: <http://www2.epa.gov/nepa/environmental-impact-statement-rating-system-criteria>.

^[2] In 2008, when the U.S. Ninth Circuit Court of Appeals remanded a fuel economy rule to DOT for failing to monetize CO₂ emissions, it noted that "[w]hile the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero."

^[3] See, for example, EPA's [Regulatory Impact Analysis](http://www3.epa.gov/airquality/oilandgas/pdfs/og_prop_ria_081815.pdf) of the Proposed Emission Standards for New and Modified Sources in the Oil and Natural Gas Sector (August 2015) for a complete discussion. http://www3.epa.gov/airquality/oilandgas/pdfs/og_prop_ria_081815.pdf

Thank you for the opportunity to provide comments on the Draft EIS. If you have any questions or comments, please feel free to contact me at 303-312-6704, or your staff may contact David Fronczak at 303-312-6096 or fronczak.david@epa.gov.

Sincerely,



Philip S. Strobel
Director, NEPA Compliance and Review Program
Office of Ecosystems Protection and Remediation

cc: Greg Larson, BLM