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GEOG 5385 - EIS Critique

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I. Introduction

In 2015 the Bureau of Land Management (BLM) Colorado River Valley Field Office in Silt, Colorado, prepared the Environmental Impact Statement (EIS), *Previously Issued Oil and Gas Leases in the White River National Forest Draft EIS,* to analyze the potential impacts of cancelling, reaffirming, or modifying 65 federal oil and gas leases within the White River National Forest. The leases were issued between 1995 and 2012. An earlier EIS for these leases was completed in 1993 and is no longer adequate due to changes in laws and regulations as defined by the National Environmental Policy Act (NEPA).

This analysis required a Reasonably Foreseeable Development Scenario (RFDS) of potential oil and gas leasing activity within the analysis area. As stated in the Draft EIS, its purpose is to estimate future oil and gas exploration and development in order to evaluate potential effects that could happen if leasing are approved. The RFDS found that a total of 444 wells are projected within the 65 leases (unevenly distributed) and 4 percent of all wells will be horizontally drilled.

II. Summary of Findings

This is a review of the aforementioned Draft EIS with particular attention to chapters 1-3.1, 3.5 (Volume 1) and 4.5 (Volume 2), with specific regards to Water Resources.

- Chapter 1 clearly defines the Purpose and Need for Action.
- Chapter 2 fairly outlines a reasonable range of Alternatives including the Proposed Action.
- Chapter 3.1-3.5 satisfactorily describes the Affected Environment for water resources.
- Chapter 4.5 is less successful in analyzing the Environmental Impacts for water resources.

Overall the Draft EIS is successful in conveying the rationale behind the Proposed Action. However, many shortcomings persist, mostly within the environment impact sections, which leave many holes in the reasoning.

III. Overview of the Purpose and Need (Chapter 1.3 and 1.4)

The Purpose and Need of the Action is straightforward because the leases may or may not be in compliance with NEPA and therefore an assessment is needed to determine conformity. The statement is well-defined, concise and well-rounded. It conveys exactly what it needs to—no more and no less. It lays the framework for the alternatives by simplifying the range of alternatives: reaffirm, modify or cancel the leases. It explains the history of the previously approved EIS in 1993 and why it is potentially no longer valid.

Specific Comments (with corresponding chapter and section number from EIS):

1.1.1 Background for the Draft EIS gives examples of modified regulations since 1993 to be considered in the current EIS such as, updated federal endangered and threatened species list, changes to the National Ambient Air Quality Standards, employment of the Colorado Roadless Rule, and new oil and gas drilling and production technologies. This is important because it provides specific examples of what regulations need to be addressed in the Draft EIS and why the old documents are no longer valid. This critique only addresses how water resources are affected by the modifications.

1.3 The foremost purpose of the action is to revisit and assess previous BLM decisions to issue 65 leases on Forest Service lands. Supplementary descriptions of the purpose aim to increase collaboration between the BLM and Forest Service so that resource development can meet energy needs in the most efficient manner. These descriptions are used to reinforce the purpose to comply with NEPA.

1.4 The foremost need of the action is to supply U.S. energy needs and address the NEPA regulations This need is clearly defined and straightforward. Additional need statements include trying to responsibly collaborative responsibility to issue and manage oil and gas leases. These items are also reinforcing compliance with NEPA as well as reiterating the BLM issues the leases, but the Forest Service manages the oil and gas development.

1.7.2 Issues from public scoping relating to water resources are summarized in Table 1-5 in the Draft EIS:

Table 1-5 Summary of Primary Scoping Comments

Resource	Primary Scoping Comments	Resource Issues Analyzed in EIS
Process	What NEPA deficiencies exist and by what process should the BLM address them?	Sections 1.2 through 1.5
	By what authority may the BLM cancel or modify leases?	Sections 1.2 through 1.5
	How can cooperators, agencies with regulatory authority, affected stakeholders, and other interested parties participate during the NEPA process?	Section 1.7
Purpose and Need	Should the Purpose and Need for agency action extend beyond addressing a NEPA deficiency?	Sections 1.2 and 1.3
	How should the BLM balance the requirements of its multiple use mandate under Federal Land Policy and Management Act of 1976 and the need to maintain resource values with the need to respond to the requirements of the MLA?	Sections 1.2, 1.3, and 1.5
	What are BLM's and Forest Service's respective roles and decisions to be made?	Section 1.4
Analysis Approach (General)	What RFDS and other development assumptions should be used for EIS analysis? What level of analysis is appropriate for a lease sale EIS?	Section 4.1
	How should the BLM address changed circumstances and new information in a remedial NEPA process?	Chapter 1.0; Chapter 2.0; Section 4.1
Cumulative Impacts	What reasonably foreseeable future actions are appropriate for inclusion in the cumulative impact analyses?	Section 4.1
Water Resources	How would the projected water use affect long-term availability of water sources?	Section 4.5
	How would the characteristics of the oil/gas formations, aquifer formations, and their interconnectedness affect water quality during activities such as drilling, hydraulic fracturing, or other reasonably foreseeable activities?	Sections 4.3 and 4.5
	What are appropriate setbacks for protection of public and private wells, lakes and streams, impaired waters, floodplains, or other water resources? What design features, BMPs, mitigation measures, and conditions of approval can be incorporated into the alternatives to reduce risk to water resources?	Chapter 2.0; Section 4.5
	How can the impacts from spills to water quality and other resources be minimized?	Chapter 2.0; Section 4.5
	How should water quantity and quality be monitored?	Section 4.5

After reading these issues raised through public scoping, it is more apparent how the Purpose and Need statements were derived. This table helps to clearly define the issues.

IV. Overview of the Alternatives Including the Proposed Action (Chapter 2.0)

The alternatives are mostly stated fairly well. The no action alternative is clearly defined as is the action alternative. These actions fulfill the need by attempting to meet energy needs of the U.S; stepwise addressing the deficiency of each regulatory year (1991 and 2014); and support collaboration with the Forest Service who will ultimately manage possible future development on each lease, not just the predication development of the Draft EIS, which only legally addresses the leases themselves, and not how they are the be managed.

Specific Comments (with corresponding chapter and section number from EIS):

2.2 Aside from Alternative 1 (No Action Alternative) of reaffirming all leases and Alternative 5 of cancelling all leases, the remaining Alternatives 2-4 are not clear about the differences of each.

The following is a summary of alternatives 2-4 in the Draft EIS.

- Alternative 2—Modifies leases to address inconsistencies with the 1993 EIS and ROD. Adds stipulations identified in the 1993 EIS and ROD but not attached to leases as issued.
- Alternative 3—Modifies 65 leases to match the stipulations for future leasing identified in the Proposed Action from the 2014 White River National Forest.
- Alternative 4 (Proposed Action)—Modifies or cancels the 65 leases to match the stipulations and availability decisions identified for future leasing in the 2014 WRNF Draft ROD.

Yes, the alternatives provide a reasonable range of alternatives, but the nuances between Alternatives 3 and 4 are too similar to justify creating a new alternative. The Draft EIS says the only difference between Alternatives 3 and 4 is that part of the lease coul be cancelled under Alternative 4, some leases or parts of leases would be cancelled to match either the 1993, 2014 or future regulations. So why have an alternative 3 to begin with?

These alternatives try to meet the Needs of the action by finding the right amount of stipulations to cultivate oil and gas fields. The range of alternatives attempts to address the NEPA deficiency by finding the right amount of stipulations to implement.

2.6 The Draft EIS skirts the requirements for mitigation and monitoring by pushing these measures onto site-specific analysis. The Draft EIS states that it is unclear what each site would require to minimize and mitigate impact. Yet many scoping comments address this issue and look for answers in the Draft EIS. Given the amount of controversy surrounding the Draft EIS, this issue is poorly treated and could use improvements by supplying examples of mitigation and monitoring.

2.8 Each alternative section contains a table of stipulations per leased acreage. These results are shown from Table 2.9 in the Draft EIS below. The table displays the logic that by gradually adding more stipulations in each alternative, the impact progressively decreases.

Summary of Environmental Impacts and Resource Protections

Resource Affected	**Alternative 1 – No Action**	**Alternative 2 – 1993 Stipulations**	**Alternative 3 – 2014 Stipulations**	**Alternative 4 – …Plus option to cancel: Preferred**	**Alternative 5 – Cancel all Leases**
Surface Water	There are no stipulations specifically designed to minimize adverse impacts to surface water resources under this alternative. General NSO stipulations for coverage of other resources would, if implemented, limit development of 23% of Colorado Source Water Assessment and Protection (CSWAP)	Same as Alternative 1, except that 11% of the SWPP areas would be covered by general NSO stipulations.	There are two NSO stipulations specifically designed to minimize adverse impacts to surface water resources Resource-specific stipulations that limit surface disturbance would cover 7% of CSWAP areas, 89% of COGCC Rule 317B areas, 9% of	There are two NSO stipulations specifically designed to minimize adverse impacts to surface water resources. The combination of the resource-specific NSO lease stipulations and areas closed to leasing would cover 45% of CSWAP	There would be no stipulations needed for protection of surface water resources. Surface disturbance from decommissio ning and reclaiming existing wells and infrastructure would be temporary and surface water would be protected by implementati

	areas, 9% of Local Source Water Protection Plans (SWPP); 11% of Outstanding Waters, 52% of impaired and monitored waters, and 23% of perennial streams. No stipulation coverage would be provided for COGCC Rule 317B areas.		SWPP areas, 99% of Outstanding Waters, and 100% of Impaired Waters and perennial streams. General NSO stipulations including those for other resources would cover up to 88% of the CSWAP areas, 92% of COGCC Rule 317B areas, 88% of the SWPP areas; 99% of the Outstanding Waters, , and 100% of perennial streams and impaired and monitored waters.	areas, 89% of COGCC Rule 317B areas, 98% of SWPP areas, 99% of Impaired Waters, and 100% of Outstanding Waters and perennial streams. General NSO stipulations including those for other resources and the areas closed to leasing would cover up to 93% of CSWAP areas, 92% of COGCC Rule 317B areas. 99% of the SWPP areas. and100 % of, Outstanding Waters, impaired and monitored waters, and perennial streams would be precluded from surface disturbance.	on of mitigation measures until reclamation success occurs.
Groundwater	There are no stipulations	Similar to Alternative 1,	There are CSU	Similar to Alternative 3,	Once reclamation

	designed specifically to minimize impacts to groundwater resources under this alternative. Areas of high aquifer sensitivity in Zone 1 would have the most protection from NSO lease stipulations designed to cover other resources, should they be implemented.	with slightly more coverage in Zone 3 due to increased acreage of NSO stipulations.	stipulations designed to minimize adverse impacts to groundwater under Alternative 3. These stipulations, combined with the NSO stipulations intended to cover other resources, would provide more coverage of groundwater resources and aquifers compared to Alternative 1.	with additional coverage of groundwater resources in the areas that would be closed to leasing.	is completed, this alternative would have the lowest potential to adversely affect groundwater resources because there would be no mineral development.

V. Affected Environment – Water Resources

Specific Comments (with corresponding chapter and section number from EIS):

3.5.1.2 All surface waters are located within the Colorado River Basin and includes detail down to the 6th-level subwatersheds, that encompass the leases under consideration for direct, indirect, and cumulative effects to water resources. This is very specific and describes the area affected surface water resources.

3.5.13. The affected water resources include water quality, which uses classifications based on State of Colorado's Source Water Assessment and Protection (CSWAP) Program. This program aims to protect surface water sources and groundwater under the influence of surface water which are connected by drainage networks upstream. "CSWAP zones" for water sources are delineated based on the concept of buffer zones gradations around the wells. The buffer zones and upstream zones described here are used later in the impact chapter.

The affected water resources also include water use. The Colorado Division of Water Resources reports approximately 42,000 cubic feet per second are allocated to three counties. Of these rights, there are 5,400 cubic feet per second that are allotted to Industrial use, which included oil and gas development. These are the baselines for further impact analysis.

3.5.5 Groundwater use is affected regionally by the hydrologic units and the Draft EIS makes an important distinction between alluvial and bedrock aquifers. Alluvial aquifers have better flow rates and water quality because of the increase in porosity and permeability due to grain sizes. On the contrary, bedrock aquifers have low permeability and flow rates, higher total dissolved solids concentrations, and they are typically associated with hydrocarbon-bearing strata and therefore have lower quality of water. This distinction of aquifer type comes up again in the impact assessment. This emphasizes the importance of alluvial aquifers for groundwater and its sensitivity and susceptibility.

Groundwater use if also affected by quality and quantity. Depending on the zone, groundwater withdrawals range from 993 to 46,000 acre-feet, with most of the water being drawn from alluvial aquifers.

In the Draft EIS the quality of water in alluvial aquifers TDS concentrations range between 1,000 milligrams per liter (mg/L), up to over 7,000 mg/L. The majority of the samples exceeded the USEPA secondary drinking water standard of 500 mg/L. Both groundwater quantity and quality are assessed in the impact analysis.

Groundwater contamination is the last affected resource and one that was controversial during public scoping. The Draft EIS states the possibility of multiple sources of groundwater contamination. Alluvial aquifers are most sensitive because they are used the most and their characteristics including their connectivity to surface waters. Additional concerns are that contamination from construction of oil and gas wells threaten groundwater. The CSWAP program has also run an assessment for protecting groundwater resources. This all would seems like it should lay the framework for a measurement indicator, but it does not.

VI. Environmental Consequences – Water Resources

Specific Comments (with corresponding chapter and section number from EIS):

4.5.1.1 The Draft EIS contains measurable indicators such as buffers around sensitivity zones, buffer of water supply protection zones, percentage of coverage for protected waters, outstanding waters, impaired water, perennial rivers and streams. Soils and wetland are discussed in other chapters of the Draft EIS. While the baselines are provided, there is no mention of significant thresholds. One possible given explanation is that the approval of the lease itself does not impact surface and groundwaters, but the act of developing them, as designed in site-specific analysis and thus, cannot be predicted through the leasing action.

4.5-3 The Draft examines water resources impact parameters for each alternative. Below is an example of one cumulative table from the No Action alternative:

Table 4.5-3 Percent of Surface Water Resources Indicators Covered by Stipulations under Alternative 1

	Resource Coverage	Alternative 1 Total	Zone 1	Zone 2	Zone 3	Zone 4
State CSWAP Areas	Unrelated NSO/CTL	23	100	33	8	2
COGCC Rule 317B Areas	Unrelated NSO/CTL	0	No Resource	0	No Resource	No Resource
Local SWPP Areas[1]	Unrelated NSO/CTL	9	No Resource	42	9	No Resource
Outstanding Waters	Unrelated NSO/CTL	11	No Resource	0	12	No Resource
Impaired and Monitored Waters	Unrelated NSO/CTL	52	No Resource	52	No Resource	No Resource
Perennial Streams	Unrelated NSO/CTL	23	No Resource	52	17	0

4.5.15 The summary of impacts state "Compared to the No Action Alternative, Alternatives 2 through 5 in general progressively provide increased coverage to surface water resources inside the lease boundaries through stipulations that would limit surface disturbance and minimize erosion and sedimentation. However, the increased coverage to the lease areas may have the opposite impact to the areas outside the leases by causing the disturbance to occur off-lease. Therefore, Alternatives 2 through 4 may increase the risk of impacts to water resources in the areas immediately adjoining the leases, although Alternative 4 would have less increase because of the leases cancelled due to the areas closed to leasing in Zone 3. Alternative 5 would provide the most coverage to water resources, including those outside the lease areas." This is the logical selection, but it still does not explain the need for Alternative 3.

4.5.16 The cumulative effects are reported as the tendency of the oil and gas industry's reliance on surface water resources and recycling of fracturing fluids instead of using fresh groundwater, which would likely cause little cumulative impact on groundwater availability. The Draft EISs contends that because the oil and gas reservoirs are isolated from the shallow aquifers it is unlikely that hydraulic fracturing would adversely affect underground sources of drinking water. This is another lost opportunity of the Draft EIS to address the public real concern of hydraulic fracturing.

The Draft EIS does admit that the increase of wells using water could increase the communication between surface water and groundwater, thereby increasing the risk of

water contamination. In addition, increased activity would increase the risk of unintended spills and well failures contributing to groundwater contamination. Furthermore, even though it is unlikely that an unintended accidents could exacerbate or create a cumulative effect.

VII. Other

The Draft EIS uses several maps and some figures. Most of the elements of the maps were adequate, but they all had legibility problems with labels, maybe from poor copy quality. They all had relative well thought out cartographic decisions, but the muted colors are hard to distinguish between the hill shading effect of topography and the Private Surface Ownership. Overall the maps were well utilized. There is also a nice figure of the hydrologic units that is easier to digest than in paragraph form.

While the Draft EIS addresses many of the issues of concern by the public, mostly the EIS is disappointing in its reply to public involvement. The EIS claims most concerns are out of scope and should be addressed by site-specific analysis or claims that their concerns are unwarranted. It's hard to know if this is a brushoff or valid conclusions by the BLM.